Author’s response to reviews

Title: Examining the correlates of meal skipping in Australian young adults

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Author’s response to reviews:

Professor Clare Collins
Editor-in-Chief, Nutrition Journal
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Dear Professor Collins,

We appreciate the opportunity to revise and resubmit our manuscript entitled “Correlates of meal skipping in young adults” for consideration for publication in the Nutrition Journal. We would like to thank the reviewers for their comments, which have been addressed, with corresponding changes made to the manuscript where appropriate.

Please find below point-by-point responses to the reviewers’ comments with a detailed response to each comment and indication of where the changes have been made to the manuscript.

Yours sincerely,

Felicity Pendergast
On behalf of all authors

Reviewer 1
This paper studies the correlates of meal skipping in young Australian adults. The topic of meal skipping fits in well with recent trends in nutritional research to study the impact of the timing of eating (chrono-nutrition, a key word to be added). Generally it was well written and it provides novel and interesting data. Please find below some suggestions to further improve the paper. Overall, the paper was quite lengthy and could be condensed in several places to enhance the readability.

We thank reviewer for these comments and have condensed mainly the introduction section of this manuscript to increase readability. The remainder of the manuscript has been reviewed and condensed as much as possible without compromising on detail or research integrity. (150 words removed)

Title: suggestion to add the word Australian to young adults?

Australian has now been added to the title of this manuscript.

“Examining the correlates of meal skipping in Australian young adults”

Line 1

Abstract -Line 19-20: diet-related chronic disease risk factors -> remove the word 'factors'?

“Factors” has now been removed

“Meal skipping is associated with diet-related chronic disease risk factors and is highly prevalent in young adults.”

Line 20

line 22: this eating behavior -> meal skipping?

“Meal skipping” has replaced “eating behaviours” in this sentence.

“Therefore, the aim of this study was to examine the prevalence and correlates of this eating behaviour meal skipping in young adults.”

Line 22

line 23: add the number/percentage of males and females? (NB 76% female!)

The percentages of males and females has been added.
“Young adults aged 18-30 years (n=578) (24% male, 76% female) used ‘FoodNow’, a purpose designed real-time smartphone application to record food and beverage consumption over four non-consecutive days.” Line 23

Results: Would it be possible to add more numbers to the Abstract?

The results section of the abstract has now been adjusted to include additional quantitative results.

“Participants with a university education were less likely to be a meal skipper (any meal) (OR=0.46; 95%CI: 0.22, 0.95; p=0.035), while those who previously or currently smoked cigarettes were more likely to be breakfast skippers (OR=1.10; 95%CI: 1.15, 3.86; p=0.016) compared to those who had never smoked before. Those who are time scarce were more likely to be either breakfast (OR=1.12; 95%CI: 1.00, 1.26; p=0.036) or lunch skippers (OR=1.11; 95% CI: 1.01, 1.23; p=0.033).”  Line 39-44

Introduction:

First line: definition of meal skipping is not a very strong opening sentence. Omit this sentence and start with the problem (as described in the second sentence?)?

In light of the reviewer’s comment the first sentence of the introduction has been omitted.

“ skipping is the omission or failure to consume one or more traditional main meal (breakfast, lunch or dinner) throughout the day (1). Frequently skipping meals, particularly the breakfast meal, is associated with a number of nutrition related outcomes.”  Line 52-53

line 51-52 lower intakes of total energy, vitamins and minerals -> throughout the rest of the day? please clarify.

This sentence has now been reworded to improve the clarity.

“These include such as poor diet quality (2), lower intakes of total energy, vitamins and minerals (3), higher total energy intake (2), and chronic disease risk factors such as central adiposity (4, 5), markers of insulin resistance (5) and cardio metabolic risk factors (5).” Line 55-58

Though the Introduction provides a general good background on the topic of meal skipping, it could be enhanced by condensing the information and being a little more succinct. E.g. line 98-101 begin with 'in summary' and the next paragraph with 'in conclusion'.

The introduction section of this manuscript has been condensed to increase readability.

Methods:
Statistical analysis: how did the researchers deal with missing data?

An additional sentence has been added to the results section to further clarify how we dealt with missing data.

“Participants’ were excluded from this analysis if they did not complete the online questionnaire (n=106), if they had not completed any following day questions (n=175) or if they had less than three days of following day data (n=127) (Figure 1). Three days of dietary data has previously been reported to be sufficient for reporting mean energy intake (18). A complete case analysis approach was used with regard to excluding participants from analysis.

Line 277

Statistical analysis: Did the researchers test for any effect modifiers?

We did not examine effect modifiers as our previous review of the literature did not lead to any pre-specified hypotheses regarding this.

Results:

Table 1: perhaps add two columns per gender?

The study was not powered to report findings separately for males and females. As such we would prefer to report data as a cohort of both genders to reduce confusion when interpreting results.

Discussion:

One point that may warrant further attention is that originally this study included more subjects, which could not be included for several reasons. How could this have affected the outcomes of this study? And does this potentially impact on the external validity?

We examined the original sample, the excluded participants and the final analysis sample. Overall there were no substantial differences between the original sample, excluded sample and the final analysis sample with respect to age, BMI or SEIFA. With respect to sex, males and females were excluded due to missing data at relatively similar proportions resulting in an original recruited sample that was similar in sex distribution as the original sample. However, the original and final analysis sample were predominantly female, and therefore there are concerns about external validity for this reason (as we noted in the original manuscript). We have added to the discussion a discussion of this issue.

“Related to this is the reduced sample size included in the final analysis, which may introduce bias. Analysis of the original sample, the excluded participants and the final analysis sample
suggests that there no substantial differences with respect to important characteristics such as age, BMI or SEIFA. However, as previously described the sample was predominantly female, and therefore concerns about external validity are still relevant and results should be interpreted in light of these criteria.”

Line 424-430

Reviewer 2

The paper is well written and examines an interesting and important field in Nutrition, meal skipping and correlates of meal skipping in young adults. The method used with real time registration via an app for cell phones represents a promising way to do this kind of research - because how to measure food intake in a population in a way that is both reliable and represents a low burden to both participant and researcher is a difficult task.

I have a few points for considerations regarding the revision of the paper.

We thank the reviewer for these positive comments.

Abstract:

I recommend including the findings on education also in the conclusion of the abstract, not only in the conclusion in the manuscript.

The findings on education have been added to the conclusion of the abstract.

“Conclusions: The findings suggest that the correlates of meal skipping vary according to the specific meal skipped. University education status needs to be considered when designing interventions aimed at the reduction of meal skipping among young adults, while correlates such as time management and smoking status may offer potential behaviour change targets within these interventions.” Line 46-49

Background:

Page 4, line 51: Is meal skipping, in particular breakfast skipping, associated with lower intake of total energy? In the context it its used here, it can create misunderstanding. Lower intake of total energy could lead to less obesity in the long run, and therefore skipping of breakfast may be interpreted as a healthy behavior - which I think the authors do not mean to anticipate.

Could it be that you mean higher intake of total energy? If not, this sentence need to be rephrased to make more sense to the reader.
Many overweight/obese people seem to think that skipping of meals is a way of losing weight in the long run. Is there any evidence that this might be true? It would be good if the current evidence base in this can be stated in the background section.

The original sentence was an error, it has now been reworded to improve clarity.

“These include such as poor diet quality (2), lower intakes of total energy, vitamins and minerals (3), higher total energy intake (2), and chronic disease risk factors such as central adiposity (4, 5), markers of insulin resistance (5) and cardio metabolic risk factors (5).”

The reviewer has requested more information regarding breakfast skipping and associations with energy and obesity, however we have not included more discussion of this as it would require a large addition in the introduction to address properly, and the focus of manuscript is not solely breakfast skipping and in light of comments to reduce the length of the manuscript overall.

Line 55-58

Page 4, line 64-65: if the overall range was 5-83%, how come that breakfast was ranged 14-89%?

This data was taken from a published systematic review looking at specific meal skipping behaviours and their rates in varying studies. Meal skipping was assessed as total meal skipping, breakfast skipping, lunch skipping and dinner skipping in this review. Each study in the systematic review used different methods to measure / categorise meal skipping hence the ranges vary from study to study and also across the varying meal skipping behaviours. The wording of this sentence has been adjusted to improve its meaning.

“While much of the research is focused on breakfast skipping exclusively, a recent systematic review reported that overall meal skipping (any meal) rates in young adults (18-30 years) ranged between 5-83%, with rates for skipping specific main meals varying: breakfast (14-89%), lunch (8-57%), dinner (5-47%) (9).” Line 68

Methods:

Page 6, line 117: Recruitment was done e.g. via Facebook. But in the limitation section, the authors suggest that targeted recruitment should be considered. But is not FB used as a targeted recruitment in your study? To my knowledge, you can tailor messages to a certain population in FB, but it costs money. Considering your sample that were not very varied - did you try to recruit low SES and men via FB?

The researchers did try and target recruitment to males on Facebook. We found however that males were less responsive to this method of recruitment. An additional section has been added about the limitations of this manuscript to explain this further.
“Future research may need to consider alternative recruitment strategies to ensure that a range of participants, varying in sex and social economic position, are recruited to decrease bias associated with the current sample. While Facebook recruitment allows targeted advertisements based on a number of factors such as age, sex and location, recruitment of makes and participants from low SES areas was challenging. Therefore, alternative targeted strategies such as collaboration with organisations that males or those from a low SES background are connected to e.g. local sporting teams or events held for young adults may be needed.”

Page 7, line 121: out of curiosity: is it common to pay each participant e.g. $25 in Australia to participate in research? In some parts of the world, this would be considered as creating a bias.

Yes, it is not uncommon for studies in Australia to compensate participants for their time.

This study had ethics approval for all aspects for the study including the compensation, and this complies to the NHMRC national statement.

The following statement was provided to the Deakin University ethics board when justifying the compensation. “Participants will be offered a $25 shopping voucher as reimbursement for their participation in this research project.”

Measures:

Page 9, line 176: I know from other studies, that even 1-2 yrs in university may be of importance when health literacy is in question, even if you don't finish a degree (minimum of 3 years - bachelor). So it seems to me that your categories are a bit "wide", and that the cut off : finishing a university degree is quite strict. This should be addressed in the limitation section.

A section has been added to the limitations section of this manuscript discussing the limitation of using “finishing a university degree” as a category during analysis.

“Fourthly, education status was measured as a binary variable; university degree versus no university degree. Previous research has shown that any amount of time spent in university education (incomplete university education) can impact health literacy (54), thus future research may warrant examination of this correlate as a continuous variable during analysis.”

Page 9, line 180: I find it hard to understand why you categorise smoking as never smoked in one category, and ex-smokers, occasionally smokers and regular smoker in one category. What is the rationale for when it comes to meal skipping, that an ex-smoker (maybe someone in your sample smoked for 2 yrs from 18-20, and is now 30=ex-smoker) are analysed together with a regular smoker, and not with "never smoked"? To me, that would make a lot more sense. Also ,
if occasionally could mean 1-2 times per month, it could make sense to categorise them with never smoked? Please make a rationale for why your way of categorizing makes sense, or consider to re-categorize this variable.

The measures section of the manuscript has been expanded to provide a rational for why the smoking variable was categorised with these cut points.

“Smoking status was categorised as “never smoked”, or “ex, occasionally or regular smoker” (25). These cuts points were chosen as previous research suggests that ex-smokers retain dietary behaviours similar to those of current smokers (27).” Line 191-192

Discussion:

Page 16, line 343: Persons who were current smokers were more likely to be breakfast skippers ….

But I think you mean: ex-smokers, occasionally smokers and regular smokers….

See my comment above. It is not quite correct to limit this category to referring to them as regular smokers. Please adjust accordingly. The whole paragraph (until line 360), must be adjusted accordingly, because it does not make sense when it includes ex-smokers, and when there is no definition of what an ex-smoker is.

Throughout the manuscript the wording surrounding the smoking results has been adjusted to reflect the reviewer’s comments. All wording now reflects the fact that those who have engaged in cigarette smoking behaviours are more likely to skip a breakfast meal as opposed to those who have never smoked cigarettes.

Line 39, 356