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)	Recommendations for successful sensory screening in older adults with dementia in long-term care: A qualitative environmental scan of Canadian specialists
AUTHORS	Wittich, Walter; Hobler, Fiona; Jarry, Jonathan; McGilton, Kathy

VERSION 1 – REVIEW

REVIEWER	Anne W Ekdahl Department of Neurobiology, Care Sciences and Society (NVS), Division of Clinical geriatrics, Karolinska Institutet (KI), Sweden
REVIEW RETURNED	17-Sep-2017

GENERAL COMMENTS	In page 4 r 34 to 39 it says that the cause of dementia is known - to my knowledge it is not. p 8 r 20-21 about the sample size. I agree it seems sufficient, but it is a bit difficult to see that it is based on earlier results. I should says it was shown in the analysis or?

REVIEWER	Ralph Möhler Cochrane Germany, Medical Center - University of Freiburg
REVIEW RETURNED	26-Sep-2017

GENERAL COMMENTS	Thank you for giving me the opportunity to review the interesting manuscript. Following you find my comments which might further improve the manuscript. The introduction covers the important aspects but there is some redundancy. I recommend shortening this section. Please add a short introduction in the method of environmental scan. Selection of the participants: the selection of participants followed a pragmatic approach but seems prone to a selection bias. Please comment why the participants were not been recruited from a wider range of experts. This should also be part of the discussion. The fact that saturation was reached could also be seen as a lack of variation in the experiences of the study participants. Data collection: page p, line 10: Regarding the duration of the interviews please report the range rather than the standard deviation. The results are described comprehensively.

REVIEWER	Francesco Panza, MD, PhD University of Bari Aldo Moro, Bari, Italy
REVIEW RETURNED	01-Oct-2017

GENERAL COMMENTS	This paper aimed to identify screening tools, technologies, and strategies that vision- and hearing-care specialists recommend to front-line healthcare professionals for the screening of older adults in long-term care homes (LTCHs) who have dementia. The goal is ambitious and the manuscript appears to be an hardy work, but there are some limitations and concerns to be addressed. In particular: 1. Introduction: the Authors should include in their References section a recent meta-analysis conducted on the link age-related hearing loss (ARHL)-cognition [Taljaard et al. The relationship between hearing impairment and cognitive function: A meta-analysis in adults. Clin Otolaryngol. 2016;41(6):718-729]. 2. In Table 2, the Authors included a few information about the experience of specialists: for example, describing years' experience working in dementia care, but SD is very high; there is not information about how many older patients each specialist examines every year. 3. In Table 3 (page 27), It would be important to know what recommendations are most cited by the specialists. 4. Discussion: The Authors should include a brief section devoted to the underlying mechanisms linking vision and hearing loss to late-life cognitive disorders. 5. Discussion: Among possible mechanisms underlying the association between ARHL and cognitive decline and between vision loss and cognitive decline, the Authors should explain and clarify some conceptual information about ARHL and the age-related constellation of comorbid pathological factors often included in the operational definitions of frailty syndrome in older age (Front Aging Neurosci. 2015 Jun 9;7:113; Neuroepidemiology. 2016;46:290-1), given that cognitive impairment and dementia are causally linked with frailty (J Alzheimers Dis. 2015;47(4):793-813).

REVIEWER	Heather Whitson Duke University; United States
REVIEW RETURNED	06-Oct-2017

GENERAL COMMENTS	This article addresses an important topic, which is the high co-prevalence of sensory and cognitive impairments in late life and the real-world practice challenges created by this comorbidity. In this qualitative study, the authors conducted structured telephone interviews with 11 health care professionals who specialize in vision or hearing care in cognitively impaired individuals. Following a thematic content analysis, the qualitative data is presented in a framework that summarizes these specialists' recommendations regarding barriers, facilitators, and tools for assessment of sensory impairments in people with cognitive deficits. As far as I know this study makes a unique contribution to existing literature. Major Concerns: 1) Although the authors state that they achieved thematic saturation

	in these 11 interviews, the sampling strategy was narrow in scope and likely to have missed relevant perspectives and knowledge on this topic. All of the 11 providers interviewed in this convenience sample were in Canada and were recruited through connections with the study team or by referral of other participants. This approach seems likely to have missed relevant information on the topic, as it will be biased towards those who are like-minded (hence, not surprising that theme saturation would be reached). The findings are still useful to an appropriate audience but less likely to alter thinking or practice for a general or international audience. 2) This qualitative study only included one type of stakeholder (experts in sensory health screening), without attempting to gather information from nurses in long-term care, caregivers of patients, or primary providers. As such, the findings represent an inventory of opinions from one set of stakeholders (and the opinions are not always aligned). There is some value in the information learned, but again, the potential impact of the findings is limited by virtue of the narrow scope. Minor Points: 1) Please clarify last sentence of the abstract: “These suggestions were contradicted at times the realities of service provision or the need for standardized and validated measures.” Does it mean these suggestions were sometimes “in contrast to” the realities of service provision or the need for standard, valid measures? 2) Introduction: I don’t think there is consensus around the statement “The neurodegeneration that characterizes dementia is caused by a proliferation of the pathogenic proteins β-amyloid (Aβ) and tau across neural networks…” First, it should be clarified that amyloid and tau are characteristic in Alzheimer’s dementia, not all dementia. Secondly, it should not be said that the neurodegeneration is caused by amyloid and tau. We know there is neurodegeneration and we know there is accumulation of amyloid and tau, but we don’t know for certain that amyloid/tau cause the neurodegeneration. 3) Results: there are instances in which it seems that interpretations or speculations are included in the Results section. Please clarify whether statements such as this (in the Results section) represent data/perspectives that were abstracted from the interviews, or represent the author’s speculation: “In part, this absence may be due to policies or regulations that do not include or promote sensory screening,lack of education and training on how to screen, or not prioritizing hearing and vision screening given the multiple demands on their time.” 4) Results section: It is unclear why more text was devoted to expounding on the barriers involving staff inattention and lack of education and less is given to the other barriers identified in the final paragraph of the Barriers section. 5) Results: little attention is given in the text to vision screening tools and strategies, compared to those for hearing. There were fewer vision-specific tips elicited but that may mean that the ones listed are all the more important. 6) Table 3 could be a useful resource to individuals wanting to create a sensory screening program in a nursing home setting. I don’t see “cerumen removal prior to screening” included in the table, although it surfaced during interviews as an important strategy.

REVIEWER	Katharina Echt US Department of Veterans Affairs Birmingham/ Atlanta Geriatric Research, Education and Clinical

	Center; Emory University Department of Medicine Division of General Medicine and Geriatrics United States
REVIEW RETURNED	26-Oct-2017

GENERAL COMMENTS	Kudos to the authors for generating another high caliber paper, addressing an area critically important to advancing the field of sensory loss in aging and doing so in a fashion that features clinician engagement ultimately for generating practicable healthcare process and quality improvement to better meet the sensory needs of older long-term care residents with cognitive impairment. Introduction: 4|46 consider bolstering this point by additionally citing literature, here or elsewhere, regarding interventions for sensory loss which moreover support cognitive function. 5|20 – useful here to provide example citations of research that has in contrast to the foregoing accommodated cognitive loss in the sensory assessment of older adults, relative to accommodating sensory loss in support of valid cognitive assessment. 5|25 – "...sensory tests require a response ..." - consider noting that in cognitive impairment the making of a veridical response is the culmination of several component processes any or all of which may be adversely impacted (e.g., attention to instructions, comprehension and recall of instructions, sustained focus (vigilance) as stimuli are presented, response selection, response making) as a function of cognitive loss severity, and experience, along a continuum. 6|20 –clearly staff education is needed. Bolster this point via reference to prior work to develop and implement interprofessional clinical education (in-service, self-study curricula) in the LTCH setting (e.g., Duffy, MA et al., 1995 – see also Watson, G 2001, p. 320-321, at http://onlinelibrary.wiley.com/doi/10.1046/j.1532-5415.2001.4930317.x/epdf) and barriers / challenges encountered.

VERSION 1 – AUTHOR RESPONSE

Reviewer: 1
Reviewer Name: Anne W Ekdahl
Institution and Country: Department of Neurobiology, Care Sciences and Society (NVS), Division of Clinical geriatrics, Karolinska Institutet (KI), Sweden
Competing Interests: None declared

In page 4 r 34 to 39 it says that the cause of dementia is known - to my knowledge it is not.
Response: We agree, this sentence has been rewritten accordingly in order to express the multifactorial nature of dementia.

p 8 r 20-21 about the sample size. I agree it seems sufficient, but it is a bit difficult to see that it is based on earlier results. I should says it was shown in the analysis or?
Response: We have rephrased this sentence to clarify that previous research with similar methodological approach guided us in the sample size determination during recruitment. We believe

that the discussion (and limitation) of data saturation in the discussion section address the concern about confirming this choice of sample size.

Reviewer: 2
Reviewer Name: Ralph Möhler
Institution and Country: Cochrane Germany, Medical Center - University of Freiburg
Competing Interests: None declared

Thank you for giving me the opportunity to review the interesting manuscript. Following you find my comments that might further improve the manuscript.

The introduction covers the important aspects but there is some redundancy. I recommend shortening this section.
Response: In the process of incorporating the feedback from all reviewers, we have also restructured and shortened some of the introduction. We hope that these redundancies have been eliminated.

Please add a short introduction in the method of environmental scan.
Response: We have added three sentences at the beginning of the methods section in order to introduce the use of an environmental scan as the methodology of choice.

Selection of the participants: the selection of participants followed a pragmatic approach but seems prone to a selection bias. Please comment why the participants were not been recruited from a wider range of experts. This should also be part of the discussion. The fact that saturation was reached could also be seen as a lack of variation in the experiences of the study participants.
Response: This information has been added as requested to both the methods and the limitations in the discussion.

Data collection: page p, line 10: Regarding the duration of the interviews please report the range rather than the standard deviation.
Response: The range has been added to the Data collection section.

The results are described comprehensively.
Response: Thank you

Reviewer: 3
Reviewer Name: Francesco Panza, MD, PhD
Institution and Country: University of Bari Aldo Moro, Bari, Italy
Competing Interests: None declared

This paper aimed to identify screening tools, technologies, and strategies that vision- and hearing-care specialists recommend to front-line healthcare professionals for the screening of older adults in long-term care homes (LTCHs) who have dementia. The goal is ambitious and the manuscript appears to be an hardy work, but there are some limitations and concerns to be addressed. In particular:

1. Introduction: the Authors should include in their References section a recent meta-analysis conducted on the link age-related hearing loss (ARHL)-cognition [Taljaard et al. The relationship between hearing impairment and cognitive function: A meta-analysis in adults. Clin Otolaryngol. 2016;41(6):718-729].
Response: This suggested references has been added accordingly.

2. In Table 2, the Authors included a few information about the experience of specialists: for example, describing years' experience working in dementia care, but SD is very high; there is not information about how many older patients each specialist examines every year.
Response: Unfortunately, the frequency or intensity of service delivery to older adults with sensory and cognitive impairment was not part of our list of questions, even though we agree that this would be informative to put the results in context. Therefore, we have added this suggestion in the discussion section for future studies.

3. In Table 3 (page 27), It would be important to know what recommendations are most cited by the specialists.
Response: We recognize that some readers may be interested in a presentation of recommendations by response frequency. Such display of the data however would encourage the perception that quantitative displays equal qualitative relevance. Upon careful and thorough reflection of this point, we decided not to report frequencies of participant responses as proposed by the reviewer. Margarete Sandelowski (2001), in her article on this topic proposed that there are certain instances when the quantification of qualitative findings is appropriate. However, we believe that this is not one of those cases. We do, however, somewhat accommodate the reviewer as the extent to which each findings section is discussed reflects the frequency in which the comments were reported.
[Sandelowski, M. (2001). Focus on Research Methods: Real qualitative researchers do not count: The use of numbers in qualitative research, 24(3), 230–240]

4. Discussion: The Authors should include a brief section devoted to the underlying mechanisms linking vision and hearing loss to late-life cognitive disorders. Among possible mechanisms underlying the association between ARHL and cognitive decline and between vision loss and cognitive decline, the Authors should explain and clarify some conceptual information about ARHL and the age-related constellation of comorbid pathological factors often included in the operational definitions of frailty syndrome in older age (Front Aging Neurosci. 2015 Jun 9;7:113; Neuroepidemiology. 2016;46:290-1), given that cognitive impairment and dementia are causally linked with frailty (J Alzheimers Dis. 2015;47(4):793-813).
Response: We appreciate that an overview of the possible causal links among sensory and cognitive decline, as well as its links to frailty are an important component of this topic. However, we see ourselves limited in "briefly" reviewing this topic, given that the manuscript is already lengthy, and that our data cannot in any way contribute to the ongoing discussion regarding causality or mechanisms. Therefore, we have chosen to simply refer to the ongoing search for consensus on causality in the introduction, with appropriate references.

Reviewer: 4
Reviewer Name: Heather Whitson
Institution and Country: Duke University; United States
Competing Interests: None declared

This article addresses an important topic, which is the high co-prevalence of sensory and cognitive impairments in late life and the real-world practice challenges created by this comorbidity. In this qualitative study, the authors conducted structured telephone interviews with 11 health care professionals who specialize in vision or hearing care in cognitively impaired individuals. Following a thematic content analysis, the qualitative data is presented in a framework that summarizes these specialists' recommendations regarding barriers, facilitators, and tools for assessment of sensory impairments in people with cognitive deficits. As far as I know this study makes a unique contribution to existing literature.

Major Concerns:
Although the authors state that they achieved thematic saturation in these 11 interviews, the sampling strategy was narrow in scope and likely to have missed relevant perspectives and knowledge on this topic. All of the 11 providers interviewed in this convenience sample were in Canada and were recruited through connections with the study team or by referral of other participants. This approach seems likely to have missed relevant information on the topic, as it will be biased towards those who are like-minded (hence, not surprising that theme saturation would be reached).
Response: We agree with the reviewer that this point is a valid criticism of our study, and we have added an explanation within the limitations section of the discussion, referring to the limitations of time and money as the root source for not expanding our recruitment further.

Comment: The findings are still useful to an appropriate audience but less likely to alter thinking or practice for a general or international audience.
Response: We are happy to hear that the reviewer appreciates the usefulness of our findings; however, we respectfully disagree with the reviewer on the point of not altering practice because we believe that the vision/hearing/cognition community of practitioners as well as researchers in this domain are currently actively looking and asking for information of this type, because of the dearth of information available on this topic from a practitioner's perspective. Therefore, and in line with some of the comments by the other 4 reviewers, we hope that we are able to convince this reviewer that our findings are indeed of relevance for an international audience.

Comment: This qualitative study only included one type of stakeholder (experts in sensory health screening), without attempting to gather information from nurses in long-term care, caregivers of patients, or primary providers. As such, the findings represent an inventory of opinions from one set of stakeholders (and the opinions are not always aligned). There is some value in the information learned, but again, the potential impact of the findings is limited by virtue of the narrow scope.
Response: Please note that we conducted a parallel environmental scan with nurses in long-term care, which is currently under review with another journal. Given the qualitative nature of both studies and the word limits of manuscript submissions, it was not possible to combine both data sets in one publication. Therefore, we decided to keep the scope narrow and provide more depth in the present manuscript. We have acknowledged this second upcoming publication in the discussion section, and added the absence of other additional stakeholders as a limitation.

Minor Points:
Please clarify last sentence of the abstract: "These suggestions were contradicted at times the realities of service provision or the need for standardized and validated measures." Does it mean these suggestions were sometimes "in contrast to" the realities of service provision or the need for standard, valid measures?
Response: We have edited this sentence accordingly, replacing "contradicted" with "in contrast to". Thank you for this clarification suggestion.

Introduction: I don't think there is consensus around the statement "The neurodegeneration that characterizes dementia is caused by a proliferation of the pathogenic proteins β-amyloid (Aβ) and tau across neural networks…" First, it should be clarified that amyloid and tau are characteristic in Alzheimer's dementia, not all dementia. Secondly, it should not be said that the neurodegeneration is caused by amyloid and tau. We know there is neurodegeneration and we know there is accumulation of amyloid and tau, but we don't know for certain that amyloid/tau cause the neurodegeneration.
Response: In line with comments by other reviewers as well, this sentence has been edited to remove any reference to any specific cause but to simply refer to the multifactorial picture around dementia in

general. We decided to keep this as non-specific as possible because the purpose of this paper is not to discuss causality but to focus on clinically relevant strategies.

Results: there are instances in which it seems that interpretations or speculations are included in the Results section. Please clarify whether statements such as this (in the Results section) represent data/perspectives that were abstracted from the interviews, or represent the author's speculation: "In part, this absence may be due to policies or regulations that do not include or promote sensory screening, lack of education and training on how to screen, or not prioritizing hearing and vision screening given the multiple demands on their time."
Response: We have re-formulated this sentence in order to reflect that the participants expressed such speculation.

Results section: It is unclear why more text was devoted to expounding on the barriers involving staff inattention and lack of education and less is given to the other barriers identified in the final paragraph of the Barriers section.
Response: We have added a qualifier to the beginning of this paragraph, explaining that these were barriers that were less frequently mentioned, since the previous barriers-section begins with "the most often repeated" barriers.

Results: little attention is given in the text to vision screening tools and strategies, compared to those for hearing. There were fewer vision-specific tips elicited but that may mean that the ones listed are all the more important.
Response: We made the same observation as this reviewer while we are conducting the analysis. Since our analysis was data-driven, our report reflects the content of the interviews, whereby more data were available on hearing devices and strategies. We have added this observation within the limitations section.

Table 3 could be a useful resource to individuals wanting to create a sensory screening program in a nursing home setting. I don't see "cerumen removal prior to screening" included in the table, although it surfaced during interviews as an important strategy.
Response: We have corrected this by adding cerumen removal to Table 3. We should explain that our original definition of "strategy" was to look for information where existing protocols are strategically altered for this population. In the case of cerumen removal, we do not believe that this activity should be specific for this population but should apply to all older adults in long-term care. However, in order to make Table 3 as rich and useful as possible, we agree that adding this item will remind practitioners of its existence and importance.

Reviewer: 5
Reviewer Name: Katharina Echt
Institution and Country: US Department of Veterans Affairs, Birmingham/ Atlanta Geriatric Research, Education and Clinical Center; Emory University Department of Medicine, Division of General Medicine and Geriatrics, United States
Competing Interests: none declared

Comment: Kudos to the authors for generating another high caliber paper, addressing an area critically important to advancing the field of sensory loss in aging and doing so in a fashion that features clinician engagement ultimately for generating practicable healthcare process and quality improvement to better meet the sensory needs of older long-term care residents with cognitive impairment.
Response: We are delighted that this reviewer finds our work as useful as we hope it to be.

Introduction:
4|46 consider bolstering this point by additionally citing literature, here or elsewhere, regarding interventions for sensory loss which moreover support cognitive function.
Response: We have added some text and additional references to rehabilitation interventions that support cognitive function.

5|20 – useful here to provide example citations of research that has in contrast to the foregoing accommodated cognitive loss in the sensory assessment of older adults, relative to accommodating sensory loss in support of valid cognitive assessment.
Response: Thank you to the reviewer for catching this omission (the joy of referencing software glitches). We have now inserted the appropriate references in this section of the introduction.

5|25 – "...sensory tests require a response ..." - consider noting that in cognitive impairment the making of a veridical response is the culmination of several component processes any or all of which may be adversely impacted (e.g., attention to instructions, comprehension and recall of instructions, sustained focus (vigilance) as stimuli are presented, response selection, response making) as a function of cognitive loss severity, and experience, along a continuum.
Response: We have added this information to the introduction, in order to better justify the direction and purpose of the presented study.

6|20 –clearly staff education is needed. Bolster this point via reference to prior work to develop and implement inter-professional clinical education (in-service, self-study curricula) in the LTCH setting (e.g., Duffy, MA et al., 1995 – see also Watson, G 2001, p. 320-321, at http://onlinelibrary.wiley.com/doi/10.1046/j.1532-5415.2001.4930317.x/epdf) and barriers / challenges encountered.
Response: We have added additional text in the discussion highlighting the importance of staff education and knowledge translation, and added the recommended and other references.

VERSION 2 – REVIEW

REVIEWER	Ralph Möhler Cochrane Germany, Medical center - University of Freiburg, Germany
REVIEW RETURNED	05-Dec-2017

GENERAL COMMENTS	Thank you very much for the revision. Based on the revised paper, I have an additional comment. In the revised paper another part of the project is mentioned about the same topic and conducted in parallel, including nursing staff. I am wondering why the results of this other part are not published together with these results. This would strongly increase the value of the paper. Therefore I recommend reporting both parts of the project in one paper. Minor comment: Please add the information about the convenience sample in the abstract.

REVIEWER	Francesco Panza, MD, PhD

	Neurodegenerative Disease Unit, Department of Basic Medicine, Neuroscience, and Sense Organs, University of Bari Aldo Moro, Bari, Italy
REVIEW RETURNED	23-Nov-2017

GENERAL COMMENTS	My previous concerns have been satisfactorily addressed. Please, check references 7 and 13 for correctness.

VERSION 2 – AUTHOR RESPONSE

Reviewer: 2
Reviewer Name: Ralph Möhler
Institution and Country: Cochrane Germany, Medical center - University of Freiburg, Germany
Competing Interests: None declared

Thank you very much for the revision.

Comment: Based on the revised paper, I have an additional comment. In the revised paper another part of the project is mentioned about the same topic and conducted in parallel, including nursing staff. I am wondering why the results of this other part are not published together with these results. This would strongly increase the value of the paper. Therefore I recommend reporting both parts of the project in one paper.
Response: We are happy to hear that the reviewer agrees that the parallel findings with nursing staff are of such interest. There are two reasons why these findings are not integrated into the same paper for BMJ Open: 1). Both studies are qualitative, and therefore word-heavy given that the results include individual quotes. Therefore, in order to maintain the rich nature of each of the data sets, we decided to present the two studies individually; 2) this second parallel manuscript is currently under revision with another journal. Therefore, we prefer not to change direction at this point mid-submission, as we have already committed to the submission with a different journal with this parallel publication.

Minor comment:
Please add the information about the convenience sample in the abstract.
Response: This information has been added to the abstract.

Reviewer: 3
Reviewer Name: Francesco Panza, MD, PhD
Institution and Country: Neurodegenerative Disease Unit, Department of Basic Medicine, Neuroscience, and Sense Organs, University of Bari Aldo Moro, Bari, Italy
Competing Interests: None declared

My previous concerns have been satisfactorily addressed. Please, check references 7 and 13 for correctness.
Response: Thank you for catching this error, we have merged these 2 references as they were intended to refer to the same document. The journal title has been corrected.