Author's response to reviews

Title: A prospective study of the impact of musculoskeletal pain and radiographic osteoarthritis on health related quality of life in community dwelling older people

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Version: 3 Date: 29 June 2012

Author's response to reviews: see over
Reviewer's report

Title: A prospective study of the impact of musculoskeletal pain and radiographic osteoarthritis on health related quality of life in community dwelling older people

Version: 2 Date: 16 February 2012

Reviewer: BårdNatvig

Reviewer's report:

This is in my opinion an interesting (sic) and well-written article. There are however some advanced statistics that I do not feel qualified to assess, so I would recommend that a statistician also review the article.

I do only have some minor comments and suggestions (discretionary revisions): page 3: n=1053 for "decline over 5 years" - not necessary information in the abstract.

This has been deleted.

Page 7: ...OARSI atlas (as previously described)....described where? The reference is to the atlas itself?

A reference to Foley et al 2006[1] has been added.

Page 8: same comment about "as previously described"...TTM Muscular Meter...

This reference is correct, we have changed the wording slightly.

Page 10: Participants: Why exclude persons "who did not have an MRI at Phase 1"? Isn’t it X-ray that is used in this study?

While X-ray and not MRI is used in the study described in this manuscript, these measures are drawn from the TASOAC study which includes a much larger collection of measures than those described here. One of the primary hypotheses of the TASOAC study was to assess progression of OA. MRI was required to assess this hypothesis, and therefore participants with no MRI scans at baseline were not invited back for Phase 2 of the TASOAC study. Therefore the following phrase was moved from the Results to the Methods section to clarify this: “Participants who did not have an MRI at Phase 1 (n= 105) were excluded from further participation in the study, as TasOAC aimed to measure progression of osteoarthritis.”

Page 10: Joint pain is used two times at the lower part of the page. I think anatomical sites used in figure 1 is a better term for what you study.

This has been changed to “Pain at the anatomical regions of interest”.

Page 12: Is it correct that p<0.001 for difference over time when all 95% CI overlap, even if you use mixed models? I am not a statistician, but this kind of results make me wonder.....so if it is correct you might consider to comment or explain for readers like me?

The means and CI’s came from summary statistics, but p values from the mixed models, which adjust for within-person correlation when the same people are observed multiple times over a period of time. I have inserted p values from the unadjusted data and added more information on the results of the mixed model analysis.

Level of interest: An article of importance in its field
Quality of written English: Acceptable
Statistical review: Yes, but I do not feel adequately qualified to assess the
Reviewer #1: BårdNatvig

statistics.

**Declaration of competing interests:**
I declare that I have no competing interests
Reviewer's report

Title: A prospective study of the impact of musculoskeletal pain and radiographic osteoarthritis on health related quality of life in community dwelling older people

Version: 2 Date: 21 February 2012
Reviewer: Shigeyuki Muraki

Reviewer's report:

Laslett and colleagues have used a prospective model to study osteoarthritis and pain at multiple sites and their impact on health-related quality of life in the elderly. This is an interesting paper, but a critical piece is missing because the authors have not described how they assessed self-reported OA and pain. These items are quite important and should be described in the manuscript. 

This is described in the manuscript (now on page 7, paragraph 2). We have elected to move it further to the top of the methods section and have rewritten it to make it clearer. All these questions are yes / no options, as indicated in the Methods.

Abstract

1. Background: There have been several papers on the association between pain and radiographic changes with QOL. Please describe the background of this manuscript clearly.
Several references have been added to the Introduction.

Introduction

1. Although baseline back, knee, and hip pain were associated with reduced QOL over 4 years of observation in a Chinese volunteer cohort, why did the authors examine these associations again in western populations? Please clarify.
This Chinese study (Woo et al[2]) included only pain of the back, neck, hips and knees, whereas we included an additional 3 sites. This study did not include questions on diagnosis of osteoarthritis (self-reported or from medical records) or radiographic measures, and therefore could not assess the role of diagnosed arthritis or radiographic measures of OA in quality of life outcomes.

Materials and Methods

1. Are there any references regarding TasOAC? If not, please describe the details.
There is no published cohort profile of TASOAC. More detail has been added in the methods.
The authors should also spell out TasOAC before using the abbreviation. This has been corrected.

2. Was the AQOL validated in Tasmanian men and women?
It was validated in Australian men and women

3. The authors used categorical methods to read osteophytes and joint space narrowing; thus, it may be better to use kappa methods rather than ICC to examine the repeatability.
Both ICC and kappa are acceptable for these ranked ordinal measures, as there are more than two groups in the original form of the measures (4 categories). ICC allows us to assess the degree of agreement, whereas kappa would not eg grade 2 and 3 are more closely related than 1 and 3. For this study, these measures were dichotomised.
4. Please describe more clearly how you assessed physician-diagnosed osteoarthritis, pain, and RA. This is very important. What are the questions regarding OA, pain, and RA?

These have been rewritten to make them clearer:

“Participants completed questionnaires (n=1099) which asked “Have you had been told by a doctor that you have osteoarthritis at any of these sites”, and “Do you experience pain at any of these sites?”. The seven anatomical sites were neck, back, hands, shoulders, hips, knees, and feet. Participants were given the choice between answering "yes" or "no". Participants were also asked “Have you been told by a doctor that you have rheumatoid arthritis?” (yes / no). Questions were asked about pain at Phase 1, 2 and 3; doctor diagnosed OA at Phase 1 and 2, and about doctor diagnosed RA at Phase 1.”

Are the questions validated?
Yes. This reference (March et al, 1998[3]) has been added to the manuscript (page 15, last paragraph).

Results
1. Participants: There was some description of MRI, but there was no description of this in the Methods. Please clarify.

We have not listed the methods as MRI is relevant only in the sense that it explains why 105 patients had measures at Phase 1 but not Phase 2. We do not use data from MR imaging in this manuscript.

2. What is the association between self-reported OA and radiographic OA at each site?

We only conducted radiographs at the hip and knee at Phase 1.

Hip JSN but not hip osteophytes are more common in persons reporting doctor-diagnosed hip OA; and both knee JSN and osteophytes are more common in persons reporting doctor-diagnosed knee OA. This is for the reviewer's interest and has not been published at this point in time.

3. Please show the standardized beta in Step 2 of Table 2, because the impact of variables on QOL can be compared using the standardized beta.

The purpose of standardised betas are to compare variables with different units of measurement. Since all variables in Step 2 of Table 2 are binary, the units are the same. Therefore we do not consider that using standardised beta will add anything to the interpretation of this data and have left the data as it is.

4. What statistical methods were used to determine the linear association between the number of pain sites and QOL? Please describe this clearly in the methods and results.

Baseline associations between number of sites of pain and QoL was assessed in the same way as all of the other baseline data – using linear regression. Likewise, longitudinal associations between of sites of pain and QoL was assessed using multilevel mixed-effects linear regression models. We have added the modelling method to the legend of Figure 1.

5. In Table 4, why did the authors not test the association between diagnosed OA and QOL after 5 years of observation?
Diagnosed OA was not asked in the Phase 3 questionnaire, as indicated in the footnote of Table 4.

Discussion

1. Page 14, line 2. The authors concluded that the back and shoulders were the most important factors in their analyses, but did not explain how they came to this conclusion. Please clarify.
   We have reworded this, it now reads “Pain in the shoulders and back were the most important factors in our analyses, but knees, hips and even hands and feet were significant”.
   This is based on the factors with the largest beta coefficients and hence strongest associations with total AQoL score, in Table 2 and Table 4.

2. Page 14, line 18. The reviewer agrees that pain is more strongly associated with QOL than radiographic findings, but several papers have shown that radiographic OA was also associated with QOL. Why were JSN and osteophyte at the knee and hip not associated with QOL at all in this paper? Please discuss this.
   We used a different outcome measure to those used by the two most comparable studies [4, 5]. We used a generic QoL tool, which assesses quality of life over 5 dimensions (Illness, independent living, physical senses, and psychological wellbeing - see Table 3). Norimatsu and colleagues [4] found that having knee OA (KL grade ≥2) was associated with quality of life, using a disease specific measure of OA (Japanese Knee Osteoarthritis Measure (JKOM)). The JKOM assesses pain and stiffness, activities of daily living, social activities, and general health condition. Muraki and colleagues [5] used the WOMAC as their outcome measure. Therefore, the simplest explanation is that JSN and osteophytes are associated with an aspect of a disease-specific QoL measure such as pain or stiffness which is not included in the AQoL. It is also possible that radiographic OA is a bystander in the process and may have differing associations with structural factors responsible for pain and thus QoL in different cohorts.

3. Page 15, lines 1–4; Mental distress is not only associated with mental health component of QOL but also with other components of QOL. In fact, it is well known that mental distress is associated with the presence or severity of pain. Thus, an analysis that excludes the mental health component cannot suggest that the limitation regarding the absence of information on psychological factors is not a major issue.
   We are aware that this is a limitation, and list it as a limitation in the Discussion section. We conducted sensitivity analyses on the findings (which we also mention in the Discussion), by omitting the Psychological Wellbeing subscale of the AQoL, on which we expected most of mental-health related factors to load. The results did not change appreciably, thus we concluded that the model was robust.
   We have edited the wording of the sentence to which the reviewer refers, deleting “is not a major issue” and replacing it with “does not invalidate our findings”.

Level of interest: An article whose findings are important to those with closely related research interests

Quality of written English: Acceptable

Statistical review: No, the manuscript does not need to be seen by a
statistician.  

**Declaration of competing interests:**  
'I declare that I have no competing interest
Reviewer #3: Svetlana Solovieva

Reviewer’s report
Title: A prospective study of the impact of musculoskeletal pain and radiographic osteoarthritis on health related quality of life in community dwelling older people
Version: 2 Date: 22 February 2012
Reviewer: Svetlana Solovieva

Reviewer’s report:
This is a very interesting study concerning the impact of osteoarthritis on quality of life. A longitudinal study design and availability of both radiographic changes at different body sites and self-reported symptoms allows for more sorrowful evaluation of the potential effect of OA on QoL. The manuscript is well written and could be accepted with revision.

Major Compulsory Revisions
I have only one concern related to the low response rate of baseline study (57%). Were any data available to compare participants and non-participants? The consequences of low participation rate should be properly discussed.

In the Discussion, we acknowledged that the initial response rate of the study is lower than desirable, but that this is similar to other comparable Australian studies. The TASOAC study population were randomly selected from the electoral roll, which is the most complete population listing available in Australia. There is no evidence of response bias in terms of smoking rates, so we contend it is reasonable to regard TASOAC as broadly representative of the population of Southern Tasmania.

A high response rate widely regarded as desirable because it reduces the likelihood of bias in the study analyses, but a low response rate does not necessarily bias outcomes, as very elegantly shown by Carter and colleagues[6]. For selection bias to occur, we would need to observe differential participation by the joint distribution of the exposure and the outcome (i.e. exposure and outcome are dependent predictors of participation). Population data is available for the AQL in the National Survey of Mental Health and Wellbeing, but the sample size for Tasmanian data was too small to make the age-stratified comparisons required to decide if TASOAC’s AQoL responses are representative of Tasmania.

To the sentence referred to above, we have added an extra sentence: "...and a lower response rate does not mean that relationships between outcome and exposure are necessarily biased.[24]

Level of interest: An article of importance in its field
Quality of written English: Acceptable
Statistical review: Yes, and I have assessed the statistics in my report.
Reviewer #4:

Reviewer's report
Title: A prospective study of the impact of musculoskeletal pain and radiographic osteoarthritis on health related quality of life in community dwelling older people
Version: 2 Date: 24 February 2012
Reviewer: Pekka Mäntyselkä

Reviewer's report:
This study aims to describe the association between osteoarthritis (OA) and quality of life (QoL) in a community dwelling population-based sample of older people with a five-year follow-up. Pain symptoms were. Diagnosed osteoarthritis was defined as self-reported OA at neck, back, hands, shoulders, hips, knees or feet. As well pain symptoms at these locations were asked. X-rays of hips and knees were taken at baseline radiological findings were scored. Assessment of Quality of Life (AQoL) questionnaire was used as a measurement of QoL. The data consist of 1098 men and women aged 50-80 years. Follow-up data for QoL were collected on average 2.6 years and 5 years later. The main findings were that pain is common and stable over time; pain is the strongest musculoskeletal correlate of QoL and mediates the association between diagnosed OA and QoL.

Major Compulsory revisions
At the first sight, the design and method seem to be valid in order to answer the study question. However, I feel confused with this study. There are different concepts and definitions. Self-reported physician diagnoses of different OA, radiological scoring of knee and hip OA and pain in joints (or back) with possible OA. Therefore I have several questions:
- The authors say that they did not seek to confirm doctor-diagnosed cases of osteoarthritis. Would this have been possible?

It would have been possible, but very difficult, as persons with OA have no characteristic markers in terms of medication use, medical specialists seen, or of imaging ordered to make it easier for us to check. Since site-specific JSN is more common in persons reporting doctor diagnosed hip and knee OA, and osteophytes more common in doctor-diagnosed knee OA, (see reviewer #2) this suggests that using self-reported doctor diagnosis is a reasonable proxy.

- Was there a discrepancy between self-reported and radiological OA of knee or hip? How many of those who reported having OA had also radiological OA and vice versa?

See response to reviewer #2

Hip JSN but not hip osteophytes are more common in persons reporting doctor-diagnosed hip OA; and both knee JSN and osteophytes are more common in persons reporting doctor-diagnosed knee OA.

- Participants who did not have an MRI at phase 1 were excluded. What was MRI for? It is written that TasOAC aimed to measure progression of OA. Why this data were not used in this study?

See response to reviewer #1.

- The authors state that pain is common over time. Did they measure pain at follow-up? In methods it is written that participants completed questionnaires about pain in baseline. In Table 4 (footnote) is written that “radiographs not included as they were only collected at phase 1”. But did participants report about pain and OA also at follow-up?
Reviewer #4:

Yes. Pain was asked about in each of Phases 1, 2 and 3 – specifically, pain as a yes or no response, in each of 7 anatomical regions. A sentence on this has been added to the Methods “Questions were asked about pain at Phase 1, 2 and 3; doctor diagnosed OA at Phase 1 and 2, and about doctor diagnosed RA at Phase 1.”

- WOMAC or other OA-specific questionnaires were not used in assessment of pain and function. Why?
  Presence of pain was asked at 7 different sites, and we had Phase 1 WOMAC data for knees only, we elected to omit the WOMAC for the sake of having similar scales of measurement for all sites.

The authors state that pain and radiographic changes are common in persons with osteoarthritis, but their relative contributions to quality of life are unknown. Radiographic changes are certainly common in OA because criteria of OA include radiological changes. As well pain is usually the first symptom of OA. In a study focusing on OA diagnosis based on self-report is questionable. Therefore I find it difficult to see what we are talking about. Are we talking about OA or something which is taught to be OA, or pain related to OA or pain regardless of OA. Therefore I find the base of this setting does not lie on the solid ground. Still, the conclusion of this study may be right although not surprising. For example a study from Japan has shown that subjects with symptomatic OA had significantly lower physical QoL than subjects without it (Muraki et al. 2010) Another study with a follow up suggested that “age, knee osteoarthritis, knee pain, comorbidity, and increasing chair stand time were independently related to the subsequent health-related quality of life” (Norimatsu et al 2011).

There does not appear to be a question in the paragraph above. However, we have added a paragraph in the Discussion, adding the findings of Norimatsu and colleagues:

“This differs from the findings of one study[4], who found that radiographic OA was associated cross-sectionally with a disease-specific measure of QoL, after adjustment for pain and other covariates. The strength of our study is that, unlike Norimatsu and colleagues, we have collected (self-reported) diagnosis of OA and radiographic findings separately (in addition to pain), and while finding them to be correlated, when both diagnosis and radiography appear together in one model, radiographic findings are no longer associated with QoL. Our data demonstrates that diagnosis of OA reflects more than radiographic evidence of joint damage, but that with the exception of diagnosed OA of the back, is not independent of pain.”

I conclude that - at the first sight - this study is well conducted and the findings are plausible although not very novel in general. Pain is related to worsening QoL more than radiological changes of OA, and multisite pain is even more strongly related to low QoL. However, after reading this paper properly, I found myself in a state of confusion. Self-reported OA could be assessed against radiological changes. QoL could be assessed in relation to more precisely defined OA and pain in general.

Level of interest: An article whose findings are important to those with closely related research interests

Quality of written English: Acceptable

Statistical review: Yes, but I do not feel adequately qualified to assess the statistics.
Reviewer #4:

**Declaration of competing interests:**
I declare that I have no competing interests

Reference List


