**Supplementary material**

***Information sources – specificities for the different databases***

Specificities for the different databases: (i) in EBSCO and Scielo, title and abstract had to be searched separately, and so different combinations were required; (ii) in PEDro and PubMed, search was done selecting title/abstract, not keywords; (iii) in Web of Science the combination of title, abstract and keywords was termed “topic”. No filters were applied in any database. Following existing guidelines, a wide net was cast (Higgins et al., 2019). In line with this philosophy, there were two post-protocol registration changes. First, in Scielo all eight planned combinations retrieved zero results. Therefore, we decided to remove some constraints: (i) search in Scielo was not limited to title or abstract, and instead accepted all indexes; (ii) we removed the third search field (“random\*”). This allowed the search in Scielo to return results that could be included in the screening process.

In PEDro, the search engine did not recognize some terms and combinations. Again, we decided to use a less narrow search: (i) the second and third fields of search were ignored, and the records only had to include terms from the first field *(“stretch\*” OR “flex\*” OR “mobility” OR “range of motion”)*; (ii) because PEDro does not allow using Boolean operators directly in the search, these terms were introduced as *stretch\* flex\* mobility “range of motion”* and the engine was programmed to “match any search term (OR)”. In the February 16, 2021 updated, PEDRO retrieved found 270 records when date of entry was limited to December 25, 2020; however, when date limits were removed, PEDro assumed only the search terms and delivered the same 21 results as in the initial search.

***Search strategy – specific example as required by PRISMA guidelines***

 Search strategy for PubMed on December 24, 2020: *(("stretch\*"[Title/Abstract] OR "flex\*"[Title/Abstract] OR "mobility"[Title/Abstract] OR "range of motion"[Title/Abstract]) AND ("post-exerci\*"[Title/Abstract] OR "post-workout"[Title/Abstract] OR "post-exertion"[Title/Abstract] OR "post-train\*"[Title/Abstract] OR "after exerci\*"[Title/Abstract] OR "after workout"[Title/Abstract] OR "after exertion"[Title/Abstract] OR "after training"[Title/Abstract] OR "recover\*"[Title/Abstract] OR "warm-down"[Title/Abstract] OR "cool-down"[Title/Abstract])) AND ("random\*"[Title/Abstract])*. No filters were applied, and 2421 results were provided.

***Planned moderator analyses***

Using a random-effects model and independent computed single factor analysis, potential sources of heterogeneity likely to influence the effects of interventions were selected *a priori*.

*Subgroup analyses*

As the post-exercise recovery responses may be affected by participants age, training status (e.g., athletes vs. sedentary), health status and sex, these factors were considered as potential moderator variables. Sub-group analyses were also planned according to the studies’ RoB as assessed through RoB 2 (Sterne et al., 2019), as well as RCT design, i.e., parallel versus cross-over (Elbourne et al., 2002).

*Single intervention factor analysis*

Single intervention factor analyses were computed for stretching modality (i.e., passive, static, dynamic, PNF), comparator modality (e.g., massage, passive rest, low-intensity cycling), training modality (e.g., endurance, balance, sports) preceding stretching, and duration and intensity of exercise preceding stretching, based on the reported influence of these variables on post-exercise recovery responses (Van Hooren & Peake, 2018).

When appropriate, subgroup analyses and single training factor analyses were divided using the median split technique (Moran, Clark, Ramirez-Campillo, Davies, & Drury, 2019; Moran et al., 2018; Moran et al., 2017). The median was calculated if at least three studies provided data for a given moderator. Of note, when two experimental groups (with the same information for a given moderator) were included in a study, only one of the groups was considered to avoid an augmented influence of the study on the median calculation. In addition, to minimize heterogeneity, instead of using a global median value for a given moderator (e.g., median age, derived from all included studies), median values were calculated considering only those studies that provided data for the outcome being analysed.

*Meta-regression*

A multivariate random-effects meta-regression was conducted to verify if any of the intervention variables (e.g., stretching modality, comparator modality, and training modality preceding stretching) predicted the effects of post-exercise stretching on outcome measures. Computation of meta-regression was performed with at least 10 studies per covariate (Higgins et al., 2019).

***Supplementary Table 1***

Reasons for excluding papers in the screening stage (analysis of title and abstract)

|  |  |  |
| --- | --- | --- |
| **Rule** | **Exclusion criteria** | **Excluded records (*n*)§** |
| **Study type** | Book, book section/chapter, book review.Commentary, editorial, opinion, letter, note, short survey.Conference paper, abstracts published in journals.Errata, corrigendum.Feasibility and/or pilot studies.\*Guidelines, policy statements, reports.Magazine articles.Patent registration.Retraction or withdrawal (plus original study).Reviews (any kind), meta-analysis.Study design, study protocol, trial registration.Thesis.Other unpublished work. | 206723384837414411673 + 8304 + 64125 |
| **Out of scope** | Non-exercise related studies.Exercise-related studies that were out of scope (e.g., longitudinal effects of training programs, perioperative training programs; themes not related to our topic). | 3978 + 601503 + 40 |
| **Participants** | Non-human animals (e.g., rats). | 1 |
| **Interventions** | No post-exercise stretching intervention, e.g.:* Stretching as the training intervention *per se*.
* Stretching applied pre-exercise (e.g., warm-up).
* Multimodal interventions (e.g., stretching combined with massage).
* Stretching applied multiple times per day before the relevant timepoints (e.g., 24h).
* No stretching intervention at all (most of the studies in this category).
 | 274 + 5 |
| **Comparators** | Absence of comparators (i.e., single-group observational studies).Multimodal comparators that also include stretching. | 1 |
| **Outcomes** | No outcomes related to strength and/or ROM for short-term recovery.ANDno outcomes related to DOMS, strength and/or ROM for delayed recovery. | 2 + 1 |
| **Study design** | Non-randomized studies.Non-supervised intervention and/or comparators.Case reports, case series, observational studies (e.g., case-control and cohort studies). | — |
| **Timeframe for follow-up** | No study will be excluded if presenting values >72h, but these will not be considered for analysis. | — |
| **Untraceable full text** | The full texts could not be found, even in the journal websites. Links were disable and, in some cases, the studies did not even appear in Google searches or in new searches in the databases from where they had been originally exported. | 2 |

\*We verified if feasibility and/or pilot studies were within the scope of our PICOS criteria, which they were not.

§ Most numbers refer to the first round of searches. Whenever a ‘+’ sign appears, it means that the second number refers to the updated searches.

***Supplementary table 2***

Risk of bias in individual studies (one assessment per outcome).

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Study** | **D1** | **D2** | **D3** | **D4** | **D5** | **DS** | **Overall** |
| Bonfim et al. (2010)*Pain (pressure dorimeter)* |  |  |  |  |  | N/A |  |
| Bonfim et al. (2010)*Pain (VAS)* |  |  |  |  |  | N/A |  |
| Cè et al. (2013)*Maximum voluntary contraction* |  |  |  |  |  |  |  |
| Cè et al. (2013)*Stand and reach* |  |  |  |  |  |  |  |
| César et al. (2021)*Handgrip-based measures* |  |  |  |  |  | N/A |  |
| Cooke, Nix, Greenwood, and Greenwood (2018)*Perceived muscle soreness* |  |  |  |  |  | N/A |  |
| Cooke et al. (2018)*Isokinetic torque testing* |  |  |  |  |  | N/A |  |
| Kokkinidis, Tsamourtas, Buckenmeyer, and Machairidou (1998)*Strength (leg curl)* |  |  |  |  |  | N/A |  |
| Kokkinidis et al. (1998)*Sit and reach* |  |  |  |  |  | N/A |  |
| Kokkinidis et al. (1998)*Pain questionnaire* |  |  |  |  |  | N/A |  |
| McGrath, Whitehead, and Caine (2014)*Sit and reach* |  |  |  |  |  | N/A |  |
| McGrath et al. (2014)*Muscle soreness scale* |  |  |  |  |  | N/A |  |
| Mika, Mika, Fernhall, and Unnithan (2007)*Maximum voluntary contraction* |  |  |  |  |  |  |  |
| Muanjai and Namsawang (2015)*Soreness (VAS)* |  |  |  |  |  | N/A |  |
| Muanjai and Namsawang (2015)*Knee flexion – range of motion* |  |  |  |  |  | N/A |  |
| Muanjai and Namsawang (2015)*Maximal isometric contraction* |  |  |  |  |  | N/A |  |
| Muanjai and Namsawang (2015)*Vertical jump* |  |  |  |  |  | N/A |  |
| Torres, Carvalho, and Duarte (2005)*Pain (VAS)* |  |  |  |  |  | N/A |  |
| Torres et al. (2005)*Isokinetic peak torque* |  |  |  |  |  | N/A |  |
| Torres, Pinho, Duarte, and Cabri (2013)*Maximal concentric peak torque* |  |  |  |  |  | N/A |  |
| Torres et al. (2013)*Soreness (VAS)* |  |  |  |  |  | N/A |  |
| West, Cooke, LaBounty, Byars, and Greenwood (2014)*Power output-related variables in cycle ergometer* |  |  |  |  |  |  |  |

D1 – Randomization process. D2 – Deviations from intended intervention – effect of assignment to intervention. D3 – Missing outcome data. D4 – Measurement of the outcome. D5 – Selection of the reported result. DS – Domain S – Bias arising from period and crossover effects; specific to crossover designs and not applicable to parallel trials. VAS – Visual analogue scale. N/A – Not applicable. Colors: green means low risk of bias; yellow means some concerns; red means high risk of bias.

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