

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)	Factors influencing the decision to convey or not to convey elderly people to the Emergency Department after emergency ambulance attendance: a systematic Mixed Studies Review.
AUTHORS	Oosterwold, J; Sagel, Dennis; Berben, Sivera; Roodbol, Petrie; Broekhuis, Manda

VERSION 1 – REVIEW

REVIEWER	Judy Lowthian Monash University, School of Public Health & Preventive Medicine
REVIEW RETURNED	18-Mar-2018

GENERAL COMMENTS	<p>BMJ Open Review</p> <p>Factors that influence the EMS referral decision of elderly people after an emergency ambulance call: a systematic mixed studies review</p> <p>Thank you for asking me to review this manuscript that describes a systematic mixed studies review, designed to elucidate the factors that influence referral decisions by EMS personnel for older patients.</p> <p>This study is important and timely in the context of persistent emergency demand by older cohorts, in a globally ageing population.</p> <p>The study design is appropriate for the stated research question, and includes quantitative and qualitative studies for synthesis after evaluation of study quality with a multi-method appraisal tool. The results are summarised in the text and supported by two tables. The discussion points are appropriate.</p> <p>Comments:</p> <ol style="list-style-type: none"> 1. Page 5 Section 2.1 Please summarise the inclusion criteria in the text 2. Pages 8-9 Section 3.3.3 'Personal and role related factors' + Pages 23-26 Table 2 <p>I think that Section 3.3.3 would benefit from re-writing, as some of the language used in the text is slightly confusing. I suggest incorporating some of the language from Table 2 into the</p>
-------------------------	---

	<p>text, to enhance readability.</p> <p>(eg)</p> <p>p 8, lines 38-40. 'Knowing the profession' – please add 'one factor...influenced conveyance decision – educational background/<u>professional title</u>'</p> <p>p. 24, lines 8-39 'Table 2'.</p> <ul style="list-style-type: none"> • I suggest incorporating the factor 'previous negative experiences' into 'experience/confidence' • Please elaborate on the two points under 'health status of EMS staff' <p>3. Pages 9-10 Section 3.3.4. 'Micro-level themes' This section would benefit from an introductory sentence to tie the points listed together.</p> <p>4. Page 11 Table 1 – please add in the reference number for each study (next to author and date)</p> <p>5. Page 40-42 Please label Figure 1,2,3.</p> <p>6. Page 42 Please add a legend to explain A1, A4 etc</p> <p>7. The manuscript is generally well written for publication in English, but would benefit from English language proof-reading/editing.</p>
--	--

REVIEWER	Alison Porter Swansea University
REVIEW RETURNED	04-Apr-2018

GENERAL COMMENTS	<p>This is an interesting review but I think would benefit from some revision before it is published.</p> <p>The quality of English is generally good.</p> <p>Title: 'referral decision of elderly people' implies that it is the elderly people (rather than paramedics) who are making the decision.</p> <p>Abstract: The topic of the paper – as set out in the objective given in the abstract – is to review evidence about conveyance/non-conveyance decisions. However, the title talks about the 'referral decisions' which is confusing – patients may or may not be referred on to another service. This same confusion is found at other points in the paper.</p> <p>The abstract does not make it entirely clear that it is a review paper. The abstract does not give an indication of methods.</p> <p>In the abstract, the results section places an emphasis on factors which are likely to inhibit non-conveyance – what about factors which might encourage it?</p> <p>In the abstract, the conclusion places a big emphasis on the risks of non-conveyance, but does not consider whether perception of risk has an influence on decision making which is higher than actual risk.</p> <p>Introduction: seems quite short. It would be useful for it to include a brief discussion of the types of conditions for which non-conveyance</p>
-------------------------	--

	<p>protocols may be developed. How much consistency in these is there across countries?</p> <p>There is a brief reference to patient refusal, but the introduction does not convey a sense that decision making can be a joint process between patients and clinicians (and also sometimes family members).</p> <p>The introduction needs to justify the paper's focus on elderly people – especially since there seems to be a limited amount of evidence specifically on this group.</p> <p>Method: would be good to have more indication of inclusion/exclusion criteria in the text rather than an appendix– study design? Language? Date of publication?</p> <p>The section on synthesis gives a nice theoretical framing.</p> <p>To what extent were the authors looking at perceived/reported factors influencing decision making?</p> <p>Results: what is included in the MMAT score?</p> <p>'Decisions' is presented as a micro-level theme – yet the whole paper is about decisions.</p> <p>Not sure why your search didn't pick up on Porter et al 2007 'Should I stay or should I go? Deciding whether to go to hospital after a 999 call' JHSRP 12:1 pp32-38 but you might find something interesting in there as it's right on-topic.</p> <p>Also the much more recent Simpson et al 2017 'Popping Nana back into bed' BMCHSR 17(1) (I didn't write that one).</p> <p>I found table 2 quite confusing . It's too long to be easily navigable.</p> <p>Facts are reported (eg 5.8% of patients needed to be transferred to the ED) but it's not clear which of a number of possible sources they come from. I think it would work better if you condensed/summarised the points – and if you want to make the full detail available, reference it in full and put it in an appendix or supplementary paper.</p>
--	--

VERSION 1 – AUTHOR RESPONSE

Response to reviewer comments, list of changes

Date: May 16th, 2018
(revised) Title: Factors influencing the decision to convey or not to convey elderly people to the Emergency Department after emergency ambulance attendance: a systematic mixed studies review.
Manuscript number: BMJ open-2018-021732

We would like to thank the reviewers Dr Judy Lowthian and Dr Alison Porter for careful and thorough reading of our manuscript and for their thoughtful comments and constructive suggestions that have helped us improve the quality of the manuscript. Our detailed responses are listed in the table below.

Reviewer 1	Reply
<p><u>Title</u></p> <p>1. 'referral decision of elderly people' implies that it is the elderly people (rather than paramedics) who are making the decision.</p>	<p>We agree that the title can result in misunderstandings and changed it to:</p> <p>“Factors influencing the decision to convey or not to convey elderly people to the Emergency Department after emergency ambulance attendance: a systematic mixed studies review.”</p>

<p><u>Abstract</u></p> <p>1. The topic of the paper – as set out in the objective given in the abstract – is to review evidence about conveyance/non-conveyance decisions. However, the title talks about the ‘referral decisions’ which is confusing – patients may or may not be referred on to another service. This same confusion is found at other points in the paper.</p>	<p>Throughout the entire paper, we now consistently write about whether to convey or not to convey an elderly person to the ED after emergency ambulance attendance.</p>
---	--

<p>1. The abstract does not make it entirely clear that it is a review paper.</p>	<p>In the abstract we reformulated and extended the following text under the new heading ‘data sources’, according to the PRISMA checklist:</p> <p>“A Mixed Studies Review of empirical studies was performed based on systematic searches, without date restrictions, in PubMed, CINAHL and Embase (April 2018)”</p>
<p>2. The abstract does not give an indication of methods.</p>	<p>Here as well, we reformulated and extended the following text under the new heading ‘study appraisal and synthesis methods’:</p> <p>“The Mixed Methods Appraisal Tool was used in appraising the included articles. Data were assessed using a theoretical framework synthesis approach.”</p>
<p>3. In the abstract, the results section places an emphasis on factors which are likely to inhibit non-conveyance – what about factors which might encourage it?</p>	<p>We reformulated and added the following text under results:</p> <p>“ED referral by EMS staff is determined by many factors, and not only the acuteness of the medical emergency. Factors that increase the likelihood of non-conveyance are: non-conveyance guidelines, use of feedback loop, the experience, confidence, educational background and composition (male-female) of the EMS staff attending, and consulting a physician, EMS colleague or other healthcare provider. Factors that boost the likelihood of conveyance are: being held liable, a lack of organisational support, of confidence and/or of baseline health information, and situational circumstances. Findings are presented in an overarching framework that includes the impact of these factors on the decision’s outcomes.”</p>

<p>1. <u>In the abstract, the conclusion places a big emphasis on the risks of non-conveyance, but does not consider whether perception of risk has an influence on decision making which is higher than actual risk.</u></p>	<p>The conclusion has been simplified to: “Many non-medical factors influence the ED conveyance decision after emergency ambulance attendance, and this makes it a complex issue to manage.”</p>
<p><u>Introduction</u></p> <p>1. Seems quite short. It would be useful for it to include a brief discussion of the types of conditions for which non-conveyance protocols may be developed. How much consistency in these is there across countries?</p>	<p>The text has been revised and expanded with information on common conditions for which non-conveyance or alternative referral is preferable. The paragraph now describes the following: “Whether EMS staff can adequately determine the medical necessity for an ED evaluation is not easy to define and to measure. A systematic review and meta-analysis showed that there is insufficient evidence to support paramedics determining the medical necessity for ambulance transport³². A retrospective analysis of emergency department data showed that 7.1% of patients aged 75+ taken there by ambulance were considered as non-urgent, with the largest number of non-urgent conveyances following falls³³. Currently, researchers are focussing on adequate, community-based, alternative referrals by EMS staff for older people who have fallen”</p>
<p>2. There is a brief reference to patient refusal, but the introduction does not convey a sense that decision making can be a joint process between patients and clinicians (and also sometimes family members).</p>	<p>It is indeed useful to explain that decision making can be a joint process. We therefore revised the text to: “National protocols can guide EMS staff in making a decision over the conveyance or non-conveyance of an elderly person after an emergency ambulance call, but these protocols cannot cover the full scope of practice. Other factors also influence the conveyance decision-making process in which negotiation or joint decision-making between EMS staff, the patient and sometimes their family in deciding what is best for the patient can also play a pivotal role”</p>
<p>3. The introduction needs to justify the paper’s focus on elderly people – especially since there seems to be a limited amount of evidence specifically on this group.</p>	<p>In the last paragraph of the rationale we added the following text to justify the focus on elderly people: “<i>In the future, the growing aging population will have major consequences for the utilisation of EMS and so the conveyance decision, to the ED or elsewhere, after emergency ambulance attendance is of growing importance. Insight into factors that influence this conveyance decision-making is especially important for the population of elderly because avoidable admissions may result in functional decline, iatrogenic illness, adverse events, ED overcrowding, excessive</i></p>

	<p>interventions and high healthcare costs. To increase knowledge about factors that may influence the conveyance decision for the specific group of elderly vulnerable people, after EMS attendance, there is a need for a full overview of these factors and the impact of the decision.”</p> <p>We added a heading ‘Objectives’ with text that now reads:</p> <p>“The aim of this study is to provide an overview of those factors that influence the decision whether or not to convey an elderly person to the ED after ambulance attendance and the outcomes of such decisions. The findings will be summarised in a conceptual framework and are intended to inform practice, policymakers and future researchers. They can also serve as a basis for developing future EMS conveyance decision-making guidelines for vulnerable elderly people, where special attention is paid to minimising the risk of inappropriate conveyance and use of EMS and ED resources, adverse outcomes and medical legal consequences.”</p>
<p><u>Method</u></p> <p>1. <u>Would be good to have more indication of inclusion/exclusion criteria in the text rather than an appendix– study design? Language? Date of publication?</u></p>	<p>We have added, as suggested, the inclusion criteria in the text. Furthermore, we added an extra inclusion criteria which doesn’t influence our previous search. This has been done because we spoke about adults and the elderly in the previous manuscript, this is unclear. Now the emphasis is specifically on the elderly. We have formulated it as follows:</p> <p>“Studies were included if they contained empirical evidence on one or more factors that influenced the conveyance or non-conveyance decision to an ED for an elderly person after being attended by ambulance personnel. In more detail, studies were incorporated if they specifically addressed elderly patients; elderly people were part of a broader age group (e.g. all adults); the factors considered could be linked to elderly patients (e.g. end-of-life situations, falls) or when general factors were identified that affect all age groups (e.g. EMS staff-related factors). Searches were not restricted by publication date or by country, although only publications written in English, Dutch or German were eligible for inclusion. Detailed inclusion and exclusion criteria are provided in supplementary Appendix 1.”</p>
<p>2. <u>The section on synthesis gives a nice theoretical framing.</u></p>	<p>Thank you for your remark. We adjusted the theoretical and conceptual framework in reaction to the lack of clarity regarding the factor decision.</p>
<p>3. <u>To what extent were the authors looking</u></p>	<p>We were equally interested in both perceived and</p>

<u>at perceived/reported factors influencing decision making?</u>	reported factors and report this in table 2.
---	--

<u>Results</u>	
1. What is included in the MMAT score?	We have added additional information on the MMAT score in 2.5: “The MMAT has been tested for validity and been used in various systematic mixed studies reviews to evaluate the methodological quality by answering four questions regarding recruitment, randomisation (if applicable), appropriateness of outcome measures and attrition rate/completeness of data.”
2. ‘Decisions’ is presented as a micro-level theme – yet the whole paper is about decisions.	This is indeed confusing. We changed this theme into ‘Input of significant others’ in both the text and the conceptual framework.
3. Not sure why your search didn’t pick up on Porter et al 2007 ‘Should I stay or should I go? Deciding whether to go to hospital after a 999 call’ JHSRP 12:1 pp32-38 but you might find something interesting in there as it’s right on-topic. Also the much more recent Simpson et al 2017 ‘Popping Nana back into bed ‘ BMCHSR 17(1) (I didn’t write that one).	We have updated our database searches and retrieved additional relevant studies which include both the articles mentioned by the reviewer.
4. I found table 2 quite confusing. It’s too long to be easily navigable. Facts are reported (eg 5.8% of patients needed to be transferred to the ED) but it’s not clear which of a number of possible sources they come from. I think it would work better if you condensed/summarised the points – and if you want to make the full detail available, reference it in full and put it in an appendix or supplementary paper.	We have condensed/summarised the points in table 2. Both the results and the outcomes are now better linked to their sources.

<p>FORMATTING AMENDMENTS (if any) Required amendments will be listed here; please include these changes in your revised version: - Kindly re-upload FIGURE with at least 300 dpi resolution.</p>	
---	--

Reviewer 2	Response
<p>Thank you for asking me to review this manuscript that describes a systematic mixed studies review, designed to elucidate the factors that influence referral decisions by EMS personnel for older patients. This study is important and timely in the context of persistent emergency demand by older cohorts, in a globally ageing population. The study design is appropriate for the stated research question, and includes quantitative and qualitative studies for synthesis after evaluation of study quality with a multi-method appraisal tool. The results are summarised in the text and supported by two tables. The discussion points are appropriate.</p>	<p>We thank the reviewer for the summary and feedback on the manuscript.</p>
<p>Method</p> <p>1. Page 5 Section 2.1 Please summarise the inclusion criteria in the text</p>	<p>We have added the inclusion criteria in the text as suggested:</p> <p>“Studies were included if they contained empirical evidence on one or more factors that influenced the conveyance or non-conveyance decision to an ED for an elderly person after being attended by ambulance personnel. In more detail, studies were incorporated if they specifically addressed elderly patients; elderly people were part of a broader age group (e.g. all adults); the factors considered could be linked to elderly patients (e.g. end-of-life situations, falls) or when general factors were identified that affect all age groups (e.g. EMS staff-related factors). Searches were not restricted by publication date or by country, although only publications written in English, Dutch or German were eligible for inclusion. Detailed inclusion and exclusion criteria are provided in supplementary Appendix 1.”</p>
<p>Results</p> <p>1. Pages 8-9 Section 3.3.3 'Personal and role related factors' + Pages 23-26 Table 2 I think that Section 3.3.3 would benefit from re-</p>	<p>1. We have re-written section 3.3.3. and table 2 to enhance readability. 2. As suggested by the reviewer, we incorporated the 'previous negative</p>

<p>writing, as some of the language used in the text is slightly confusing. I suggest incorporating some of the language from Table 2 into the text, to enhance readability.(eg) p 8, lines 38-40. 'Knowing the profession' – please add 'one factor...influenced conveyance decision – educational background/professional title'</p> <p>2. p. 24, lines 8-39 'Table 2'.</p> <ul style="list-style-type: none"> • I suggest incorporating the factor 'previous negative experiences' into 'experience/confidence' • Please elaborate on the two points under 'health status of EMS staff' <p>3. Pages 9-10 Section 3.3.4. 'Micro-level themes'</p> <p>This section would benefit from an introductory sentence to tie the points listed together.</p>	<p>experiences' factors in 'experience/confidence' in table 2.</p> <p>3. We have added the following sentence:</p> <p>"The micro-level theme consists of the knowledge that informs EMS staff on the scene, and can be subdivided into six themes: 'personal and role-related factors', 'cues', 'judgement', 'input of significant others', 'thinking' and 'evaluation' ."</p>
<p>4. Table 1, page 11 – please add in the reference number for each study (next to author and date)</p>	<p>The table has been adjusted as suggested.</p> <p>The suggested correction has been made.</p> <p>We have added a legend to provide clarification.</p> <p>A native speaker has edited the final text.</p>
<p>1. Figures Page 40-42 Please label Figure 1,2,3.</p>	
<p>1. Page 42 Please add a legend to explain A1, A4 etc</p>	
<p>English writing The manuscript is generally well written for publication in English, but would benefit from English language proof-reading/editing.</p>	

Editorial Requirements:	Response
<p>1. Please define "EMS" in the title.</p>	<p>We changed the title and left out the term EMS</p>
<p>2. Please revise the Strengths and Limitations section (after the abstract) to focus on the methodological strengths and limitations of your study, rather than summarizing the results.</p>	<p>This section was indeed focused on the results. We have changed this section to present the methodological strengths and limitations of our study as shown below:</p> <ul style="list-style-type: none"> • The broad and empirical nature of the study has made it possible to identify multiple factors that influence the referral decision by EMS staff after ambulance emergency attendance, and the outcomes of this decision. • Building on existing general decision-making frameworks, an overarching framework was developed that proved

	<p>helpful in structuring the influential factors identified.</p> <ul style="list-style-type: none"> • A weakness is that not all of the factors identified can be definitely related to the elderly population because, in many studies, the elderly formed part of a broader study population, and the results were not specified by age group. • The low methodological quality in some of the studies and the considerable age of some of them are limitations of the study. • The search strategy does not include dissertations and reports, and so some relevant information may have been overlooked.
3. We note that the search is over a year old. Please update this to include more recent literature	We updated the literature search to cover publications up to April 2018 and have added 9 new articles and one article has been removed from the previous manuscript. This article did not provide age information.
4. Please complete and include a PRISMA check-list, ensuring that all points are included and state the page numbers where each item can be found. The check-list can be downloaded from here: http://www.prisma-statement.org/	<p>We have downloaded the PRISMA checklist, and included the relevant items in our manuscript. The completed PRISMA checklist with page numbers can be found as supporting document 5.</p> <p>The whole paper now conforms to the PRISMA checklist</p>
5. Please include the full search strategy for at least one database as a supplementary file.	We have added the search strategy for Pubmed in Supplementary Appendix 2
6. Please include the original protocol for the study, if one exists, as a supplementary file.	Not applicable

VERSION 2 – REVIEW

REVIEWER	Alison Porter University of Swansea, College of Medicine
REVIEW RETURNED	12-Jun-2018

GENERAL COMMENTS	The authors have made some good revisions to this paper and it is now a very interesting, clear and informative read. My only suggestion would be in relation to the Micro-level themes: their Theme 3 is called 'judgement' but seems to be specifically about decision support tools, so would be better with a title to reflect that. Meanwhile, Theme 5 is 'Thinking' - which doesn't quite work in English, and I think this theme would be better called 'Judgement'.
-------------------------	---

VERSION 2 – AUTHOR RESPONSE

Response to reviewer comments, list of changes

Date: July 13th, 2018
 (revised) Title: Factors influencing the decision to convey or not to convey elderly people to the Emergency Department after emergency ambulance attendance: a systematic mixed studies review.
 Manuscript number: BMJ open-2018-021732

Dear Dr. Porter,

Thank you for your comments that we have made good revisions and that you find the document very interesting, clear and informative. In response to your comments, the following changes have been made

Comments	Reply
<p><u>Results, 3.3.3</u> Micro-level themes: Theme 3 is called 'judgement' but seems to be specifically about decision support tools, so would be better with a title to reflect that. Meanwhile, Theme 5 is 'Thinking' - which doesn't quite work in English, and I think this theme would be better called 'Judgement'.</p>	<p>As suggested by the reviewer, we changed the theme 'judgement' into 'decision support tools', and 'Thinking' into 'judgement'.</p> <p>The text in 3.4 has changed into: “The process of data extraction and coding led to a small revision of the framework. The theme ‘Decisions’ was redefined as 'Input of significant others', in order to give a more accurate description of the factors found from the studies. ‘Use of decision support tools’ was added as a new theme.”</p>
	<p>Throughout the entire paper, we changed ‘theoretical framework’ into ‘best fit’ framework according to the literature.</p>