The Medical Student's Intention to Practise in Rural Australia: a Questionnaire

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INTRODUCTION

Although there is debate about the extent, there is no doubt that there is a shortage of rural general practitioners (GPs) in Australia\(^1\)\(^2\). Strasser et al, estimate the 23% of GPs who work in rural areas, provide for 35–40% of national GP need\(^3\). This diminished GP availability translates to decreased health service delivery, and possibly, health outcomes. As the medical workforce continues to seek more reasonable working conditions, this under-supply is predicted to worsen\(^1\). Further, the predicted attrition rate among the predominantly middle-aged rural GPs is extremely high\(^3\)\(^5\). These reductions in the effective workforce can only be remedied by attraction of more young GPs to the country.

Possible solutions

In response to the shortage of GPs in rural areas, the Australian Federal Government has promised to spend large amounts of money ($526 million over four years) on a series of initiatives seeking to address this issue\(^6\). Currently, there are many schemes underway attempting to increase the number of rural GPs. These can be divided into four main categories, each of which seeks to influence one of the four phases of training and practice, and include:

- programs that improve university admission of rural origin students;
- programs seeking to increase positive rural experience within universities;
- specific rural-based postgraduate training programs; and
- incentives to recruit city doctors and to retain rural doctors.

Measuring the effectiveness of programs

Despite a commitment to such a large expenditure, the effectiveness of the many of the current initiatives has not been fully assessed. The predominant method of evaluating the effectiveness of rural training, recruitment and retention programs has been to assess the increase in rural GP numbers some many years later (ie to measure outcome in terms of “behaviour”). The usefulness of behaviour as the outcome is limited by the time delay between cause and effect. This is because the evaluation of a program is often not available for many years, and at times, not until after the completion of the program, and the interpretation of the data is difficult, as it measures the effect of exposure to multiple programs over the intervening period\(^7\)\(^8\).
An alternative evaluation measure based on determinants of behaviour

Given the inadequacies associated with behavioural measurement, and Rabinowitz’s finding that a student’s intention to undertake a rural career is a significant predictor of outcome, it may be suggested that a student’s intention to work in a rural setting would be a useful evaluation measure. While the task of measuring intention may appear simple enough, it can be argued that a multi-factorial measure is required. Using a dichotomous or even a Likert scale to measure intention lends itself to multiple biases. Further, simply asking students what their intention is before and after a program is not likely to provide a detailed understanding of the impact of the program. In order to measure subtle changes in intention, the measure should address a range of variables likely to affect the decision-making process.

Another issue to consider comes from work carried out in the social sciences that informs us that an individual’s intention to undertake a particular behaviour is influenced by a number of factors. The factors that go to make up a personal behavioural intention have been studied for many decades. As a result, two dominant theories have emerged: the first by Fishbein and Ajzen, and the second by Triandis. While the theories differ in their specifics, they are consistent in that both suggest that there are multiple factors influencing a person’s intention to undertake a particular behaviour. If an instrument of intention is to be used to evaluate programs, it should ideally provide specific detail as to the effect the program had on the various factors that go to make up intention.

THE QUESTIONNAIRE

In the following section, the development of a questionnaire based on both the Fishbein and Ajzen, and the Triandis models is discussed. The questionnaire was designed to measure Intention as conceptualised by both theoretical models. The questionnaire is therefore longer than if it were based on either model alone. Examples of items from the questionnaire are included to illustrate the measurement of the various determinants. In total, the questionnaire consists of 103 items and takes approximately 25 minutes to complete.

Section 1

The first part of the questionnaire seeks to measure situational intention directly. It includes items probing the intention to work in a rural setting, the furthest the respondents believe they would work from a capital city, and the percentage of their career likely to be spent in city and country locations. In addition, the intention to specialise, become a GP, an academic or enter research is explored.

Sections influenced by the Fishbein and Ajzen Model

Fishbein and Ajzen suggest that the influences on intention are the beliefs that underlie the decision making process. An understanding of behaviour can be gained by tracing its determinants back to the underlying beliefs. Fishbein and Ajzen claim there are only two determinants of intention, and these are the “attitude” towards the behaviour, and the “subjective norm”.
Attitude
Attitudes are determined by evaluating the importance of each one of a list of possible outcomes.

*Example:*
Access to community facilities/shopping is:

| Totally unimportant | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Vitally important |

Then the likelihood of finding such an outcome in the country relative to the city is evaluated.

*Example:*
Access to community facilities/shopping is:

<table>
<thead>
<tr>
<th>City</th>
<th>Unlikely</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>Likely</th>
</tr>
</thead>
<tbody>
<tr>
<td>Country</td>
<td>Unlikely</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>Likely</td>
</tr>
</tbody>
</table>

The importance is coded 0 to 6 and the likelihood of finding a positive aspect in the country is coded 1 to 7. The likelihood of finding it in the city is coded −1 to −7. These are added to find the differential likelihood of finding the aspect in the country over the city. The importance is multiplied by the differential likelihood. These products are added, and the total of all items is the “estimate of attitude”.

The list of outcomes used in the questionnaire was identified through open-ended questioning of a group of medical students. The most commonly cited outcomes form the list of “salient beliefs”. Another source of these beliefs is the literature. Strasser et al identified 28 items relating to aspects of the quality of life of rural practitioners. These coincided with some of those offered by students through open-ended questions and all are included in the questionnaire.

Subjective norm
The subjective norm is the total of the influences of important others on the decision making process. In a similar way to that of salient beliefs for the attitude component, a list of salient referents (important others) is obtained. For each of these, the respondent is asked to assess what s/he believes are the wishes of that important other.

*Example:*
My father thinks I ought to spend part of my career in the country

| Disagree strongly | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Agree strongly |

The student is then asked how closely s/he would like to comply with the referent’s wishes.
Example:
In general, how much do you want to do what your father thinks you should do?

<table>
<thead>
<tr>
<th>Not at all</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Slightly</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moderately</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strongly</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

The referent scale is coded from –3 to +3 and the likelihood to comply is coded zero to +3. Then each referent scale is multiplied by the likelihood to comply. The sum of the products from all items gives the “estimate of the subjective norm”. The strength of association is then determined by fitting a multiple regression model with Intention as the dependent variable and Attitude and Subjective Norm as the independent variables.

Sections influenced by the Triandis model

In the Triandis Model, the conceptualisation of intention is similar to that used by Fishbein and Ajzen. However, Triandis defines the determinants of intention somewhat differently stating that intention (I) is determined by the individual’s perceived consequences (C) associated with undertaking the behaviour of interest, their affect (A) or sum of the emotions evoked by undertaking the behaviour, and social factors (S) that will be described more fully later. The Triandis model can be expressed as follows:

\[ I = (C) + (A) + (S) \]

Perceived consequences
These are measured in the same way as described for estimate of attitude in the Fishbein and Ajzen discussion.

Affect
In the Triandis Model, affect (A) is measured by determining the subject’s emotion toward a rural career. A list of Salient Emotions is determined in the same way as that described earlier for Salient Referents and Salient Beliefs. Respondents are asked to comment on how undertaking a particular activity would make them feel.

Example:
Working in a rural community would make me feel:

<table>
<thead>
<tr>
<th>Calm</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>Anxious</th>
</tr>
</thead>
</table>

Whilst the Triandis Model does not attempt to evaluate the importance of these emotions, we have added this to the questionnaire, to test its effect.

*Example:*

In choosing a career setting, this is:

| Unimportant | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Important |

These items are scored in a similar way to items in the Fishbein and Ajzen model.

**Social factors**

In the Triandis model, Subjective Norm is expanded to include:

- A Role Belief (RB) component, measuring perceived appropriateness of the act for others within the respondent’s role group.

*Example:*

I believe it would be appropriate for medical students to plan to work (after graduation) for some period of time in the country.

| Agree strongly | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Disagree strongly |

- A Personal Normative Belief (PNB) component, or moral obligation.

*Example:*

I feel an obligation to spend part of my career in the country.

| I feel an obligation to spend part of my career in the country | 1 | 2 | 3 | 4 | 5 | 6 | 7 | I do not feel any obligation to spend part of my career in the country |

- A component measuring the presence of an interpersonal contract (IC).

*Example:*

I have made some sort of agreement with someone to spend part of my career in the country.

| Agree strongly | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Disagree strongly |

How bound do you feel by this agreement?

| Not really bound | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Strongly bound |
And a Self Concept (SC) component.

Example:
I am the sort of person who would be happy working in a rural environment.

| Agree strongly | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Disagree strongly |

Final scoring
Intention, as measured according to the Triandis model, is the summation of measures of all of these components (ie $I = \Sigma PC + \Sigma VA + \Sigma NB + \Sigma RB + \Sigma PNB + \Sigma SC + \Sigma IC$). Again, the strength of association is determined by fitting a multiple regression model with Intention as the dependent variable, and the remaining components as independent variables.

DISCUSSION
Application
When used as an evaluation measure, the questionnaire will provide detail as to the effect the intervention had on specific components of a student’s intention. If the instrument is applied before a program (for example a rural rotation), and immediately afterwards, variations in the scores relating to a factor will reveal whether the program had a positive or negative effect on that factor. For example, students may have a negative score for, say, a factor measuring the likelihood that their children could be well “brought up” in a rural setting. If this score did not improve during a rotation with a rural GP, the educators could be brought in to discuss ways they have personally succeeded in this aspect of rural life. Ways to impart that knowledge to the next cohort of students could be discussed. The instrument could be reapplied to the next cohort (before and after) and an improvement sought. This process could be repeated until success is achieved.

Advances afforded by the use of a measure of intention
Not only does this measure of intention show promise as an evaluation tool, it also has the potential to be used to assist in the selection of students. According to our current understanding, the best predictor of taking up a rural career is the rural origin of the medical student\textsuperscript{9,16}. Rabinowitz, in his 22-year long study found that rural origin students were more likely to work in under-serviced rural areas than were those who undertook the standard medical course\textsuperscript{7,17–20}. While these results support the rural origin hypothesis, it should be noted that Rabinowitz facilitated his rural origin students with a raft of supports similar to those recommended by the Rural Undergraduate Steering Committee (RUSC)\textsuperscript{21}. Through offering support to only the rural origin students, Rabinowitz may have left the others (ie urban students) without the support needed to “convert” to a rural career\textsuperscript{22}. After further analysis, Rabinowitz found rural origin and intention to take up a primary care career were the only two statistically significant determinants of a subsequent rural career. Yet, other studies found that knowledge about, and attitudes toward primary care of first year medical students did not influence career choice\textsuperscript{23}. Further, Davies, in South Australia, found that “(RACGP) trainees with
a rural background were no more likely to enter rural practice than trainees with an urban background\(^{24}\).

If we interpret these inconsistencies in terms of the Triandis model, the value of measuring factors influencing intention rather than rural origin per se, becomes clear. Originating from a rural area is likely to impact on several of the determinants of intention (and therefore behaviour). The Triandis model assists in understanding how it is that rural origin students may be more likely to return to a rural setting, and may offer an explanation for inconsistencies found in the literature.

**Further development**

The length of this version of the questionnaire may have led to respondent fatigue. A more succinct survey may have resulted in an even higher response rate. To further develop the instrument, factor analysis will be conducted with the current collection of items. This will serve two purposes; first, it will identify particular items measuring distinct components of the decision making process, and secondly it will reveal redundant items that can be omitted so as to reduce the size of the questionnaire.

While Fishbein and Ajzen, and Triandis have both developed theories of rational behaviour, several studies have shown the Triandis model to more powerful\(^{25–28}\). As the questionnaire as described in this paper includes elements relating to both models, this affords a comparison of the predictive ability of each of the models. With the data provided by 162 of 188 (86%) first year medical students studying at Monash University, a direct comparison of the two models within this setting will be made. Items relating to the weaker model will be removed. This will allow for further refinements of the questionnaire, with the result being an instrument that sits solidly within behavioural theory.

**SUMMARY AND CONCLUSIONS**

The value of a measure of intention in evaluating the success of programs that are designed to address the problem of the under-supply of rural doctors has been discussed. Based on its success in explaining and predicting behaviour\(^{26–30}\), the Triandis model appears an ideal framework for such an instrument. Through advancing on work that has been conducted in this area, a tool to measure the impact of an intervention on a student’s intention to undertake rural medical career is being developed. With this, resources can be channelled to programs proven to be effective, and the problem of the rural workforce shortage will be addressed more successfully.

**REFERENCES**


**AUTHORS**

Dr George T Somers graduated (MBBS) at Melbourne University in 1976. He trained for rural general practice at Hobart (Tas) and Dandenong (Vic). He has practised as a rural general practitioner in Emerald (in the Dandenong Ranges, 60 km east of Melbourne) for 20 years. He is a staunch advocate of fringe-metropolitan medical practice.

Over the past 5 years he has become increasingly involved in research. This led to a Graduate Diploma in Clinical Epidemiology (Newcastle) in 1998. He commenced a Master of Rural Health (Monash) in 2000, which has been converted to a full-time PhD candidature in 2001. He is currently studying at the Monash University School of Rural Health, Traralgon, and continues his practice part time.

His main interest remains the influences on medical students to choose a rural career, and he is developing an instrument to measure this.