PEER REVIEW HISTORY

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ARTICLE DETAILS

<table>
<thead>
<tr>
<th>TITLE (PROVISIONAL)</th>
<th>The association between self-efficacy, career interest and rural career intent in Australian medical students with rural clinical school experience</th>
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<tbody>
<tr>
<td>AUTHORS</td>
<td>Isaac, Vivian; Walters, Lucie; McLachlan, Craig</td>
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VERSION 1 - REVIEW

| REVIEWER           | George T Somers  
School of Rural Health, Monash University, Australia |
<table>
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<tr>
<td>Comments:</td>
<td>As I am associated with a School of Rural Health, I acknowledge that I may have a bias in favour of the effectiveness of programs delivered by Schools of Rural Health. As the authors have the same risk of bias, this should have been declared. They deny any funding, but as paid employees of RCS, this should be declared.</td>
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<tr>
<td>REVIEW RETURNED</td>
<td>22-Aug-2015</td>
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GENERAL COMMENTS

<table>
<thead>
<tr>
<th>Comments:</th>
<th>While this paper discusses an important relationship in rural career choice, it is not a new finding. The authors have failed to identify critical Australian papers on the topic written as early as 2001. Their claim that “The study provides valuable information on the association between self-efficacy and rural career intention among medical students, which has not been previously studied” is false. They repeat the claim that self-efficacy or Rural Intent have not been studied in this context several times in the paper. (P6 L17-20; P7 L17-22; P10 L46-49). The literature review and the paper itself are in critical need of revision before publication. Two questionnaires which include a measure of self-efficacy and of rural intention have been developed and published during the early 2000’s. The Rural intention Questionnaire was first presented in 2000 and 2001 (1, 2). This was grounded in the Behavioural Theories described by Fishbein and Ajzen and by Triandis. It included measures of Rural Intention, Self-Efficacy (perceived ease of living and working in the country) Affect (including anxiety and positive affect), Perceived Consequences and Subjective Norms. These variables were tested for validity and reliability. This work formed the basis for a PhD Dissertation in 2005 (3). I commend Chapter 18 to the authors for an in-depth discussion on career decision-making.</th>
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The second questionnaire was also developed during PhD work. It was a shorter index, initially called the Situational Expectation Score (4) but later called The SOMERS Index, an eponymous mnemonic standing for Stated rural intent, Optional rural training, Medical specialisation, Efficacy, and Rural Status (5). After considerable statistical evaluation of all items and their interrelationships, Efficacy in this index was measured on a single item, “Considering all things, how easy would living and working in the country be for you?”

The five indicators of the SOMERS Index were found to be very closely related, especially stated rural intent, optional rural training and efficacy. These loaded strongly on a simple solution to a component matrix including all five indicators, (0.90, 0.83 and 0.82 respectively)(5). So the finding that these three are closely related is not new, but is confirmed by this study. The utility of this instrument was shown in a prospective controlled longitudinal (pre-post RCS) quasi-experiment which suggested that students had largely made their career choice prior to attending the RCS, emphasising the importance of selection over conscription(6).

Other comments:

The observed relationship between rural placements and intention, and indeed possibly efficacy, presented in these papers are not time-specific. They do not meet the criteria necessary to infer causality. It is likely that rural intention preceded the rural placement. So, the reason that students chose a rural placement was more likely because they had already decided where they would work, and were merely gaining skills to support that decision(8). In that context, a longer rotation may result in increased efficacy, but this may not further influence pre-existent rural intention. Extreme care needs to be taken when researchers, usually attached to Rural Clinical Schools, continue to claim that the rural placements caused increased rural intention. (See below for more comments on possible conflict of interest and publication bias).

While this paper describes a survey using items based on Bandura’s work to estimate self-efficacy, the authors show no evidence to support its validity or reliability. They seem to further reduce the responses to three categories, severely limiting any claim to having continuous variables, required for multivariate analysis.

The measure for rural intention utilised is not a valid measure of strength of intention. What the FRAME survey measures is the distance from a capital city in which the respondent would “most like to practise” This approach really comprises a series of ‘yes-no’ answers to preference for the described locations and does not provide continuous data appropriate for the multivariate analysis used. In any case, this is not the same as asking how strongly this intention is held. It is a poor substitute for strength of intention. A reliable and valid measure of strength of rural intent has been described in the PhD and associated papers.
I am to be convinced that ‘rural interest’ has any long-term career choice meaning. The critical importance of being a generalist in choosing a rural career could be further researched. It is unclear whether there is usable data relating to this from this research. The use of retrospective self-report is weak and open to bias. Only attendees of RCS were surveyed so potential selection bias needs to be addressed, and comparative analyses with urban students are limited. Ceiling and floor effects are a possible consequence of this selection approach.

As the authors are all employees of Rural Clinical Schools, they need to declare that there may be an associated conflict of interest. If this were a paper about the benefits of cigarette smoking and they were employees of Philip Morris, this too would be expected. Similarly, they need to declare funding from the RCS, unless all of the work in this study was carried out on unpaid time. It is apparent that few people who are not employees or strongly linked to schools of rural health write on the topic, opening a risk of publication bias. Referees, as in my case, are similarly likely to be linked to the Rural Clinical School “industry.”

This declaration is important because these authors also continue the long trend to imply causation from association. This was the case of the paper they quote in support of a claim, despite several meta-analyses concluding otherwise, that “student placements exhibit significant influence on rural career interest and intention.” The jury is still out on that point (7, 8). Virtually all papers that have claimed causality have lacked the power or the rigour to support such findings.

Summary

This work is not novel, as the authors claim. While this paper does support earlier work, there are unstated limitations relating to the validity and reliability of the instruments used to estimate rural intention and self-efficacy. There is a need to be transparent about affiliations with the rural medical education training networks, and potential bias in favour of these programs, even with the best of intentions.

1. Somers GT, editor. The application of behaviour theory to the selection of educational programs for rural health professionals. ANZAME: The Association for Health Professional Education, Annual Conference; 2000; Fremantle, Western Australia.
4. Somers G. The Situational Expectation Score (SES): a simple scale to predict who is likely to work in rural areas. Australian


REVIEWER
Jennene Greenhill
Flinders university Australia

I work with Lucie Walters and am a memeber if the FRAME policy group but I was not involvevd in the research project

REVIEW RETURNED
02-Sep-2015

GENERAL COMMENTS
the limitations could included a more information to address whether the sample size is adequate for generalisablity.

Good study clearly written mostly grammatical revisions

P2 Line 19 full stop after participate
28 delete semi colon and space after bracket
29 no capital for ‘very’
48 delete extra bracket
49 delete extra bracket
P3 Line 31 add is - the study ‘is’
P 4 Line 13 full stop after areas
14 reword sentence - It remains unknown...
P 5 Line 25 full stop after interest
28 better wording eg A cognitive career theory (view or perspective) has not yet been (explored or used) in the medical education literature.
52 change medial to medical
P6 line 5 change red font and format
25 full stop after figure 1
P 8 line 38 full stop after ‘remote areas’
Please make the analysis section consistent in reporting OR and CI values.
P9 line 25 delete “change in” as this study didn’t compare changes.
Line 39 change sentence to student who have a rural background are more that twice likely to become...
P11 line 6 change an to a
Line 18 reword sentence begging in with The concept... as it is unclear.
VERSION 1 – AUTHOR RESPONSE

1. We acknowledge Somers et al work on development of an index associated with rural career choice. Within the Somers index a single question on self-efficacy was used “Considering all things, how easy would living and working in the country be for you?” Our purpose of the study was not to propose an index but to show an association between student’s self-efficacy and career intent and to explore factors that influenced such findings. In this context there has been no previous study that specifically looked at this association among rural medical students in Australia and explored the factors that influenced such associations. However cautiously we have removed the statement that there have been no previous studies.

2. The two questionnaires specified by the reviewer are conference papers that aren’t accessible. Although we note a publication in the Aust. J. Rural Health (2011)[1], the rural intention questionnaire or the SOMERS Index has a different purpose i.e to explore associations with predicted rural career choice. In the index, self-efficacy (as a single-item) is used to measure rural career choice. On the contrary, our purpose is to measure self-efficacy more broadly. There is no previous measure that specifically looks at Bandura’s sources of self-efficacy [2], which is adapted in social cognitive career theory[3] and our primary aim. We have adapted Bandura’s tools to understand rural career behaviour in medical students and how this relates to rural career intentions as well as adjusting for factors understood to influence rural career intentions.

3. The reviewer has highlighted that rural intent; optional rural training and self-efficacy are closely related. We acknowledge the consistency of our findings with his work. Our study additionally shows that self-efficacy is independently associated with rural career interest and that both rural career interest and self-efficacy is associated with intent independent of rural background. This suggests that self-efficacy could have similar effects on urban students as per our study findings.

4. We agree with the reviewer that the association is cross-sectional and we could not determine causality. We suggest that longitudinal tracking of rural career intentions among medical students on actual and eventual rural practice are evaluated with respect to change in self-efficacy and interest levels. We have highlighted our study limitation, which is common place amongst published studies that use a cross sectional design.

5. We developed 6 questions based on Bandura’s self-efficacy in a 5-point likert scale and used the composite score for analysis. We used the guidelines specified for development of self-efficacy questions and the questions showed good internal consistency (alpha 0.78). We recommend future studies to test the reliability of our questions. The reviewer is not correct in his impression that self-efficacy was treated as a categorical variable.

6. In the study rural intention was treated as binary variables and our intention was not to study the strength of intention. We used multivariate logistic regression analyses to explore binary outcome variables. Therefore the measure of rural intention used in the study is valid for logistic regression.
7. While we agree that retrospective evaluation of change in career interest could be biased, however we note that career interest is a significant pathway component related to change in self-efficacy development, choice behaviour [3]. This is supported by our references that we have included in the manuscript. We have shown previously that career interest prospectively increases after one-year follow-up at a Australian rural clinical school[4]. Therefore career interest is an important variable to test in the evaluation rural career choice, endurance and performance.

8. Minor corrections to sentence structures have been amended as kindly suggested.

9. Conflicts of interest declared

References in the reply:

**VERSION 2 – REVIEW**

<table>
<thead>
<tr>
<th>REVIEWER</th>
<th>George Somers</th>
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<td>School of Rural Health, Monash University</td>
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| REVIEW RETURNED | 15-Oct-2015 |

| GENERAL COMMENTS | The reviewer completed the checklist but made no further comments. |
Association between self-efficacy, career interest and rural career intent in Australian medical students with rural clinical school experience

Vivian Isaac, Lucie Walters and Craig S McLachlan

BMJ Open 2015 5:
doi: 10.1136/bmjopen-2015-009574

These include:

References
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