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The effect of percussive therapy on musculoskeletal performance and perceptions of pain: A systematic narrative literature review.

Other

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Review methods were amended after registration. Please see the revision notes and previous versions for detail.

Citation

Review question
What are the effects of percussive therapy treatment on muscle strength, explosive muscle strength, flexibility and perceptions of musculoskeletal pain?

Searches [1 change]

1. PubMed

2. SPORTDiscus

3. CINAHL

4. Cochrane Library

5. PsycINFO

Literature will also be searched in OpenGrey, Google and Google Scholar using the key words percussive therapy, percussion therapy, percussive massage and massage gun. In addition all sources will be searched using the following brand names Therabody, Theragun, Hyperice, Hypervolt, Muscle Gun, Recovapro, Physion, Powerplate, Myopro, Fluxmassage, Exogun, Addsfit, Hydragun, Timtam.

The introduction of percussive therapy massage guns in 2008 will influence the search start date in order to capture any preliminary research. The search will include both quantitative and qualitative studies and databases will be searched from January 2006, with a final search conducted before completion of the study in order to capture and include any recent articles.

Inclusion criteria

Studies will be included if they meet all the following criteria:

-All adult populations

-Investigate percussive therapy delivered by massage guns

-Percussive therapy is administered directly to the targeted muscles or tendons for treatment in any location on the body

-Literature published in any language. Articles not in English will be translated

-Full-text version of the article is available

-Published from January 2006

Exclusion criteria

Studies will be excluded if they meet any of the following criteria:

-Populations under 18 years old

-Investigate vibration techniques other than percussive therapy delivered by massage guns

-Percussive therapy is administered indirectly and not directly to the targeted muscle or tendon for treatment in any location on the body

-Full-text version of the article is not available

-Published prior to January 2006

Search strategy
https://www.crd.york.ac.uk/PROSPEROFILES/253767_STRATEGY_20210507.pdf

Types of study to be included
All existing literature will be included, for example, primary research studies, systematic reviews, meta-analyses, conference papers and websites, providing full-text version of the article is available. Literature published in any language will be included and any articles not in English will be translated. Articles without the full text version avaiable will be excluded.

Condition or domain being studied
Muscle strength, explosive muscle strength, flexibility and musculoskeletal pain - which will be considered in the following way:

Muscle strength –maximal force exerted by a muscle or muscle group in one maximal effort against a resistance

Explosive muscle strength– ability of a muscle or muscle group to rapidly develop force

Flexibility – the range of motion possible through a joint, due to the ability of muscles and tendons to elongate

Musculoskeletal pain – unpleasant sensory experience associated with the bones, joints or tissues of the body

Participants/population
All adult populations

Inclusion criteria - adults aged 18 and over.

Excluded criteria - below 18 years of age

Intervention(s), exposure(s)
This review will focus on the application and treatment of percussive therapy delivered by massage guns on acute and chronic physiological adaptations, particularly on muscle strength, explosive muscle strength, flexibility and perceptions of musculoskeletal pain, across all adult populations. The first massage gun was invented in 2008 and in recent years, there has been an increase in the popularity of handheld devices for personal and professional therapeutic use, and by strength and conditioning coaches and athletes to elicit potential performance gains. The technology behind massage guns is often referred to as percussive therapy and the device is allowed to "float" over the surface of the skin, applying vibration and rapid pulses in short bursts of pressure applied to the muscle belly or tendon. It is comprised of a triad of characteristics; frequency (Hz), amplitude (mm) and torque (lbs), and mimics the therapeutic effects of tapotement massage therapy, which applies rhythmic percussive strokes to the body with a cupped hand.

Comparator(s)/control

The comparative effects of percussive therapy on muscle strength, explosive muscle strength, flexibility and on perceptions of musculoskeletal pain will be considered when compared with alternative, placebo or no treatment.

Main outcome(s)

Outcomes related to physiological adaptations as a result of percussive therapy applied to the muscle or tendon being treated; specifically, these are changes in muscle strength, explosive muscle strength, flexibility or in perceptions of musculoskeletal pain.

Additional outcome(s)

Additional outcomes relate to the study designs. It is expected that these may be diverse and context specific, therefore it is not possible to produce an exhaustive list at the outset. However, these may include effective protocols used in percussive therapy, such as frequency, amplitude, torque and duration. Knowing the most effective protocols used for treatment allows researchers to develop targeted interventions to improve changes in physiological adaptations and reduce perceptions of musculoskeletal pain.

Data extraction (selection and coding)

Study selection at title/abstract screening and full text screening will be performed by one reviewer and checked for consistency and completeness by all reviewers. After eliminating any duplicates which have been identified by the search engines, an initial screening of titles and abstracts will be undertaken to exclude records that do not meet the inclusion criteria. Each record will be classified as 'include', 'exclude' or 'maybe' to identify relevant and exclude irrelevant literature. The researcher will be inclusive at this stage and, if uncertain about the relevance of a publication or report, it will be left in. The full text will be obtained for all the records that potentially meet the inclusion criteria. The full text papers will be screened and studies that do not meet the inclusion criteria will be listed with the reasons for exclusion. A PRISMA flow-chart of the study selection will be included in the review.

Disagreements between review authors will be resolved by discussion.

Data will be extracted from the included studies and managed in an Excel spreadsheet. A data extraction form will be developed to incorporate the requirements of the review and will be tested on three included papers and, where necessary, revised to ensure it can be reliably interpreted and captures all relevant data from different study designs.
Data will be extracted on the participants, study design, interventions, comparators and outcomes. In addition, the data extraction form will include authors, year of study, aim/purpose, type of paper (e.g. journal article), geographical area, sample size, intervention length, specifics about the treatments involved, measures used to assess the adaptations and key findings that relate to the narrative review question. One reviewer will extract data using the structured data extraction form which will be checked for consistency and completeness by all other reviewers.

Risk of bias (quality) assessment

Included studies will be appraised using a standardised critical appraisal tool. Two full text papers will be tested by one reviewer on Mixed Methods Appraisal Tool Version 2018 and Critical Appraisal Skills Programme tool. Reviewers will discuss which tool fits best and offers a good selection to cover the types of methodologies used in the included studies and the remaining studies will be appraised. Both tools are standardised, validated and widely used for systematic reviews. This critical appraisal may establish that some studies have limitations in relation to methodological quality and reporting findings but may still include contextually-rich details that contribute to the overall narrative synthesis and the research question.

One reviewer will assess the risk of bias and methodological quality using the PEDro scale and will be checked for consistency and completeness by all reviewers. The PEDro scale awards points ranging from 0-10 and includes the following domains: Eligibility criteria and source, random allocation, concealed

allocation, baseline comparability, blinding of participants, therapists and assessors, adequate follow-up (> 85%), intention-to-treat analysis, between-group statistical comparisons, reporting of point measures and measures of variability. Studies will be judged at high risk of bias and low quality with a score of <3.

Strategy for data synthesis

Findings from the included studies will be synthesised narratively with reference to the narrative synthesis guidance, in order to draw conclusions based on the body of evidence. This guidance focusses on synthesising findings from multiple studies that relies on the use of words and text to summarise and explain the findings and details specific tools and techniques that can be used in the synthesis (Popay et al., 2006).

Attempts will be made to contact the original authors of the study to obtain relevant missing data. If the author is uncontactable after two attempts in one-month, the available data from the published studies will be used. Any missing data will not be inferred.

Analysis of subgroups or subsets

Not applicable

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Type and method of review

Narrative synthesis, Systematic review

Anticipated or actual start date

14 May 2021

Anticipated completion date

02 May 2022

Funding sources/sponsors

None

Conflicts of interest

Language

English

Country

England

Stage of review

Review Ongoing

Subject index terms status
Subject indexing assigned by CRD

Subject index terms
Humans; Massage; Pain; Perception

Date of registration in PROSPERO
13 May 2021

Date of first submission
11 May 2021

Stage of review at time of this submission [3 changes]

Stage	Started	Completed
Preliminary searches	Yes	Yes
Piloting of the study selection process	Yes	Yes
Formal screening of search results against eligibility criteria	Yes	Yes
Data extraction	Yes	Yes
Risk of bias (quality) assessment	Yes	Yes
Data analysis	Yes	Yes

Revision note
Updated search criteria on websites too capture additional literature on topic

The record owner confirms that the information they have supplied for this submission is accurate and complete and they understand that deliberate provision of inaccurate information or omission of data may be construed as scientific misconduct.

The record owner confirms that they will update the status of the review when it is completed and will add publication details in due course.

Versions
13 May 2021
15 June 2021
26 October 2021
06 January 2022