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Exploring the Acute Benefits of Manual Soft Tissue Mobilization and Myofascial Release on Dynamic Athletic Performance in National Level Soccer Players

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Abstract

Objectives. This study aimed to investigate the acute effects of Manual Soft Tissue Mobilization (MSTM) and Myofascial Release (MFR) on key dynamic performance metrics in national-level male soccer players.

Materials and methods. Twenty-four nationally competitive male soccer players (aged 18-23) were randomly assigned to MSTM (n = 12) and MFR (n = 12) groups. Each participant underwent a single intervention session specific to their group. Pre- and post-intervention assessments were conducted to evaluate flexibility (Sit-and-Reach Test), explosive power (Standing Broad Jump and Countermovement Jump), and dynamic balance (Single-Leg Hop Test). Certified professionals used standardized application protocols. Repeated measures ANOVA was employed to determine statistical significance, and partial eta squared ($\eta^2 p$) was used to assess effect size.

Results. Both MSTM and MFR resulted in substantial enhancements ($p < .05$) across all performance metrics. The MFR group demonstrated superior gains compared to the MSTM group: flexibility (+11.58 % vs. +5.29 %, $\eta^2 p = .61$), standing broad jump (+4.25 % vs. +2.15 %, $\eta^2 p = .70$), countermovement jump (+7.68 % vs. +4.65 %, $\eta^2 p = .56$), and dynamic balance (+4.11 % vs. +3.03 %, $\eta^2 p = .29$). All changes were statistically significant, with MFR exhibiting larger effect sizes.

Conclusions. The study concluded that both soft tissue techniques significantly improved flexibility, explosive power, and dynamic balance in elite male soccer players, with MFR consistently yielding greater acute benefits. These findings highlight the effectiveness of incorporating MFR into pre-competition warm-up routines for enhancing immediate performance. Further research should focus on exploring the longevity of these effects, sport-specific performance metrics, and combined protocols to refine pre-competition strategies.

Keywords: myofascial release, manual soft tissue mobilization, athletic performance, soccer players, explosive power, fascial system.

Introduction

Athletic performance is shaped by a complex interaction of physiological, biomechanical, and psychological factors, making it essential to adopt evidence-based strategies for performance enhancement (Bompa & Buzzichelli, 2019). One such approach that has gained significant attention in sports science is soft tissue mobilization (STM), which is believed to enhance muscle function, boost circulation, and aid in recovery (Behm & Wilke, 2019a). Soccer, being a sport characterized by high-intensity physical demands, requires substantial endurance, agility, and explosive power. Given these requirements, STM's could play a crucial role in ensuring that elite athletes maintain optimal performance levels. Although widely utilized by athletes and sports professionals, the immediate impact of STM on dynamic athletic performance remains a subject of debate. This study aims to examine the short-term benefits of STM on key performance metrics in national-level soccer players, providing empirical data on its effectiveness in high-performance sports. STM encompasses a variety of manual therapy techniques designed to manipulate muscles, fascia, and connective tissues, thereby improving flexibility, decreasing stiffness, and enhancing neuromuscular function (Schroeder & Best, 2015). Techniques such as myofascial release, deep tissue massage, and instrument-assisted soft tissue mobilization (IASTM) have shown potential in increasing local blood flow, reducing myofascial restrictions, and minimizing neuromuscular inhibition (Cheatham et al., 2015a). These physiological benefits are particularly relevant for soccer players, who frequently perform high-intensity, repetitive movements that can lead to muscle tightness, fatigue, and microtrauma (Wiewelhove et al., 2016). From a mechanistic standpoint, STM is thought to enhance athletic performance through multiple pathways. First, by increasing muscle temperature and circulation, STM can improve muscle elasticity and reduce passive stiffness, leading to an improved range of motion (ROM) and more efficient movement patterns (Tang et al., 2024). Second, STM has been linked to improved proprioceptive feedback and neural activation, which may enhance motor control and coordination essential elements in soccer performance (Behm & Wilke, 2019a). Lastly, STM could play a role in mitigating delayed onset muscle soreness (DOMS) and acute muscle fatigue by facilitating lymphatic drainage and reducing inflammatory responses (Wiewelhove et al., 2016), thereby allowing athletes to sustain high-intensity efforts for longer durations.

Soccer requires a combination of speed, agility, strength, and endurance, with players frequently engaging in rapid accelerations, decelerations, changes in direction, and explosive movements, all of which impose significant mechanical stress on the musculoskeletal system (Nédélec et al., 2012)players are frequently required to play consecutive matches interspersed by 3 days and complete physical performance recovery may not be achieved. Incomplete recovery might result in underperformance and injury. During congested schedules, recovery strategies are therefore required to alleviate post-match fatigue, regain performance faster and reduce the risk of injury. This article is Part I of a subsequent companion review and deals with post-match fatigue mechanisms and recovery kinetics of physical performance (sprints, jumps, maximal strength and technical skills. To sustain peak performance, athletes must maintain neuromuscular efficiency and manage fatigue, particularly in competitive settings where marginal performance improvements can influence match outcomes (Bangsbo et al., 2006) the players perform intermittent work. Despite the players performing low-intensity activities for more than 70 % of the game, heart rate and body temperature measurements suggest that the average oxygen uptake for elite soccer players is around 70 % of maximum (VO_2max). Given these demands, STM could serve as a valuable tool in pre-competition preparation and recovery strategies for elite soccer players. Previous studies have suggested that acute interventions such as dynamic stretching, foam rolling, and massage may positively influence performance metrics like sprint speed, jump height, and agility (Peacock et al., 2014a). However, the specific effects of STM on these parameters remain insufficiently explored, particularly in elite soccer players. While some research suggests that STM can enhance flexibility and neuromuscular function (Cheatham et al., 2015a). Other studies indicate minimal or negligible effects on force production and explosive power (Stroiney et al., 2020). These inconsistencies highlight the need for controlled studies to determine STM's immediate effects on dynamic athletic performance in soccer. Despite its widespread application in sports settings, limited research has examined the acute effects of STM on key performance indicators in soccer players. Much of the existing literature focuses on long-term adaptations following STM interventions (Markovic, 2015) or emphasizes its role in injury rehabilitation rather than performance enhancement (Behm & Wilke, 2019a). Additionally, while studies on foam rolling and massage therapy have provided insights into the acute physiological responses to soft tissue manipulation, research specifically investigating STM techniques within soccer-specific contexts remains scarce (Cheatham et al., 2015a). Understanding STM's immediate impact on attributes such as sprint speed, agility, vertical jump height, and balance is essential for optimizing pre-game routines and recovery strategies in soccer. If STM proves to be beneficial in enhancing these performance factors, it could provide a competitive edge by improving match readiness and reducing performance declines associated with fatigue. However, if STM is found to have no significant effect or even an adverse impact, its inclusion in pre-competition protocols may need to be reconsidered.

To address this gap, the present study aims to systematically evaluate STM's short-term effects on dynamic athletic performance in national-level soccer players. Specifically, the study seeks to determine the immediate influence of STM on critical performance metrics, including sprint speed, agility, vertical jump height, and balance in elite soccer players. By examining these factors, the study aims to offer evidence-based insights into STM's effectiveness in high-performance soccer, thereby contributing to the refinement of training and recovery protocols.

Materials and Methods

Participants

This study adopted a randomized controlled trial (RCT) design to examine the acute effects of two soft tissue mobilization techniques, Manual Soft Tissue Mobilization (MSTM) and Myofascial Release (MFR), on key performance metrics in national-level male soccer players. A total of 24 nationally competitive male soccer players, aged 18 to 23 years, were recruited from the Kalimpong district in the eastern part of the region. All participants had a minimum of three years of competitive playing experience and were free from musculoskeletal injuries for at least six months before the study to ensure homogeneity and minimize confounding variables. The study was conducted by the ethical principles outlined in the ("World Medical Association Declaration of Helsinki," 2013). Participants were randomly assigned to one of two intervention groups: the Manual Soft Tissue Mobilization group (MSTM, n = 12) or the Myofascial Release group (MFR, n = 12). Both groups underwent a single-session intervention, and performance assessments were conducted both before and immediately after the intervention to measure acute changes. Randomization and standardized testing protocols were employed to enhance internal validity and minimize measurement bias. The intervention and data collection were conducted in December 2024.

Table 1. Demographic Values for Participants (mean ± SD), n = 24

Age (Y)	Height (cm)	Weight (kg)	BMI	Experience
20.46 ± 1.64	160.08 ± 8.15	54.08 ± 4.98	21.28 ± 3.17	3.63 ± 0.71

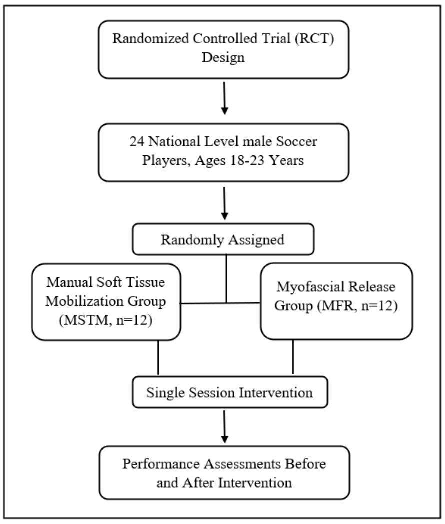

Fig. 1. Flow Diagram Based on CONSORT Guidelines Depicting Participant Enrollment, Allocation, Follow-Up, and Analysis

Training Protocol

The Manual Soft Tissue Mobilization (MSTM) and Myofascial Release (MFR) training protocol was designed to assess their acute effects on muscle function, pain reduction, and flexibility. A single-session intervention was implemented, with each technique applied for approximately 15 minutes to evaluate its immediate impact. Both protocols targeted large muscle groups such as the quadriceps, hamstrings, and gastrocnemius, with standardized intensity, duration, and rest intervals to ensure consistency. All massage sessions were conducted by certified specialists with expertise in soft tissue therapy, ensuring proper technique and consistency. Each intervention was administered following standardized protocols, with controlled intensity and frequency over a predetermined duration.

In Table 2 MSTM was applied with moderate pressure (5-6/10 on a pressure scale) using rhythmic and dynamic techniques to enhance circulation, muscle pliability, and neuromuscular activation. The session began with superficial effleurage, performed for 2 minutes, using light gliding strokes along the muscle fibers to increase blood circulation and prepare the tissues for deeper mobilization. This was followed by deep effleurage for 2 minutes, where increased pressure was applied to enhance venous return and tissue pliability. Next, kneading was performed for 3 minutes, using circular, rhythmic pressure into the muscle belly to reduce muscular tension. Stripping, a technique involving deep, sustained pressure along muscle fibers, was applied for 4 minutes to release muscle adhesions and trigger points. The protocol concluded with percussion (tapotement) for 4 minutes, where light, rhythmic tapping was used to stimulate neuromuscular function and muscle activation.

Table 2. Standardized Training Protocol for Manual Soft Tissue Mobilization (MSTM): Techniques, Application, and Expected Outcomes

Technique	Duration	Application Method	Expected Outcome
Superficial Effleurage	2	Light gliding strokes along muscle fibers (proximal to distal)	Increases circulation and warms up tissues
Deep Effleurage	2	Increased pressure with hands gliding along muscle fibers	Enhances tissue pliability
Kneading	3	Circular, rhythmic pressure into the muscle belly	Reduces muscle tension
Stripping	4	Sustained deep pressure along muscle fibers, targeting adhesions	Releases tight bands in the muscle
Percussion	4	Light rhythmic tapping to stimulate neuromuscular function	Enhances acute muscle activation

Table 3. Standardized Training Protocol for Myofascial Release (MFR): Techniques, Application, and Expected Outcomes

Technique	Duration	Application Method	Expected Outcome
Superficial Fascia Release	2	Gentle stretching of the skin along fascial lines	Hydrates fascia, improves tissue glide
Cross-Hand Release	3	Sustained opposing pressure using both hands	Releases deep fascial restrictions
Deep Tissue Release	4	Slow, deep compression at key tension points	Improves flexibility, reduces pain
Stretch Release	3	Passive stretching combined with fascial gliding	Enhances ROM and functional movement
Active MFR	3	Patient performs movement while therapist applies pressure	Boosts neuromuscular adaptation

Each technique was executed at a speed of 1-2 cm/sec, with 30-second rest intervals provided after every two techniques.

In Table 3 MFR was performed with higher intensity (7-8/10 on the pressure scale) and involved slow, sustained, deep tissue techniques to reduce fascial restrictions and improve movement efficiency. The session began with superficial fascia release for 2 minutes, during which gentle stretching along fascial lines was applied to hydrate the fascia and enhance tissue glide. Next, cross hand release was performed for 3 minutes, where the therapist applied sustained opposing pressure with both hands to break down deep fascial adhesions. Deep tissue release followed for 4 minutes, utilizing slow, deep compression at key tension points to improve flexibility and alleviate localized pain. Stretch release was performed for 3 minutes, combining passive stretching with fascial gliding to enhance range of motion (ROM) and movement efficiency. The protocol concluded with active MFR for 3 minutes, in which the patient actively moved the muscle while the therapist applied sustained pressure, facilitating neuromuscular adaptation and functional mobility. Each technique was held for 30-60 seconds, with a 45-second rest period provided between two consecutive techniques.

Outcome Assessment

To evaluate the acute effects of Manual Soft Tissue Mobilization (MSTM) and Myofascial Release (MFR) interventions, four key athletic performance metrics were assessed both pre- and post-intervention under standardized conditions:

Flexibility was measured using the Sit-and-Reach Test, a reliable and widely accepted method for assessing hamstring and lower back flexibility (Mayorga-Vega et al., 2014). The participants performed the test barefoot, and the best of three attempts was recorded after a standardized warm-up.

Lower-body Power was assessed using two tests:

The Standing Broad Jump (SBJ), which evaluated horizontal jump distance as an indicator of explosive leg power (Asan et al., 2025). Participants performed three attempts, with the best distance recorded. A manual tape measure was used for this test.

The Countermovement Jump (CMJ) was used to assess vertical jump height. Participants were instructed to stand upright with hands on hips, perform a rapid downward movement followed by a maximal vertical jump. Two familiarization trials were given, followed by three test trials. The highest jump, visually estimated using a wall-mounted scale or marked surface, was recorded for analysis (Krzysztofik et al., 2024).

Dynamic Balance (DB) was evaluated using the Single-Leg Hop Test, which assessed lower limb stability and neuromuscular control. The participants were instructed to hop forward as far as possible on one leg and land with balance. The distance was measured with a manual tape, and loss of balance or touchdown with the opposite foot invalidated the trial. The best of three valid trials was considered for analysis (Myer et al., 2011).

Data Collection Procedure

All baseline assessments were conducted on the same day before the intervention to establish pre-treatment values for each performance variable. Participants first completed a standardized dynamic warm-up routine to ensure consistency and reduce injury risk. Following the intervention, immediate post-treatment measurements were taken using the same standardized testing protocols and in the same sequence as the pre-tests. All tests were administered by trained assessors who were blinded to group allocation to minimize bias. Each test was performed under consistent environmental conditions, and adequate rest intervals were provided between trials to prevent fatigue-related performance decrements. Participants were verbally encouraged during tests to ensure maximal effort. The best score from multiple valid attempts was recorded for each performance metric.

Statistical Analysis

The collected data were analyzed using the Statistical Package for the Social Sciences (SPSS, version 26). Descriptive statistics, including mean and standard deviation, were calculated to summarize the central tendency and variability of the measured variables. To evaluate the acute effects of Manual Soft Tissue Mobilization (MSTM) and Myofascial Release (MFR) on dynamic athletic performance, a repeated measures Analysis of Variance (ANOVA) was conducted to compare pre- and post-intervention scores within and between the two groups. Effect sizes for both main and interaction effects were determined using partial eta squared and categorized as small (<0.06), moderate (≥0.06-0.13), and large (≥0.14) (Cohen, 1988). The level of statistical significance was set at $p < 0.05$.

Results

The Table 4 presents the comparative analysis of pre-test and post-test data across different physical performance variables for two groups: MSTM and MFR. The analysis includes flexibility, standing broad jump (SBJ), countermovement jump (CMJ), and dynamic balance (DB). In terms of flexibility, the MSTM group exhibited an improvement from 29.83 ± 1.26 to 31.41 ± 1.31, reflecting a percentage increase of 5.29 %, whereas the MFR group demonstrated a more substantial enhancement from 30.25 ± 1.60 to 33.58 ± 1.62, corresponding to an 11.58 % improvement. The statistical analysis yielded a significant effect (SS = 9.18, F = 34.89, p = .000) with a partial eta squared (η^2p) of 0.61, indicating a strong effect size. Similarly, in SBJ performance, the MSTM group improved from 177.58 ± 3.08 to 181.41 ± 3.26, reflecting a 2.15 % increase, while the MFR group showed a greater improvement from 178.25 ± 2.22 to 185.83 ± 2.12, representing a 4.25 % enhancement. The statistical results (SS = 42.18, F = 53.67, p = .000, η^2p = 0.70) suggest a highly significant and strong effect. For CMJ, the MSTM group showed an increase from 26.83 ± 1.26 to 28.08 ± 1.16 (4.65 %), whereas the MFR group exhibited a more notable improvement from 27.08 ± 1.56 to 29.16 ± 1.46 (7.68 %). The statistical findings (SS = 2.08, F = 28.94, p = .000, η^2p = 0.56) further confirm the significant impact of the intervention. Lastly, in DB performance, the MSTM group improved from 131.91 ± 3.23 to 135.91 ± 3.42 (3.03 %), whereas the MFR group showed a relatively higher increase from 131.50 ± 2.71 to 136.91 ± 2.35 (4.11 %). The statistical analysis (SS = 6.02, F = 9.16, p = .006, η^2p = 0.29) indicates a moderate effect. Collectively, these findings suggest that both groups

Table 4. Pre-Test and Post-Test Performance Analysis Across Physical Fitness Variables in MSTM and MFR Groups

Variables	Groups	Pre data M ± SD	Post data M ± SD	Δ (%)	SS	F	p	η^2p
Flexibility	MSTM	29.83 ± 1.26	31.41 ± 1.31	5.29	9.18	34.89	.000	.61
	MFR	30.25 ± 1.60	33.58 ± 1.62	11.58				
SBJ	MSTM	177.58 ± 3.08	181.41 ± 3.26	2.15	42.18	53.67	.000	.70
	MFR	178.25 ± 2.22	185.83 ± 2.12	4.25				
CMJ	MSTM	26.83 ± 1.26	28.08 ± 1.16	4.65	2.08	28.94	.000	.56
	MFR	27.08 ± 1.56	29.16 ± 1.46	7.68				
DB	MSTM	131.91 ± 3.23	135.91 ± 3.42	3.03	6.02	9.16	.006	.29
	MFR	131.50 ± 2.71	136.91 ± 2.35	4.11				

experienced significant improvements across all measured variables, with the MFR group consistently demonstrating greater percentage gains in performance, highlighting the efficacy of the applied intervention.

Discussion

The findings of this study demonstrate significant acute improvements in physical performance variables following both manual soft tissue mobilization (MSTM) and myofascial release (MFR) interventions among national level soccer players, with MFR consistently producing superior percentage gains across all measured parameters. The substantial improvement in flexibility observed in both groups aligns with previous research on manual therapy techniques. The MFR group demonstrated markedly greater improvements (11.58%) compared to the MSTM group (5.29%), with strong statistical significance ($p < .001$, $\eta^2p = 0.61$). This superior response to MFR is consistent with findings by (Peacock et al., 2014b) who reported significant acute increases in range of motion following myofascial release techniques. The enhanced flexibility response may be attributed to MFR's ability to directly influence fascial tissue properties through sustained pressure application, potentially inducing viscoelastic deformation and neuromuscular relaxation (Behm & Wilke, 2019b; Schleip, 2003). MacDonald et al. (2013) similarly demonstrated that myofascial release techniques produced immediate improvements in joint range of motion without compromising muscular performance, supporting our findings of enhanced flexibility concurrent with improved power metrics (MacDonald et al., 2013). The mechanisms likely involve both mechanical and neurophysiological responses, including thixotropic changes in ground substance, altered fascial hydration, and modified mechanoreceptor activity (Cheatham et al., 2015b). Both jumping parameters (SBJ and CMJ) showed significant improvements following treatment, with consistent superiority in the MFR group. The standing broad jump improvements (MFR: 4.25 % vs. MSTM: 2.15 %, $p<.001$, $\eta^2p = 0.70$) and countermovement jump gains (MFR: 7.68 % vs. MSTM: 4.65%, $p < .001$, $\eta^2p = 0.56$) demonstrate meaningful acute performance enhancement. These findings correspond with those of Healey et al. (2014), who observed acute improvements in explosive power following myofascial interventions (Healey et al., 2014). The superior power performance following MFR might be explained by the comprehensive impact on the myofascial continuity that extends through kinetic chains relevant to jumping actions. Krause et al. (2016) noted that targeted myofascial release can optimize force transmission along anatomical trains, potentially improving the efficiency of the stretch-shortening cycle crucial for explosive movements (Krause et al., 2016). Additionally, MFR's ability to reduce neural inhibition may contribute to improved motor unit recruitment and rate coding during explosive movements (Monteiro et al., 2017). Both interventions positively influenced dynamic balance, with moderate effect size ($\eta^2p = 0.29$) and the MFR group again showing greater percentage improvement (4.11 % vs. 3.03 %). This enhanced proprioceptive function following manual therapy interventions aligns with findings by Halperin et al. (2014), who demonstrated improved balance performance following targeted soft tissue interventions (Halperin et al., 2014). The mechanisms underlying these improvements likely involve enhanced afferent feedback from muscle spindles and mechanoreceptors following the reduction of tissue restrictions (Konrad et al., 2021). Evidence suggests that myofascial techniques may improve joint position sense and kinesthetic awareness by normalizing mechanoreceptor function within fascial tissues (Griefahn et al., 2017). Myers (2014) proposed that fascial continuity provides an integrated proprioceptive network; therefore, techniques that comprehensively address fascial restrictions may optimize this network's function more effectively than more localized approaches (Myers, 2014).

The consistently superior results observed in the MFR group across all performance parameters provide compelling evidence for the preferential application of myofascial release techniques when acute performance enhancement is the primary objective before athletic competition. The larger effect sizes observed in flexibility and jumping performance particularly highlight MFR's potential utility in sports requiring explosive power and optimal range of motion. These findings align with current trends in sports science that emphasize the importance of fascial system integrity for optimal athletic performance (Wilke et al., 2016). The integration of MFR techniques into pre-competition preparation protocols may offer performance advantages beyond traditional warm-up routines, particularly for power-dominant sports like soccer, where multiple physical qualities must be optimized concurrently (Behm et al., 2020). While this study demonstrates significant acute benefits of both interventions, several limitations should be acknowledged. The immediate post-intervention testing does not address the duration of these acute effects, which represents an important consideration for practical application. Future research should examine the time course of these performance enhancements to optimize implementation timing relative to competition demands. While national-level soccer players represent a relevant athletic population, sport-specific performance measures that are essential (e.g., sprint speed, change of direction ability) would further enhance the ecological validity of these findings. Investigation into how these acute improvements in fundamental physical qualities translate to sport-specific performance metrics represents an important direction for future study (Behm & Chaouachi, 2011). Moreover, exploring diverse myofascial release (MFR) techniques, durations, and anatomical target areas may contribute to the refinement of clinical recommendations aimed at optimizing acute performance outcomes. The potential synergistic effects of combining MFR with other pre-competition strategies (e.g., dynamic stretching, neuromuscular activation) also warrants investigation (Konrad et al., 2020).

Conclusions

This study demonstrated that both Manual Soft Tissue Mobilization (MSTM) and Myofascial Release (MFR) interventions significantly improved flexibility, explosive power, and dynamic balance in national-level male soccer players. The MFR group exhibited consistently greater percentage gains across all measured performance parameters, suggesting its superior efficacy for acute performance enhancement. These findings highlight the value of integrating soft tissue techniques, especially MFR, into pre-competition routines to optimize athletic readiness. Future research should explore the time course and longevity of these acute effects to determine their functional relevance across match durations. Furthermore, incorporating sport-specific performance indicators such as sprint time, agility, and change-of-direction speed would enhance ecological validity. Further studies may also investigate combined pre-competition protocols (e.g., MFR with dynamic stretching or neuromuscular activation drills), variations in technique intensity and duration, and effects in male athletes and other sports disciplines to generalize findings across broader athletic populations.

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Conflict of Interest

The authors declare no conflict of interest in relation to this study.

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Вивчення ефективних переваг мануальної мобілізації м'яких тканин та міофасціального розслаблення щодо динамічної спортивної результативності футболістів національного рівня

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Авторський вклад: A – дизайн дослідження; B – збір даних; C – статаналіз; D – підготовка рукопису; E – збір коштів

Реферат. Стаття: 6 с., 4 табл., 1 рис., 22 джерела.

Мета дослідження. Мета цього дослідження полягала у вивченні ефективного впливу мануальної мобілізації м'яких тканин (ММMT) та міофасціального розслаблення (МФР) на ключові показники динамічної результативності у футболістів національного рівня.

Матеріали та методи. Двадцять чотири конкурентоспроможних футболістів національного рівня (віком 18–23 роки) розподілено за методом рандомізації на групи ММMT ($n = 12$) та МФР ($n = 12$). Кожен учасник проходив одну інтервенційну сесію, специфічну для своєї групи. На перед- та постінтервенційному етапах дослідження проведено аналіз з метою оцінки показників гнучкості (нахил тулуба вперед з положення сидячі), вибухової сили (стрибок у довжину з місця та стрибок з контррухом), а також динамічної рівноваги (стрибок на одній нозі). Сертифіковані фахівці використовували стандартизовані протоколи застосування. Для визначення статистичної значущості було застосовано дисперсійний аналіз із повторними вимірами, а для оцінки розміру ефекту використовувався частковий ета-квадрат (η^2p).

Результати. У результатах як ММMT, так і МФР групи спостерігалося суттєве поліпшення ($p < .05$) за всіма показниками результативності. Група МФР продемонструвала кращі результати порівняно з групою ММMT: гнучкість (+11.58% проти +5.29%, $\eta^2p = .61$), стрибок у довжину з місця (+4.25% проти +2.15%, $\eta^2p = .70$), стрибок з контррухом (+7.68% проти +4.65%, $\eta^2p = .56$) та динамічна рівновага (+4.11% проти +3.03%, $\eta^2p = .29$). Усі зміни були статистично значущими, причому група МФР показала більші розміри ефекту.

Висновки. Дослідження показало, що обидві методики впливу на м'які тканини значно покращили гнучкість, вибухову силу та динамічну рівновагу у елітних футболістів, причому у методиці МФР спостерігалося постійне збільшення відчутних переваг. Отримані результати підкреслюють ефективність впровадження методики МФР у програми передзмагальних розминок для безпосереднього підвищення результативності. Подальші дослідження слід зосередити на вивченні тривалості цих ефектів, показників результативності в конкретних видах спорту та комбінованих протоколів з метою вдосконалення стратегій підготовки до змагань.

Ключові слова: міофасціальне розслаблення, мануальна мобілізація м'яких тканин, спортивна результативність, футболісти, вибухова сила, фасціальна система.

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