Reviewer’s report

Title: Dose-Response of resistance training for neck-and shoulder pain relief: A workplace intervention study

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Reviewer: Jessica Micheletti

Reviewer's report:

This study reports the findings of a two different frequency of training per day. The aim was to examine the dose-response of this two trainings for pain relief, strength and health-related quality of life. The study is well written and of interest, but could be improved.

Abstract

- Change: "Musculoskeletal disorder is more prevalent among office workers" for "Musculoskeletal disorder have high prevalent among office workers".

Background

The introduction is well described. However an overview of the problem should be improved. Three possibilities of training dose are cited: 1-) Different volumes and equal frequency of training per week, which results in a different total volume (reference 25); 1-) Equal volumes per session and different training frequency per week, which results in a different total volume (reference 27), and 3-) Different training frequency per day resulting in different volume per day and different total volume.

Still the author cites a study in the discussion section with different frequencies per week with different volume in each session but resulting in an equal total volume (reference 18).

The first two possibilities have already been observed in the literature, and the third is what the author puts as a gap. I think this overview should be clearer to the readers, and more evidences should be addressed.
Page 5 Line 2-3: "To the authors' knowledge, only a few studies have examined this dose-response relationship (26, 27)." This sentence should be better explain, once the sentence before is the opposite of this idea. I think that the authors should make clear to readers that others dose-response studies with pain vs different volume of training exist (as the studies 4, 22 and 25) as well as studies with pain vs different frequency of training per week, but studies with pain and different frequency of training do not. Please, reformulate this paragraph for better understanding.

Authors cite in Page 5 - Line 35-36 "it is not clear whether different training volume caused by a greater training frequency per day could relief the pain to a greater extent than lower training frequency". This is the focus and studies with this intention need to be addressed in the introduction for better overview.

Study design

The flowchart is confusing. Thirty-three participants were accessed by eligibility, however in the Subjects Section (Page 6 Line 47-48) the authors cited that an email was sent and only 30 participants responded by agreeing to participate in the study. In the pre-test 30 participants were analyzed, there was a loss of 3 (for other reasons) during the control period, but 30 were analyzed in the mid-test? This loss of 3 participant maybe should be putted below the mid-test and after the randomization process. The flowchart needs to be clearer. It has correct templates to use.

Just as placed in the last frame of losses (with 5 losses), the first ones should also have the smallest letter like this in "time", "disease" and "other reasons" for better understanding.

The final TG20 group value is less than the number needed to detect the desired effect size. This is a major limitation of the study.

Subjects

Did the workers who answered the email agreeing to be part of the study have similar office jobs? If so, can you quote the percentage of each type of work performed? For example, secretary, researcher, dentists, etc. Still, was the average sitting time of these subjects collected?? If so, it is relevant information to add as well.
Why was it not included people with pain above 60mm in the VAS? the reason need to be addressed in the manuscript.

Table 1 is confuse. I do not understood what the asterisk symbol represents.

Procedures
Page 6 Line 1-2: "The TG10 and TG20 groups reported to perform 89% and 87% of the training sessions respectively." Performing 89% of the training means the participant may have missed 5 times. If you consider these consecutive absences, the participant did not performed a week of training, which is bad within a training program, once can affect your adaptation and even regress possible improvements. Did you have any control over those missed days? Were these missed days consecutive? Was there any kind of exclusion for X consecutive missing days?

Training
Perhaps the term elastic band should be replaced by elastic tube. To review! (see this article: Test-retest reliability of knee extensors endurance test with elastic resistance from Lopes et al.)

The authors cite that the band progression was implemented by utilizing thicker bands, two bands, or shortening the band in the starting position of the exercise. However the order of this progression was not made explicit. Which option was initially made? swap the band for a thicker one? put two bands? The reader who will perform this training needs to know these details.

Participants previously performed a 12-15RM test to find the ideal starting elastic tube ???

How was exercise speed controlled? Metronome? how much beats per minute?

Isometric strength
Photos can help the reader better understand the test.

Results
p-valor should be added in Table 2.
In my opinion figures 3, 4 and 5 could be merged into one table only. This makes the correct values of general pain, worst pain and health-related quality of life more visible, as well as reducing the number of figures in the text.

Discussion

The discussion is well written. However, like in the introduction I believe that there is a need to focus more deeply on the gap presented: The lack of studies that observe different training's frequency per day. Even if there are no studies on this, or few, this should be cited.

Specifically, paragraphs 2 and 3 aim to show that approximately 60-minute of training (volume) is sufficient for pain improvements. However, the authors cite Andersen et al 27 as an example to support this thought (Page 14 - Line 43). However, the authors of the above article noted that 1-2 sessions of 20 minutes produce similar effects to 2-3 sessions of 20 minutes. This results in a time between 20 and 60 minutes of exercise. Being the lower value a little distant from the 60 minutes set as sufficient. So maybe less time is enough, and that should be discussed.

Finally, the discussion presents important points, however, attention is still suggested to the population of men and women. Hormonal differences, gains in training and even pain may be influenced by gender. This is a point that can be discussed and even entered as a limitation.

Are the methods appropriate and well described?
If not, please specify what is required in your comments to the authors.

Yes

Does the work include the necessary controls?
If not, please specify which controls are required in your comments to the authors.

Yes

Are the conclusions drawn adequately supported by the data shown?
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Are you able to assess any statistics in the manuscript or would you recommend an additional statistical review?
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I am able to assess the statistics

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