PEER REVIEW HISTORY

BMJ Open publishes all reviews undertaken for accepted manuscripts. Reviewers are asked to complete a checklist review form (**http://bmjopen.bmj.com/site/about/resources/checklist.pdf**) and are provided with free text boxes to elaborate on their assessment. These free text comments are reproduced below.

ARTICLE DETAILS

TITLE (PROVISIONAL)	Exercise interventions for ankylosing spondylitis: A protocol for a Bayesian network meta-analysis
AUTHORS	Kan, Shun-Li; Chen, Lingxiao; Yuan, Zhi-Fang; Hu, Wei; Zhu, Ru-Sen

VERSION 1 - REVIEW

REVIEWER	Johanna Callhoff Epidemiologist German Rheumatism Research Center, Berlin Germany
REVIEW RETURNED	22-Mar-2019

GENERAL COMMENTS	This is a thorough and well-written protocol for a Bayesian network meta-analysis on exercise interventions for ankylosing spondylitis. The authors clearly state the planned steps of the data collection and analysis. I have just a few remarks that might help improve the protocol and the analysis. Outcome measures -I recommend to use standardized mean differences instead of mean differences. What is the rationale to use simple mean differences? Please explain. -You mention that the highest pain score will be regarded as the final pain score (line 132). Does that mean that you collect the highest score from the mentioned alternatives back pain, back pain at night etc? -Is there a minimum/maximum trial duration for a trial to be included in the review? How do you ensure comparability in durations? I recommend to decide a trial duration (e.g. 24 weeks) as the "standard" and preferably collect outcomes at this timepoint. Otherwise it might be difficult to compare the results of a short 12 week intervention with a 2 year lasting trial. Statistical Analysis - The Der Simonain Laird Method has been shown to be not favourable in many situations, I suggest to use the Hartung-Knapp-Sidik-Jonkstra Method as recommended by a work group of the Cochrane Collaboration [1] Eligibility criteria -How will trials be treated that do not report all outcomes of interest? Will you contact the authors of those trials to obtain measures not reported? Will you impute values not reported from other trials? Please describe your strategy for missing data.

	Reference [1]Veroniki, A.A., Jackson, D., Viechtbauer, W., Bender, R., Knapp, G., Kuss, O. & Langan, D. (2015): Recommendations for quantifying uncertainty in the summary intervention effect and estimating between-study heterogeneity variance in random-effects meta-analysis. Cochrane Database Syst. Rev. 2015 (Suppl. 1), 25-27.

REVIEWER	Runsheng Wang Columbia University Medical Center
REVIEW RETURNED	29-Mar-2019

GENERAL COMMENTS	The study intended to address an important question in management of ankylosing spondylitis/axial spondyloarthritis. The overall study design is solid, but needs some minor improvements: 1, in the abstract, study type, participants, interventions and outcomes should be briefly described. 2, More descriptions in the section of Eligibility criteria/type of studies, for example, RCT that compares different PT, and/or RCT that compare PT to placebo/no exercise? etc. , length of the studies? etc. 3, outcomes: the outcomes of interested in BASFI, pain, BASDAI, at what time frame? or their changes at the end of the studies?

VERSION 1 – AUTHOR RESPONSE

Responds to the reviewer's comments:

Reviewer: 1

Comment: I recommend to use standardized mean differences instead of mean differences. What is the rationale to use simple mean differences? Please explain.

Answer: Thank you for your comments and suggestions. Your advice is very important for us. We will use mean difference for a certain outcome when more than 50 percent studies reporting the outcome use the same measurement. Otherwise, standardized mean difference will be used. We have added relevant details in the manuscript.

Comment: You mention that the highest pain score will be regarded as the final pain score (line 132). Does that mean that you collect the highest score from the mentioned alternatives back pain, back pain at night etc?

Answer: Thank you for your comments. We will collect the highest score from the mentioned alternatives. We think the highest score may manifests the final effects of exercise interventions on ankylosing spondylitis.

Comment: Is there a minimum/maximum trial duration for a trial to be included in the review? How do you ensure comparability in durations? I recommend to decide a trial duration (e.g. 24 weeks) as the

"standard" and preferably collect outcomes at this timepoint. Otherwise it might be difficult to compare the results of a short 12 week intervention with a 2 year lasting trial.

Answer: Thank you for your suggestions. We will divide the trial duration into short-term follow-up (6 months) and long-term follow-up (12 months). If the trial duration is closer to 6 months or 12 months, we will classify the trial duration as short-term follow-up or long-term follow-up. We have added relevant information in the manuscript.

Comment: The Der Simonain Laird Method has been shown to be not favourable in many situations, I suggest to use the Hartung-Knapp-Sidik-Jonkstra Method as recommended by a work group of the Cochrane Collaboration.

Answer: Thank you for your suggestions. Your advice is very important for us. We will use the Hartung-Knapp-Sidik-Jonkstra method. We have added relevant information in the manuscript.

Comment: How will trials be treated that do not report all outcomes of interest? Will you contact the authors of those trials to obtain measures not reported? Will you impute values not reported from other trials? Please describe your strategy for missing data.

Answer: Thank you for your comments. Trials reporting any one of the outcomes of interest will be included. We will contact the corresponding author to obtain measures not reported and data directly reported in the texts, if possible. We will impute values not reported from other trials. If the study only reports SE, p value or CI, we will convert them into SD. If the study reports median and IQR, we will calculate SD by dividing the IQR by 1.35 and considering the median equivalent to the mean. We have added relevant information in the manuscript.

Reviewer: 2

Comment: in the abstract, study type, participants, interventions and outcomes should be briefly described.

Answer: Thanks for your suggestions. We have added relevant information in the manuscript.

Comment: More descriptions in the section of Eligibility criteria/type of studies, for example, RCT that compares different PT, and/or RCT that compare PT to placebo/no exercise? etc. , length of the studies? etc.

Answer: Thank you for your suggestions. We have added relevant information in the manuscript.

Comment: outcomes: the outcomes of interested in BASFI, pain, BASDAI, at what time frame? or their changes at the end of the studies?

Answer: Thank you for your comments. We will prioritize the data at the end of the studies compared with the changes from baseline. We have added relevant details in the manuscript.

VERSION 2 – REVIEW

REVIEWER	Johanna Callhoff German Rheumatism Research Centre
REVIEW RETURNED	29-Apr-2019

GENERAL COMMENTS	Thank you, I have no further comments.

REVIEWER	Runsheng Wang Columbia University Medical Center USA
REVIEW RETURNED	09-May-2019

GENERAL COMMENTS	The reviewer completed the checklist but made no further comments.