

# INPLASY PROTOCOL

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Support: N/A.

**Review Stage at time of this submission:** Formal screening of search results against eligibility criteria.

## Conflicts of interest:

None declared.

## Training Load, Neuromuscular Fatigue and Well-Being in Volleyball: A Systematic Review

Rebelo, A<sup>1</sup>; Pereira, JR<sup>2</sup>; Cunha, P<sup>3</sup>; Coelho-e-Silva, MJ<sup>4</sup>; Sherar, LB<sup>5</sup>; Valente-dos-Santos, J<sup>6</sup>.

**Review question / Objective:** This systematic review aims to compile and order all the training load measures, all fatigue assessments, and all well-being questionnaires used in volleyball training/match monitoring, systematizing them.

**Condition being studied:** Training load: cumulative amount of stress placed on an individual from multiple sessions and games over a period of time. Neuromuscular fatigue: A response that is less than the expected or anticipated contractile response, for a given stimulation. Well-being: A continuous, active process, which is geared towards balancing one's physical, emotional, social, intellectual and spiritual wellness in order to enhance one's life quality.<sup>5</sup> In sport science the subjective measurement of the response to training and competition are used through the athlete self-report measures (ASRMs). In practice, these often comprise brief, single-item checklists derived from validated questionnaires that are intended to be completed daily.

**INPLASY registration number:** This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 11 July 2022 and was last updated on 11 July 2022 (registration number INPLASY202270059).

## INTRODUCTION

**Review question / Objective:** This systematic review aims to compile and order all the training load measures, all fatigue assessments, and all well-being questionnaires used in volleyball training/match monitoring, systematizing them.

**Rationale:** Frequently monitoring the variables related to performance can help coaches to assess the effectiveness of their training programs and update those to better meet the athletes' needs. Besides, another reason to frequently monitor athletes is to reduce the time lost to illness

and injury. The particularities of the variables mentioned before alongside with the complexity of the majority of team-sports calendar (e.g., short preparation periods and weeks with high volumes of matches and training sessions) can make the training process hard to monitor and prescribe. The success will, in the end, be determined by how coaches coped with the balance between training loads and recovery. Previous research has shown the importance of conducting systematic reviews about training/match monitoring with increasing attention given to the consensus as to which variables related to training load, fatigue, and well-being are most useful.

**Condition being studied:** Training load: cumulative amount of stress placed on an individual from multiple sessions and games over a period of time. Neuromuscular fatigue: A response that is less than the expected or anticipated contractile response, for a given stimulation. Well-being: A continuous, active process, which is geared towards balancing one's physical, emotional, social, intellectual and spiritual wellness in order to enhance one's life quality.<sup>5</sup> In sport science the subjective measurement of the response to training and competition are used through the athlete self-report measures (ASRMs). In practice, these often comprise brief, single-item checklists derived from validated questionnaires that are intended to be completed daily.

## METHODS

**Participant or population:** Volleyball athletes from any sex and level.

**Intervention:** N/A.

**Comparator:** N/A.

**Study designs to be included:** Observational studies.

**Eligibility criteria:** Scientific peer-reviewed published papers written in English, Portuguese, French, and Spanish were eligible for the present systematic review.

Moreover, studies were eligible if: (1) subjects were volleyball athletes; (2) the study included at least, two moments of evaluation with a baseline monitoring measurement and a post-intervention monitoring measurement. Studies that do not describe any monitoring strategy or studies that used these strategies during a recovery/return to play program were excluded from the present systematic review.

**Information sources:** This systematic review will be conducted in accordance with the recommendations of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA). The literature search will be performed from database inception to February 2022 in four electronic databases: MEDLINE/PubMed, SPORTDiscus, Web of Science, and Scopus.

**Main outcome(s):** The mean difference, or difference in means, so that it can be measured the absolute difference between the mean value in two different groups.

**Quality assessment / Risk of bias analysis:** Methodological quality will be assessed using a modified version of the Downs and Black checklist for assessing the methodological quality of randomized and nonrandomized healthcare interventions. This checklist has been validated for use with observational study designs and has been previously used to assess methodological quality in systematic reviews assessing cross-sectional and longitudinal studies. The number of items from the original checklist can be tailored to the scope and needs of the systematic review, with 10–15 items used in previous systematic reviews. For this review, 11 items in the checklist were deemed relevant. Each item is scored as “1” (yes) or “0” (no/unable to determine), and the scores for each of the 11 items are summed to provide the total quality score. The quality of each included article will be rated against the checklist independently by two authors (AR and JRP). Any disparity in the outcome of the quality appraisal will be discussed, and a third author (JV-S) will

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be consulted if a decision could not be reached.

**Strategy of data synthesis:** Tables describing all data available from all included studies. Data will be extracted from each article by the lead author (AR). Data not provided or presented non-numerically will be identified as “not reported”. The following data, where possible, will be extracted from each article: • Participants’ characteristics, sample size, sex, age, stature, and body mass, reported as mean  $\pm$  standard deviation. • Study methodology – training load, neuromuscular fatigue and well-being measures (i.e., outcome measures, tests administered, and timing of assessments). • Study results – results of statistical analyses.

**Subgroup analysis:** N/A.

**Sensitivity analysis:** N/A.

**Language:** Scientific peer-reviewed published papers written in English, Portuguese, French, and Spanish were eligible for the present systematic review.

**Country(ies) involved:** Portugal. United Kingdom (England).

**Keywords:** volleyball; injury prevention; periodization; workload; rating of perceived exertion; heart rate; wellness; countermovement jump.

**Dissemination plans:** We plan to publish the final manuscript in a scientific journal

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