

REVIEW ARTICLE

Interprofessional practice education: is the ‘interprofessional’ component relevant to recruiting new graduates to underserved areas?

S Deutschlander¹, E Suter¹, R Grymonpre²

¹Alberta Health Services, Calgary, Alberta, Canada

²Faculty of Pharmacy, University of Manitoba, Winnipeg, Manitoba, Canada

Submitted: 9 December 2013; Revised: 23 April 2013; Accepted: 27 May 2013; Published: 20 November 2013

Deutschlander S, Suter E, Grymonpre R

Interprofessional practice education: is the ‘interprofessional’ component relevant to recruiting new graduates to underserved areas?

Rural and Remote Health 13: 2489. (Online) 2013

Available: <http://www.rrh.org.au>

ABSTRACT

Introduction: Globally, there has been a serious health human resource (HHR) shortage for underserved populations in and outside of urban centers. This article focuses on practice education, specifically interprofessional (IP) practice education, and its impact on recruiting new health sciences graduates to populations in underserved areas as an important HHR outcome. The authors reviewed 16 articles on prelicensure practice education to identify whether (1) IP practice education is a successful recruitment strategy to for graduates to underserved communities and (2) the IP component provides an important recruitment incentive over uniprofessional practice education.

Methods: A scoping review was conducted for the time period from 2004 to 2012 yielding 1245 articles of which 16 studies were selected for this review.

Results: Out of these 16 studies, the following HHR outcomes were reported: practice uptake by new graduates with underserved populations (eight studies), interest in working with underserved populations after graduation (eight studies), and residency requests for IP sites (three studies). These results show that IP practice education has a modest influence on recruitment to underserved areas. The impact of the IP component as an added recruitment incentive over practice education alone was not assessed in any study. Therefore, it remains uncertain whether the IP component offers an added benefit to successful recruitment.

Conclusions: Given the shortage of healthcare providers in rural and urban underserved populations, innovative recruitment and retention strategies to these areas must be developed and evaluated. This review of the literature suggests that IP practice education experiences offered to students may influence their first place of employment at graduation, especially in rural and urban primary



care specialities involving underserved populations. The existing evidence is not strong; recommendations for future research include describing the IP practice education interventions in greater detail, designing longitudinal studies tracking all former students in such programs, and developing methodologically and theoretically rigorous intervention studies to measure the impact of the IP component as an added recruitment incentive over uniprofessional practice education experiences.

Key words: workforce shortages, graduate career choices, health sciences students, prelicensure interprofessional practice education, recruitment of healthcare providers.

Introduction

Globally, there has been a serious health human resource (HHR) shortage for underserved populations in and outside of urban centers¹⁻³. The greatest demand for health service providers is in sectors such as primary care, medical and hospital services, and long-term care⁴. Health and education systems need to develop strategies that draw various healthcare providers to these less desirable settings. This article focuses on practice education, specifically interprofessional (IP) practice education, and its impact on recruiting new health sciences graduates to practice in underserved areas as an important HHR outcome. HHR have been described as the human capital needed to design healthcare systems and to implement health service delivery models that are cost effective⁵. IP practice education refers to any type of practice placement where learners from two or more different health professions learn about, with and from each other. Sixteen articles were reviewed to identify whether (1) IP practice education is a successful strategy to recruit graduating students to underserved communities and (2) the IP component provides an important recruitment incentive over uniprofessional practice education.

The awareness of provider shortages in underserved communities has motivated many academic institutions with IP health sciences programs (IP courses in combination with uniprofessional and practice courses) to acknowledge their social responsibility and address the issue through explicit objectives and innovative recruitment strategies^{1,2,6-9}. Some programs require a stated commitment by their applicants to

work with underserved communities or a desire to serve community health needs as essential admission criteria². These education programs have attempted to capitalize on factors that are seen as influencing career choice in favor of underserved communities^{1,2,6,8-12}. Minority ethnic background, family of origin from underserved communities, or residency training/clinical placements in underserved communities are seen as strong influences on taking up practice there^{1,2,4,13-15}. Some critics question the influence of these factors, in particular rural exposure, largely due to confounding variables³.

Since the 1970s, many IP health sciences programs in the USA, Canada and Australia have encouraged students from underserved communities to apply to their programs^{2,7}. For example, evaluations of the Martin Luther King Jr. Health Center, New York City, showed that minority physicians with a higher percentage of minority residency colleagues (from New York's urban underserved populations in the Bronx) were significantly more likely ($p=0.04$) to practice in underserved communities². This study argued that a commitment to practice in these communities after graduation 'accounts for much of the success that the [IP program] has had in recruiting, training and graduating physicians of color'², even though some lack of follow-through has also been observed once participants from these areas have experienced an urban lifestyle^{2,4}.

Practice education opportunities in rural areas are also intended to expose urban participants to these settings with the hope of practice uptake after graduation^{3,14,16}. Wilkinson et al¹⁴. argued that 'medical students that receive rural



undergraduate training are more likely to become rural doctors'. The significance of this factor is shown in some partnerships between academic institutions and underserved communities that offer extensive practice education options in underserved communities to accommodate the large number of students in these programs^{7,17}. In 1991, the Community Partnerships in Health Promotion initiative funded by the W.K. Kellogg Foundation with \$6 million for each of the seven participating sites has created practice education opportunities in hundreds of underserved communities^{7,8,17}. With support from the initiative, some academic institutions have completely restructured their curricula to create rural IP practice opportunities^{7,17} despite inconclusive evidence of their impact on graduate student recruitment.

While some influences have been discussed to impact recruitment of graduates to underserved areas, there appears to be a lack of evidence about the influence of the IP component in these programs. This review examines whether IP practice education is a successful recruitment strategy, in particular what the IP component adds to the placement experiences of students. This objective leads to a closer examination of the evaluations of the intervention studies with particular focus on the assessment of the IP component.

Definition of interprofessional practice education

Currently, there is no consensus on the definition of IP practice education. Depending on the discipline, academic departments use terms including *clinical placements*, *fieldwork*, *clerkships*, *rotations*, *externships* and *internships* to describe 'that special part of a professional educational programme in which students gain 'hands-on' experience of working with clients under the supervision of a qualified practitioner'¹⁸. Others refer specifically to service learning as a different form of practice education where placements occur in community settings primarily focussing on prevention as a major benefit to the communities¹⁹. For this review, Alsop et al.'s definition of practice education for *interprofessional* practice education has been adapted as 'that special part of a professional educational program in which students *learn with,*

from and about each other while gaining 'hands-on' experience working with clients under the supervision of *qualified practitioners from any discipline*' (emphasis added).

Methods

Literature searches

An initial literature search on peer-reviewed articles on interprofessional interventions and HHR outcomes from 2004 to 2009 was conducted in Medline, Embase, CINAHL, ABI Inform and Web of Science for a related project. The search terms related to quality workplace, staff satisfaction, recruitment, retention, turnover, career choice and cost combined with terms relating to collaboration, teamwork and interprofessional; English and French language abstracts were considered. Standard steps were followed for selecting, rating and classifying articles^{20,21}. Abstracts and full articles were rated for relevancy by three authors who discussed any discrepancies in ratings to reach a consensus²². For this review, with its specific focus on students and their career choices as a result of IP practice interventions, eight intervention studies (out of 1184 abstracts) met the inclusion criteria. These articles measured outcomes related to recruitment or interest of new graduates in choosing work or placements in underserved communities^{1,7,9-11,13,23,24}. By screening the reference lists of the articles and hand searching a few relevant journals, five more studies outside of the time period for this review were found^{6,8,12,17,25}.

Since this comprehensive search was not specifically directed at IP practice education, it was supplemented with a scoping review of peer-reviewed studies in Medline for January 2004 to August 2012. The search terms comprised synonyms for practice education including *clinical*, *practice* or *community placements*, *fieldwork*, *clerkship* and others combined with IP or related terms. HHR-related terms for outcomes included *recruitment*, *interest* or *intent to practice in underserved communities* or related terms. Out of 61 abstracts, three more relevant studies were found^{2,26,27}. While this was not an exhaustive search of all databases, Medline indexes approximately 5600



journals with a strong focus on health administration matching the topic of interest.

Review of studies

In total, 16 studies evaluating 12 IP practice education initiatives for prelicensure learners were included in this review. Table 1 summarizes key features of included studies. Most IP practice education interventions were conducted in rural settings and the primary care sector. Besides medical students, students from nursing, social work and various allied health disciplines were most frequently involved in these studies. Most evaluation designs were cohort or case studies without controls.

Results

Human health resource outcomes of interprofessional practice education interventions

The primary focus of this review was to establish whether IP practice placements had a discernible effect on recruitment of new graduates to less desirable settings. Three types of result were found to relate to the career choices of students:

- practice uptake in underserved communities (eight studies)
- intent/interest to return to underserved areas (eight studies)
- residency requests for IP sites (three studies).

The total number of articles is greater than 16 studies because some measured more than one outcome (Table 1)^{7,9,10}.

Practice uptake in underserved communities

Interprofessional training in community-based primary care settings showed a limited degree of success on the recruitment of former students to these environments. Of the 16 articles included in this review, only eight measured actual recruitment of graduates to underserved areas. Oneha

et al⁸. reported that after 6 years of placing students at three primary care centers in rural and urban areas in Hawaii, four new graduates (total student numbers not provided) from nursing and social work were recruited back to these settings. The program at Creighton University in Omaha, Nebraska resulted in three graduates (out of 111 occupational therapy, physical therapy and pharmacy students in the program) taking up work with First Nations communities²⁴. These graduates also became clinical instructors for entry-level university students at these sites.

Rhyne et al¹. found that pharmacy, occupational therapy, physical therapy and speech language pathology students with IP rural placements chose rural employment as their first job more often than controls. Rhyne et al¹. also reported that 'practitioners who had participated in a rural practicum, practiced in rural and underserved locations significantly more often than those who had not'¹. Without providing exact figures, the study on the Interprofessional Rural Program of British Columbia (IRPbc) referred to greater practice uptake in five rural communities by nurses, social workers, speech language pathologists, pharmacists and medical lab technicians at graduation^{9,10}. In total, 120 students cycled through the consecutive placement phases between 2003 and 2006. In New York City, the medical graduates from an interdisciplinary social medicine program practiced primary care with urban underserved populations at statistically higher rates ($p=0.03$) than graduates from different programs (no specific numbers provided)². Baldwin^{7,23} presented some results for rural primary care practice by medical graduates from the Interdisciplinary Health Sciences Program at the University of Nevada, which enrolled nearly 4000 students from at least 12 different disciplines until 1980. Out of 152 medical graduates from this program who could be tracked in 1986, 57 were practicing in rural areas or small towns. These data suggested that the IP experiences 'influenced these graduates to choose rural and underserved practice sites, at least in the short run'⁷.



Table 1: Characteristics of IP intervention studies^{1,2,6-13,17,23-27}

Characteristic	Studies [ref]/content
Studies by HHR outcomes (total 16) [†]	a. <u>Uptake of work in underserved areas</u> Baldwin et al 2007[23], Baldwin 2009[7], Charles et al 2008[10], Charles et al 2006[9], Mu et al 2004[24], Oneha et al 1998[8], Rhyne et al 2006[1], Strelnick et al 2008[2]. b. <u>Intent/interest to return to underserved areas</u> Charles et al 2006[9], Charles et al 2008[10], Critchley et al 2007[26], McNair et al 2001[12], McNair et al 2005[11], Meyer et al 2005[27], Norris et al 2003[6], Yamada et al 2005[13]. c. <u>Residency requests for IP sites</u> Baldwin 2009[7], Harris et al 1998[25], Harris et al 2003[17].
Location/setting type	Location: rural (8), rural/urban (7), urban (1). Type of setting: primary care (13), acute care (2), mental health (1).
Country	US (11), Canada (2), Australia (3).
Professional group	Medicine (12), nursing (11), social work (6), pharmacy (5), PT (5), public health (5), OT (3), speech therapy (3), other (lab/medical technology, nutrition/dietetics, audiology, spiritual care/theology, dentistry, psychology) (9).
Evaluation design	Cohort/case study without controls (8), cohort/case study with controls (3), before–after study (3), no information (2).

HHR, health human resource, IP, interprofessional.

[†]Total number of articles is higher since some reported more than one outcome.

Intent/interest to return to underserved areas

Eight studies placing professionally diverse student teams in rural or urban primary care or mental health settings found an increased interest in working with these populations among participating students. In their post-placement evaluation, McNair et al¹¹. found that out of 91 past students, 25% had maintained a moderate interest in rural practice 1 year after completing the IP course. This interest was greater among nursing and allied health students than among medical students. Also, 18 students had engaged in further rural activities^{11,12}. Yamada et al¹³. provided little information about the intent of graduates of community-based, interdisciplinary training (CBIT) to return to work with underserved communities. While 281 students attended CBIT since 1992, 25 interviews with medical graduates suggested that familiarity with local communities and comfort with working in interdisciplinary teams as a result of CBIT could increase practice uptake in underserved communities. A few (exact figures not provided) out of 120 students from a rural program in British Columbia (IRPbc) reported their

intent to return to rural practice after spending time consolidating their skills at urban centers^{9,10}.

At post-evaluation, 48% (188 students) of 393 medical students participating in a mandatory rural health module at the University of Melbourne agreed that it had increased the possibility for them to practice in rural Australia²⁶. Meyer et al²⁷. reported the outcomes from an elective interdisciplinary mental health course in rural Appalachian areas as offered by the University of Ohio. Out of three student cohorts comprising 38 participants, six (16%) strongly agreed with the statement ‘because of this class, I am more likely to work in a rural area’²⁷. It cannot be determined from the article whether these respondents were representative of the participants. Program evaluators of the Student Providers Aspiring to Rural and Underserved Experiences (SPARX) program at the University of Washington conducted a follow-up survey of former students enrolled in this extracurricular IP program⁶. Of 38 students responding (112 students did not reply), 24 students reported that SPARX had increased their interest in rural practice ‘quite a bit’ or ‘very much’. Thirteen students (out of 38) reported that the SPARX



program had a positive influence on their interest in urban underserved practice. A comparison between SPARX and non-SPARX students showed that the program succeeded in increasing primary care choices among its graduates (62% of medical graduates as compared to 50% of controls at $p < 0.01$). The study did not report whether primary care practice was taken up mainly in underserved areas.

Residency requests for interprofessional sites

Only three studies showed an increased uptake of primary care- or acute care- related residency training opportunities for medical students in rural areas. In 1991, 27 schools in seven US states initiated an extensive redesign of their health profession curricula toward multidisciplinary instruction to increase primary care residency rates in community settings. The evaluations of the residency rates over 5 years (1991 to 1996) involving approximately 2500 students showed an average increase from 17% to 28% in primary care residency rates as compared to the national average (14% to 22%)^{17,25}. Most importantly, one of the seven sites had transferred a major portion of the education program to rural, underserved communities comprising more than 100 rural centers and small rural hospitals. Therefore, the increased uptake in primary care specialities also spread to a greater number of rural communities (no specific data provided). Baldwin⁷ presented outcomes from the Interdisciplinary Health Sciences Program at the University of Nevada on choice of residency training for medical students attending the program between 1972 and 1977. He argued that students from this program were twice as likely to select primary care residency training than students from other programs (80% as compared to 44% of students from other programs). Given that some of these sites are in Native communities, the evidence suggested that underserved communities also benefitted from this program⁷.

Design of interprofessional practice education

In this review, the design of the IP practice education in each study was carefully examined to understand which design elements, if any, might be associated with positive graduate

recruitment. Particular attention was paid to curriculum context, format of practice education experience, and the theoretical underpinnings driving the IP practice education.

Curriculum context of interprofessional practice education interventions

The curriculum context of the IP practice education experiences took many forms and was often poorly described. In some studies, student applications for IP programs were reviewed by community representatives and/or program faculty^{8,10,11,17,25}. For one program, the application process involved students presenting at various health organizations to publicly show their commitment to promoting social justice². Several studies described IP placements as voluntary practice education opportunities outside of the regular core curriculum involving smaller numbers of students^{6,8,10,11,27}. Two programs made rural practice placements mandatory to all or at least some of their health sciences students outside of their core curriculum^{1,26}. Other studies described mandatory sessions embedded within the entire learning continuum of students' core curriculum^{2,7,25}. These embedded IP practice education experiences were therefore offered alongside discipline-specific learnings. Overall, existing studies involved students in practice education opportunities at various points in their learning continuum. In relation to recruitment impact of IP practice education, Rhyne et al¹. argue that practice education opportunities have greater effect closer to graduation when practice decisions are made, while other authors promoted them at the beginning of students' programs before students' individual professional identities are solidified¹³. For a few programs, the students were the driving force behind planning and design of their learning opportunity^{2,6,23}.

Format of interprofessional practice education experiences

All practice education experiences were set up as placements of IP student teams. As a variation on the team placement, two projects paired up two students under the co-



preceptorship of two different or the same profession^{2,11}. These teams of students provided health and social services to individuals in clinical and community environments. The IP clinical skill development varied between studies but included case management or total patient care^{1,6,13,17,24,25}, case presentations and clinical rounds^{9,11} and patient screenings and in-services^{6,7,24}. Clinical observation experiences (eg shadowing home care providers and other professionals) were another type of IP practice experience^{10,11,24}. One study emphasized observations of alternative therapies (eg acupuncture, biofeedback training, guided imagery and herbal therapies) as part of the IP practice education experience². Other student activities involved observations of community-based interdisciplinary team meetings and panel discussions²⁷. Tutorials or other sessions to discuss principles of IP practice and working in rural communities were often integrated in the practice education experiences^{1,6,8,9,11,24,26}. Two studies did not provide much detail on the practice learning activities^{7,26}.

Community-based projects, which are largely service learning opportunities, were integral to IP practice education in several studies^{2,6,8,11,13,25}. The projects were primarily health education (eg substance abuse, HIV/AIDS,) to various community subgroups including elementary/high school students, residents of shelters and other individuals^{2,6,8,13}, development of health promotion information^{9,11}, health needs analyses¹¹, information sessions with community members (eg local youth) on future careers in health care⁹, social activities with communities¹¹, community health assessments^{8,17,25}, healthcare policy research^{17,25}, and designing interventions with/for the community²⁵.

Theoretical underpinnings

Few reports described theoretical underpinnings for the interventions. Two intervention studies explicitly referred to adult learning theory to endorse their IP education programs^{2,27}. Baldwin and Baldwin referred to a philosophy of learning together where 'students and faculty are companions in learning'²³. In the other studies, implicit references were found to experiential learning theory, adult

learning principles and the contact theory to explain the ways in which students were brought together in active learning sessions. While not being theories per se, four studies specifically referred to pedagogical approaches about types of interactions that should be designed to make IP practice education meaningful to learners. McNair et al¹¹. emphasized approaches promoting interactive learning among professionally diverse learners: exchanges, actions, simulations, observations and experiences. Rhyne¹ described problem-based learning as a key learning approach to the educational experience. Meyer et al²⁷. mentioned active and adult learning activities including reflection, discussion, analysis and working in teams. All of these approaches showed awareness among curriculum planners to align successful IP learning strategies with theoretical underpinnings.

Evaluating the interprofessional component

The second focus of this review was to identify whether the IP component provides an important recruitment incentive. All studies emphasized that IP practice education is ideal for learning healthcare practice, particularly in rural areas. Some authors argued that it better addresses the limited resources including chronic staffing shortages and the complexities of community settings requiring people to work together in ways that are not typical for urban centers^{6,8,9,24}. Added perceived benefits from IP practice education included the improvement of the working environment for providers¹¹, gaining role clarity and greater comfort in working with interdisciplinary teams^{1,8,13}, and familiarity with underserved communities^{13,25}. IP training may also lessen professional isolation and conflict between the professions as argued by Hays et al²⁸. While teamwork or collaborative practice has become important to provide better patient care regardless of location^{6,24}, the consequences of not collaborating may be more disastrous in rural areas⁹.

Besides gaining important IP competencies such as role clarity and improving collaborative practice, Harris et al¹⁷. stated that 'little is known about the value of a multidisciplinary component to health professions education', in particular



whether it contributes to recruitment. None of the studies in this review contributed to evidence, currently lacking, that the IP component is an influence leading to recruitment of healthcare providers to underserved areas. With several types of IP interventions occurring at the same time, Oheha et al.⁸ evaluated the 'combined curriculum objectives'. Yamada et al.¹³ pointed to 'the difficulty of identifying the influence of a particular element of curriculum on temporally remote behaviour (e.g. employment choice)'. Rhyne et al.¹ also stated that it was difficult to differentiate the effects of the practice education experience from the other components of the program. While their evaluation of the IP program used controls for comparison, self-selection for the IP program versus random selection for the control program may have skewed the higher uptake in underserved communities among the IP program participants¹. The gap in evaluating the IP practice component is a significant shortcoming of the reviewed studies given the extensive planning and resources that are invested in IP practice education to address workforce shortages.

Discussion

This review of IP practice education studies and their impact on attracting new graduates to underserved populations in rural and urban areas is timely given the global workforce challenges, particularly in underserved settings. The review found 16 studies that implemented IP practice education for prelicensure learners and reported HHR outcomes. While most IP practice education interventions were intended as recruitment strategies, only eight studies demonstrated some success and numbers were small. Two of the most comprehensive programs embedding IP practice courses in their core curricula had increased residency requests in primary care specialities, some of which were also in underserved areas. Another eight studies reported interest by students to work in these areas after graduation. The findings about the career choices of students in this review are modest given the overall numbers of students that attended these programs and the considerable resources involved in creating such practice education opportunities.

Some authors found the current evidence on the impact of IP practice education on graduate recruitment encouraging. Mu et al.²⁴ suggested that the positive experiences of the students in rural placements 'may help increase the recruitment and retention of health care providers (from various professions) to underserved rural areas'. This supports McNair et al.'s¹¹ statement that 'the results strongly support the argument to continue to develop rural IPE programs at undergraduate level'. Other authors expressed more caution towards the influence of IP practice education on the recruitment of new graduates to rural areas. While achieving positive attitudes about rural communities through these placements is a step forward, these attitudes 'do not necessarily translate to an intention to enter [such] practice long-term'¹¹. Thus, merely expressing an interest in future rural employment is too tentative to be seen as strong evidence. McNair et al.¹¹ noted discrepant results between students' high level of interest to 'spend *some time* in a rural health setting' as compared to their commitment to practicing in the rural setting (implying more permanent rural work).

Other studies have also shown that practice education without the IP component can be quite successful in attracting students. Rebesch and Aronson 2009²⁹ analyzed the impact of a capstone (final) placement of a 4-year liberal arts program. The employment surveys from 71 nursing graduates having taken this course indicated that more than 50% elected to work in their capstone speciality, up to 41% obtained employment at their capstone sites, with at least 67% of them still in these positions after 2 years. Rhyne et al.¹ compared IP practice education students with controls who had rural practice education without an IP component but also made rural career choices. Thus, the conclusion that 'any rural training experience may increase the likelihood that students will choose rural practice' is convincing (Rhyne)¹.

The lack of sound theoretical models supporting the design and outcomes evaluation of IP practice education reduces the ability to clearly explain the impact of current interventions, especially the impact of the IP component, which was not evaluated in any of the studies. To better understand the



impact of IP practice education programs as a recruitment strategy, more rigorous study and evaluation designs are required. The lack of longitudinal studies to measure the impact on future actions becomes particularly apparent²⁹. The weak evaluations of the interventions are compounded by the use of different terminology without clear definitions (eg *clinical placement, community project, fieldwork* and *clerkship*). Descriptions of IP education interventions were incomplete with important details often omitted, which also applies to strategies that did not work well. This is a common problem in implementation science³⁰, creating a barrier to replicating these studies and understanding their impact.

With the exception of a few methodologically more rigorous studies^{1,2,11,24}, the existing evidence is based primarily on small, non-controlled, non-randomized studies and on mostly anecdotal evidence. Self-selection bias of students entering these programs may be a confounding factor and has not been adequately addressed in these studies.

Conclusions

Research about recruitment of healthcare providers to rural and urban underserved populations is important and must be continued to address the current HHR challenges in these areas. The studies examined offer some evidence that IP practice education experiences may influence graduates' decisions to work in healthcare specialties such as primary care for underserved populations in rural and urban areas. However, the current evidence is inadequate to understand the key features of a successful IP practice education experience in enhancing new graduate recruitment.

Recommendations

To enhance conceptual clarity and methodological rigour, the following recommendations are made for researchers in this area:

- Clearly describe the IP practice education interventions to make them replicable for others and

to develop theoretical explanations for the current evidence.

- Design longitudinal studies that track actual employment of former students in IP practice education experiences.
- Develop methodologically and theoretically rigorous intervention studies and evaluation designs to measure the impact of IP components.

References

1. Rhyne RL, Daniels ZM, Skipper BJ, Sanders ML, VanLeit BJ. Interdisciplinary health education and career choice in rural and underserved areas. *Medical Education* 2006; **40**: 504-513.
2. Strelnick AH, Swiderski D, Fornary A, Gorski V, Korin E, Ozuah P et al. The residency program in social medicine of Montifiore Medical Center: 37 years of mission-driven, interdisciplinary training in primary care, population health, and social medicine. *Academic Medicine* 2008; **83(4)**: 378-389.
3. Ranmuthagala G, Humphreys J, Solarsh B, Walters L, Worley P, Wakerman J et al. Where is the evidence that rural exposure increases uptake of rural medical practice? *Australian Journal of Rural Health* 2007; **15**: 285-288.
4. Daniels ZM, Vanleit BJ, Skipper BJ, Sanders ML, Rhyne RL. Factors in recruiting and retaining health professionals for rural practice. *Journal of Rural Health* 2007; **23(1)**: 62-71.
5. Health Canada. *Health human resources strategy*. (Online) 2011. Available: <http://www.hc-sc.gc.ca/hcs-sss/hhr-rhs/strateg/index-eng.php> (Accessed 12 April 2012).
6. Norris TE, House P, Schaad D, Mas J, Kelday JM. Student providers aspiring to rural and underserved experiences at the University of Washington: Promoting team practice among the health care professions. *Academic Medicine* 2003; **78(12)**: 1211-1216.



7. Baldwin Jr. DC. Does interprofessional education affect career choice? An outcome study. Presented at CAB II, Halifax. 2009.
8. Oneha MF, Sloat A, Shoultz J, Tse A. Community partnerships: Redirecting the education of undergraduate nursing students. *Community Partnerships* 1998; **37**: 129-135.
9. Charles G, Bainbridge L, Copeman-Stewart K, Art ST, Kassam R. The interprofessional rural program of British Columbia (IRPbc). *Journal of Interprofessional Care* 2006; **20**: 40-50.
10. Charles G, Bainbridge L, Copeman-Stewart K, Kassam R, Tiffin S. Impact of an interprofessional rural health care practice education experience on students and communities. *Journal of Allied Health* 2008; **37**: 127-131.
11. McNair R, Stone N, Sims J, Curtis C. Australian evidence for interprofessional education contributing to effective teamwork preparation and interest in rural practice. *Journal of Interprofessional Care* 2005; **19**: 579-594.
12. McNair R, Brown R, Stone N, Sims J. Rural interprofessional education: Promoting teamwork in primary health care education and practice. *Australian Journal of Rural Health* 2001; **9(Suppl)**: S19-S26.
13. Yamada S, Withy MK, Ramirez V, Lindberg M. The effect of community-based, interdisciplinary training on the careers of physicians. *Journal of Interprofessional Care* 2005; **19**: 171-179.
14. Wilkinson D, Birks J, Margolis S, Baker P. Preliminary evidence from Queensland that rural clinical schools have a positive impact on rural intern choices. *Rural and Remote Health* **4**: 340. (Online) 2004. Available: www.rrh.org.au (Accessed 1 October 2012).
15. Dalton L, Spencer J, Dunn M, Albert E, Walker J, Farrell G. Re-thinking approaches to undergraduate health professional education: Interdisciplinary rural placement program. *Collegian* 2003; **10**: 17-21.
16. MacRae M, van Diepen K, Paterson M: Use of clinical placements as a means of recruiting health care students to underserved areas in Southeastern Ontario: part 1 - student perspectives. *Australian Journal of Rural Health* 2007; **15**: 21-28.
17. Harris DL, Henry RC, Bland CJ, Staarnaman SM, Voyteck KL. Lessons learned from implementing multidisciplinary health professions educational models in community settings. *Journal of Interprofessional Care* 2003; **17(1)**: 7-20.
18. Alsop A, Ryan S. *Making the most of fieldwork education: A practical approach*. London: Chapman & Hall, 1996.
19. Clark PG. Service-learning education in community-academic partnerships: Implications for interdisciplinary geriatric training in the health professions. *Educational Gerontology* 1999; **25**: 641-660.
20. Clarke M, Oxman AD. *Cochrane reviewers' handbook*, 4.1 edn. Oxford: Update Software and the Cochrane Collaboration, 2001.
21. Khan KS, Riet RS, Glanville J, Sowden AJ, Kleijnen J. *Undertaking systematic reviews of research on effectiveness: CRD's guidance for those carrying out or commissioning reviews*, 2nd ed. York: York Publishing Services, 2001.
22. Suter E, Deutschlander S, Mickelson G, Nurani Z, Lait J, Harrison L et al. Can interprofessional collaboration provide health human resources solutions? A knowledge synthesis. *Journal of Interprofessional Care* 2012; **26(4)**: 261-268.
23. Baldwin Jr. DC, Baldwin M. (2007). Interdisciplinary education and health team training: A model for learning and service. *Journal of Interprofessional Care* 2007; **21**: 52-69.
24. Mu K, Chao CC, Jensen GM, Royeen CB. Effects of interprofessional rural training on students' perceptions of interprofessional health care services. *Journal of Allied Health* 2004; **33**: 125-131.
25. Harris DL, Starnaman SM, Henry RC, Bland CJ. Alternative approaches to program evaluation. Multidisciplinary education outcomes of the W.K. Kellogg community partnerships and health professions education initiatives. *Academic Medicine* 1998; **73**: S13-S15.



26. Critchley J, DeWitt DE, Khan MA, Liaw ST. A required rural health module increases students' interest in rural health careers. *Rural and Remote Health* 7: 688. (Online) 2007. Available: www.rrh.org.au (Accessed 24 September 2012).

27. Meyer D, Hamel-Lambert J, Tice C, Safran S, Bolon D, Rose-Grippa K. Recruiting and retaining mental health professionals to rural communities: An interdisciplinary course in Appalachia. *Journal of Rural Health* 2005; 21(1): 86-91.

28. Hays RB, Acklin F, Chan P, Davis A, McAllister L, Murphy B et al. The University of Sydney rural careers project. *Australian Journal of Rural Health* 1993; 1: 23-25.

29. Rebesch L, Aronson B. Assessment of nursing student's learning outcomes and employment choice after the implementation of a senior capstone course. *International Journal of Nursing Education Scholarship* 2009; 6(1): 1-15.

30. Michie S, Fixsen D, Grimshaw JM, Eccles MP. Specifying and reporting complex behaviour change interventions: the need for a scientific method. *Implementation Science* 2009; 4(40): 1-6.
