Author’s response to reviews

Title: Health coaching for promoting physical activity in low back pain patients: A secondary analysis on the usage and acceptance

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Author’s response to reviews:

Ref.: Revision for SSMR-D-19-00092, "Explaining unsuccessful physical activity promotion in low back pain patients: A secondary analysis on the usage and acceptance of health coaching"

Cologne, 2 December 2019
Dear Dr. Diehl,

Please find enclosed our revisions made in the manuscript entitled “Explaining unsuccessful physical activity promotion in low back pain patients: A secondary analysis on the usage and acceptance of health coaching”. The changes made in the manuscript are highlighted by color.

We greatly appreciated the comments of the two reviewers. They were very helpful to improve the quality of our manuscript.
At first, we would like to thank the two reviewers for their valuable input; the time and the effort they put in revising the manuscript is very much appreciated. The feedback given was very detailed and considerably improved the quality of this manuscript.
Thank you for reconsidering this paper for publication in the Journal BMC Sports Science, Medicine and Rehabilitation. Subsequently, we outline the changes of our revision:

Comments from reviewer #1

# In their manuscript "Explaining unsuccessful physical activity promotion in low back pain patients: A secondary analysis on the usage and acceptance of health coaching" the authors try to explain why there multi-component intervention failed to prove effectiveness. Generally, if there is poor adherence it is difficult to observe an effect. Therefore, the authors investigate the usage and acceptance of three different health coaching approaches that all together belong to one multi-component intervention addressing physical activity promotion in low back pain patients in a secondary analysis. In multi-
component interventions, it is highly relevant to understand which components work for whom and E-health approaches represent a promising and cost-effective method for promoting physical activity, but also require some prerequisites such as Internet access and technology readiness. To analyse the usage of E-health approaches in different target groups and to compare usage and acceptance of face-to-face versus web-based intervention components is still of high relevance. In their manuscript, the authors describe the study population and results in a clear manner. Nevertheless, the following points should be revised:

Thank you very much for your general comment and your appreciation of our study and manuscript. We have addressed your feedback more detailed in the following.

Background section

Researchers in the field of physical activity promotion are encouraged to use pilot and feasibility studies before running an RCT. It is well known that factors like unsuccessful recruitment, retention or low adherence are challenging and need to be considered beforehand. Please provide reasons why you did not conduct a feasibility trial beforehand. Did you rely on data from other studies about usage and acceptance of the web-based intervention component for example? It would make sense to provide those data and to explain to the reader why this potentially worked out differently in your specific sample.

Thank you for your comment. We agree that a pilot study assessing feasibility is very useful and have done so. However, we did not report this in the previous version of the manuscript. We added the following sentences to clarify our methodological approach:

- In the methods we added “To assess the recruitment strategy and the feasibility in the inpatient rehabilitation a pilot study was conducted” (p. 4, ll. 95-96).
- In the limitations we added “Nevertheless, a pilot study was done, the response rate was not evaluated in the pilot study but taken from previous work of the research group regarding sustainability of inpatient rehabilitation” (p. 13, ll. 302-304).

Methods section

The authors describe that two interventions have been evaluated previously (p. 4, l. 80). What are the differences between those two interventions. Did you use baseline data from both intervention arms? In line 87 the authors wrote that the secondary analysis is based on T1 data of the intervention group. Which one is it?

Thank you for your comment. We see that further information is needed to clarify the differences between the interventions. The intervention (Movement Coaching) was designed as a multicomponent approach and comprised of three different components: face-to-face contact (small group intervention, twice during inpatient rehabilitation), a tailored telephone aftercare (8 weeks and 12 weeks after rehabilitation) and an internet-based aftercare (web 2.0 platform; available up to six months after rehabilitation). The control intervention was designed as a low intensity intervention merely comprising of two general presentations on physical activity during inpatient rehabilitation which could be downloaded from a homepage during aftercare. We changed it accordingly:

- To clarify we added “a multicomponent intervention (Movement Coaching) compared to a low level intensity intervention (control intervention)” (p. 4, ll. 89-90).

We only used data (also baseline data to describe the baseline characteristics of the sample) of the Movement Coaching intervention group.

To clarify we added “Movement Coaching” (p. 4, l. 99).

The study protocol, with the detailed description of the two interventions, has already been reported elsewhere [18].
What do you mean by that "The researchers sent the T1 and T2 questionnaires by post?" (p. 4, l. 84).
Following the informational meeting about the study, patients answered the baseline questionnaire at the beginning of inpatient rehabilitation (T0). The outcome data at six months (T1) and twelve months (T2) were collected using a questionnaire which was sent by letter.
- We deleted “The researchers sent the T1 and T2 questionnaires by post.” and added “The outcome data at six months (T1) and twelve months (T2) were collected using a questionnaire, which was sent by letter” (p. 4, ll. 93-94).

No results should be provided in the methods section (p.5, l. 106-108).
- Thank you for your comment.
  - We deleted the following sentence from the methods section and added it to our results: “There were no statistically significant differences in the characteristics of participants who replied and did not reply within the Movement Coaching intervention group (p>0.05)” (p. 8, ll. 192-194).

How often did the coach try to contact the patient via telephone (p. 5, l. 117)?
- Telephone aftercare comprised at least two calls of the coach (week 8 & week 12 after rehabilitation). On request further telephone coaching sessions were available. Therefore, numbers differed slightly between participants. If patients could not be reached by telephone in the designated week, the coach tried to contact him/her within the next two weeks. If a patient was not available within three weeks of the initial contact time, the phone coaching was deleted without replacement.
  - We added “...in the designated week...” and “If a patient could not be reached within the period of three weeks, the phone coaching was deleted without replacement” (p. 6, ll. 132-134).

It is not necessary to explain how physical activity has been assessed. This is not part of the manuscript (p. 6, l. 139-140).
- We agree that this is not needed to understand the study.
  - Accordingly, we deleted the sentence “To measure everyday physical activity the Global Physical Activity Questionnaire (GPAQ) was used [16].”

Results section

Can you explain why so many patients did not fulfill the COHEP questionnaire (p. 9, l. 213)?
- The COHEP-questionnaire was answered by a minimum of 90% (n=83) of the 92 patients after six month of follow-up (T1). The actual dropout was, therefore, only 10% for the COHEP-questionnaire. The described 41% are related to the 201 patients at baseline. We agree that this may be confusing to the reader and changed it as follows: and therefore confusing.
  - We deleted “The COHEP-questionnaire was answered by 41% (n=83) of the patients” and added “The COHEP-questionnaire was answered by 90% (n=83) of the 92 patients, who answered at six month follow-up” (p. 10, ll. 235-236).
  - We added “(n=92)” in table 7 (now table 8).

How many patients had face-to-face contact?
- The face-to-face meetings were integrated in the official therapy plan of the rehabilitation centre and so all patients of the Movement Coaching intervention group had face-to-face contact.
  - We added “...and all patients of the Movement Coaching intervention group had face-to-face contact” (p. 6, l. 146).
Did usage and acceptance vary by age or by sex?

Age and sex did not have an influence on usage and acceptance. This was determined by using binary logistic regression models. To present a clear story, we decided against integrating the logistic regression models in the manuscript.

Discussion

What do you mean by "control intervention results" (p.10, l. 229)?

The “control intervention” was a low intensity intervention. The main study evaluated the effectiveness of the multicomponent Movement Coaching intervention in comparison to the control intervention (both promote physical activity for patients with low back pain). In the main study, the multicomponent intervention could not prove its effectiveness compared to the control intervention results.

We added “a multicomponent intervention (Movement Coaching) compared to a low level intensity intervention (control intervention)” (p. 4, ll. 89-90).

Please add "or neither had no internet access" to line 245 on page 10.

Thank you for your comment.

We changed the sentence accordingly:“...or neither had no internet access” (p.11, l. 268).

What do you know about technology readiness of your specific sample?

It seems to me that a lot of people from your sample did not have access to the internet. Please provide data about internet access in your target group 18-65 years in your country.

In the year 2014 79.1% of the German population with an age of 50-59 years used the internet, which is close to the numbers revealed in our study (26% of the participants had no internet access).

We added the reference and the following sentence to further clarify this:“…, which is similar to the average percentage for the German [28]” (p. 11, l. 269).

We added “The present...” (p. 11, l. 267).

We modified “Nevertheless,...” (p. 11, l. 269).

Did you take into account the timing of the three different approaches? The web-based and the telephone-based component, was it both made available only after inpatient rehabilitation? What about the acceptance of those approaches if they are provided during inpatient rehabilitation?

During the inpatient rehabilitation the participants had face-to-face contact to the coach. The telephone coaching and the web-platform were used for the time after the inpatient rehabilitation, when the participants had no face-to-face contact to the coach. The content of the telephone coaching and the web-platform was designed for using them after some time of self activity in daily life (compare Table 2). The usage of the web-platform was explained during the inpatient rehabilitation.

Another research group concluded that it is important to focus on aftercare over the whole time of rehabilitation.

Beside the individualization, it is important to focus on aftercare throughout the rehabilitation” (p. 12, l. 291).

Is this really a "strength" or is it the aim of your study (p. 12, lines 279-280).

You are right, this sentence is indeed confusing as it was the aim of the study to analyse the usage and acceptance. We changed it as follows.

The main strength is that this study analysed the usage and acceptance of a lifestyle intervention”
Comments from reviewer #2

Dear authors,

to my view you are investigating a very important question, which - in the light of evolving apps and computerized aides to support behaviour change - should gain much more attention.

Still, before publication, some aspects should be clarified:

Thank you very much for this kind general comment and appreciating the aim of our study. We hope that our study helps to raise attention to this important research area. We addressed your specific comments in the following and accordingly made changes to our manuscript.

Background

Methodological aspect:

To my view your statement on the effectiveness of approaches to promoting physical activity is lacking an explanation that the effect of an intervention is firstly depending on the content of the intervention and secondly on successful implementation. Lifestyle coaching is definitely a complex intervention and its effectiveness depending on various context factors. For the reader it would be important to understand what theoretical framework the intervention is based on, how it was developed (including implementation strategy) and whether and how it was piloted. Building upon that, the research question for the current paper could be derived. Unfortunately the necessary information can neither be derived from the DRKS data, nor from the protocol publication. (This part can refer to Craig P, Dieppe P, Macintyre S, Michie S, Nazareth I, Petticrew M. Developing and evaluating complex interventions: the new Medical Research Council guidance. BMJ. 29. September 2008;a1655.).

Thank you for your comment. We see that the background might be confusing for some readers and added more detail to present the theoretical framework. Please see as follows:

In the background we added “Lifestyle interventions are complex and their success is often dependent on various factors such as the content and implementation of it [12]” (p. 3, ll. 72-72).

Moreover, we added “also” (p. 3, l. 74).

For the main trail we used a pilot study to assess the recruitment strategy and the feasibility in the inpatient rehabilitation.

In the methods we added “To assess the recruitment strategy and the feasibility in the inpatient rehabilitation a pilot study was conducted” (p. 4, ll. 95-96).

To understand what theoretical framework the intervention is based on,

we added “The intervention is based on the “Rubicon Model of Action Phases” [21] and the “MoVo Process Model” [22]. Additionally, contextual needs are considered within the concept of the intervention [23]. Concerning coaching methods and principles, the coach does not give any rules, concrete suggestions or solutions. The coach emphasizes the patient’s self-efficacy and individual resources to elaborate individual strategies on physical activity promotion [24].” (pp. 5-6, ll. 123-128).

Population: The intervention is going to be used in a rehabilitation context of patients with back pain. One component (face-to-face coaching) is applied during inpatient rehabilitation, the other two (phone calls, website) in aftercare. I miss in your introduction referrals to literature regarding the sustainability of rehabilitation measures in general but especially for back pain patients. I attached a literature list of some examples below.
Thank you very much for the list and pointing this out.

- We added “Exercise therapy is an integral part of musculoskeletal rehabilitation in low back pain patients [2] and recommended as a successful therapy [3]. However, evidence on sustainability is lacking [4] and implementing physical activity in daily routine after rehabilitation is a common problem [5]” (p. 3, ll. 57-60).

Methods

# To clarify a "why" question (" … gain understanding why the multicomponent intervention …..") qualitative study designs would even be more adequate than a short questionnaire. Please state, why you didn't use a qualitative or mixed-method approach.

◊ As we did a secondary analysis it was only possible to use the already existing data of the main study. As a qualitative approach would be adequate, we integrated this in our limitations.

- We added “Future research should also rely on qualitative methods, as these may offer the opportunity to carry out an in-depth exploration of unanticipated and complex issues [44]” (p. 13, ll. 309-311).

Moreover, we clarified the aim of the study and modified the title of the manuscript:

- We modified: “The aim of the present study was to analyse the usage and acceptance of a multicomponent, health coaching intervention, which aimed to improve physical activity of low back pain patients (Movement Coaching) [18,19], and thereby gain an understanding of why this intervention could not prove its effectiveness” (p. 4, ll. 79-82).

- We modified the title: “Health coaching for promoting physical activity in low back pain patients: A secondary analysis on the usage and acceptance”

- We also modified the aim of the study in the abstract.

# The description of the study population is rather rough - especially a description of the back pain and other health parameters are lacking (chronic, acute or relapsing back pain, severity of paint, with or without functional impairment, duration of the problem; comorbidities, esp. comorbidities that require adaptation of exercise programs such as osteoarthritis, chronic heart failure). A table with participants characteristics would be helpful.

◊ Thank you for your comment. We agree that adding more information about our sample would give other researchers the opportunity to compare data sets and studies. Therefore, we added a table with baseline characteristics of the sample. Please see below:

Table 1 Baseline characteristics of the sample

<table>
<thead>
<tr>
<th></th>
<th>mean (SD)</th>
<th>Age (years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender: men</td>
<td>n (%)</td>
<td>143 (71%)</td>
</tr>
<tr>
<td>Body mass index (kg/m²)</td>
<td>mean (SD)</td>
<td>28.9 (±5.3)</td>
</tr>
<tr>
<td>Highest level of education</td>
<td>n (%)</td>
<td>101 (50%)</td>
</tr>
<tr>
<td>“lower secondary school”</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Duration of low back pain</td>
<td>n (%)</td>
<td>168 (84%)</td>
</tr>
<tr>
<td>&gt; 12 months</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intensity of pain</td>
<td>mean (SD)</td>
<td>4.6 (±0.9)</td>
</tr>
<tr>
<td>during the last four weeks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(min.=1; max.=6)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

SD=standard deviation.
To avoid duplicating information in text and table, we deleted the following sentence “The participants were mainly men (n=143; 71%), had an average age of around 50 years (49.7 (±8.3)) a body mass index of 28.9 (±5.3) kg/m², and 50% (n=101) had a maximum of lower secondary school education” and added “Participant characteristics are presented in table 1” (p. 5, l. 115).

(We needed to change the numbering of the tables).

# Intervention: was the handling of the website explained during inpatient rehabilitation?
◊ Yes the handling of the web 2.0 online platform was explained during the inpatient rehabilitation but indeed we forgot to mention this.
- We added “..., which was explained during the inpatient rehabilitation” (p. 6, l. 138).

# Measures: please only refer to measures that will be presented in the results part. (GPAQ results are not reported).
◊ Thank you for your comment, which is in line with reviewer 1.
- Therefore, we deleted the sentence “To measure everyday physical activity the Global Physical Activity Questionnaire (GPAQ) was used [16].”

# Non-standardised questions: Please explain, why you didn't ask for an overall rating and the subjective benefit of the website? That would have made the ratings of the two components better comparable.
◊ Thank you for your question, which is very interesting. Unfortunately, we did not think of this in advance and, therefore, did not include this in our study.
- We added “Moreover, future trials should assess all components of an intervention to make them comparable to each other” (p. 13, ll. 310-311).

# Correct typo in Table 2, 2nd column, line 2
◊ Thank you for this advice. We corrected typo in Table 2.

# Statistical analysis: did you verify that the parameters for which you report means and SD are normally distributed? Otherwise please also give medians and percentiles. (Especially results for the COHEP Scales)
◊ Thank you. We modified the table and added the medians and percentiles.

<table>
<thead>
<tr>
<th>COHEP-Scale</th>
<th>n</th>
<th>mean (±SD)</th>
<th>Median [25%; 75%]-percentile</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Comprehension-fostering behaviour of program trainers</td>
<td>83</td>
<td>86.3 (±11.6)</td>
<td>86 [80;94]</td>
</tr>
<tr>
<td>2. Transferability to everyday life</td>
<td>85</td>
<td>79.4 (±11.5)</td>
<td>80 [73;88]</td>
</tr>
<tr>
<td>3. Comprehensibility of medical information</td>
<td>86</td>
<td>85.9 (±9.7)</td>
<td>86 [80;93]</td>
</tr>
<tr>
<td>4. Amount of information</td>
<td>84</td>
<td>88.2 (±24.6)</td>
<td>75 [60;85]</td>
</tr>
</tbody>
</table>
Results

# Table 4: is not quite clear - (n=111) in the telephone coaching 1 "Call duration" cell means 111 probands were reached? And it took 3.5 attempts on average to reach them? Or why is there no n= in the bottom cell?
- Furthermore I don't understand the footnote - is it supposed to explain the discrepancy with the text - where it says 113 participated in telephone coaching 1? Please make this easier to understand!
  ◊ We reached 113 participants, but have data about the call duration and call attempts of 111. With the footnote we explained that of two participants data is missing.
- Yes, it took 3.5 attempts on average to reach the participants.
- We added “(n=111) a” in table 5.
- We modified the footnote into “a = Different n due to missing data”
- In the text we added “113 (telephone coaching 1) and 99 (telephone coaching 2) participants were reached, but due to missing data not for all of them data about the call duration and call attempts exist” (p. 9, ll. 201-203).

# Table 5: The title of the table seems not correct - it is not really "acceptance" what is reported there is some kind of "usefulness rating". And please correct the Scale description for the upper part - according to table 2 the extremes of the Likert scale are "very good" and "very bad". No information should be in bold letters?
- We modified the title of the table into “Usefulness rating of the telephone coaching” and corrected the scale descriptions.

# Table 6: same problem with the title; and also the extremes of the Likert-Scale don't match table 3.
- ◊ We modified the title of the table into “Usefulness rating of the web-platform” and corrected the scale descriptions.

Discussion

# Please discuss your results against the results from rehabilitation research! The conclusion could also refer to the methodology for development and evaluation of complex interventions (Craig et al., see above).
- ◊ Thank you for your comment. We modified the conclusion and referred to the methodology for development and evaluation of complex interventions.
- We modified “Since the usage and acceptance could influence the effectiveness, utilisation and acceptance studies might help to explain the reason for non-effective lifestyle interventions. Therefore, more studies analysing the usage and acceptance are needed.” into “As usage and acceptance may influence effectiveness of complex interventions, utilisation and acceptance studies might help to explain the reason for non-effective lifestyle interventions. Therefore, more studies should include process evaluation to understand the discrepancy between observed and expected results. Furthermore, a feasibility and piloting stage is needed [12]” (p. 13, ll. 318-322).

We discussed our results against the results from rehabilitative research.
- We added “As not every approach is suitable for every patient, rehabilitation and aftercare programs need to be more individual. This is in line with Deck et al. (2015) [39], who summarized that a more flexible design of rehabilitation and aftercare is needed to improve patients’ benefit. Beside the individualization, it is important to focus on aftercare throughout the rehabilitation [49]” (p. 12, ll. 288-292).
# Some Literature concerning interventions to increase sustainability of rehabilitation interventions - just from one group and not meant to be complete!


◊ Thank you very much for the potential references.

This manuscript is not under consideration for publication elsewhere. All authors have approved the final version of this revised manuscript.
We are looking forward to your response.

Sincerely,
Lea A. L. Dejonghe