PEER REVIEW HISTORY

ARTICLE DETAILS

TITLE (PROVISIONAL)	Perspectives of health professionals towards deprescribing practice in Asian nursing homes: a qualitative interview study
AUTHORS	Kua, Chong-Han; Mak, Vivienne; Lee, Shaun Wen Huey

VERSION 1 – REVIEW

REVIEWER	Nagham Ailabouni University of washington
REVIEW RETURNED	26-Mar-2019

GENERAL COMMENTS	It is difficult to compile research related to the barriers and enablers of deprescribing in a succinct way. I commend you for your work as I believe this is an important area for research and addresses a gap in the literature in Asia. However, I would recommend you to provide the manuscript to professional to proof-read the entire manuscript. I believe this would make the entire manuscript flow better and ensure that all typos and grammatical errors are picked up. This will also help with consistency in displaying of the quotes included, and make sure that the reader is getting the right message from the included quotes which are valuable and support existing literature. BMJ Open Review Title: Perspectives of health professionals towards deprescribing practice in nursing homes: an Asian setting Major comments • Abstract, Methods utilized need to be included in the design section of the abstract • Strengths and limitations summary, point 3: Limited to other Asian countries and other settings worldwide as well. This is a major limitation and more transparency is needed • Intro, line 25: Major flaw in the definition of deprescribing. Deprescribing does not involve the substitution of agents. Only reduction, tapering and stopping/discontinuing. • Line 27: It is not known that deprescribing definitely improves patient outcomes. Language needs to change to reflect this. Suggest using potentially improve patient outcomes. • The authors outline that deprescribing is a new area of research in Asia. However, it is not clear the impact this study can have for future research. I would suggest making it clear that in order to develop processes of deprescribing that work in a particular health care system, firstly gaining an understanding of the barriers and enablers is pertinent in developing the right process that can ensure successful uptake of deprescribing

	• Methods and analysis, Line 11-14: Were participants and/or convenors aware that the deprescribing study is going to occur? If so, then the results of the study could be more biased towards those who are already aware and have more motivation and interest in conducting deprescribing. This needs to be listed as an additional limitation. • Semi-structured interviews : Line 60. The questions used in the interview are overall valuable, however a clearer and more in-depth description of how these questions were generated and why these were chosen is needed in the methods section. Was a certain qualitative framework used? Why or why not? • There is an imbalance in the number of recruited pharmacists, doctors and nurses where most of the data that could have been coded comes from nurses. Although the authors mention this in the limitations section of the discussion, more clarity around the effect this may have on displaying a balanced view on deprescribing from all included parties who are involved is important to note. • I suggest incorporating a table displaying the COREQ-32 checklist for this study • Page 10, line 60: The supporting quote related to calcium supplementation doesn't make sense and doesn't support the sub-theme illustrated. • Page 14, line 36-48: This is a major theme that needs to be highlighted in light of other studies. Specialist influence on GPs' autonomy and competence when considering stopping medicines (i.e. GPs are more reluctant to mess with medicines started by specialists). The quote illustrates this somewhat but the authors need to highlight this theme more strongly. • Discussion, line 7-9: This sentence sends the message that residents were perhaps included in the study. This needs to be amended where it is explained that health professionals interviewed believe that deprescribing might be a priority for their patients. Minor comments • Abstract, Line 37: Further methods that can help support the process of deprescribing would be more appropriate than improve deprescribing • Strengths and limitations summary, point 2: Change wording to improve the uptake of deprescribing in residential care settings. • Throughout the manuscript, reference citations are being placed before the full stops. These need to come after the full stops. • Intro, Line 55: 'Had' instead of 'has' • Methods and analysis, line 23: Provide not provided informed consent • Data analysis, line 37: The acronym SRQR needs to be spelled out in full before using the acronym • Patient involvement section is overall un-necessary. Can be incorporated as an additional sentence in previous sections.

REVIEWER	Wade Thompson University of Southern Denmark, Denmark
REVIEW RETURNED	04-Apr-2019

GENERAL COMMENTS	Thanks for the opportunity to review this manuscript. The authors present findings around barriers and facilitators for deprescribing

	from the perspective of healthcare practitioners in Singapore, working in a nursing home setting. It seems the study was well thought out and well conducted. Overall, my feeling is that the manuscript could be improved by (1) providing a more cohesive and consistent summary of results and (2) focusing the discussion section a bit more on what is novel about this study and the practical implications of the results. I make specific comments below: Introduction P5 line 7 to 11 not sure these lines are necessary – may better to use this space to focus on the unique challenges for nursing home residents in this context P5 line 11 can you clarify "significant"? P5 line 16 may want to quality what you mean by polypharmacy here, given the number of different definitions P5 line 41 to P6 line 44 – this is an in-depth summary of existing literature on this topic. I appreciate the detail here but this section is quite long. Consider providing a more high-level summary of existing knowledge in a concise manner. The section at the bottom of page 6 is helpful to provide context for the current study-- could be good to expand on this section a bit to help the reader understand what specific knowledge gaps exist in an Asian context based on that previous study, and to get a better sense of the specific rationale for your study based on current literature. Aims Page 7 line 14 consider clarifying "determinants" here - or could just say "factors that affect their views and acceptance …" as you do below Methods P8 line 7 consider removing "in-depth" P8 line 18 – were there any other criteria here about who was approached to attempt to achieve a balanced and representative sample? Such as years of practice, site? P9 line 4 – can you provide more information on how the interview guide was developed? Using experience? Existing literature? Was it piloted? P9 line 21 "we determined the various demographic and clinical characteristics of our participants that can affect success of deprescribing " – can you expand on this point a bit? It's unclear to me what this means (especially considering you state in the results that you did not actually collect demographic characteristics [p10 line 17]) How long did interviews last? Results P10 line 20 to 24 – this summary feels like it could fit better in the discussion? P10 line 36 – subtheme on types of medications. Since this is under the theme of "facilitator", you may consider trying to frame it to be more consistent with the overall theme? For example, was it the HCP awareness that certain medications COULD be possible targets for deprescribing that was the facilitator? Basically, to get more at what specifically about "types of medications" facilitated

	deprescribing? P11 line 27 – similar comment for life expectancy sub-theme. It is mentioned as being a consideration, but it is a sub-theme of "facilitators". So could again be good to clarify how this was a faciliator specifically. For example, on P11 line 60 - nurses following surrogate markers versus life expectancy – how is this a facilitator of deprescribing? And is there a quotation to support this statement? P12 line 6 to 11 – could you provide more detail here? Perhaps a quotation on the importance or teamwork, or some sense of what participants specifically said? P12 line 40 "The participants suggested that a more systematic guideline, clear-cut algorithm and multidisciplinary efforts are needed to ensure understanding and smoothen the process" - this is seems like a lot of different things. Again, could you provide a little more detail on this sub-theme around each of the points in that line above. For example, some quotations or just more detail on what participants said. P12 line 37 to 58 – did participants provide any more detail around what they would actually be looking for in a guideline/tool? Did they lack awareness of existing tools? There are currently an abundance of tools and guidelines available to assist with deprescribing? So is there some other barrier to using these? P13 line 2 – similar to above comments, would be good to get a sense of how this fits under the "facilitator" overall theme? Is it HCP acknowledgement of possible benefits that facilitates the process? There could be more detail in this section. Especially because you open the discussion essentially summarizing this sub-theme. P13 line 32 would be good to clarify further how this is a barrier? Is it that symptoms are not acknowledged as possibly drug-related? And that there is therefore no acknowledgement that deprescribing is possible? P14 line 2 – again, consider adding more explanation of how this fits under the main theme of barriers P15 line 11 – these could probably be considered screening criteria as opposed to deprescribing guidelines, so you may want to consider alternate wording P15 line 27 to 30 – could be good to have a quotation here On overall comment on the results section is that there could be a more consistent narrative on how each sub-theme related to the overall theme and in some situations, more detail. It seems a bit fragmented as it currently stands. This could come down mostly to how things are worded and presented under each sub-theme. It may be good to add a summary figure or table for the themes/sub-themes – give the reader an overall sense of the findings P16 line 7 to 23 this seems to be a nice summary of your findings, but what is presented in the results does not clearly demonstrate these points. As I mention above, presenting a more clear and consistent narrative around the results may help strengthen the points you bring up in this section. P16 line 43 "Unfortunately, unlike acute care hospitals, pharmacists and doctors are usually not available in nursing homes, which may hinder communication" -- could you clarify this point a bit? What do you mean by "not available"? P18 line 36 - as I mention above, there are now quite a few tools / guides to help with deprescribing – do you have a sense of whether

	there was awareness of resources other than Beers or STOPP? P18 line 41 to 57 – this section seems a bit repetitive of what was already mentioned above – could be good to think about what these things mean for future research or initiatives in deprescribing? You mention things like case studies and mentoring – what could this look like? P19 line 1 to 9 – it would good to discuss this point a bit more. To me, it seems like the main novel thing with this study is that it is one of the first to be conducted on this topic in an Asian country (something also reflected in the title). The findings generally confirm what is already known on this topic, so could be good to focus on what the results mean in the context of Singapore (And possibly other countries in Asia) and what is novel/why? For example, does it confirm that barriers/facilitators in Singapore nursing homes are similar to those experienced in other countries? What implications could have particularly in the Singapore/Asia context? How do your findings inform future initiatives or research? Why these findings are important specifically in this population/setting. Abstract P3 line 9 – again, “in depth” may not be necessary I don’t have any major comments for the abstract – it may be good to modify the content after addressing some of my other comments

VERSION 1 – AUTHOR RESPONSE

The reviewers have 2 overall comments:

Comment #1
It is difficult to compile research related to the barriers and enablers of deprescribing in a succinct way. I commend you for your work as I believe this is an important area for research and addresses a gap in the literature in Asia. However, I would recommend you to provide the manuscript to professional to proof-read the entire manuscript. I believe this would make the entire manuscript flow better and ensure that all typos and grammatical errors are picked up. This will also help with consistency in displaying of the quotes included, and make sure that the reader is getting the right message from the included quotes which are valuable and support existing literature.

Main author: We thank the reviewer for the encouraging comments and suggestions. There is a research gap in this area within Asia, which was one of the primary reasons we had decided to conduct this study as the reviewer had pointed out. We have asked a native English-speaking colleague to proof-read the entire manuscript as recommended by the reviewer and editorial team.

Comment #2
Thanks for the opportunity to review this manuscript. The authors present findings around barriers and facilitators for deprescribing from the perspective of healthcare practitioners in Singapore, working in a nursing home setting. It seems the study was well thought out and well conducted. Overall, my feeling is that the manuscript could be improved by (1) providing a more cohesive and consistent summary of results and (2) focusing the discussion section a bit more on what is novel about this study and the practical implications of the results. I make specific comments below:

Main author: We thank the reviewer for the encouraging comments and suggestions. We have improved on the manuscript to give a more cohesive and consistent summary of the results, as well

as focus on the study novelty and practical implications of the results in discussion, by addressing the specific comments given.

The first reviewer has noted 19 suggestions:

Major comments
Suggestion #1
1) Abstract, Methods utilized need to be included in the design section of the abstract

Main author: Thank you. We have expanded on the methods in the design section (page 3, line 9-18): "Design: This was a qualitative study comprised of semi-structured face-to-face interviews guided by 10 open-ended questions. Interviews were conducted until saturation when no new ideas were formed. The interviews were audio-recorded, transcribed verbatim, and analysed for themes. To derive themes, we employed directed content analysis of transcript data. Coding was completed using a combination of open, axial, and selective coding".

Suggestion #2
2) Strengths and limitations summary, point 3: Limited to other Asian countries and other settings worldwide as well. This is a major limitation and more transparency is needed

Main author: We have changed it to "As the study was only conducted in one country, findings may not be representative of other Asian countries and settings worldwide". (Page 4, line 18-20)

Suggestion #3
3) Intro, line 25: Major flaw in the definition of deprescribing. Deprescribing does not involve the substitution of agents. Only reduction, tapering and stopping/discontinuing.

Main author: Thank you for the correction. We have changed it to "reduction, tapering and discontinuing". (Page 5, line 30)

Suggestion #4
4) Line 27: It is not known that deprescribing definitely improves patient outcomes. Language needs to change to reflect this. Suggest using potentially improve patient outcomes.

Main author: We have changed it to "… can potentially improve patient outcomes." (Page 5, line 32)

Suggestion #5
5) The authors outline that deprescribing is a new area of research in Asia. However, it is not clear the impact this study can have for future research. I would suggest making it clear that in order to develop processes of deprescribing that work in a particular health care system, firstly gaining an understanding of the barriers and enablers is pertinent in developing the right process that can ensure successful uptake of deprescribing

Main author: Thank you for the suggestion. We have elaborated on the outline by including the sentence "In order to develop processes of deprescribing that work in a particular health care system, gaining an understanding of the barriers and enablers first is pertinent in developing the right process that can ensure successful uptake of deprescribing". (Page 6, line 41-46)

Suggestion #6
6) Methods and analysis, Line 11-14: Were participants and/or convenors aware that the deprescribing study is going to occur? If so, then the results of the study could be more

biased towards those who are already aware and have more motivation and interest in conducting deprescribing. This needs to be listed as an additional limitation.

Main author: We have inserted in under limitation: “Although the deprescribing study had yet to commence, there is also a possibility that results of the study could be more biased towards those who were already aware of the deprescribing study, and thus had more motivation and interest in conducting deprescribing.”. (Page 20, line 34-41)

Suggestion #7
7) Semi-structured interviews : Line 60. The questions used in the interview are overall valuable, however a clearer and more in-depth description of how these questions were generated and why these were chosen is needed in the methods section. Was a certain qualitative framework used? Why or why not?

Main author: We apologise that this was unclear in our initial submission. We have included “The KAP conceptual framework was employed in this study. The questions were developed by expert opinions between the researchers (CHK, SWHL, VSLM) and a senior consultant geriatrician working in the settings. The interview was piloted on a doctor, a pharmacist, and a nurse to determine the clarity and comprehensibility of the questions, as well as the time taken to complete the interview. No changes were required for the original interview questions”. (Page 8, line 9-18)

Suggestion #8
8) There is an imbalance in the number of recruited pharmacists, doctors and nurses where most of the data that could have been coded comes from nurses. Although the authors mention this in the limitations section of the discussion, more clarity around the effect this may have on displaying a balanced view on deprescribing from all included parties who are involved is important to note.

Main author: We thank the reviewer for the opportunity to improve on this. We have inserted more details on the impact into the discussion section: “We acknowledged that most of the data could have been coded came from nurses. This may have an effect on displaying a balanced view of deprescribing from all included parties. We took this into consideration and reported any varied view from doctors, pharmacists, and nurses separately in the subthemes.” (Page 20, line 22-30)

Suggestion #9
9) I suggest incorporating a table displaying the COREQ-32 checklist for this study

Main author: We thank the reviewer for the suggestion. We have reported using SRQR checklist as required by the journal. (Page 8, line 50; Appendix material)

Suggestion #10
10) Page 10, line 60: The supporting quote related to calcium supplementation doesn’t make sense and doesn’t support the sub-theme illustrated.

Main author: We have removed the quote as suggested. (Page 9, line 58)

Suggestion #11
11) Page 14, line 36-48: This is a major theme that needs to be highlighted in light of other studies. Specialist influence on GPs’ autonomy and competence when considering stopping medicines (i.e. GPs are more reluctant to mess with medicines started by specialists). The quote illustrates this somewhat but the authors need to highlight this theme more strongly.

Main author: We have highlighted this by adding this sentence after the quote: “This was an important point, as its signified that specialists have a major influence on GPs’ autonomy and competence when considering stopping medicines. Thus, GPs are more reluctant to change medicines started by specialists.” (Page 14, line 60 - Page 15, line 5)

Suggestion #12
12) Discussion, line 7-9: This sentence sends the message that residents were perhaps included in the study. This needs to be amended where it is explained that health professionals interviewed believe that deprescribing might be a priority for their patients.

Main author: We have changed it to “…we witnessed a consistent belief in the health professionals interviewed that deprescribing might be a priority for their patients…”. (Page 19, line 4-6)

Minor comments
Suggestion #13
13) Abstract, Line 37: Further methods that can help support the process of deprescribing would be more appropriate than improve deprescribing

Main author: We have changed it to “…further methods that can help support the process of deprescribing” as advised. (Page 3, line 48)

Suggestion #14
14) Strengths and limitations summary, point 2: Change wording to improve the uptake of deprescribing in residential care settings.

Main author: We have changed it “…to improve the uptake of deprescribing in residential care settings”. (page 19, line 32)

Suggestion #15
15) Throughout the manuscript, reference citations are being placed before the full stops. These need to come after the full stops.

Main author: We have placed the reference citations after the full stops as advised.

Suggestion #16
16) Intro, Line 55: ‘Had’ instead of ‘has’

Main author: We have changed it to “had” as advised. (Page 6, line 32)

Suggestion #17
17) Methods and analysis, line 23: Provide not provided informed consent

Main author: We have changed it to “provide” as advised. (Page 7, line 27)

Suggestion #18
18) Data analysis, line 37: The acronym SRQR needs to be spelled out in full before using the Acronym

Main author: We apologised, and have spelled out in full “Standards for Reporting Qualitative Research (SRQR)” as advised. (Page 8, line 50)

Suggestion #19
19) Patient involvement section is overall un-necessary. Can be incorporated as an additional sentence in previous sections.

Main author: Thank you. We need to include the section as it is a requirement of the journal (Page 8, line 57).

The second reviewer has noted 27 suggestions:

Introduction
Suggestion #1
P5 line 7 to 11 not sure these lines are necessary – may better to use this space to focus on the unique challenges for nursing home residents in this context

Main author: Thank you for the suggestion. We have removed these lines and replaced with “Many nursing home residents are plagued by advanced frailty and confusion.[1] Medication management for these residents is further challenged by multiple healthcare providers, hospital admissions, rigid organisational structures, resource limitations, medical hierarchies, contrasting care expectations of family and doctors, and the variable life priorities of each individual resident.[2]” (Page 5, line 6-14)

Suggestion #2
P5 line 11 can you clarify “significant”?

Main author: We apologised that this was unclear. We have clarified “significant co-morbidities” to “multiple co-morbidities”, which meant to capture the general complexity of patients without limiting to any single disease. (Page 5, line 16)

Suggestion #3
P5 line 16 may want to quality what you mean by polypharmacy here, given the number of different definitions

Main author: We have quantified by including “defined as 5 or more medications”, as reported in the reference. (Page 5, line 20)

Suggestion #4
P5 line 41 to P6 line 44 – this is an in-depth summary of existing literature on this topic. I appreciate the detail here but this section is quite long. Consider providing a more high-level summary of existing knowledge in a concise manner.
The section at the bottom of page 6 is helpful to provide context for the current study-- could be good to expand on this section a bit to help the reader understand what specific knowledge gaps exist in an Asian context based on that previous study, and to get a better sense of the specific rationale for your study based on current literature.

Main author: Thank you. We have summarised it as follows (Page 5, line 48 – Page 6, line 16):
“These studies found that factors such as existing organization systems and policies, self-perceived restriction in the ability to be involved in medication-related issues, lack of knowledgeable and skilled personnel, as well as attitudes (including devolving of responsibility between GPs and specialist physicians) were barriers to deprescribing.[2,11]
There were varying priorities between the professions on factors that are important for deprescribing in long-term care facilities. Some of the key considerations include: ‘evidence for deprescribing’, ‘clinical appropriateness of therapy’ as well as ‘clinician receptivity’, with different behaviors and

attitudes reported between countries.[12,13] For example, Swedish general practitioners' expressed that their main concern in medication management was to achieve a good quality of life, while among Australian general practitioners, they were more concerned with the low financial reimbursement associated with providing care to these residents.[13]"

We have expanded the paragraph to provide context for the current study (Page 6, line 20-27): "Although there was numerous literature that explored the perceptions, barriers, and enablers of health professionals towards deprescribing, there is a limited understanding of the perspectives of health professionals towards deprescribing in nursing homes, particularly in Asia where the concept of deprescribing is still relatively new and the populations are rapidly aging."

Aims
Suggestion #5
Page 7 line 14 consider clarifying "determinants" here - or could just say "factors that affect their views and acceptance …" as you do below

Main author: Thank you. We have replaced it with "factors that affect their views and acceptance". (Page 6, line 55)

Methods
Suggestion #6
P8 line 7 consider removing "in-depth"

Main author: We have removed "in-depth" as advised. (Page 7, line 7)

Suggestion #7
P8 line 18 – were there any other criteria here about who was approached to attempt to achieve a balanced and representative sample? Such as years of practice, site?

Main author: We did not apply any criteria to the doctors and pharmacists due to their limited number across the four participating nursing homes. For nurses in the nursing homes, convenience sampling rotating across the four homes was employed until data saturation was reached. Years of practice was not documented as the nursing homes were uncomfortable in disclosing the data.
We have included these details. (Page 7, line 20-25)

Suggestion #8
P9 line 4 – can you provide more information on how the interview guide was developed? Using experience? Existing literature? Was it piloted?

Main author: We have included "The KAP conceptual framework was employed in this study. The questions were developed by expert opinions between the researchers (CHK, SWHL, VSLM) and a senior consultant geriatrician working in the settings. The interview was piloted on a doctor, a pharmacist, and a nurse to determine the clarity and comprehensibility of the questions, as well as the time taken to complete the interview. No changes were required for the original interview questions." (Page 8, line 9-18)

Suggestion #9
P9 line 21 "we determined the various demographic and clinical characteristics of our participants that can affect success of deprescribing " – can you expand on this point a bit? It's unclear to me what this means (especially considering you state in the results that you did not actually collect demographic characteristics [p10 line 17])
How long did interviews last?

Main author: We have changed it to "…we assessed the various clinical characteristics of the doctors, pharmacists, and nurses across the four nursing homes in general (such as primary place of practice, any specialization, length of practice in nursing homes, any access to education infrastructure)". (Page 8, line 36-43)
We have included "The interview lasted 14 minutes on average", due to the limitations on the available time that the participants could spare for the interviews from their work routine. (Page 9, line 15)

Results
Suggestion #10
P10 line 20 to 24 – this summary feels like it could fit better in the discussion?

Main author: We have shifted "Overall, we found the participants had some knowledge regarding deprescribing. They tried to practice it within their area of knowledge and displayed enthusiasm towards deprescribing" to Discussion as advised. (Page 16, line 7-9).

Suggestion #11
P10 line 36 – subtheme on types of medications. Since this is under the theme of "facilitator", you may consider trying to frame it to be more consistent with the overall theme? For example, was it the HCP awareness that certain medications COULD be possible targets for deprescribing that was the facilitator? Basically, to get more at what specifically about "types of medications" facilitated deprescribing?

Main author: Thank you for the suggestions. We have changed the subtheme from "Perceptions on deprescribing based on types of medications" to "Awareness of medications that are unnecessary or could be targeted for deprescribing". (Page 9, line 35)

Suggestion #12
P11 line 27 – similar comment for life expectancy sub-theme. It is mentioned as being a consideration, but it is a sub-theme of "facilitators". So could again be good to clarify how this was a faciliator specifically. For example, on P11 line 60 - nurses following surrogate markers versus life expectancy – how is this a facilitator of deprescribing? And is there a quotation to support this statement?

Main author: We have changed the subtheme from "Life expectancy of the patient" to "Improving quality of life in limited life expectancy of the patient". (Page 10, line 25)
We have removed "nurses following surrogate markers versus life expectancy". (Page 10, line 55)

Suggestion #13
P12 line 6 to 11 – could you provide more detail here? Perhaps a quotation on the importance or teamwork, or some sense of what participants specifically said?

Main author: Thank you. We have added two quotations to provide more details (Page 10, line 60 - Page 11, line 5):
"And also the doctor as…a team to practice it (deprescribing). But currently, I just like…review the patient individually" (P15, female)
".. is good if they can work as a team…basically if they have a common understanding" (D5, male)

Suggestion #14
P12 line 40 "The participants suggested that a more systematic guideline, clear-cut algorithm and multidisciplinary efforts are needed to ensure understanding and smoothen the process" - this is

seems like a lot of different things. Again, could you provide a little more detail on this sub-theme around each of the points in that line above. For example, some quotations or just more detail on what participants said.

Main author: Thank you. We have added several quotations to provide more details (Page 11, line 53 – Page 12, line 46):

The participants suggested that a more systematic guideline, clear-cut algorithm and multidisciplinary efforts are needed to ensure understanding and smoothen the process.
“A standard guideline that would help, because we have so many pharmacists with different ways of practicing and different habits. So it would be better if we had something standardized to follow. So that all homes can have the same, sort of, deprescribing procedures.” (P12, female)
“And where is the guide you see, there's actually no clear guideline sometimes… I think, local guidelines. The expert opinion...more specific guideline, with regard to certain medication, common medication that would be useful.” (D5, male)
“I think guideline…If there's a clear-cut algorithm…We're pharmacists are algorithm people. So we love algorithm” (P1, female)

Also, participants suggested other areas of improvement including face-to-face doctor-pharmacist discussions, as well as a deprescribing quick reminder guide.
“I think…discussion…sometimes…where we intervene…the deprescribing, maybe we miss out some of the important information. For example, we are not aware of the latest condition but doctor's the one who also, work closer with the nurse and also the family. Doctor also examine the patient regularly that's why doctor will know, more about the patient” (P15, female)
“...like, small cuts, a reminder to try to cut off PPIs, if there's no clear indication. Because a lot of current usage has a lot of unclear indication. If they -- now they have this very thick standard, black and white thing that pharmacists are more confident in cutting down medications” (P12, female)

Additionally, nurses noted that mentoring, case studies, lectures, and guidebooks would be useful to get more nurses to participate in deprescribing.
“I think those senior ones will not have much of a problem; they know their medication…. these are for the juniors…Mostly they just follow the orders, until they get to the stage where they can mostly be on their own” (N8, female)
“So just in the endorsement we will talk about the resident's condition and if he benefits (from) the medicine or if he does not benefit (from) the medicine so we can off it…Like…the case study” (N6, male)

Suggestion #15
P12 line 37 to 58 – did participants provide any more detail around what they would actually be looking for in a guideline/tool? Did they lack awareness of existing tools? There are currently an abundance of tools and guidelines available to assist with deprescribing? So is there some other barrier to using these?

Main author: Thank you. We have added two quotations to provide more details (Page 11, line 47-58):
“A standard guideline that would help, because we have so many pharmacists with different ways of practicing and different habits. So it would be better if we had something standardized to follow. So that all homes can have the same, sort of, deprescribing procedures.” (P12, female)
“And where is the guide you see, there's actually no clear guideline sometimes… I think, local guidelines. The expert opinion...more specific guideline, with regard to certain medication, common medication that would be useful.” (D5, male)

Suggestion #16
P13 line 2 – similar to above comments, would be good to get a sense of how this fits under the "facilitator" overall theme? Is it HCP acknowledgement of possible benefits that facilitates the process? There could be more detail in this section. Especially because you open the discussion essentially summarizing this sub-theme.

Main author: We have changed the subtheme from "Benefits of deprescribing" to "Acknowledgement of possible benefits of deprescribing". (Page 12, line 53)

We have added two more quotes to substantiate the subtheme (Page 13, line 2-7):
"One, it (deprescribing) reduces and side effects...Two, it reduces pill burdens...the cost...It also reduces manpower...And with less...medication error" (D11, female)
"… reduces the cost...maybe side effect" (N7, female)

Suggestion #17
P13 line 32 would be good to clarify further how this is a barrier? Is it that symptoms are not acknowledged as possibly drug-related? And that there is therefore no acknowledgement that deprescribing is possible?

Main author: We have changed the subtheme from "Cognitive status of patient and identification of adverse drug reactions (ADR)" to "Symptoms not acknowledged as possibly drug-related". (Page 13, line 30)

We have further added in "…as symptoms were not acknowledged as possibly drug-related, and therefore lacked acknowledgement that deprescribing was possible." (Page 13, line 32-37)

Suggestion #18
P14 line 2 – again, consider adding more explanation of how this fits under the main theme of barriers

Main author: We have amended the subtheme to "Lack of knowledge in patient and family members' preferences" (Page 14, line 4)
We have included "However, health professionals were often unable to assess the patient's preference due to their speech or cognitive disabilities, and difficulties in contacting their family members." (Page 14, line 13-16)

Suggestion #19
P15 line 11 – these could probably be considered screening criteria as opposed to deprescribing guidelines, so you may want to consider alternate wording

Main author: We thank and have noted the suggestion. We have changed it to "screening criteria". (Page 15, line 27)

Suggestion #20
P15 line 27 to 30 – could be good to have a quotation here

Main author: We have added a quotation (Page 15, line 48-53):
"Usually, I'm also reading the notes of the pharmacist or...if the doctors are doing laboratory tests...We're just waiting again, for the next monthly (input) from the doctor. We're just waiting again for the next lab test" (N13, male)

Suggestion #21

On overall comment on the results section is that there could be a more consistent narrative on how each sub-theme related to the overall theme and in some situations, more detail. It seems a bit fragmented as it currently stands. This could come down mostly to how things are worded and presented under each sub-theme.
It may be good to add a summary figure or table for the themes/sub-themes – give the reader an overall sense of the findings

Main author: We have presented a summary table as advised (Page 9, line 24; Table 2) for the themes/sub-themes to give the reader an overall sense of the findings.

Suggestion #22
P16 line 7 to 23 this seems to be a nice summary of your findings, but what is presented in the results does not clearly demonstrate these points. As I mention above, presenting a more clear and consistent narrative around the results may help strengthen the points you bring up in this section.

Main author: We have presented a clearer narrative as advised around the results (Page 16, line 6-37):
"Overall, we found the participants had some knowledge regarding deprescribing. They tried to practice it within their area of knowledge and displayed enthusiasm towards deprescribing. The comments from the participants were summarised in two conceptual themes: facilitators and barriers to deprescribing. Several subthemes surrounding facilitators of deprescribing were identified. The awareness of the possible benefits of deprescribing, as well as the medications that were unnecessary or could be targeted for deprescribing were important to initiate deprescribing. In the deprescribing process, teamwork (between doctors, pharmacists and nurses), systematic deprescribing practice and educational tools were important facilitators in the process of deprescribing. Improving quality of life in limited life expectancy during deprescribing is an emphasis for this frail population. Several subthemes in barriers to deprescribing were also identified including the lack of acknowledgement of symptoms as possibly drug-related, as well as the lack of knowledge of patient and family members' preferences. During the process of deprescribing, participants also lamented the limited number of tools for deprescribing, as well as a lack of coordination between health professionals in hospitals and nursing homes, which hinder successful deprescribing."

We have also shifted the previous summary to the later part of the discussion, where it is more appropriate. (Page 19, line 4-23)

Suggestion #23
P16 line 43 "Unfortunately, unlike acute care hospitals, pharmacists and doctors are usually not available in nursing homes, which may hinder communication" -- could you clarify this point a bit? What do you mean by "not available"?

Main author: We have clarified it to "not around in the nursing homes most of the time". (Page 16, line 60)

Suggestion #24
P18 line 36 - as I mention above, there are now quite a few tools / guides to help with deprescribing – do you have a sense of whether there was awareness of resources other than Beers or STOPP?

Main author: We appreciate and thank for the point brought up. As deprescribing is still a relatively new concept in Singapore, there was no indication of the use of other deprescribing tools during the interviews, except the Beers and STOPP criteria as well as the local deprescribing guide developed for proton pump inhibitors.
We have included this in the discussion. (Page 18, line 55-60).

Suggestion #25
P18 line 41 to 57 – this section seems a bit repetitive of what was already mentioned above – could be good to think about what these things mean for future research or initiatives in deprescribing? You mention things like case studies and mentoring – what could this look like?

Main author: We have included “Future initiatives should look at increasing collaboration and communication between acute hospitals, nursing homes, and specialist clinics in Singapore. Future initiatives in Singapore can also look at educating health professionals in nursing homes on how to deprescribe and monitor in older adults.” (Page 20, line 4-11)

Suggestion #26
P19 line 1 to 9 – it would good to discuss this point a bit more. To me, it seems like the main novel thing with this study is that it is one of the first to be conducted on this topic in an Asian country (something also reflected in the title). The findings generally confirm what is already known on this topic, so could be good to focus on what the results mean in the context of Singapore (And possibly other countries in Asia) and what is novel/why? For example, does it confirm that barriers/facilitators in Singapore nursing homes are similar to those experienced in other countries? What implications could have particularly in the Singapore/Asia context? How do your findings inform future initiatives or research? Why these findings are important specifically in this population/setting.

Main author: We thank the reviewer for the suggestions. We have expanded it (Page 19, line 34 – Page 20, line 11): “Our results confirmed previous findings that the risk-benefit ratio is an important determinant in deprescribing.[10] Our results similarly evidenced that first-generation antihistamine is perceived as an important target for deprescribing in our setting.[11] Anticholinergic and sedative drug exposure have been associated with poorer physical and cognitive functions,[27] and deprescribing of unnecessary first-generation antihistamine would potentially improve outcomes for this frail population. However, our study further found that we need a better process for deprescribing in nursing homes in Singapore. Despite the existence of established tools such as Beers[20] and STOPP criteria[19], our studies identified areas for improvement such as more suitable tools for our setting, mentoring and case discussions, as well as better collaboration and communication in the process of deprescribing. Better explicit deprescribing tools and algorithms that are developed or adapted for the Asian setting for deprescribing may help in greater practicability and comprehensiveness. We also identified that a lack of coordination between health professionals in hospitals and nursing homes could possibly hinder successful deprescribing in Singapore nursing homes. Future initiatives should look at increasing collaboration and communication between acute hospitals, nursing homes, and specialist clinics in Singapore. Future initiatives in Singapore can also look at educating health professionals in nursing homes on how to deprescribe and monitor in older adults.”

We have also added future research in the conclusion statement (Page 20, line 46-53):
“In conclusion, this study highlighted several themes. Future research could assess how routine case studies and mentoring could improve deprescribing knowledge and practice in the nursing homes, as well as identify patients’ perspectives toward deprescribing in other parts of the world with different cultures.”

Abstract
Suggestion #27
P3 line 9 – again, “in depth” may not be necessary

Main author: Thank you. We have removed “in-depth” as advised. (Page 3, line 9)

I don't have any major comments for the abstract – it may be good to modify the content after addressing some of my other comments

Main author: We thank the reviewer for the kind comments and suggestions.

VERSION 2 – REVIEW

REVIEWER	Nagham Ailabouni School of Pharmacy, University of washington
REVIEW RETURNED	25-Jul-2019

GENERAL COMMENTS	Worthwhile paper and interesting findings. However, I encourage the authors to pay closer attention to the language used throughout the manuscript and to try to deliver a clearer outline/organization and discussion of the major themes. I believe this will be improved by seeking help from a professional proof reader. Careful attention should be paid to paraphrasing words and grammatical structure of sentences in quotations as well to make sure sentences are complete, concise and match the language/writing style of the entire manuscript. Comments: Overall: Full-stops should come after references in all sentences. I highly recommend this to be sent to a professional proof-reader. Grammatical and spelling errors are common throughout the revised manuscript. For example, throughout the manuscript "We're" is being used. Try to use "we are" etc. Abstract: - When data saturation is reached instead when "until saturation" - Improve "Quality of life for patients with limited life expectancy" - Improved communication working towards an aligned care management care plan for older adults that has continuity of older adults between pharmacists/doctors/nurses. Just saying teamwork doesn't really illustrate the point. - Vague language. Mentoring who? - No need for commas before 'and' at the end of a sentence. Fix throughout. - Result: Need to be consistent. Stick to either facilitators or enablers. Enablers used more in deprescribing literature - Conclusion: We have identified, instead of using "through the study" - Whenever possible authors should use deprescribing enablers or deprescribing challenges instead of "barriers of deprescribing" – results in abstract. But fix throughout the manuscript (easier to read and cuts down on words) Introduction: - Please remove "plagued" from the first line. It has been frowned upon to use words such as these when describing geriatric

	illnesses. Instead use softer language such as “Older adults, particularly those residing in nursing care homes, tend to be frail and are more likely to suffer from cognitive decline.” Or similar - Polypharmacy is associated with instead of comes with. Also, it is important to note that the most commonly used definition in the literature is the use of >5 more of medicines but there are other definitions such as “any medicine prescribed that is not clinically indicated”. - Please check use the word “fallers” in the reference mentioned. Preferred terminology is “those who have experienced a fall” or “are at a high risk of falling” Discussion: - Consistent with a New Zealand General Practitioner study Page 11 - “We’re pharmacists are algorithm people” Doesn’t make much sense. Please paraphrase by using brackets in between words. Page 14 - Intervviews: typo

REVIEWER	Wade Thompson University of Southern Denmark, Denmark
REVIEW RETURNED	10-Jul-2019

GENERAL COMMENTS	Thanks for addressing my suggestions-- the manuscript is looking good. The main thing to me is that is still unclear how some of the subthemes act as facilitators. It seems this could be fixed by being more explicit in the narrative summary of these subthemes, so it may just be a matter of paying some extra attention to the wording in the facilitator subthemes. See my specific comments: Introduction P5 line 7 “plagued by” --consider maybe just saying “have advanced frailty and confusion.” P5 line 7 to 14 -- you may consider moving this section to the end of the paragraph. That is, starting the paragraph with “Older adults residing in nursing homes often…” . Or otherwise just consider editing the paragraph a bit to flow better. The content is good but it’s possible that with the added text, it became a bit disjointed. Results P10 line 7 to 14 – consider deleting this as it is not really a result Subtheme on awareness of medications (page 9) -- I still feel this theme could be benefit from a brief explanation of how this is specifically a facilitator . You may a consider a short sentence explaining this explicitly. Same comment again for the life expectancy theme. It would be helpful to be explicit about what makes the concept of life expectancy a facilitator. Discussion P16 line 7 to 37 this paragraph seems to simply repeat the results

	section, you could consider deleting it As I mentioned in my previous review, the participants seemed to be calling for more tools/guidelines and you talk about needing more tools for deprescribing. However, there are currently an abundance of tools available to assist with deprescribing (beyond simply Beers and STOPP) -- so do you have some sense of why healthcare providers are not aware of these? I.e. is the barrier more awareness of tools rather than the need to develop new ones? Or is there some other barrier here? Abstract Conclusion – you may consider using similar content to the conclusion in the main body (p20 line 46) around suggestions for future research-- the current abstract conclusion doesn't really add much to what is already in the results section

VERSION 2 – AUTHOR RESPONSE

Reviewer: 2

Please leave your comments for the authors below

Thanks for addressing my suggestions-- the manuscript is looking good. The main thing to me is that is still unclear how some of the subthemes act as facilitators. It seems this could be fixed by being more explicit in the narrative summary of these subthemes, so it may just be a matter of paying some extra attention to the wording in the facilitator subthemes. See my specific comments:

Main author: We thank the reviewer for the encouraging comments and suggestions.

Introduction

P5 line 7 "plagued by" --consider maybe just saying "have advanced frailty and confusion."

Main author: Thank you for the advice. We have replaced it with: "have advanced frailty and confusion" (Page 5 line 7).

P5 line 7 to 14 -- you may consider moving this section to the end of the paragraph. That is, starting the paragraph with "Older adults residing in nursing homes often…". Or otherwise just consider editing the paragraph a bit to flow better. The content is good but it's possible that with the added text, it became a bit disjointed.

Main author: Thank you for the suggestion. We have moved this section to the end of the paragraph (page 5 line 18-25).

Results

P10 line 7 to 14 – consider deleting this as it is not really a result

Main author: Thank you for the suggestion. We have deleted the sentence as suggested.

Subtheme on awareness of medications (page 9) -- I still feel this theme could be benefit from a brief explanation of how this is specifically a facilitator. You may a consider a short sentence explaining this explicitly.

Main author: Thank you for the advice. We have inserted the sentence: “Acceptance of participants towards deprescribing is facilitated by an increased awareness of the medications that are unnecessary or inappropriate (poor risk-benefit profile) for older patients” (Page 9 line 39-42).

Same comment again for the life expectancy theme. It would be helpful to be explicit about what makes the concept of life expectancy a facilitator.

Main author: Thank you for the advice. We have inserted the sentence: “Most participants felt that deprescribing is important in an older patient with limited life expectancy, as there is a lack of evidence of clinical benefits from certain classes of medications” (Page 10 line 30-35).

Discussion

P16 line 7 to 37 this paragraph seems to simply repeat the results section, you could consider deleting it

Main author: Thank you for the suggestion. We have deleted it.

As I mentioned in my previous review, the participants seemed to be calling for more tools/guidelines and you talk about needing more tools for deprescribing. However, there are currently an abundance of tools available to assist with deprescribing (beyond simply Beers and STOPP) -- so do you have some sense of why healthcare providers are not aware of these? I.e. is the barrier more awareness of tools rather than the need to develop new ones? Or is there some other barrier here?

Main author: Thank you for the comment. We have amended the paragraph to include the possible reason for the lack of awareness: “…thus emphasizing the need of a criteria-based guideline more suited for our region. Despite an abundance of tools to assist with deprescribing,[25] there was no indication on the use of other deprescribing tools during the interviews, except the Beers and STOPP criteria as well as the local deprescribing guide developed for proton pump inhibitors.[18] Limited awareness of deprescribing tools may be partly attributed to this lack of awareness on deprescribing, since this topic has not been taught in medical, pharmacy, or nursing undergraduate education. This calls for additional professional continuing education, as well as for the medical community to increase the awareness of deprescribing among its members” (Page 19 line 18-35).

Abstract

Conclusion – you may consider using similar content to the conclusion in the main body (p20 line 46) around suggestions for future research-- the current abstract conclusion doesn’t really add much to what is already in the results section

Main author: Thank you for the suggestion. We have included similar content for the abstract: “In conclusion, this study highlighted that deprescribing in the nursing homes is perceived

by health professionals to be challenging and future research could assess how routine case studies, mentoring and better multidisciplinary communication could improve deprescribing knowledge and process in the nursing homes.” (Page 3 line 53-60).

Reviewer: 1

Please leave your comments for the authors below

Worthwhile paper and interesting findings. However, I encourage the authors to pay closer attention to the language used throughout the manuscript and to try to deliver a clearer outline/organization and discussion of the major themes. I believe this will be improved by seeking help from a professional proof reader. Careful attention should be paid to paraphrasing words and grammatical structure of

sentences in quotations as well to make sure sentences are complete, concise and match the language/writing style of the entire manuscript.

Comments:

Overall: I highly recommend this to be sent to a professional proof-reader.

Main author: We thank the reviewer for the encouraging comments and suggestions. We have sought help from an academic proof reader to improve on the language and flow of the manuscript.

Full-stops should come after references in all sentences.

Main author: We have incorporated references after full-stops as it is a formatting requirement of the journal.

Grammatical and spelling errors are common roughout the revised manuscript. For example, throughout the manuscript “We’re” is being used. Try to use “we are” etc.

Main author: Thank you for your advice, we have changed “we’re” to “we are” and paraphrased the sentences in the quotations throughout the manuscripts.

Abstract:

- When data saturation is reached instead when “until saturation”

Main author: We have changed it to: “Interviews were conducted until data saturation was achieved and no new ideas were formed” (Page 3 line 11-13).

- Improve “Quality of life for patients with limited life expectancy”

Main author: We have corrected it to: “quality of life for patients with limited life expectancy” (Page 3 line 32).

- Improved communication working towards an aligned care management care plan for

older adults that has continuity of older adults between pharmacists/doctors/nurses.

Just saying teamwork doesn’t really illustrate the point.

Main author: Thank you for the suggestion, we have changed “teamwork between doctors, pharmacists and nurses” to “improving communication between doctors, pharmacists and nurses” (Page 3 line 34) and due to word count limits in the abstract, we have elaborated it as advised in the main text: “Teamwork between doctors, pharmacists and nurses can be strengthened by improving communication working towards an aligned care management care plan for older adults and ensuring its continuity” (Page 11 line 23-28).

- Vague language. Mentoring who?

Main author: We have amended it to “mentoring nurses” (Page 3 line 46).

- No need for commas before ‘and’ at the end of a sentence. Fix throughout.

Main author: We have noted and rectified it throughout the manuscript.

- Result: Need to be consistent. Stick to either facilitators or enablers. Enablers used more

in deprescribing literature

Main author: We have stick to “enablers” and “challenges” as advised.

- Conclusion: We have identified, instead of using “through the study”

Main author: Thank you. We have noted it, and have removed the sentence after the comment from the other reviewer.

- Whenever possible authors should use deprescribing enablers or deprescribing

challenges instead of “barriers of deprescribing” – results in abstract. But fix throughout

the manuscript (easier to read and cuts down on words)

Main author: We have changed it to “enablers” and “challenges” throughout the manuscript as advised.

Introduction:

- Please remove “plagued” from the first line. It has been frowned upon to use words

such as these when describing geriatric illnesses. Instead use softer language such as

“Older adults, particularly those residing in nursing care homes, tend to be frail and are

more likely to suffer from cognitive decline.” Or similar

Main author: Thank you for the advice. We have changed it to “Many nursing home residents have advanced frailty and confusion” (Page 5 line 7), as advised by the other reviewer.

- Polypharmacy is associated with instead of comes with. Also, it is important to note that

the most commonly used definition in the literature is the use of >5 more of medicines

but there are other definitions such as “any medicine prescribed that is not clinically

indicated”.

Main author: We have changed it to: “Polypharmacy is associated with” (Page 5 line 13). We have also changed it from “defined as 5 or more medications” to “commonly defined as 5 or more medications” (Page 5 line 11).

- Please check use the word “fallers” in the reference mentioned. Preferred terminology

is “those who have experienced a fall” or “are at a high risk of falling”

Main author: Thank you. We have paraphrased it to: “number of residents who have experienced a fall” (Page 5 line 37).

Discussion:

- Consistent with a New Zealand General Practitioner study

Main author: We have corrected the sentence to: “Consistent with a New Zealand General Practitioner study” (Page 18 line 14-16).

Page 11

- “We’re pharmacists are algorithm people” Doesn’t make much sense. Please paraphrase

by using brackets in between words.

Main author: We have paraphrased it to: "…pharmacists are (taught to follow) algorithm" (Page 12 line 9).

Page 14

- Intervviews: typo

Main author: Thank you. We have corrected the spelling (Page 14 line 30).

VERSION 3 – REVIEW

REVIEWER	Wade Thompson University of Southern Denmark
REVIEW RETURNED	16-Sep-2019

GENERAL COMMENTS	Thanks for addressing my comments - the added explanations in the results have helped to clarify the themes (in my mind at least!). One small comment about the introduction: The opening paragraph looks much better. One thing is that you may consider combining the points in the first two sentences into one sentence to improve the flow. For example: "Many nursing home residents have advanced frailty, confusion, and multiple co-morbidities requiring nursing care." or something along those lines.