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Is there a link between confidence in procedural skills and choice of practice location?

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Objectives: To examine the level of confidence in procedural skills of family medicine residents in Ontario and to determine if this is associated with the choice of a more rural practice location.

Methods: In May and June 1997 a survey was mailed to 247 second-year residents in all family medicine training programs in Ontario. Questions included location of family medicine training, choice of ideal practice location, special training courses taken during residency, and confidence levels in various emergency and ambulatory-care procedures.

Results: Of the 247 residents, 157 (63.6%) responded, and 155 responses were analyzed. The respondents were similar to the total sampling frame with respect to gender and family medicine program. There was no independent association between confidence in a procedural skill and choice of practice location. However, logistic regression analysis showed that residents who received at least some rural training were more likely to choose a non-urban practice location than residents who did not receive rural training. Residents with some rural training were significantly more confident than residents without rural training in both ambulatory-care and emergency procedures. On the other hand, residents with some rural training had significantly lower overall confidence as a family physician than residents without rural training.

Conclusion: These findings would support a recommendation for increased rural training opportunities in family medicine residency to increase the number of residents who ultimately choose a rural practice location.

Objectifs : Examiner le niveau de confiance à l'égard des techniques d'intervention des résidents

en médecine familiale en Ontario et déterminer s'il y a un lien avec le choix d'un lieu de pratique plus rural.

Méthodes : En mai et juin 1997, on a envoyé un questionnaire à 247 résidents de deuxième année de tous les programmes de formation en médecine familiale de l'Ontario. Les questions portaient notamment sur le lieu de la formation en médecine familiale, le choix du lieu de pratique idéal, les cours de formation spéciale suivis pendant la résidence et les niveaux de confiance à l'égard de diverses interventions d'urgence et de soins ambulatoires.

Résultats : Sur les 247 résidents, 157 (63,6 %) ont répondu et l'on a analysé 155 réponses. Les répondants ressemblaient au cadre d'échantillonnage total en ce qui a trait au sexe et au programme de médecine familiale. Il n'y avait aucun lien indépendant entre la confiance à l'égard d'une technique d'intervention et le choix du lieu de pratique. Une analyse de régression logistique a toutefois montré que les résidents qui ont reçu au moins un peu de formation en médecine rurale étaient plus susceptibles de choisir un lieu de pratique non urbain que ceux qui n'en avaient pas reçu. Les résidents qui ont reçu un peu de formation en médecine rurale avaient beaucoup plus confiance que les autres dans leurs techniques d'interventions d'urgence et de soins ambulatoires. Par ailleurs, les résidents qui ont reçu un peu de formation en médecine rurale présentaient un niveau de confiance globale beaucoup moins élevé comme médecin de famille que ceux qui n'en avaient pas reçu.

Conclusion : Ces constatations appuieraient une recommandation visant à accroître les possibilités de formation en médecine rurale dans les programmes de résidence en médecine familiale afin d'augmenter le nombre de résidents qui finissent par choisir d'exercer en milieu rural.

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Several factors appear to be important to graduating family physicians when choosing a practice location; these include having partners in practice, family and lifestyle issues, availability of recreational facilities and call schedules.1–7 Published studies have noted that graduating doctors have a tendency to practise in communities similar in size to their home communities.1,5,7 They are more likely to choose a rural practice location if they receive part or all of their training in a rural location.2–4,8,9

Most rural family physicians are required to perform more procedures than their urban counterparts.10–12 Family medicine residents and graduate physicians have expressed concerns about the quality of training in family medicine programs as being insufficient preparation for rural practice.11,13,14 Australian family practice graduates identified a lack of procedural skills as a reason for not entering rural practice.15

There are few Canadian studies of training in procedural skills. O'Connor and Davidson,16 in a survey of Queen's University graduates, found that at the time of graduation, family medicine residents felt confident in only 6 of 11 emergency medicine procedures. They also found that residents' feelings of competence in certain emergency medicine skills on graduation were associated with feelings of competence for those same skills when in practice. In a survey of family medicine residents at the University of Western Ontario, Speechley and colleagues17 showed that self-reported competence in technical skills was lower than that for any other skills measured at the time of graduation. A recent review of self-assessed competence in procedural skills of graduating family medicine residents in Ontario showed that a feeling of adequate competence in procedures was achieved for only 16 of 40 procedural skills.18 According to Whiteside and colleagues,19 family medicine residents in rural training programs in British Columbia felt under-prepared in several skill areas, including trauma care, fracture care and vacuum extraction. In contrast, only 13.2% of this group felt under-prepared in office surgical procedures.

Despite the important ranking assigned to procedural skills for rural family practice by both residents and practising physicians, few have studied the relationship between physicians' confidence in their technical skills and their choice of practice location. The main objective of this study was to determine whether family medicine graduates who have more confidence in their procedural skills would be more likely to choose non-urban practice locations.

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Methods

Second-year family medicine residents in all Ontario programs were surveyed by mail during May and June 1997. A second questionnaire or reminder card was mailed to all residents who had not returned their questionnaire by the second week of June. Only one mailing was possible for the 12 residents of the program in Sudbury because of a delay in obtaining approval for the study.

The survey included questions on gender, family medicine program, location of family medicine training, any special training courses involving procedural skills, ideal choice of practice location (community size) in the next 1 to 5 years, overall confidence in ability as a family physician and overall confidence in technical procedures as a family physician. The overall confidence questions were added to help assess whether the confidence rating for any individual procedure or group of procedures was influenced by an individual's confidence either in technical skills in general or as a family doctor in general. The questionnaire also required residents to rate their confidence level with respect to the competent performance of each of 17 emergency or hospital-based procedures and 17 ambulatory or office-based procedures. These procedures are listed in

Table 1.

Practice location was defined by community size: urban (>50 000 population), semi-urban (10 000 to 50 000) and rural (<10 000). The location of family medicine training was designated as "rural" training if the respondent indicated that any part of his or her family medicine training took place in a rural practice setting. The confidence level rating scale, a 4-point scale ranging from very unconfident to very confident, was adapted from Tressolini.20 The procedures included in the survey had been identified as being suitable for performance by family doctors,10,21–26 and were part of Canadian training programs in family medicine.27

The questionnaire was screened by 4 practising rural physicians to verify the suitability of the procedures for rural practice. A pilot test was done with first-year family medicine residents using the ambulatory procedural component.

Mean confidence scores were calculated as the average item score for all procedures in that category. The t-test was used for comparison of mean confidence levels. For logistic regression analysis, practice location choice was re-coded to a dichotomous variable, namely, urban practice location (>50 000 population) or non-urban practice location (¾50 000). Regression analysis was done using a backward stepwise method in which all variables were forced into the equation and then removed one by one if they did not meet a statistical significance of $p < 0.05$.

This study received ethical approval from The University of Western Ontario Review Board for Health Sciences Research involving human subjects (review no. E5906).

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Results

The overall response rate was 63.6% (157/247 residents). One questionnaire had major gaps in information and 1 was spoiled, leaving 155 questionnaires for analysis. Six residents were undecided about their practice location choice and were excluded from any further analysis involving practice location choice.

There was no significant difference in the gender of nonrespondents compared to respondents, and the proportion of respondents from each family medicine program was not significantly different from the proportion of residents from each program in the overall sampling frame.

Fifty-eight percent of the respondents were female and 41.9% male; 32.9% had experienced some rural-based training during their residency.

Ninety-nine percent of the respondents had taken Advanced Cardiac Life Support (ACLS) training, whereas only 52% had taken Advanced Trauma Life Support (ATLS) and 50% had taken Neonatal Resuscitation (NRP). Only 10% had trained in Pediatric Advanced Life Support (PALS) and 12% had Advanced Life Support in Obstetrics (ALSO) training.

The proportion of respondents who had rural training was as follows: Hamilton 8%, Kingston 72.2%, London 23.3%, Ottawa 10.5%, Sudbury 88.9%, Thunder Bay 100% and Toronto 16.4%.

There was no significant difference between males and females for any of the practice location choices ($p = 0.86$). An urban location as the ideal choice was indicated by 35.1%, whereas 47.4% preferred a semi-urban location and 13.6% chose a rural location.

The mean confidence levels for all procedures according to practice location choice are shown in Table 2. There was a progressive increase in mean confidence score for both ambulatory and emergency procedural skills moving from urban to semi-urban to rural practice location choice. These differences were significant only for confidence levels in emergency procedures, which ranged from 2.59 (95% confidence interval [CI] 2.45–2.74) for the urban practice choice to 2.97 (95% CI 2.77–3.18) for rural. There was no significant difference in feelings of overall confidence as a family doctor ($p = 0.84$) or overall procedural confidence ($p = 0.06$) across all practice location choices.

There was a significant difference in the number of special training courses taken by residents in the different practice location choice groups. Those choosing urban practice locations took, on average, 2.00 (95% CI 1.73–2.27) courses, those choosing semi-urban locations took 2.31 (95% CI 2.06–2.55) courses, and those choosing rural practice locations took 2.75 (95% CI 2.21–3.29) courses ($p = 0.02$).

Table 3 shows the distribution of rural training among the residents and their choice of practice location. Significantly more residents who had some rural training chose rural practice locations (chi squared = 16, df = 2, $p < 0.001$). In those choosing urban practice, 16.7% had some rural training compared with 65% of those residents who chose a rural practice location. Overall, residents who had some rural training were 1.5 times more likely to have chosen a non-urban practice location as their ideal choice than residents with no rural training.

In the logistic regression analysis, confidence in ambulatory procedures, confidence in emergency procedures, overall confidence as a family doctor, overall confidence in technical procedures, gender, and number of special training courses taken were not significantly related to choice of urban or non-urban practice location. Rural training was the only variable that was significantly related to practice location choice ($p = 0.007$). The same results were obtained when the analysis was repeated with rural or non-rural location choice as the dependent variable.

The logistic regression results prompted us to look further at the differences between those residents who had some rural training and those who did not. There was no significant difference in the gender distribution of residents between those with and without rural training ($p = 0.37$).

Table 4 illustrates the differences in confidence scores and number of special training courses taken for those residents with and without rural training. Those residents with some rural training were significantly more confident than residents with no rural training in ambulatory procedures ($p = 0.01$), emergency procedures ($p < 0.01$) and overall technical skills ($p = 0.01$). With respect to overall confidence as a family doctor, however, those residents without rural training expressed significantly more overall confidence than their counterparts with some rural training ($p = 0.01$).

Residents having rural training took significantly more special training courses than the residents with no rural training. Family medicine residents with some rural training took, on average, 2.67 of the extra courses compared with 2.07 for residents without rural training ($p < 0.01$).

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Discussion

This cross-sectional study attempted to demonstrate an association between confidence in procedural skills and choice of practice location. Such a study design cannot show cause and effect; it can only establish whether a relationship among variables exists.

When procedure confidence variables and other variables related to procedural skills were examined in a logistic regression model to determine their relative importance as factors associated with practice location choice, only rural training was significantly associated with practice location choice. Those residents with some rural training in their family medicine program were more likely to choose a non-urban practice location. This finding is consistent with many studies supporting the finding that rural training in residency is associated with choice of rural practice location.2–4,8,9

Procedural skill confidence by itself, as an individual variable, was not significantly associated with practice location choice. This is a surprising finding since much is made of the difference in technical skills necessary for rural practice as opposed to urban practice.

In this study, any relationship of confidence in procedural skills to choice of practice location was overshadowed by the rural training variable because rural training has many more components than just procedural skills training that may influence practice location choice. Such features as rural environment, lifestyle and practice style are all part of the rural practice

experience and may play important roles in the decision to choose rural practice. Further study of the differences between urban and rural training might elaborate on these features.

Confidence in procedural skills is a component of medical training that is enhanced by rural training. This is clearly shown by the fact that family medicine residents with some rural training were significantly more confident in both emergency and ambulatory procedures than their counterparts with no rural training. This confirms the 1997 findings of Dixon-Warren.18

The differences in the procedure confidence variables between those with and without rural training cannot be accounted for only by differences in general confidence as a family doctor. In fact, with respect to overall confidence as a family doctor, those residents without rural training were more confident than those with rural training. This was an unexpected finding that merits more study. It may be that there are factors supplying additional general confidence to residents with only urban training. The actual confidence difference, although statistically significant, is small.

In this study, gender was not significantly associated with either rural training or choice of a rural practice location; this should soothe fears expressed by some that female graduates would be less likely to choose rural practice.28

Rurally-trained residents were more likely to take special training courses than residents with no rural training. It is not clear whether these courses were more available to residents in rural training or were selectively chosen because of interest. Levitt and colleagues29 have shown that completion of the ALSO program in family medicine residency resulted in increased confidence in obstetric skills. However, in this analysis, special training courses, per se, were not significantly associated with practice location choice.

The strength of this study includes the establishment of a reliable and valid instrument to survey procedural skills training and confidence levels. Although other studies have used an overall technical confidence variable, this study is the first to use an average item score for confidence, which should be more reflective of actual confidence in procedural skills. The study was conducted near the end of the second year of family medicine training, when confidence is at its peak and training location decisions are being made. This is the ideal time to assess the relation between the two. The respondents were not significantly different from the whole sampling frame, which should lend support to generalizing the findings for all family medicine residents in Ontario.

Limitations

There are several limitations to this study. It is based on self-reported data, which may not reflect actual practice location after graduation. There are many factors that influence practice location choice and these may have influenced the residents' answers to the practice location question,

despite the attempt to remove the influence of factors such as family wishes by asking the residents to indicate their ideal choice. The distribution of practice location choices in this study is similar to those of other self-report studies,8,30,31 including the 1998 Janus report31 on Canadian family practice. This adds strength to the findings reported in this study.

The rural training variable used in this study was not well defined. Neither the duration of the rural training nor the timing of the training within the 2-year family medicine residency was described in any detail. We do not believe that this detracts from the strength of the findings because we accepted any report of rural training as a positive response. If anything, this easily attained definition should have diluted any positive influence of rural training on practice location choice rather than magnified it.

It is not clear whether rural training increases confidence in procedural skills or whether residents who are more interested in procedures are attracted to rural training sites. It is not clear whether the choice of a rural practice location occurs before the choice of a residency training site, during residency training or near the end of training. It is possible that residents who select rural training may be more likely to select rural practice later. In a 1981 US study, Glenn and Hofmeister32 suggested that rural training might not act as a strong change agent for practice location but, rather, reinforce pre-existing positive feelings about rural practice. More research is needed to clarify the contribution of rural training to the choice of practice location.

Finally, this study only looked at procedural skills variables. It is well established that many factors influence the choice of rural practice, and this study is only a narrow view of that larger question.

In view of these findings we recommend that family medicine training programs increase the number of rural training opportunities to promote the choice of non-urban practice locations by graduates.

Competing interests: None declared.

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