PEER REVIEW HISTORY

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ARTICLE DETAILS

TITLE (PROVISIONAL)	Evaluation of a web-based platform for osteoarthritis treatment – study protocol for a randomized clinical study
AUTHORS	Nero, Håkan; Ranstam, Jonas; Kiadaliri, Aliasghar; Dahlberg, Leif

VERSION 1 – REVIEW

REVIEWER	Kelli Allen University of North Carolina & Durham VA Medical Center, USA
REVIEW RETURNED	29-Mar-2018

GENERAL COMMENTS	This is a well written protocol paper describing an interesting study. I have the following suggestions for strengthening the manuscript: Abstract: - In the 2nd sentence, please clarify what is meant by "only around 20%...receive proper treatment." This is a pretty broad statement. - 2nd sentence of methods, consider replacing "standard treatment" with "BOA." - In the methods section, please briefly provide information on participant criteria (general), length of intervention and follow-up time points. - Why is a student's t-test used in addition to the mixed model? Strengths & limitations section: last bullet point, does this apply to clinicians other than physiotherapists, particularly in BOA? Same comment in other sections of the paper. Introduction - Same comment as above about 20% receiving appropriate treatment. Please clarify, and does this relate to how much BOA has been implemented? - Here or in the methods section, please describe why you decided to design this as a superiority trial. That is a pretty high bar, considering the BOA program is more intensive in some respects. Given that JA is less costly, it would still be a positive result if it is non-inferior to BOA. There will be a cost analysis, which will help to address this. But I think somewhere in the manuscript it would be helpful to provide the rationale for using a superiority hypothesis. Methods - Is there any minimum "threshold" for # of patients to recruit per site? - For patients assigned to JA, is there any initial or ongoing technical support provided, if needed? - Please briefly describe how patients will initially be identified. - Please clarify the reasoning for using initial assessments to "validate" baseline assessments. How and why this will be done is not clear. Also, how will this information be used to avoid misclassification bias and minimize risk of floor and ceiling effects? - Page 7, line 7- what does "additionally" mean here? Please clarify that the following criteria apply to all participants.

	- Please describe why the 30 CST was chosen as the primary outcome (vs. something pain-related). Also, please justify why the pain measure will only be analyzed if the primary outcome is significant? - It is noted that BOA may vary across sites, which is appropriate in a pragmatic trial. However, please describe how this variability may be evaluated or considered in the analyses phase. - Last paragraphs of both intervention sections seem to belong in the measures section since they describe assessment methods rather than intervention components. - Please describe a bit more about the Sustain aspect of the JA treatment.

REVIEWER	Jo Adams University of Southampton, UK
REVIEW RETURNED	14-May-2018

GENERAL COMMENTS	I have some suggestions for consideration Abstract: Currently this is rather complicated to follow and it is not yet clear what the key components are 1 The first sentence of the abstract currently lacks impact and can be made clearer for the readership to provide at the outset a clear rationale for your study. 2 The abstract can benefit from a further review to clarify and specify more precisely your research question, target patient population, intervention arms and analysis plan as currently these don't elucidate your trial fully. 3 The BOA is (we later learn from the introduction) focused on leg lengthening exercises but the abstract implies that the BOA is much wider than this – as it currently stands it is not clear why chair exercises might be the primary outcome. I suggest that this is clarified in the abstract early on to be specific and clear. Main text: 1. For your first paragraph stating specify statistics you need references to support these figures. 2. Also please can clarify what you mean by "proper treatment" as this is rather a catch all phrase 3. I have assumed that the "face to face programme" is the BOA but this is not yet explicit for a reader so a review of this section would be helpful 4. Please clarify early on which is the standardised treatment and which the experimental as this is not as clear as it could be from the offset. 5. Are you comparing the difference between baseline and 12 month F/U for number of sit to stand repetitions ? If so this can be included to add specific detail for the reader 6. In the strengths and limits section I understand why clinicians cannot be blind but can patients be blind to which intervention group is anticipated to be superior? Ie we don't yet know which is the most effective way to deliver your treatment ? 7. Appurtenant – is rather unusual can you chose a more simple term here ? 8. I suggest that the aim of the study is consistent throughout – either superiority or effectiveness 9. P5 line 46 – I am not clear about what is meant by one group of each treatment here so please can this sentence be reviewed 10. P5 line 50 you quite rightly mention that outcomes will be monitored but monitored for what ?

	11. You use sealed envelopes which may be criticised for potential bias – so it may be worth listing this as a limit of the study in the bullet points at the start. 12. P6 line 44 – possibly an alternative way to express “all pts will be asked to participate” is “all pts will be invited to participate” 13. P6 the screening assessment currently is a little confusing. It seems that you are using screening to validate baseline assessments and avoid risk of misclassification bias. Should your screening not be done to screen for eligible pts? 14. P7 – Usually null hypothesis are written that there is no difference – your statement is a little confusing (and you change this later on in the text) So I suggest just sticking from the outset with Ho = there is no difference. This I think will be more straightforward and consistent 15. Page 13 – to strengthen your approach for the online version it may be worth stating how the educational components have been developed utilising educational theory. 16. You state that pts will report knee pain – instead (as some wont) it may be preferable to state pts will be asked to report knee pain. 17. PPI section looks great – I suggest to help expression you change pts were thoroughly interviewed – to patients were interviewed in depth (very slight semantic change) 18. Change the word compliance (this means you tell people what to do and is a little outdated in health psychology approaches now) to adherence (which implies you are working in partnership. 19. In your dissemination routes are you going to plan to have any lay routes too so that pts get feedback on the trial ?

VERSION 1 – AUTHOR RESPONSE

Reviewer: 1
Reviewer Name: Kelli Allen
Institution and Country: University of North Carolina & Durham VA Medical Center, USA
Competing Interests: None

This is a well written protocol paper describing an interesting study. I have the following suggestions for strengthening the manuscript:

Abstract:
1 - In the 2nd sentence, please clarify what is meant by "only around 20%...receive proper treatment." This is a pretty broad statement.

Thanks to Reviewer 1 for helpful comments. In regard to the 2nd sentence in the Abstract, the sentence has been clarified (page 3).
New text: …only around 20% of people with knee or hip OA receive the primary treatment recommended by international guidelines (i.e. information, exercise, weight management).

2 - 2nd sentence of methods, consider replacing "standard treatment" with "BOA."
The sentence has been altered accordingly (page 3).
New text: A total of 270 participants with clinically diagnosed knee OA will be recruited at primary care centers and randomized to either standard treatment (BOA) for 3 months, or the experimental group (6-week online intervention program).

3 - In the methods section, please briefly provide information on participant criteria (general), length of intervention and follow-up time points.

Information has been added in the Method section, please see page 3.
New text: A randomized clinical trial will be performed, comparing regular face-to-face care according to BOA with the digital version, Joint Academy. A total of 270 participants with clinically diagnosed knee OA will be recruited at primary care centers and randomized to either standard treatment (BOA) for 3 months, or the experimental group (6-week online intervention program). Both groups will receive educational sessions and exercises yet with a difference in program deliverance. The objective of the study is to investigate the mean group difference in physical function from baseline to 12 months. The two treatment groups will be compared with respect to the number of repetitions of the 30-second chair stand test at 3, 6 and 12 months, using a mixed model repeated measures ANOVA.

4 - Why is a student's t-test used in addition to the mixed model?
The t-test is used in the sample size calculations whereas the mixed model is used for the main analysis in the study. We realize the confusion is due to the text in the Method section of the Abstract and have removed information regarding the t-test (page 3) and also clarified this on page 10 (Estimated sample size and power).
New text: Page 3: The two treatment groups will be compared with respect to the number of repetitions of the 30-second chair stand test at 3, 6 and 12 months, using a mixed model repeated measures ANOVA.
Page 10: For sample size calculation, the null hypothesis has been tested with a one-sided significance level of 0.025, equivalent to a two-sided significance level of 0.05, using Student's t-test, assuming that the number of repetitions has a Gaussian distribution.

5 Strengths & limitations section: last bullet point, does this apply to clinicians other than physiotherapists, particularly in BOA? Same comment in other sections of the paper.
In this study, physiotherapists will be the only clinicians in contact with participants, hence the choice of wording. Due to the organizational structure of the BOA program the physiotherapist meeting the patient for the first time and assessing them, is the same person distributing exercise in the BOA program as well as being a personal physiotherapist within JA for those randomized to this group. Since the recruitment for the study takes place during the first visit to the clinic (for pragmatical reasons) unfortunately this prevents blinding. However, the baseline assessment of function and pain is performed before randomization, therefore the physiotherapist is un-biased regarding patient treatment allocation at the start of the study.
Introduction

6 - Same comment as above about 20% receiving appropriate treatment. Please clarify, and does this relate to how much BOA has been implemented?
This has been clarified in the Introduction, please see page 6. The percentage is an estimate based on how many individuals seeking primary care with diagnosed hip or knee OA that have gone through the BOA program (also found in BOA yearly report 2014). It's hard to pin-point the exact cause for this but may be related to implementation of BOA in regard to how well clinicians other than physiotherapists or occupational therapists are aware of the benefits and availability of such treatment.
New text: However, despite the systematic and thorough work put into BOA and the BOA program, only around 20% of the Swedish OA population seeking primary care for OA enter the self-management program.

7 - Here or in the methods section, please describe why you decided to design this as a superiority trial. That is a pretty high bar, considering the BOA program is more intensive in some respects. Given that JA is less costly, it would still be a positive result if it is non-inferior to BOA. There will be a cost analysis, which will help to address this. But I think somewhere in the manuscript it would be helpful to provide the rationale for using a superiority hypothesis.

We started off with a non-inferiority design, yet after review of the study by the Swedish Research Council we changed this to a superiority trial. This decision was taken since there is no greater RCT available in which the primary analysis has evaluated the effects of the BOA program in comparison to some form of control on the basis of function and pain (the preliminary results mentioned in the Introduction are from a secondary analysis on a small cohort), hence these effects are unknown and it is necessary for us to use a superiority design. As long as the reporting of the initial plan is accurate, it is possible to test and report non-inferiority as a second step, if superiority is not achieved.
We've changed the text on page 7 to shortly explain this.
New text: Superiority is chosen over non-inferiority due to the lack of RCT's showing effects of the BOA program on pain and function, in comparison to a control group.

Methods

8 - Is there any minimum "threshold" for # of patients to recruit per site?
We have asked clinics to aim at recruiting a minimum of 26 participants, which is deemed possible based on their regular yearly influx. This has been clarified on page 8.
New text: Ten primary care centers around Sweden that are experienced in OA and use the face-to-face BOA program will participate and include a minimum of 26 patients each (13 patients per group).

9 - For patients assigned to JA, is there any initial or ongoing technical support provided, if needed?
Yes, patients have constant access to technical support through the regular channels offered at Joint Academy. We have added a comment about this in the manuscript on page 17.
New text: Should technical issues arise, the participant has constant access to the regular support channel offered at Joint Academy.

10 - Please briefly describe how patients will initially be identified
All patients being referred to the clinic (by a general practitioner, orthopedist or physiotherapist) or seeking care for OA, visiting the care center for a physiotherapist evaluation, and being eligible (fulfilling the inclusion criteria) will be asked to participate. We have clarified this on page 8.
New text: All patients being referred to the clinic or seeking care for OA, visiting the care center for a physiotherapist evaluation, and being eligible (fulfilling the inclusion criteria) will be invited to participate in the study to minimize selection bias.

11 - Please clarify the reasoning for using initial assessments to "validate" baseline assessments. How and why this will be done is not clear. Also, how will this information be used to avoid misclassification bias and minimize risk of floor and ceiling effects?
Thank you for pointing this out. This part of the manuscript has been up for debate within the group, and after reconsidering we feel it was unclearly described. The screening is primarily used to minimize the risk of floor and ceiling effects (to avoid recruiting those with extreme pain and function in either direction, which may affect the result) although there may be other beneficial effects. The text on page 9 has been altered accordingly.
New text: A pre-randomization screening will be performed in which patients will be asked to report their knee pain (Numerical Rating Scale (NRS) 0-10) as well as perform a 30-second chair stand test (30 CST) to minimize the risk of floor and ceiling effects.

12 - Page 7, line 7- what does "additionally" mean here? Please clarify that the following criteria apply to all participants.
That is correct, the following criteria apply to all. In retrospect we agree the sentence is confusing and it has now been removed. Small changes have been done to this part, please see page 9.
New text: A pre-randomization screening will be performed in which patients will be asked to report their knee pain (Numerical Rating Scale (NRS) 0-10) as well as perform a 30-second chair stand test (30 CST) to minimize the risk of floor and ceiling effects. All inclusion- and exclusion criteria are listed

below.

13 - Please describe why the 30 CST was chosen as the primary outcome (vs. something pain-related). Also, please justify why the pain measure will only be analyzed if the primary outcome is significant?
Our initial idea was to have pain as the primary outcome, but after discussions with clinicians and experts in the field we decided on physical function. According to our reasoning, pain has been commonly investigated as a primary outcome due to the nature of pharmacological studies and potential effects on pain, yet in rehabilitation medicine we feel function is a very important aspect of the disease. Unpublished observations and general consensus among physiotherapists in Sweden is that physical function, or the lack of it, is more important to patients than their pain. In fact, there are studies such as the one from Selten et al (see below) indicating that physical function is one of the most important factors when making a treatment decision for hip or knee OA. Also, a paper from Chan et al reported that most patients self-graded their OA severity higher than their corresponding pain score, which indicates that there are other factors of importance, such as physical function.
With reference to the question on analysis of pain, this is a strategy to handle multiplicity issues, please see the EMA reference below.
References:
Selten et al. Hierarchical structure and importance of patients' reasons for treatment choices in knee and hip osteoarthritis: a concept mapping study. Rheumatology, Volume 56, Issue 2, 1 February 2017, Pages 271–278.
Chan et al. A qualitative study on patients with knee osteoarthritis to evaluate the influence of different pain patterns on patients' quality of life and to find out patients' interpretation and coping strategies for the disease. Rheumatology Reports 2011; 3:e3. 2011.
EMA. Points to consider on multiplicity issues in clinical trials. European Medicines Agency, London, 19 September 2002, CPMP/EWP/908/99.

14 - It is noted that BOA may vary across sites, which is appropriate in a pragmatic trial. However, please describe how this variability may be evaluated or considered in the analyses phase.
The variability across sites will be evaluated according to ICH E9 Statistical principles for clinical trials (please see reference below). Accordingly, since these factors are not expected to have an important influence on the primary variable of interest, potential influence will be investigated after data collection.
Ref: European Medicines Agency, London, September 1998, CPMP/ICH/363/96) section 3.2 Multicentre Trials

15 - Last paragraphs of both intervention sections seem to belong in the measures section since they describe assessment methods rather than intervention components.
Thank you for pointing this out, they have now been moved to Outcome measures, please see page 15.
New / moved text:
Questionnaires
For measurements in the BOA program, questionnaires are distributed at baseline, 3 months (3 month-evaluation includes an individual physiotherapy visit at the clinic) and at 6 and 12 months. At 6 and 12 months, questionnaires are delivered by mail. Participants entering the JA program will complete web-based questionnaires (containing the measurements described previously) at baseline, after six weeks (according to standard protocol in JA), and at 3, 6 and 12 months. Additionally, JA participants will be asked to report their knee pain using an NRS scale weekly during the study period.

16 - Please describe a bit more about the Sustain aspect of the JA treatment.
We have added some text on the Sustain program, as per your request (page 17).

New text: In the Sustain program, exercises will be delivered a patient-specified number of times per week. Similar to the six-week program, a physiotherapist is constantly available via the chat function. Push-notifications will be delivered every day of scheduled exercise, reminding participants to enter JA, exercise and report their experience of each activity. As in the first part of the program, difficulty level of exercises can be altered by either patient or physiotherapist. New educational sessions on subjects related to OA as well as previous ones will be steadily available. Should technical issues arise, the participant has constant access to the regular support channel offered at Joint Academy.

Reviewer: 2
Reviewer Name: Jo Adams
Institution and Country: University of Southampton, UK
Competing Interests: None declared

Thank you for this interesting and timely protocol describing the web based delivery of an OA exercise programme by physiotherapists. This is a particularly timely protocol and will be interesting to the readership. Some of this impact is not yet fully realised and I recommend a full English language review to aid clarity and simplicity of message. At the moment there are some aspects that are difficult to understand. These will I am sure be improved by a further English language review.
Thank you for taking the time to read our manuscript and delivering valuable suggestions for improvement. Our manuscript has gone through language review already by a reviewer with English as her native language, but we will do our best to review it once more to further improve the writing.
I have some suggestions for consideration

Abstract: Currently this is rather complicated to follow and it is not yet clear what the key components are

1 The first sentence of the abstract currently lacks impact and can be made clearer for the readership to provide at the outset a clear rationale for your study.
We have added some text to the first sentence, please see the answer to the first question from Reviewer 1, and the changes in the manuscript on page 3.
New text: Despite favorable results from structured face-to-face treatment of osteoarthritis (OA) in Sweden through the Better management of OsteoArthritis (BOA) initiative, only around 20% of people with knee or hip OA receive the primary treatment recommended by international guidelines (i.e. information, exercise, weight management).

2 The abstract can benefit from a further review to clarify and specify more precisely your research question, target patient population, intervention arms and analysis plan as currently these don't elucidate your trial fully.
As previously noted by Reviewer 1 question nr 3 as well as in our response to this question, please see manuscript page nr 3.
New text: A randomized clinical trial will be performed, comparing regular face-to-face care according to BOA with the digital version, Joint Academy. A total of 270 participants with clinically diagnosed knee OA will be recruited at primary care centers and randomized to either standard treatment (BOA) for 3 months, or the experimental group (6-week online intervention program). Both groups will receive educational sessions and exercises yet with a difference in program deliverance. The objective of the trial is to evaluate the effectiveness of the online treatment program, in comparison with BOA. The two treatment groups will be compared with respect to the number of repetitions of the 30-second chair stand test at 3, 6 and 12 months, using a mixed model repeated measures ANOVA.

3 The BOA is (we later learn from the introduction) focused on leg lengthening exercises but the abstract implies that the BOA is much wider than this – as it currently stands it is not clear why chair

exercises might be the primary outcome. I suggest that this is clarified in the abstract early on to be specific and clear.
The Abstract has been changed and it has been clarified that the reference to the BOA program and statistics of it's reach is based on knee or hip OA. Our interest in physical function has also been explained. Please see Page 3.
New text:
Introduction
Despite favorable results from structured face-to-face treatment of osteoarthritis (OA) in Sweden through the Better management of OsteoArthritis (BOA) initiative, only around 20% of people with knee or hip OA receive the primary treatment recommended by international guidelines (i.e. information, exercise, weight management). In 2014, a digital treatment program named Joint Academy was introduced in Sweden, based on the same concept as the face-to-face BOA program. In line with BOA, Joint Academy follows national and international guidelines and best practice for OA treatment. Results from observational studies suggest that this digital treatment is a valuable alternative to the traditional treatment approach and can positively impact patients function and pain. However, conclusions from such studies commonly suggest that more rigorous testing is necessary to ascertain the benefits of digital treatment delivery for people with OA.
Methods and analysis
A randomized clinical trial will be performed, comparing regular face-to-face care according to BOA with the digital version, Joint Academy. A total of 270 participants with clinically diagnosed knee OA will be recruited at primary care centers and randomized to either standard treatment (BOA) for 3 months, or the experimental group (6-week online intervention program). Both groups will receive educational sessions and exercises yet with a difference in program deliverance. The objective of the trial is to evaluate the effectiveness of the online treatment program, in comparison with BOA. The two treatment groups will be compared with respect to the number of repetitions of the 30-second chair stand test at 3, 6 and 12 months, using a mixed model repeated measures ANOVA.

Main text:

1. For your first paragraph stating specify statistics you need references to support these figures.
We have moved superscript references to clarify from where numbers originate, please see page 6.

New text: To facilitate the implementation of evidence-based guidelines for osteoarthritis (OA) treatment1-4, the Swedish National quality register BOA (Better management of patients with OsteoArthritis) was established, with an OA self-management program including education and supervised exercise (the BOA program). The purpose of the BOA program is to provide patients with structured and relevant OA information and the opportunity to perform joint-strengthening exercises. The BOA program is clinic-based and provided at about 500 primary care centers3. The program varies slightly between regions, but in general it consists of three educational sessions and for most patients six weeks of individually adapted neuromuscular exercises. The program has been shown to be feasible in clinical practice; the intervention was rated as good or very good by 94% of the patients. After three months, 62% reported daily use of what they had learned and 91% reported weekly use5.

2. Also please can clarify what you mean by "proper treatment" as this is rather a catch all phrase
The text has been replaced, please see page 6.
New text: However, despite the systematic and thorough work put into BOA and the BOA program, only around 20% of the Swedish OA population seeking primary care for OA enter the self-management program7.

3. I have assumed that the "face to face programme" is the BOA but this is not yet explicit for a reader so a review of this section would be helpful
That is correct, and it has been clarified in the Abstract and in the Method (page 3 and 8)

New text: Page 3 - ….In 2014, a digital treatment program named Joint Academy was introduced in Sweden, based on the same concept as the face-to-face BOA program….
Page 8 - For patient recruitment, primary care centers around Sweden that are experienced in OA and currently offering the face-to-face BOA treatment to 70-100 patients per year, will be enrolled and recruit patients.

4. Please clarify early on which is the standardised treatment and which the experimental as this is not as clear as it could be from the offset.
Due to comments from Reviewer 1 above, this has been changed in the Abstract (page 3).
New text: A total of 270 participants with clinically diagnosed knee OA will be recruited at primary care centers and randomized to either standard treatment (BOA) for 3 months, or the experimental group (6-week online intervention program).

5. Are you comparing the difference between baseline and 12 month F/U for number of sit to stand repetitions ? If so this can be included to add specific detail for the reader
If Reviewer 2 is referring to that this information is missing in the Abstract, this has now been clarified (page 3). Otherwise, this is described in the Methods and Analysis – Outcome measures on page 13 ("The primary outcome is the change in number of repetitions of the 30 CST (continuous variable) from baseline to 12 months follow-up").
New text: Page 3 - . The objective of the trial is to evaluate the effectiveness of the online treatment program, in comparison with BOA. The two treatment groups will be compared with respect to the number of repetitions of the 30-second chair stand test at 3, 6 and 12 months, using a mixed model repeated measures ANOVA

6. In the strengths and limits section I understand why clinicians cannot be blind but can patients be blind to which intervention group is anticipated to be superior? Ie we don't yet know which is the most effective way to deliver your treatment ?
Excellent comment, in fact patients will be blinded regarding what treatment is anticipated to be superior. We've added this information on page 5.
New text: The nature of the two treatment modalities makes blinding difficult, although patients are blinded regarding what treatment is hypothesized to be superior

7. Appurtenant – is rather unusual can you chose a more simple term here ?
We have changed the wording, please see page 6.
New text: …However, despite the systematic and thorough work put into BOA and the BOA program, only…

8. I suggest that the aim of the study is consistent throughout – either superiority or effectiveness
We have changed the wording accordingly on page 3 and 7.
New text:
Page 3 - . The objective of the trial is to evaluate the effectiveness of the online treatment program, in comparison with BOA.
Page 7 - The objective of the trial is to evaluate the effectiveness of the online treatment program in comparison with BOA, primarily with reference to increased physical function.

9. P5 line 46 – I am not clear about what is meant by one group of each treatment here so please can this sentence be reviewed
The sentence has been revised, please see page 7-8.
New text: Ten primary care centers around Sweden that are experienced in OA and use the face-to-face BOA program will participate and include approximately 30 patients each (15 patients per group).

10. P5 line 50 you quite rightly mention that outcomes will be monitored but monitored for what ?
We are not sure if we fully understand the question but acknowledge that the use of “monitored” leaves questions unanswered. Hence the word has been removed, please see page 8.
New text: All outcome variables will be patient-reported at baseline, and at 3, 6 and 12 months after start, for both groups.

11. You use sealed envelopes which may be criticised for potential bias – so it may be worth listing this as a limit of the study in the bullet points at the start.
Although using sealed envelopes has its flaws, we have taken every measure available to us to ensure that the allocation will not be compromised. The randomization is made with random blocks of 4 or 6 evading the possibility of predicting the upcoming allocation and the clinician has never seen the randomization list and have, according to our belief after discussing the study with all involved physiotherapists, no reason to wish for one or the other outcomes. Adding on, the investigators are not involved in the delivery of envelopes to patients or has any contact with or control over which patients come to the clinic at what time, and the statistician can after randomization is completed ensure that the list, and thereby the order of allocation, was followed.

12. P6 line 44 – possibly an alternative way to express “all pts will be asked to participate” is “all pts will be invited to participate”
The wording has been changed accordingly (page 8-9)
New text: All patients being referred to the clinic or seeking care for OA, visiting the care center for a physiotherapist evaluation, and being eligible (fulfilling the inclusion criteria) will be invited to participate in the study to minimize selection bias.

13. P6 the screening assessment currently is a little confusing. It seems that you are using screening to validate baseline assessments and avoid risk of misclassification bias. Should your screening not be done to screen for eligible pts?
Please see Reviewer 1’s question nr 11 about this issue and our reply, text has been altered to make it clearer (page 9).
New text: A pre-randomization screening will be performed in which patients will be asked to report their knee pain (Numerical Rating Scale (NRS) 0-10) as well as perform a 30-second chair stand test (30 CST) to minimize the risk of floor and ceiling effects.

14. P7 – Usually null hypothesis are written that there is no difference – your statement is a little confusing (and you change this later on in the text) So I suggest just sticking from the outset with Ho = there is no difference. This I think will be more straightforward and consistent
We have changed some text on page 10, to make the information clearer.
New text: The null hypothesis is that there is no difference in the mean number of repetitions between the experimental treatment (web-based JA) and the standard treatment (the BOA program).

15. Page 13 – to strengthen your approach for the online version it may be worth stating how the educational components have been developed utilising educational theory.
The educational material in Joint Academy is based on the lectures within the BOA program, developed by professional care takers (physiotherapists and occupational therapists) trained by the Swedish Reumatology Association and BOA. After each session patients answer a quiz to confirm the take-home messages were delivered. We’ve added some text in regard to the educational material on page 17.
New text: Furthermore, participants watch short and engaging video sessions explaining how to live with OA. These videos are based on the educational material within the BOA program (developed by trained health professionals) and provide education regarding lifestyle changes. After each session, participants are given a quiz to confirm that the take-home message has been received.

16. You state that pts will report knee pain – instead (as some wont) it may be preferable to state pts will be asked to report knee pain.
As per your proposal, changes have been made on page 9, 14 and 15.

17. PPI section looks great – I suggest to help expression you change pts were thoroughly interviewed – to patients were interviewed in depth (very slight semantic change)
The text has been altered accordingly (page 18).
New text: These patients were able to test JA and were interviewed in depth about their opinions

18. Change the word compliance (this means you tell people what to do and is a little outdated in health psychology approaches now) to adherence (which implies you are working in partnership.
Compliance has been changed to adherence on page 16.
New text: Individuals in the JA group will undergo an interactive six-week program to treat their OA pain, followed by the Sustain program to enable maintained individual adherence with the necessary life style changes.

19. In your dissemination routes are you going to plan to have any lay routes too so that pts get feedback on the trial ?
All participants expressing interest before study start, during or after will receive information about the results from the study and the conclusions drawn. Information about this has been added on page 20.
New text: The results of the main trial and each of the secondary outcomes will be submitted for publication in peer-reviewed journals and will also be disseminated to participants expressing interest.