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The Role of Massage and Supplementation in Accelerating Recovery of Basketball Players: A Mini Review

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ABSTRACT: Basketball players often undergo training sessions for several days without a break. Each session places significant physical stress on players due to repetitive high-intensity activity, jumping movements, fatigue, and the risk of muscle injury due to eccentric loading. Massage and supplementation are popular recovery methods in the sport. Currently, there is no consensus on which recovery strategies have the greatest impact and effectiveness when applied to basketball players. This review aims to highlight the role of massage and supplementation in accelerating basketball player recovery. Recovery should be integrated as an integral component of a training program. Based on the research reports included in this mini-review, we conclude that massage and supplementation with L-glutamine, Vitamin E, Vitamin C, and β-carotene can accelerate basketball player recovery. Future research is needed to more extensively analyze other supplementation options, herbal ingredients, their effects on reducing oxidative stress and post-exercise inflammation, dosages, and product safety.

KEYWORDS: Massage; Supplementation; Recovery; Basketball.

I. INTRODUCTION

Basketball is one of the most popular sports internationally. It's a fast-paced game characterized by repetitive movements, varying intensity and duration, and sudden changes in direction, both horizontally and vertically (Cabarkapa *et al.*, 2020). Basketball players often undergo training sessions or matches for several days without a break. Each session places significant physical stress on the athlete due to the repetitive high-intensity activity, jumping movements, and the risk of muscle fatigue and injury from eccentric loading (Davis *et al.*, 2022). V

arious recovery methods have been implemented to speed up the recovery process after intense physical activity, such as consuming carbohydrates, stretching, wearing compression garments, active warm-ups, deep water exercises, and taking vitamin C supplements (Coyle and Coyle, 1993; Mason *et al.*, 2020; Setiawan *et al.*, 2023). A recent review suggests that cold water immersion therapy is an effective method for reducing delayed onset muscle soreness (DOMS), which typically occurs between 24 and 72 hours after exercise (Ayubi *et al.*, 2025). This pain is categorized as a type I muscle injury due to strain, which is characterized by pain when pressed and stiffness that appears when touched or moved (Cheung, Hume and Maxwell, 2003). Furthermore, a study reported that intermittent immersion interspersed with sitting at room temperature was shown to accelerate recovery to baseline performance levels compared to contrast water therapy, particularly in male athletes after strenuous exercise (Ingram *et al.*, 2009).

Furthermore, massage and supplementation are popular recovery methods in the sports world. One study reported that massage interventions can reduce muscle soreness and increase range of motion (ROM) after exercise (Kafrawi *et al.*, 2024). In addition, a recent study also reported that pomegranate peel supplementation was able to accelerate recovery by reducing oxidative stress and inflammation after exercise (Ayubi *et al.*, 2025). However, there is still no consensus on which recovery strategies have the greatest impact and effectiveness when applied to basketball players.

This review aims to highlight the role of massage and supplementation in accelerating the recovery of basketball players.

II. THE EFFECT OF MASSAGE TO ACCELERATE THE RECOVERY OF BASKETBALL PLAYERS

A study reported that massage, either alone or combined with stretching, had an effect on the recovery process after a match in male and female basketball players at the national level (Delextrat *et al.*, 2014). In male athletes, both types of treatment had a positive impact on vertical jump performance. Meanwhile, in female athletes, the combined treatment (massage and

stretching) resulted in a smaller decline in repeated sprint ability after a basketball game. Furthermore, both recovery methods helped reduce the perception of fatigue and soreness. Furthermore, these results are supported by a study examining the effect of Traditional Thai Massage on recovery after a basketball-specific workout. Only the 10-minute recovery protocol resulted in a significant increase in heart rate variability after exercise (Kaesaman, 2019). In addition, mechanical stress on muscles is thought to trigger changes in parasympathetic system activity (such as heart rate, blood pressure, and heart rate variability) and hormone levels (e.g., cortisol), which ultimately trigger a relaxation response (Weerapong, Hume and Kolt, 2005). Furthermore, incorporating massage into a regular recovery routine can help reduce athletes' anxiety and improve their mood, which in turn supports the recovery process. Therefore, although the direct impact of massage on physical performance remains unclear, sports massage and its variations may be an effective method for enhancing recovery in basketball players.

III. THE EFFECT OF MASSAGE TO ACCELERATE THE RECOVERY OF BASKETBALL PLAYERS

L-glutamine is known as a supplement that can accelerate the recovery process. A double-blind, crossover study examined the effect of L-glutamine supplementation on biomarkers of muscle damage in professional male basketball players during competition (Córdova-Martínez *et al.*, 2021). The study reported significant decreases in aminotransferase, creatine kinase, myoglobin, and adrenocorticotropic hormone levels after L-glutamine consumption (6 grams per day for 20 days) compared to the placebo group. However, cortisol levels, an indicator of catabolic state, did not change significantly throughout the test period in the experimental group (Córdova-Martínez *et al.*, 2021). This is very useful for accelerating recovery, considering that creatine kinase and lactate dehydrogenase levels in the morning after a basketball game increase by 210% and 110% compared to baseline levels (Souglis *et al.*, 2015).

IV. RESEARCH LIMITATIONS AND FUTURE RESEARCH DIRECTIONS

Although several interventions used to accelerate recovery in basketball players have been described, the limited research on other supplementation methods used in basketball is a limitation of this study. Future research is needed to more comprehensively analyze other potential supplementation options, herbal ingredients, their effects on reducing oxidative stress and post-exercise inflammation, dosages, and product safety.

V. CONCLUSIONS

Recovery should be considered an integral component of any training program. Based on the research reports included in this mini-review, we conclude that massage and supplementation with L-glutamine, vitamin E, vitamin C, and beta-carotene can accelerate the recovery of basketball players. Future research is needed to more comprehensively analyze other potential supplementation options, herbal ingredients, their effects on reducing oxidative stress and post-exercise inflammation, appropriate dosages, and product safety.

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