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) | Implementation strategies supporting fall prevention interventions in a long-term care facility for older persons: a systematic review protocol |
|---------------------|-------------------------------------------------------------------------------------------------------------------------------------|
| AUTHORS             | Albasha, Neah; McCullagh, Ruth; Cornally, Nicola; Mc Hugh, Sheena; Timmons, Suzanne                                                   |

VERSION 1 – REVIEW

| REVIEWER         | Morris, Meg |
|------------------|-------------|
|                  | La Trobe Univ, Room 423 HS3 |
| REVIEW RETURNED  | 25-Aug-2021 |

GENERAL COMMENTS

This is a very nice paper on an important topic. Its clearly written and thorough. My feedback is as follows:

1. The SR will consider all original research between 1st January 2001 and 1st May 2021. This should be until 21 August 2021.

2. Please be more specific about the following inclusion criteria: “…where data is presented on the implementation strategy or outcome”. Please separate these out and define them and be much more specific about what you mean by “outcome”

3. Please explain to the reader what the Expert Recommendation for Implementing Change Taxonomy is and why its helpful to use.

4. In the strengths and limitations list and throughout you state an aim is to implement these interventions in the real world. What specifically do you mean by the “real world”? In the body of the manuscript please discuss the construct of “real world” in greater detail

5. In the manuscript, please describe what you mean by the different categories of outcomes (i.e., implementation outcomes, service outcomes and client outcomes

6. Please explain more what you mean by multidimensional intervention components – the evidence on multi-factorial interventions is not all that strong – it seems to be over-emphasised in the current manuscript. Please see the Cameron Cochrane review.

7. Please operationally define what you mean by a fall.

8. Are you going to separate injurious falls from non-injurious falls & how will you do this.
9. Please explain Powell et al.’s and Proctors et al.’s frameworks in more detail as most readers won’t be familiar with these.

10. I am concerned that no patient and public will be involved in this review – please can you reconsider as I think it’s important to have consumers co-produce the research.

11. Some recent refs seem to be missing – e.g.

Heng, H., Jazayeri, D., Shaw, L., Kiegaldie, D., Hill, A. M., & Morris, M. (2020). Hospital falls prevention with patient education: a scoping review. BMC Geriatrics, 20, 1-12. doi:10.1186/s12877-020-01515-w

Shaw, L., Kiegaldie, D., & Morris, M. E. (2021). Educating health professionals to implement evidence-based falls screening in hospitals. Nurse Education Today, 101. doi:10.1016/j.nedt.2021.104874

Jazayeri, D., Heng, H., Slade, S. C., Seymour, B., Lui, R., Volpe, D., . . . Morris, M. E. (2021). Benefits and risks of non-slip socks in hospitals: A rapid review. International Journal for Quality in Health Care, 33(2). doi:10.1093/intqhc/mzab057

Heng, H., Slade, S. C., Jazayeri, D., Jones, C., Hill, A. M., Kiegaldie, D., . . . Morris, M. E. (2021). Patient Perspectives on Hospital Falls Prevention Education. Frontiers in Public Health, 9. doi:10.3389/fpubh.2021.592440

Shaw, L. K., Kiegaldie, D., Morris, M. E., & Jones, C. (2021). Improving hospital falls screening and mitigation using a health professional education framework. Nurse Education Today, 98. doi:10.1016/j.nedt.2020.104695

Francis-Coad, J., Lee, D. C. A., Haines, T. P., Morris, M. E., McPhail, S. M., Etherton-Beer, C., . . . Hill, A. M. (2021). Fall prevention education for older people being discharged from hospital: Educators’ perspectives. Health Education Journal. doi:10.1177/00178969211032711

Morris, M. E., Haines, T., Hill, A. M., Cameron, I. D., Jones, C., Jazayeri, D., . . . McPhail, S. M. (2021). Divesting from a Scored Hospital Fall Risk Assessment Tool (FRAT): A Cluster Randomized Non-Inferiority Trial. Journal of the American Geriatrics Society. doi:10.1111/jgs.17125

REVIEWER
Perracini, Monica
Universidade Cidade de Sao Paulo, Physical Therapy

REVIEW RETURNED
09-Sep-2021

GENERAL COMMENTS
The investigation on the effectiveness of fall prevention implementation strategies in long-term care facilities is relevant and valuable for all stakeholders involved in long-term care. Therefore, I really encourage authors to proceed with their study. Notwithstanding, one major issue related to this protocol is the study design. My opinion is that its objectives fit better for a scoping review rather than a systematic review. Clearly, the authors want to map all the implementation strategies and outcomes using several different studies sources: clinical trials, qualitative studies, and quasi-experimental studies. They
proposed a definite framework for collecting and synthesizing information. However, the wide range of design studies makes it harder to appraise studies regarding their effectiveness and risk of bias critically. Another complex issue is dealing with 73 distinct strategies grouped in nine subheadings and eight different outcomes. Therefore, the mapping perspective on scoping reviews based on the proposed frameworks is more reasonable and adequate to initially identify how these implementation strategies are set up in studies and the gaps. For instance, a bubble chart can be used to flag what are the most frequent strategies. I would recommend an SR after this initial scoping review based only on randomized clinical trials that investigated the effectiveness of implementation interventions if the mapping revealed that there are enough studies.

Other comments:

1. Although the terminology is a problem in LTC, it seems inadequate to use long-term care settings for residential care for older people since home-based programs are also considered for long-term care. I would suggest using long-term care facilities. Saying so, there is a wide range of LTCFs (private, public and non-profit). This also should be at least identified in studies. Globally, it can vary a lot, including quality safety issues, staff number etc.

2. Please, when you mention fall-related outcomes (incidence of falls, risk of falling, the proportion of fallers and recurrent fallers), it is critically important to also identify the timeframe for follow-up since fall events depend on exposure. In addition, it's also important to evaluate which practices in the intervention and control group (frequently denominated as usual care or current practices) were implemented. Secondary outcomes can also be identified (e.g. reduction in the number of medications used, decreased disability, etc.). The Resident's baseline data should also be collated and informed in extraction tables. Sample sizes should be analysed in terms of adequacy to estimate fall reduction (e.g. 35% reduction, etc.)

3. Not only which the strategy that has been used is essential but also how was the implementation process. This is usually collected using a multi-methodology approach that can also be further discussed in a scoping review.

4. Please give a reason for including only studies in English and Arabic.

VERSION 1 – AUTHOR RESPONSE

The reviewer comments:
The reviewer 1:
This is a very nice paper on an important topic. Its clearly written and thorough. My feedback is as follows:
1. The SR will consider all original research between 1st January 2001 and 1st May 2021. This should be until 21 August 2021.
Response: We appreciate your review of our protocol; we have made this change to page 1, lines 23-24.
2. Please be more specific about the following inclusion criteria: "...where data is presented on the implementation strategy or outcome". Please separate these out and define them and be much more specific about what you mean by "outcome"

Response: We have separated these out in the abstract on page 1, lines 24-25, and have defined “implementation strategy” (page 5, line 107-109). We have also added more detail to the outcome section, to better explain the different type of study outcomes, page 7, lines 167-169.

3. Please explain to the reader what the Expert Recommendation for Implementing Change Taxonomy is and why its helpful to use.

Response: More information has been included (page 5-6, lines 118-126).

4. In the strengths and limitations list and throughout you state an aim is to implement these interventions in the real world. What specifically do you mean by the “real world”? In the body of the manuscript please discuss the construct of “real world” in greater detail

Response: We have provided more explanation of the real-world clinical setting (page 4, lines 94-100).

5. In the manuscript, please describe what you mean by the different categories of outcomes (i.e., implementation outcomes, service outcomes and client outcomes

Response: We have defined the categories of outcomes (page 7, lines 167-169). We have now removed “service outcome” when we will not be focussing on this - hopefully this makes it clearer to the reader.

6. Please explain more what you mean by multidimensional intervention components – the evidence on multi-factorial interventions is not all that strong – it seems to be over-emphasised in the current manuscript. Please see the Cameron Cochrane review.

Response: We have explained in more detail what is meant by both multifactorial and multicomponent (or multidimensional) interventions on page 4, lines 88-91. We agree that the evidence for multifactorial (tailored) and multicomponent/ multidimensional (standardised) interventions in preventing falls in residential care facilities is not strong; however the evidence for single interventions in this setting is also low. This is in contrast to the community where the evidence for exercise-only interventions is excellent (which is perhaps what you are alluding to?). To clarify, we do intend to include single intervention and multifactorial and multicomponent interventions, and indeed our text on the challenges of the "real world" (comment #4) reflects the particular challenges of implementing multifactorial interventions in actual clinical practice.

7. Please operationally define what you mean by a fall.

Response: We have defined falls (page 3, lines 58-59), as per the WHO.

8. Are you going to separate injurious falls from non-injurious falls & how will you do this.

Response: As our main focus is on implementation strategies and implementation outcomes, falls-related outcomes are only part of our outcome reporting. Thus, we will focus on falls risk and rate (whether causing an injury or not). Of note, we will not exclude a paper with good implementation strategy and implementation outcome data if it only includes data on injurious falls (noting that we expect this is unlikely). Page 8, lines 175-176.

9. Please explain Powell et al.’s and Proctors et al.’s frameworks in more detail as most readers wont be familiar with these.

Response: We have expanded our description of the frameworks of Powell et al. (page 11-12, lines 238-244) and Proctors et al. (page 12, lines 247-255).
10. I am concerned that no patient and public will be involved in this review – please can you reconsider as I think its important to have consumers co-produce the research.
Response: Thank you for raising this important issue. Involving staff working in residential care facilities in this review is extremely beneficial to effectively interpret the results. Two of the authors (ST and NC) have extensive clinical experience in residential care (one prior and one ongoing), and the need for this systematic review arose from conversations with other clinicians in RCF. However, based on your feedback, we will now also include another clinician outside of our research group, who currently works in a LCF. We have also reflected on your suggestion to include patients (i.e. residents or their families or their representatives), and based on this we will also include a senior advocate (from our national support and advocacy service for vulnerable adults, older people and healthcare patients) in the review process. We have considered these matters on page 13, lines 272-278.

11. Some recent refs seem to be missing – eg.

Heng, H., Jazayeri, D., Shaw, L., Kiegaldie, D., Hill, A. M., & Morris, M. (2020). Hospital falls prevention with patient education: a scoping review. BMC Geriatrics, 20, 1-12. doi:10.1186/s12877-020-01515-w

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Morris, M. E., Haines, T., Hill, A. M., Cameron, I. D., Jones, C., Jazayeri, D., . . . McPhail, S. M. (2021). Divesting from a Scored Hospital Fall Risk Assessment Tool (FRAT): A Cluster Randomized Non-Inferiority Trial. Journal of the American Geriatrics Society. doi:10.1111/jgs.17125
Response: Thank you for the references you suggested; the resources are very useful because they contain valuable information on preventing falls among older people. However, our focus is on preventing falls among older people in residential care facilities, and these references relate to the acute care context (hospitals), and so we will not include them in our protocol.

Reviewer: 2
Prof. Monica Perracini, Universidade Cidade de Sao Paulo, Universidade estadual de Campinas
Comments to the Author:
The investigation on the effectiveness of fall prevention implementation strategies in long-term care
facilities is relevant and valuable for all stakeholders involved in long-term care. Therefore, I really encourage authors to proceed with their study. Notwithstanding, one major issue related to this protocol is the study design. My opinion is that its objectives fit better for a scoping review rather than a systematic review. Clearly, the authors want to map all the implementation strategies and outcomes using several different studies sources: clinical trials, qualitative studies, and quasi-experimental studies. They proposed a definite framework for collecting and synthesizing information. However, the wide range of design studies makes it harder to appraise studies regarding their effectiveness and risk of bias critically. Another complex issue is dealing with 73 distinct strategies grouped in nine subheadings and eight different outcomes. Therefore, the mapping perspective on scoping reviews based on the proposed frameworks is more reasonable and adequate to initially identify how these implementation strategies are set up in studies and the gaps. For instance, a bubble chart can be used to flag what are the most frequent strategies. I would recommend an SR after this initial scoping review based only on randomized clinical trials that investigated the effectiveness of implementation interventions if the mapping revealed that there are enough studies.

Response: We have reflected on this interesting suggestion but ultimately we believe an SR is more appropriate. We have two clearly defined research questions (page 6, lines 130-134), which will not change. A scoping review is exploratory, based on broad and unspecification research questions, and it depends on the evidence base identified to direct the research, with the focus liable to change as the search progresses. We already know that there are several RCTs and before-after studies which describe falls intervention programme implementation in residential care, and we do not plan to simply “map” this literature. Many systematic reviews have been published on the implementation strategies and outcomes, for various interventions (often characterised using behaviour change taxonomy, or in this case an implementation framework and taxonomy), with some recent papers detailed below. Thus, there is a clear precedent for performing an SR on implementation strategies and/or implementation outcomes. Re. the issue of having 73 strategies in the ERIC compilation, in the first instance we intend to present implementation strategy data under the nine subheadings only, in the results table. Where used in the included studies, the individual strategies will be used to systematically and consistently code the data (which may be described differently by different authors), but we will not be presenting data on these individually. To specifically clarify re. the inclusion of qualitative studies: these will only be included as an additional or complementary source of information on the intervention or implementation strategy where an RCT and/or pre-post study has a complementary qualitative paper (as often occurs), or uses mixed methods. This qualitative data can help contextualise the success or lack of success of implementation. Furthermore, we are not planning to include any grey literature or guidelines/recommendations, as is common in scoping reviews. Recent SRs of implementation strategies or implementation outcomes. Spoon D, Rietbergen T, Huis A, Heinen M, Dijk M Van, Bodegom-vos L Van, et al. International Journal of Nursing Studies Implementation strategies used to implement nursing guidelines in daily practice: A systematic review. Int J Nurs Stud [Internet]. 2020;111:103748. Available from: https://doi.org/10.1016/j.ijnurstu.2020.103748

Peven K, Bick D, Purssell E, Rotevatn TA, Nielsen JH, Taylor C. Evaluating implementation strategies for essential newborn care interventions in low- and low middle-income countries: a systematic review. 2020;

Wagenaar BH, Hammett WH, Jackson C, Kemp CG, Atkins DL, Belus JM. Implementation outcomes and strategies for depression interventions in low- and middle-income countries: a systematic review. 2021;

Goorts K, Dizon J, Milanese S. The effectiveness of implementation strategies for promoting evidence informed interventions in allied healthcare: a systematic review. 2021;0:1–11 PubMed.
Villarosa AR, Maneze D, Ramjan LM, Srinivas R, Camilleri M, George A. The effectiveness of guideline implementation strategies in the dental setting: A systematic review. Implement Sci. 2019;14(1):1 PubMed –16.

Johnson LG, Armstrong A, Joyce CM, Teitelman AM, Buttenheim AM. Implementation strategies to improve cervical cancer prevention in sub-Saharan Africa: A systematic review. Implement Sci. 2018;13(1):1 PubMed –18.

Other comments:

1. Although the terminology is a problem in LTC, it seems inadequate to use long-term care settings for residential care for older people since home-based programs are also considered for long-term care. I would suggest using long-term care facilities. Saying so, there is a wide range of LTCFs (private, public and non-profit). This also should be at least identified in studies. Globally, it can vary a lot, including quality safety issues, staff number etc.

Response: We agree that the term ‘LTC facilities’ would clearly differentiate long-term residential-based care from long-term but home-based care. We have changed this (page 1, lines 14 and 16; page 7, lines 151-153). We will indeed describe the provider-type for the facilities in each study.

2. Please, when you mention fall-related outcomes (incidence of falls, risk of falling, the proportion of fallers and recurrent fallers), it is critically important to also identify the timeframe for follow-up since fall events depend on exposure. In addition, it’s also important to evaluate which practices in the intervention and control group (frequently denominated as usual care or current practices) were implemented. Secondary outcomes can also be identified (e.g. reduction in the number of medications used, decreased disability, etc.). The Resident’s baseline data should also be collated and informed in extraction tables. Sample sizes should be analysed in terms of adequacy to estimate fall reduction (e.g. 35% reduction, etc.)

Response: Thank you for offering these suggestions. We have now included in the protocol that we will present the duration of the intervention and the follow-up, as the timeframe is also important when considering implementation outcomes, particularly sustainability. (page 11; line 227). We will be presenting the data on the implementation of the intervention in detail, and will of course also detail any usual care or control intervention implementation also (page 11, line 229). We do not plan to evaluate the evidence for change in medication use or functional ability (although this will be included in the discussion section if crucial to understanding the implementation success), as our focus is on 1) implementation outcomes and 2) falls-related data. We will indeed include baseline data on the residents as available. (page 11; line 228)

3. Not only which the strategy that has been used is essential but also how was the implementation process. This is usually collected using a multi-methodology approach that can also be further discussed in a scoping review.

We will be including a description of the implementation process and the success of the process (i.e. the implementation outcome) - see SR objective #1 on page 6, lines 139-140. As previously, this can be described well in an SR.

4. Please give a reason for including only studies in English and Arabic.

We have included the two languages as one of the authors speaks Arabic, allowing us to include any papers found in this language. We have included this explanation (Page 10; lines 204-205)
| **GENERAL COMMENTS** | The revision addresses my concerns. I just have one remaining concern - to make the review current by time of publication I think the search should be extended to Dec 31 2021. Thus the manuscript should say: "The SR will consider all original research that empirically evaluated or tested implementation strategies to support fall prevention interventions in LCF, published in English or Arabic between 1st January 2001 and 31st December 2021. And the review should be updated in line with this, thank you. |