

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 early and late readmissions in Australian hospitalised patients and investigating role of admission nutrition status as a predictor of hospital readmissions: a cohort study
AUTHORS	Sharma, Yogesh; Miller, Michelle; Kaambwa, Billingsley; Shahi, Rashmi; Hakendorf, Paul; Horwood, Chris; Thompson, Campbell

VERSION 1 – REVIEW

REVIEWER	Ingibjörg Gunnarsdóttir Iceland
REVIEW RETURNED	02-May-2018

GENERAL COMMENTS	<p>This is an interesting and important analysis describing factors influencing early and late readmission in Australian hospitalised patients. Overall the paper is well written and the clinical relevance of the information is high. One of the main result of the paper is that malnutrition is a strong predictor of unplanned readmission and thus a major limitation that only 16% of the patients were screened for malnutrition.</p> <ol style="list-style-type: none">1. Information about the group screened for malnutrition is missing. Was the group different somehow?2. Please include information about the number of subjects at low risk, medium risk and high risk of malnutrition in each group in table 1 or in the text.3. Please explain why you don't use all the MUST classes for malnutrition in your analysis? It would be interesting to see the risk of readmission in each group compared with the reference group not at risk.
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REVIEWER	Amir Barzin University of North Carolina at Chapel Hill - Department of Family Medicine
REVIEW RETURNED	11-May-2018

GENERAL COMMENTS	<p>Manuscript ID bmjopen-2018-022246 Review – Amir Barzin</p> <p>I appreciate the opportunity to review this original manuscript evaluating the factors of readmission in Australian hospitalized patients and the roll that nutritional status plays in readmissions. As a hospitalist, transitional care provider, and primary care physician, I think that was a very interesting read and approach to limiting readmissions. I appreciate the authors desire to bring forth more information regarding the process. Regarding the submission, I</p>
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believe that it has a number of strengths:

- Large sample size that involves a multiple centers in Australia
- The fact that the readmissions at OTHER hospitals were also captured
- The ability to look at the data over a one-year period of time
- The statistical analysis seems appropriate for the desired outcomes

Although many strengths exist in this manuscript, I believe the paper could have been further strengthened through these minor edits:

Introduction: There are other well documented discussions regarding the validity of malnutrition and the impact on readmissions that may help support the initial statement. Consider looking at the following publications:

1. Lim SL, Ong KC, Chan YH, Loke WC, Ferguson M, Daniels L. Malnutrition and its impact on cost of hospitalizations, length of stay, readmission and 3-year mortality. *Clin Nutr.* 2012;31(3):345-350.
2. Barker LA, Gout BS, Crowe TC. Hospital malnutrition: prevalence, identification, and impact on patients and the healthcare system. *Int J of Environ Res and Public Health.* 2011;8:514-527.

I appreciate the identification of not mentioning medications at discharge as a factor for readmissions; however, medication error is a leading cause of readmissions (Forester et al. The incidence and severity of adverse events affecting patients after discharge from the hospital. *Ann Intern Med.* 2003 Feb 4;138(3):161-7). Maybe inserting a comment discussing this would be helpful to frame the limitation.

Methods: This was well done, and the data was clearly presented. I believe that the statistical analysis looks appropriate. No recommendations.

Discussion: I appreciate the discussion on both early and late readmissions and the discussion about the higher readmission rates. I also like the discussion including other studies and how they could or could not be helpful in this review.

Overall, I think that this is very well written.

Comments to the Editor:

Well written. Do think that this is a good example of an ongoing discussion about how to maximize care for those in and out of the hospital and limit cost of care. This is an interesting variable to consider for intervention.

VERSION 1 – AUTHOR RESPONSE

Reviewer: 1

Reviewer Name: Ingibjörg Gunnarsdóttir

Institution and Country: Iceland

Please state any competing interests or state 'None declared': None

Please leave your comments for the authors below

This is an interesting and important analysis describing factors influencing early and late readmission in Australian hospitalised patients. Overall the paper is well written and the clinical relevance of the information is high. One of the main result of the paper is that malnutrition is a strong predictor of unplanned readmission and thus a major limitation that only 16% of the patients were screened for malnutrition.

1. Information about the group screened for malnutrition is missing. Was the group different somehow?

Response 1

There were some differences between the two groups and this information has now been included in the results section of the text. (Page 11)

“Patients who underwent MUST screening were significantly older (67.8 years (SD 18.4) vs. 66.0 years (SD 18.7), $P < 0.001$), had a higher CCI (1.8 (SD 2.3) vs. 1.7 (SD 2.2), $P < 0.005$) and a longer LOS (5.7 days (IQR 8.7) vs. 3.1 days (IQR 4.5), $P < 0.001$) but were less likely to be of indigenous status (84 (1.8%) vs. 670 (2.8%), $P < 0.001$) than those who missed MUST screening.”

2. Please include information about the number of subjects at low risk, medium risk and high risk of malnutrition in each group in table 1 or in the text.

Response 2

We have now included this information as advised by the reviewer and have now added the number of subjects as low, medium and high risk of malnutrition in (Table 1).

3. Please explain why you don't use all the MUST classes for malnutrition in your analysis? It would be interesting to see the risk of readmission in each group compared with the reference group not at risk.

Response 3

We included only nourished and malnourished patients in our analyses purely for the ease of understanding by the reader, as there were no significant differences between the odds ratios between moderately and severely malnourished patients.

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Well written. Do think that this is a good example of an ongoing discussion about how to maximize care for those in and out of the hospital and limit cost of care. This is an interesting variable to consider for intervention.

Response: We thank reviewer for the constructive feedback.

We have included the two references in the introduction section as suggested by the reviewer. (Page 7, paragraph 1)

“Malnutrition is associated with adverse health outcomes for patients and leads to increased health care costs.^{11 12”}

We have now modified the introduction section and have now included drug adverse reactions as one of the causes for readmissions, as advised by the reviewer. (pages 6-7)

“Studies have identified that some of the factors responsible for readmissions e.g. medication errors, may be potentially modifiable and there may be similar other factors which are yet to be identified and could be the target for future interventions.^{8”}

VERSION 2 – REVIEW

REVIEWER	Amir Barzin
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	UNC-Chapel Hill, USA
REVIEW RETURNED	24-May-2018
GENERAL COMMENTS	This revision captures key elements that were missing in the first edit, and has added statistical information that appears to be missing from the first edit. Improved clarity with this.
REVIEWER	Ingibjörg Gunnarsdóttir University of Iceland and Landspítali National University hospital, Iceland
REVIEW RETURNED	30-May-2018
GENERAL COMMENTS	I have no further comments to the authors.