

# INPLASY PROTOCOL

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**Conflicts of interest:**  
None declared.

## Effect of Different Types of Training on the Adolescent athlete's Swimming Performance: A Systematic Review

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**Review question / Objective:** The purpose of this study was to investigate (1) how different training methods in adolescent swimmers improve swimming performance; and (2) which form of strength training maximizes swimming performance. **Condition being studied:** This review shows that swimming is different from other sports because it is performed in the water, which requires a specific form of training. The results showed that a training regimen that combined swimming and other training appeared to have a better effect on swimming performance than a swimming-only training method. Based on the principle of specificity and the improvement of swimming performance, there is no clear conclusion.

**INPLASY registration number:** This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 04 May 2022 and was last updated on 04 May 2022 (registration number INPLASY202250020).

### INTRODUCTION

**Review question / Objective:** The purpose of this study was to investigate (1) how different training methods in adolescent swimmers improve swimming performance; and (2) which form of

strength training maximizes swimming performance.

**Rationale:** Different training methods are widely used in swimming to improve swimming performance. There are various types of training methods, which follow the principle of specificity to varying

degrees. There is disagreement in the literature as to which training method maximizes swimming performance, what level of training volume is appropriate for adolescents, and what swimming-specific training translates into swimming performance.

**Condition being studied:** This review shows that swimming is different from other sports because it is performed in the water, which requires a specific form of training. The results showed that a training regimen that combined swimming and other training appeared to have a better effect on swimming performance than a swimming-only training method. Based on the principle of specificity and the improvement of swimming performance, there is no clear conclusion.

## METHODS

**Search strategy:** Literature search was performed on five international databases, SCOPUS, PubMed, EBSCOhost (SPORTDiscus), CNKI, and Web of Science. These searches cover Chinese and English documents published before March 30, 2022. They searched electronic databases for various keywords related to "training" and "teenage swimmers." Eighteen studies met inclusion and exclusion criteria, and data were then systematically reviewed using PRISMA guidelines. In addition, the Physical Therapy Evidence Database (PEDro) scale was used to measure the scientific rigor of each study.

**Participant or population:** Adolescent athlete's Swimming.

**Intervention:** Different Types of Training.

**Comparator:** SPSS.

**Study designs to be included:** experimental methodology.

**Eligibility criteria:** The literature search was undertaken in four international databases: the SCOPUS, PubMed, EBSCOhost

(SPORTDiscus), CINAHL Plus, and China National Knowledge Infrastructure (CNKI). The searches covered documents in English and Chinese published until 30th December 2020. Only articles in journals were accepted. The key terms used were: ("training" OR "exercise") AND ("adolescent" OR "juvenile" OR "teenager" OR "youth" OR "young" OR "junior" OR "children"). AND ("player\*" OR "athlete\*" OR "sportsman\*" OR "sportswoman\*" OR "sportsperson\*" OR "Jock\*") AND ("Swimming Performance") In addition, age (children and adolescents of 6–16 years in age) was used as the limiter.

**Information sources:** SCOPUS, PubMed, EBSCOhost (SPORTDiscus), CNKI, and Web of Science. These searches cover Chinese and English documents published before March 30, 2022.

**Main outcome(s):** A range of studies have investigated different training methods. Percent change in performance and between-group ES were calculated; 18 studies met the inclusion criteria. The review shows that there is no clear consensus on which strength training method is most beneficial for swimming performance. All methods had intervention groups that improved swimming performance.

**Quality assessment / Risk of bias analysis:** Summary of methodological quality assessment scores.

**Strategy of data synthesis:** PRISMA flow chart.

**Subgroup analysis:** Population: Athletes Intervention: training Comparison: Two or more groups Outcome: swimming performance Study designs RCT or Non-RCT.

**Sensitivity analysis:** There is no Sensitivity analysis.

**Country(ies) involved:** China and Malaysia.

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**Keywords:** Adolescent swimming, training, effectsize.

**Contributions of each author:**

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