## 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

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| **TITLE (PROVISIONAL)** | Hearing and Vision Screening Tools for Long-term Care Residents with Dementia: Protocol for a Scoping Review |
| **AUTHORS** | Hobler, Fiona; McGilton, Kathy; Campos, Jennifer; Dupuis, Kate; Labreche, Tammy; Guthrie, Dawn; Jarry, Jonathan; Singh, Gurjit; Wittich, Walter |

## VERSION 1 - REVIEW

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| **REVIEWER** | Jesper Dammeyer<br>University of Copenhagen<br>Department of Psychology |
| **REVIEW RETURNED** | 28-Mar-2016 |

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| **GENERAL COMMENTS** | Thank you for the opportunity to read this manuscript ”Hearing and Vision Screening Tools for Long-tern Care Residents with Dementia: Protocol for a Scoping Review”. It is an important protocol and I enjoyed reading it.<br>Overall it is a well-written and structured protocol. Relevant literature is introduced. The relevance of a Scoping review is well argued. I only have a few recommandations and questions.<br><br>P3l19. Something is missing in the sentence. “research and clinically”<br>P6l32. The pilot study is interesting and seems to be a useful for planning the review. The pilot study can be implemented mush more and structured. More information about the pilot study would be useful for the reader. How many participants, how was is carried out, how has data analysed?<br>P7l21. “Not surprisingly”. I do not think I am not surprised. I would like more information about how standardized tests was administrated and not.<br>P7l30. Deafblindness or dual sensory loss as an independent groups is shortly mentioned. However, some researchers (also some of them included in references) argue that deafblindness is a different – and more severe – condition than hearing loss plus vision loss. I suggest to mention some of this research, it will be another argument for why this review is important. See for instance http://www.ncbi.nlm.nih.gov/pubmed/25114064 Thus, it might be better to introduce and discuss as three different groups: hearing loss, vision loss, dual sensory loss.<br>P10l14. I will recommend also to indlude “deafblind” next to “deaf-blind”<br>P11l53. Update November 2015 |

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| **REVIEWER** | Christine R. Kovach, PhD, RN, FAAN, FGSA<br>University of Wisconsin-Milwaukee |
| **REVIEW RETURNED** | 04-Apr-2016 |

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| **GENERAL COMMENTS** | The paper is, in general, written clearly. It describes procedures that will be used in the future to conduct a scoping review. The standard procedures proposed by Arksey and O'Malley (2005) will be used with some methodological enhancements from Levac et al. (2010). The review has not yet been done. The paper is not a methods paper or a review paper. It describes a proposed project for the future. As such, the paper does not enhance readers knowledge of methods for conducting scoping reviews and does not provide insights into the the use of hearing and vision assessments in older adults with dementia. Hence, the manuscript should be rejected. On page 6 the paragraph that begins on line 20 is confusing and seems to conflict with the purpose as stated in the abstract. |

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| **REVIEWER** | Sophie Ampe<br>University of Leuven (Belgium) |
| **REVIEW RETURNED** | 21-Apr-2016 |

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| **GENERAL COMMENTS** | GENERAL COMMENTS:<br>The fact that both researchers and practitioners are taken into account/will benefit from the study is a big strength of the study. You should point this out more clearly. However, you should make a clear distinction between both fields. An explanation on how you are defining both fields throughout your study could be helpful.<br>My main concern with this study is that the research question is very broad. I wonder if this could hinder the quality of the research. Is it useful to take all these studies/topics into account in this one review?<br>It is not clear why you focus on LTC residents, why have you selected this setting? People with dementia are not only cared for in LTC after all… It should be clarified in the introduction what the specific characteristics are that distinguish this setting from other settings, in terms of the hearing/vision assessments.<br><br>SPECIFIC COMMENTS:<br>ABSTRACT<br>The abstract could be more specific, e.g. the methods-section raises questions: what does 'interview-base grey literature search' mean? Which clinical professionals are participating?<br>I only understood the abstract after reading the whole text, I think it could be more informative.<br><br>STRENGTHS & LIMITATIONS<br>"The scoping team will also consolidate …": This certainly is an advantage for the research team, but can you explain how this is a strength for the study or the research domain?<br><br>INTRODUCTION<br>Overall, I wonder whether there are more recent publications on this topic. If not, could you please address the reasons?<br>You are citing numbers from Canada – are the results to be used only in Canadian LTCF? In that case this should be mentioned in the methods-section and abstract.<br>Can you explain why you are focusing on LTC residencies? What |

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| | are the characteristics of these settings that distinguish them from other settings (are assessments different in the LTC residencies? If so, please explain)?<br>"… however, the underlying mechanisms of this association are unestablished, with suggestions of a possibly attributable common neuropathological origin, effects of social isolation, or cognitive load caused by hearing loss (Lin et al., 2013)": I do not understand, can you please explain?<br>"For accumulative reasons, there is a pressing need to further investigate the relationship between these interacting comorbidities, as well as the most appropriate interventions and rehabilitative treatments by employing a comprehensive interdisciplinary, collaborative approach (O'Malley, 2013; Swenor et al., 2013).": What do you mean with "interacting comorbidities"? hearing – vision, or cognitive impairment – hearing loss, or other?<br>You mention a "larger study", can you please (shortly) explain this?<br><br>METHODOLOGY<br>I do not know the methodological framework by Arksey & O'Malley. An overview figure/scheme with its main points could be helpful.<br>You list the different stages in your review process: can you please write in a few words what each of these stages comprise exactly?<br>The following sentence could be split up in smaller phrases to increase readability: "We will further adhere to the methodological enhancements based on previously published scoping reviews by providing transparency…. and by allowing for post-hoc development of inclusion/exclusion criteria and data synthesis in terms of the value yielded by qualitative or quantitative analysis of results (Armstrong et al., 2011)."<br>Although I find the involvement of both the research and he clinical field a big strength of your study, I am confused throughout the text as both terms are frequently used. They sometimes seem interchangeable, while I think there is a clear difference between the two terms.<br>How will the interviews be analysed?<br>"As a result, each article will be rated twice using numeric exclusion codes, with reviewers instructed to use a top-down approach and rate each article for exclusion by use of the first exclusionary code that applies.": what are these 'numeric exclusion codes', can you give an example or provide a table with the codes? What does the top-down approach comprise?<br>Under the heading 'data extraction', you speak of 'content experts': who are these, why are they experts, how are they recruited, …?<br>Under the heading 'Consultation': who and what are 'content developers'?<br>How many different expert panels are involved in the study?<br>Suggestion: a figure/timeline with an overview of the different steps/stages/collaborators in the study would greatly increase the readability of the text.<br><br>ETHICS AND DISSEMINATION<br>It is the first time you mention 'utility' when talking about 'aims'. This does not correspond to the aims: 'identify assessment measures… overview of the use and evaluate sensibility'<br>A more consistent use of vocabulary would improve comprehensibility throughout the text.<br>"This type of review also allows us to include consultations with key stakeholders to identify gaps in the evidence and research that need to be addressed in future investigations.": if identifying gaps is an aim of your study, it should be mentioned earlier. |

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| | "…and possibly contributing to improvements in quality of life for these residents.": can you please explain how you see this? |

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| **REVIEWER** | Tammy Hopper<br>University of Alberta, Canada |
| **REVIEW RETURNED** | 26-Apr-2016 |

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| **GENERAL COMMENTS** | The authors are addressing an important, timely issue regarding the care of individuals who have dementia. Dual sensory loss is highly prevalent among older adults and, as the authors note, dual sensory loss is even more common among individuals with dementia, yet is often under-identified. The manuscript is well-written and comprehensive in its scope. My recommendations for improvement are as follows: (1) include more appropriate references for communication and language impairments in Alzheimer's dementia. For example, the Kim and Bayles (2007) article used to cite communication difficulties in dementia is related to late-stage aspects of the disease only. Other more comprehensive sources are available and more appropriate to cite in this section; (2) specify whether the purpose of the review is to analyze assessments or, specifically, screening measures for hearing and vision. The terms assessment and screening are used interchangeably throughout the manuscript and are not synonymous; (3) re-consider the use of the concept of 'sensibility' which is confusing and may be unnecessary if a consideration of psychometric aspects of reliability and validity are considered (including ecological validity); (4) acknowledge in the discussion of limitations of the study that a possible outcome is that very few studies will exist in which both hearing and vision screenings have been used with individuals who have a diagnosed dementia. Although there are numerous screening tests for vision and hearing function among typically aging older adults, based on my own research and clinical experience, I think that the scoping review will not yield a "possibly very large scale" of screening tools used with people who have dementia; and (5) delete the use of the PRISMA-P checklist as I cannot see how it applies to the current scoping review. |

## VERSION 1 – AUTHOR RESPONSE

Reviewer: 1
Reviewer Name: Jesper Dammeyer
Institution and Country: University of Copenhagen Department of Psychology, Denmark
Competing Interests: None declared

Thank you for the opportunity to read this manuscript "Hearing and Vision Screening Tools for Long-term Care Residents with Dementia: Protocol for a Scoping Review". It is an important protocol and I enjoyed reading it.
Overall it is a well-written and structured protocol. Relevant literature is introduced. The relevance of a Scoping review is well argued. I only have a few recommandations and questions.

• P3l19. Something is missing in the sentence. "research and clinically"

Thank you; we have added "context" to the following:
"We will conduct a scoping review to identify the screening measures used in research and clinical

contexts that test hearing and vision in adults aged over 65 years with dementia"

Location of edits: Abstract, Page 3

• P6l32. The pilot study is interesting and seems to be a useful for planning the review. The pilot study can be implemented mush more and structured. More information about the pilot study would be useful for the reader. How many participants, how was is carried out, how has data analysed?

The following has been added to the Introduction under the heading “Pilot Project in Training Resident Centered Communication”:

“This study took place in a 128-bed, for-profit, LTC home in Ontario, Canada with 12 residents who had a diagnosis of dementia and 20 caregiving staff. The aim of the study was to determine if a Resident Communication Centred Intervention could influence caregiver and residents’ outcomes. The RCCI involved a dementia care workshop, the development of individualised resident communication care plans by a Speech-Language Pathologist (SLP), with staff supported at the bedside by an advanced practice nurse to implement the care plans. Individualised communication care plans were tailored according to the cognitive, sensory and linguistic abilities of the residents. Comparing post intervention to baseline results, residents experienced a significant improvement in their mood and staff experienced reduced burden, shown by use of multilevel mixed effects linear regression.”

Location of edits: Page 7

• P7l21. “Not surprisingly”. I do not think I am not surprised. I would like more information about how standardized tests was administrated and not.

The following adaptations were made to the standardised testing procedures for hearing and vision, as outlined in the “Pilot Project in Training Resident Centered Communication” subsection:

“For example, the following adaptations were made to the standardised testing procedures for hearing and vision: a) audiometric testing: two participants were unwilling to complete the test and some were unable to learn to respond consistently to pure-tone stimuli, thus live voice testing at a conversational level was improvised using simple tasks; b) vision testing: participants often demonstrated difficulty following test instructions and maintaining prolonged attention even though instructions were communicated using clear and simple speaking skills (Young & Manthorp, 2009). Therefore, when necessary, test procedures were modified; e.g., for patients who had difficulty sustaining attention, only a subset of the Teller cards was show (Pichora-Fuller et al., in preparation):”

Location of edits: Page 8

• P7l30. Deafblindness or dual sensory loss as an independent groups is shortly mentioned. However, some researchers (also some of them included in references) argue that deafblindness is a different – and more severe – condition than hearing loss plus vision loss. I suggest to mention some of this research, it will be another argument for why this review is important. See for instance http://www.ncbi.nlm.nih.gov/pubmed/25114064 Thus, it might be better to introduce and discuss as three different groups: hearing loss, vision loss, dual sensory loss.

The following information has been added to the Introduction:
“Researchers as well as health service providers in the field of deafblindness agree that the co-presentation of vision- and hearing loss is not simply additive but multiplicative, thereby creating a new and more complex type of sensory impairment (Dammeyer, 2014; Hersh, 2013; Saunders &

Echt, 2007)."
Our initial search results have also indicated that the research into sensory impairment has been stratified into these three groups, and so our scoping results will also be reported in partitioned reviews dedicated to: a) hearing; b) vision; and c) dual sensory screening, as described in the Methodology on page 10.

Location of edits: Page 9 & 11

• P10l14. I will recommend also to indlude "deafblind" next to "deaf-blind"

In our literature search, we searched for deafblind as a subject heading, not as a text word, and thereby the spelling of the word was dictated by the index of each database, e.g., in Medline this was "Deaf-Blind Disorder/", in EMBASE "deafblindness/" and in PsychINFO "deaf blind/". The subject headings (those with a /) are standardised terms in the database, whereas the terms denoted with ".tw" are those searched for in exact typed form, as entered thus by a member of the research team and the Library Information Specialist. Introducing a new spelling of the word should therefore not yield additional results to the strategy employed here.
However, following previous reflections on terminology and what was captured with the above strategy, both the terms deafblind and deaf-blind are considered within the literature search (Lagati, 1995).

Location of information: Appendix 2

• P11l53. Update November 2015

The search will be updated to include results from November 2015 to May 2016. The Search Methods' section has been updated accordingly.

Location of edits: Page 12 & Appendix 2

Reviewer: 2
Reviewer Name: Christine R. Kovach, PhD, RN, FAAN, FGSA
Institution and Country: University of Wisconsin-Milwaukee, USA
Competing Interests: None declared

• The paper is, in general, written clearly. It describes procedures that will be used in the future to conduct a scoping review. The standard procedures proposed by Arksey and O'Malley (2005) will be used with some methodological enhancements from Levac et al. (2010). The review has not yet been done. The paper is not a methods paper or a review paper. It describes a proposed project for the future. As such, the paper does not enhance readers knowledge of methods for conducting scoping reviews and does not provide insights into the the use of hearing and vision assessments in older adults with dementia. Hence, the manuscript should be rejected. On page 6 the paragraph that begins on line 20 is confusing and seems to conflict with the purpose as stated in the abstract.

We are submitting a protocol paper which, in line with BMJ guidelines, has not yet been completed; hence we do not yet have insights to share about hearing and vision assessment of older adults with dementia.
However, as is now common practice in the case of systematic reviews, we also wish to contribute to research discussion and conceptualisation by providing transparency, reproducibility and utility (Armstrong et al., 2011) of this type of review in making this protocol publically available.

In the cited paragraph on page 6, we attempt to connect previous research findings from treatment

studies with the aims and facets of our scoping review. This paragraph has been restructured for clarification as follows:
“For these reasons, there is a pressing need to further investigate the relationship between hearing, vision and cognitive impairment, as well as to develop appropriate interdisciplinary interventions to moderate their effects on older and vulnerable persons, by herein employing a comprehensive interdisciplinary, collaborative approach (O’Malley, 2013; Swenor et al., 2013).”

Location of edits: Page 7

Reviewer: 3
Reviewer Name: Sophie Ampe
Institution and Country: University of Leuven (Belgium)
Competing Interests: None declared

GENERAL COMMENTS:
• The fact that both researchers and practitioners are taken into account/will benefit from the study is a big strength of the study. You should point this out more clearly. However, you should make a clear distinction between both fields. An explanation on how you are defining both fields throughout your study could be helpful.

For the purpose of our study, we consider researchers to be those individuals whose primary training is focused on research methodologies, techniques and skills to conduct research (e.g., PhD); whereas we consider practitioners as those individuals whose primary focus during their training was the acquisition of skills for the purpose of delivering a clinical service. We acknowledge that, in the case of clinician-scientists, there is a certain overlap between these two categories, likely beneficial to our purposes. We aim to have representation of all three groups on our team.

The above information has been entered as a footnote to the description of the review team under Methodology on page 9. A brief reference to this has also been made in the first point of the Strengths and Limitations section.

Location of edits: Page 10 & 4

• My main concern with this study is that the research question is very broad. I wonder if this could hinder the quality of the research. Is it useful to take all these studies/topics into account in this one review?
The research question is broad to capture the full extent of the hearing and vision screening tools for this population; however, our initial review has identified 67 hearing screening papers, 159 vision papers, and 12 dual sensory screening papers. Therefore, our plan will be to report our findings in the form of three reviews, addressing hearing, vision and dual sensory screening separately, as described in the Methodology.

Location of information: Page 11

• It is not clear why you focus on LTC residents, why have you selected this setting? People with dementia are not only cared for in LTC after all… It should be clarified in the introduction what the specific characteristics are that distinguish this setting from other settings, in terms of the hearing/vision assessments.

The following information has been added to the Introduction:
“Sensory loss is widespread among older adults, and is often overlooked in those living in residential settings. Nursing home residents tend to be older and have higher levels and more severe physical

and cognitive impairment, than those living in the community (Carpenter & Hirdes, 2013). […] Dual sensory loss or deafblindness, was found to have the highest prevalence in older adults in LTC settings, at approximately 25%, compared to those non-institutionalised or dwelling in other settings (Vaal et al., 2007),"

In addition, in long term care settings a majority of the residents have moderate to severe dementia; the population for which we know little about effective hearing and vision screening tools. Finally, as referenced in the text, Yamada et al. (2014) state, "visual and hearing impairments are associated with higher rates of common clinical problems in nursing home residents, especially when they are combined."

These tools may be applicable to older adults in other settings, but we chose long term care environments as a start, as they have one of the highest needs and fastest growing populations, as outlined in the Introduction.

Location of edits: Page 5 & 6

SPECIFIC COMMENTS:
ABSTRACT
• The abstract could be more specific, e.g. the methods-section raises questions: what does 'interview-base grey literature search' mean? Which clinical professionals are participating? I only understood the abstract after reading the whole text, I think it could be more informative.

Thank you for highlighting this need for further information. The Methodology as described in the Abstract has been revised as follows:
"We will conduct electronic database searches in CENTRAL, CINAHL, Embase, MEDLINE, and PsycINFO. We will also carry out a "grey literature" search for studies or materials not formally published, both online and through interview discussions with healthcare professionals and research clinicians working in the field. Our aim is to find new and existing hearing and vision screening measures used in research and by clinical professionals of optometry and audiology. Abstracts will be independently reviewed twice for acceptance by a multidisciplinary team of researchers and research clinicians."

Due to the word limitations of this section, we have added a definition of "grey literature" to the Search Methods subsection in the main text:
"[…] augmented by web-based grey literature searches, for published and unpublished in books or journals, including conference proceedings and abstracts, dissertations or theses, project reports, and government documents, and test searches using Google Scholar and Opengrey, and the instrumental database for Health and Psychosocial Instruments (HAPI)"

Location of edits: Page 3 & 12

STRENGTHS & LIMITATIONS
• "The scoping team will also consolidate …": This certainly is an advantage for the research team, but can you explain how this is a strength for the study or the research domain?

We agree that this statement was confusing, thus we deleted it.

Location of edits: Page 4

INTRODUCTION
• Overall, I wonder whether there are more recent publications on this topic. If not, could you please

address the reasons?

The following elaboration has been added to the Introduction:
"In the traditional research domains of vision and hearing, participants with severe cognitive impairment are often excluded from recruitment and data collection, as tests that are otherwise standardised in their administration would need to be adapted for this population. For example, the requirement of reading letters on an eye chart relies on the ability to identify and remember these letters, and then repeat them; making these test formats unsuitable for individuals with impaired memory and language abilities; thus having to be substituted with the spelling of familiar words (such as the person's name) or basic numbers chart. This resulting exclusion process results in the limited scope of recent publications on the topic of sensory and co-morbid cognitive loss."

Location of edits: Page 8 & 9

• You are citing numbers from Canada – are the results to be used only in Canadian LTCF? In that case this should be mentioned in the methods-section and abstract.

Figures from a study by Seitz et al. (2010) are cited for the prevalence of dementia in LTC homes. This study, although authored mainly in Canada, provides a review of prevalence studies carried out in Europe, the Americas, New Zealand, Australia and Africa. The cited pilot study (Pichora-Fuller et al., in preparation) was indeed conducted in Canada; however, we are not restricting our review or application of our findings to Canadian LTCFs.

Other figures cited in the introduction refer to population statistics (Prince et al. (2015) from the World Alzheimer Report 2015: The Global Impact of Dementia. An analysis of prevalence, incidence, cost & trends) and prevalence of sensory impairment in LTC reference studies conducted in the US and across Europe, as well as in Canada.

Location of information: Page 5-6

• Can you explain why you are focusing on LTC residencies? What are the characteristics of these settings that distinguish them from other settings (are assessments different in the LTC residencies? If so, please explain)?

Please see the above response for our rationale. Currently in many parts of Canada LTCF hearing and vision screening assessments are conducted using the MDS 2.0 tool (Kim et al. 2015). This assessment system has been used as a mandatory tool in multiple regions in Canada, as well as across New Zealand, and Europe, and is also widely used within- and cross-country research. Notwithstanding the evidence to support inter-rater reliability of these items (see Hirdes et al., 2008) and their worldwide usage, information regarding the validity of the items on vision/hearing is lacking and it is not yet understood how well the items work with a population who have dementia. And although clinical professionals undergo training on this administration process, inconsistencies in how and whether sensory impairment is reported do occur (Dullard & Saunders, 2016), especially when the client may be more limited in their ability to complete the assessment due to cognitive limitations.

Location of information: Page 5-7

• "… however, the underlying mechanisms of this association are unestablished, with suggestions of a possibly attributable common neuropathological origin, effects of social isolation, or cognitive load caused by hearing loss (Lin et al., 2013)": I do not understand, can you please explain?

Thank you for bringing this to our attention. Here we attempt to explain this association and exemplify

what the research literature provides us with as an explanation. The statement has been revised as follows:

”Although the mechanisms underlying the association between cognitive and sensory impairment remain unknown, it has been suggested that this relationship may result from a common neuropathological origin in the brain underlying both sensory loss and cognitive decline, effects of social isolation caused by both sensory and cognitive loss, and/or increased cognitive/attentional load caused by sensory loss (Albers et al., 2015; Lin et al., 2013).”

Location of edits: Page 6

• “For accumulative reasons, there is a pressing need to further investigate the relationship between these interacting comorbidities, as well as the most appropriate interventions and rehabilitative treatments by employing a comprehensive interdisciplinary, collaborative approach (O’Malley, 2013; Swenor et al., 2013).”: What do you mean with “interacting comorbidities”? hearing – vision, or cognitive impairment – hearing loss, or other?

We have also clarified this sentence to read:
“For these reasons, there is a pressing need to further investigate the relationship between hearing, vision and cognitive impairment, as well as to develop appropriate interdisciplinary interventions to moderate their effects on older and vulnerable persons, by herein employing a comprehensive interdisciplinary, collaborative approach (O’Malley, 2013; Swenor et al., 2013)”

Location of edits: Page 7

• You mention a “larger study”, can you please (shortly) explain this?

Our larger study looks towards the development of a sensory screening package for LTC residents with dementia. In the first phase, we will first carry out comprehensive Scoping Review, Environmental Scan interviews and a Consultation with Experts to develop of a comprehensive list of hearing and vision tests suitable for older adults that have been used either for clinical or research purposes.

In a second phase we will further develop the package of screening tools by conducting evaluations of Feasibility in LTCFs, Inter-rater Reliability and Construct Validity of the screening tools to be included in the package, to finally produce a package of tools and a process for selecting tools within this package that considers the degree and nature of sensory loss in older adults with dementia.

A visual summary of the process in Phase One is provided with Appendix 3

METHODOLOGY
• I do not know the methodological framework by Arksey & O’Malley. An overview figure/scheme with its main points could be helpful.

The process is not linear but iterative, requiring researchers to engage with each stage in a reflexive way and repeat steps where necessary to ensure that the literature is covered in a comprehensive way.

With these differences in mind, we go on to describe the stages of the framework we adopted for conducting a scoping study in Appendix 1: Methodological Framework (Arksey & O'Malley, 2005) outlined below.

Location of edits: Appendix 1

• You list the different stages in your review process: can you please write in a few words what each of these stages comprise exactly?

As above, please see Appendix 1: Methodological Framework (Arksey & O'Malley, 2005) for a complete description.

Location of edits: Appendix 1

• The following sentence could be split up in smaller phrases to increase readability: “We will further adhere to the methodological enhancements based on previously published scoping reviews by providing transparency…. and by allowing for post-hoc development of inclusion/exclusion criteria and data synthesis in terms of the value yielded by qualitative or quantitative analysis of results (Armstrong et al., 2011).”

Thank you for this helpful note. We have split the cited sentence into three shorter phrases:
“We will further adhere to the methodological enhancements based on previously published scoping reviews by providing transparency, reproducibility and utility with the presentation of this protocol (Armstrong et al., 2011). We aim for consistency in labelling and defining scoping terms (Colquhoun et al., 2014), and maintaining a broad search strategy with clearly defined concepts and their continuous refinement (Levac et al., 2010). Additionally, we will use multidisciplinary expertise and group consultation within the scoping team to inform and guide the definition of the search criteria and clinical applicability of data for extraction (Daudt et al., 2013; Levac et al., 2010), and to allow for the post-hoc development of inclusion/exclusion criteria and data synthesis in terms of the value yielded by qualitative or quantitative analyses of results (Armstrong et al., 2011).”

Location of edits: Page 10

• Although I find the involvement of both the research and he clinical field a big strength of your study, I am confused throughout the text as both terms are frequently used. They sometimes seem interchangeable, while I think there is a clear difference between the two terms.

Please see our response to first general comment above.

Location of edits: Page 10 & (Page 4)

• How will the interviews be analysed?

The information collected from environmental scan interviews will be analysed by use of thematic content analysis to identify the important points raised by healthcare professionals. This information has been added to the Methodology.

Location of edits: Page 13

• “As a result, each article will be rated twice using numeric exclusion codes, with reviewers instructed to use a top-down approach and rate each article for exclusion by use of the first exclusionary code that applies.”: what are these ‘numeric exclusion codes’, can you give an example or provide a table with the codes? What does the top-down approach comprise?

This sentence is unclear, and thus we removed it. We have included instead:
“Two reviewers will independently make a decision to exclude articles from the review based on the

agreed-upon exclusion criteria."

Location of edits: Page 14

• Under the heading 'data extraction', you speak of 'content experts': who are these, why are they experts, how are they recruited, …?

The term "content experts" was used to refer to the "expert panel", who are responsible for devising the contents of the screening package. The term "expert panel" has replaced previous variations throughout to maintain consistency.

Further information has been added to the description under the section for "Consultation":
"Our panel will be comprised of experts with specialised clinical and/or research experience in the fields of clinical neuropsychology, nursing, geriatrics, audiology, optometry, and software development, recruited from the professional networks of the members of the study team. Given the highly specialized nature of this field of research, the network of specialists is tight-knit and many of the pertinent players are known to each other, making this identification and recruitment process relatively speedy."

Location of edits: Page 17

• Under the heading 'Consultation': who and what are 'content developers'?

As above, "content developers" was used to refer to the "expert panel" responsible for "developing" the contents of the screening package. The term "expert panel" has been replaced throughout to maintain consistency.

Location of edits: Page 17

• How many different expert panels are involved in the study?

There is only one "expert panel" employed in this study (as above).

Location of edits: Page 17

• Suggestion: a figure/timeline with an overview of the different steps/stages/collaborators in the study would greatly increase the readability of the text.

The overall study has been outlined in the below flowchart of Appendix 2: Development of the sensory screening package.

ETHICS AND DISSEMINATION
• It is the first time you mention 'utility' when talking about 'aims'. This does not correspond to the aims: 'identify assessment measures… overview of the use and evaluate sensibility'
A more consistent use of vocabulary would improve comprehensibility throughout the text.

Thank you for highlighting this inconsistency. The term "utility" has been replaced by feasibility that relates directly to the concept of "sensibility", described by Yeung et al. (2015) as accounting for feasibility and acceptability.

Location of edits: Page 3 & 18

• “This type of review also allows us to include consultations with key stakeholders to identify gaps in the evidence and research that need to be addressed in future investigations.”: if identifying gaps is an aim of your study, it should be mentioned earlier.

The consultation exercise is noted as the 6th stage of Arksey and O'Malley’s (2005) framework for scoping reviews. Identifying gaps in the literature has been added as an aim of this type of review along with the supplementary description of the steps in this process - see Appendix 1.

The following sentence has been added to the Methodology for earlier reference to this:
“[…] employing a scoping approach to review existing literature and to examine the extent, range and nature of research activity, identify research gaps in this literature, and then summarise and disseminate research findings, as outlined in Appendix 1”

Location of edits: Page 9

• “…and possibly contributing to improvements in quality of life for these residents.”: can you please explain how you see this?

The presence of hearing and vision challenges can negatively impact clinical interactions and the ability to take part in interventions (Dullard and Saunders, 2016); thus, we have included the following…
“[…] to facilitate the accurate screening of hearing and vision in older adults with dementia living in LTC, resulting in better personalised care, and thus possibly contributing to improvements in social participation, clinical interaction and in overall quality of life for these residents (Dullard and Saunders, 2016).”

Location of edits: Page 19

Reviewer: 4
Reviewer Name: Tammy Hopper
Institution and Country: University of Alberta, Canada
Competing Interests: None declared

The authors are addressing an important, timely issue regarding the care of individuals who have dementia. Dual sensory loss is highly prevalent among older adults and, as the authors note, dual sensory loss is even more common among individuals with dementia, yet is often under-identified. The manuscript is well-written and comprehensive in its scope. My recommendations for improvement are as follows:

(1) include more appropriate references for communication and language impairments in Alzheimer's dementia. For example, the Kim and Bayles (2007) article used to cite communication difficulties in dementia is related to late-stage aspects of the disease only. Other more comprehensive sources are available and more appropriate to cite in this section;

Thank you for this note. Communication difficulties are indeed not limited to late-stage dementia; thus we have added the following description to the Introduction:

“Indeed, language impairment is often seen as one of the first symptoms of dementia (Klimova et al., 2015; Tang-Wai & Graham, 2008). The dementias, particularly in their moderate to severe staging, are characterized by deficits in memory and language processing attributed to the temporal lobe area, and is reflected in the individual’s ability to recognise, generate and repeat words, organize information in conversation, as well as variable impairments of grammatical, semantic (related to

meaning) and lexical (vocabulary) knowledge (Pichora-Fuller et al., 2013; Mansur, 2011; Vuorinen et al., 2000)."

Location of edits: Page 5

(2) specify whether the purpose of the review is to analyze assessments or, specifically, screening measures for hearing and vision. The terms assessment and screening are used interchangeably throughout the manuscript and are not synonymous;

This is a good point. To clarify, we are looking at screening measures only, as the purpose of screening is to identify the possible presence of an impairment and then to subsequently referral to more specialized services, whereas the purpose of assessment is often that of more specific diagnosis. We aim to find suitable screening measures to provide a more sensitive method of identifying impairments, thereby resulting in an efficient referral process to the appropriate vision and hearing specialists.
The term "assessment" has been replaced throughout the text with the terms "measure", "tool", and "screening", as appropriate.

Location of edits: throughout

(3) re-consider the use of the concept of 'sensibility' which is confusing and may be unnecessary if a consideration of psychometric aspects of reliability and validity are considered (including ecological validity);

We have clarified the difference between sensibility and ecological validity, and why we are focusing on sensibility, thus:
"It has been argued that despite having evidenced reliability, validity and responsiveness to change, instruments can be underused due to numerous reasons including its practicality (Rowe and Oxman, 1993), and therefore, evaluating an instrument's sensibility (which includes face and content validity) should be an important first step to see if this will be acceptable in the research or clinical field. In this sense, sensibility should also be assessed before ecological validity, as completing the test successfully and acceptably with the intended population is most indicative of its feasibility, rather than real-world validity and applicability of results. The reliability and validity of the tools selected with consideration of sensibility will be carried out a later stage of the process in developing the screening package.."
The above information has been added to the Methodology.

Location of edits: Page 11

(4) acknowledge in the discussion of limitations of the study that a possible outcome is that very few studies will exist in which both hearing and vision screenings have been used with individuals who have a diagnosed dementia. Although there are numerous screening tests for vision and hearing function among typically aging older adults, based on my own research and clinical experience, I think that the scoping review will not yield a "possibly very large scale" of screening tools used with people who have dementia;

Our initial review results suggest a larger scale of studies that look at cognition and vision or cognition and hearing, but not all three abilities together; identifying 67 hearing screening papers, 159 vision papers, but only 12 dual sensory screening papers. For this reason, we will plan to present our results in three separate reports, discussing 1) dementia and visual impairment, 2) dementia and hearing impairment, and then 3) dementia and dual sensory impairment; as noted under the Methodology on page 11.

Please see the following revisions to the Strengths and Limitations section to reflect this distinction:

“A limitation of this scoping review may lie in the possibly very large scale of its findings for vision or hearing measures with populations who have cognitive impairment, and, for reasons of feasibility, we may not be able to provide a more in-depth quality analysis of the individual studies reported therein.”

Location of edits: Page 4

(5) delete the use of the PRISMA-P checklist as I cannot see how it applies to the current scoping review.
The Prisma-P checklist, originally requested for the submission of this manuscript to BMJ Open, has been removed based on reviewers’ comments.

Please refer to Appendices 1 to 3 for further clarification. With these we also attempt to reduce the increased word count owing to the addition of requested information.

We appreciate the helpful comments from the editor and reviewers above, which we hope has enabled us to better the quality of our manuscript. Thank you also in advance for your time and further consideration of this protocol and its revisions.

We look forward to receiving your response.

Yours sincerely,
Katherine S. McGilton

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**VERSION 2 – REVIEW**

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| **REVIEWER** | Jesper Dammeyer<br>Department of Psychology, University of Copenhagen, Denmark |
| **REVIEW RETURNED** | 31-May-2016 |

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| **GENERAL COMMENTS** | The manuscript has been revised and improved. I can recommend publication. |

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| **REVIEWER** | Tammy Hopper<br>University of Alberta, Canada |
| **REVIEW RETURNED** | 15-Jun-2016 |

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| **GENERAL COMMENTS** | The authors have addressed reviewers' suggestions and requests for revision. The revised manuscript is much improved. Publication of this scoping review protocol will make an important contribution to the under-developed literature in this area. |