Author’s response to reviews

Title: Publication in a medical student journal predicts short- and long-term academic success: a matched-cohort study

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Author’s response to reviews:

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Manuscript Title: Publication in a medical student journal predicts short- and long-term academic success: a matched-cohort study

Dear Dr. Messin,

Thank you for the opportunity to make the requested revisions to our manuscript and for reconsidering our revised manuscript for publication in BMC Medical Education. We thank the reviewers for their time and effort spent reviewing our paper. Their comments have been immensely helpful in improving the quality and readability of our manuscript. We are pleased that the paper was found to be novel and of great importance to the field of medical student research, publishing and future careers.
We have responded to the reviewers’ comments and suggestions below and have tracked changes in the revised copy of the manuscript. We hope that the article is now suitable for publication.

REVIEWER REPORTS:

Ahmed Abu-Zaid, MBBS (Reviewer 1):

With pleasure, I read the paper titled "Publication in a medical student journal predicts short- and long-term academic success: a matched-cohort study" by Al-Busaidi and colleagues. The topic is of great importance to the field of medical student research, publishing and future career. The study represents the first ever investigation to look into the impact of publishing in a MSJ on students' academic success at both short- and long-term levels — this offers novelty and originality to the work presented. Overall, the manuscript reads very well, in terms of English Language, clarity, flow of ideas, supported evidence, citations and statistical analysis. The use of matched-cohort study design is unique and powerful, and rarely seen in medical education research — this adds to the strength of paper in terms of evidence presented. The methodology is largely well described, data are well interpreted, and conclusions are properly deduced.

Confounding variables are major limitations in the study, but they were acknowledged by authors. Lastly, I congratulate the authors for such an amazing work.

Author reply:

We were very delighted to read your positive comments. Thank you for your review of our manuscript. We greatly appreciate your feedback, which has been immensely useful in improving the quality and readability of our paper.

I have a few minor questions and/or suggestions:

1. Please delete the paragraph beginning with "The conceptual framework underpinning this study draws on ..." as it is a repetition.

Author reply:

As suggested by the reviewer, we have deleted this part of the introduction section.

2. A proportion of the scientific community regards the MSJs as "inferior" and perceives them negatively, and often cites a "fragile" peer-review. A brief comment on that will be appreciated.
Author reply:

We have added a few sentences highlighting this point (see Introduction section, Page 3, Paragraph 2).

3. Despite the methodology search (google searches, databases, online registries and information obtained from author metadata, etc), could it be possible that some data were missed which would have affected the results of study? If so, this should be included as a limitation.

Author reply:

Thank you for raising this point, which we agree with. We have added a sentence in the limitation section discussing this specific limitation (Discussion section, Page 12, Paragraph 2).

4. "Overall there were 1-5 authors per article, most of whom were students" ... "Almost all articles (98%) had only one student author, while only one article was authored by multiple students". It is quite confusing as whether the bulk of authors in NZMSJ are students or non-students. Please clarify.

Author reply:

Our study analysed all original contributions (original article, reviews and case reports) co-authored by medical students in the NZMSJ over the period 2004-2011. Therefore, all articles were written by at least one student-author. We identified 50 publications authored by 67 unique authors (49 students and 18 non-students). Therefore, the bulk of authors were students (49 unique student-authors Vs. 18 non-student-authors).

Additionally, of the 50 student-authored articles, 49 (98%) were co-authored by a single student while 1 article was authored by multiple students (this is in addition to other non-student authors).

We have re-written this part of the Results section to clarify this point and avoid confusing the reader.

5. Regarding the post-graduation PubMed-indexed publications by students, were some of them published in high-impact or well-respected journals? How many students were first-authors on these papers as a measure of true substantial contribution to research?

Author reply:
The main outcome of our study was “the number of PubMed®-indexed publications after graduation”. The questions you raised are certainly important related to post-graduation PubMed-indexed publications. However, we believe outlining the details related to the quality of the publishing journals (e.g. using impact factor, h-index) and the order of student authorship is beyond the scope and objectives of this study, and does not necessarily represent meaningful addition to our understanding of the impact of MSJs on the short- and long-term academic success of student authors. Therefore, we have elected not to explore the above questions related to post-graduation PubMed-indexed publications.

6. It will be interesting to show a few examples of post-graduation PubMed-indexed publications by students.

Author reply:

Thank you for this suggestion. This comment/suggestion is similar to the one raised in item 5 (above). As mentioned above, exploring post-graduation PubMed-indexed publications is beyond the scope and objectives of this study. Our main objective was to determine the presence vs. absence of post-graduation PubMed-indexed publications among cases and controls, and not the quality of publishing journals or the magnitude of student contributions (first vs. co-authorship).

7. It will be an added value to your paper if you compare-and-contrast some relevant aspects of your results to the results of other MSJs (maybe in terms of post-graduation PubMed-indexed publications, etc).

Author reply:

Our study represents the first ever investigation to look into the impact of publishing in any MSJ on students' academic success at both short- and long-term levels. This exercise was made possible by the fact that all published articles in the NZMSJ have an ‘author biography’ which enabled us to identify student authors of published articles.

Direct comparison of some of our results with other MSJs is not a straight-forward activity. For example, most MSJs do not provide ‘author biography data’ which makes student author identification difficult. Furthermore, criteria for acceptance of student-authored publications in other MSJs are different.

We believe that the next step is to extend the findings of our study in other independent cohorts (see Discussion section, final paragraph). This is quoted here for your convenience:
“Future work should consider prospective assessment of students’ perceptions of MSJs, and their perceived impact on interest in research and academic careers. Several other MSJs exist around the world [4], and replication of these findings in other independent cohorts is needed to validate and confirm the findings of the present study.”

8. If possible, or maybe as a future study, it will be interesting to look into the rates of post-graduation publication, completion of higher academic degrees, and pursuing an academic career between students who published in MSJs and those who published in mainstream journals.

Author reply:

This question is an interesting one but unfortunately cannot be answered by our current study/design. We agree that a future study appropriately designed to answer this question is required.

Reviewer 2 (Reviewer 2):

The paper has appropriately aligned its aims with the study design, execution and interpretation.

The authors had a well defined inclusion criteria to answer their hypothesis.

The main limitation is that they have confined themselves to a single medical student journal, which is primarily a national journal. Therefore, there is an inherent selection bias.

Author reply:

We would like to thank you for your positive feedback and valuable comments.

REQUESTED REVISIONS:

The authors need to acknowledge and / or improve the following limitations.

1- Using a single medical student journal, which predominantly caters to students of a single country introduces significant bias to the study. This also limits the generalization of the findings.

Author reply:

Our study was based on a single medical student journal (MSJ) from New Zealand for several reasons. The NZMSJ was the most suitable MSJ to examine our objectives/hypotheses. It
provides author biography data which facilitated the identification of student authors to conduct this analysis. Furthermore, assessing primary and secondary outcomes of interest was possible via publicly available databases and registries in New Zealand. We have added a sentence to the discussion section acknowledging that using one MSJ limits the generalizability of the study findings to other MSJs/cohorts. We have also suggested the replication of our findings in other independent cohorts/MSJs.

2- Most journals do not have comprehensive author biography data, and this may have resulted in missing papers authored by medical students.

Author reply:

This is similar to the point raised by Reviewer #1 (item 3). This study was based on a single MSJ, the NZMSJ. It is the policy of the NZMSJ that every article is accompanied by an author biography data. Pre- and post-graduation articles published in PubMed-indexed journals were identified using standardised search criteria using student author name(s) and other identifiers such as country affiliation (New Zealand). Because some journals may not include detailed author biography, our search strategy may have resulted in some missing papers authored by students.

As recommended by reviewers #1 & #2, this unavoidable limitation is now acknowledged in the discussion section (page 13, paragraph 2).

3- No data is given about the country / region of the medical student at the time of publication of their paper in the NZMSJ. This may allow the readers to understand the generalizability of the findings.

Author reply:

All medical student authors in this study were enrolled in one of two medical schools in New Zealand. As stated in the methods section (page 5, paragraph 3), only articles published by New Zealand medical students were included. This decision was made to allow matching of controls using the publicly-available graduate databases described in the study.

This point has been highlighted in the discussion section as a limitation of the study, and we have addressed the need for replication of these findings in international cohorts.
Melody Goodman (Reviewer 3):

1. The authors report the case control ratio as 2:1 but it should be reported 1:2 to indicate 1 case to 2 control ratio

Author reply:

This has been corrected as suggested by the reviewer.

2. Is not clear the publishing in student journals produces this outcomes. How do you know it is not some of the other potential factors mentioned in the manuscript (e.g., development of key academic skills while still a medical student, inspiration to pursue a clinical academic career, interest in research)? I am not sure the data supports this assertion. Yes more than half of those who published in SMJ have a pub-med indexed paper but so do a third of the controls.

Author reply:

This point is similar to comment No. 13 (also addressed below). Your point is valid, and we have acknowledged in the discussion that there may be unmeasured confounders affecting our analysis (Discussion section, page 13, paragraph 2). This is quoted here for your convenience:

“The analysis included a relatively small, self-selected cohort of students who published in the NZMSJ. For example, students who are already interested in academic careers are more likely to be involved in research and motivated to publish their findings than their peers. This and other unmeasured potentially confounding variables could explain the associations observed in this study.”

We have been careful to claim association, not causation. It is unfortunately impossible to fully adjust for or measure these potential motivational/psychological factors given the retrospective design of this study. We have highlighted these as areas for further research in the discussion. Regardless, we believe that MSJs play an important role in supporting the early-career development of medical student researchers, and that this impact is supported by our results, particularly given that the findings have persisted on a multivariate analysis (see comment #9 below).

3. If MSJ have a student friendly environment what is to turn off potential academic the first time they submit to a mainstream journal and the process is not so "friendly".

Author reply:

This is an interesting hypothesis, albeit one that we do not feel our data can address.
If this hypothesis was true, it may be expected that students publishing in the NZMSJ would go on to have lower publication rates in mainstream journals and would be discouraged from pursuing academic careers – this does not appear to be the case on examining the data.

4. A better control would be someone who participated in research but did not publish in a MSJ?

Author reply:

The controls used in this study were age-, gender-, and year of graduation- matched individuals obtained from publicly available university graduation records.

Using controls who participated in research but did not publish in an MSJ may help to control some potential confounding related to early career interest in research. However, practically it is near-impossible to retrospectively identify and quantify student research involvement at universities from a time period over the last 10-15 years.

We have therefore used matched controls as described above as this was the most appropriate group with available data for analysis.

5. Have any of the medical students published in mainstream journals?

Author reply:

Yes, the primary outcome of this study was PubMed-indexed journals (i.e. mainstream journals) following graduation from medical school.

The Results section (PubMed-indexed Publications subheading) contains a detailed analysis of pre- and post-graduation PubMed-indexed publication rates.

6. If there are multiple authors on the paper. Are the students first author? Are the students corresponding author? If someone other than the student is the first author and/or the corresponding author how much does the student learn from this process?

Author reply:

See our response to point #4 from reviewer 1. Our study examined the “impact of publishing in a MSJ on short- and long-term academic success”. The main outcome was “the number of PubMed®-indexed publications after graduation”. Analysing student authorship order and therefore potential contribution to is beyond the scope and objectives of this study, and does not
necessarily represent meaningful addition to our understanding of the impact of MSJs on the short- and long-term academic success of student authors. These questions could be addressed in future studies that are designed to examine the perceived benefits from first vs. corresponding student authorship in MSJs.

7. You can't compare cases and controls in terms of the n's because there are twice as many controls as there are cases

Author reply:

As this is a case-control study, we suggest we can compare cases and controls. The reviewer may be referring to proportions so we have provided percentages in addition to raw numbers wherever comparisons have been made between the groups.

We have elected to include the raw numbers in each group (i.e. in Table 1) in the interest of full reporting of the data, allowing future researchers to incorporate the data as part of systematic reviews or pooled analyses. However, if the reviewer feels strongly regarding this point, we would be open to removing these additional data.

8. It is unclear if the analysis takes into account the match case-control study design. McNemar's chi-squared may be a more appropriate statistic to examine some of the comparisons

Author reply:

Unfortunately, McNemar’s chi-squared test requires 1:1 matching of paired nominal data, and therefore cannot be used to examine comparisons in our 1:2 matched cohort.

In order to account for the matched nature of the data, we have removed p values calculated by chi-squared tests, and have instead presented p values from odds ratios calculated by conditional logistic regression; a method recommended by Cummings et al. for analysis of matched cohort data (1, 2). This has resulted in very minor changes to the odds ratios and 95% confidence intervals reported in Table 1.


Corresponding changes have been made to Table 1, and relevant parts of the results section.

9. Are those with a PhD more likely to have faculty positions and thus more likely to publish? These factors are examined separately but this may be an important confounder. This should have been used in the matching criteria or should be controlled for in multivariable analysis.

Author reply:

We have now conducted a multivariate analysis as suggested to attempt to control for these confounding factors. Student publication in the NZMSJ was still predictive of post-graduate publication in a PubMed-Indexed journal, when adjusted for higher degree attainment and faculty position in a multivariate regression model (OR 2.64, 95% CI 1.23-5.68, p=0.01).

10. Authors are making generalizations based on a small sample size

Author reply:

This is an unavoidable limitation of the study, which we have addressed in the discussion section. We have now updated the manuscript to further acknowledge this limitation and have stated the need to replicate these findings in other cohorts (page 13, paragraph 1).

11. Could the students have published in other SMJ besides the one examined in this analysis?

Author reply:

It is possible that students may have published in other MSJs during the examined time period, but based on the experience of two of the co-authors, who have both previously published in the NZMSJ and served in editorial/reviewer roles, this is extremely uncommon, and unlikely to have significantly influenced the results.

We have acknowledged this as a potentially cross-contaminating factor in the limitations section of the results.

12. There is a chance that obtaining a higher degree specifically PhD mediate the relationship between publishing in a MSJ and PubMed indexed publications and faculty appointments.

Author reply:

This point has been addressed above in the response to comment #9.
13. Isn't publishing in a MSJ the same as having a research experience this just seems like a
proxy measure for having research experience being associated with the outcomes (e.g.,
faculty appointment, advanced degree, PubMed indexed publications).

Author reply:

This is a valid point, and we have acknowledged in the discussion that there may be unmeasured
confounders affecting our analysis.

To this point specifically; we have previously analysed the outcomes of medical student research
projects at the two medical schools in New Zealand and have shown that a minority of students
(<5%) with research experience publish in MSJs (1,2). Therefore, it is unlikely that publication
in the NZMSJ in itself is a proxy for research experience in medical students, but may represent
a proxy measure for students who are eager and motivated, as mentioned in the limitations
section of the discussion.

1. Wells CI, Wallace HB, McLaughlin SJ, Alexander HC, Shelling AN. Rate and predictors
of publication by medical and health science summer research students: a 14-year

2. Al-Busaidi IS, Alamri Y. Publication rates and characteristics of undergraduate medical

14. Unclear how univariate odds ratios and 95% CI were calculated. Did this take into account
the matched nature of the data?

Author reply:

These analyses have now been re-calculated and clarified in the results as using conditional
logistic regression, as addressed in comment #8 above.

15. The discussion section did have a nice write up on the study limitations with some revised
analysis and writing you may be able to use this data to convince me you have sufficiently
tested your hypothesis but given the issues with the methodology I am not convinced your
data supports the assertions made.

Author reply:
Thank you again for your comments, we greatly appreciate your time spent reviewing our manuscript. We have significantly revised our manuscript and feel that the data does support the conclusions drawn in the paper.

END.