

**ATTITUDE AND KNOWLEDGE TOWARDS CONCUSSION AMONG
DOCTORS AND RUGBY PLAYERS IN MALAYSIA**

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AKU JANJI

Diperakui bahawa disertasi bertajuk **ATTITUDE AND KNOWLEDGE TOWARDS CONCUSSION AMONG DOCTORS AND RUGBY PLAYERS IN MALAYSIA** merupakan kerja dan penyelidikan yang asli dari **DR S.M. WAZIEN WAFAB. S. SAADUN TAREK WAFAB.** No. Kad Pengenalan 871015-08-6307, No Matrik: **P-UM0322/16** dari tempoh 2016 sehingga 2020 adalah di bawah penyeliaan kami. Disertasi ini merupakan sebahagian daripada syarat untuk penganugerahan Sarjana Perubatan Kecemasan, segala hasil penyelidikan dan data yang diperolehi adalah hak milik terpelihara Universiti Sains Malaysia.

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LIST OF SYMBOLS, ABBREVIATIONS AND ACRONYMS

RoCKAS	Rosenbaum Concussion Knowledge and Attitudes Survey
CKI	Concussion Knowledge Index
CAI	Concussion Attitude Index
CC	Cerebral Concussion

ABSTRAK

Pengenalan: Malaysia berhadapan dengan kekurangan kajian penyelidikan untuk menilai sikap dan pengetahuan terhadap konkusi otak di kalangan doktor dan pemain ragbi. Kekurangan pengetahuan dan sikap tidak selamat ini boleh menyebabkan kesudahan jangka pendek dan jangka panjang jika konkusi otak tidak diurus dengan betul. Pengertian dan kesalahpahaman yang kurang baik mengenai konkusi otak dapat mengakibatkan kurangnya pelaporan yang tepat dan menyebabkan lebih banyak pemain dan doktor mengabaikan kecederaan tersebut.

Kaedah: Ini adalah kajian keratan rentas di kalangan doktor dan pemain ragbi di Malaysia untuk menilai pengetahuan dan sikap terhadap konkusi otak. Soal selidik yang dikendalikan sendiri, RoCKAS-ST diterima pakai dari kajian sebelumnya. Soal selidik diberikan kepada 285 pemain ragbi dan 217 doktor masing-masing dengan kadar pulangan 63% dan 23%. Analisis deskriptif dan ANOVA univariat digunakan untuk menganalisis tindak balas statistik.

Hasil: Kedua-dua doktor dan pemain ragbi mencatatkan indeks sikap yang baik berbanding dengan kajian sebelumnya yang lain namun indeks pengetahuan pemain ragbi di Malaysia adalah rendah. Terdapat perbezaan yang signifikan dalam indeks pengetahuan di kalangan doktor dan pemain ragbi di Malaysia.

Kesimpulan: Lebih banyak program latihan dan pendidikan mengenai konkusi otak harus dilakukan di Malaysia untuk meningkatkan tahap pengetahuan dan sikap di kedua-dua kumpulan pemain ragbi dan doktor terutama yang dalam bidang perubatan kecemasan, perubatan keluarga, perubatan sukan, bedah saraf, pembedahan dan ortopedik.

Kata kunci

Konkusi otak, Ragbi, Kecederaan Otak Traumatik

ABSTRACT

Introduction: Malaysia is faced with the inadequacy of research studies assessing the attitudes and knowledge towards concussions among doctors and rugby player. This lack of knowledge and unsafe attitudes can lead to short and long term sequelae if a CC is not managed correctly. The poor understanding and misconception regarding concussions could result in a lack of proper reporting and lead to more players and doctors ignoring the injury.

Methods: This is a cross sectional study among doctors and rugby players in Malaysia to assess knowledge and attitude towards . Self-administered questionnaire, RoCKAS-ST is adopted from previous study. Questionnaire was given to 285 rugby players and 217 doctors with return rate of 63% and 23% respectively. Descriptive analysis and univariate ANOVA was used to analyse the statistical response.

Results: Both doctors and rugby players recorded good attitude index compared to other previous study however the knowledge index of rugby players in Malaysia is subpar. There is significant differences in knowledge index among doctors and rugby players in Malaysia

Conclusions: More training and education programme regarding should be done in Malaysia to increase the level of knowledge and attitude in both group of rugby players and doctors especially those in emergency medicine, family medicine, sports medicine, neurosurgery, surgery and orthopaedics.

Keyword

Concussion, Rugby, Traumatic Brain Injury

CHAPTER 1

INTRODUCTION

1.1 Introduction

Concussion is one of the common complications that can occur in contact sport. With Malaysians becoming more active and involved in rugby, the risk of concussion is higher. Lack of exposure to diagnosing and managing concussion among doctors in Malaysia will cause a threat to the players who participated in this sport. Concussion is categorised as a mild traumatic brain injury. Malaysia has no structured concussion treatment, because it is often difficult to treat and manage. Not only is Malaysia facing this challenge, it can also be seen in other countries such as Singapore (Sirisena et al., 2018) and Canada (A Mann et al., 2017). Many of the time, athletes who have suffered concussion do not have neurological defects but it can lead to dangerous symptoms such as second-impact syndrome and long-term sequelae such as depression, sleep disturbances, cognitive and memory loss.

There is no evidence available to date on the prevalence and severity of this disease in Malaysia since only traumatic brain injury is reported in the National Trauma Registry.

The difficulty in diagnosing concussion happens because there are no imaging or blood parameters to confirm the diagnosis as the symptoms are sensitive but not specific. Most of the time, the treatment of concussion allows the athlete to go to the doctors themselves. Therefore it is necessary for both players and doctors to have good awareness and attitude toward concussion in order to avoid any morbidity that can occur from concussion.

CHAPTER 2

STUDY PROTOCOL

2.1 INTRODUCTION

In recent years rugby has become a much more major sport. Between the years 2016 to 2017, the member unions of the World Rugby boosted by 600,000 players; in 2017, there were 9.1 million players compared to 8.5 million players in 2016 (Rugby, 2017). Players are prone to all kinds of injuries as rugby is a high-risk contact sport, the most significant being concussions that are experienced during training sessions and matches. (Group, 2016).

Evidence has shown over the years that the game is becoming quicker and more physically challenging (Austin et al., 2011). Rugby players have a greater risk of suffering injuries from incidents sustained during a game compared with other sports. Data reported in a recent report showed that the number of rugby concussions has been constantly growing in the last few years (Yeomans et al . , 2018).

Annually, it is estimated that about 1.6 million to 3.8 million sports-related concussions are identified in the United States alone, although it is suspected that the figure is probably higher due to many unreported incidents, because there are players that do not seek care .(Giza although Kutcher, 2014) Sadly, there are no figures available in Malaysia relating sports-related concussions. A concussion is characterized as a 'traumatically caused temporary brain function disruption involving a complex pathophysiological mechanism' and is clinically diagnosed based on the existence of at least one symptom like headaches, loss of consciousness, confusion , dizziness, nausea or vomiting (Raftery, 2014). Diagnosing a concussion is difficult; one explanation for this is that the symptoms can change quickly and develop over time. Concussion is known as one of the most difficult injuries to treat, evaluate, and handle in sports medicine. Since 2012, meetings have been held within the Concussion in

Sport Group (CISG) in Switzerland to discuss the latest clinical recommendations for concussion related to sport (McCrory et al., 2017).

Concussions can be harmful when not properly handled. A concussion may lead to a second-impact syndrome if not treated properly. This condition can cause diffuse cerebral swelling when a player has a subsequent concussion or a mild head injury (Williams, 2013). Concussions is also associated with long-term sequelae, such as cognitive dysfunction and chronic traumatic encephalopathy, observed in former players of the National Football League who have sustained multiple concussions throughout their careers (Williams, 2013). While the brain seems fine, at microscopic level, it reveals primary and secondary proteinopathies (Omalu et al., 2010).

Given the need for further study in this area of concern, this research was conducted to assist in responding to the attitude and knowledge of doctors and rugby players in Malaysia towards concussions. The results of this study, based on existing guidelines and evidence, will enhance the understanding of concussions and their management.

2.2 LITERATURE REVIEW

Knowledge about concussions

A concussion is common among athletes, especially rugby players, because of the nature of the game which requires physical contact for the team to win the game. According to Cahill et al. (2016), doctors, including orthopaedic surgeons, must know about concussions. According to these authors, media attention and coverage of concussion cases among high profile athletes have increased knowledge about concussion among the players and doctors. The high coverage of concussion has led to the development of various guidelines to diagnose and treat concussion, for instance, guidelines published by the Concussion in Sport Group in the 2012 Zurich Consensus statement (Kerrigan & Giza, 2017).

Rugby players suffer from injuries that can result in concussion; however, most of them report such cases to their coaches and doctors because of little knowledge about concussion. It is estimated that about 36% of the players who get a head injury and experience symptoms related to concussions do not report them to the doctors because they think that it is part of the game (Williams, 2013). Players do not have much knowledge about the seriousness of concussion; instead, they have misconceptions about the concussion. Most of the players who report cases of concussion report them to their coaches, parents, and doctors come last, making it hard for the doctors to understand the severity or intervene earlier before the situation gets worse.

In a study conducted by Sirisena et al. (2018), it was found that most emergency physicians who are normally first responders when players get injured have no formal training about concussion. In this study, for instance, more than 90% of emergency physicians who were included in the study stated that they had not received formal training of concussion. About 77% of the participants also recognized that loss of consciousness, which is one sign of

concussion was not a priority for diagnosis. This finding was against the recommendations from Ochiai and Abe (2019), who suggested that a player must be removed from the game when he or she gets head injury for examination even if the injury is minor. Inadequate knowledge about this fact makes players continue playing and eventually getting serious concussion related conditions. According to these authors, the immediate examination would ensure early detection and treatment.

According to Delahunt et al., (2014), the knowledge about concussion is limited among many rugby professionals because the majority of studies related to concussion have focused on American football and ice hockey players. Inadequate research on concussion is thus likely to impact how rugby players and doctors understanding on concussion in Malaysia. Inadequate knowledge of concussion among players is also evident when players who get head injury continue to play and supported by teammates to continue to play.

Discrepancies in knowledge and attitude about concussion

Discrepancies in knowledge about concussion among rugby players and doctors can affect the management of concussion, especially on reporting and diagnosis. According to Sufrinko et al. (2017), various research works are inconsistent about the best measures for diagnosing concussion. According to these authors, the inconsistencies in various research may make it hard for clinicians or doctors to decide the best method of diagnosis, especially when the clinician has no enough knowledge concerning concussion. Some studies, for instance, suggest that comprehensive assessment batteries are effective as its test exceeds 90%, while other studies suggest that a multidimensional approach involving neurocognitive testing is more effective. Furthermore, these authors have postulated that tools used post-recovery to enable the players to understand their recovery process have not been given much attention making it difficult for players to know when they would be ready to play after injury.

Assessing head injury among rugby players can be very challenging among sports medicine personnel (Riemann & Guskiewicz, 2000). The complex nature of the brain makes it hard for doctors to diagnose some injuries, which may seem small but dangerous to the player. According to these authors, doctors may be forced to depend on subjective signs and symptoms given by the athletes in cases of mild head injury. There are no adequate tools that doctors can use to effectively examine athletes, which may lead to athletes to return playing decisions that can be disastrous.

Studies have also shown that most athletes are not aware of the danger that concussion can cause to them. According to the study conducted by Martin et al. (2017), most players reported that they are aware of injuries related to rugby games; however, they said that they would continue playing even after experiencing symptoms of concussion. Most players further suggest that they would be more willing to play after experiencing symptoms of concussion when matches are in critical stage, for example, when the matches are in playoffs. In this study, 40% of the respondents argued that they are willing to play despite having concussion because they do not want to let their supporters down. Players also believe that having concussion symptoms cannot be the reason to play a rugby match because rugby is for strong players. The results that authors of this study obtained indicate that despite the risk associated with concussion, players are willing to continue playing based on various reasons. Moreover, it was also found that some rugby players who play rugby for recreational or community-based do not have access to better treatment; hence, experiencing concussion symptoms while performing their daily duties. Another discrepancy that exists among players is that most of them are not aware of rugby guidelines, which may put them to more risk of being injured and suffering from concussion.

According to Yeomans et al. (2018), more studies concerning injuries in rugby have been conducted; however, a lot of controversies concerning the rate and etiology of injuries

still exist. According to these authors, most researches concerning concussions have used questionable, making the intervention ineffective. It is, therefore, crucial to have deep insight on incidences and aetiology of injuries to reduce the injuries in sport. Discrepancies in knowledge concerning concussions are, therefore, limiting the effort of developing effective policies and guidelines to reduce cases of concussions.

Relationship between demographic factors and knowledge and attitude of concussions

Various researchers have conducted studies on the relationship between demographic factors, knowledge, and attitudes towards the management of concussion. In a study conducted by Young et al. (2019), which examined the relationship between knowledge and attitude and how they influence player's decision to perform concussion management, factors such as attitude, perceived norms and personal agency influenced the players to make a decision towards the management of concussion. According to this study, the more knowledgeable the player is about the concussion, the more likely that play is to support the management of concussion in China. This study further found that the cultural background of the players can determine their intention towards the management of concussion. In China, for example, teachers or coaches are viewed as people of wisdom and honor who deserve respect; hence, players are likely to follow what they are taught. In such a society, players are more likely to observe procedures required for the management of concussion. Further, personal experience is another determinant of how athletes can report and manage cases such as concussion (Keays et al., 2017). Players who have sustained injuries before are more likely to report or seek intervention to manage concussion.

Lack of adequate knowledge and education to rugby players and rugby unions can determine the rate of concussion and intervention measures of managing the condition. Baker et al. (2013) conducted a study to determine concussion among under 20 rugby players and found that few players are aware of the time needed to rest before resuming to play after

concussion. Junior players are the ones with no enough knowledge concerning rugby rules, such as resting for three weeks before playing after sustaining the injury. This finding suggests that more education concerning rugby guidelines is required to prevent more injuries among the players and to enable them to understand the rugby guidelines so that they can avoid the emergence of concussion, which is common in rugby. Furthermore, most respondents in this study reported that they are willing to report signs of concussions to their coaches, meaning that coaches and management must also be well informed about concussions to be able to help the players.

Identification of signs and symptoms of concussion

Rugby is the most physical games where players come to close contact in the world. Players and doctors can easily identify signs and symptoms of concussions. In the United States, for instance, more than 1.6million people report cases of concussions every year. About 51% of US college students who have suffered from concussion have been able to report signs and symptoms of concussion (Kiss, 2020). Players are able to report signs and symptoms such as headaches, emotional cognitive, and sleep dysfunctional. When these symptoms persist for more than 30 days, they become post-concussion. Other symptoms that are normally identified and reported include; dizziness, photophobia, and nausea, which may occur a short time after injury (Kerrigan & Giza, 2017). Early intervention of these symptoms is crucial for the outcomes; however, there is no preferred evidence-based treatment (Dexheimer et al., 2017). Doctors can be able to identify signs of concussion by getting information from the players or by conducting a diagnostic test.

2.3 PROBLEM STATEMENT & STUDY JUSTIFICATION

1. There is no study that has been done in Malaysia before to assess the attitude and knowledge towards concussions among doctors and rugby player in Malaysia. This is crucial as poor knowledge and unsafe attitudes can cause short and long term sequelae if a concussion is not properly managed.
2. There are no rugby safety and awareness programmes in Malaysia that focus on the management of concussions. The lack of understanding and misconception regarding concussions could result in a lack of reporting and lead to more players and doctors ignoring the injury.

2.4 BENEFIT OF THIS STUDY

1. Results of this study can be used to measure the level of safety among rugby players and doctors in Malaysia regarding concussion. This can help to plan for education and awareness programmes in Malaysia regarding concussions.
2. Results of this study can address if there are any misconceptions or unsafe practices among doctors when diagnosing and managing players with suspected concussion.

2.5 RESEARCH QUESTIONS

1. What is the current level of knowledge and attitude towards concussion among rugby and doctors in Malaysia?
2. Are there any discrepancies in knowledge and attitude rugby players and doctors in Malaysia?

3. Can the rugby players and doctors in Malaysia identify sign and symptoms of concussion?
4. Is there any relationship between demographic factors and knowledge and attitude of concussion?

2.6 OBJECTIVES

1. General objectives

To determine the level of attitude and knowledge towards concussion among doctors and rugby players in Malaysia

2. Specific objectives

- i. To determine if there is discrepancies of attitude and knowledge towards concussion among doctors and rugby players in Malaysia
- ii. To study demographic data and factors affecting attitude and knowledge towards concussion among doctors and rugby players in Malaysia

2.7 METHODOLOGY

2.7.1 Study Design

This study was designed to a cross-sectional studied which defined as the study of a particular phenomenon (or phenomena) at a particular time which used to describe the incidence of experience, knowledge and attitude of rugby players and doctors in Malaysia.

2.7.2 Study Area

Malaysia.

2.7.3 Study population

To this study, the population would be all the rugby players in Malaysia and the doctors from emergency, family medicine, sports medicine, surgery, neurosurgery, orthopaedics.

2.7.3 Study Participants

There were two groups of participants of this study which are the rugby players and the selected doctor who treats the patient who experiences concussion. The rugby players identified through a list of the players from Malaysia Rugby Union. The selection of the player base to experience as played contact player for more than a year. Meanwhile, the doctors can be categorised to doctor from emergency department, orthopaedic, family medicine particularly from local clinic, and neurosurgeon and sports medicine in Malaysia.

2.7.3.1 Inclusion Criteria

The inclusion criteria of the rugby players are defined as a local player who had experience as played contact rugby for more than a year. Those players must have experience playing in tournaments of national and international level. The players divided into two categories of female and male players.

For the doctors, the inclusion criteria identified are doctors from emergency department, orthopaedic, family medicine, and neurosurgery, surgery and sports medicine in Malaysia. The selection doctor can be from government hospital or Hospital University Sains Malaysia. Next, the doctors must have more than 2 years working experience.

2.7.3.2 Exclusion Criteria

The exclusion criteria of the rugby players identify as the player from school level and age lower than 18 years old. This criterion should be excluded from this study as determine the level of maturity to response to the survey. Professional players will not be responding and included in the study as the result might skewed the result.

As for the doctors, those who are not from emergency, neurosurgery, surgery, orthopaedic, family medicine and sports medicine are being excluded from the study. This can be explained as the doctors do not have the experience to diagnose and manage the patient. In addition, house officer has also been excluded as considered less experience in handling the patient.

2.7.4 Sampling Method

The sampling method divided into probability and non probability sampling technique. With probability samples, the chance, or probability, of each case being selected from the population is known and is usually equal for all cases. This means that it is possible to answer research questions and to achieve objectives that require to estimate statistically the characteristics of the population from the sample. Meanwhile, the non-probability refers to each case being selected from the total population is not known and it is impossible to answer research questions or to address objectives that require to make statistical inferences about the characteristics of the population. So this study will apply the probability sampling technique as the list of the players could be obtained from the Malaysia Rugby Union.

Since the numbers of the population can be determined, the stratified random sampling technique used to determine the sample. The population can categorise into two or more relevant and significant strata based on one or a number of attributes. To this study, the player divided into amateur level and aged more than 18 years old. For the doctor, from emergency department, orthopaedic, family medicine, and neurosurgery, surgery and sports medicine in Malaysia.. Dividing the population into a series of relevant strata able to facilitate that the sample is more likely to be representative, and ensure that each of the strata is represented proportionally within your sample.

2.7.51 Sample Size Calculation

Most of the previous studies determined the sample size based on the rule of thumb which five times or ten times of the incoming paths for the construct

(Barclay et al., 1995; Chin & Newsted, 1998). However, Hair et al. (2011) argued that the rule of thumb is used to estimate the requirements of minimum sample size. Some other factors such as effect size, reliability, number of indicators, and effective power are not considered in the determination of the sample size. To this study, the numbers of the population of this study can be determined. So this study suggests using Krejcie and Morgan (1970) calculation of sample size as in figure 1. The estimate numbers population of rugby players are greater than 1000 and 500 of the specialist doctors. From the estimation, Krejcie and Morgan (1970) suggest the appropriate sample size for players are 285 and 217 of the doctors. However, it is important to consider whether the sample size is adequate to provide enough accuracy to base decisions on the findings with confidence.

The calculation for sample size adapted from small sample techniques with the formula as:

$$s = \frac{X^2 NP(1-P)}{d^2 (N-1) + X^2 P(1-P)}$$

s = required sample size.

X^2 = the table value of chi-square for 1 degree of freedom at the desired confidence level (3.841).

N = the population size.

P = the population proportion (assumed to be .50 since this would provide the maximum sample size).

d = the degree of accuracy expressed as a proportion (.05).