

Wellness status and training load among Malaysian rugby players during Asia rugby men's championship 2023: a comparative analysis

Estado de bienestar y carga de entrenamiento entre los jugadores de rugby de Malasia durante el campeonato asiático de rugby masculino 2023: un análisis comparativo

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Resumen. El Campeonato Asiático de Rugby Masculino (ARMC) es una plataforma reconocida para que los equipos de rugby de la zona exhiban sus habilidades y compitan a nivel internacional. Las tensiones físicas y psicológicas del torneo sobre los competidores pueden tener consecuencias para su salud general. El propósito de este estudio es analizar la carga de entrenamiento y la relación de carga de trabajo aguda a crónica (ACWR) y evaluar el bienestar del equipo de rugby de Malasia durante el Campeonato Asiático de Rugby Masculino 2023. El estudio contó con la participación de 30 jugadores de Malasia. Miembros del equipo de rugby. A lo largo de la competición, se evaluaron minuciosamente los datos de la carga de entrenamiento, como el tiempo de la sesión, la calificación del esfuerzo percibido (sRPE) de la sesión y numerosos indicadores de bienestar como la fatiga, la calidad del sueño, el estado de ánimo, el dolor muscular y el nivel de estrés. El ACWR se determinó dividiendo el promedio móvil de la carga de trabajo crónica por el promedio móvil de la carga de trabajo aguda. Los datos demostraron diferencias en los patrones de carga de entrenamiento y los valores de ACWR y se utilizaron cuestionarios de autoinforme para recopilar datos sobre el estado de bienestar durante la competición. El estudio enfatiza la importancia de monitorear la carga de entrenamiento para optimizar el rendimiento de los jugadores y reducir el riesgo de lesiones durante torneos de rugby extenuantes. El estudio revela las dificultades de bienestar que enfrentaron los jugadores de rugby de Malasia en ARMC 2023, lo que orienta intervenciones personalizadas para mejorar el bienestar y el rendimiento durante los partidos internacionales de rugby. También mejora la comprensión de los enfoques de gestión de la carga de entrenamiento y puede guiar métodos de entrenamiento futuros para eventos similares.

Palabras clave. monitoreo de la carga de entrenamiento, relación de la carga de trabajo aguda a crónica (ACWR), rugby de Malasia, rendimiento del atleta, riesgo de lesiones, estado de bienestar, bienestar del jugador.

Abstract. The Asia Rugby Men's Championship (ARMC) is a well-known platform for rugby teams in the area to exhibit their abilities and compete on an international level. The tournament's physical and psychological strains on competitors may have consequences for their overall health. The purpose of this study is to look at the training load and the acute-to-chronic workload ratio (ACWR) and to evaluate the wellness on the Malaysia Rugby squad during the Asia Rugby Men's Championship 2023. The study enlisted the participation of 30 Malaysia Rugby squad members. Throughout the competition, training load data such as session time, session rating of perceived exertion (sRPE), and numerous wellness indicators such as fatigue, sleep quality, mood, muscular soreness, and stress level were thoroughly evaluated. The ACWR was determined by dividing the chronic workload rolling average by the acute workload rolling average. The data demonstrated differences in training load patterns and ACWR values and self-report questionnaires were used to collect data for wellness status throughout the competition. The study emphasizes the significance of monitoring training load to optimize player performance and reduce the risk of injury during strenuous rugby tournaments. The study reveals wellness difficulties faced by Malaysia Rugby players at ARMC 2023, guiding personalized interventions to enhance well-being and performance during international rugby games. It also enhances understanding of training load management approaches and may guide future training methods for similar events.

Keywords. training load monitoring, acute-to-chronic workload ratio (ACWR), Malaysia Rugby, athlete performance, injury risk, wellness status, player well-being.

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Introduction

In competitive sports, the primary focus is on achieving the highest level of performance, while at the same time ensuring the well-being of the players. Rugby, a sport known for its high physical demands and complex strategic elements, provides an interesting context for studying the relationship between athlete well-being and the dynamics of training load (Taylor, Myers, Sanders, Ellis & Akubat, 2021). This is the focus of this case study, which involves wellness status and load monitoring among, Malaysian 15's elite rugby team (Bunga Raya 15's), participating in the Asia

Rugby Men's Championship, the highest level of rugby competition in the region. The intense requirements of preparing for and participating in tournaments place considerable physical and psychological stress on players, emphasizing the significance of comprehensive athlete management measures.

In Malaysia, the concept of training loads monitoring are still at introductory phase, providing a systematic year-long training program implementation, allowing coaches and managers to plan effectively (Baki, Mohamad & Nadzalan, 2022). However, the effectiveness of the physical conditioning program is often judged based on an athlete's actual

performance during competition. Current practices in Malaysia lack systematic training workload management and sensitivity to daily training load, particularly during competition phases. Limited research and publications exist on workload profiles and management among athletes in Malaysia, particularly among elite groups. This lack of research hinders further studies on workload management and monitoring in Malaysia by elite or development groups.

Additionally, selecting the appropriate workload management system or method requires a proven analysis or findings (Borresen & Lambert, 2009), but there is limited local research available. At the moment one of our referrals is Amateur Rugby Union practices. Training load monitoring widely used (about 73%) by coaches for teams competing in Amateur Rugby Union, with session rating of perceived exertion (sRPE) was the main method of monitoring (83% usage) (Griffin, Kenny, Comyns, & Lyons, 2021). The acute:chronic workload ratio (ACWR) can be calculated using this sRPE data collected (Cousins, Morris, Sunderland, Bennett, Shahtahmassebi, & Cooper, 2019). A more advanced calculation method utilizing several other variables has also been suggested, such as exponentially weighted moving averages (EWMA) which accounts for the decay of fitness and fatigue. This may be the next choice of method to be considered in future for the Malaysian team.

Participating in such high-intensity competitions, on the other hand, may impose massive physical and psychological demands on players, thereby impacting their general state of wellness. Understanding rugby players' wellness state during the ARMC 2023 is essential for designing efficient strategies to promote their well-being and optimize performance.

Workload management systems should consider the specific needs of each player or position of play (Lindsay, Draper, Lewis, Gieseg & Gill, 2015), but this is difficult to determine due to no studies quantifying the difference in output produced between elite and non-elite rugby players in Malaysia. An athlete's performance must be optimized, injuries must be avoided, and success in competitive sports depends on accurate training load monitoring (Windt, Gabbett, Ferris & Khan (2017). For the Malaysia Elite 15's Rugby squad, the Asia Rugby Men's Championship (ARMC) 2023, which features intense matches and demanding training regimens, provides a difficult environment. Monitoring training load and evaluating the acute-to-chronic workload ratio (ACWR) throughout the ARMC 2023 might offer helpful insights on the team's training plans and their effects on player performance and injury risk.

As a way to examine the performance preparation and in order to reduce the danger of illness or injury while improving player skill and performance, the goal was to evaluate how well-prepared players were for the Asia Rugby Men's Championship 2023.

Methods

This research may be viewed as a component of the

strength and conditioning coach's (researcher's) training monitoring and well-being monitoring of the participating rugby players. The goal was to examine the performance preparation and in order to reduce the danger of illness or injury while improving player skill and performance, the goal was to evaluate how well-prepared players were for the Asia Rugby Men's Championship 2023.

Research Design

Quantitative experimental design was used for this study. Throughout the 28-day period, players engaged in conventional team training as guided by the coaches. This includes two competitive international matches for the Malaysia Rugby side. All players practiced fatigue evaluations in the weeks preceding up to the completion of the major experimental trials. Each morning, before the players began their normal routine, fatigue levels were assessed. Individuals' opinions of wellbeing indicators were tested on a daily basis during the 28-day period. With the exception of match and rest days, training load were recorded every day.

Participants

Main criteria of inclusion were the Malaysia Rugby 15's Elite squad was used to draw participants for this study. The primary requirements for inclusion were that the participants must have been formally registered as Malaysia National Rugby 15's Elite participants at the time the data was collected. Thirty Malaysia Rugby players playing in the Asia Rugby Championship 2023 took part in the study. The study included the Malaysia Rugby team participating in the Asia Rugby Men's Championship 2023. The research had 30 players in all, with a mean age of 27.7 and a range of 23 to 38. All players gave their informed consent.

Data Collection

Data was collected during the Asia Rugby Men's Championship 2023, which lasted June 2023. The well-being parameters were evaluated using a subjective method. Subjective measures included daily self-report questionnaires that assessed fatigue, sleep quality, mood states, stress, and recovery. Players will scale their wellness (Sleep Quality, General Muscle Soreness, Mood state, Fatigue and Stress) on a scale 1 (one) to five (5), with 1 was the lowest and five the highest (Noon, Jame, Clarke, Akubat & Thake, 2015).

Data on the training load were gathered. Each training session's length and session rating of perceived exertion (sRPE) were recorded. The rolling average of the acute workload (such as a 1-week rolling average) was divided by the rolling average of the chronic workload (such as a 4-week rolling average) to get the ACWR.

Perceived Wellness Questionnaires

Wellness evaluations were conducted prior to the commencement of training. Players were requested to rate their general well-being on a scale of 1 to 5, with 5 being the highest probable score. According to Allen, Lamb and Westerblad (2008), wellness is the athlete's physiological function as well as a decline in pre-game psychological function. According to the research by Johnston, Gabbett and Jenkins (2013), cumulative tiredness negatively impacted high-intensity sprinting, maximum accelerations, and defensive performance in the championship game.

This indicates that when players do not have enough time to rest in between practice and competition, fatigue builds up, impairing critical performance areas and raising the player's risk of injury and illness.

Training Load Monitoring

Internal and external workloads contribute to the training load, which is defined as the physical loading experienced by a player and the quantification of work performed outside of the player (Drew & Finch, 2016). Training load is calculated by multiplying session RPE by the duration of the session. Accurately calculating session load and monitoring individual player daily routines and match or game load is crucial for accurate training management.

The study involved participants providing their session rate of perceived exertion (sRPE) after each training session, which was multiplied to calculate training load in arbitrary units (AU). Acute training load (ATL) was the total training load for one week, while chronic training load (CTL) was the average weekly training load over a four-week period. ACWR was determined by dividing acute training load by chronic training load. All rugby players exercised according to their playing position during the study session.

Acute Chronic Workload Ratio (ACWR)

The entire training and match workload information performed by a player during a seven-day period is referred to as the acute workload (Hulin, Gabbett, Lawson, Caputi, & Sampson, 2016). It is determined by multiplying the sRPE score by the training session time. If a player trains twice in a single day, the acute workload for that day is calculated by combining the workloads from both sessions. Depending on the ACWR model utilized by the strength conditioning or fitness coach, the final acute workload value and interpretation of the data will change. The chronic workload, which is generally the 28-day average acute workload, is used to assess a player's fitness.

Data Analysis

The study used ANOVA to compare velocity threshold mean values, normality analysis, and Spearman's rank correlation coefficient to determine correlations between training load and wellness measures. Correlations were also found between training load and wellness measures. Data

was analyzed using SPSS 20.0.

Descriptive statistics were utilized to summarize the wellness data and training load acquired during the Asia Rugby Men's Championship 2023. Throughout the competition, changes in tiredness, sleep quality, emotional states, stress levels, and muscle soreness were tracked. Match-related characteristics such as match intensity, schedules for travel, and recovery strategies were investigated for potential relationships with player health. Each player's ACWR values and each training sessions were analyzed. Analysis was done on how training load patterns and ACWR values changed during various championship phases.

Results

Descriptive data for this study has been showed in Table 1, with mean age of the group was 27.7 (± 4.81) years old, height 1.78 (± 0.07) meters and weight 97.51 (± 14.61) kilogram.

Table 1.

Anthropometry Description

	Mean	SD
Age (years old)	28.07	4.81
Height (m)	1.78	0.07

According to initial findings from the wellness tests, Malaysia Rugby players' well-being state fluctuated during the Asia Rugby Men's Championship 2023. Fatigue levels increased during intense matches and during periods of heavy game load, while sleep quality went through, particularly on travel days. Players' mood states varied, with higher degrees of stress and tiredness and lower levels of energy reported. Stress levels were shown to be higher, especially before major matches. Recovery scores varied, emphasizing the need for efficient strategies for recovering during the competition.

Between weeks one and four, Figure 1 compare the mood state, stress level, fatigue level, muscle soreness and quality of sleep while, figure 2 compares the Total Score for wellness, mood, exhaustion, sleep quality, stress, and soreness in the general muscles. The first phase, which lasted from Week 1 to Week 2, was evident from the average overall wellbeing score, which was 19.5 and 19.3 out of 20. Due to international tournaments, the overall wellness score has dropped to 19.1 and 19.3 out of 20 as we enter weeks three and four.

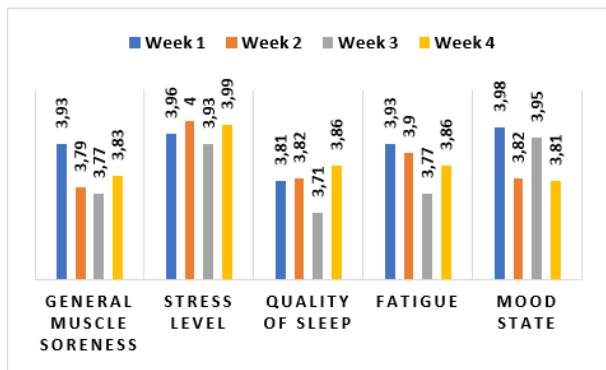


Figure 1. Wellness status

Initial results from the training load monitoring show that training load patterns and ACWR values will vary during the course of the Asia Rugby Men’s Championship in 2023.

Between the first and fourth weeks, Table 2 compares the training load, acute-to-chronic workload ratio, and monotony. As we can see, there was an initial phase from Week

1 to Week 3, which resulted in a rather high average training load of between 786.783 (701.74) and 894.92 (644.07) AU. Due to the last part of the competition in week 4, the amount of training hours is reducing as we reach week 4.

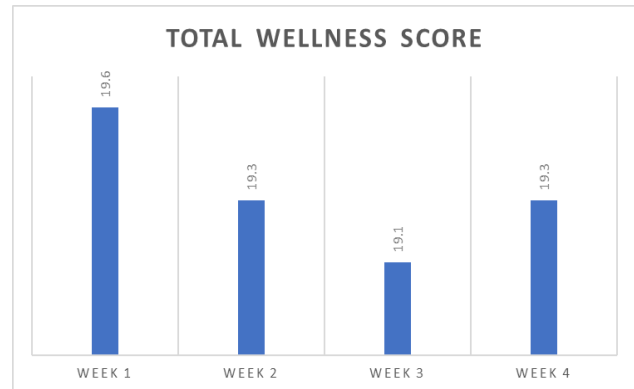


Figure 2. Total wellness score

Table 2.

Comparison week by week between Training Load, ACWR, Monotony & Volume

Week	TL (AU) (mean ± SD)	ACWR (mean ± SD)	Monotony (mean ± SD)	Volume (mean ± SD)
Week 1	786.78 ± 701.74	0.98 ± 0.08	133 ± 0.64	1019.86 ± 11840
Week 2	842.92 ± 644.07	0.89 ± 0.13	130 ± 0.07	850.29 ± 148.10
Week 3	748.92 ± 510.85	0.84 ± 0.09	130 ± 0.14	731.00 ± 90.64
Week 4	704.28 ± 584.38	0.94 ± 0.12	140 ± 0.20	795.3 ± 90.646

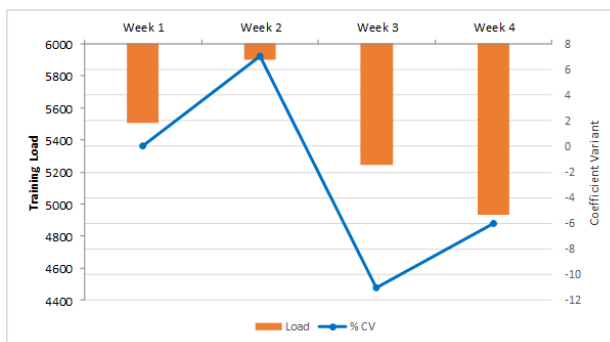


Figure 3. Training strain and weekly changes (%) in weekly training strain during the preparation phase (week one till week four).

The training load increased during the stressful match weeks and reduced throughout the tournament’s preparation period (Figure 3). The highest weekly training load shift occurred during the competition period (weeks one through week four) and was 7% from week one to week two. The smallest reduction (-11%) was observed from week three to week four (Figure 1). Weeks three and four showed the lowest within-week coefficient of variation (-11%), whereas week two had the highest within-week coefficient of variance (7%). Over the course of the four weeks, the weekly training load’s coefficient of variation (weekly mean)

was 85%. These findings were consistent with past sports such as rugby (Cross, Williams, Trewartha, Kemp, & Stokes, 2016) and football (Scott, Lockie, Knight, Clark & de Jonge 2013). Higher values were seen when the training load was increased. The ACWR values varied. These fluctuations demonstrate how training load management is dynamic throughout international rugby competitions.

Discussion

The findings of this study give beneficial insights into the wellness issues encountered by Malaysia Rugby players during the Asia Rugby Men’s Championship 2023. The observed variation in tiredness levels, sleep quality, moods, stress levels, and recovery demonstrates the physical and psychological challenges of participation in high-intensity rugby matches. The study of match-related aspects, including intensity and travel plans, contributes to a better understanding of the contextual factors that impact player wellness (Halson, 2014). The study aimed to understand the wellbeing and stress levels of elite players who completed full-time training, identifying the most stressful periods for players. This information would help coaches and manag-

ers better understand the stresses faced by players, ultimately improving their performance. Psychological stress, such as emotional state, stress levels, sleep quality, fatigue, and muscle soreness, were significantly affected during training camp. Additionally, physical fitness tests were conducted to assess players' fitness, which may lead to feelings of constrained freedom, doubt, and limited social contacts. The research revealed that Malaysian Rugby Players significantly respond to wellbeing, with some subjective metrics not being related to training pressure.

These findings have significance for the development of personalized procedures intended at optimizing player well-being and performance during international rugby events.

The results of this study provide information on the Malaysian rugby team's training program and ACWR for the 2023 Asia Rugby Men's Championship. Assisting in the optimization of training programs to improve player performance, monitoring training load and ACWR can help detect times when injuries may be more likely to occur (Hulin, Gabbett, Lawson, Caputi & Sampson, 2016). Gabbett, Hulin., Blanch and Whiteley (2016) highlights the popularity of acute training load in team sports for improving player fitness, reducing injury risk, and performance.

However, the research aimed to determine the current level of workload among Malaysian rugby players during the competition phase of their training periodization. During the first four weeks of the pre-season, there were significant fluctuations in weekly load, with a 7% increase from week one to week two and a -11% decrease from week two to week three. Over the last three weeks, the weekly load stabilized. Rugby teams engaging in high-intensity competitions should have individualized training load management and periodization techniques, as shown by the observed fluctuations in training load patterns and ACWR values (Quarrie, Raftery, Blackie, Cook, Fuller, Gabbett, Gray, Gill, Hennessy, Kemp & Lambert, 2017).

According to this study, weekly training load values varied between 2000 and 5900 A.U. in the first four weeks of preseason and between 1.2 and 1.5 A.U. in the last four weeks, demonstrating a weekly load decline until stability. A monotonous index of more than two arbitrary units is thought to put athletes at risk for illness and overtraining. However, as in our trial (5901 A.U. under increasing monotony-week two), this outcome was only present when the load was abnormally high. In contrast to the findings of this study, a prior study that employed a certain periodization training strategy and was focused on technical and tactical skill revealed small values (1.21-1.26 A.U.) over many seasons.

Conclusion

This comprehensive review of the wellness status of Ma-

laysia Rugby players during the Asia Rugby Men's Championship 2023 emphasizes the need for analyzing and monitoring player well-being in high-intensity events. The changes in fatigue, sleep quality, moods, stress levels, and recovery highlight the need for focused treatments to enhance player wellness (Meeusen, Duclos, Foster, Fry, Gleeson, Nieman, Raglin, Rietjens, Steinacker & Urhausen, 2013). Understanding the issues that rugby players encounter during the ARMC allows coaches and sports science experts to create strategies to improve player well-being as well as performance in future championships.

To maximize athlete performance and lower the risk of injuries during intensive rugby matches, training load monitoring, including the evaluation of ACWR, is essential. The findings of this investigation provided insight into the training load patterns and ACWR values for the Malaysian rugby squad in the Asia Rugby Men's Championship in 2023. These results may have consequences for similar international rugby competitions as well as for the team's future training programs and load management techniques.

Load prescription should be customized to meet each individual's changing demands after identifying high-risk individuals through a team program. Implementing player-specific programming requires observation and communication, and health monitoring identifies athletes who are fatigued or have non-physical issues that might impair performance or result in injury. High-risk gamers must carefully manage their load since they have a lower load tolerance. These athletes can be divided into a number of groups, such as elite athletes, junior team members, those who are recovering from injuries, new players, those who are competing for the first time, those who have advanced to higher levels of competition, those with a poor history of training, and those who are under a lot of non-physical or life stress. High-risk players can have a customized and efficient load prescription made for them by using player-specific programming and studying athletes.

Malaysia Rugby team programs use single-item self-report measures to assess risk, including fatigue, muscle soreness, stress, mood, sleep quality, and total score. These measures reveal mild to moderate associations with workload assessments, with predominantly negative associations. Future authors should consider these measures for inclusion in predictive risk tools alongside recognized risk indicators.

Due to their intense acute and chronic internal workloads, elite rugby players are more likely to sustain injuries. More closely related to damage and sickness than ACWR assessed over three and fourteen days are acute workloads >2125 AU. To lower the risk of injury, strength and conditioning coaches should make sure that players have a modest ACWR. Although there is no perfect load management technique, adhering to the ideas presented in this paper can help lower the risk of damage. Workload evaluations are understood by Malaysia Rugby team programs us-

ing single-item self-report measures, with weak to moderate relationships established. Future studies should take these metrics into account and include them with recognized risk markers in predictive risk tools.

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