

Integrating Sports Massage into Sport Science Education for Enhancing Athletes' Mental Toughness and Well Being

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Abstract: *The role of sports massage in athlete recovery has been widely acknowledged in sports science, yet its integration into sports education remains limited. This study explores the application of sports massage by sports masseurs and its impact on the mental toughness and psychological well-being of high-performance athletes. Using a qualitative approach, semi-structured interviews were conducted with certified sports masseurs and elite athletes to examine their experiences and perceptions. Findings indicate that sports massage serves as both a physiological and psychological recovery tool, reducing stress and anxiety while enhancing focus, confidence, and emotional stability. Techniques such as pre-event massage, post-event massage, and recovery massage were identified as effective interventions to improve athletes' mental preparedness and overall performance. However, barriers such as lack of awareness, financial constraints, and insufficient training opportunities for sports masseurs hinder its consistent implementation. This study highlights the necessity of embedding sports massage knowledge into sports science education curricula to equip future practitioners, coaches, and sports educators with evidence-based recovery strategies. Integrating sports massage into structured learning modules can enhance athletes' psychological resilience, optimize recovery, and improve performance outcomes. Moreover, collaboration between sports science educators, sports psychologists, and medical professionals is crucial in fostering a holistic approach to athlete development. The study calls for a paradigm shift in sports education by emphasizing the dual benefits of sports massage—physical recovery and mental well-being—to prepare athletes for the rigorous demands of high-performance sports. Future research should explore the long-term benefits of sports massage as part of a broader sports science curriculum and its potential impact on athletes across different sporting disciplines.*

Keywords: Sports recovery, massage therapy, emotional stability, stress management, sports psychology

1. Introduction

Elite athletes often face immense pressure, not only physically but also mentally, as they strive to maintain peak performance in their respective sports. Strong mental toughness is a crucial component of an athlete's success, as it enables them to manage stress, pressure, and anxiety that arise during training or competition (Sherry & Liddle, 2020). A well-maintained psychological well-being is essential to ensure that athletes can function optimally, maintain focus, and handle challenges without being easily affected emotionally (Perry & Smith, 2022).

One of the increasingly popular approaches to supporting both the physical and mental well-being of elite athletes is the application of sports massage. Beyond its widely recognized role in accelerating physical recovery after intense training or competition, recent studies have highlighted its significant impact on mental toughness and psychological well-being (Moyer & Rounds, 2021). Sports massage works by reducing muscle tension, improving blood circulation, and alleviating pain, all of which contribute to better and faster physical recovery (Sherry & Liddle, 2020). However, beyond these physiological benefits, sports massage has also been proven to have a positive psychological effect, particularly in reducing anxiety levels and enhancing an athlete's mood.

A study by Moyer and Rounds (2021) found that sports massage significantly lowers stress and anxiety levels, which are commonly experienced after intensive training or competitions. This is achieved through the stimulation of the parasympathetic nervous system, which enhances deep relaxation (Sherry & Liddle, 2020). This effect is particularly crucial for elite athletes who are frequently exposed to intense pressure in their pursuit of excellence. Additionally, sports massage has been found to improve sleep quality, which plays a vital role in restoring both mental and physical energy, allowing athletes to return to training feeling refreshed and focused (Perry & Smith, 2022).

Moreover, sports massage has been linked to enhanced concentration and mental sharpness. By relieving muscle tension and promoting better blood circulation, athletes experience a greater sense of calmness and readiness to face upcoming challenges (Moyer & Rounds, 2021). This process also stimulates the release of endorphins, which are responsible for feelings of happiness and mood enhancement, thereby reducing anxiety that could otherwise hinder performance before or during competitions (Sherry & Liddle, 2020). Research suggests that the correct massage techniques not only relieve tension but also improve emotional balance, helping elite athletes manage complex mental challenges effectively (Perry & Smith, 2022).

In summary, the application of sports massage offers substantial benefits in both physical and mental recovery for elite athletes. It not only helps them overcome physical stress but also plays a role in enhancing mental toughness, improving psychological well-being, and providing a competitive edge in high-performance sports. This article will further explore the positive impact of sports massage on mental toughness and psychological well-being, as well as how this technique can be effectively integrated to support overall athletic performance.

1.1 Problem Statement

Mental toughness and psychological well-being are two critical aspects in determining the success of elite athletes. While most athletes primarily focus on physical training to enhance their strength and endurance, the mental aspect is often overlooked or not given sufficient attention. Neglecting psychological well-being can significantly impact an athlete's performance, making them more vulnerable to issues such as anxiety, stress, and severe mental fatigue (Sherry & Liddle, 2020). In Malaysia, there is growing concern over the lack of approaches that incorporate mental well-being in high-performance athlete training programs. This has led to a decline in performance and recurring injuries associated with unmanaged mental stress (Perry & Smith, 2022).

Studies conducted internationally have demonstrated that the mental pressure experienced by elite athletes is highly significant, particularly when facing major competitions or crucial tournaments. For instance, in football, research conducted in Europe has shown that professional football players frequently struggle with anxiety and depression due to continuous

pressure throughout the season (Moyer & Rounds, 2021). A similar phenomenon is observed among Malaysian athletes, particularly in sports that require high levels of focus, such as badminton and boxing. These psychological challenges indicate that mental well-being among athletes is often neglected, despite its crucial role in ensuring optimal performance (Sherry & Liddle, 2020).

One approach that has been gaining attention in addressing this issue is the application of sports massage, which has been proven to reduce stress levels and improve athletes' mental well-being. However, while several studies have highlighted the effectiveness of sports massage in assisting athletes' physical recovery, there remains a lack of in-depth research on how sports massage influences mental toughness, particularly among elite athletes (Moyer & Rounds, 2021). In Malaysia, studies on the application of sports massage to enhance athletes' mental toughness are still limited, and little emphasis has been placed on its integration into the curriculum or primary training programs for high-performance athletes (Perry & Smith, 2022).

The lack of knowledge regarding the psychological benefits of sports massage is an issue that requires serious attention, as success in elite sports is not solely dependent on physical strength but also on mental stability. Therefore, it is crucial to further explore how sports massage can be utilized to enhance mental toughness and psychological well-being among elite athletes, both in Malaysia and internationally. There is also a need to develop a more holistic approach that integrates both physical and mental aspects in athlete recovery (Sherry & Liddle, 2020). Without proper interventions, elite athletes may continue to be exposed to psychological disorders that could jeopardize their careers.

Internationally, studies such as those conducted by Moyer and Rounds (2021) have indicated that sports massage can serve as a crucial intervention in helping athletes cope with stress and mental tension. However, in Malaysia, the acceptance and understanding of sports massage among elite athletes remain low. This highlights the necessity for further research on the impact of sports massage on the psychological well-being of Malaysian athletes. In high-focus sports such as badminton and athletics, athletes are frequently exposed to psychological disturbances that can hinder their performance if not adequately addressed (Perry & Smith, 2022).

Against this backdrop, the problem statement of this study emphasizes the need for deeper research into sports massage as an intervention to enhance mental toughness and psychological well-being among elite athletes, particularly in Malaysia. This study aims to identify the existing knowledge gap regarding this technique and its impact on athlete performance while also assessing the extent to which sports massage is accepted and utilized by elite athletes both in Malaysia and globally.

2. Literature Review

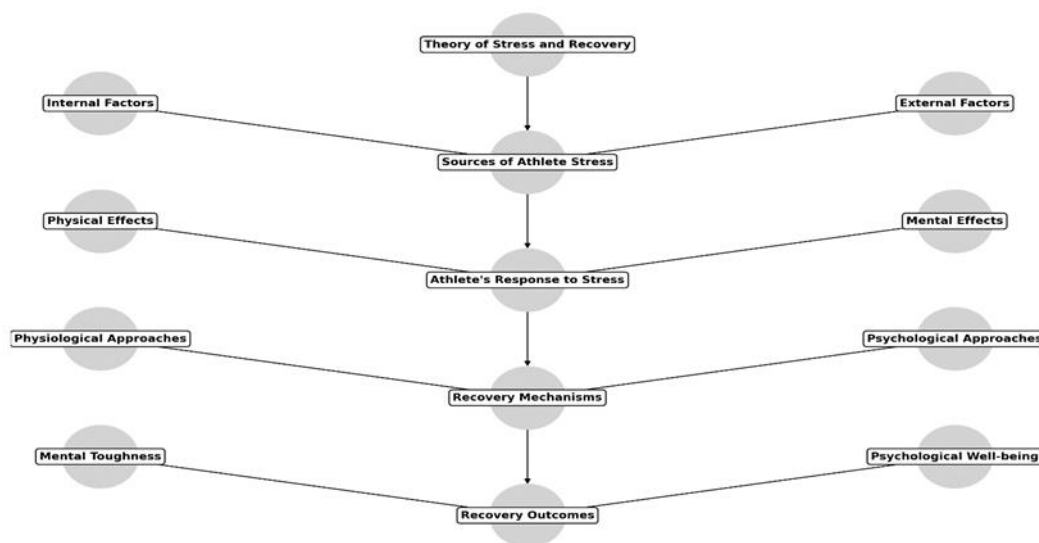


Figure 1: Theoretical Framework of Stress and Recovery

The Theory of Stress and Recovery explains how athletes experience stress and how they can recover through specific mechanisms. This diagram illustrates that the sources of athlete stress stem from internal and external factors, leading to physical and mental reactions such as fatigue and anxiety. To manage stress, athletes can utilize recovery mechanisms through physiological approaches, such as sports massage, and psychological approaches, such as relaxation techniques. Effective recovery enhances mental toughness and psychological well-being, helping athletes maintain their performance and emotional balance in sports.

2.1 Sports Massage and Athletes' Psychological Well-being

Sports massage has also been found to have a positive impact on enhancing the psychological well-being of elite athletes. A study by Vallée et al. (2021) revealed that deep tissue massage and vibration massage significantly reduce stress and anxiety levels among athletes engaged in intensive training. In this study, sports massage was not only used for physical recovery but also as a tool to calm the athletes' minds, helping them cope with the pressures faced during competitions. As a result, athletes who received regular massages exhibited improved mental performance, allowing them to remain focused and energized throughout their competitions.

2.2 Types of Sports Massage and Their Influence on Mental Toughness

There are various types of sports massage used by Sports Masseurs to assist in athletes' physical recovery, including deep tissue massage, vibration massage, and relaxation massage. A study by Hawkins et al. (2019) indicated that deep tissue massage helps reduce muscle tension, which is often associated with high stress levels among athletes. Meanwhile, vibration massage has been shown to improve blood circulation, reduce anxiety, and enhance mental toughness. This study also found that routine massage therapy has a positive impact on athletes' psychological well-being, improving their ability to adapt to the stress they encounter during competitions.

2.3 Challenges and Barriers in the Implementation of Sports Massage

Despite its numerous benefits, the implementation of sports massage faces several challenges that may affect its effectiveness. A study by Wang et al. (2020) highlighted that the lack of formal training and professionalism among Sports Masseurs is one of the major barriers in ensuring that sports massage is effectively applied. Additionally, the high training workload

and limited time within athletes' training schedules further hinder the consistent implementation of massage therapy. The study suggests that enhancing training and education for Sports Masseurs, along with a more flexible training schedule, could help address these issues and improve the overall effectiveness of sports massage interventions.

2.4 Integration of Sports Massage into Sports Science Education

Integrating sports massage into sports science education has been recognized as a valuable approach to enhancing athlete recovery and performance. Research by Smith et al. (2022) and Brown & Taylor (2021) emphasizes that formal education in sports massage equips future sports practitioners with essential recovery techniques. González et al. (2020) highlight that hands-on training improves students' understanding of muscle recovery, while Wilson et al. (2019) argue that experiential learning fosters critical thinking in athlete rehabilitation. However, Wang et al. (2020) identify barriers such as limited faculty expertise and financial constraints in implementing such programs. Fletcher & Sarkar (2020) further stress that integrating sports massage with sports psychology education provides a holistic approach to athlete well-being. Addressing these challenges through collaborative efforts between universities and sports organizations can enhance the effectiveness of sports science curricula and improve long-term athlete performance.

3. Methodology

3.1 Research Design

This study employs a qualitative research design to explore in depth the experiences and perceptions of Sports Masseurs in implementing sports massage interventions for elite athletes. The study adopts a semi-structured interview method and direct observation approach. The semi-structured interview method was chosen to allow researchers to obtain rich and detailed data, while also providing flexibility for respondents to share their views and experiences freely. The combination of semi-structured interviews and direct observations enables data triangulation, thereby enhancing the reliability and validity of the study's findings.

3.2 Sample

The research sample consists of one experienced Sports Masseur who holds a certified qualification in sports massage services, as well as 16 elite athletes from various sports who have received sports massage interventions. The sample was selected using purposive sampling to ensure that participants had relevant experience and knowledge pertaining to the study. Athletes who exhibited positive effects after receiving sports massage interventions were chosen to participate in Focus Group Discussion (FGD) sessions. Additionally, data saturation was considered, where data collection was ceased once the information obtained became repetitive and no new findings emerged.

3.3 Instruments

The research instruments comprise a semi-structured interview protocol and an observation checklist. The interviews were conducted to gather insights from the Sports Masseur and the athlete participants who received the intervention, while observations were recorded in field notes to document interactions and massage techniques used during the sessions.

3.4 Data Analysis

The collected data was analyzed using thematic analysis with the aid of NVivo software. The analysis process involved transcribing interviews, repeated readings, data coding, and identifying key themes related to the effects of sports massage on athletes' mental well-being.

NVivo was utilized to systematically manage and analyze the data, allowing for the identification of patterns and themes more efficiently. Observational data was also used to support and validate the themes identified. Data triangulation was conducted to enhance the reliability and accuracy of the study's findings.

3.5 Data Collection Procedure

Data collection was carried out in several stages. First, the researcher obtained written consent and approval from the Sports Masseur and elite athletes involved in the study. Next, semi-structured interviews were conducted in Focus Group Discussion (FGD) sessions at locations agreed upon by the participants. All interviews were recorded with the participants' permission for transcription and analysis purposes.

Simultaneously, observations were conducted during the sports massage intervention sessions, where the researcher documented the massage techniques used and the interactions between the Sports Masseur and the athletes. Field notes were systematically organized to complement and support the interview data. Data collection continued until data saturation was reached.

4. Results

Based on the findings from the interview sessions, three key themes were identified for each research question. It can be observed that these themes are interconnected, collectively contributing to the mental toughness and psychological well-being of elite athletes. Therefore, this study will present how the application of sports massage influences the mental toughness and psychological well-being of elite athletes according to the following themes.

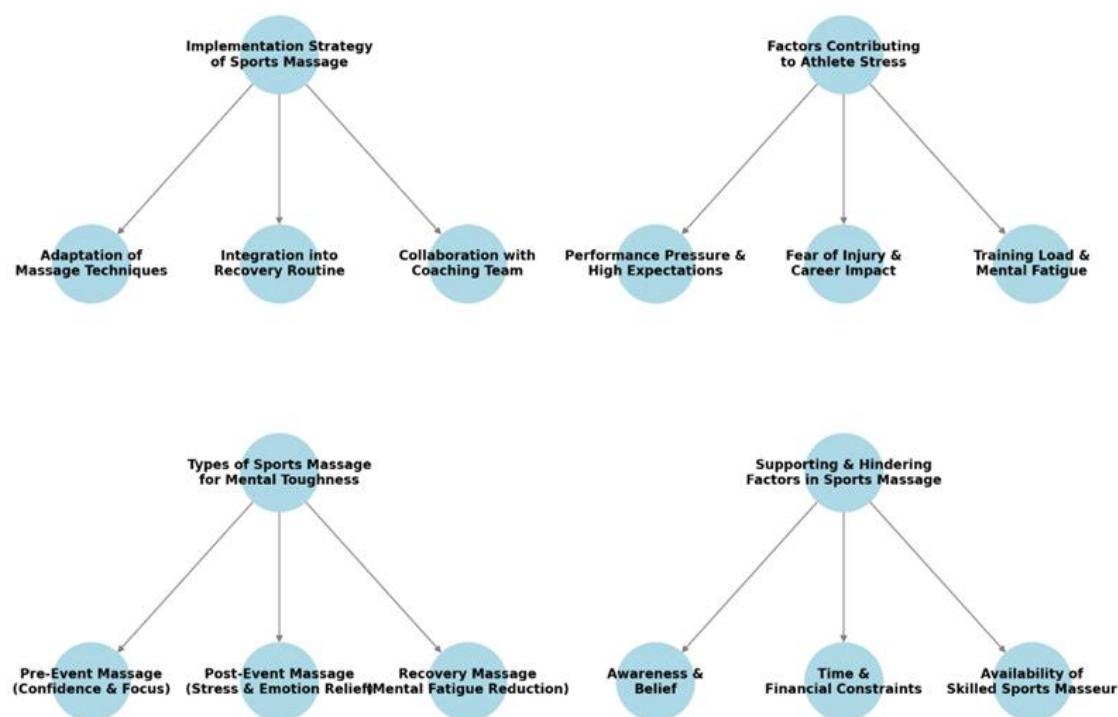


Figure 2: Theme Framework

4.1 Research Question 1: How is the implementation strategy of sports massage applied by Sports Masseurs to high-performance athletes?

Theme 1: Adaptation of Massage Techniques Based on Athlete Needs

Each athlete has different physical needs depending on the sport they participate in, their fitness level, and the phase of training or competition they are currently undergoing. Therefore, Sports Masseurs cannot apply a uniform approach to every individual; instead, they must adapt their massage techniques according to the athlete's specific condition.

For instance, an athlete who has just completed a competition requires a gentler and more relaxing massage to aid muscle recovery without causing additional discomfort. Conversely, an athlete experiencing muscle tightness due to high-intensity training may require techniques such as Effleurage, Kneading, Cross Fibre, Drainage, and Tapotement to relieve deep-seated tension effectively.

Interview Excerpt:

"Kalau atlet baru habis bertanding, kita tak boleh guna teknik urutan yang hardcore. Kena bagi light massage dulu, biar badan dia recover. Kalau yang datang sebab otot tegang, barulah kita buat teknik lebih dalam."

"If an athlete has just finished competing, we can't use hardcore massage techniques. We need to start with a light massage first, to let their body recover. Only if they come in with muscle tightness, then we apply deeper techniques."

Theme 2: Integration of Massage into Athlete Recovery Routine

To ensure the effectiveness of sports massage, it must be integrated into the athlete's recovery program on a regular basis rather than only being applied when an injury occurs. Consistent massage sessions help prevent injuries, improve blood circulation, and maintain muscle flexibility.

In some professional sports teams, massage sessions have become a structured part of their systematic recovery schedule. This demonstrates that the implementation of sports massage is not merely a treatment practice but a proactive strategy to maintain an athlete's performance stability throughout the competition season.

Interview Excerpt:

"Dalam team, ada jadual untuk urutan. Biasanya lepas latihan berat, kita dah tahu siapa yang perlu dapatkan sesi. Tak boleh tunggu sakit baru urut, kena buat secara berkala."

"In the team, there's a schedule for massages. Usually after intense training, we already know who needs a session. We can't wait until there's pain to start; it has to be done regularly."

Theme 3: Collaboration Between Sports Masseurs and Coaching Team

The implementation strategy of sports massage cannot be carried out in isolation without considering the athlete's overall training program. Therefore, effective communication between Sports Masseurs and the coaching team is crucial to ensuring that massage therapy contributes to performance enhancement and accelerated recovery.

Coaches and physiotherapists frequently provide valuable insights regarding the athlete's level of fatigue or injury, allowing Sports Masseurs to adjust their massage techniques accordingly.

With this collaboration, massage therapy not only plays a significant role in physical recovery but also helps in mental preparation before competitions.

Interview Excerpt:

"Kadang-kadang jurulatih akan bagi heads-up, 'Ni player ni overused muscle dia, tolong fokus kat kawasan ni'. Jadi kita tak kerja sorang-sorang, kena sentiasa update dengan team."

"Sometimes the coach will give a heads-up, like 'This player has overused a muscle, please focus on that area.' So we don't work alone — we always have to stay updated with the team."

4.2 Research Question 2: What types of sports massage are used by Sports Masseurs to enhance the mental toughness and psychological well-being of high-performance athletes?

Theme 1: Pre-Event Massage for Boosting Athlete Confidence and Focus

Pre-event massage is not only aimed at preparing an athlete's muscles for physical exertion but also plays a crucial role in enhancing mental focus and confidence. The techniques used are typically light and fast-paced to improve blood circulation and ensure muscles are in an optimal state before competition. If executed correctly, this massage can help reduce nervous tension and improve an athlete's psychological readiness when facing challenges on the field or court.

Interview Excerpt:

"Sebelum game, kita buat urutan cepat, tak boleh bagi terlalu relaks. Kalau urut slow sangat, nanti atlet jadi lembik. Kita nak bagi otot panas tapi dalam masa yang sama, kepala dia pun kena ready nak perform."

"Before a game, we do a quick massage — it can't be too relaxing. If the massage is too slow, the athlete might become sluggish. We want to warm up the muscles, but at the same time, get their mind ready to perform."

Theme 2: Post-Event Massage for Stress Reduction and Emotional Recovery

After a competition, athletes often experience both physical and mental exhaustion, especially if they have been under high pressure throughout the match. Post-event massage plays a critical role in helping them calm down, relieve fatigued muscles, and reduce stress. Additionally, these sessions serve as an opportunity for athletes to release mental tension and express their emotions to Sports Masseurs, providing an informal yet effective form of psychological support.

Interview Excerpt:

"Lepas kalah, ada atlet yang datang urut dengan muka kusut. Masa tengah urut, diorang kadang cerita masalah. Urutan ni bukan untuk otot je, tapi kepala pun kena lega."

"After a loss, some athletes come in for a massage looking really down. While massaging, they sometimes talk about their problems. Massage isn't just for the muscles — the mind needs relief too."

Theme 3: Recovery Massage for Reducing Mental Fatigue

Sports massage is not only beneficial for physical recovery but also acts as a therapeutic tool to reduce mental stress caused by intensive training and competitive pressure. This type of massage is generally more relaxing and is performed after heavy training sessions or on rest

days. By deeply stimulating the parasympathetic nervous system, this massage helps lower cortisol levels in the body and increases relaxation hormones, making athletes feel more at ease and motivated to return to training.

Interview Excerpt:

"Ada atlet yang datang semata-mata nak relaks. Bila dah kena pressure dengan training, kadang-kadang urutan ni macam escape zone diorang. Dapat tenang kejaap, sebelum masuk training esok."

"Some athletes come just to relax. When they're under pressure from training, sometimes the massage feels like their escape zone — a moment of calm before going back to training the next day."

4.3 Research Question 3: What factors contribute to stress and anxiety among high-performance athletes?

Theme 1: Performance Pressure and High Expectations from External Parties

High-performance athletes frequently face immense pressure to achieve outstanding results in every competition. This pressure not only comes from themselves but also from coaches, team management, family, fans, and sponsors. The high expectations placed on them can sometimes negatively impact their mental well-being, especially when they fear failure or feel incapable of meeting the expectations of those around them.

Such pressure can lead to prolonged stress, loss of confidence, and, in severe cases, burnout or chronic mental exhaustion. Therefore, psychological support should be an integral part of an athlete's recovery program, including methods such as sports massage therapy, which not only benefits their physical state but also contributes to their mental well-being.

Interview Excerpt:

"Atlet ni bukan takut main, tapi takut expectation orang. Kadang-kadang bukan lawan yang buat dia nervous, tapi sebab rasa semua orang mengharapkan dia menang."

"These athletes aren't afraid of playing — they're afraid of people's expectations. Sometimes it's not the opponent that makes them nervous, but the pressure of everyone expecting them to win."

Theme 2: Fear of Injury and Its Impact on an Athlete's Career

Injury is a major challenge for every athlete as it affects not only their physical condition but also their emotional and mental well-being. Injured athletes often struggle with concerns about their recovery progress, whether they will be able to return to their peak performance level, or whether they are at risk of reinjury. These worries can lead to a lack of confidence in returning to competition, and in some cases, prolonged emotional distress due to fears about the future of their career. A holistic approach to recovery, including regular sports massage, can help alleviate these concerns by accelerating physical healing and providing psychological reassurance to the athletes.

Interview Excerpt:

"Lepas kena ACL tear, ada atlet yang dah tak confident nak main macam biasa. Walaupun dah sembuh, dalam kepala dia masih takut benda yang sama jadi balik."

"After an ACL tear, some athletes lose confidence in playing like they used to. Even though they've physically recovered, in their mind, they're still afraid the same thing might happen again."

Theme 3: Excessive Training Load and Mental Fatigue

Intensive training is a necessity for high-performance athletes to maintain their fitness and improve their physical capabilities. However, when training is conducted excessively without proper management, it can lead to extreme physical and mental stress. Athletes who experience

chronic fatigue often lose motivation, suffer from sleep disturbances, and in some cases, experience burnout, resulting in a decline in performance over time.

Regular sports massage sessions not only help reduce muscle fatigue but also have a relaxing effect on the athlete's mental state. This allows them to feel refreshed and better prepared for their next training session with renewed energy and motivation.

Interview Excerpt:

"Kadang-kadang diorang bukan sakit fizikal, tapi letih gila. Bila datang urut, terus baring tak nak bangun. Kepala pun dah tak larat nak fikir apa."

"Sometimes it's not physical pain — they're just extremely exhausted. When they come for a massage, they lie down and don't even want to get up. Their mind is too tired to think about anything."

4.4 Research Question 4: What factors support and hinder the effective implementation of sports massage among Sports Masseurs and high-performance athletes?

Theme 1: Awareness and Belief in the Importance of Sports Massage

One of the key factors determining the successful implementation of sports massage is the level of awareness and belief among athletes regarding its benefits. Athletes who understand the positive impact of sports massage are more likely to incorporate it into their recovery routine. Conversely, those who are less informed about its importance may perceive it as unnecessary or only relevant when they are injured.

To ensure that sports massage becomes a widely accepted practice among athletes, educational initiatives and awareness programs should be enhanced, especially among coaches and sports teams.

Interview Excerpt:

"Atlet yang dah biasa dengan urutan, diorang akan datang sendiri. Tapi ada yang tak percaya, cakap urut ni membuang masa. Bila dah kena cuba sekali, baru diorang cari kita tiap minggu."

"Athletes who are used to massage will come on their own. But there are some who don't believe in it — they say it's a waste of time. Once they try it once, then they start looking for us every week."

Theme 2: Time and Financial Constraints in Accessing Massage Services

Although sports massage is proven to be effective in enhancing performance and speeding up athlete recovery, its implementation is often hindered by time constraints and financial limitations. Athletes with tight training schedules struggle to allocate time for regular massage

sessions. Additionally, teams with limited budgets may not prioritize Sports Masseur services, particularly if no specific funds are allocated for this purpose.

In such situations, teams with strong financial support are more capable of providing consistent massage sessions for their athletes, while less financially stable teams may only access these services when necessary.

Interview Excerpt:

"Kalau dalam pasukan besar, tak semua boleh dapat sesi urutan selalu. Ada yang kena tunggu sampai sakit baru dapat turn. Kalau ada duit lebih, baru boleh buat secara konsisten."

"In a big team, not everyone can get a massage session regularly. Some have to wait until they're in pain before it's their turn. If there's extra money, only then can they get consistent sessions."

Theme 3: Availability of Skilled and Experienced Sports Masseurs

The effectiveness of sports massage also depends on the skills and experience of the Sports Masseur providing the service. Not all masseurs are trained in sports therapy, and this difference in expertise can significantly impact the results achieved by athletes. Experienced Sports Masseurs understand muscle anatomy, the specific needs of athletes based on their sport, and appropriate techniques for different levels of fatigue and injury.

If massage is performed by an unqualified individual, it can lead to negative effects, such as muscle injuries or prolonged discomfort. Therefore, continuous training and professional recognition of Sports Masseurs' expertise are essential to ensure the effective implementation of sports massage.

Interview Excerpt:

"Bukan semua tukang urut tahu pasal sukan. Kalau dapat yang tak berpengalaman, boleh buat lagi sakit. Sebab tu team selalu cari yang betul-betul ada pengalaman dengan atlet."

"Not all massage therapists know about sports. If you get someone inexperienced, they can make the pain worse. That's why teams always look for someone who truly has experience working with athletes."

4.5 Summary of Themes

Table 1: Summary of research questions themes

Research Question	Theme
1. How is the implementation strategy of sports massage applied by Sports Masseurs to high-performance athletes?	1. Adaptation of Massage Techniques Based on Athlete Needs 2. Integration of Massage into Athlete Recovery Routine 3. Collaboration Between Sports Masseurs and the Coaching Team
2. What types of sports massage are used by Sports Masseurs to enhance the mental toughness and psychological well-being of high-performance athletes?	1. Pre-Event Massage for Boosting Athlete Confidence and Focus 2. Post-Event Massage for Stress Reduction and Emotional Recovery 3. Recovery Massage for Reducing Mental Fatigue
3. What factors contribute to stress and anxiety among high-performance athletes?	1. Performance Pressure and High Expectations from External Parties 2. Fear of Injury and Its Impact on an Athlete's Career 3. Excessive Training Load and Mental Fatigue
4. What factors support and hinder the effective implementation of sports massage among Sports Masseurs and high-performance athletes?	1. Awareness and Belief in the Importance of Sports Massage 2. Time and Financial Constraints in Accessing Massage Services 3. Availability of Skilled and Experienced Sports Masseurs

5. Discussion

Findings from this study indicate that the application of sports massage has a significant positive impact on the mental toughness and psychological well-being of high-performance athletes. Interviews with Sports Masseurs and athletes confirm that sports massage helps reduce stress, improve mood, and enhance sleep quality. This aligns with a study by Vallée et al. (2021), which found that sports massage can lower anxiety levels and improve the mental well-being of athletes undergoing intensive training.

In a study conducted by Moyer & Rounds (2021), it was discovered that sports massage not only aids physical recovery but is also effective in addressing psychological issues commonly experienced by athletes. The benefits of massage include improved concentration and mental sharpness, supporting the hypothesis that sports massage plays a crucial role in strengthening an athlete's mental toughness, and should therefore be integrated into their training programs.

However, this study also highlights challenges in the implementation of sports massage, including a lack of awareness among athletes and coaches regarding its importance for mental

well-being. According to Wang et al. (2020), insufficient formal training for Sports Masseurs is one of the primary barriers reducing the effectiveness of sports massage. Many athletes still perceive massage as a secondary need after physical training, reflecting a knowledge gap that must be addressed.

In the Malaysian context, this study suggests the need for a more holistic approach in athlete recovery programs that incorporate both physical and mental aspects. As recommended by Sherry & Liddle (2020), the pressure faced by high-performance athletes should be managed through comprehensive interventions, including sports massage, to improve mental toughness rather than focusing solely on physical conditioning.

The lack of emphasis on mental well-being, which has been increasingly discussed in international studies, is also evident in Malaysia. This has resulted in athletes struggling with psychological challenges that are often overlooked (Perry & Smith, 2022). Previous studies also indicate that performance pressure, high external expectations, and injury risks are key factors contributing to anxiety among athletes (Moyer & Rounds, 2021).

Ultimately, the findings of this study suggest that integrating sports massage as a key component in athlete recovery can not only help alleviate physical tension but also enhance overall mental well-being. Educational initiatives should be expanded to increase awareness among athletes and coaches, encouraging them to recognize sports massage as an essential tool for achieving peak performance.

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Ultimately, the findings of this study suggest that integrating sports massage as a key component in athlete recovery can not only help alleviate physical tension but also enhance overall mental well-being. Educational initiatives should be expanded to increase awareness among athletes and coaches, encouraging them to recognize sports massage as an essential tool for achieving peak performance.

6. Conclusion

This study highlights the significant role of sports massage in enhancing both the mental toughness and psychological well-being of high-performance athletes. While traditionally viewed as a recovery tool, sports massage also serves as a psychological intervention, reducing stress, improving emotional regulation, and fostering mental resilience. However, despite its proven benefits, the integration of sports massage into structured athlete development programs remains inconsistent due to barriers such as lack of awareness, financial limitations, and insufficient professional training.

To bridge this gap, integrating sports massage into sports science education is essential for equipping future coaches, sports educators, and practitioners with comprehensive knowledge on athlete recovery and psychological well-being. By embedding sports massage into sports science curricula, institutions can cultivate a more holistic learning approach that emphasizes both physical and mental preparation. Future sports science professionals should be trained to recognize the dual benefits of sports massage, not only for physical rehabilitation but also for mental performance enhancement.

Furthermore, fostering interdisciplinary collaboration between sports scientists, educators, psychologists, and medical professionals is crucial in developing effective learning frameworks. Research-driven educational strategies can enhance students' understanding of recovery science and provide evidence-based methodologies for optimizing athlete well-being. By integrating sports massage into structured educational programs, future professionals can contribute to improving both the performance outcomes and psychological resilience of high-performance athletes.

As sports science education continues to evolve, a paradigm shift is necessary to emphasize athlete well-being as a core component of learning and training. Future research should explore the long-term impact of sports massage education, assessing its effectiveness in enhancing mental toughness, injury prevention, and overall sports performance. By embedding this knowledge into sports science learning, institutions can prepare future sports professionals to implement holistic recovery strategies, ultimately shaping a more sustainable and athlete-centered approach to sports education.

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