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What is the effectiveness of massage on recovery of athletes in team-based ball sports?

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Relevant discipline	Physiotherapy
Sources searched	• PubMed - 5th April 2021 • Pedro - 5th April 2021 • Google Scholar - 16th April 2021
Highest level of Evidence found	Randomized control trials
Quality appraisal of the body of Evidence	**Strength of Evidence:** Four out of seven resources collected are low level of evidence
	Quality of Evidence: Three out of seven sources collected are rated as high-quality evidence. Factors which reduce the validity of the resources include: publication bias, lack of extensive details regarding inclusion and exclusion criteria, confounding factors not considered in the study, non-randomised sampling of participants and inability to identify the details regarding author's credentials.
	Statistical significance: All sources reported statistical significance in the text. The results demonstrated a statistically significant improvement in hamstring length, vertical jump/ countermovement jump, Delayed Onset of Muscle Soreness, balance, concentration and fatigue.
	Clinical significance: None of the sources collected reported clinical significance in their study or information.
	External validity/applicability: High external validity or applicability is throughout all the sources. Massage is commonly used in sports teams. Six out of seven sources have shown the majority of participants are at least university level sports players and two out of seven sources are professional level players. Athletes participating in recreational sport have a lower likelihood of serious injury compared to university and professional level. Overall, outcome measures such as muscle recovery in relation to fatigue, muscle power and flexibility are generalizable to the athlete population and relevant in clinical practice.
Summary of Evidence findings	This review included three randomized control trials and four lower level articles. Three articles focused on DOMS and demonstrated: 10-minute lower limb sports massage decreased the severity of DOMS within the first 24 hours; 34-minute lower limb Western massage decreased DOMS immediately post-massage; 30-minute lower limb sports massage decreased DOMS immediately post-massage. One study assessed the effects of 30-minute massage on inflammatory blood markers. Creatine kinase, lactate dehydrogenase, lactate, C reactive protein and interleukin 6 all decreased 24 hours post massage and deep massage produced greater statistically significant results. Three studies investigated changes in sports performance after massage, these studies varied in the skills assessed, however vertical jump height and running speed were the most common. 34-minute lower limb Western massage and 30-minute lower limb sports massage did not increase shuttle run speed, nor did they increase vertical jump height post-massage for more than 24-hours post-massage. This review also assessed muscle length post-massage which produced conflicting results. An 8-minute classic massage on the posterior thigh demonstrated statistically significant increases in hamstring length immediately post-massage however, these increases in hamstring length were not maintained over the period of 24 hours post-intervention. In contrast, 34-minute lower limb Western massage demonstrated no increases in quadriceps length.
Conclusions	This review suggests that post-game massage could assist athletes in reducing the perception of DOMS as well as decreasing the levels of inflammatory creatine kinase and lactate. By decreasing DOMS and enhancing the recovery process, an athlete may be able more easily tolerate the training demands of their sport. The effects of massage on increasing muscle length are still largely unclear. The evidence indicates that massage may contribute to increasing muscle length for less than 24-hours post massage which is not likely to contribute to decreased risk of injury. Finally, massage is suggested to have no effect on running speed and a significant short-term performance improvement less than 24-hours in vertical jump.
Implications for clinical practice	The evidence can provide insight to physiotherapists and other sporting associates to deliver or recommend the use of massage based on the purposes of decreasing DOMS and possibly increasing recovery processes. Clinicians and athletes may consider the use of massage in conjunction with other modalities that have demonstrated a greater effect in increasing performance such as cold-water immersion.

1. Sarakul, K., Eungpinichpong, W. & Sripongngam, T. (2016). Effects of traditional Thai massage on free throw accuracy in basketball players, *International Journal of GEOMATE*, *11*(1)1, 2910-2915.

This evidence summary has been prepared by undergraduate students as part of the HLTH 3057 Advanced Evidence Based Practice course. Due to limitations of assignment requirements reviews are limited to a maximum of 8 evidence sources. Conclusions and implications for clinical practice reported are provisional based on the evidence identified in this review and should be contextualized to local practice, clinical expertise and patient values. For further information on the review process please contact steve.milanese@unisa.edu.au

2. Delextrat, A., Calleja-González, J., Hippocrate, A. & Clarke, N.D. (2013). Effects of sports massage and intermittent cold-water immersion on recovery from matches by basketball players, *Journal of Sports Sciences*, *31*(1), 11–19.
3. Hopper, D., Conneely, M., Chromiak, F., Canini, E., Berggren, J. & Briffa, K. (2005). Evaluation of the effect of two massage techniques on hamstring muscle length in competitive female hockey players, *Physical Therapy in Sport*, *6*(3), 137–145.