

Mar 03, 2025

# THE EFFECTS OF ANABOLIC STEROIDS ON ATHLETE HEALTH: AN UMBRELLA REVIEW OF SYSTEMATIC REVIEWS

DOI

<https://dx.doi.org/10.17504/protocols.io.n2bvj9755lk5/v1>

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**DOI:** <https://dx.doi.org/10.17504/protocols.io.n2bvj9755lk5/v1>

**Protocol Citation:** Polina Rybakova, Alexander Miroshnikov, Alexey Shevtsov 2025. THE EFFECTS OF ANABOLIC STEROIDS ON ATHLETE HEALTH: AN UMBRELLA REVIEW OF SYSTEMATIC REVIEWS. **protocols.io**

<https://dx.doi.org/10.17504/protocols.io.n2bvj9755lk5/v1>

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**Protocol status:** Working

**We use this protocol and it's working**

**Created:** February 24, 2025

**Last Modified:** March 03, 2025

**Protocol Integer ID:** 123263

**Keywords:** athletes, anabolic androgenic steroids, cardiovascular system, skeletal system, pancreas, heart, liver, reproductive system, psyche, athletes' health., effects of anabolic steroid, effects of anabolic androgenic steroid, harm of anabolic steroid, use of anabolic steroid, anabolic androgenic steroid, anabolic steroid, toxic steroid, toxic steroids of today, health of an athlete, own testosterone decrease, action of testosterone, athlete health, testosterone, synthetic hormone, risk of acne, increase in cholesterol, detoxification, serious disruptions in the body, liver failure, cholesterol, endocrine system, athlete, testicular atrophy, main organ of detoxification, acne, effect

## Disclaimer

Funding sources/sponsors: None

Conflicts of interest: None

## Abstract

The harm of anabolic steroids to the health of an athlete is enormous and multifaceted. These synthetic hormones, imitating the action of testosterone, cause serious disruptions in the body. The cardiovascular system affects the increase in cholesterol, blood pressure and the risk of developing cardiomyopathy.

The liver, the main organ of detoxification, is a colossal burden caused by toxic steroids of today, which can lead to jaundice, liver failure and even cancer.

The endocrine system also undergoes significant changes. In men, the production of their own testosterone decreases, leading to testicular atrophy, impotence and infertility. Women have the same signs of masculinization: deepening of the voice, growth of hair on the face and body, menstrual irregularities.

Mental disorders such as aggression, depression and psychosis - some companions use anabolic steroids. In addition, the risk of acne, baldness and musculoskeletal problems increases. Ultimately, the use of anabolic steroids harms the athlete's health, nullifying all efforts aimed at achieving sustainable results.

**The aim of this umbrella review** is to systematically identify and analyse systematic reviews that address the effects of anabolic androgenic steroids on athletes' health.

## Guidelines

The study is being conducted at the Department of Sports Medicine of the Russian University of Sports. In accordance with the recommendations of the Preferred Reporting Items for Overviews of Reviews (PRIOR) and the Synthesis Without Meta-analysis (SWiM) tool for writing reviews without meta-analysis. The study protocol was compiled before the start of the search and did not change either during or after its completion, according to the Preferred Reporting Items for Systematic Review and Meta-Analysis Protocols (PRISMA-P)

## Materials

The search will be performed using the following keywords (table).

|  |                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|--|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | CochraneLibrary | 1 запрос - "androgenic steroids" AND sport*2<br>запрос - "anabolic steroids" AND sport* AND "cardiovascular system" AND "bone system" AND pancreas AND heart AND liver AND "reproductive system" AND psyche AND "athletes' health"                                                                                                                                                                                                                                                                                                                                                                                                          |
|  | Elibrary        | 1 запрос - спортсмены AND анаболические стероиды2 запрос - спортсмены AND анаболические стероиды AND сердечно-сосудистая система AND костная система AND поджелудочная железа AND сердце AND печень AND репродуктивная система AND психика AND Здоровье спортсменов                                                                                                                                                                                                                                                                                                                                                                         |
|  | Epistemonikos   | 1 запрос - "androgenic steroids" AND sport*2 запрос - (title: ("androgenic steroids" AND sport*) OR abstract: ("androgenic steroids" AND sport*)) AND (title: ("cardiovascular system" AND "bone system" AND pancreas AND heart AND liver AND "reproductive system" AND psyche AND "athletes' health") OR abstract: ("cardiovascular system" AND "bone system" AND pancreas AND heart AND liver AND "reproductive system" AND psyche AND "athletes' health"))) OR abstract: (title: ("androgenic steroids" AND sport*) OR abstract: ("androgenic steroids" AND sport*)) AND (title: ("cardiovascular system" AND "bone system" AND pancreas |

|  |                 |                                                                                                                                                                                                                                                    |
|--|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  |                 | AND heart AND liver AND "reproductive system" AND psyche AND "athletes' health") OR abstract: ("cardiovascular system" AND "bone system" AND pancreas AND heart AND liver AND "reproductive system" AND psyche AND "athletes' health"))))          |
|  | Google Scholar1 | запoc - "androgenic steroids" AND sport*                                                                                                                                                                                                           |
|  | Lilacs          | запoc - "androgenic steroids" AND sport*                                                                                                                                                                                                           |
|  | Mednar          | запoc - "androgenic steroids" AND sport*                                                                                                                                                                                                           |
|  | Pubmed          | 1 запoc - "androgenic steroids" AND sport*2 запoc - (((((((("anabolic steroids") AND ("cardiovascular system")) AND ("bone system")) AND (pancreas)) AND (heart)) AND (liver)) AND ("reproductive system")) AND (psyche)) AND ("athletes' health") |
|  | ResearchGate    | 1 запoc - "androgenic steroids" AND sport*2 запoc - "anabolic steroids" AND sport* AND "cardiovascular system" AND "bone system" AND pancreas AND heart AND liver AND "reproductive system" AND psyche AND "athletes' health"                      |
|  | Scopus          | запoc - "androgenic steroids" AND sport*                                                                                                                                                                                                           |

## Before start

Before the search began, it was determined that the review would include only systematic reviews and/or meta-analyses, as this type of research is the "gold standard" of evidence-based medicine and provides a comprehensive picture of the benefits and harms associated with an intervention.



## Original language title

- 1 In Russian: ВЛИЯНИЕ АНАБОЛИЧЕСКИХ СТЕРОИДОВ НА ЗДОРОВЬЕ СПОРТСМЕНОВ: ЗОНТИЧНЫЙ ОБЗОР СИСТЕМАТИЧЕСКИХ ОБЗОРОВ

## Anticipated or actual start date

- 2 23.02.25

## Anticipated completion date

- 3 23.03.25

## Stage of review at time of this registration

- 4 Pilot screening completed

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## PICOS

- 9 P – Healthy athletes, over 18 years of age; I – AAS use; C – Placebo or no placebo; O – any health outcome; S – Systematic reviews and/or meta-analyses of randomized controlled trials (RCTs), cohort studies, case-control studies, etc.

## Review question

- 10 THE EFFECTS OF ANABOLIC STEROIDS ON ATHLETE HEALTH

## Searches

- 11 **Selection of studies.** Initially, two review authors (Rybakova P.D. and Shevtsov A.V.), in parallel and independently of each other, will screen article titles, abstracts and, if necessary, full texts from database records according to the eligibility criteria. Any discrepancies will be resolved by consensus discussion. Any disagreements will be resolved by another reviewer (Miroshnikov A.B.).  
**Data extraction.** Two review authors (Rybakova P.D. and Shevtsov A.V.), in parallel and independently of each other, will extract the found articles. Duplicates and articles that do not meet the criteria will be removed. Any discrepancies will be resolved by consensus discussion. Any disagreements will be resolved by another reviewer (Miroshnikov A.B.). Inter-rater (kappa) agreement should range from 0.5 (weak) to 1.00 (almost perfect), as recommended by M. McHugh

## Sources of information and search strategies

- 12 Sources of information and search strategies. The literature search will be performed in accordance with the PRISMA-S and PRESS (Peer Review of Electronic Search Strategies) checklists. The literature search for the umbrella review will be in the Cochrane Library, Elibrary, Epistemonikos, Google Scholar, Lilacs, Mednar, Pubmed, ResearchGate, Scopus.

## Quality assessment

- 13 The methodological quality of included articles was assessed using the AMSTAR-2 tool.



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