INPLASY

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Change of spatiotemporal parameters during running at different degrees of inclination; systematic review

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ADMINISTRATIVE INFORMATION

INTRODUCTION

Review question / Objective The objectives and research questions were developed using the PICO model. (1. Population) Adults recreational runners who don't train competitively. The study included men and women who were healthy and had no injuries at the time of the study. (2. Intervention) Measurements of spatiotemporal parameters under varying inclination conditions. (3. Comparator) Comparison of the spatial and temporal parameters of the run at zero inclination angle and inclination from (-20%) to 20%. (4. Outcomes) Direction of changes and their volume in spatiotemporal parameters.

Rationale Running has become one of the most popular forms of physical activity in the 21st century. Its popularity and accessibility have caused more and more people not only to run, but to undertake regular training. One of the most popular and simplest means of training is running up and downhill. Running at different angles of inclination is one of the training elements used to develop speed, technique and running strength. A natural consequence of running uphill and downhill is a change in stride length, cadence and also other kinematic parameters. Determining the volume and direction of changes in the spatiotemporal structure of running, at different angles of inclination, would allow us to better understand the impact of this training measure on the musculoskeletal apparatus of recreational and amateur runners. Therefore, it is important to specify what kind of research has already been conducted and to characterize the research protocols. In addition, it is necessary to clearly define the measured spatiotemporal parameters and the research methods used. Analysis of the above data could help improve the training of recreational and amateur runners.

Condition being studied The spatiotemporal parameters of running are measures that characterize the biomechanics of a runner's musculoskeletal system. The above parameters include: stride length, cadence, foot contact time, stride width, running speed, flight time, foot rotation, and running phases. These parameters are closely interrelated, and their interrelation determines the economy of locomotion, the efficiency of running, and consequently the sports result. One method of optimizing the spatiotemporal structure of running is training using inclination. The use of uphill and downhill in training, increases the level of strength and economy of running, which allows to get better results at zero incline.

METHODS

Search strategy (run* OR running) AND (spatial* OR temporal* OR time* OR space* OR kinematic* OR "kinematic* parameter*" OR "step time" OR "space time parameter*" OR "spatiotemporal parameter*" OR phase* OR "running phase*") AND (slope* OR "different* slope*" OR gradient* OR inclination* OR "different* inclination*") AND (athlete* OR runner*).

Participant or population Adult recreational runners who don't train competitively. The study included men and women who were healthy and had no injuries at the time of the study.

Intervention Measurements of spatiotemporal parameters under varying inclination conditions.

Comparator Comparison of the spatiotemporal parameters of the run at zero inclination angle and inclination from (-20%) to 20%.

Study designs to be included Research analyzing the spatiotemporal parameters of running with a variable gradient and constant speed during the test performed.

Eligibility criteria Only original and full-text studies written in English, Polish or Portuguese. Studies published in scientific journals in the 21st century.

Information sources The review will include only articles published in scientific journals, searched automatically in three databases: Scopus, PubMed and Web of science. In addition, a manual search will be conducted. Other types of scientific meterials such as reviews, letters to the editor, book chapters, or conference abstracts will not be taken into account.

Main outcome(s) At the current stage of the review, the results are not yet developed.

Additional outcome(s) At the current stage of the review, the results are not yet developed.

Data management All retrieved papers will be exported to (EndNote X20, Thomson Reuters, Philadelphia, PA, USA), The database created will be used for assessment and eligibility for review.

Quality assessment / Risk of bias analysis The assessment of the risk of bias will be evaluated on the basis of the Joanna Briggs Institute (JBI) critical appraisal checklist for analytical cross sectional studies. Based on the criteria adopted, the individual components of the included studies, will be assigned a high, moderate or low risk of bias.

Strategy of data synthesis The results of the study will be compiled based on the following categories: gender, age, body height, body weight, research instruments, sample characteristics, incline value, running speed, main results.

Subgroup analysis The grouped data will be characterized and described as clearly as possible. In such a way that they respond as precisely as possible to the objectives of the work.

Sensitivity analysis At the current stage of the review, the results are not yet developed.

Language restriction Only considered articles written in English, Polish or Portuguese.

Country(ies) involved Poland, Portugal.

Keywords spatiotemporal parameters, inclination, biomechanics, running speed.

Dissemination plans We plan to publish the review in a journal with a high impact factor index. Above that, we plan to present the review, its concepts, strategies and results at a scientific conference.

Contributions of each author
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