INPLASY PROTOCOL

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None declared.

External and internal load during training sessions in elite women's soccer: a systematic mini review

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Review question / Objective: **The present systematic mini review aim to provide an overview about external and internal load during training sessions in elite women's soccer, with special focus on fatigue, training adaptions and injuries.**
Condition being studied: **Continuous training load monitoring in the context of the regular team routine.**
Eligibility criteria: **To investigate continuous monitoring, we include articles with a minimum of one week of monitoring, irrespective of gender and study focus (e.g. studies reporting descriptive data of training load without studying its effects will be included). Articles will be excluded if: the participants are not all elite women's soccer players (e.g. mixed samples including elite and non-elite players); the participants are aged under 18; the participants are not monitored longitudinally over a minimum of a 1-week period or five sessions (if the duration is not stated; friendly matches are considered training sessions) to consider continuous monitoring practices; no GPS-derived training load data are reported; the articles do not report any training load indicators; single drills are monitored rather than the entire training session, or the article focuses on the comparison between a specific drill and match demands; data from training sessions are not reported; and the articles are editorials or reviews.**

INPLASY registration number: This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 07 December 2021 and was last updated on 07 December 2021 (registration number INPLASY2021120038).

INTRODUCTION

Review question / Objective: **The present systematic mini review aim to provide an overview about external and internal load during training sessions in elite women's soccer, with special focus on fatigue, training adaptions and injuries.**

Rationale: A better understanding of the training process in elite women players is vital to define appropriate strategies that may contribute to enhance performance (by promoting positive training adaptations), accelerate recovery (by reducing fatigue), and reduce injury risk (by controlling the impact of training loads). Recent systematic reviews revealed that information about women's soccer is very sparse. These reviews considered only wearable technology incorporating global positioning systems (GPS) to quantify external training load and the rating of perceived exertion (RPE) to subjectively quantify internal training load. Notably, other objectively-quantified internal training load methods (such as heart rate, HR) have not been included.

Condition being studied: Continuous training load monitoring in the context of the regular team routine.

METHODS

Search strategy: A systematic search was conducted in PubMed, Scopus, Web of Science and Ebsco combining the following groups of keywords in the title, abstract or key words: (women OR female) AND (football OR soccer) AND (elite OR professional OR top-level OR highly-trained) AND (load OR intens* OR volume OR training OR monitor* OR quantif* OR speed OR acceleration OR "heart rate" OR subjective OR rat* OR "perce* effort" OR exertion) AND (GPS OR "global positioning system" OR LPS OR "local positioning system" OR "time motion" OR physiolog*) AND (fatigue OR adaptations OR performance OR testing OR injury) AND NOT ("American Football" OR "Australian Football" OR AFL). The search was restricted to English peer-reviewed journals from 2000 to November 2021.

Participant or population: Professional adult female soccer players.

Intervention: Training Load in Women soccer players continuously monitored in the context of the regular team routine.

Comparator: None.

Study designs to be included: Observational.

Eligibility criteria: To investigate continuous monitoring, we include articles with a minimum of one week of monitoring, irrespective of gender and study focus (e.g. studies reporting descriptive data of training load without studying its effects will be included). Articles will be excluded if: the participants are not all elite women's soccer players (e.g. mixed samples including elite and non-elite players); the participants are aged under 18; the participants are not monitored longitudinally over a minimum of a 1-week period or five sessions (if the duration is not stated; friendly matches are considered training sessions) to consider continuous monitoring practices; no GPS-derived training load data are reported; the articles do not report any training load indicators; single drills are monitored rather than the entire training session, or the article focuses on the comparison between a specific drill and match demands; data from training sessions are not reported; and the articles are editorials or reviews.

Information sources: Electronic databases (PubMed, SPORTDiscus via EBSCOhost, Web of Science and Scopus) will be searched for relevant publications prior to the November 2021.

Main outcome(s): Methods to collect and interpret training load.

Quality assessment / Risk of bias analysis: The quality score of each study is based on a 16-item checklist adapted from a previous publication (Sarmento et al, What performance analysts need to know about research trends in association football (2012–2016): a systematic review. Sports Med. 2018;48(4):799–836). Publications are evaluated based on: (1) clarity of purpose; (2) relevance of background literature; (3) appropriateness of the study design; (4) study sample; (5) sample size justification; (6) informed consent (if any); (7) outcome measures – reliability; (8) outcome

measures – validity; (9) methods description; (10) results reporting; (11) analysis methods; (12) practical importance; (13) description of drop-outs (if any); (14) appropriately conclusions; (15) practical implications; (16) study limitations. A binary scale was used to score these items (1=yes; 0=no), except for items 6 and 13, which could also be classified as not applicable (n/a). After that, a percentage score was calculated for each study by summing the scores of all items and dividing that by the maximum score the study could achieve. The publications' quality score was classified as: (1) low methodological quality for scores ≤ 50%; (2) good methodological quality for scores between 51% and 75%; and (3) excellent methodological quality for scores > 75%. The revised Risk of Bias Assessment Tool for Nonrandomized Studies (RoBANS) was used to judge the risk of bias at study-level. RoBANS contains six domains: the selection of participants, confounding variables, the measurement of exposure, the blinding of the outcome assessments, incomplete outcome data, and selective outcome reporting, and each study was classified as Low Risk, Unclear and High Risk.

Strategy of data synthesis: None.

Subgroup analysis: None.

Sensitivity analysis: None.

Language: English.

Country(ies) involved: Portugal.

Keywords: Training load; GPS; Heart rate; RPE; Female athletes.

Contributions of each author:

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