Systematic review

Please complete all mandatory fields below (marked with an asterisk *) and as many of the non-mandatory fields as you can then click *Submit* to submit your registration. You don't need to complete everything in one go, this record will appear in your *My PROSPERO* section of the web site and you can continue to edit it until you are ready to submit. Click *Show help* below or click on the icon
to see guidance on completing each section.
This record cannot be edited because it has been rejected

1. * Review title.

Give the working title of the review, for example the one used for obtaining funding. Ideally the title should state succinctly the interventions or exposures being reviewed and the associated health or social problems. Where appropriate, the title should use the PI(E)COS structure to contain information on the Participants, Intervention (or Exposure) and Comparison groups, the Outcomes to be measured and Study designs to be included.

Prognostic factors and treatment effect modifiers for children and adolescents with musculoskeletal pain: a protocol for a systematic literature review

2. Original language title.

For reviews in languages other than English, this field should be used to enter the title in the language of the review. This will be displayed together with the English language title.

3. * Anticipated or actual start date.

Give the date when the systematic review commenced, or is expected to commence.

21/06/2016

4. * Anticipated completion date.

Give the date by which the review is expected to be completed.

01/12/2017

5. * Stage of review at time of this submission.

Indicate the stage of progress of the review by ticking the relevant Started and Completed boxes. Additional information may be added in the free text box provided.
Please note: Reviews that have progressed beyond the point of completing data extraction at the time of initial registration are not eligible for inclusion in PROSPERO. Should evidence of incorrect status and/or completion date being supplied at the time of submission come to light, the content of the PROSPERO record will be removed leaving only the title and named contact details and a statement that inaccuracies in the stage of the review date had been identified.
This field should be updated when any amendments are made to a published record and on completion and publication of the review.

The review has not yet started: No

Review 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

Provide any other relevant information about the stage of the review here (e.g. Funded proposal, protocol not yet finalised).

6. * Named contact.

The named contact acts as the guarantor for the accuracy of the information presented in the register record.

Negar Pourbordbari

Email salutation (e.g. "Dr Smith" or "Joanne") for correspondence:

7. * Named contact email.

Give the electronic mail address of the named contact.

negar@dcm.aau.dk

8. Named contact address

Give the full postal address for the named contact.

Dr. Negar Pourbordbari
Research Unit of General Practice in Aalborg and Department of Clinical Medicine, Aalborg University
Fyrkildevej 7, 9220 Aalborg
Denmark

9. Named contact phone number.

Give the telephone number for the named contact, including international dialling code.

004527914224

10. * Organisational affiliation of the review.

Full title of the organisational affiliations for this review and website address if available. This field may be completed as 'None' if the review is not affiliated to any organisation.

Research Unit of General Practice in Aalborg and Department of Clinical Medicine, Aalborg University, Denmark

Organisation web address:

11. Review team members and their organisational affiliations.

Give the title, first name, last name and the organisational affiliations of each member of the review team. Affiliation refers to groups or organisations to which review team members belong.

Dr Negar Pourbordbari. Research Unit of General Practice in Aalborg and Department of Clinical Medicine, Aalborg University, Denmark
Mr Allan Riis. Research Unit of General Practice in Aalborg and Department of Clinical Medicine, Aalborg University, Denmark
Professor Martin Bach Jensen. Research Unit of General Practice in Aalborg and Department of Clinical Medicine, Aalborg University, Denmark
Dr Jens Lykkegaard Olesen. The Faculty of Medicine Department of Clinical Medicine, Aalborg University, Denmark
Dr Michael Skovdal Rathleff. Research Unit of General Practice in Aalborg and Department of Clinical Medicine, Aalborg University, Denmark

12. * Funding sources/sponsors.

Give details of the individuals, organizations, groups or other legal entities who take responsibility for initiating, managing, sponsoring and/or financing the review. Include any unique identification numbers assigned to the review by the individuals or bodies listed.

Research Unit of General Practice in Aalborg and Department of Clinical Medicine, Aalborg University, Denmark

13. * Conflicts of interest.

List any conditions that could lead to actual or perceived undue influence on judgements concerning the main topic investigated in the review.

None

14. Collaborators.

Give the name and affiliation of any individuals or organisations who are working on the review but who are not listed as review team members.

15. * Review question.

State the question(s) to be addressed by the review, clearly and precisely. Review questions may be specific or broad. It may be appropriate to break very broad questions down into a series of related more specific questions. Questions may be framed or refined using PI(E)COS where relevant.

The aim of this study is to conduct a systematic review on children and adolescents with musculoskeletal pain with a view to determining which baseline patient characteristics are associated with a poor outcome in follow-up regardless of which treatment has been provided (prognosis) or are associated with a successful outcome to a specific treatment (treatment effect modifiers).
Review question: What are the prognostic factors and treatment effect modifiers for children and adolescents with musculoskeletal pain?

16. * Searches.

Give details of the sources to be searched, search dates (from and to), and any restrictions (e.g. language or publication period). The full search strategy is not required, but may be supplied as a link or attachment.

This systematic review search will be conducted in the following electronic databases: MEDLINE, Embase, CINAHL, Web of Science, Cochrane and SPORTDiscus without limitations on dates.
Articles reported in English, German, Danish, Norwegian, Swedish, French, Spanish, Japanese, Chinese, Thai, Arabic, Persian, Turkish and Hindi will be included.
The search strategy will be divided into seven parts. 1. Pain; 2. Musculoskeletal defined in components; 3. Anatomic regions; 4. Musculoskeletal conditions in general and those common among children and adolescents; 5. Children and adolescents and synonyms; 6. Predictive factors and synonyms; and 7. Final search string to be applied in above mentioned electronic databases and also tested in MEDLINE with 5336 hits.
Additional details about the search strategy can be found in the attached PDF document (link provided

below).

17. URL to search strategy.

Give a link to the search strategy or an example of a search strategy for a specific database if available (including the keywords that will be used in the search strategies).

https://www.crd.york.ac.uk/PROSPEROFILES/41378_STRATEGY_20170613.pdf

Alternatively, upload your search strategy to CRD in pdf format. Please note that by doing so you are consenting to the file being made publicly accessible.

Yes I give permission for this file to be made publicly available

18. * Condition or domain being studied.

Give a short description of the disease, condition or healthcare domain being studied. This could include health and wellbeing outcomes.

Children and adolescents aged 0-19 years with musculoskeletal pain.

19. * Participants/population.

Give summary criteria for the participants or populations being studied by the review. The preferred format includes details of both inclusion and exclusion criteria.

The participants must all have some form of self-reported musculoskeletal pain at recruitment. Musculoskeletal pain is defined according to the International Association for the Study of Pain, IASP as: “pain arisen from muscle, tendon, bone and joint. Excluded from the definition is pain due to serious local causes, such as tumors, fractures, or infections, and systemic and neurological causes”. Types of pain are named according to the region affected, e.g. back pain, neck pain, shoulder pain, elbow pain, buttock pain, hip pain, knee pain, and ankle pain.
Inclusion criteria: 0 to 19 years of age, self-reported musculoskeletal pain.
Exclusion criteria: Older than 19 years of age.

20. * Intervention(s), exposure(s).

Give full and clear descriptions or definitions of the nature of the interventions or the exposures to be reviewed.

All interventions used to treat musculoskeletal pain in children and adolescents are eligible, including conservative as well as non-conservative interventions. Conservative intervention is defined as: utilization of non-surgical treatment options, such as, but not limited to, the following: physiotherapy, immobilization, bandaging, drug therapy, wait and see and intraarticular, intramuscular and intratendinous injections with NSAID/glucocorticoid/steroid. We will also include studies that do not contain interventions.

21. * Comparator(s)/control.

Where relevant, give details of the alternatives against which the main subject/topic of the review will be compared (e.g. another intervention or a non-exposed control group). The preferred format includes details of both inclusion and exclusion criteria.

We expect that most studies will not have used a comparator as they are prospective cohort studies. If the study design is a randomized trial, we will include all types of comparators.

22. * Types of study to be included.

Give details of the types of study (study designs) eligible for inclusion in the review. If there are no restrictions on the types of study design eligible for inclusion, or certain study types are excluded, this should be stated. The preferred format includes details of both inclusion and exclusion criteria.

Prospective cohort studies (including randomized trials) with a population of children and adolescents aged 0-19 years will be included in this systematic review if they report prognostic factors or treatment effect

modifiers (e.g. baseline variables that are associated with the outcome).

23. Context.

Give summary details of the setting and other relevant characteristics which help define the inclusion or exclusion criteria.

There will be no restrictions on the type of setting.

24. * Primary outcome(s).

Give the pre-specified primary (most important) outcomes of the review, including details of how the outcome is defined and measured and when these measurement are made, if these are part of the review inclusion criteria.

We will search for all baseline patient characteristics that are: (i) associated with a poor outcome on follow-up regardless of which treatment has been provided (prognosis); or ii) associated with a successful outcome to a specific treatment (treatment effect modifiers). These may include intrinsic variables (such as age, height, weight, pain intensity, pain duration and similar) or extrinsic variables (such as social status, parental education, sports participation and similar).

Timing and effect measures

We will include patient characteristics that are associated with both short- and long-term outcomes. These will be divided into three endpoints, i.e. short-term (3 months), medium-term (3-12 months) and long-term (more than 12 months).

25. * Secondary outcome(s).

List the pre-specified secondary (additional) outcomes of the review, with a similar level of detail to that required for primary outcomes. Where there are no secondary outcomes please state ‘None’ or ‘Not applicable’ as appropriate to the review

The proportion of patients that report themselves free of musculoskeletal pain at follow-up in the included studies.

Timing and effect measures

We will include patient characteristics that are associated with both short- and long-term outcomes. These will be divided into three endpoints, i.e. short-term (3 months), medium-term (3-12 months) and long-term (more than 12 months).

26. Data extraction (selection and coding).

Give the procedure for selecting studies for the review and extracting data, including the number of researchers involved and how discrepancies will be resolved. List the data to be extracted.

The process of study selection will be conducted by two reviewers (NP and AR). They will independently identify studies from the electronic database search and will screen the titles and/or abstracts that have relevance to the question: what are the prognostic factors for children and adolescents with musculoskeletal pain? Studies kept after the primary assessment will be screened by full text and then selected for a final inclusion.
Any excluded studies will be recorded, along with a reason for the exclusion. There will be no blinding of the review authors to the journal titles, authors or institutions. Reference lists of all included studies will be screened for additional eligible publications that may have been missed during the initial search.
Any disagreements inside the reviewer group will lead to the involvement of a third reviewer (MSR).
NP will extract data using a pre-defined data extraction form (see Appendix 1 in the full protocol), inspired by The Cochrane Collaboration, Data collection form for intervention reviews: RCTs and non-RCTs (3). All the extracted data will then be validated by a second person (MSR). The collected data will include a description of the participants, setting (e.g. general practice or population-based cohort) and results (including all patient characteristics tested for association with outcome).

We will contact the corresponding author with a request for information, if any data concerning the intervention or outcome is missing from an included study, the intention being to increase the thoroughness of the descriptions of interventions and outcomes in this study.

Studies examining children and adolescents with musculoskeletal pain aged 0 to 19 years will be included in this review. If a study reports on an age range that exceeds this, we will contact the corresponding author and ask for data on the 0-19 year olds. The requested data will be included if it can be retrieved within one month of the inquiry.

27. * Risk of bias (quality) assessment.

State whether and how risk of bias will be assessed (including the number of researchers involved and how discrepancies will be resolved), how the quality of individual studies will be assessed, and whether and how this will influence the planned synthesis.

The QUIPS risk of bias tool for prognostic studies will be used to assess the quality of each paper (4). This tool contains items and considerations for six bias domains i.e. study participation, study attrition, prognostic factor measurement, outcome measurement, study confounding, statistical analysis and reporting (see Appendix 2 in full protocol). Each of the six potential bias domains will be rated by NP as high, moderate, or low risk of bias. When assessing the overall risk of bias in each study, a study will be described with a low risk of bias when either a) most of or b) the most important (determined a priori) or c) all of the six bias domains are rated with a low risk of bias. The same applies to moderate and high risk of bias.

28. * Strategy for data synthesis.

Give the planned general approach to synthesis, e.g. whether aggregate or individual participant data will be used and whether a quantitative or narrative (descriptive) synthesis is planned. It is acceptable to state that a quantitative synthesis will be used if the included studies are sufficiently homogenous.

A narrative synthesis is planned, the reason being the expected substantial heterogeneity in our results. If the prognostic factors or treatment effect modifiers are adequately homogenous, we will conduct a meta-analysis and pool the individual variables.

29. * Analysis of subgroups or subsets.

Give details of any plans for the separate presentation, exploration or analysis of different types of participants (e.g. by age, disease status, ethnicity, socioeconomic status, presence or absence or co-morbidities); different types of intervention (e.g. drug dose, presence or absence of particular components of intervention); different settings (e.g. country, acute or primary care sector, professional or family care); or different types of study (e.g. randomised or non-randomised).

Data will be divided into two main separate groups: prognostic factors and treatment effect modifiers and then sub-grouped into regions of musculoskeletal pain, gender and age.

30. * Type and method of review.

Select the type of review and the review method from the lists below. Select the health area(s) of interest for your review.

Type of review

Cost effectiveness
No

Diagnostic
No

Epidemiologic
No

Individual patient data (IPD) meta-analysis
No

Intervention

No

Meta-analysis
No

Methodology
No

Network meta-analysis
No

Pre-clinical
No

Prevention
No

Prognostic
Yes

Prospective meta-analysis (PMA)
No

Qualitative synthesis
No

Review of reviews
No

Service delivery
No

Systematic review
Yes

Other
No

Health area of the review

Alcohol/substance misuse/abuse
No

Blood and immune system
No

Cancer
No

Cardiovascular
No

Care of the elderly
No

Child health
No

Complementary therapies
No

Crime and justice
No

Dental
No

Digestive system
No

Ear, nose and throat
No

Education

No

Endocrine and metabolic disorders
No

Eye disorders
No

General interest
No

Genetics
No

Health inequalities/health equity
No

Infections and infestations
No

International development
No

Mental health and behavioural conditions
No

Musculoskeletal
No

Neurological
No

Nursing
No

Obstetrics and gynaecology
No

Oral health
No

Palliative care
No

Perioperative care
No

Physiotherapy
No

Pregnancy and childbirth
No

Public health (including social determinants of health)
No

Rehabilitation
No

Respiratory disorders
No

Service delivery
No

Skin disorders
No

Social care
No

Surgery
No

Tropical Medicine
No

Urological
No

Wounds, injuries and accidents
No

Violence and abuse
No

31. Language.

Select each language individually to add it to the list below, use the bin icon to remove any added in error.
English

There is an English language summary.

32. Country.

Select the country in which the review is being carried out from the drop down list. For multi-national collaborations select all the countries involved.

Denmark

33. Other registration details.

Give the name of any organisation where the systematic review title or protocol is registered (such as with The Campbell Collaboration, or The Joanna Briggs Institute) together with any unique identification number assigned. (N.B. Registration details for Cochrane protocols will be automatically entered). If extracted data will be stored and made available through a repository such as the Systematic Review Data Repository (SRDR), details and a link should be included here. If none, leave blank.

34. Reference and/or URL for published protocol.

Give the citation and link for the published protocol, if there is one

Give the link to the published protocol.

http://www.crd.york.ac.uk/PROSPEROFILES/41378_PROTOCOL_20160520.pdf

Alternatively, upload your published protocol to CRD in pdf format. Please note that by doing so you are consenting to the file being made publicly accessible.

Yes I give permission for this file to be made publicly available

Please note that the information required in the PROSPERO registration form must be completed in full even if access to a protocol is given.

35. Dissemination plans.

Give brief details of plans for communicating essential messages from the review to the appropriate audiences.

The manuscript will be submitted for publication in an appropriate peer-reviewed journal. In addition to this we will produce material to be distributed to general practitioners and other health care providers, who manage children and adolescents with musculoskeletal pain. This will be done in the form of a short animation video, visualizing the main study results from the systematic review. The animation will be distributed through social media, websites and patient associations. This will ensure dissemination of our results to our target audience.

Do you intend to publish the review on completion?

Yes

36. Keywords.

Give words or phrases that best describe the review. Separate keywords with a semicolon or new line. Keywords will help users find the review in the Register (the words do not appear in the public record but are included in searches). Be as specific and precise as possible. Avoid acronyms and abbreviations unless these are in wide use.

systematic review
children
adolescence
musculoskeletal pain
prognosis
treatment effect modifier

37. Details of any existing review of the same topic by the same authors.

Give details of earlier versions of the systematic review if an update of an existing review is being registered, including full bibliographic reference if possible.

38. * Current review status.

Review status should be updated when the review is completed and when it is published.
Please provide anticipated publication date

Review_Ongoing

39. Any additional information.

Provide any other information the review team feel is relevant to the registration of the review.

References:
1. http://www.iasp-pain.org/files/Content/ContentFolders/GlobalYearAgainstPain2/MusculoskeletalPainFactSheets/AcutePain_Final.pdf
2. http://www.spine-health.com/glossary/conservative-treatment.
3. Cochrane Training, Data collection form for intervention reviews: RCTs and non-RCTs. http://training.cochrane.org/resource/data-collection-forms-intervention-reviews 2014.
4. Hayden JA, van der Windt DA, Cartwright JL, Côté P, Bombardier C. Assessing bias in studies of prognostic factors. Ann Intern Med. 2013;158(4):280-6.

40. Details of final report/publication(s).

This field should be left empty until details of the completed review are available.

Give the link to the published review.