



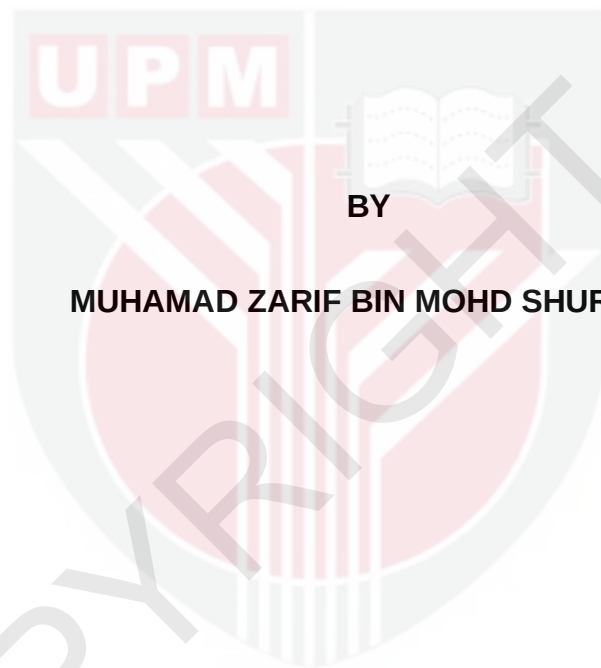
UNIVERSITI PUTRA MALAYSIA

***FACTORS INFLUENCING PARENTAL AWARENESS OF
MUSCULOSKELETAL DISORDERS IN RELATION TO HEAVY
BACKPACKS CARRIED BY PRIMARY SCHOOL CHILDREN IN SERI
KEMBANGAN, SELANGOR.***

MUHAMAD ZARIF BIN MOHD SHURKRI

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BY

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**Thesis submitted in fulfilment of the requirement for the degree of
Bachelor of Science in Environmental and Occupational Health with
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I would like thank God, for letting me through all these difficulties. I have experienced your guidance day by day. You are the one who let me finish this degree. I will keep trusting you for my future.

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ABSTRACT

FACTORS INFLUENCING PARENTAL AWARENESS OF MUSCULOSKELETAL DISORDERS IN RELATION TO HEAVY BACKPACKS CARRIED BY PRIMARY SCHOOL CHILDREN IN SERI KEMBANGAN, SELANGOR.

MUHAMAD ZARIF BIN MOHD SHURKRI

Introduction: Most school children use a backpack which weighing more than 10% of their body weight. Children who carry excessive burdens in their schoolbags on a regular basis may develop musculoskeletal disorders such as lower and upper back discomfort, shoulder pain, and neck pain which is linked to discomfort and impairment in children. It is essential for parents to be aware of this issue to prevent worst health problems in their children. **Objective:** The main objective of this study is to assess the awareness level of the parents about heavy backpack effects to their children health. **Methodology :** This was a cross sectional study, involving 119 pairs of parents and their children aged between 8 to 11 years old in SK Seri Serdang, Seri Kembangan, Selangor. The school and the respondents were purposively selected. The data was collected from 1st until 31 October. The parents were given a set of questionnaires ($\alpha=0.7$) consist of five sections namely socio demographic information, knowledge on school backpack, knowledge on health effect, recommendation, and anthropometric measurement. **Results and Discussion:** This study consists of 57 (47.9%) male and 62(52.1%) female respondents who are the parents of the children in SK Seri Serdang. Most of the respondent (68.1%) have diploma and lower educational level. The awareness of the parents on the health effect of heavy backpack among their children showed that 42% have high, 26% moderate, and 32% low level on the health effect of heavy backpack among their children. The anthropometric data of the children showed mean $\pm$ SD of weight = 34.32 ± 9.25 kg, height = 140.13 ± 6.38 cm and body mass index = 18.31 ± 4.57 kg/m². The mean $\pm$ SD of school backpack weight = 4.60 ± 1.03 kg. A total of 40.3% of the children carry backpack which exceeded the recommended weight. This study found that educational level ($\chi^2 = 6.71$, $p = 0.035$) of the parents is significantly associated with the parent's awareness level. **Conclusion:** Less than half of the parents are highly aware on the health effect of heavy backpack on their children. Parents with higher educational level showed higher awareness level as compared with those with lower educational level. Hence, awareness campaign on the health effect of heavy backpack among school children shall be done among the parent's association.

Keyword: awareness, socio demographic, BMI , heavy backpack, school children

ABSTRAK

FAKTOR-FAKTOR YANG MEMPENGARUHI KESEDARAN IBU BAPA TERHADAP MASALAH MUSKULOSKELETAL BERHUBUNG BEG GALAS BERAT YANG DIBAWA OLEH KANAK-KANAK SEKOLAH RENDAH DI SERI KEMBANGAN, SELANGOR.

MUHAMAD ZARIF BIN MOHD SHURKRI

Pendahuluan: Kebanyakan kanak-kanak sekolah menggunakan beg galas yang beratnya melebihi 10% daripada berat badan mereka. Kanak-kanak yang membawa beban berlebihan dalam beg sekolah mereka secara tetap boleh mengalami gangguan muskuloskeletal seperti ketidakselesaan bahagian bawah dan atas belakang, sakit bahu dan sakit leher yang dikaitkan dengan ketidakselesaan dan kecacatan pada kanak-kanak. Adalah penting bagi ibu bapa untuk mengetahui isu ini untuk mengelakkan masalah kesihatan yang paling teruk pada anak-anak mereka. **Objektif:** Objektif utama kajian ini adalah untuk menilai tahap kesedaran ibu bapa tentang kesan beg galas berat kepada kesihatan anak-anak mereka. **Metodologi :** Kajian ini adalah kajian keratan rentas, melibatkan 119 pasangan ibu bapa dan anak-anak mereka yang berumur antara 8 hingga 11 tahun di SK Seri Serdang, Seri Kembangan, Selangor. Sekolah dan responden telah dipilih secara bertujuan. Data dikumpul dari 1 hingga 31 Oktober. Ibu bapa telah diberikan satu set soal selidik ($\alpha = 0.7$) terdiri daripada lima bahagian iaitu maklumat sosio demografi, pengetahuan tentang beg galas sekolah, pengetahuan tentang kesan kesihatan, pengesyoran, dan pengukuran antropometri. Keputusan dan Perbincangan: Kajian ini terdiri daripada 57 (47.9%) responden lelaki dan 62 (52.1%) perempuan yang merupakan ibu bapa kepada kanak-kanak di SK Seri Serdang. Kebanyakan responden (68.1%) mempunyai pendidikan diploma dan kebawah. Kesedaran ibu bapa terhadap kesan kesihatan beg galas berat dalam kalangan anak mereka menunjukkan bahawa 42% mempunyai tahap tinggi, 26% sederhana, dan 32% rendah terhadap kesan kesihatan beg galas berat di kalangan anak-anak mereka. Data antropometrik kanak-kanak menunjukkan min $\pm$ SD berat = 34.32 ± 9.25 kg, tinggi = 140.13 ± 6.38 cm dan indeks jisim badan = 18.31 ± 4.57 kg/m². Min $\pm$ SD berat beg galas sekolah = 4.60 ± 1.03 kg. Sebanyak 40.3% kanak-kanak membawa beg galas yang melebihi berat yang disyorkan. Kajian ini mendapati bahawa tahap pendidikan ($\chi^2 = 6.71$, $p = 0.035$) ibu bapa dikaitkan secara signifikan dengan tahap kesedaran ibu bapa. Kesimpulan: Kurang daripada separuh ibu bapa sangat menyedari kesan kesihatan beg galas berat kepada anak-anak mereka. Ibu bapa yang berpendidikan tinggi menunjukkan tahap kesedaran yang lebih tinggi berbanding mereka yang mempunyai tahap pendidikan yang rendah. Justeru, kempen kesedaran tentang kesan kesihatan beg galas berat di kalangan murid sekolah hendaklah dilakukan dalam kalangan persatuan ibu bapa.

Kata kunci: kesedaran, sosio demografi, BMI ,beg galas berat, kanak-kanak sekolah

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LIST OF ABBREVIATIONS

WHO	World Health Organization
AOTA	American Occupational Therapy Association
MOE	Ministry of Education Malaysia
JKEUPM	University Ethics Committee Involving Human Subjects of Universiti Putra Malaysia
SPSS	Statistical Package for Social Sciences
NIOSH	National Institute of Occupational Safety and Health
BMI	Body Mass Index
PIBG	Parents and Teacher Association

CHAPTER I

INTRODUCTION

1.1 Background of Study

Most adults and children use a backpack on a regular basis. However, children are particularly vulnerable to the negative effects of carrying a backpack that weighs more than 10% of their body weight, which can lead to musculoskeletal disorders such as lower and upper back discomfort, shoulder pain, and neck pain (Kitsner et al., 2013).

The weight of the backpack and its negative effects are a major topic of concern. Pain or discomfort, postural dislocation, changed movement patterns, and other physiological changes have all been linked to carrying a large schoolbag, according to research (Puckree et al., 2004). Aside from the weight of the bag, the type of bag and time of carrying, as well as the placement of the bag at the back of the person, can all impact the development of back discomfort (Guessogo, 2020). It will also increase spine instability, which may raise the likelihood of spinal tissue damage and, as a result, proprioceptive impairments. This problem has the potential to be persistent in the long-term and may contribute to scoliosis disease.

Furthermore, improper use of backpacks can lead to abnormal spine curvature and increased muscle activation, which in turn can lead to musculoskeletal disorders. According to a study by Pirpiris et al. (2002), carrying a backpack on one shoulder increases muscle activation on the opposite side of the body, leading to muscle imbalances and potential musculoskeletal problems.

It is essential for parents to be aware of this issue to prevent similar health problems in their children. Overloading, inappropriate, or badly worn backpacks induce physical stresses in children, resulting in significant forward lean of the head and trunk. This daily discontinuous postural adaptation is linked to discomfort and impairment in children. The American Occupational Therapy Association (AOTA) highlighted some backpack safety criteria, such as loading and wearing a backpack. Many parents undoubtedly pay little or no attention to backpack design, cushioning, and total weight when selecting a backpack (Chalise et al., 2020). They may also be unaware of the acceptable backpack weight, or how to properly lift, carry, or wear a backpack.

Parents are the main source of providing proper schoolbags in terms of weight, size, straps, and waist support to their children, as well as monitoring how and for how long they carry the backpack (Chalise et al., 2020). They can also notice early indications in their children, such as discomfort or incorrect posture, and contact with medical specialists. In the perspective of Malaysia's education system, we may see students wearing large schoolbags on a regular basis. This should be a big issue for both parents and society. As a result, parental awareness aids in the purchase of secure schoolbags for their children as well as the reduction of the burdens carried by them.

In summary, the weight and improper use of backpacks can lead to various musculoskeletal disorders, making it essential for parents to be aware of the issue and take appropriate action. By understanding the potential risks and taking steps to ensure their children use backpacks safely, parents can help prevent musculoskeletal problems and promote the long-term health and well-being of their children.

1.2 Problem Statement

In recent years, the weight of schoolbags carried by primary school children in Malaysia has become a significant issue, with a non-scientific survey conducted at a primary school in Kuala Lumpur indicating that most children found carrying a schoolbag to be a difficult task (The Star, 2012). Research conducted by Shuhaimi and Rahman (2020) found that over 59.3% of respondents in government schools carried schoolbags weighing more than 10% of their body weight, and 14.3% of respondents in private schools reported the same.

Furthermore, the weight of schoolbags in Malaysia is much higher than recommended, with a study in the South China Morning Post (2017) revealing that school backpacks weighed an average of 4.9kg, which was 63% higher than the recommended weight. Shuhaimi and Rahman (2020) also found that the weight of the schoolbag and the way in which it was carried were risk factors for developing back pain in primary school children, with 32.1% of the children they surveyed suffering from low back discomfort due to carrying heavy schoolbags.

Although several studies have found adverse effects, prevalence, and risk factors associated with schoolbag use, such as back pain in younger children, the general public remains largely unaware of this issue (Ponarac et al., 2021). Physicians are frequently asked for advice on the preferred type of schoolbag and how to carry it to avoid the risk of back discomfort, indicating a lack of awareness among parents and school authorities (Paezmoguer et al., 2019).

Although the Minister of Education has attempted to address the issue by introducing lockers in schools, urging publishers to divide materials into volumes, and forming habits when packing bags (Hazlina, 2018), the problem continues to affect students, with no clear solutions in sight. Moreover, there has been little research conducted on the issue of schoolbag weight in Selangor. As a result, there is a need to investigate parents' awareness of heavy backpacks and their effect on their children's health in Seri Kembangan, Selangor, with the intention of determining the extent of parental awareness and identifying areas where educational and intervention programs can be implemented. By conducting this research, we can develop a better understanding of the issue and work towards finding effective solutions to reduce the burden of heavy schoolbags on primary school children.

1.3 Study Justification

Carrying heavy schoolbags was a widespread issue that had been associated with negative health outcomes in children. Therefore, it was crucial to address this problem in a comprehensive manner, and this study aimed to contribute to that effort by examining the awareness of parents regarding the effects of heavy backpacks on their children's health. This study filled a significant gap in the literature by investigating this issue in Seri Kembangan, Selangor, where there had been very few studies conducted.

By examining the awareness level of parents regarding the effects of heavy backpacks, this study aimed to provide valuable evidence that could be used to raise awareness about the importance of reducing the weight of children's backpacks. Moreover, the findings of this study could be used to justify the need to focus on improving parental awareness of the impact of heavy schoolbags on their children's health, which could potentially lead to improved health outcomes for children.

Another important aspect that this study addressed was the influence of sociodemographic factors on parental awareness. By identifying these factors, policymakers and school authorities could develop targeted interventions that could help raise awareness among parents who may be more susceptible to low levels of awareness. This was particularly important since a lack of awareness could be influenced by various factors, such as the parents' educational background, age and gender.

The evidence gained from this study could also be used to develop policies and strategies that could help reduce the weight of children's backpacks. For example, authorities could use this evidence to promote the use of digital textbooks or other technological solutions that could lessen the weight of children's backpacks. Moreover, the evidence could be used to guide the development of educational materials, such as pamphlets or videos, that could help raise awareness about healthy backpack practices among parents, teachers, and students.

Additionally, this study provided benefits to school communities by acting as a tool to provide information regarding healthy school backpack practices. School authorities could use the findings of this study to develop guidelines on the weight and content of children's backpacks, which could improve children's daily activities in school. This could include the implementation of locker systems or providing students with trolleys to transport their books and other materials, reducing the burden of carrying heavy backpacks.

The findings of the study can contribute to the development of new policies and strategies by providing evidence that can inform decision-making. For example, authorities can use the evidence to promote the use of digital textbooks or other technological solutions that can lessen the weight of children's backpacks. The evidence can also guide the development of educational materials, such as pamphlets or videos, that can help raise awareness about healthy backpack practices among parents, teachers, and students. Moreover, the study can provide school authorities with the necessary information to develop guidelines on the weight and content of children's backpacks, which can improve children's daily activities in school. Overall, the evidence gained from the study can be used to develop targeted interventions and policies that can help reduce the weight of children's backpacks and improve health outcomes for children.

In conclusion, this study had the potential to make a significant contribution to the current understanding of the awareness of parents regarding the effects of heavy schoolbags on their children's health in Seri Kembangan, Selangor. The evidence generated from this study could be used to develop targeted interventions to improve parental awareness and develop policies that could help reduce the weight of children's backpacks, leading to improved health outcomes for children.

1.4 Research question

The present study has several research questions that need to be answered namely:

1. What is the socio-demographic information of the parents and the children?
2. What is the anthropometric measurement of the children?
3. What is the weight of the children's backpack in school?
4. What is the awareness of parent regarding health effect of heavy backpack?
5. Is there any significant association between awareness of parents regarding effect of heavy backpack and backpack weight of school children.
6. Is there any significant association between awareness of parents and sociodemographic information?
7. Is there any significant association between anthropometric measurement and health effect of carrying heavy backpack?

1.5 Research Objectives

1.5.1 General Objectives

The main objective of this study is to assess the awareness level of the parents about heavy backpack effects to their children health.

1.5.2 Specific Objective :

1. To assess the socio-demographic information of the parents .
2. To determine the anthropometric measurement of the children.
3. To determine the weight of the children's backpack in school.
4. To assess awareness of parent regarding the health effect of heavy backpack.
5. To determine the association between awareness of parents regarding effect of heavy backpack and backpack weight of school children.
6. To determine the association between awareness of parents regarding heavy school backpack effect to their children and socio-demographic information.
7. To determine the association between awareness of parents regarding health effect of heavy backpack and the anthropometric measurement.

1.6 Research Hypothesis

Research hypothesis of the study are as follows:

1. There is significant association between awareness of parents regarding effect of heavy backpack and backpack weight of school children.
2. There is significant association between awareness of parents regarding heavy school backpack effect to their children and sociodemographic information.
3. There is significant association between anthropometric measurement and health effect of carrying heavy backpack.

1.7 Conceptual Definition

This section will discuss the conceptual and operational definitions of several study variables applied in this study. As for the conceptual definition, it is obtained through experts of this research field while the operation definitions are applied according to relevant concepts to be used in this context of the study.

1.7.1 Awareness

Conceptual : The awareness in this study can be referred to public or common knowledge or understanding about a social, scientific multicultural awareness. If individuals have greater awareness mean they have greater knowledge of such subjects (Gafoor, 2012).

Operational: Awareness in this study is measured using a questionnaire format and the score level is determined by the addition of score from Section B and C.

1.7.2 Anthropometric measurement

Conceptual: Anthropometry is the science of obtaining systematic measurements of the human body(*Biology Dictionary*, 2017).

Operational: Anthropometric measurements involve in this study are height, weight and body mass index (BMI)

1.7.3 Primary school children

Conceptual: Children are those who categorized below age 14 years old (Jabatan Penerangan Malaysia, 1991). Primary school children in Malaysia consist of children who have range of age from 7 years old until 12 years old (Ministry of Education, Malaysia).

Operational: Student of Standard 4, 5 and 6 from primary school in Selangor who fulfil the inclusive criteria such as Malaysian citizen and children with no history of fractures or injuries of the lower extremities in the past year.

1.7.4 Health effect

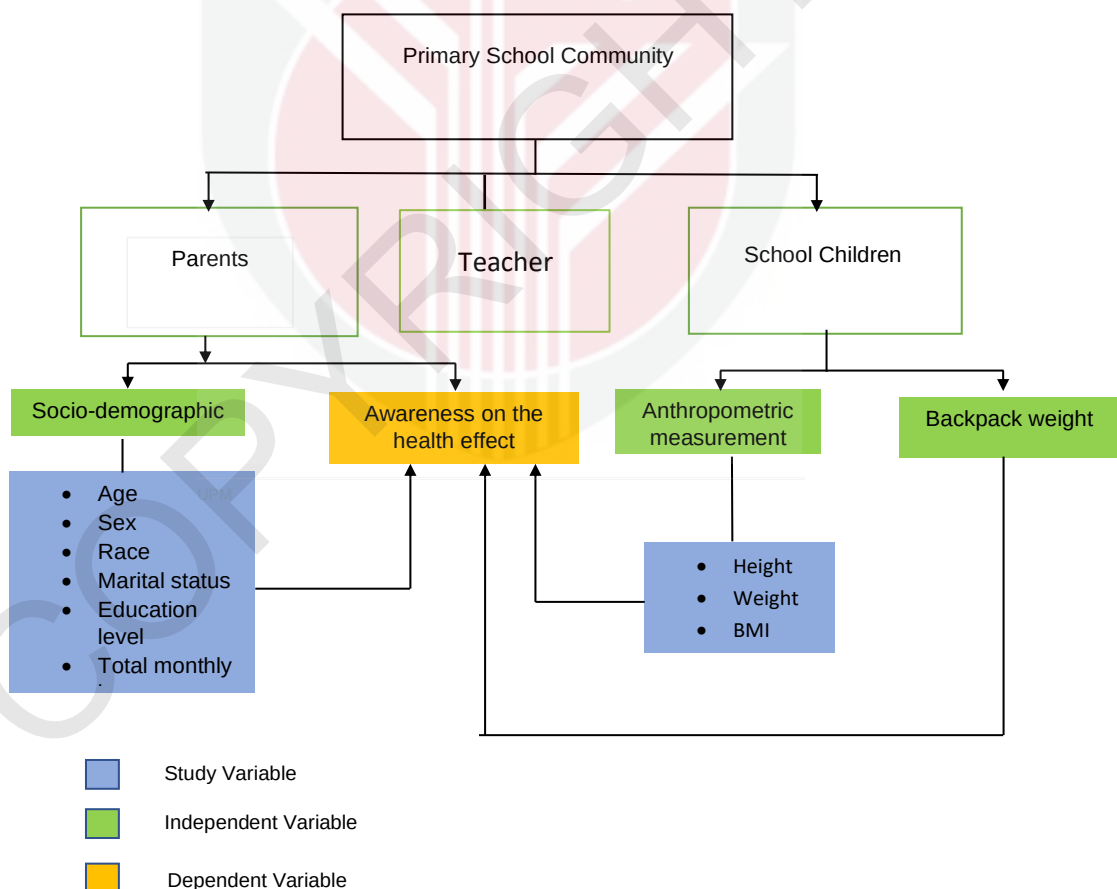
Conceptual: Health effect can be defined in this study as the changes in health, for short-term or long-term which resulting from exposure of carrying heavy backpack to school.

Operational: The health effect of carrying heavy backpack such as neck pain, back pain, shoulder pain, is measured in a questionnaire format.

1.8 Conceptual Framework

The figure below shows the conceptual framework for the study research. Based on Figure 1, there are three colours of indicator where blue box indicates the scope of study, orange box indicates dependent variables, green box indicates the independent variables. This figure shows that anthropometric measurement, backpack weight and socio demographic are the independent variable which affecting the awareness level of parent on the health effect of heavy backpack to school children.

Figure 1 Conceptual Framework



CHAPTER II

Literature Review

2.1 Backpack Characteristic

Backpacks have become a ubiquitous accessory for students, providing a convenient way to transport books, supplies, and personal belongings to and from school. However, the improper use of backpacks has been associated with negative health outcomes in children, making it essential to address this issue in a comprehensive manner. In order to mitigate the health risks associated with carrying heavy backpacks, it is important to consider the characteristics of a healthy backpack. As noted by Kellis and Emmanouilidou (2010), children's school backpacks are often selected based on aesthetics rather than ergonomics, and frequently feature thin cloth straps that provide no additional support. To avoid discomfort and potential injury, the weight of a healthy backpack should not exceed the safe limit, which according to the National Back Pain Association, is ideally less than 10% of the student's body weight and should be carried on both shoulders in a backpack type schoolbag (NIOSH, 1981).

In addition to weight considerations, a proper backpack should also have dorsal straps that help to distribute the load and lower the pressure on the student's shoulders. Mohseni (2012) found that using a backpack with two straps is preferable to using one strap, as it helps to divide the weight of a heavy bag into two parts. However, even with a suitable backpack, it is important to use it in a proper way to avoid muscle pain. According to Legg (1995), carrying a heavy bag or weight on the back is not harmful when students follow the right guidelines, such as keeping the load as close to the body

as possible and using the major muscles of the body to regulate the sufferings of muscular discomfort.

Aside from the physical attributes of a backpack, it is also important to consider the student's individual characteristics when selecting a backpack. A study by Negrini et al. (1999) found that backpack use in children can result in changes in posture, and that children with pre-existing spinal problems may be at a higher risk of developing spinal pain when carrying backpacks. For these students, backpacks with spinal support can be beneficial.

In addition, socio-demographic factors may influence the use of backpacks and the awareness of healthy backpack practices. A study by Kumari et al. (2017) found that parents with higher levels of education were more likely to be aware of the proper use of backpacks, suggesting the need for targeted interventions to raise awareness among less-educated parents.

2.2 Factor affecting weight of backpack

Carrying a school backpack is a common daily activity for schoolchildren. The weight of the backpack, however, has been found to be a concern due to its potential impact on the health of children. Studies have shown that a heavy backpack can cause musculoskeletal pain, discomfort, and fatigue, leading to an increased risk of back and neck pain (Brackley & Stevenson, 2004; Pascoe et al., 2011). Thus, it is important to understand the factors that affect the weight of school backpacks among schoolchildren.

One factor that has been identified is the academic level of the student. A study conducted by Negrini et al. (2002) found that the weight of school backpacks increased with increasing grade level. The authors noted that older students tend to carry more books and materials, which results in heavier backpacks. Similarly, a study by You et al. (2020) also found that the weight of backpacks increased with increasing grade level, with high school students carrying heavier backpacks than elementary and middle school students.

Another factor that affects the weight of school backpacks is the amount of homework assigned to students. A study by Brackley and Stevenson (2004) found that the weight of backpacks increased on days when students had more homework. The authors noted that students tend to carry more books and materials when they have more homework assignments, resulting in heavier backpacks. Additionally, a study by Negrini et al. (2002) found that the weight of backpacks was higher on days when students had more classes, as more books and materials were required for the additional classes.

The design of the backpack is also an important factor that affects the weight of the backpack. A study by Hong et al. (2016) found that the weight of backpacks varied depending on the design of the backpack. The authors noted that backpacks with multiple compartments and pockets tend to encourage students to carry more items, resulting in heavier backpacks. Similarly, a study by Brackley and Stevenson (2004) found that backpacks with wheels tend to be heavier than those without wheels, as the wheels and frame add additional weight to the backpack.

Finally, the type of school can also affect the weight of backpacks. A study by Pascoe et al. (2011) found that students in private schools tended to carry heavier backpacks than those in public schools. The authors noted that private schools tend to have more demanding academic programs and larger class sizes, which may result in heavier backpacks. Similarly, a study by Hong et al. (2016) found that students in urban schools tended to carry heavier backpacks than those in rural schools, as urban schools tend to have larger student populations and more demanding academic programs.

In conclusion, the weight of school backpacks is an important issue that can affect the health and well-being of schoolchildren. The factors that affect the weight of backpacks include the academic level of the student, the amount of homework assigned to students, the design of the backpack, and the type of school. Understanding these factors can help educators, parents, and students develop strategies to reduce the weight of backpacks and promote the health and well-being of schoolchildren.

2.3 Health effects of carrying heavy backpack

Heavy backpacks are a common problem among schoolchildren that can have serious health effects. The use of backpacks has become increasingly common among children as a way to carry their books, lunches, and other supplies. However, carrying a heavy backpack can cause a range of musculoskeletal disorders (MSDs), including back pain, neck pain, and shoulder pain, which can have a long-term impact on children's health.

A number of studies have investigated the health effects of carrying heavy backpacks in schoolchildren. A study by Mackenzie et al. (2019) found that heavy backpacks were associated with increased back pain in schoolchildren. The study surveyed 1,032 schoolchildren aged between 11 and 15 years old and found that those who carried backpacks weighing more than 15% of their body weight were at a significantly higher risk of experiencing back pain. Similarly, another study by Hrysomallis et al. (2013) found that heavy backpacks were associated with an increased risk of MSDs in schoolchildren. The study investigated 388 schoolchildren aged between 10 and 16 years old and found that those who carried backpacks weighing more than 10% of their body weight were more likely to experience MSDs.

In addition to MSDs, heavy backpacks can also have other health effects on schoolchildren. A study by Graham et al. (2008) found that heavy backpacks were associated with increased fatigue in schoolchildren. The study surveyed 212 schoolchildren aged between 11 and 15 years old and found that those who carried backpacks weighing more than 15% of their body weight were more likely to experience fatigue. The study also found that carrying heavy backpacks can lead to decreased postural stability, which can increase the risk of falls and other injuries.

The use of heavy backpacks has also been linked to changes in gait and posture in schoolchildren. A study by Negrini et al. (2004) found that carrying a heavy backpack can lead to changes in gait and posture, which can have long-term effects on children's health. The study investigated 38 schoolchildren aged between 6 and 11 years old and found that carrying a heavy backpack led to an increase in forward head posture, which can cause neck and back pain. Similarly, a study by Hong et al. (2013) found that carrying heavy backpacks was associated with changes in gait pattern, which can lead to an increased risk of falls and other injuries.

Several interventions have been proposed to address the problem of heavy backpacks in schoolchildren. These include the use of rolling backpacks, which can reduce the load on children's backs, and the implementation of backpack weight limits in schools. A study by Brackley and Stevenson (2004) found that the use of rolling backpacks can significantly reduce the load on children's backs, and can also reduce the risk of MSDs. The study investigated 129 schoolchildren aged between 9 and 12 years old and found that those who used rolling backpacks had a significantly lower risk of MSDs compared to those who used traditional backpacks. Similarly, a study by Pascoe and Pascoe (1997) found that the implementation of backpack weight limits in schools can reduce the load on children's backs and can also reduce the risk of MSDs.

In conclusion, carrying a heavy backpack can have serious health effects on schoolchildren, including musculoskeletal disorders, fatigue, changes in gait and posture, and an increased risk of falls and other injuries. Several interventions have been proposed to address the problem of heavy backpacks, including the use of rolling backpacks and the implementation of backpack weight limits in schools. It is important for parents, teachers, and school administrators to be aware of the risks

2.4 Association between awareness of parents and weight of the backpack.

Research has found that carrying a heavy backpack can lead to pain and discomfort in the neck, back, and shoulders, as well as poor posture and spinal curvature (Dianat et al., 2015). While many parents are aware of the risks associated with heavy backpack use, there is still a significant proportion of parents who are unaware of this issue. A key factor that may influence parental awareness of the risks associated with backpack weight is the weight of the backpack itself.

Several studies have investigated the relationship between parental awareness and backpack weight. One study found that parents of children who carried heavier backpacks were more likely to be aware of the risks associated with heavy backpack use (Grave et al., 2016). Another study found that parents who perceived their child's backpack to be heavy were more likely to report concerns about their child's posture and spinal health (Negrini et al., 2002). These findings suggest that parents may be more likely to recognize the risks associated with heavy backpack use if their child's backpack is particularly heavy.

However, other studies have found that there is no significant relationship between backpack weight and parental awareness (Karras et al., 2019; Schomaker et al., 2017). For example, Schomaker et al. (2017) found that while parents of children with heavier backpacks were more likely to report concerns about their child's health, there was no significant difference in awareness between parents of children with heavy and light backpacks. These conflicting findings suggest that the relationship between backpack weight and parental awareness is complex, and may be influenced by other factors such as parental education level and access to information

2.5 Association between awareness of parents and BMI of the children

The prevalence of overweight and obesity in children has increased globally in recent decades. The World Health Organization (WHO) estimates that 38 million children under the age of 5 were overweight or obese in 2019. One of the factors that may contribute to this problem is the use of heavy backpacks by schoolchildren. In recent years, there has been growing concern about the potential negative effects of carrying heavy backpacks on children's musculoskeletal system. Moreover, the lack of parental awareness regarding the impact of heavy backpacks on children's health may contribute to the increase in body mass index (BMI) in children.

Several studies have investigated the association between parental awareness of musculoskeletal disorders (MSD) caused by heavy backpacks and the BMI of their children. In a study conducted in Iran, Kordi et al. (2017) found that the prevalence of overweight and obesity was higher in children whose parents were not aware of the negative effects of heavy backpacks on their children's health. The authors suggested that increasing parental awareness could help reduce the risk of overweight and obesity in schoolchildren.

Similarly, a study conducted in Turkey by Yildiz et al. (2019) found that parental awareness of the potential harm caused by heavy backpacks was associated with lower BMI in children. The authors found that children whose parents were aware of the negative effects of heavy backpacks on their children's health had lower BMI compared to children whose parents were not aware of the potential harm. The authors suggested that educating parents about the importance of monitoring their children's backpack weight could have a positive impact on children's health.

Another study conducted in Malaysia by Lee et al. (2020) also found that parental awareness of the negative effects of heavy backpacks on children's health was associated with lower BMI in children. The authors found that children whose parents were aware of the potential harm of carrying heavy backpacks had lower BMI compared to children whose parents were not aware of the potential harm. The authors recommended that educating parents on the appropriate weight of backpacks for their children could help prevent MSD and overweight and obesity in children.

However, not all studies have found a significant association between parental awareness of MSD caused by heavy backpacks and the BMI of their children. In a study conducted in the United States, Farrelly et al. (2015) found that parental awareness of the potential harm caused by heavy backpacks was not associated with the BMI of their children. The authors suggested that other factors such as diet and physical activity levels may have a greater impact on children's BMI than the weight of their backpacks.

In conclusion, parental awareness of the negative effects of heavy backpacks on children's MSD may play a role in reducing the risk of overweight and obesity in schoolchildren. The existing literature suggests that educating parents on the importance of monitoring their children's backpack weight could have a positive impact on children's health. However, further studies are needed to explore the association between parental awareness of MSD caused by heavy backpacks and the BMI of their children, taking into account other potential factors that may affect children's BMI



2.6 Association between awareness level of parents and musculoskeletal disorder (MSD)

MSDs associated with heavy backpack use are a growing concern for primary school children, and can cause pain and discomfort in the neck, back, and shoulders, as well as poor posture and spinal curvature (Dianat et al., 2015). While many parents are aware of the risks associated with heavy backpack use, there is still a significant proportion of parents who are unaware of this issue. This lack of awareness can have serious consequences for children's health, as well as for their academic performance, as MSDs can lead to absenteeism and reduced productivity in the classroom (Carrillo et al., 2019). Understanding the factors that influence parental awareness of MSDs associated with heavy backpack use is therefore critical for developing effective strategies to promote parental awareness and reduce the prevalence of MSDs among school-aged children.

One key factor that influences parental awareness of MSDs associated with heavy backpack use is parental education level. Studies have consistently found that parents with higher levels of education are more likely to be aware of the risks associated with heavy backpack use (Dianat et al., 2015; Karras et al., 2019; Negrini et al., 2002). This may be due to the fact that parents with higher levels of education have a better understanding of health and wellness issues and are more likely to seek out information on these topics. Additionally, parents with higher levels of education may be more likely to have access to information through their social networks, such as friends or family members who work in healthcare or education.

Another factor that can influence parental awareness of MSDs associated with heavy backpack use is the age of the child. Parents of younger children are often more aware of the risks associated with heavy backpack use than parents of older children (Karras

et al., 2019; Negrini et al., 2002). This may be due to the fact that younger children are more vulnerable to the effects of heavy backpack use and may be more likely to complain about pain or discomfort. Parents of younger children may also be more involved in their children's school activities and may be more likely to receive information about the risks associated with heavy backpack use through their child's school or healthcare provider.

Gender is another factor that can influence parental awareness of MSDs associated with heavy backpack use. Several studies have found that parents of girls are more likely to be aware of the risks associated with heavy backpack use than parents of boys (Carrillo et al., 2019; Grave et al., 2016; Karras et al., 2019). This may be due to the fact that girls are more likely to report pain or discomfort associated with heavy backpack use than boys or may be more likely to seek medical attention for these issues. Additionally, parents of girls may be more likely to have social networks that include other parents who are concerned about health and wellness issues and may be more likely to seek out information on this topic.

The weight of the backpack itself is also an important factor that can influence parental awareness of MSDs associated with heavy backpack use. Several studies have found that parents of children who carry heavier backpacks are more likely to be aware of the risks associated with heavy backpack use (Grave et al., 2016; Karras et al., 2019; Negrini et al., 2002). This may be due to the fact that parents who see their child struggling with a heavy backpack are more likely to be concerned about the potential health consequences. Additionally, parents who perceive their child's backpack to be heavy may be more

2.7 Root causes for heavy backpack among schoolchildren

The root cause of heavy backpacks among schoolchildren is the combination of several factors, including the increasing amount of materials required for class, the lack of storage options available in schools, and the preference for fashionable backpack designs rather than ergonomic ones (Kellis & Emmanouilidou, 2010). As students progress through school, the amount and weight of materials they need to carry often increase, leading to heavier backpacks. Additionally, many schools do not provide enough storage options, such as lockers or cubbies, for students to store their materials during the day. This forces students to carry everything they need with them throughout the day. Finally, many students choose backpacks based on their style rather than their ergonomic design, which can lead to discomfort or pain when carrying heavy loads.

Kellis and Emmanouilidou (2010) found that students' backpacks are frequently composed of thin cloth straps that provide little to no additional support, and are preferred for their aesthetics rather than their ergonomics. The weight of a healthy backpack should not exceed the safe limit, which according to the National Back Pain Association, is less than 10% of the student's body weight and should be carried on both shoulders in a backpack type schoolbag (NIOSH, 1981). Proper backpacks should have dorsal straps that help to lower the pressure put on the shoulder of the students.

In addition to these factors, the lack of awareness among parents and educators regarding the negative health effects of heavy backpacks can also contribute to the problem. Many parents may not be aware of the recommended weight limits for backpacks or may not realize the impact that heavy backpacks can have on their children's health. Similarly, educators may not have received training on proper backpack usage or may not have the resources to provide students with alternative storage options.

Overall, heavy backpacks among schoolchildren are a complex problem with multiple contributing factors. Addressing this issue will require a comprehensive approach that includes improving storage options in schools, promoting the use of ergonomic backpacks, and raising awareness among parents and educators about the negative health effects of heavy backpacks (Kellis & Emmanouilidou, 2010). By addressing these factors, we can help to reduce the prevalence of heavy backpacks among schoolchildren and improve their overall health and well-being.

CHAPTER III

METHODOLOGY

3.1 Study Design

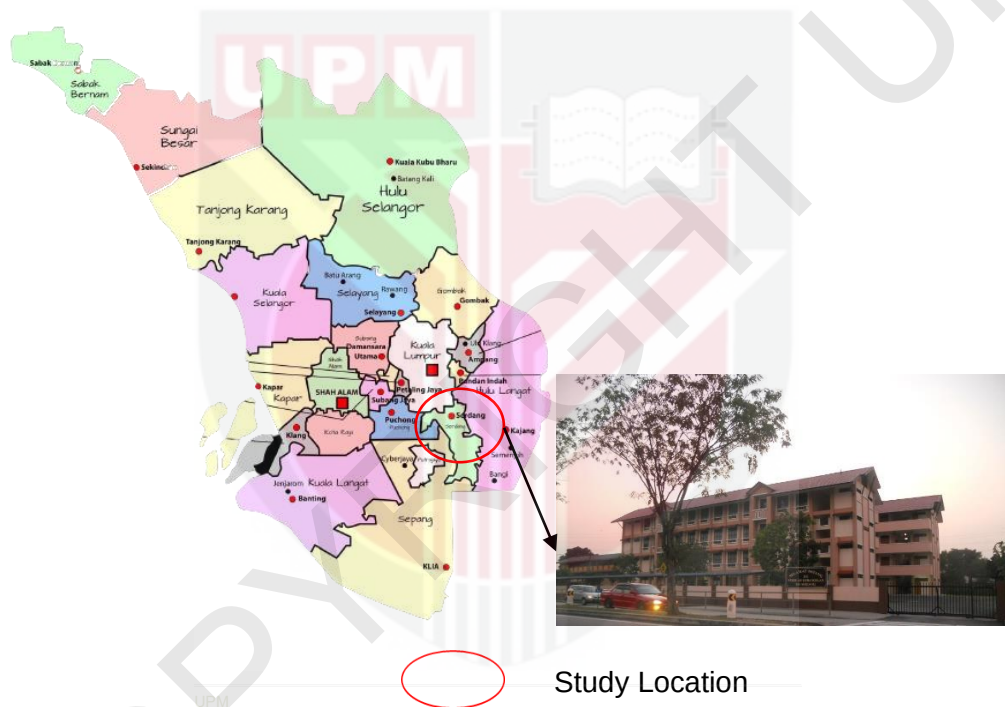
In this research, cross-sectional study was used to assess the awareness of parents on the health effect of heavy backpack to their children in Seri Kembangan, Selangor.



3.2 Study Location

The study was conducted in a primary school located in Sri Kembangan, Selangor. The school named is Sekolah Kebangsaan Sri Serdang. The school was chosen due to its accessibility for the researcher during Covid-19 Pandemic.

Figure 2: Map of Study Location in Selangor



3.3 Study Duration

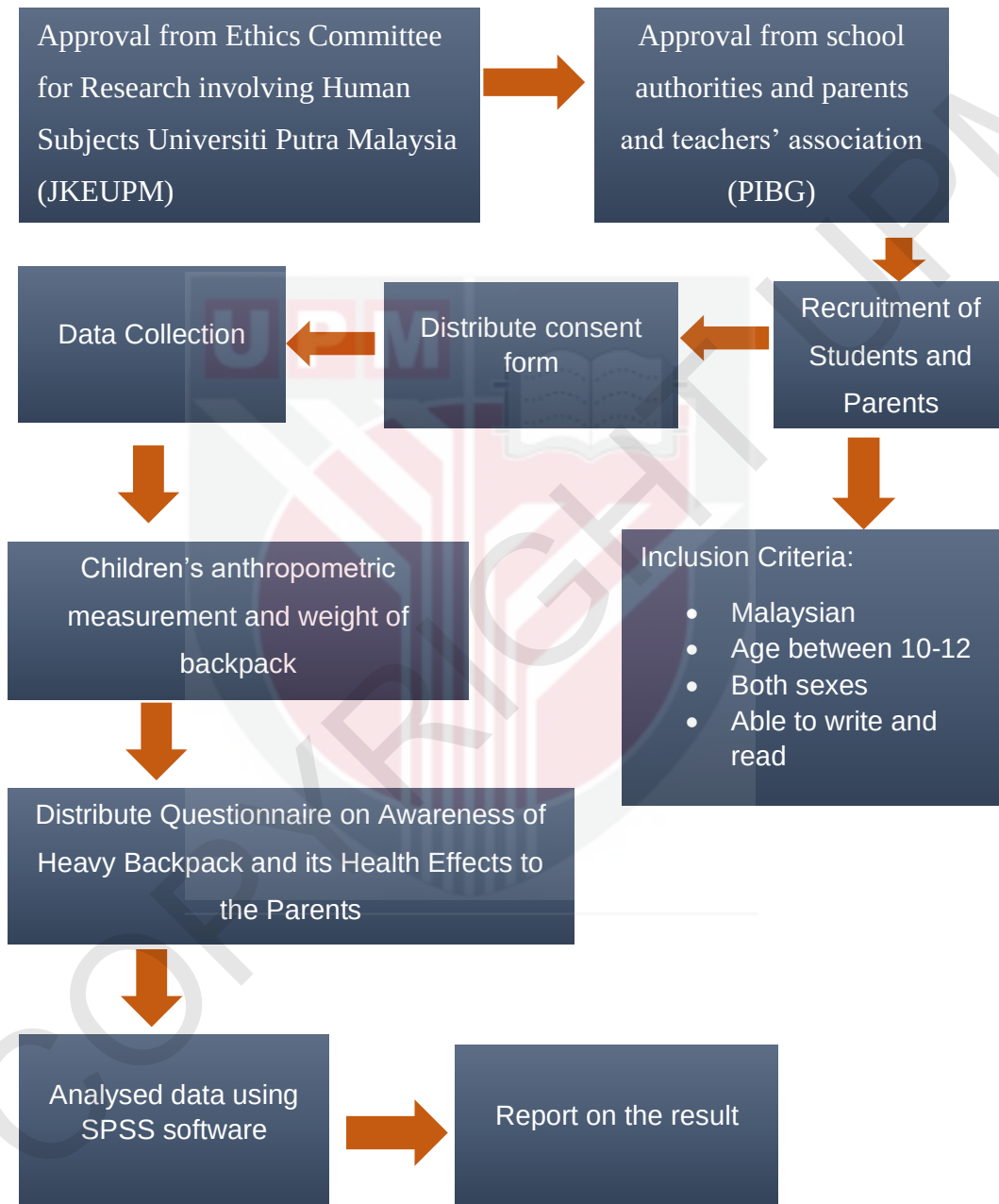
In this research, the study duration was conducted from March 2022 until January 2023

3.4 Sampling

3.4.1 Sampling Procedure

This study was conducted after receiving approval from The University Ethics Committee Involving Human Subjects of Universiti Putra Malaysia, JKEUPM,(JKEUPM-2022-408), Ministry of Education, Selangor Education Department and Principal of the participating school in the Appendix 3. Then, the following step of data collection was performed by distributing questionnaires to the parents and school children that meet the criteria. Further process on sampling procedures is showed in Figure 3 :

Figure 3 :Sampling Procedure



3.4.2 Study Population

The targeted population was the primary school community in Seri Kembangan, Selangor.

3.4.3 Study Sample

The study sample of this study consist of parent and their children who study in Sekolah Kebangsaan Sri Serdang, which is in Seri Kembangan, Selangor.

3.4.4 Sampling Frame

Sampling frame is a list of elements from which a sample may be drawn. In this study, the detailed information regarding the parents and school children were obtained from the school management itself.

3.4.4 Sampling Unit

The sampling unit is the parents and children pair that meet inclusion criteria below:

The inclusive criteria of this study:

- Malaysian
- Age between 10-12
- Both sexes
- Able to write and read

The exclusive criteria in this study:

- Children with a history of fractures or injuries of the lower extremities (part of the body that includes the leg, ankle, and foot.) in the past

3.4.5 Sampling Method

In this study, the sampling method utilized was purposive sampling. Purposive sampling was employed to select schools and classes of students that would be included in the study. The researchers carefully selected the schools to ensure that they were representative of the population of interest. Moreover, the selection of the class of students that would participate in the study was also done through purposive sampling. The school authorities provided the class list of student from Grade 4 due to the limited sampling time and availability of the other grade classes that the researchers were given.

By using purposive sampling, the researchers were able to select schools and classes of students that were most appropriate for their research questions. This method allowed them to carefully consider the characteristics of the population and to select participants who would provide the most relevant data.

3.4.6 Sample Size

The sample size calculation was determined according to the objectives of the study.

The calculation of this study sample size for the objectives were using the formula from Lwanga & Lemeshow (1991).

According to Alsiddiky et. al (2019), the prevalence of awareness among parents about schoolbag and health related issue is $P = 0.90$. The sample size for this study was calculated by using formula adopted by Lwanga & Lemeshow (1991) as from below:

$$n = \frac{Z_{1-\alpha/2}^2 P (1 - P)}{d^2}$$

where,

n = sample size

$$Z_{1-\alpha/2}^2 = 1.96$$

$$P = 0.90 \text{ (Alsiddiky et. al , 2019)}$$

d = precision (in proportion of one; if 5%, $d = 0.05$)

$$n = \frac{1.96^2(0.90) (1 - 0.90)}{0.05^2}$$

$$n = 138.298$$

$$n = 139$$

3.4.6.4 Two proportion

Assumed a desired power of 0.80, a significance level of 0.05, and a two-tailed test, the sample size formula for two proportions was calculated:

$$n = (Z_{\alpha/2} + Z_{\beta})^2 * [(p_1 * (1 - p_1)) / d^2] + [(p_2 * (1 - p_2)) / d^2]$$

where:

$Z_{\alpha/2}$ is the critical value of the normal distribution at $\alpha/2$ (e.g., for $\alpha = 0.05$, $Z_{\alpha/2} = 1.96$)

Z_{β} is the critical value of the normal distribution at β (e.g., for $\beta = 0.20$, $Z_{\beta} = 0.84$)

p_1 is the estimated proportion of the population with the characteristic of interest (parental awareness of MSD of heavy backpack) in the first group which was 0.90 based on the past study by Alsiddiky et. al (2019).

p_2 is the estimated proportion of the population with the characteristic of interest in the second group

d is the desired absolute precision (i.e., the maximum allowable difference between p_1 and p_2)

$$n = (1.96 + 0.84)^2 * [(0.9 * 0.1) / 0.052] + [(0.1 * 0.9) / 0.052]$$

$$n = 63.1$$

$$n = 64$$

3.4.6.5 Selection of sample size

The highest number of sample size is selected, where $n=139$. By considering of 5% for non-response, missing data, unavailability of subjects or refusal to participate, the sample size of this study is calculated as below:

$$N = 139 + \left\{ \frac{5}{100} \times 139 \right\}$$

$$N = 145.95$$

$$=146$$

Therefore, the sample needed for this study is 146 subjects.

3.5 Study Instrument

The study instruments in this study are a self-administered questionnaire and the anthropometric measurement. Each item in the questionnaire was developed in accordance with the research objectives of this proposed study to assess the awareness level about heavy backpack effects to their children health among parents in SK Sri Serdang.

3.5.1 Questionnaire

A self-administered questionnaire was used to collect relevant information based on the study objectives. The questionnaire is adapted from Javadivala et. al. (2012) and Maghribi et. al.(2015) and was modified according to the setting of this study. The questionnaire is modified from categorical variable into continuous variable.

In this study, the reliability of the questionnaire was evaluated using Cronbach's alpha. The Cronbach's alpha value of 0.7 obtained in this study indicates that the internal consistency of the survey instrument was moderately reliable. The value suggests that the items in the survey were measuring the same construct to a reasonable extent, and that the survey had an acceptable level of reliability for research purposes. In the past tense, it could be interpreted as: The Cronbach's alpha value of 0.7 indicated that the internal consistency of the survey instrument was moderately reliable. The value suggested that the items in the survey were measuring the same construct to a reasonable extent, and that the survey had an acceptable level of reliability for research purposes.

The questionnaire consists of five parts. The questionnaire was given to the parent before the anthropometric measurement will be done, it was distributed to the student to pass the questionnaire to their parent the before the week of measurement. The students were informed which part their parents need to fill in and if there is any problem the information to seek for help was given. A set of the questionnaires is attached in the Appendix.

3.5.1.1 Questionnaire on socio-demographic information

In section A, the items include socio-demographic and background information for the parents such as age, gender, race, and education level.

3.5.1.2 Questionnaire knowledge about school backpack

The questions in section B, is used to assess the general knowledge of school backpack among the parents, the question regarding characteristic of healthy backpack, the weight limit of a backpack and the correct way to carry a backpack were asked in this section. Correct responses receive one (1) mark, while wrong or unsure answers obtain a zero (0) mark.

3.5.1.3 Questionnaire about health effect from carrying heavy backpack

In section C, the questions were used to assess the awareness of the parent on health effect of the children carrying heavy backpack to school. The questions consist of the list of health issues that are related to heavy school backpack. The marks were added together with Section B to determine the awareness of the parent. The awareness level was divided by three categories : low (0-7), moderate (8-14), and high (15-20).

3.5.1.4 Questionnaire on recommendation

In section D, respondents were asked about measure that can be taken by the authorities to decrease the weight of student's backpack and to increase the awareness about school backpack among the parents.

3.5.1.5 Questionnaire on anthropometric measurement and the weight of children's backpack

In section E, the weight of children's backpack anthropometric measurement of the student such as weight, height, and Body Mass Index (BMI) were measured and recorded.

3.5.1.6 Anthropometrics measurement

Each of the students involved in this study was measured by using body composition scale and height scale to record their body weight, height, and Body Mass Index(BMI).

3.5.1.7 Measurement of the weight of children's school backpack

The weight of children's school backpack was measured by using the 20kg digital weighing scale.

3.5.2 Quality Assurance and Quality Control of the Questionnaire

A pre-test was conducted before data collection. The questions were in dual language, English, and Malay to make sure the questions are easier to be interpret by the respondent.

3.6 Data Collection

In order to ensure active participation from the respondents, a rigorous selection process was employed using purposive sampling based on two proportion sample size calculation to select students as the respondents for this study. This approach helped to ensure that the study results were representative of the student population in the school. Prior to the commencement of the study, necessary consent was obtained from the school authorities, students, and their parents to ensure that the study was conducted in a transparent and ethical manner.

The selected students who met the inclusion criteria of the study were provided with a comprehensive questionnaire that was divided into five sections. These sections included socio-demographic information, anthropometric measurements and weight of children's backpack, knowledge about school backpacks, knowledge about the health effects of carrying heavy backpacks, and recommendations for improving backpack usage.

To ensure that the respondents were well-informed about the study and fully understood the questionnaire, a face-to-face briefing was conducted while handing out the questionnaire. During this briefing, the importance and relevance of the study were explained to the respondents. The briefing was conducted in Malay, which is the native language of the students. The questionnaire was designed to be bilingual, in both Malay and English, to ensure that the respondents could answer the questionnaire in the language they were most comfortable with.

In an effort to minimize disruption to the student's learning, the questionnaire was distributed to the students during the same week as the anthropometric measurements were taken. Parents or guardians were asked to complete the sections of the questionnaire that required their input, while the researcher measured the anthropometric information and weight of the backpacks during class breaks.

Overall, the research process was conducted with great care to ensure that the results were accurate and representative of the student population in the school. The thorough selection process, comprehensive questionnaire, and bilingual approach helped to ensure that the study results were both reliable and comprehensive.

3.7 Data Analysis

The data that has been collected was moved and analysed by using statistical computer software (Statistical Package and Service Solution- SPSS Version 26) in accordance with objectives of this study. Table 3.1 below shows the summary of statistical analysis with objectives of this study, respectively. The data management, data cleaning, handling of missing data and extreme values, and multivariable analysis to estimate the independent effect of variables on the outcome will be using the same software.

Table 3.1: Summary of Statistical Analysis

Objectives	Variables	Types of Data	Statistical Analysis
To assess the socio-demographic information of the parents and the children.	• Age • Gender • Education	Categorical	Descriptive Statistic (Frequency and Percentage)
To determine the anthropometric measurement of the children	• Weight • Height • Body Mass Index(BMI) • BMI Status	Continuous Categorical	Descriptive Statistic (Frequency, Mean , Standard

			Deviation and Percentage)
To determine the weight of the children's backpack in school.	Backpack Weight	Continuous	Descriptive Statistic (Mean and Standard Deviation)
To assess knowledge of parent regarding the health effect of heavy backpack.	Awareness of parent	Categorical	Descriptive Statistic (Frequency and Percentage)
To determine the association between awareness of parents regarding health effect of heavy backpack and socio-demographic information	- Awareness of parent - Age - Gender - Education level	Categorical Categorical	Chi square test (Non-parametric test)

To determine the association between awareness of parents regarding effect of heavy backpack and BMI Level Status	- Awareness of parent - BMI	Continuous Continuous	Pearson/ Spearman Correlation
To determine the association between awareness of parents regarding health effect of heavy backpack and status of the backpack weight	- Awareness of parent - Status of the backpack weight	Categorical Categorical	Chi-square test (non-parametric test)

3.8 Ethical Consideration

This research was approved by Ethic Committee UPM (JKEUPM-2022-408) for research involving human subjects on 14th October 2022. Permission to conduct the study was also obtained from the Ministry of Education, Selangor Education Department and Principal of the participating school. Written informed consent was obtained from parents and respondents before data collection

CHAPTER IV

RESULT

Data collection for this study was carried out between 1st and 31st October 2022. A total of 119 school children who had been consented by their parents were selected to participate in the study based on the inclusion and exclusion criteria. The children were purposively selected from the students of Sekolah Kebangsaan Sri Serdang. The parents of the selected children were required to complete 5 sections of data collection, which included (1) Sociodemographic Data, (2) Knowledge about school backpack, (3) Knowledge about Health Effects from carrying heavy backpack, (4) Recommendation, and (5) Anthropometric measurement and the weight of children's backpack.

A total of 146 sets of questionnaires were distributed, but only 119 completed sets of questionnaires were received for this study. Thus, the response rate for this study was 81.5%

4.1 Socio-demographic information of the parents

In the present study, an analysis was conducted on the socio-demographic distribution of the parents who participated in the research. The findings, which are presented in Table 4.1, indicate that out of the 119 participants, 57 of them (47.9%) were male, while 62 (52.1%) were female. The respondents were all parents of children attending SK Seri Serdang, which is located in Selangor, Malaysia.

Furthermore, the study revealed the age distribution of the respondents, which is also presented in Table 4.1. It was found that a majority of the participants were aged 40 years old and above, accounting for a total of 61 respondents (51.3%), while the number of respondents who were 39 years old and below was 58 (48.7%).

The educational level of the participants was also examined, and the results are presented in Table 4.1. The findings show that the majority of the respondents had attained a diploma or lower level of education, with a total of 81 respondents (68.1%). Meanwhile, the remaining 38 respondents (31.9%) were parents who had achieved a degree or higher level of education.

In terms of gender distribution, the percentage of male and female participants was almost equal. However, the study showed that the majority of the parents who participated in this research were aged 40 years old and above. This finding is consistent with previous studies, which have found that parents in this age group are more likely to participate in research studies. This could be due to their increased life experience and sense of responsibility towards their children.

Moreover, the educational level of the respondents was found to be skewed towards the lower end of the educational spectrum. This result is in line with previous research that suggests that individuals with lower levels of education are more likely to experience socio-economic challenges, which could impact their awareness and knowledge of health-related issues.

Table 4.1: Socio demographic distribution of the parents (N=119)

Parent's age		
	Frequency	Percent (%)
39 and below	58	48.7
40 and above	61	51.3
Total	119	100.0
Parent's gender		
Male	57	47.9
Female	62	52.1
Total	119	100.0
Parent's educational level		
Diploma and below	81	68.1
Degree and higher	38	31.9
Total	119	100.0

4.2 Anthropometric measurement of the students and BMI

Table 4.2 presented the anthropometric measurements and BMI of the student participants in this study. The mean $\pm$ SD of height, weight, and BMI of the children were reported, followed by categorization of BMI based on the chart published by the National Center for Chronic Disease Prevention and Health Promotion (2020) for Grade 4 student's.

The results indicated that the mean weight of the children was 34.32 ± 9.25 , ranging from 20.3 kg to 69.8 kg. The mean height was 1.40 ± 0.07 , ranging from 1.24 m to 1.61 m. The mean BMI was 18.31 ± 4.57 , ranging from 12.15 kg/m^2 to 27.97 kg/m^2 .

Of the 119 children who participated in the study, 58 (48.7%) had a normal BMI, ranging between 14 kg/m^2 to 19.5 kg/m^2 . Among them, 37 (52.9%) were male and 21 (42.9%) were female. Furthermore, 20 (16.8%) children had an underweight BMI, ranging from 12 kg/m^2 to 13.9 kg/m^2 , consisting of 8 (6.7%) male students and 12 (10.1%) female students.

Additionally, 31 (26.1%) children were found to have an overweight BMI, ranging from 19.6 kg/m² to 23.9 kg/m². Of these, 19 (27.1%) were male and 12 (24.5%) were female. Lastly, 10 (8.4%) children were found to be obese, with a BMI ranging from 24.0 kg/m² to 25.0 kg/m². This group consisted of 6 (8.6%) male children and 4 (8.2%) female children.

These results suggest that a considerable proportion of the student participants in this study were either underweight, overweight, or obese. Further analysis and intervention may be needed to address these issues and promote healthy weight management among school children.

Table 4.2: Anthropometric measurement and BMI of the student's distribution

(N=119)

Variable	Freq (%)	Mean	SD	Minimum	Maximum
Weight (kg)		34.316	9.25	20.3	69.8
Height (m)		1.40	0.07	1.24	1.61
BMI (kg/m²)		18.31	4.57	12.15	27.97
Underweight (12.0 – 13.9)	20 (16.8%)				
Normal (14.0 - 19.5)	58 (48.7%)				
Overweight (19.6 - 23.9)	31 (26.1%)				
Obese (24.0 - 25.0)	10 (8.4%)				
Male					
Underweight (12-14.1)	8 (11.4%)				
Normal (14.2 - 19.4)	37 (52.9%)				
Overweight (19.5-23.7)	19 (27.1%)				
Obese (>23.7)	6 (8.6%)				
Female					
Underweight (12-13.9)	12 (24.5%)				
Normal (14 -19.5)	21 (42.9%)				
Overweight (19.6-23.9)	12 (24.5%)				
Obese (>23.9)	4 (8.2%)				

Reference for standard Body Mass Index for Children: National Center for Chronic Disease

Prevention and Health Promotion (2020)

4.3 Backpack weight

Table 4.3 presented the weight of backpacks carried by the school children in this study. The results showed that a majority of the students had backpacks that did not exceed 10% of their body weight, with 51 respondents (59.7%) falling into this category. However, 48 respondents (40.3%) had backpacks that exceeded 10% of their body weight, which may increase the risk of musculoskeletal disorders such as back pain, neck pain, and shoulder pain, as noted by Abdelati et al. (2017).

The mean weight of the school backpacks was 4.60 ± 1.028 kg, with a range between 2.39 kg to 7.33 kg, as reported in Table 4.3. The weight of the backpacks could be influenced by various factors, such as the age and gender of the students, the type of school they attend, and the amount of books and equipment they need to carry. For instance, younger children may have lighter backpacks than older children, while male students may have heavier backpacks than female students due to their larger body size.

The weight of the backpacks may also be influenced by the students' academic level, as higher-level students may need to carry more books and equipment than lower-level students. Additionally, students attending schools that do not have lockers or storage facilities may need to carry more items in their backpacks throughout the day, which may increase the weight of their backpacks.

Overall, the findings from Table 4.3 suggest that while most of the students had backpacks that did not exceed 10% of their body weight, a significant proportion of them had backpacks that were heavier, which may increase the risk of musculoskeletal disorders. It is therefore important for schools and parents to consider the weight of school backpacks and take steps to ensure that they are not excessively heavy, in order to protect the health and wellbeing of school children.

Table 4.3: Backpack weight distribution (N=119)

Variable	Frequency (%)	Mean	SD	Minimum	Maximum
Backpack weight (kg)		4.60	1.028	2.39	7.33
<u>Status</u>					
Exceed	48 (40.3%)				
Not Exceed	51 (59.7%)				

4.4 Awareness Level of the parents

Table 4.4 presented the distribution of parental awareness levels based on their scores, which were categorized as Low (0-7), Moderate (8-14), and High (15-20). The mean awareness level was 11.02 ± 5.53 , with a range between 2 and 19. The findings indicate that 38 (31.9%) of the parents had a low level of awareness regarding the health effects of heavy backpacks on their children, while 31 (26.1%) had a moderate level of awareness and 50 (42%) had a high level of awareness.

The results suggest that a significant proportion of parents in the study had a low level of awareness about the health effects of heavy backpacks. This could be a cause for concern as the weight of backpacks is a common issue among school children and has been associated with musculoskeletal disorders. Parents who are unaware of the risk factors associated with heavy backpacks may not take the necessary measures to ensure their children maintain a healthy weight and avoid such disorders.

However, it is encouraging to note that a considerable number of parents in the study had a moderate to high level of awareness regarding the health effects of heavy backpacks. These parents may take proactive measures to ensure their children's well-being, such as encouraging healthy habits like regular exercise, providing nutritious meals, and monitoring the weight of their children's backpacks.

Table 4.4: Awareness level of parent's distribution (N = 119)

Variable	Frequency (%)	Mean	SD	Minimum	Maximum
Awareness Level		11.02	5.53	2	19
Low	38 (31.9%)				
Moderate	31 (26.1%)				
High	50 (42.0%)				

4.5 Normality testing

Table 4.5 showed the normality testing results for awareness score and body mass index (BMI) of the students. The p-values for both variables were less than 0.05, indicating non-normal distribution. Thus, the non-parametric Spearman Correlation Test was used to analyze the relationship between the variables, as it does not assume normality. This ensured the validity of results by avoiding inappropriate use of parametric tests.

In summary, the awareness score and BMI were not normally distributed, and the Spearman Correlation Test was used for analysis. The use of non-parametric tests when data is not normally distributed is crucial in ensuring valid statistical analysis.

Table 4.5: Kolmogorov- Smirnov Test (N=119)

Variables	Statistic	p-value
Awareness score	0.176	<0.01
Body Mass Index	0.129	< 0.01

***p is significant when >0.05**

4.6 The association between awareness level of the parents with socio demographic factors

Table 4.6 described the association between the awareness level of the parents with sociodemographic factors. The Chi Square Test was used to analyse the association between the awareness level of the parents and sociodemographic factors, including age, gender, and educational level. According to the results presented in Table 4.6, it was found that age ($\chi^2 = 2.53$, $p = 0.282$) and gender ($\chi^2 = 2.19$, $p = 0.335$) were not significantly associated with the outcome variable. This implies that age and gender did not have a statistically significant effect on the outcome. However, the findings showed that educational level ($\chi^2 = 6.71$, $p = 0.035$) had a significant association with the outcome variable at a significance level of $p < 0.05$. This suggests that there is a relationship between educational level and the outcome variable.

The p-value of 0.035 indicates that the probability of obtaining a chi-square statistic as extreme as the observed value is less than 0.05 under the null hypothesis that there is no association between educational level and the outcome variable. Therefore, the null hypothesis was rejected, and it was concluded that there was evidence of a significant association between educational level and the outcome variable.

Table 4.6: The association between awareness level of the parents and socio demographic factors

Variables	Awareness Level			Total	P-Value	X ² value (df)
	Low (%)	Moderate(%)	High (%)			
Age						
39 and below	22 (33.9%)	12 (20.7%)	24 (41.4%)	58	0.282	2.53(2)
40 and above	16 (26.2%)	19 (31.1%)	26 (42.6%)	61		
Total	38 (31.9%)	31 (26.1%)	50 (42.0%)	119		
Gender						
Male	20 (35.1%)	17 (29.8%)	20 (35.1%)	57	0.335	2.19 (2)
Female	18 (29.0%)	14 (22.6%)	30 (48.4%)	62		
Total	38 (31.9%)	31 (26.1%)	50 (42.0%)	119		
Educational Level						
Diploma and Lower	32 (39.5%)	19 (23.5%)	30 (37.0%)	81	0.035*	6.71(2)
Degree and Higher	6 (15.8%)	12 (31.6%)	20 (52.6%)	38		
Total	38 (31.9%)	31 (26.1%)	50 (42.0%)	119		

*p is significant when < 0.05

4.7 The association between awareness level of the parents and the BMI of the students

Table 4.7 reports the association between awareness level of the parents and the BMI of the students. A non-parametric testing was used to identify the association between awareness level of the parent and BMI of the students. The test that was used in this test is Spearman correlation test.

According to the results presented in Table 4.7, there was no significant association found between awareness level and BMI of the students. The p-value recorded was 0.749, which was greater than the set significance level of 0.05. Additionally, the Spearman-correlation value obtained was 0.030, which further supports the lack of significant correlation between the two variables.

Table 4.7: Association between awareness level and BMI of the students

Variables	Awareness Level	
	Spearman	Sig.(2-tailed)
	Correlation	
BMI	0.030	0.749

***p is significant when <0.05**

4.8 The association between awareness level of the parents and status of the bag's weight

Table 4.8 described the association between the awareness level of the parents with the status of the bag's weight. The Chi Square Test was used to analyse the association between the awareness level of the parents and status of the bag weight. In the study, the weight status of the school bag was calculated by dividing the weight of the bag by the weight of the student, then multiplying by 100. The result was compared to 10% of the children's weight.

The statistical analysis of the data revealed that the independent variables recorded a p-value of more than 0.05 ($\chi^2 = 0.729$, $p = 0.694$), which indicates that the association is not significant. Hence, the null hypothesis was failed to be rejected, and it can be concluded that no significant association exists between the awareness level of the parents and the weight status of the bag.

Table 4.8: The association between awareness level of the parents with status of the bag's weight

Variables	Awareness Level			Total	P-Value	X ² value (df)
	Low	Moderate	High			
Status of the bag's weight						
Exceed	17(14.28%)	13 (10.92%)	18 (15.13%)	48 (40.34%)	0.694	0.729(2)
Not Exceed	21(17.65%)	18 (15.13%)	32 (26.89%)	71(59.66%)		
Total	38 (31.93%)	31 (26.05%)	50 (42.02%)	119 (100%)		

CHAPTER V

DISCUSSION

5.1 Socio-Demographic factors

This study was conducted in Seri Kembangan, Selangor and was able to recruit 119 respondents. The sample size may be considered small, but it is in line with other studies that have been conducted in similar settings (Lutfiyya et al., 2019). The majority of the respondents were female, which is in contrast with the study by Javadivala et al. (2012) where more males participated. The difference in gender distribution may be due to the nature of the study, which focused on the health of school children, a topic that may be of greater interest to mothers.

Moreover, the study found that most of the parents were 40 years old and above (51.3%). This age group is older than the majority of residents in Seri Kembangan in 2020, according to the data from Dewan Selangor (2020). This difference may be due to the fact that the parents of school children in this study were likely to be older than the general population of Seri Kembangan. It is also possible that parents in this age group are more likely to be concerned about the health of their children and therefore more willing to participate in a study on this topic.

Additionally, the majority of respondents in this study had a diploma or lower level of education (68.1%), which is consistent with the statistics shown by the Department of Statistics Malaysia (2019). This may be due to the fact that Seri Kembangan is a rapidly growing area where a large number of people have migrated from other parts of the country, and therefore, may have lower levels of education.

In conclusion, the demographics of the study sample may have implications for the generalizability of the findings. The higher proportion of female respondents and older parents may limit the generalizability of the findings to other populations.

5.2. Awareness level of the parents and socio demographic factors (age, educational level, gender of the parent)

The findings from the study showed that the awareness level of parents about the health effects of heavy backpacks on their children was significantly associated with educational level but not with gender and age. This is an interesting finding as it highlights the importance of education in increasing awareness and knowledge about health-related issues.

The study found that parents with higher educational levels had a significantly higher level of awareness compared to those with lower educational levels. This suggests that parents with higher education have a better understanding of the potential health effects of heavy backpacks on their children and are more likely to take appropriate measures to prevent these effects. This finding is consistent with previous research that has shown a positive relationship between education and health-related knowledge (Grossman, 2006).

On the other hand, the study did not find any significant association between the awareness level of parents and the gender or age of the parents. This finding suggests that gender and age do not play a significant role in determining the level of awareness about the health effects of heavy backpacks. This result is consistent with previous research that has shown no significant association between gender and health-related knowledge (Winkleby et al., 1992) and mixed findings for the relationship between age and health-related knowledge (Lee et al., 2017; Wister, 2015).

It is important to note that the lack of significant association between awareness level and gender and age should not be interpreted as gender and age being unimportant factors in determining health-related knowledge. Rather, this finding suggests that other factors may be more influential in determining the level of awareness about the health effects of heavy backpacks.

One possible explanation for the lack of significant association between awareness level and gender and age is that the study sample consisted of parents who had school-going children, and the concern about the weight of the backpack is more relevant to parents with school-going children, regardless of their gender or age. Furthermore, it is possible that the study was underpowered to detect significant associations between awareness level and gender and age.

5.3 Awareness level of the parents and the BMI status of the students

It is important to note that the findings of this study contribute to a growing body of research investigating the relationship between parental awareness and the health outcomes of their children. While this study found no statistically significant association between parental awareness and BMI status in school children, it is possible that other factors not accounted for in this study may have influenced the results.

For example, the economic status of families may have an impact on the ability of parents to provide healthy food choices for their children. As noted in the article by Musa (2018), the increasing cost of living may make it difficult for parents to afford healthy food options, leading to a higher prevalence of overweight and obese children. Additionally, the COVID-19 pandemic and resulting movement restrictions may have further exacerbated these economic challenges.

Moreover, the movement restrictions implemented during the MCO may have also influenced the results of this study. Children who were unable to participate in their regular physical activities or who spent more time indoors due to the pandemic may have experienced a decrease in physical activity levels, leading to an increase in BMI. As reported by Awaludin (2021), there was an increase in abnormal BMI levels among children following the implementation of the MCO in Malaysia.

Furthermore, the study by Weiland et al. (2022) highlights the importance of parental involvement in promoting healthy lifestyles in children, including healthy nutrition and regular physical activity. Future studies could investigate the impact of different types of parental involvement, such as educational programs or access to healthy food options, on the BMI status of their children.

In conclusion, while this study found no statistically significant association between parental awareness and BMI status in school children, it is important to consider the impact of other factors such as economic status and the COVID-19 pandemic. Future research could investigate the role of parental involvement in promoting healthy lifestyles in children and explore potential interventions to address the factors contributing to high BMI levels in school children.

5.4 Awareness level and status of the bag's weight

The findings of this study are in line with the results of previous studies, which have also reported no significant association between parental awareness and the weight of school bags. For instance, a study by Yurt et al. (2018) found that there was no significant correlation between parental knowledge and the weight of school bags. Similarly, a study by Mohammadi et al. (2017) reported no significant relationship between parental knowledge and the weight of school bags.

However, it is important to note that the design and construction of the bag can have a significant impact on its weight, regardless of parental awareness. For example, a study by Rao et al. (2012) found that bags with a single strap were associated with a higher incidence of musculoskeletal disorders than those with double straps. Another study by Macias-Tomei et al. (2021) suggested that reducing the size and weight of the school bag could help reduce the incidence of musculoskeletal disorders in children.

Therefore, it is essential to educate parents on the appropriate design and construction of school bags, in addition to promoting awareness of the weight issue. Several studies have emphasized the importance of designing bags that are both ergonomic and functional. For example, a study by Cheung et al. (2010) recommended the use of backpacks with padded shoulder straps and a waist belt to distribute the weight of the bag more evenly.

In conclusion, while the awareness level of parents did not have a significant impact on the weight status of the school bag, other factors such as the design and construction of the bag may have a more significant impact on the weight. Educating parents on the appropriate design and construction of school bags can help reduce the risk of musculoskeletal disorders in children, in addition to raising awareness of the weight issue.



CHAPTER VI

CONCLUSION AND RECOMMENDATION

6.1 Conclusion

This cross-sectional study was conducted at SK Seri Serdang, Seri Kembangan as the representative for Selangor which involved 119 parents and their children as the respondents. The aimed was to assess the awareness level of the parents about the health effect of carrying heavy backpack to their children health.

The study's findings suggested that despite the awareness of some parents regarding the potential health risks associated with heavy school backpacks, many schoolchildren in Malaysia were still carrying backpacks that exceeded the recommended weight limit of 10% of their body weight. This indicated that there was still a need for greater awareness and more effective interventions to reduce the burden of heavy backpacks on students' health.

6.2 Limitation

This study has a few limitations. Firstly, the data obtained for this study on parental awareness were based on self-reported questionnaires, which may be subject to recall and information bias. Besides that, the study was done on various classes which may vary for their class schedule results to different weight of the bag. Other than that, the study does not measure the health effect of the heavy backpack due to lack of equipment and workforce. Lastly, the study was done at only one school due to limited time and the procedure to assess for the study was hard to be approved by the school authorities.

6.3 Recommendation

6.3.1 Future research

More research on this study will be beneficial to the scope of this study, for the betterment of this study these things should be considered to increase the sample size by considering more of non-response, missing data, unavailability of subjects or refusal participate. Besides that, the research of this study, should include the measurement of the health effect on the schoolchildren and increase the workforce which will enhance the accuracy of this study. Other than that, research on this study, should be performed on various schools from different area or types such as from urban and rural or government and private school to have better comparison. Lastly, the research of this study should be done on a face-to-face interview session with the parents to ensure the respondent are clear with the aims of this study eventually make the respondent to give a well cooperation for the research.

6.3.2 Government authorities

The heavy backpack problem among school children in Malaysia is a pressing issue that can lead to several negative consequences, such as musculoskeletal disorders and poor academic performance. The study found that most students carry backpacks within the recommended weight limit, but some still exceed the limit, and many parents are not aware of the risks associated with heavy backpacks. The results also showed a significant association between parents' educational level and their awareness level, suggesting that education and awareness campaigns should be targeted towards parents with lower education levels. To address this issue, the government and schools can implement various measures, such as providing lockers or storage facilities, reducing the weight of textbooks, and promoting the use of digital devices for learning. Additionally, it is crucial to educate both parents and students about the risks of heavy backpacks and the proper ways to carry them. By taking these steps, the government and schools can promote a healthy learning environment and prevent long-term health issues among school children in Malaysia.

6.3.3 School authorities

One of the key recommendations to address the issue of heavy backpacks is to educate students on proper backpack use. This can include teaching them how to distribute weight evenly and adjust straps to ensure proper alignment with their bodies. Additionally, collaboration with parents is essential to reinforce good habits and proper use of backpacks at home. Schools can communicate with parents through newsletters, workshops, and social media, to educate them on the dangers of heavy backpacks and provide guidance on proper backpack selection and use. By working together, schools and parents can help prevent long-term health issues and promote healthy habits among students.

6.3.4 Current Control Measure

Despite efforts made to address the issue of heavy school backpacks in Malaysia, it is clear that the current control measures were not enough. The findings of this study and other past studies indicated that many students continued to carry backpacks that were too heavy for their young bodies, putting them at risk for long-term health problems.

One of the main issues with the previous control measures was that they focused primarily on reducing the weight of the backpacks, without addressing the underlying causes of the problem. For example, campaigns were launched to encourage students to carry lighter backpacks, but little was done to address the fact that many students were carrying multiple heavy textbooks. As a result, students were still being forced to carry more weight than was healthy for them, even if their backpacks were made lighter.

Additionally, many of the previous control measures were aimed at individual students and their families, rather than addressing the root causes of the problem. While some schools implemented policies to limit the weight of backpacks, these policies were not always enforced consistently or effectively, putting the burden on individual students and their families to comply with these policies.

To truly address the issue of heavy backpacks in Malaysia, there needs to be a more comprehensive approach that takes into account the underlying causes of the problem. This may include measures such as providing digital textbooks and other educational resources, working with publishers to reduce the weight of textbooks, and implementing policies that limit the amount of materials that students are required to carry. By taking a more comprehensive approach, it may be possible to address the issue of heavy backpacks in a way that is more effective and sustainable in the long term.

6.4 Strength of the study

There are several strengths to this study that should be highlighted. First, the study provides important information on the relationship between parental awareness of the health effects of heavy backpacks and various demographic factors, such as educational level, age and gender. This information can be used to target interventions aimed at increasing parental awareness of this issue and encouraging them to take steps to reduce the weight of their children's backpacks.

Besides that, the study used a standardized questionnaire to collect data on parental awareness of the health effects of heavy backpacks, which improves the reliability and validity of the findings. By using a validated instrument to collect data, the study is able to provide more accurate and comparable results that can be used to guide future research and interventions.

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**ETHICS COMMITTEE FOR RESEARCH INVOLVING HUMAN SUBJECTS
(JKEUPM)
UNIVERSITI PUTRA MALAYSIA**

Research title	: Awareness Of Parents on The Health Effect of Heavy Backpack Among The Primary School Children in Seri Kembangan, Selangor.
Study Site	: Seri Kembangan, Selangor.
JKEUPM Ref No.	: JKEUPM-2022-408
Principal Investigator	: Dr. Saliza Binti Mohd Elias
Co-Investigator	: Muhamad Zarif Bin Mohd Shurkri (Student)

Documents received and reviewed with reference to the above study:

1. Ethics Application Form, Version 1 dated 02/06/2022
2. Respondent's Information Sheet / Consent (English), Version 1 dated 02/06/2022
3. Respondent's Information Sheet Parent's / Guardian's Consent (English), Version 1 dated 02/06/2022
4. Proposal (English), Version 2 dated 07/08/2022
5. Questionnaire / Interviews (English), Version 1 dated 02/06/2022
6. Curriculum Vitae of:
 - a. Dr. Saliza Binti Mohd Elias

The University Research Ethics Committee, Universiti Putra Malaysia (JKEUPM) operates in accordance to the ICH-GCP Guidelines.

Decision by JKEUPM:

☒

Approved

☒

Permission MUST BE OBTAINED from the respective hospitals/ institutions before conducting the research

☐

Disapproved

Please note that the approval is **VALID UNTIL 14 OCTOBER 2023**

Researchers should comply with the following:

- I. Complete a Study Final Report upon study completion (Form 3.2).
- II. Ethical approval is required in the case of amendments/ changes to the study documents/ study sites/ study team.
- III. Applicable for Clinical Trial Studies and Clinical interventional Studies only: Progress Report has to be submitted to JKEUPM at every 6 months from the date of approval (Form 3.1). Report occurrences of all Serious Adverse Events (SAEs), Suspected Unexpected Serious Adverse Reaction (SUSARs) and Protocol Deviation/ Violation at all JKEUPM approved sites to JKEUPM. All serious adverse events (SAEs) detected or being notified should be reported immediately to the sponsor except for those SAEs that the protocol or other document (e.g.,

APPENDIX 3



KEMENTERIAN PENDIDIKAN MALAYSIA
BAHAGIAN PERANCANGAN DAN PENYELIDIKAN DASAR PENDIDIKAN
ARAS 1-4, BLOK E8
KOMPLEKS KERAJAAN PARCEL E
PUSAT PENTADBIRAN KERAJAAN PERSEKUTUAN
62604 PUTRAJAYA

TEL : 0388846591
FAKS : 0388846579

Ruj. Kami : KPM.600-3/2/3-eras(13431)
Tarikh : 9 September 2022

MUHAMAD ZARIF BIN MOHD SHURKRI
NO. KP : 000611021231

188, JALAN KENANGA 7/2, PERSIARAN AMANJAYA 5
8000 SUNGAI PETANI
KEDAH

Tuan,

**KELULUSAN BERSYARAT UNTUK MENJALANKAN KAJIAN :
AWARENESS OF PARENT ON THE HEALTH EFFECT OF HEAVY BACKPACK AMONG PRIMARY SCHOOL CHILDREN IN
SELANGOR**

Perkara di atas adalah dirujuk.

2. Sukacita dimaklumkan bahawa permohonan tuan untuk menjalankan kajian seperti di bawah telah diluluskan dengan syarat :

" KELULUSAN INI BERGANTUNG KEPADA KEBENARAN PENGARAH JPN DAN PERTIMBANGAN PENTADBIR SEKOLAH. PENGUTIPAN DATA TIDAK BOLEH MELIBATKAN MURID TAHUN 6. "

3. Kelulusan adalah berdasarkan kepada kertas cadangan penyelidikan dan instrumen kajian yang dikemukakan oleh tuan kepada bahagian ini. Walau bagaimanapun kelulusan ini bergantung kepada kebenaran Jabatan Pendidikan Negeri dan Pengetua / Guru Besar yang berkenaan.

4. Surat kelulusan ini sah digunakan bermula dari **8 September 2022** hingga **23 Disember 2022**

5. Tuan dikehendaki menyerahkan senaskhah laporan akhir kajian dalam bentuk *hardcopy* bersama salinan *softcopy* berformat pdf dalam CD kepada Bahagian ini. Tuan juga diingatkan supaya mendapat kebenaran terlebih dahulu daripada Bahagian ini sekiranya sebahagian atau sepenuhnya dapatan kajian tersebut hendak diterbitkan di mana-mana forum, seminar atau diumumkan kepada media massa.

Sekian untuk makluman dan tindakan tuan selanjutnya. Terima kasih.

"BERKHIDMAT UNTUK NEGARA"

Saya yang menjalankan amanah,

Ketua Penolong Pengarah Kanan
Sektor Penyelidikan dan Penilaian Dasar
b.p. Pengarah
Bahagian Perancangan dan Penyelidikan Dasar Pendidikan
Kementerian Pendidikan Malaysia

salinan kepada:-

JABATAN PENDIDIKAN SELANGOR

* SURAT INI DIJANA OLEH KOMPUTER DAN TIADA TANDATANGAN DIPERLUKAN *

APPENDIX 5

QUESTIONNAIRE

SECTION A

Please fill in the provided space.

Sila isi maklumat di ruang yang disediakan

Parent's Information / Maklumat Peniaga

Age (years old) Umur (Tahun) :
Sex / Jantina :
Race / Kaum :
Occupation/ Pekerjaan :
Monthly Income (RM) /Pendapatan Bulanan :
Educational Level / Tahap Pendidikan :
Marital Status / Status Perkahwinan :

SECTION B

For each question below, please tick (/) in the box provided for the best answer that characterized how you feel about the statement. Please choose only ONE answer for each of the question.

Bagi setiap soalan di bawah, sila tandakan (/) dalam kotak yang disediakan untuk jawapan terbaik yang mencirikan perasaan anda tentang pernyataan tersebut. Sila pilih SATU jawapan sahaja bagi setiap soalan

1. What is the type of school bag carried by the child?

Apakah jenis beg sekolah yang dibawa oleh kanak-kanak itu?

- ☐ Bag pack / Beg sandang dengan dua tali pengikat
☐ Shoulder bag / Beg sandang dengan satu tali pengikat
☐ Bag with wheels / Beg beroda

2. Does your child complain about carrying a heavy backpack to school?

Adakah anak anda mengadu kerana membawa beg galas yang berat ke sekolah?

- ☐ Yes / Ya
☐ No / Tidak

3. What is the ideal weight of school bag in relation to child weight?

Berapakah berat ideal beg sekolah dikaitkan dengan berat kanak-kanak?

- ☐ < 15 % of child body weight / kurang daripada 15% berat kanak-kanak
☐ >15 % of child body weight / lebih daripada 15% berat kanak-kanak

1. How much time did your child spent carrying the school bag daily?

Berapa banyak masa yang dihabiskan anak anda membawa beg sekolah setiap hari

- ☐ Less than 4 minutes / Kurang daripada 4 minit
- ☐ More than 4 minutes to 15 minutes / Lebih daripada 4 minit sehingga 15 minit
- ☐ More than 15 minutes and above / 15 minit dan keatas

2. What is the mode of transportation use by your child to the school?

Apakah cara pengangkutan yang digunakan oleh anak anda ke sekolah?

- | | |
|--|---|
| ☐ Bus / bas | ☐ Motorcycle/ Motosikal |
| ☐ Car/ Kereta | ☐ Walk/ Berjalan |
| ☐ Bicycle / Basikal | ☐ Others, please state(Lain-lain, sila nyatakan) |

3. Do you help your child to prepare their school bag based on their school schedule every day ?/ Adakah anda membantu anak anda menyediakan beg sekolah mereka berdasarkan jadual sekolah mereka setiap hari?

- ☐ Yes / Ya
- ☐ No / Tidak

4. Do you aware of your child school schedule patterns?/ Adakah anda mengetahui corak jadual persekolahan anak anda?

- ☐ Yes /Ya
- ☐ No / Tidak

5. Do you check school bag and remove unnecessary contents daily?/ Adakah anda memeriksa beg sekolah dan mengeluarkan kandungan yang tidak diperlukan setiap hari?

- ☐ Yes / Ya
- ☐ No / Tidak

6. Do you search for updates on school bag safety?/ Adakah anda mencari kemas kini tentang keselamatan beg sekolah?

- ☐ Yes/ Ya
- ☐ No/ tidak

1. Does your child have enough space on your chair to sit with your bag? / Adakah anak anda mempunyai ruang yang cukup di atas kerusi anda untuk duduk bersama beg anda?

☐ Yes/ ya

☐ No/ Tida

2. Do you think that your child bag is too heavy for him/her to carry to school? / Adakah anda rasa beg anak anda terlalu berat untuk dibawa ke sekolah?

☐ Yes/ Ya

☐ No/ tidak

3. Does your child easily carry all books and notebooks in his/her bag for the school? / Adakah anak anda mudah membawa semua buku dan buku nota di dalam begnya untuk ke sekolah?

☐ Yes/ Ya

☐ No/ tidak

Section C

For each of the question below circle the response the best characterized how you feel about the statement, where; 1 = Strongly Disagree, 2 = Disagree, 3 = Neither Agree nor Disagree, 4 = Agree, 5 = Strongly Agree

Bagi setiap soalan di bawah bulatkan jawapan yang paling menggambarkan perasaan anda tentang pernyataan tersebut, di mana; 1 = Sangat Tidak Setuju, 2 = Tidak Setuju, 3 = Tidak Setuju atau Tidak Setuju, 4 = Setuju, 5 = Sangat Setuju

“ What are the health effects that are the consequences from carrying heavy backpack?”

“Apakah kesan kesihatan yang merupakan akibat daripada membawa beg galas yang berat?”

	Strongly Disagree/Sangat Tidak Setuju	Disagree/Tidak Setuju	Neither Agree nor Disagree/Tidak Setuju atau Tidak Setuju	Agree/Setuju	Strongly Agree/Sangat Setuju
Shoulder pain/ Sakit Bahu	1	2	3	4	5
Lean forward/ Bongkok ke depan	1	2	3	4	5
Fatigue/ keletihan	1	2	3	4	5
Musculoskeletal pain/ sakit di bahagian belakang	1	2	3	4	5
Low back pain/ Sakit di bahagian pinggang bawah	1	2	3	4	5
Neck pain/ sakit leher	1	2	3	4	5
Hand pain/ sakit tangan	1	2	3	4	5
Scoliosis/ Skoliosis	1	2	3	4	5

SECTION D

For each question below, please tick (/) in the box provided for the best answer that characterized how you feel about the statement. Please choose only **ONE** answer for each of the question.

Bagi setiap soalan di bawah, sila tandakan (/) dalam kotak yang disediakan untuk jawapan terbaik yang mencirikan perasaan anda tentang pernyataan tersebut. Sila pilih SATU jawapan sahaja bagi setiap soalan.

1. Do you think the number of schoolbooks need to be reduce?/ Adakah anda fikir bilangan buku sekolah perlu dikurangkan?

☐ Yes/ Ya
☐ No/ Tidak

2. Do you think school's authority should provide locker to each of the student?/ Adakah anda fikir pihak berkuasa sekolah perlu menyediakan loker kepada setiap pelajar?

☐ Yes/ Ya
☐ No/ Tidak

3. Do you think the school's authority need to rearrange the student schedule? / Adakah anda fikir pihak berkuasa sekolah perlu menyusun semula jadual murid?

☐ Yes/ Ya
☐ No/ Tidak

4. Do you think the school's authority need to spread more awareness on schoolchildren bag? / Adakah anda fikir pihak berkuasa sekolah perlu menyebarkan lebih banyak kesedaran mengenai beg pelajar sekolah?

☐ Yes / ya
☐ No / tidak

5. Please fill in the blank if you have any other recommendation (optional). / Sila isi tempat kosong jika anda mempunyai sebarang cadangan lain (pilihan).

THIS SECTION ONLY WILL BE USED BY THE EXAMINER

SECTION E

Student Information

Grade :
Sex :
Weight (kg) :
Height (cm) :
BMI :
School bag weight (kg) :

END OF THE QUESTIONNAIRE

Thank you for answering the question. Please contact me through my email at zarifshurkry@gmail.com if you are interested to know the result of this study.

APPENDIX 6



The principal of SK Seri Serdang



The respondents of this study



Face to face brief explanation of the study to the children