

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)	Guideline-based exercise management for hip and knee osteoarthritis: a cross-sectional comparison of healthcare professional and patient beliefs in Ireland.
AUTHORS	Toomey, Clodagh; Bhardwaj, Avantika; Browne, Jacqui; Dowling, Ian; Grealis, Stacey; Hayes, Peter; Higgins, Niall; Maguire, Darragh; O'Hora, John; Rector, Joseph; Wood-Thornsbury, Arianna; Kennedy, Norelee

VERSION 1 – REVIEW

REVIEWER	Nicolson, Philippa University of Oxford, Nuffield Department of Orthopaedics, Rheumatology and Musculoskeletal Sciences
REVIEW RETURNED	21-Nov-2023

GENERAL COMMENTS	<p>Thank you for the opportunity to review this manuscript which reports the findings of three cross-sectional surveys exploring differences in health professional and patient beliefs about guideline-based exercise management for hip and knee osteoarthritis.</p> <p>This is an interesting and important study, and I congratulate the authors on a well-written manuscript. I have made a small number of comments, primarily related to clarity.</p> <p>Title – indicates the study is focused only on differences in beliefs. Reading on, the Abstract results section first reports agreement on statements, indicating that both similarities and differences were a focus of the study rather than only differences?</p> <p>Strengths and Limitations Page 3, Line 14. 'influencers' should be 'influences' Line 15. Unsure why the authors have specifically identified people aged 70+ as likely to have different beliefs? I note that age was not entered into the models as a covariate so this does not seem to link to the findings.</p> <p>Page 5, Line 35. Following on from my comment regarding the title, the authors state the 'Primary objective was to identify differences in beliefs..' but the Abstract first reports similarities in beliefs rather than differences?</p> <p>Page 7, Lines 35-37. Statistical analysis. The authors state that 'statements were collapsed to a binary scale'. While this is commonly done it should come with justification. What was the reasoning behind grouping 'neither' with negative responses rather than keeping it separate?</p>
-------------------------	---

	<p>Page 7, Line 57. How did the authors decide which covariates to enter in each model?</p> <p>Figure 2 - very nicely presents the results for each level of the Likert scale (without dichotomising!)</p>
--	--

REVIEWER	Gwynne-Jones, David P. University of Otago, Orthopaedic Surgery
REVIEW RETURNED	30-Nov-2023

GENERAL COMMENTS	<p>This is a study embedded within a much larger study. The primary outcome of this study is to compare beliefs between GPs, physio and patients with OA. A secondary outcome was to compare the beliefs of patients who had been referred to a PT with those who had actually seen a PT. The main finding was that the beliefs of patients regarding exercise therapy were less positive than those of PT and GPs. The secondary outcome was that patients who attended PT had more positive exercise beliefs.</p> <p>I found the paper too long and confusing. Introduction needs shortening.</p> <p>The aim is to compare PwOA and health professionals (GP and PTs) yet the hypothesis is that PTs would have more positive beliefs than GPs and PWOA. The results and discussion refer to PWOA v GP and PT.</p> <p>The secondary hypothesis is that patients referred to PT from GP or had seen PT would have more positive beliefs</p> <p>Three separate surveys were administered with 9 common questions which were compared. Ideally these questions should have been identical but there was some variation. The questions are supposed to align with guidelines which have been developed based on EBM but some of them are in my view weak , ambiguous or rather general . A lot of additional information was also collected as part of the IMPACT study of which most was not included in this paper or used in the analysis. Some of this detail could be excluded from the methods as it is included in the supplementary files. It is not clear why the two secondary questions regarding referral to PT or attendance at PT were chosen for analysis amongst all the other questions collected.</p> <p>Results The response rate was very poor eg 5-8%. There were only 97 patients with OA who were not representative of the usual age groups seen. Give numbers as well as % for experiences of patients with OA. 47 48,5% had been referred or self referred. 49 (50.5%) had been given exercises of which 45 were by PT . Which of these patients were analysed as referred to PT (bit not seen ?) and which were seen by physio?</p> <p>I found fig 2 confusing and the results are either not used or have been summarised in table 2 which was used for the analysis. The GP and PT responses are relatively similar, with PTs for some reason less likely to agree that walking and swimming is safe for everyone, but more likely to recommend a trial of exercise prior to surgery. PwOA were statistically less likely to have positive responses but still had over 80% positive on 3 of the 6 . I think some of the questions chosen were rather vague.</p> <p>The section on predictors of relief is relatively weak . The numbers and make up of the PwOA used are not made clear and the other predictors are not analysed elsewhere. The section on sources of education is not really relevant to this paper.</p> <p>Discussion Too long, needs to be more focussed. Some is relevant but other parts more speculative. It may be relevant to the wider</p>
-------------------------	--

	<p>IMPACT study but is not strictly relevant to this shorter paper. GP vs PT results as per hypothesis not really discussed as both were very similar. Patients have less positive beliefs for questions c,f and h which are the only results of any real interest</p> <p>I am not convinced that the paper and findings are sufficiently new and compelling to justify publication as a separate paper rather than as part of the wider study.</p>
--	---

VERSION 1 – AUTHOR RESPONSE

Reviewer: 1

Dr. Philippa Nicolson, University of Oxford

Comments to the Author:

Thank you for the opportunity to review this manuscript which reports the findings of three cross-sectional surveys exploring differences in health professional and patient beliefs about guideline-based exercise management for hip and knee osteoarthritis.

This is an interesting and important study, and I congratulate the authors on a well-written manuscript. I have made a small number of comments, primarily related to clarity.

Response: Thank you for taking the time to review this manuscript and for your comments and suggestions. We hope this iteration provides clarity around the issues you have raised.

Title – indicates the study is focused only on differences in beliefs. Reading on, the Abstract results section first reports agreement on statements, indicating that both similarities and differences were a focus of the study rather than only differences?

Response: Thank you for the comment. There were differences in stakeholder beliefs for all bar one statement (Table 2 chi-square results) so we are mainly talking about differences rather than similarities here in the between-stakeholder analysis. However, your comment has highlighted that there may be confusion in the objectives / results so we have clarified this with the inclusion of “within-stakeholder agreement” (via consensus analysis) and “between-stakeholder differences” (chi-square analysis) throughout. The title has also now been changed to include “comparison” rather than differences, and the setting and design has also now been included.

List of changes made to improve clarity on objectives/results:

- Title: “Guideline-based exercise management for hip and knee osteoarthritis: a cross-sectional comparison of healthcare professional and patient beliefs in Ireland.”
- Abstract Objectives: To identify within-stakeholder agreement and between-stakeholder differences in beliefs regarding exercise for osteoarthritis among general practitioners (GPs), physiotherapists (PTs) and people with hip and knee osteoarthritis (PwOA). A secondary objective was to explore how referral patterns may influence beliefs.
- Abstract outcome measures: “Nine beliefs statements related to exercise effectiveness, safety and delivery were rated on a 5-point Likert scale and analysed for within-stakeholder consensus. Chi-square tests assessed differences in agreement between groups.”
- Abstract results: “Positive within-stakeholder consensus (>75% agreement) was reached for most statements (7/9 GPs, 6/9 PTs, 5/9 PwOA). However, beliefs of PwOA were significantly less positive compared to healthcare professionals for six statements”.
- Introduction: “The objective of this study was to identify within-stakeholder agreement and between-stakeholder differences in beliefs in relation to statements on exercise for management of hip and knee OA in PwOA, GPs and PTs.
- Main text results has subheadings introduced for within-stakeholder vs. between-stakeholder analysis.

Strengths and Limitations

Page 3, Line 14. ‘influencers’ should be ‘influences’

Response: Thank you – change made.

Line 15. Unsure why the authors have specifically identified people aged 70+ as likely to have different beliefs? I note that age was not entered into the models as a covariate so this does not seem to link to the findings.

Response: Since only online methods of recruitment were available at the time of survey administration, we expect that this may have biased our sample with respect to age. Only 6% of the OA sample recruited were age 70+ years. The wording has been changed now to make the limitation more general as below:

“Different results with respect to beliefs and influences may have been found if non-online recruitment methods were available (e.g. paper surveys in healthcare settings).

Page 5, Line 35. Following on from my comment regarding the title, the authors state the ‘Primary objective was to identify differences in beliefs.’ but the Abstract first reports similarities in beliefs rather than differences?

Response: As described above, we have stuck with “differences” for the primary objective since the chi-square analysis tests for differences.

We hope the changes made throughout will help to provide clarity around the analyses regarding within-stakeholder and between-stakeholder beliefs.

Page 7, Lines 35-37. Statistical analysis. The authors state that ‘statements were collapsed to a binary scale’. While this is commonly done it should come with justification. What was the reasoning behind grouping ‘neither’ with negative responses rather than keeping it separate?

Response: Thanks for the recommendation. The following rationale has been included in the statistical analysis:

““Neither” was included with negative beliefs since statements were deemed to align somewhat with best practice and anything short of agreement may be considered unsatisfactory knowledge translation or personal experience.”

Page 7, Line 57. How did the authors decide which covariates to enter in each model?

Response: Covariates were selected based on demographic and pain variables that were collected in the survey and that had been found to influence exercise or physical activity participation in previous literature. Age was also considered for inclusion but was omitted due to collinearity with duration of symptoms. The line has been changed to include references as follows:

“Based on correlates of physical activity for hip and knee OA from previous literature, the following covariates were included using an enter method in each model: sex[26], average pain rating (none/mild/moderate/severe)[26], pain duration (6 months-1 year /1-2 years /2-3 years /3-4 years /4+ years)[27] and number of comorbidities[26].”

Figure 2 - very nicely presents the results for each level of the Likert scale (without dichotomising!)

Reviewer: 2

Dr. David P. Gwynne-Jones, University of Otago

Comments to the Author:

This is a study embedded within a much larger study. The primary outcome of this study is to compare beliefs between GPs, physio and patients with OA. A secondary outcome was to compare the beliefs of patients who had been referred to a PT with those who had actually seen a PT. The main finding was that the beliefs of patients regarding exercise therapy were less positive than those

of PT and GPs. The secondary outcome was that patients who attended PT had more positive exercise beliefs.

I found the paper too long and confusing.

Response: Thank you for taking the time to review this manuscript and for your comments and suggestions. This study was the first step in a project aimed at understanding the context around poor implementation of exercises programmes for osteoarthritis in practice. The authors have taken all of your points, and that of other reviewers, into consideration and have edited throughout to improve clarity where this was lacking.

Introduction needs shortening.

Response: Although it was not clear which elements of the introduction were deemed excessive, the authors have now condensed 3 paragraphs within the introduction to make it shorter.

The aim is to compare PwOA and health professionals (GP and PTs) yet the hypothesis is that PTs would have more positive beliefs than GPs and PWOA. The results and discussion refer to PWOA v GP and PT.

The secondary hypothesis is that patients referred to PT from GP or had seen PT would have more positive beliefs

Response: Thank you for drawing our attention to this. We can see how the way the aim was written may cause some confusion. The aim is to compare across all three stakeholder groups, (as per chi-square 2x3 test of independence) and so the objective has now been re-written to omit "healthcare professionals" to make this clearer:

"The primary objective of this study was to identify within-stakeholder agreement and between-stakeholder differences in beliefs in relation to statements on exercise for management of hip and knee OA in PwOA, GPs and PTs."

Three separate surveys were administered with 9 common questions which were compared. Ideally these questions should have been identical but there was some variation.

Response: The questions chosen across all three surveys would ideally be identical. However, following review from stakeholders and PPI steering committee during the design and validation period, the questions were altered slightly to improve understanding for the patient stakeholder group.

The questions are supposed to align with guidelines which have been developed based on EBM but some of them are in my view weak, ambiguous or rather general.

Response: While some questions are very strongly associated with evidence-based guidelines, e.g. "Hip and knee problems can be improved by specific muscle strengthening exercises", others have more mixed evidence, e.g., group vs. individualised programming, and are likely dictated more by patient or healthcare professional preference and experience. The authors felt it was important to include these types of questions too to understand where implementation efforts or education should be focused. This has also been addressed in the discussion. The following change was made to the methods to include "best practice":

"The belief statements were intended to align with current evidence-based guidelines[1,2] and best practice for exercise and OA."

A lot of additional information was also collected as part of the IMPACT study of which most was not included in this paper or used in the analysis. Some of this detail could be excluded from the methods as it is included in the supplementary files.

Response: It is unclear to which detail in the methods you are referring to. The only part of the methods that refers to other collected data that was not used in the analysis is: "A final section related to barriers and enablers to exercise delivery, referral or uptake was included in each survey. Results

of that analysis are presented elsewhere.” Please let us know if the comment has not been understood.

It is not clear why the two secondary questions regarding referral to PT or attendance at PT were chosen for analysis amongst all the other questions collected.

Response: The overarching aim of this paper was to understand the relationship between different stakeholder beliefs, with the goal of being able to inform future interventions that may improve uptake of exercise programmes for osteoarthritis in healthcare settings and communities. These two questions regarding referral are rationalised in the introduction that explains how the attitudes and beliefs of healthcare professionals regarding exercise may be transferred to their patients. It was also hypothesised that PwOA who had received a physiotherapy referral from their GP, or who had seen a PT for their condition would have more positive beliefs about exercise compared to those who had not. This helps us to understand if a referral is enough to change health behaviours and beliefs.

Results The response rate was very poor eg 5-8%. There were only 97 patients with OA who were not representative of the usual age groups seen.

Response: We have acknowledged this in the limitations section and expect that we would have had a higher and more representative response if additional recruitment methods were available at the time. However, we were limited by COVID lockdown to online responses.

Give numbers as well as % for experiences of patients with OA.

Response: Thanks for the comment – change made as requested.

47 48,5% had been referred or self referred. 49 (50.5%) had been given exercises of which 45 were by PT . Which of these patients were analysed as referred to PT (bit not seen ?) and which were seen by physio?

Response: Thank you for the question and pointing out that this is unclear. The additional detail has now been added as follows:

“Of the 97 PwOA, 78.4% (n=76) had spoken to their GP regarding their joint pain, 63.9% (n=62) had an X-ray of their joint. 44.6% (n=43) had been referred to physiotherapy by their GP and 48.5% (n=47) had seen a physiotherapist for their joint (either through GP- or self-referral). Additionally, 50.5% (n=49) reported having been given specific exercises for their joint by any healthcare professional.”

I found fig 2 confusing and the results are either not used or have been summarised in table 2 which was used for the analysis.

Response: The authors feel it is important to display Likert responses in full without dichotomisation and thus have decided that figure 2 should remain.

The GP and PT responses are relatively similar, with PTs for some reason less likely to agree that walking and swimming is safe for everyone, but more likely to recommend a trial of exercise prior to surgery. PwOA were statistically less likely to have positive responses but still had over 80% positive on 3 of the 6 . I think some of the questions chosen were rather vague.

Response: This comment regarding question choice has already been addressed above.

The section on predictors of relief is relatively weak . The numbers and make up of the PwOA used are not made clear and the other predictors are not analysed elsewhere.

Response: The number of positive responses to each question has now been clarified in the results section: Experiences with Exercise for People with Osteoarthritis, as detailed above. The other predictors or covariates are included in Table 1.

The section on sources of education is not really relevant to this paper.

Response: The inclusion of healthcare professional sources of education section in this paper is deemed to be relevant in the broader understanding of beliefs about exercise for OA. If healthcare professionals do not use evidence-based sources for CPD / CME, then it is unlikely that evidence-based practices will be used.

Discussion Too long, needs to be more focussed. Some is relevant but other parts more speculative. It may be relevant to the wider IMPACT study but is not strictly relevant to this shorter paper. GP vs PT results as per hypothesis not really discussed as both were very similar. Patients have less positive beliefs for questions c,f and h which are the only results of any real interest
I am not convinced that the paper and findings are sufficiently new and compelling to justify publication as a separate paper rather than as part of the wider study.

Response: Thanks for your suggestions. The discussion has included sections for all of the study findings, including a comparison with previous literature and context on clinical implications that are relevant to global implementation efforts related to osteoarthritis management programmes. It is not clear which parts are considered speculative so perhaps more specific guidance can be offered here? The wider study includes many work packages with different study designs so it would not be appropriate to combine these different components for publication, particularly since there are many findings to present here.

VERSION 2 – REVIEW

REVIEWER	Nicolson, Philippa University of Oxford, Nuffield Department of Orthopaedics, Rheumatology and Musculoskeletal Sciences
REVIEW RETURNED	15-Feb-2024

GENERAL COMMENTS	Thanks to the authors for clearly and comprehensively responding to all of my comments. The manuscript reads well and I recommend it for acceptance in this revised form.
-------------------------	---

REVIEWER	Gwynne-Jones, David P. University of Otago, Orthopaedic Surgery
REVIEW RETURNED	22-Feb-2024

GENERAL COMMENTS	The revised manuscript is clearer but I still have a number of concerns. Objectives line 25 to 40 p 5 A bit confused 33-37 Has the hypothesis that PTs have more positive beliefs than GPs been answered in the paper? Line 30 and 37-40 Secondary objective and hypothesis regarding PT referral and beliefs in PWOA is repeated and could be clarified Secondary objective is worded differently in abstract and introduction
-------------------------	---

Results page 8 line 36 onward

I am still confused by PWOA and physio referral/attendance. Have those referred by a GP to physio actually been seen by a physio? Maybe a flow diagram would help clarify

97 patients

76 saw GP

62 had Xray

43 referred to physio by GP

47 seen by physio (is this 43 referred by GP and 4 self referred?)

How many were referred but failed to attend physio?

Additionally 49 had specific exercises for joint by health care professional (44 physio, orthopaedic surgeon 2, rheumatologist 1, GP 1 unknown 1) Do these include the same 47 patients seen by physio in which case 3 patients seeing physio did not receive exercise advice or had advice from other professionals as well? Did the other Drs give exercise advice without physio referral?

Or were these 49 in addition to the 43 referred by GP which would mean that 92 patients had some exercise advice?

This is important because 2 different questions were used in models 1 and 2 with conflicting results

Has your GP referred you to a physio? model 1

Have you seen a physio? model 2

If the same 43 patients referred by GP make up the majority of the 47 patients seen by a physio there should be minimal difference in the groups.

In the 2 models male and comorbidities had significant negative associations. Seeing a physio had a positive association in model 2 but referral to a physio had no association. Is this because they didn't actually attend?

In discussion you imply that referral to physio by GP is an intervention that may influence their beliefs regardless of whether they attended.

Which statements are felt to align with evidence based guidelines and which for best practice for exercise and OA? I note in captions to fig 2 and 3 that a-d are relating to effectiveness, while e- l are on safety and delivery. When comparing with the historical literature it is important that the same wording is used.

In conclusions the authors highlight that all stakeholders disagree with the statement d regarding severe pain. This is a poorly worded statement that I cannot agree with. A statement such as exercise can be equally effective regardless of the severity of the pain would have been better in my view.

Statement c would have an improved response if it stated exercise can be effective if Xray shows severe OA.

I note that convenience sampling of the surveys was done but perhaps a larger sample should have been used.

Discussion

Line page 12 line 22 refs 28-30 are only related to knee OA. No distinction has been made between hip and knee OA throughout the paper. I think that the literature suggests that patients with knee OA are more likely to improve with an exercise programme than those with hip OA. The authors should at least discuss this or include hip v knee in their predictive model.

P12 line 28 No evidence presented to show that "Some of the beliefs in this study are reflective of the traditional view etc" Suggest adding may be reflective

P12 line 43 You compare a study of older adults with knee pain with the current study of younger with both hip and knee pain. Suggest highlighting this difference eg compare age.

	<p>Page 13 para 1 While pwoa had significantly less positive beliefs than GPs and physios for 6 of the 9 statements the effect size was small for 4 . In fact pwoa had more positive beliefs for statement e than physios and equal to GPs for g. I think this should be emphasised for positively to give balance to the paper. The discussion of the 2 statements where the effect size was greater is reasonable . However the difference in wording of statement h is likely to be highly significant . The patients cannot agree with statements h and I as they both ask about the best way to learn about exercise</p> <p>Page 14 line 9 43 of 76 (62%) of patients who saw GP were referred to physio. Not great but better than saying less than 50% had been referred and then discussing negative or dismissive attitudes. A GP can't refer if the patient hasn't presented to them.</p> <p>P15 line 5 Most PWOA were in the 50-59 bracket with moderate joint pain. This is not correct. Only 31% were in this age bracket and it is not clear which of these had moderate joint pain (50% overall so maybe 15% of the whole cohort!). Possibly include a mean or median age in table 1 which can better allow comparison with other studies The reasons for the non representative sample are discussed in limitations but the conclusions should reflect that the pwoa are a younger, probably milder group excluding anyone with previous joint replacement surgery and therefore may not be generalisable to older patients with more severe disease.</p> <p>Line 33 Education sources are not included in the aims of this study but included in results and discussion. They may be relevant but could be better introduced.</p> <p>Conclusion suggest replacing health care professionals with GPs and physios. You have no data to suggest other professionals such as orthopaedic surgeons , rheumatologists etc have changed over recent years</p> <p>The conclusion in the first 2 sentences of the abstract is a fairer reflection of the message of the paper than the conclusion in the main manuscript. While there are differences between beliefs between pwoa and physios/GPs they are not enormous and generally positive towards exercise.</p>
--	--

VERSION 2 – AUTHOR RESPONSE

Reviewer: 1

Dr. Philippa Nicolson, University of Oxford

Comments to the Author:

Thanks to the authors for clearly and comprehensively responding to all of my comments. The manuscript reads well and I recommend it for acceptance in this revised form.

Reviewer: 2

Dr. David P. Gwynne-Jones, University of Otago

Comments to the Author:

The revised manuscript is clearer but I still have a number of concerns.

Reviewer	Response from	Revision citation
----------	---------------	-------------------

Comment	Authors	
<p>Obectives line 25 to 40 p 5 A bit confused 33-37 Has the hypothesis that PTs have more postiiive beliefs than GPs been answered in the paper?</p>	<p>Thanks for your comment. The authors have now been more explicit in the discussion of this hypothesis and finding.</p>	<p>New paragraph to discussion:</p> <p><i>“Physiotherapists are primary care providers of therapeutic exercise for people with OA and other chronic conditions. It was therefore hypothesised that PTs would have more positive beliefs regarding exercise compared to GPs. However, this was not shown to be the case based on findings in this study. PTs were significantly more positive regarding statement (g): Every patient with hip or knee OA should try exercise treatment before surgery is considered. However, more GPs responded positively to statement (e): General exercise e.g., walking and swimming is safe for everybody to do, and overall, there was a positive consensus on more statements amongst GPs (7/9) compared to PTs (6/9). These findings are somewhat at odds to the review by Nissen et al (including studies published from 2006-2019), which identified a certain lack of knowledge about the role of physical activity, exercise and physiotherapy in OA management amongst some GPs and PTs[20]. It suggests that the main barriers to implementation of exercise may not be entirely related to lack of updated knowledge or beliefs of the healthcare professionals.”</i></p>
<p>Line 30 and 37-40 Secondary objective and hypothesis regarding PT referral and beliefs in PWOA is repeated and could be clarified</p>	<p>The authors cannot see where the secondary objective and hypothesis have been repeated. These were included upon reviewer request from last revision.</p>	<p>n/a</p>
<p>Secondary objective is worded differently in abstract and introduction</p>	<p>We are restricted by abstract word limit so cannot include more detail on the secondary objective. However, we have changed the wording to align – i.e., changed “influenced by” to the “association between”.</p>	<p>Abstract</p> <p>“A secondary objective was to explore the association between referral patterns and beliefs of PwOA”</p>
<p>Results page</p>	<p>There is now a</p>	<p>Addition of Figure 1:</p>

<p>8line 36 onward I am still confused by PWOA and physio referral/attendance . Have those referred by a GP to physio actually been seen by a physio? Maybe a flow diagram would help clarify 97 patients 76 saw GP 62 had Xray 43 referred to physio by GP 47 seen by physio (is this 43 referred by GP and 4 self referred?) How many were referred but failed to attend physio?</p>	<p>flow diagram (Figure 1) to clear up any misunderstandings PwOA referral or attendance at physiotherapy. Please note there was a coding error and the correct number of individuals referred to physio was 37, not 43. This has not altered the findings and message of the paper. The updated regression is also presented below.</p> <p>Of the 37 referred to physiotherapy, 5 did not attend because they were still on a waitlist. The 47 who did attend physio were the 32 referred by their GP plus 15 who self-referred privately.</p>	<pre> graph TD A[97 people with Osteoarthritis] --> B[76 78% spoke with GP] B --> C[62 64% had an X-ray] C --> D[44/76 58% referred to consultant 38 attended 6 on waitlist] C --> E[37/75 49% referred to physiotherapist 32 attended 5 on waitlist 1 not answered] C --> F[47/96 49% attended physiotherapy 32 referred / attended 15 private self-referral 1 not answered] D --> G[49/97 51% received exercise advice by HCP 44 by physiotherapist 2 by orthopaedic surgeon 1 by rheumatologist 2 by GP] E --> G F --> G </pre>
<p>Additionally 49 had specific exercises for joint by health care professional (44 physio, orthopaedic surgeon 2, rheumatologist 1, GP 1 unknown1) Do these include the same 47 patients seen by physio in which case 3 patients seeing physio did not receive exercise advice or</p>	<p>See flow diagram and information presented above.</p> <p>There were 3 people with OA who reported having been to a physio but not receiving exercise advice. Additionally, some people were not referred to physio but were given exercise advice from another</p>	<p>As above.</p>

<p>had advice from other professionals as well? Did the other Drs give exercise advice without physio referral?</p> <p>Or were these 49 in addition to the 43 referred by GP which would mean that 92 patients had some exercise advice?</p> <p>This is important because 2 different questions were used in models 1 and 2 with conflicting results</p> <p>Has your GP referred you to a physio? model 1</p> <p>Have you seen a physio? model 2</p> <p>If the same 43 patients referred by GP make up the majority of the 47 patients seen by a physio there should be minimal difference in the groups</p>	<p>HCP.</p>	
<p>In the 2 models male and comorbidities had significant negative associations . Seeing a physio had a positive association in model 2 but referral to a physio had no association. Is this because they didn't actually attend?</p>	<p>Correct – the main difference between the models is the addition of people who self-referred to physio and the removal of people who were waiting to see a physio.</p>	<p>n/a</p>
<p>In discussion you</p>	<p>Statements (a),</p>	<p>n/a</p>

<p>imply that referral to physio by GP is an intervention that may influence their beliefs regardless of whether they attended.</p> <p>Which statements are felt to align with evidence based guidelines and which for best practice for exercise and OA?</p>	<p>(b), (c), (d),(g) and (i) are concordant with guidelines or based on best available evidence. Statements (e) and (f) regarding safety of exercise are general recommendations but would need to be tailored to the individual so could be open to interpretation as used in this survey. Statement (h) is related to the evidence surrounding the benefits of social support in exercise interventions but, as of now, are not part of clinical guidelines but rather, best practice.</p>	
<p>I note in captions to fig 2 and 3 that a-d are relating to effectiveness, while e- I are on safety and delivery . When comparing with the historical literature it is important that the same wording is used.</p>	<p>Thanks for your suggestion. The historical literature has used a variety of wording to describe beliefs including effectiveness, benefits, delivery etc. The authors do not believe that changing any headings will add value at this time.</p>	
<p>In conclusions the authors highlight that all stakeholders disagree with the statement d</p>	<p>Thank you for your comment. Statement (d) was: "Exercise works just as well for everybody,</p>	<p>n/a</p>

<p>regarding severe pain. This is a poorly worded statement that I cannot agree with. A statement such as exercise can be equally effective regardless of the severity of the pain would have been better in my view.</p>	<p>regardless of the amount of pain they have". This statement was included, using the same wording as Holden et al (2012) and Cottrell et al (2017). Nonetheless, great consideration was given to make sure it would be understood across all stakeholder groups and it was reviewed by the PPI panel. We will certainly take your suggestions into consideration in future.</p>	
<p>Statement c would have an improved response if it stated exercise can be effective if Xray shows severe OA.</p>	<p>As above, it would be interesting to see if changing "is effective" to "can be effective" would have altered our results. We will take this into consideration and discuss with our wider panel in future.</p>	<p>n/a</p>
<p>I note that convenience sampling of the surveys was done but perhaps a larger sample should have been used.</p>	<p>A larger sample size for people with OA was expected for this survey but COVID 19 was a major barrier in terms of our recruitment methods, restricting us to online recruitment only.</p>	<p>n/a</p>

<p>Discussion Line page 12 line 22 refs 28-30 are only related to knee OA . No distinction has been made between hip and knee OA throughout the paper. I think that the literature suggests that patients with knee OA are more likely to improve with an exercise programme than those with hip OA. The authors should at least discuss this or include hip v knee in their predictive model.</p>	<p>Thank you for this observation. The literature is certainly more prevalent regarding benefits of exercise for knee OA. Nonetheless, guidelines for management of hip and knee OA are often presented together (e.g. NICE guidelines) and over 90% reported multi-site pain. With a larger sample size, the authors would have included an analysis by joint type. There were almost an even number of participants reporting knee pain as hip pain.</p> <p>Reference 30 does indeed include both hip and knee OA and is a very large analysis. This has been highlighted.</p>	<p>Discussion: “Evidence suggests that the pain-relieving qualities of exercise are effective for even moderate to severe OA disease[27–29], and a more recent meta-analysis for hip and knee OA has shown that individuals with higher pain severity at baseline benefit more from therapeutic exercise than those with lower pain[30].”</p>
<p>P12 line 28 No evidence presented to show that “Some of the beliefs in this study are reflective of the traditional view etc” Suggest adding may be reflective</p>	<p>Thanks for the comment. The preceding paragraphs to this statement show the evidence of a traditional view regarding x-rays and severity dictating treatment choice. Evidence of how this has been described elsewhere is also</p>	

	referenced (Darlow et al, Nissen et al).	
P12 line 43 You compare a study of older adults with knee pain with the current study of younger with both hip and knee pain. Suggest highlighting this difference eg compare age.	Thanks for the suggestion regarding highlighting this difference.	Discussion: “This may be reflective of the younger age and inclusion of hip and knee pain in the current study.”
Page 13 para 1 While pwoa had significantly less positive beliefs than GPs and physios for 6 of the 9 statements the effect size was small for 4 . In factpwoa had more positive beliefs for statement e than physios and equal to GPs for g. I think this should be emphasised for positively to give balance to the paper. The discussion of the 2 statements where the effect size was greater is reasonable . However the difference in wording of statement h is likely to be highly significant . The patients cannot agree with statements h and I as they both ask about the best way to learn about	The authors agree and have now emphasised the finding where PwOA have more positive beliefs than PTs regarding general exercise in the discussion. Regarding statement (g), this finding was not statistically different so it was not emphasised. The authors do not necessarily agree with the comment related to the difference between statement h and i. It is reasonable to agree (or disagree) with both statements given it is possible to have a supervised group exercise programme (h) that is also individualised (i). There are many examples of such	Discussion: “Beliefs of PwOA about exercise were significantly less positive compared to healthcare professional beliefs for 6/9 statements, even though significantly more PwOA believed that general exercises are safe for everybody to do, compared to PTs. The greatest differences were observed for statements in relation to the benefits of strengthening exercises and group-based exercise but effect sizes were small to medium overall.”

<p>exercise</p>	<p>programmes in the community that offer all of these components.</p>	
<p>Page 14 line 9 43 of 76 (62%) of patients who saw GP were referred to physio. Not great but better than saying less than 50% had been referred and then discussing negative or dismissive attitudes. A GP can't refer if the patient hasn't presented to them.</p>	<p>As discussed above, the figure referred was 37. Proportionally, the figure referred to PT who presented to the GP was still less than 50%.</p> <p>This figure is discussed negatively given the higher proportion of patients who were referred for orthopaedic consultation.</p>	<p>Discussion:</p> <p>“In the current study, 78% of PwOA had spoken to their GP about their joint pain, while under 50% of these people had been referred to a PT. Despite OA being amongst the leading causes of years lived with disability[40], the decision to seek care can be deterred by negative or dismissive attitudes from healthcare professionals about their non-urgent condition, or the perception that pain is part of ageing[41]. Healthcare professionals should take care regarding attitudes and language use during consultations[42] to help promote the effectiveness of first-line treatment strategies. Additionally, decisions regarding treatment timing may require additional educational strategies given clinical guidelines support surgical intervention as the last resort[1,2]. In this study more PwOA were referred to an orthopaedic consultant (58%) rather than PT (49%).</p>
<p>P15 line 5 Most PwOA were in the 50-59 bracket with moderate joint pain. This is not correct. Only 31% were in this age bracket and it is not clear which of these had moderate joint pain (50% overall so maybe 15% of the whole cohort!). Possibly include a mean or median age in table 1 which can better allow comparison with other studies</p>	<p>Thanks for pointing this out. Given the nature of the survey with multiple choice selection, we do not have mean/median values to provide.</p>	<p>Discussion:</p> <p>“The highest proportion (31%) of PwOA in this study were in the 50–59-year age category and 50% reported moderate joint pain.”</p>
<p>The reasons for the non representative sample are discussed in limitations but the conclusions should</p>	<p>Thank you for your suggestion.</p>	<p>Conclusion:</p> <p>“This sample included PwOA who did not have a previous joint replacement surgery and may therefore not be generalisable to an older sample with more severe disease. Knowledge translation activities should be aimed at increasing knowledge and improving access to first-line</p>

<p>reflect that the pwoa are a younger, probably milder group excluding anyone with previous joint replacement surgery and therefore may not be generalisable to older patients with more severe disease.</p>		<p>evidence-based exercise therapies, using stakeholder co-design to provide context on barriers and facilitators.”</p>
<p>Line 33 Education sources are not included in the aims of this study but included in results and discussion. They may be relevant but could be better introduced.</p>	<p>Thank you. A line to include this exploratory aim is now included.</p>	<p>Introduction: “Finally, an exploration of common sources of education for GPs and PTs was included to understand how beliefs regarding evidence are influenced.”</p>
<p>Conclusion suggest replacing health care professionals with GPs and physios. You have no data to suggest other professionals such as orthopaedic surgeons , rheumatologists etc have changed over recent years</p>	<p>Thank you. Change made.</p>	<p>Conclusion: “Beliefs of healthcare GPs, PTs and PwOA regarding exercise as a treatment for hip and knee OA have likely become more positive in recent years.”</p>
<p>The conclusion in the first 2 sentences of the abstract is a fairer reflection of the message of the paper than the conclusion in the main manuscript. While there are differences between beliefs between pwoa and</p>	<p>The authors believe the conclusion in the main manuscript is also reflective of this positivity given the sentence: “Beliefs of healthcare GPs, PTs and PwOA regarding exercise as a treatment for hip</p>	<p>n/a</p>

physios/GPs they are not enormous and generally positive towards exercise.	and knee OA have likely become more positive in recent years.”	
--	--	--

VERSION 3 – REVIEW

REVIEWER	Gwynne-Jones, David P. University of Otago, Orthopaedic Surgery
REVIEW RETURNED	08-May-2024

GENERAL COMMENTS	<p>The changes made improve the paper and give better clarity, balance and focus. The flow diagram helps clarify the referral patterns. Should it be 37/76 referred to physio not 37/75?</p> <p>The coding error and resultant inaccuracy in the earlier versions does raise some concerns about the data handling. It is disappointing that it was not spotted after questions were raised in the initial review. The statistical analysis for model 1 has changed a lot which was not mentioned in the response, but I agree does not affect the message of the paper. It is still not clear to me why the authors hypothesised that referral to a physio without actually been seen would influence PWOA beliefs.</p> <p>The limitations of the study design, low numbers, questions used and their wording remain and cannot be improved.</p> <p>Ultimately I think it is up to the Editor to decide whether the paper is of sufficient interest and quality for publication in BMJ Open.</p>
-------------------------	---

VERSION 3 – AUTHOR RESPONSE

Reviewer: 2

Dr. David P. Gwynne-Jones, University of Otago

Comments to the Author:

The changes made improve the paper and give better clarity, balance and focus.

Reviewer Comment	Response from Authors	Revision citation
The flow diagram helps clarify the referral patterns. Should it be 37/76 referred to physio not 37/75?	The total number 75 is correct as there was one non-response to this question, as described already in the flow diagram.	N/A
The coding error and resultant inaccuracy in the earlier versions	We can assure you that the coding error was a once-off and the data has now been triple	N/A

<p>does raise some concerns about the data handling. It is disappointing that it was not spotted after questions were raised in the initial review. The statistical analysis for model 1 has changed a lot which was not mentioned in the response, but I agree does not affect the message of the paper.</p>	<p>checked to ensure accuracy.</p> <p>The same statistical approach was taken for model 1 as originally described.</p>	
<p>It is still not clear to me why the authors hypothesised that referral to a physio without actually been seen would influence PWOA beliefs.</p>	<p>We believe the rationale for this hypothesis is provided by the statement in the introduction reading “Healthcare professionals’ perceptions and beliefs will affect the advice and management they offer patients, and researchers have suggested that those with biomedical or biomechanical beliefs about OA may transfer these beliefs to their patients, thus affecting their treatment choices[13,14]” and “The language used by healthcare professionals, especially GPs, can have a profound influence on patients’ beliefs”. Therefore, if a referring GP speaks positively about exercise by referring a patient to physiotherapy, these attitudes and beliefs may naturally be transferred to the patient, whereby they may believe a conservative approach is best.</p>	<p>N/A</p>
<p>The limitations of the study design, low numbers, questions used and their wording remain and cannot be improved.</p>	<p>The authors have been clear about limitations of cross sectional questionnaires but it remains the optimal approach to reach a larger audience for the purpose of these research questions. It has been an extremely valuable endeavour for establishing preliminary evidence on how prior experiences with healthcare services or referral pathways may influence patient beliefs. Since implementation of evidence-based management programmes for osteoarthritis is a critical area of need across countries and healthcare settings, understanding these relationships is a key step, and we believe, worthy of publication. Thank you.</p>	<p>N/A</p>