

INPLASY

Cardiovascular screening tools for runners, a Scoping Review

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ADMINISTRATIVE INFORMATION

Support - No sources of financing.

Review Stage at time of this submission - The review has not yet started.

Conflicts of interest - All authors declare that they don't have potential conflict of interest concerning the present Scoping Review.

INPLASY registration number: INPLASY202470103

Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 25 July 2024 and was last updated on 25 July 2024.

INTRODUCTION

Review question / Objective Identify the available evidence on existing cardiovascular risk screening tools for runners.

Population: a long-distance athletes including runners, marathoners and triathletes.

Concept: cardiovascular risk screening tools to be applied in preparticipation assessment of long-distance athletes.

Context: adult athletes who runs competitively as a sport or hobby.

Background Practicing high-level sports involves adaptations in the heart, such as an increase in the size of the cardiac cavities (increase in left ventricular size and thickness of the cardiac walls) that increase cardiac output and increase performance. Those sports that require more than 70% of maximum oxygen consumption during

training carry a greater cardiovascular risk, such as triathletes and marathon runners.

Cardiovascular screening of an athlete is essential to prevent possible damage and avoid sudden death.

Rationale To date, there is no compilation of screening tools for cardiovascular risk in runners. The concern lies mainly in competitive athletes, who tend to push themselves to their physical limits in order to improve their performance. Considering the risks of cardiovascular events associated with the practice of this physically and physiologically demanding sport, it is very important to review the updated scientific evidence to study whether there is any screening tool available for cardiovascular risk assessment in runners, in order to help maintain the health and safety of these athletes. From this information obtained, the need for further systematic reviews

to determine the properties of the scales can be assessed.

METHODS

Strategy of data synthesis Controlled language and natural language will be used with terms like: Runners, marathoners, triathletes. Cardiovascular risk screening, cardiovascular risk screening tools, cardiovascular risk screening assessment. Amateur, competitive, adults. The terms will be joined with AND-OR Boolean operators.

The following databases will be searched: OVID Medline, Embase, CENTRAL (Cochrane Library), CINHALL (EBSCOhost), SPORTDiscus (EBSCOhost), LILACS (BVS), PEDro.

For Medline, the following strategy is proposed:

1 exp Running/ 24583
 2 exp Athletes/ 22348
 3 exp Marathon Running/ 351
 4 athlet\$.ti. 33380
 5 runn\$.ti. 18384
 6 maratho\$.ti. 2737
 7 or/1-6 73501
 8 exp Mass Screening/ 146978
 9 Risk Assessment/ 314493
 10 Diagnostic Tests, Routine/ 15331
 11 Diagnosis/ 17554
 12 (risk\$ adj2 (screen\$ or questionnaire\$ or instrument\$ or function\$ or equation\$ or chart\$ or tool\$ or appraisal\$ or calculat\$ or factor\$ or engine\$ or estimat\$ or table\$ or threshold\$ or scor\$ or detect\$ or diagnos\$ or identif\$ or test\$ or assess\$)).ti,ab,kf. 1091490
 13 exp "Sensitivity and Specificity"/ 661196
 14 (sensitiv\$ or specificity).ti,ab,kf. 2013820
 15 (predictive adj5 value\$).ti,ab,kf. 151254
 16 ((false adj positive\$) or (false adj negative\$)).ti,ab,kf. 93859
 17 (observer adj variation\$).ti,ab,kf. 1771
 18 (roc adj curve\$).ti,ab,kf. 64035
 19 (likelihood adj3 ratio\$).ti,ab,kf. 21371
 20 exp Likelihood Functions/ 24014
 21 or/8-20 3834822
 22 exp Cardiovascular Diseases/ or exp Heart Diseases/ 2802449
 23 ((cardio\$ or cardia\$ or heart or myocard\$ or pericard\$ or cv or cvd or chd) adj3 (disease\$ or risk\$)).ti,ab,kf. 622966
 24 exp Heart Failure/ 154852
 25 ((cardio\$ or cardia\$ or heart or myocard\$ or ventric\$ or atri\$) adj3 (fail\$ or insuff\$ or decomp\$)).ti,ab,kf. 273365
 26 (HF or CHF or ADHF or HFrEF or HFpEF or HFmrEF).ti,ab,kf. 87449

27 exp Coronary Disease/ 241100
 28 (coronar\$ adj3 (disease\$ or risk\$ or infarct\$ or re?vascular\$ or ischemi\$)).ti,ab,kf. 211557
 29 CAD.ti,ab,kf. 54919
 30 exp Myocardial Infarction/ 198520
 31 ((myocard\$ or heart or cadio\$ or cardia\$ or endocardi\$) adj3 (infarct\$ or re?vascular\$ or ischemi\$)).ti,ab,kf. 312976
 32 (MI or AMI).ti,ab,kf. 86051
 33 (ST?segment elevation myocardial infarction or STEMI).ti,ab,kf. 16262
 34 (non?ST segment elevation myocardial infarction or NSTEMI).ti,ab,kf. 3829
 35 angina.ti,ab,kf. 59575
 36 exp Heart Arrest/ 58245
 37 exp Out-of-Hospital Cardiac Arrest/ 7742
 38 asystol\$.ti,ab,kf. 4910
 39 ((heart or cardia\$ or miocard\$) adj (attack\$ or arrest\$)).ti,ab,kf. 55895
 40 exp Arrhythmias, Cardiac/ 244810
 41 (arrhythmi\$ or tachycardi\$ or bradycardi\$).ti,ab,kf. 168399
 42 exp Ventricular Fibrillation/ or exp Ventricular Flutter/ 18103
 43 (ventricular adj (fibrillation\$ or flutter\$)).ti,ab,kf. 21415
 44 exp Atrial Fibrillation/ or exp Atrial Flutter/ 78405
 45 (atrial adj (fibrillation\$ or flutter\$)).ti,ab,kf. 103004
 46 exp Death, Sudden/ 39246
 47 (sudden or unexpect\$ or unanticipat\$ or death).ti,ab,kf. 1142140
 48 SDS.ti,ab,kf. 85769
 49 or/22-48 4241654
 50 7 and 21 and 49 1761

This strategy will be adapted to all other databases.

Manual search:

In addition, the list of references of relevant articles will be reviewed. Gray literature will be consulted, including consultation with relevant Scientific Societies in the area such as: American Heart Association (AHA) <http://www.international.heart.org>; European Society of Cardiology (ESC) <http://www.escardio.org>; Inter-American Society of Cardiology (SIA) <http://www.siacardio.com>; South American Society of Cardiology <http://www.sscardio.org> and Cardiac Society of Australia and New Zealand (CSANZ); American College of Sports Medicine (ACSM) <http://www.acsm.org>; and Sociedad Española de Medicina del Deporte, <http://www.femede.es>.

Eligibility criteria Type of participants: Runners, marathoners, triathletes, athletes who participate in endurance races.

Concept: Cardiovascular screening, Cardiovascular risk screening, cardiovascular screening tools, cardiovascular assessment tools, preparticipation cardiovascular screening, cardiac preparticipation evaluation. Instruments such as questionnaires, scores, test and normograms may be included

Context: Amateur, competitive, adults. (any age, any sex)

About design Evidence synthesis of any types and primary studies (observational and experimental) conducted in humans will be included.

Source of evidence screening and selection

The main author designs a search strategy that will be checked by the second author. The selection of articles will be made by two pairs of independent reviewers. In case of dissent, a third reviewer will be consulted.

Data management For the analysis of the results, we will begin with a summary of the articles obtained in each phase (included, excluded and causes, flow chart), using PRISMA – ScR guideline for Scoping Reviews.

Subsequently, the bibliometric analysis, analysis of data extraction with respect to the methodology and content of each article, will be presented in spreadsheets.

Reporting results / Analysis of the evidence

Data will be examined using descriptive statistics and content analysis. Results will be reported using descriptive statistics.

Presentation of the results The summarized information will be presented in tables and graphs.

Language restriction No language restriction.

Country(ies) involved Chile.

Other relevant information No

Keywords Runners; marathoners; triathletes; cardiovascular screening tools; amateur; competitive, adults.

Dissemination plans The results will be presented at scientific congresses. In addition, it is expected that at least one scientific article will be published in a widely circulated journal indexed in Web of Science (WoS).

Contributions of each author

Author 1 - Natalia Chahin-Inostroza

– Substantial contribution to the concept or design of the work, or to the acquisition, analysis or interpretation of the data for the work;

– Design of search strategy and selection of articles (reviewed by the second author)

– Writing or critically reviewing the manuscript and its intellectual content.

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Author 2 - Ruvistay Gutierrez-Arias - Second author, review of search strategy and selection of articles. Data extraction.

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Author 4 - Constanza Ulloa - Participates in screening (selection of articles), and extraction of information.

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Author 5 - Pamela Seron - Process supervisor and director of the doctoral thesis of this manuscript, which is part of the research work in the context of the PhD program in Biomedical Research Methodology and Public Health at the Autonomous University of Barcelona, which the first author is studying.

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