Author’s response to reviews

Title: Association between delivery methods for enteral nutrition and physical status among older adults

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Author’s response to reviews:

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Dr. Francesca Maria Trovato
BMC Nutrition

Dear Dr. Francesca Maria Trovato

We are grateful for the opportunity to revise our paper (NUTN-D-19-00146) entitled “Association between delivery methods for enteral nutrition and physical status among older adults”. We appreciate the helpful comments, which we believe have substantially improved our paper.

We attach tracked change versions, and separately list our point-by-point responses. We have also changed the title in accordance with the reviewer’s comment.
Yours sincerely,

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We thank the reviewers for their careful reading of our manuscript and for the helpful comments. We have addressed the comments and are resubmitting the manuscript to BMC Nutrition. In the revised version of our manuscript, we have re-analyzed our data in accordance with your recommendations. I hope that the manuscript is now suitable for publication in BMC Nutrition.

Our responses to the editor’s and reviewers’ comments are as follows:

Reviewer reports:

Judi Porter (Reviewer 1): Thank you for the opportunity to review this manuscript. It is an interesting topic, well done to authors for your work. Some comments on the manuscript follow:

Thank you for your comment. We have revised and improved the manuscript based on your suggestions.
I suggest that the terminology for "elderly" is replaced with "older adult".

We have replaced the terminology of “elderly” with “older adults” in our manuscript.

I am not convinced that a retrospective analysis of data can, as you suggest in the abstract conclusion, provide evidence of causative effect. Please reword this conclusion carefully taking care not to overstate your findings and their interpretation. Eg. within clinical decision making PEG feeding may be offered to the most mobile/ambulatory patients.

We agree with this concern. We have added a sentence in the conclusion section as follows:

P3, Line5

PEG feeding could be associated with a lower risk of becoming bedridden or death in comparison with nasogastric feeding, although PEG feeding may be offered to the most mobile/ambulatory patients within clinical decision-making.

Keywords: I do not think that end-of-life care is justified as a keyword, there is no focus on this throughout the manuscript.

We agree with this comment. We have removed “end-of-life care” from the keywords.

Introduction

Page 4, line 5: I suggest that the discussions regarding choice of enteral nutrition should be extended beyond the physicians. How many hours of nutrition training do medical staff receive? - some estimates are less than 10 hours across their training. Dietitians however have full qualifications in nutrition, and should be recognised as the experts in nutrition.

We agree with this comment. We have changed the sentence as follows.
Physicians, speech pathologists, and dietitians should have sufficient discussions on enteral nutrition with patients and their families and provide fully information about advantages and disadvantages of enteral feeding methods.

The aim "aimed to investigate the change in physical function of patients following enteral nutrition and to compare the difference between the feeding methods" is completely at odds with the primary outcomes. Your focus is not on changes in physical function, but rather death/bedridden status. The aim should be revised to align with the primary outcomes, or, the primary outcomes should be changed to measures of physical function.

We agree with this comment. We have changed the expressions of “change in physical function” to “physical status” in our title and manuscript.

Methods

I am unable to assess the "multiple imputation by chained equation" modelling for missing values. The journal statistical editor should be consulted.

We used the method of “multiple imputation by chained equation” for missing values because the missing variables (BMI, serum albumin level, estimated energy requirement, and GNRI) included both continuous and categorical variables.

Results

Page 7, line 31 Again the discussions between physicians, patients and families seems to have a rather out of date medical focus. What was the contribution by the broader interprofessional team to the decision making of enteral feeds?
Thank you for your comment. In Japan, the main discussions on the decision-making of enteral feeding are usually held among physicians, patients, and their families after physicians receive assessment reports of patients’ swallowing function from their speech pathologists, dietitians and rehabilitation physicians. We have added a sentence as follows.

P7, Line45

The discussions were held after physicians received assessment reports of patients’ swallowing function from their speech pathologists, dietitians and/or rehabilitation physicians.

Table 1

Demographics: BMI only is reported, not weight or estimated energy requirements. You report a statistically significant difference between 24 prescribed dose of enteral nutrition. What was the estimated requirements for the participants? What proportion were receiving combination oral intake via food/fluids? These factors need to be considered to place these figures within a practical context. It seems that there is no dietitian on the authorship team and therefore these aspects have been overlooked in the report.

We agree with this comment. We calculated the estimated energy requirement of patients, and showed the percentages of average intake to the energy requirements in both groups. Estimated energy requirement was calculated, using the Harris-Benedict equation and adjusting this value by activity factor (AF) and stress factor (SF). The values of AF were 1.2 for patients who did not receive physical therapy and 1.3 for patients who received physical therapy. The values of SF were 1.0 for patients diagnosed as stroke/neurological diseases and 1.2 for others. We also put the estimated energy requirement into the multivariable regression model. The dataset did not include the information on the proportion of food/fluid balance of their intake. Therefore, we added sentences in the result section and the discussion section as follows.

P9, Line47

The percentages of average intake to the energy requirements were 69% in NGT group and 70% in PEG group.

P14, Line39
Finally, the dataset had also limited information on the proportion of food/fluid balance and protein intake.

Since we added the estimated energy requirement in our final model, we removed a sentence below in the result section.

There was no effect modification between BMI and daily intake of enteral nutrition.

Kris M. Mogensen, MS, RD-AP, LDN, CNSC (Reviewer 2): This was a very interesting retrospective cohort study evaluating outcomes (death or bedridden) in patients with NGT vs PEG for long-term enteral nutrition. I have a few questions and comments that I hope will help to strengthen your manuscript.

Thank you for your comment. We have revised and improved the manuscript based on your suggestions.

1. I did not see any formal evaluation of presence or absence of malnutrition. Were these patients evaluated by a nutrition professional and did they classify any degree of malnutrition? If not, could you apply something simple such as the GLIM criteria to have some assessment of nutritional status? BMI is helpful, but albumin is a poor measure of nutritional status in ill patients.

We agree with this comment. We assessed the Geriatric Nutritional Risk Index (GNRI) in order to evaluate the risk of malnutrition in Table 1, and put it into the multivariable model (Table 3). The GNRI is calculated as: [14.89 x serum albumin (g/dl)] + [41.7 x(body weight / ideal body weight)]. The ideal body weight was defined as the value calculated from height and a body mass index (BMI) of 22. In cases with a (body weight/ideal body weight) < 1, this value was replaced by 1.

2. For daily dose of enteral nutrition, it would be much more meaningful to report the % of energy and protein requirements, rather than the volume of formula infused. Since enteral formulas vary, the difference of volume of formula infused may be meaningless if the NGT patients were receiving a 1 kcal/mL formula vs the PEG patients receiving a 2 kcal/mL formula. As a clinical nutritionist, the volume of formula isn't particularly helpful if we don't know what kind of formula was infused. Reporting % of nutritional requirements met will be much more helpful to determine if one route of feeding was more effective than the other.

We agree with this comment. We calculated “the daily average intake of enteral nutrition (kcal)” and “the estimated energy requirement (kcal)” in both groups (Table 1). Estimated energy requirement was calculated, using the Harris-Benedict equation and adjusting this value by activity factor (AF) and stress factor (SF). The values of AF were 1.2 for patients who did not receive physical therapy and 1.3 for patients who received physical therapy. The values of SF were 1.0 for patients diagnosed as stroke/ neurological diseases and 1.2 for others. We also put “the daily average intake of enteral nutrition (kcal)” and “the estimated energy requirement (kcal)” into the multivariable regression model (Table 3). We used both “nutritional requirement (kcal)” and “daily average intake (kcal)” for the multivariable model since the variable of “nutritional requirement” had missing values (33%).

Since we added the estimated energy requirement in our final model, we removed a sentence below in the result section.

There was no effect modification between BMI and daily intake of enteral nutrition.

3. In table 2, you report out death and bedridden separately, but in table 3, you reported out your combined outcome of death + bedridden, but only bedridden alone. For table 3, could you also do analysis for death alone, or are there not enough patients to have anything meaningful? if so, would state that somewhere in the manuscript.

We agree with this comment. We re-analyzed the multivariable model for the outcome of death and showed the result in the middle column in Table3.
4. In your discussion, you mention that PEG patients may be fed more consistently than the NGT patients, but your table 1 does not support this; the higher BMI may be an indicator for more enteral nutrition volume as you mention in the next paragraph, but then it's not really a normalized comparison. If you can't get % energy and protein delivery, perhaps a mL/kg body weight would help to make for a more appropriate comparison.

We agree with this comment. We calculated the estimated energy requirement in Table 1, and we have also added a sentence in Result section as follows.

P9, Line47

The percentages of average intake to the estimated energy requirements were 69% in NGT group and 70% in PEG group.

5. In regard to patients who resumed oral intake, are there speech-language pathologists or swallowing specialists who evaluate the patients? Were some receiving therapy or were some told that they would never regain swallowing function? I also wonder if having an NGT in place is a motivator to improve oral intake, in an effort to get the NGT removed?

We have assessed the number of patients who received therapy treatment from speech pathologists in both groups. We have added sentences as follows.

P9, Line45

The numbers of patients who received therapy treatments from speech pathologists were 63 (46%) in NGT group and 17 (40%) in PEG group.

P10, Line45

Among the patients who resumed oral intake, 23 patients (53%) received therapy treatment by speech pathologists.
In our study, all the patients started enteral nutrition with NGT feeding, and a part of them turned into receiving PEG feeding. Therefore, having NGT tube at the start would not make a difference of removing it between both groups.

Nicola Veronese (Reviewer 3): Very interesting paper with important clinical findings. I only suggest to the authors to add the prevalence of dementia in table 1 (is an important cause for enteral nutrition) e to give some space (a paragraph) regarding the potential association between use of PEG, dementia and frailty status.

Thank you for your comment. We revised and improved the manuscript based on your suggestions. We have assessed the presence of dementia in both groups and showed it in Table 1. We also put it into the multivariable analysis. We have added a paragraph in discussion section as follows.

P13, Line43

There was no significant difference in the presence of dementia between NGT and PEG groups. The overall prevalence of dementia was two out of ten in our analysis, and the frequency of dementia may be underestimated, since the sensitivity and specificity of detecting dementia in our database were 37.5% and 100%. In our analysis, the presence of dementia was associated with decreased risk of death and bedridden, although a previous systematic review shows that the association between presence of dementia and mortality among patients with enteral nutrition remains controversial.

We believe that the changes the reviewers have suggested have substantially improved our manuscript and we are grateful for your advice. We hope that our manuscript is now suitable for publication in BMC Nutrition.

Sincerely,

Tetsuro Hayashi