THE RELATIONSHIP BETWEEN BODY MASS INDEX (BMI) AND INJURIES AMONG UNIVERSITY PENDIDIKAN SULTAN IDRIS SPORT SCIENCE RECREATIONAL BADMINTON PLAYERS

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DECLARATION

I hereby declared that all the writings, works and the ideas in this Final Year Project report is my own idea except for quotation and reference which have been fully acknowledged.

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The Relationship Between the Body Mass Index (BMI) and Injuries Among the University Pendidikan Sultan Idris sport science Recreational Badminton Players

ABSTRACT

The greater unhealthy weight may be associated with poorer fitness and lower levels of neuromuscular control including balance and coordination which could place those with elevated BMI at greater risk of injuries. Therefore, the aim of this study is to determine the relationship between the Body Mass Index (BMI) and injuries among sport science recreational badminton players. The study used descriptive research design. There are 40 sport science recreational badminton players who participated in this study. Questionnaire design by researchers was used to collect data. The results show most of the participants have normal body weight (18.5-22.9) with a percentage 65.9 % and the highest number of injuries is ankle sprain with a percentage 37%. Interval category of correlation by Jonathan Sarwono (2009) shows that the relationship between BMI and injuries among the sport science recreational badminton players has no significant relationship. In conclusion, this study shows that the BMI does not affect the number of injuries among sport science recreational badminton players.

Keywords: Body Mass Index (BMI), injuries in badminton, recreational badminton, University Pendidikan Sultan Idris.

ABSTRAK

Berat badan yang melebihi dikaitkan dengan tahap kecergasan, keseimbangan, koordinasi dan tahap kawalan neuromuskular yang rendah. Hal ini menyebabkan mereka yang mempunyai tahap Index Jisim Badan (BMI) yang tinggi mempunyai risiko kecederaan yang tinggi pemain badminton rekreasi sains sukan di Universiti Pendidikan Sultan Idris. Oleh itu, tujuan kajian ini adalah untuk mengetahui hubungan Indeks Jisim Badan (BMI) dengan kecederaan dalam kalangan pemain badminton rekreasi sains sukan. Kajian ini menggunakan reka bentuk kajian deskriptif. Terdapat 40 orang pemain badminton rekreasi sains sukan yang menyertai kajian ini. Soal selidik yang dibina oleh penyelidik digunakan untuk proses pengumpulan data bagi kajian ini. Keputusan menunjukkan kebanyakan peserta mempunyai berat badan normal (18.5-22.9) dengan peratusan 65.9 % dan jumlah kecederaan paling tinggi ialah terseliuh buku lali kaki dengan peratusan 37%. Kategori interval korelasi oleh Jonathan Sarwono (2009) menunjukkan bahawa BMI dan kecederaan dalam kalangan pemain badminton rekreasi sains sukan tidak mempunyai hubungan yang signifikan. Kesimpulannya, kajian ini menunjukkan bahawa BMI tidak mempengaruhi bilangan kecederaan dalam kalangan pemain badminton rekreasi sains sukan.

Kata kunci: Indeks Jisim Badan (BMI), kecederaan dalam badminton, badminton rekreasi, Universiti Pendidikan Sultan Idris.

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CHAPTER 1

INTRODUCTION

1.1 Introduction

Nowadays, badminton is a popular sport and played by people of all ages either recreationally or competitively. Badminton is a racket sport played by either two opposing players which are singles or two opposing pairs which are doubles, who take positions on opposite halves of a rectangular court that is divided by a net. Playing

badminton involves repeated upper-limb motions and extended racket holding, as well as high-velocity hops, lunges, multidirectional movements, and quick posture adjustments. Because of the strong physical demands of badminton, badminton players are more likely to have badminton-related ailments. Badminton is a sport that requires both aerobic and anaerobic fitness. The physical demands of badminton lead to a high risk for upper and lower extremities injuries (Kang & Ramalingam, 2018)

Badminton was known in ancient times; an early form of the sport was played in ancient Greece. In Japan, the related game Hanetsuki was played as early as the 16th century. Badminton evolved from a game called battledore and shuttlecock, in which two or more players use small rackets to keep a feathered shuttlecock in the air. During the 18th century, the game was known in India as "Poona,". In 1860, a London toy merchant named Isaac Spratt produced a booklet called "Badminton Battledore - a new game," but no copy has survived. The new sport was officially introduced in 1873 at the Duke of Beaufort's Badminton House in Gloucestershire. The game was known as "The Game of Badminton" at the time, and the game's origins are unknown.

The name 'Badminton' comes from the Duke of Beaufort's magnificent house in Gloucestershire, England. Poona, the modern version of the game, was first played in India in the 1800s. In the mid-nineteenth century, British officers brought a version of the game known as 'Poona' back to England, where it was introduced as a game for the guests. Badminton is immensely popular in Asia, with finals of major badminton tournaments in Indonesia and Malaysia drawing crowds of up to 15,000 spectators.

Badminton at the highest level is a physically demanding sport that needs strength, endurance, and muscularity. Considered the fastest of the racquet sports, players require aerobic stamina, agility, strength, speed, and precision, besides requiring good motor coordination and complex racquet movements. (Pardiwala et al., 2020).

Body mass index (BMI) is a measure of weight adjusted for height that is determined by dividing weight in kilograms by the square of height in meters (kg/m2). Although BMI is frequently used as a measure of body fatness, it is a surrogate measure of body fat because it is excess weight rather than excess fat. Frank and Nuttall (2015) reported, in 1993 the WHO assembled an Expert Consultation Group to develop uniform categories of the BMI. The report containing the findings was released and the underweight, normal, overweight, and obese were created as the four categories. A person would be categorized as underweight if his or her BMI is between 15 and 19.9, normal weight between 20 and 24.9, overweight between 25 and 29.9, and obese between 30 and 35.

For this study the researcher used BMI Asian norm from World Health Organization (WHO 2004). Based on Asian norm, there is four categories measured which is 18.4 kg/m^2 and below (underweight), 18.5 to 22.9 kg/m^2 (normal), 23.0 to 27.4 kg/m^2 (overweight-at risk) and 27.5 kg/m^2 and above (overweight - moderately obese) (Jih, Mukherjea, Vittinghoff, Nguyen, Tsoh, Fukuoka & Kanaya, 2014). There is a different BMI range between Asians and Westerners because Asians and other

ethnic groups may have distinct body fat patterns due to genetic variations, but environmental variables appear to have a much more powerful impact.

Amoako, Nassim & Keller (2017), reported that the greater unhealthy weight may be associated with poorer fitness and lower levels of neuromuscular control including balance and coordination which could place those with elevated BMI at greater risk of injury. There are 10 studies investigating the association between BMI and knee injury and from this study there are several incidents of high BMI that serve as risk factors for various knee pathologies. From all these 10 studies, there is limited evidence that the BMI is a risk factor for patellar tendinopathy and the higher BMI was not associated with meniscus tear but was associated with chondral injuries. Next, the study also indicates that the anterior cruciate ligament (ACL) is more likely to occur than other injuries as the BMI is increased.

Dane, Can & Karsan (2002), stated that the BMI was higher in injured athletes than in non-injured ones, but there was no difference in percent body fat between injured and non-injured athletes. In this study, the large BMI but not increased body fat would point to the possibility that athletes with more muscle and large size may get more injuries due to the more exposure. The BMI can be an overwhelming risk factor for lower-extremity injury. This increased risk is thought to be from an individual's higher weight leading to a greater amount of stress on the lower extremities when doing any sports (Neely et al., 1998).

1.2 Problem Statement

The injury incidence in badminton is low compared to other sports. However, badminton players are at a high risk of new injury (Senadheera et al., 2021). Badminton is a popular sport among all generations from child to adult, especially the youth. At the same time, some of them do not have enough knowledge about the risk factor of the injuries in badminton and it is very important to know and understand that obesity can be one of the risk factors of the injuries to reduce the risk of injury. Ezzat, Schneeberg, Koehoorn and Emery (2016), reported that with this substantial prevalence of obesity in youths, understanding its impact on pertinent areas of public health, such as sport injuries, is paramount.

It is very important to have knowledge about the injury that occurs to reduce the risk of the injury that can happen when playing that sport. In this study the researcher wants to identify the risk of BMI to the injury that happened in badminton. Amoako et al., (2017), reported that there is dearth of information on body composition as a modifiable risk factor on sport injuries. In badminton recreational sports, the players have different body shape and BMI because not all of them are professional athletes and they just play badminton for health and to fill their free time with a good activity.

Badminton injuries are usually overuse injuries which develop from repeated overhead movements. Injuries to the lower limb can also occur due to the high proportion of jumping and quick changes of direction. The most common injuries in badminton are tennis elbow, golfer's elbow, wrist tendonitis, wrist strain, rotator cuff injuries and ankle sprain. Based on that situation the researcher intended to identify the

relationship between body mass index (BMI) and injuries among University Pendidikan Sultan Idris sport science recreational badminton players.

1.3 **Significant of Study**

The purpose of this study is to know the relationship between BMI status and injuries pattern among University Pendidikan Sultan Idris sport science recreational badminton players. At the same time this study also aims to see the influence of BMI on the common injuries that happen among badminton recreation players. Lastly, if we know the relationship between body mass index and injuries it may help the badminton recreational players to prevent injuries while playing.

1.4 Research Objectives

The main objective of this research is to examine the BMI status and injury pattern by provide an overview of injury risk factor among University Pendidikan Sultan Idris sport science recreational badminton players. The specific objectives of this study are as follows:

1.4.1 To identify the level of BMI among the University Pendidikan Sultan Idris sport science recreational badminton players.

1.4.2 To determine the injury pattern statistics among the University Pendidikan Sultan Idris sport science recreational badminton players.

1.4.3 To determine the relationship between the BMI and injuries among the University Pendidikan Sultan Idris sport science recreational badminton players.

1.5 Research Question

1.5.1 What is the level of BMI among the University Pendidikan Sultan Idris sport science recreational badminton players?

1.5.2 What is the injury pattern statistic among University Pendidikan Sultan Idris sport science recreational badminton players?

1.5.3 Is there any relationship between the BMI and injuries among the University Pendidikan Sultan Idris sport science recreational badminton players?

1.6 Limitation of Study

Limitation of the study is the characteristics of design or methodology that impacted or influenced the application or interpretation of the results of the study. The limitations of the study always happen in every research. In this study, the researcher has identified the limitation as below:

- This research conducted online using google form.
- The researcher has to follow up the participant to answer the questionnaire to avoid them take a lot of time.

1.7 Delimitation of the study

Delimitation in this research was a choice the researcher makes for the study that is under the control of the researcher. This study has following delimitation:

- The data obtained are from the University Pendidikan Sultan Idris sport science recreational badminton players.
- The subjects were female and male.
- The subject must play badminton more than two times per week.

1.8 Operational Definition

1. Badminton Players

   The players are among the University Pendidikan Sultan Idris sport science recreational badminton players from faculty of University Pendidikan Sultan Idris sport science and coaching, University Pendidikan Sultan Idris. This research involves both male and female players playing badminton as recreation at least two or more per week.

2. Badminton

   Badminton is a racket sport in which two opposed players (singles) or two opposing pairs (doubles) compete on opposite halves of a rectangular court separated by a net. The points are scored by striking the shuttlecock with the racquet and landing it within the opposing court.

3. Body mass index (BMI)

Body mass index (BMI) is a person's weight in kilograms divided by the square of height in meters. BMI is an inexpensive and easy screening method for weight category which is underweight, healthy weight, overweight, and obesity. In this study, the WHO (2014) BMI norm for Asian used as reference.

Table 1:1 BMI norm for Asian population (2014)

Level	Category
<18.4	Underweight
18.5-22.9	Normal
23.0-27.4	Overweight
> 22.7	Obese

4. Injury

Injury is a physical harm or damage to someone body cause by accident or an attack such as head, back and knee injury. In badminton sport, the lower extremities are most common, including sprain and fracture, as well as shoulder injury. These injuries are most commonly caused by movement involving turning, changing direction, shifting weight, pivoting, twisting and landing.