Author's response to reviews

Title: Implementation of secondary fracture prevention services after hip fracture: a qualitative study using extended Normalization Process Theory

Authors:

Sarah Drew (sarah.drew@ndorms.ox.ac.uk)
Andrew Judge (andrew.judge@ndorms.ox.ac.uk)
Carl May (c.r.may@soton.ac.uk)
Andrew Farmer (andrew.farmer@phc.ox.ac.uk)
Cyrus Cooper (cc@mrc.soton.ac.uk)
Kassim Javaid (kassim.javaid@ndorms.ox.ac.uk)
Rachael Gooberman-Hill (R.Gooberman-Hill@bristol.ac.uk)

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Author's response to reviews: see over
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Title: Implementation of secondary fracture prevention services after hip fracture: a qualitative study using extended Normalization Process Theory

Authors:

Sarah Drew¹, Qualitative Research Associate
Andrew Judge¹,², Senior Statistician and Associate Professor
Carl May³, Professor of Healthcare Innovation
Andrew Farmer⁴, Professor of General Practice
Cyrus Cooper¹,², Director and Professor of Rheumatology
M Kassim Javaid¹,², Lecturer in Metabolic Bone Disease
Rachael Gooberman-Hill⁵, Reader in Applied Health Research
And The REFReSH study group

¹ Oxford NIHR Musculoskeletal Biomedical Research Unit, Nuffield Department of Orthopaedics, Rheumatology and Musculoskeletal Sciences, University of Oxford
² MRC Lifecourse Epidemiology Unit, University of Southampton
³ Faculty of Health Sciences, University of Southampton
⁴ Nuffield Department of Primary Care Health Sciences
⁵ School of Clinical Sciences, University of Bristol

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Author's response to reviews: see over
Dear Editor,

We thank the reviewers for their thoughtful reviews for this manuscript. We are grateful for their helpful comments and suggestions. We have addressed each comment in our revised manuscript, and provide a point-by-point response to each of the concerns. We have used track changes in the manuscript to highlight our revisions and included page numbers to relate the comments back to these visible changes. We hope that you will find the revisions satisfactory.

On behalf of all authors,

Sincerely yours,

Sarah Drew
Reviewer 1: Andrew Morden

We thank the reviewer for the helpful comments and suggestions. On the basis of the comments we have made a number of changes to the manuscript.

1. Abstract conclusion – Normalization Process Theory is stated as the theoretical framework used. Should this be changed to extended Normalization Process Theory?

Author response and action:
Thank you for drawing our attention to this omission. We have added the word “extended” to the abstract.

2. Description of Extended NPT and justification for use in the background

I think the paper would benefit from some sense of the rationale for using extended NPT (as opposed to ‘standard’ NPT) would be useful. It would be helpful if more is made of the article’s contention that extended NPT goes beyond individual psychological models and network approaches. I.e. May’s Toward a general theory paper builds upon NPT and incorporates psychological and network perspectives for a more comprehensive theoretical orientation to studies.

Author response and action:
We welcome this comment, which echoes comments from Reviewers 2 and 3. To briefly and clearly describe how extended NPT is a development of NPT, we and have added the following sentences to the Introduction (page 4, paragraph 2):

“The theory builds on previous iterations of Normalization Process Theory that have presented implementation as a social process. Extended Normalization Process Theory incorporates psychological and network perspectives into earlier iterations of Normalization Process Theory to build a more comprehensive model to explain phenomena.”

Was the intention of the study to also test the extended NPT? This is not clear in the background and study aims. To my knowledge this is one of the earliest (the first?) empirical studies to use ENPT. This links to a later point about the discussion, but what were the issues or learning points (if any)?

Author response and action:
Thank you for raising this query, which helped us to recognise that this needs further clarification.

Although an original aim of the study was not to evaluate the utility of the theory, the reviewer is right to highlight that the study provided valuable learning about the application of extended Normalisation Process Theory. We have added a sentence to the Introduction to show that Using ENPT in this context provided the opportunity to learn about its use in research practice (page 5, paragraph 1):

“In addition, as one of the first studies to use extended Normalization Process Theory, there was the potential to learn about the mechanics of its application in research.”

To explain the learning points that arose from using the theory in the study we have added a discussion of the challenges of coding data using ENPT. We hope this is of interest to readers who might encounter similar issues in their work. This is achieved by the addition of the following paragraph to the Discussion (page 22, paragraph 2):
“The theory was found to be valuable in helping us to explore the research topic because the theory was able to account for all of the experiences and challenges encountered by healthcare professionals in implementing the intervention. A challenge in the application of extended Normalization Process Theory was the overlapping nature of the constructs, meaning that data could be coded into more than one construct. A decision was therefore made to code data into more than one construct where relevant. In addition, we sometimes found it hard to be certain that we were categorising data into the ‘correct’ construct. Both of these issues are consistent with existing literature. To mitigate this, the study researchers collaborated closely with each other throughout the process to make decisions about how to code the data, to arrive at an agreed code list and application of the list.”

3. Interview procedure

Additional explanation about box 1 is required. The ENPT constructs are included under theme 2. Clarification how the ENPT constructs influenced the interview guide is required in the main text. Were these embedded under all questions (inc. theme 1)? Or just restricted to theme 2? The current discussion only discusses how the topic guide was based on the elements of the IOF initiative.

Author response and action:

Thank you for raising this query, we now recognise that we need to provide a more comprehensive explanation of the process of data collection. The section entitled ‘Interview Procedure’ under ‘Methods’ has been amended to include the following information (page 6, paragraph 3):

“A topic guide (Box 1) divided into two themes was used to inform interview questions. Theme 1 was based on the four core elements of a fracture prevention service outlined by the International Osteoporosis Foundation (IOF) as part of the ‘Capture the Fracture’ initiative[12]. This helped the researcher to explore participants’ views on the best models of care across the four main components of a fracture prevention service and co-ordination of care. Theme 2 was structured around the four constructs of extended Normalization Process Theory to enable exploration of participants’ experiences of implementing fracture prevention services. Participants were also encouraged to raise any issues that they thought relevant, and the interviewer used methods such as ‘probing’ to help achieve depth[29].”

4. Coding / analysis

It would be useful and interesting to gain more insight into how the authors approached coding. Did researchers code data that could not be explained /incorporated into extended NPT? How was this dealt with? How did the authors manage tensions between being aware of extended NPT constructs and balancing a (partially) inductive approach?

Author response and action:

Thank you for raising this query, we made revisions to the Methods and Discussion sections to have explain the analysis process in more detail and to reflect on the balance between using ENPT and an inductive approach. This is an increasing issue in qualitative research, in which we are often balancing the application of theory with the need to ensure that our findings are truly driven by the data. To address this concern, we applied an inductive, thematic approach first, followed by transposition onto ENPT constructs and coded all data that related to implementation. We were aware that there was the potential for tension between being using extended NPT and attempting to code data inductively. We felt that coding the data inductively using a thematic analysis before transposing it onto the constructs of extended Normalization Process Theory helped to address any
potential tension since any issues that could not be explained by the theory would have been identified. The challenges of coding using ENPT were interesting in their own right and have now added text discussing this in response to the previous comment. In addition, the analysis presented in our manuscript focuses on data relating to implementation of services, and all of the data relating to implementation was coded using ENPT. Any other topic areas in the transcripts that were not ostensibly related to implementation were also scrutinised, and decisions were made about whether the data was in fact relevant and should be coded. As such our inductive approach enabled us to take care to include all relevant information. To elaborate on the analysis process and the potential tensions of using this type of approach we have added the following information to the manuscript:

In the Methods section we have added further clarification on the analysis process (page 9, paragraph 1):

“An abductive analysis[30] was conducted. This involved coding data inductively using a thematic analysis, and all data were scrutinised for relevance to implementation. To relate the data to extended Normalization Process Theory, codes were then transposed onto the four main constructs of the theory.”

In addition, we have added the following to the Discussion (page 22, paragraph 2):

“There was also the potential for tension between undertaking an abductive approach[30] whilst ensuring the data was not ‘forced’ into pre-defined constructs. Coding the data inductively using a thematic analysis before transposing it onto the constructs of extended Normalization Process Theory helped to address this since we first inductively coded and scrutinised data all data for issues relating to implementation before applying extended Normalization Process Theory.”

5. Reporting of results

**Related to the analysis process, it would be useful to know what themes were identified and how they fitted together to constitute the extended NPT constructs. Again, were there any themes identified which could not be accounted for by extended NPT? This might be something that could be produced as a table.**

**Author response and action:**
We agree a table could be useful in helping readers to understand how the original codes generated by our inductive analysis fitted together to constitute the ENPT constructs and thank the reviewer for this suggestion. We have therefore added the following table to this paper (page 2):
Table 2: Codes identified and their relation to the 4 main constructs of extended Normalization Process Theory

<table>
<thead>
<tr>
<th>‘Capacity’</th>
<th>‘Potential’</th>
<th>‘Capability’</th>
<th>‘Contribution’</th>
</tr>
</thead>
<tbody>
<tr>
<td>Role of dedicated fracture prevention coordinator</td>
<td>High levels of support for introducing service</td>
<td>Fracture prevention coordinators ‘freeing up’ professionals previously engaged in care</td>
<td>Multi-disciplinary team meetings</td>
</tr>
<tr>
<td>Multi-disciplinary paperwork: protocols and proforma records</td>
<td>Lack of support for introducing service from some professionals</td>
<td>Lack of time to deliver intervention</td>
<td>Clinical databases</td>
</tr>
<tr>
<td>Multi-disciplinary team-work: multi-disciplinary team meetings, joint ward rounds</td>
<td>Relationships between different professional groups</td>
<td>Lack of capacity to administer DXA scans</td>
<td>Internal monitoring systems</td>
</tr>
<tr>
<td>Positive working relationships</td>
<td>Multi-disciplinary team working</td>
<td>Challenges faced by service users in accessing services</td>
<td>External monitoring systems linked to funding</td>
</tr>
<tr>
<td>Location of professionals close to the service and each other</td>
<td>Role of fracture prevention coordinator</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Challenge of securing cooperation and communication with GPs</td>
<td>Varying commitment from practitioners in primary care</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High workload in primary care impacting on time spent implementing intervention</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Written communication with GPs, especially discharge summaries and DXA reports</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Potential role of fracture prevention coordinators in primary care</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

We hope that this has addressed the reviewer’s query about whether any codes were identified that fell outside of the scope of ENPT, in addition to the paragraph we have added to the Discussion section (see point 2).

Minor point, in the second and third sentences under 1) capacity, the word manifest is used in quick succession. Perhaps use a different word for variation?

Author response and action:
Thank you for this comment. We have amended this by changing the second use of “manifest” to “present” (page 11, paragraph 2).

My feeling is that the current presentation of the findings, split between an overarching narrative and a box containing exemplifying quotes perhaps do not tease out some of the subtle nuances of the data to fully do it justice. For example, under section 2) Potential the first point discussed is the enthusiasm for the new service – directly placing the quote underneath the assertion and contextualising why staff are enthusiastic (i.e. historical desire for it, something that has been asked for a long time) would be helpful for the reader. So my preference is for the data to appear within the main text with some extra contextualisation. Doing this may also help you to relate inductive themes identified to the enhanced NPT constructs (see my first comment in this section).

Author response and action:
We recognise that this is an important point, which it is critical to consider when presenting qualitative findings. We discussed presentation of the findings extensively when we were writing the article, as we were concerned to ensure that the relatively complex material was as clear as possible for readers. On the basis of this we decided presenting the data in this way improved the coherence of the article and enabled readers to see the core messages in the main text and refer to the illustrative quotations according to their own preference. Reviewer 3 also agreed that the boxes with quotes worked particularly well to illuminate the findings within each component. Therefore, although we thank the reviewer for raising this, we think it most appropriate to preserve the split between the narrative and illustrative quotes.

We hope that we have helped to relate the inductive themes identified to the constructs of ENPT more clearly with the addition of Table 2 to the article (see point 5).

6. Discussion / conclusions

I was left wondering if there were any lessons or insights drawn from the study about using extended NPT alongside an empirical study. This is touched upon in the conclusion, but a thoroughgoing discussion is not provided (indeed, this may not be possible). It may not have been the intention of the authors to think about examining the application of the theory in practice in this way, but it would be helpful to learn about any insights gained from doing so (and bolster the claim made in the conclusion).

Thank you once again for this comment and we agree that there is insight to be gained from the application of ENPT in research practice. We trust we have already addressed this point sufficiently by expanding on this in the Introduction and Discussion sections (see point 2).

Reviewer 2: Luciana Ballini

We thank the reviewer for the helpful comments and suggestions. On the basis of the comments we have made a number of changes to the manuscript.

Minor Essential Revisions

1. Methods

The authors say they have used extended Normalization Process Theory, providing the appropriate reference which illustrates it. From a methodological perspective, as NPT is increasingly used in
implementation research - also by researchers who haven’t taken part in its development (see McEvoy 2014) – I think it would be of interest to have an additional paragraph that explains how this extended approach differs from the previous ones and its added value.

Author response and action:
We thank the reviewer for this valuable comment. This reflects one of the points raised by reviewer 1. We have made an addition to the Introduction to provide readers with a clear but concise summary of the difference between the extended and the previous approach. In addition, reference 20 (May) is already included, which enables reader to access fuller information if they desire it. The addition made to the Introduction is as follows (page 4, paragraph 2):

“The theory builds on previous iterations of Normalization Process Theory that have presented implementation as a social process. Extended Normalization Process Theory incorporates psychological and network perspectives into earlier iterations of Normalization Process Theory to build a more comprehensive model to explain phenomena.”

2. Sample: the authors claim their “aim of conducting criterion sampling”. It would be necessary to specify the selected criteria.

Author response and action:
We thank the reviewer for raising this point and apologise for the omission of this information, we have added the criteria by amending section 1 of the Methods section entitled ‘Sample’ (page 5, paragraph 3) so that it now reads as follows:

“Rather than aiming to achieve saturation[27], the final sample size reflects our aim of conducting criterion sampling to include an appropriate range of professionals to enable us to address the research question in light of extended Normalization Process Theory and their availability[28]. This meant prioritising the recruitment of professionals most familiar with the processes of implementing fracture prevention services and ensuring participants were adequately drawn from each of the 11 hospitals.”

3. Results

I had difficulties with the following paragraph:

"The visibility of these two kinds of support meant that a culture of co-operation developed around the intervention. This culture depended on shared expertise, as well as belonging to a co-operative group, and so distance from the centre of the service was an important factor that affected behavior. A key problem for participants was therefore securing the co-operation and interest of GPs."

The variable “distance from the centre” does not seem appropriately introduced. It only appears here and not sufficiently discussed.

Author response and action:
We thank the reviewer for highlighting the lack of clarity here. To improve this section we have redrafted this section to clarify the meaning of closeness to the centre of the service (page 11, paragraph 3):
"The visibility of these two kinds of support meant that a culture of co-operation developed around the intervention. This culture depended on shared expertise, as well as belonging to a co-operative group. When professionals felt closer to the centre of the service—close to the physical location and with more involvement in implementation—then they experienced better communication and enhanced enthusiasm.”

4. A great emphasis is put on the effectiveness of the “fracture-prevention coordinator”.

I understand this was a specific implementation strategy set up by the package and I think it should be stressed more explicitly that the complex intervention came supplied with an indispensable implementation strategy.

Author response and action:
We thank the reviewer for this valuable comment and now recognise that this is a key point that needs to be emphasised. As a result we have added the following sentence to the Abstract and Principal finding’s section (page 20, paragraph 1):

“As key agents in its intervention, fracture prevention coordinators were therefore indispensable to effective implementation.”

5. The resistance from some professionals who did not share the value of the intervention is indirectly referred to by some of the respondents. Were these negative responders included in the sample? If not this should be highlighted in the limitations, as their negative attitude could have determined their unwillingness to be interviewed.

Author response and action:
We thank the reviewer for this comment. We were not able to sample according to degree of resistance to the intervention and invited all health professionals (n=82) involved in service delivery to take part in interviews. Of these, 43 took part. It is entirely possible that those who did not want to take part were less amenable to the intervention, but the study nonetheless garnered much information about positive and negative aspects of implementation from those professionals who took part. We agree that this is a potential limitation of the study, and to reflect this we have added this information to the “Strengths and Weaknesses” section of the Discussion (page 22, paragraph):

“We invited all health professionals (n=82) involved in service delivery to take part in interviews. Of these, 43 took part. A potential limitation of the study is that those who declined participation were less amenable or involved in intervention delivery, but the study nonetheless garnered much information about positive and negative aspects of implementation from those professionals who took part.”

Reviewer 3: Helen Brooks

We thank the reviewer for the helpful comments and suggestions. On the basis of the comments we have made a number of changes to the manuscript.

1. Introduction

Discretionary Revisions
I thought that the introduction section was a useful summary of existing literature. I felt it may benefit from some more background detail on NPT as well as how the extended model the authors used fits with the original theory (e.g. perhaps a diagram and short summary of other elements) for purposes of clarity for the reader.

Author response and action:
We thank the reviewer for this comment which reflects the points raised by reviewers 1 and 2 who also asked for more detail about ENPT. We have added a small section to the Introduction to explain ENPT (page 4, paragraph 2):

“The theory builds on previous iterations of Normalization Process Theory that have presented implementation as a social process. Extended Normalization Process Theory incorporates psychological and network perspectives into earlier iterations of Normalization Process Theory to build a more comprehensive model to explain phenomena.”

2. Discretionary Revisions

I would suggest that demographic information relating to participants be included in a tabular format within the ‘sample’ section in any subsequent draft as this would make it clearer for the reader.

Author response and action:
We thank the reviewer for this comment. We had considered providing a table of participants for ease of reading, however, we needed to balance the provision of information about participants with the need to preserve their anonymity. This is because the participants represent some of only a very small number of professionals working in this field. We have revisited the potential for tabulation and the possibility of providing a brief table summarising the information as currently displayed, but are not convinced that this adds anything to the text. Should the reviewers or editors like us to provide a table, we can do so.

It may be helpful to display an example of the codes generated during the analysis process which could be included as an additional figure (e.g. original single code list described in the data analysis section) for the purposes of transparency of process.

Author response and action:
We thank the reviewer for this comment that reflects that made by Reviewer 1. To address this we have added Table 2 to the manuscript (see Reviewer 1, point 5), summarising the codes identified and how they relate to the four constructs of extended Normalization Process Theory.

Results

Discretionary Revisions

I felt that within the text under each heading, the provision of examples might be useful. For example within the ‘Potential’ heading, specific examples of how co-ordinators ‘glued’ together different professional cultures and ensured there was agreement might be useful.

Author response and action:
We thank the reviewer for this comment and hope that the exemplifying quotes already in Boxes 2, 3, 4 and 5 provide the reader with specific examples of some of the issues discussed in the narrative.
Minor essential Revisions

Please describe abbreviations in full when used in the first instance (e.g. DXA reports/scans).

Author response and action:
We thank the Reviewer for raising this point and apologise for the omission. We have now edited the article to ensure that all abbreviations are described in full in the first instance.

Discretionary Revisions

The strengths and weaknesses of the study was a useful section which was well written. I felt that it may be useful to articulate how the challenges of the overlapping nature of the constructs within NPT were addressed within the current study.

Author response and action:
We thank the Reviewer for this comment that reflects points raised by Reviewers 1 and 2. To describe the learning points that we achieved from using the theory we have added the following paragraph to the Discussion section (page 22, paragraph 2):

“The theory was found to be valuable in helping us to explore the research topic because the theory was able to account for all of the experiences and challenges encountered by healthcare professionals in implementing the intervention. A challenge in the application of extended Normalization Process Theory was the overlapping nature of the constructs, meaning that data could be coded into more than one construct. A decision was therefore made to code data into more than one construct where relevant. In addition, we sometimes found it hard to be certain that we were categorising data into the ‘correct’ construct. Both of these issues are consistent with existing literature. To mitigate this, the study researchers collaborated closely with each other throughout the process to make decisions about how to code the data, to arrive at an agreed code list and application of the list.”