

REVIEW ARTICLE

Mapping the interprofessional education landscape for students on rural clinical placements: an integrative literature review

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ABSTRACT:

Introduction: Interprofessional collaboration and effective teamwork are core to optimising rural health outcomes; however, little is known about the opportunities available for interprofessional education (IPE) in rural clinical learning environments. This integrative literature review addresses this deficit by identifying, analysing and synthesising the research available about the nature of and potential for IPE provided to undergraduate students undertaking rural placements, the settings and disciplines involved and the outcomes achieved.

Methods: An integrative review method was adopted to capture the breadth of evidence available about IPE in the rural context. This integrative review is based on a search of nine electronic databases: CINAHL, Cochrane Library, EMBASE, MEDLINE, ProQuest, PubMed, SCOPUS, Web of Science and Google Scholar. Search terms were adapted to suit those used by different disciplines and each database and included key words related to IPE, rurality, undergraduate students and clinical placement. The inclusion criteria included primary research and reports of IPE in rural settings, peer reviewed, and published in English between 2000 and mid-2016.

Results: This review integrates the results of 27 primary research studies undertaken in seven countries: Australia, Canada, USA, New Zealand, the Philippines, South Africa and Tanzania. Despite geographical, cultural and health system differences, all of the studies reviewed were concerned with developing collaborative, interprofessional practice-ready graduates and adopted a similar mix of research methods. Overall, the 27 studies involved more than 3800 students (range 3–1360) from 36 disciplinary areas, including some not commonly associated with interprofessional education, such as theology. Interprofessional education was provided in a combination of university and rural placement settings including hospitals, community health services and other rural venues. The education activities most frequently utilised were seminars, tutorial discussion groups ($n=21$, 84%), case presentations ($n=11$, 44%) and community projects ($n=11$, 44%) augmented by preliminary orientation and ongoing interaction with clinicians during placement. The studies reviewed demonstrate that rural clinical learning environments provide rich and varied IPE opportunities for students that increase their interprofessional understanding, professional respect for other roles, and awareness of the collaborative and interprofessional nature of rural practice.

Conclusion: This review addresses the lack of attention given to understanding IPE in the rural context, provides Australian and international evidence that initiatives are being offered to diverse student groups undertaking placements in rural settings and proposes a research agenda to develop a relevant framework to support rural IPE. Rural clinical learning environments afford a rich resource whereby health professionals can conceptualise IPE creatively and holistically to construct transformative learning experiences for students. This review develops a case for supporting the development, trialling, evaluation and translation of IPE initiatives that harness the opportunities afforded by rural placements. Further research is required to examine the ways to optimise IPE opportunities in the rural clinical context, including the potential for simulation-based activities, the challenges to achieving sustainable programs, and to evaluate the impact of interprofessional education on collaboration and health outcomes.

KEYWORDS:

Australia, clinical learning environment, clinical placement, fieldwork, interprofessional collaboration, interprofessional education, rural placements, undergraduate students, work-integrated learning.

FULL ARTICLE:

Introduction

The complexity of contemporary health care demands interprofessional collaboration (IPC) and teamwork^{1,2}. WHO defines IPC as 'when multiple health workers from different professional backgrounds work together with patients, families, carers and communities to deliver the highest quality of care'²(p.7) and has advocated for IPC for several decades. In its most recent Framework for Action on Interprofessional Education & Collaborative Practice² the WHO reasserts that effective interprofessional education (IPE) is necessary for preparing a collaborative practice-ready health workforce. There is mounting support, nationally and internationally, for IPE to be embedded in undergraduate learning to ensure students are equipped with the requisite knowledge, skills and attitudes for employment in the

healthcare sector³⁻⁵. Given the need for graduates to be practice-ready, pre-qualification IPE can be seen as ‘an investment in the future...’⁴ (p.16). Interprofessional education is defined as ‘when two or more professions learn with, from and about each other to improve collaboration and the quality of care’⁶. For the purpose of this review, IPE is interpreted as applied by Reeves and colleagues⁴ (p.5), as ‘... all types of educational, training, learning or teaching initiatives, involving more than one profession in joint, interactive learning.’

The increased momentum of IPE in Australia mirrors international activity^{3,7-9}, although it is yet to become embedded across all health professional curricula and the clinical learning environment^{3,7,8,10}. In Australia, despite efforts to progress a national agenda, IPE remains a disparate range of fundamental or grass roots activities, often in rural environments, with no shared vision and little synchronisation within and between states and territories^{3,7,11,12}. The clinical learning environment constitutes an integral part of undergraduate healthcare curricula where the links between theory and practice are optimised through work-integrated learning¹³⁻¹⁵. Accordingly, the clinical learning environment affords an ideal setting for promoting IPE, understanding IPC and developing the skills required to facilitate transition from student to collaborative practitioner^{4,16-18}.

Since 1999, there have been a number of Cochrane reviews, Best Evidence Medical Education (BEME) reviews and other scoping and integrative reviews that reflect a growing body and higher level of evidence supporting IPE. In their literature review of 83 IPE studies, Abu-Rish and colleagues¹⁶ cited more than 20 related reviews. In cataloguing these reviews, they noted that IPE research has predominantly targeted three key themes: the conceptual basis for IPE and associated competencies, research methods signifying effective teamwork and communication, and developing sustainable models for applying IPE to health professional curricula and clinical practice¹⁶. Although Reeves, Zwarenstein and colleagues, key authors in the IPE field, have undertaken multiple reviews related to IPE interventions and outcomes^{4,19-24}, none of these reviews consider the implications of IPE in the context of rural practice settings or clinical learning environments.

Despite the growing body of IPE literature, little is known about rural clinical learning environments and their capacity to support IPE. To the knowledge of the authors, only one review has explored IPE in rural clinical settings and its focus was on paramedic involvement²⁵. This represents a noticeable gap in knowledge because there are increasing expectations that students will be exposed to rural practice settings, IPE will be provided to students undertaking workplace learning^{2,5,15} and graduates will be ready for IPC². Other factors fuelling the need for a review that maps IPE in rural settings include:

- the movement towards community-based person-centred care²⁶⁻²⁸
- the reliance in rural health on IPC²⁹⁻³¹
- efforts to build placement capacity in non-acute, including rural, settings^{15,32}
- the drive to increase students’ engagement in rural practice to address workforce shortages^{26,33}.

Furthermore, if the clinical learning environment is considered an ideal location for promoting work-integrated learning and preparing practice-ready graduates, attention is warranted to exploring the potential for IPE in rural as well as other contexts. This review seeks to address the gap in knowledge about IPE in the rural context. Accordingly, the focus has been to map the rural IPE landscape; that is, the learning opportunities available in rural settings, the settings involved, the nature of IPE provided to students undertaking rural placements, the types of students (disciplines) that have access to IPE in rural settings and the outcomes of IPE in the rural context.

In rural areas, the community represents the platform for care^{34,35}. Killam and Carter note that ‘distinct characteristics of rural areas include isolation, limited access to healthcare resources, small populations, significant distances between services and providers, and informal social structures’ (p. 2)³¹. There is a well-established body of evidence that associates rural practice with care across the lifespan, advanced generalist knowledge and integrated collaborative care^{29,30,35}. This integration of health and social care, and continuum of community and hospital care, makes it especially important that rural health professionals are equipped for IPC^{31,35,36}. For undergraduates to be equipped with the prerequisite skills and attitudes for IPC, they need to experience these in the practice setting^{35,37-39}.

Evidence suggests that 'rural placements have the potential to provide a better learning experience than that of the urban campus, due to the close contact between student and supervisor in the rural setting'⁴⁰ (p.122). Rural placements are often in smaller settings such as small rural hospitals and community-based health services where students learn and gain experience in a multidisciplinary team environment with health professionals often well known to each other^{35,36,41}. Like other primary healthcare settings, one of the benefits afforded by rural placements is the opportunity to experience IPC within a close-knit community of practice^{30,35,41,42}. Rural placements have been shown in before-and-after studies to improve interprofessional abilities and influence future collaboration in the workplace^{34,39,43}. Rural practice settings may therefore be an ideal IPE environment for students because they provide a range of opportunities for students to follow the patient journey and work across the continuum of care and professional boundaries^{34,39,41,44}.

There is potential for other practice settings to provide IPE, but the inherent importance in rural practice of sustaining collaborative interprofessional relationships renders the lack of attention to IPE in the rural context a critical omission in the literature. While there is considerable scholarship about rural clinical learning environments, the notion of IPE in these settings is relatively new and has not received the same level of attention that it has in more urban and classroom settings. Having more than a decade of experience in teaching and studying IPE, the authors were cognisant of the need for a review to address the gap in knowledge about IPE in the rural context. The aims of this review were to identify, analyse and synthesise the research available about the nature of and the potential for IPE provided to students undertaking rural placements, the settings and disciplines involved and the outcomes achieved.

Methods

The integrative review process outlined by Whittemore and Knafl was adopted for this review, 'allowing for the simultaneous inclusion of experimental and non-experimental research in order to more fully understand a phenomenon of concern'⁴⁵ (p.547). An integrative review process was considered the most appropriate method because of the diverse and complex nature of IPE, the range of disparate research methods used to study IPE^{4,16} and the applicability of this process to build theoretical understanding and to guide policy and practice^{46,47}. Moreover, as a 'new emerging topic', the notion of IPE in the rural practice environment was well suited to an integrative approach⁴⁷ (p.356). The five-stage process outlined by Whittemore and Knafl incorporates problem identification, literature search, data evaluation, data analysis and presentation of integrated findings⁴⁵. The process was expanded in recognition that integrative reviews can also synthesise data, include theoretical and empirical data and fulfil a range of purposes, such as the development of a conceptual framework or identification of a research agenda^{46,47}.

Problem identification

The increasing complexity of contemporary health care is driving the need for effective teamwork and IPC, which in turn, is increasing the impetus to facilitate IPE within the clinical learning context^{1,2,5,7,24,48}. The need for IPE is compounded by current and projected workforce shortages in rural health worldwide^{5,40,49,50}, increasing expectations that students will undertake rural placements^{40,48}, that IPE will be provided to students undertaking workplace learning⁷, and the need to graduate collaborative practice-ready health professionals². Collectively, the drivers stimulating IPE in rural practice settings necessitate a review of the nature of and potential for IPE available for students undertaking rural placements.

Literature search

Nine databases were searched: CINAHL, Cochrane Library, EMBASE, MEDLINE, ProQuest, PubMed, SCOPUS, Web of Science and Google Scholar. A range of search terms were used to ensure the different nomenclature and related concepts used by different disciplines were incorporated by the search strategy (Table 1).

The search strategy was adapted to suit each database and the Boolean technique using AND/OR was applied to capture similar or interchangeable concepts. To promote rigour, the reference lists of retrieved articles were searched manually by the first author to identify additional studies and published reports of IPE initiatives not captured by the search strategy.

The inclusion criteria included primary research and reports of IPE activities in rural settings, peer reviewed and published in English between 2000 and mid-2016. The timeframe was chosen purposefully by the authors to capture the increased focus on rural placements and expectations since the turn of the century that students will be exposed to IPE, developing trends in IPE and the outcomes of longitudinal studies^{5,24}. For the purpose of this review, the clinical learning environment is recognised to include rural and regional hospitals, multi-purpose services, community health services, general medical practice settings, community pharmacies, mobile and outreach health services and rural communities. Exclusion criteria included postgraduate and professional development activities, lack of evaluative detail and unprofessional studies involving students working with health professionals from other disciplines.

The search was undertaken by the first author with advice from a research librarian. Titles and abstracts were screened against the inclusion and exclusion criteria. The initial search, including those sourced from reference lists, identified 111 articles. After reviewing the titles and abstracts against inclusion criteria, 63 were retrieved for detailed review. Duplicates were eliminated, leaving a total of 41 articles. Ten studies were reported twice and four lacked detail, effectively reducing the number of included studies to 27 (Fig1). Similar to the approach adopted by Reeves and colleagues²³, studies were not excluded on the grounds of methodological quality but were examined with a specific lens prescribed by the review objectives and inclusion criteria⁴⁷.

Table 1: Search terms used as part of the search strategy within the nine chosen databases

Interprofessional education	interprofessional education interprofessional learning interprofessional collaboration multi-disciplinary interdisciplinary education learning
Rural	rural regional remote
Undergraduate healthcare student	healthcare health professional health science student undergraduate pre-registration
Clinical placement	clinical placement fieldwork field experience practicum professional practicum work-integrated learning

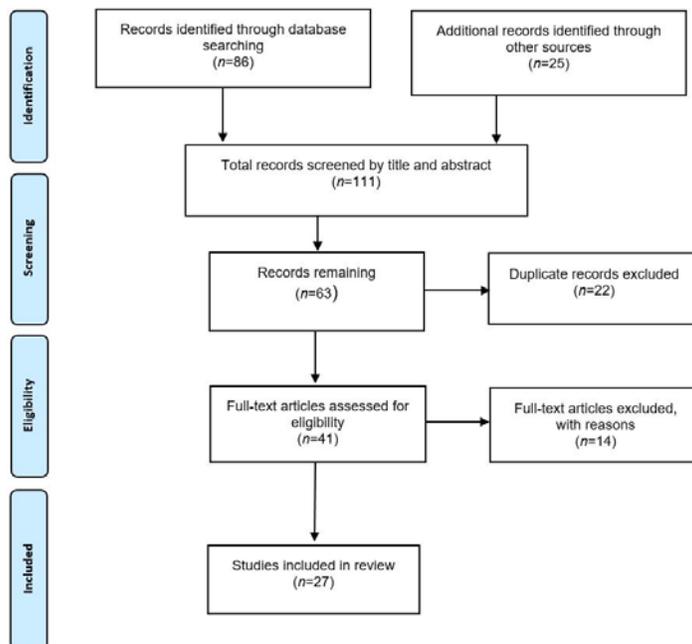


Figure 1: Flow diagram of article selection process.

Data evaluation and analysis

The authors devised a data extraction tool that addressed the review aims. The first author undertook the data extraction. To facilitate evaluation and analysis, the authors independently appraised and collectively reviewed the included studies. Findings were aggregated where meaningful, for example the disciplines engaged in IPE. Content was analysed manually to identify and extract the main ideas and themes as they related to the research aims; in other words, identifying and analysing the nature of the IPE initiatives available to students undertaking rural placements, the settings, students (disciplines) involved, methods used to evaluate outcomes, and the outcomes achieved (Table 2). Recurring patterns and themes were analysed together with similarities and differences, outliers and learning interventions. This process facilitated description, aggregation, abstraction and elicited insights into some of the reported challenges to provision of IPE programs. The IPE activities described in each report were compared and contrasted, observing for patterns, congruence across jurisdictions and unique identifiers. Meanings were discussed, abstracted and synthesised by the authorship team and any differences were resolved by consensus.

Table 2: Overview of included studies

Author, year and country	Aims	No. of student participants and discipline	Design/method	IPE interventions/ activities	Key findings
Bolte et al. 2012 Australia	To report the development, implementation and 'value-adding' component of the Enhanced Rural Inter-Professional Cultural Health (ENRICH) Program	380 Medicine Nursing Other allied health Pharmacy Social work	Qualitative program evaluation Focus group discussions	Weekly (half/full day) IPE sessions over a 6–12-month placement Simulation activities focused on rural, cultural interprofessional experiences	Students valued interprofessional contact, small-group opportunities and access to experienced local teachers Positive experience with indigenous communities Appreciated the strengths of rural communities and their health needs
Brewer 2010 USA	To describe the development, implementation and outcomes of an interdisciplinary rural summer placement experience for students from multiple health disciplines	61 Dentistry Medicine Nursing Occupational therapy Pharmacy Physical therapy Physician assistant Radiology Social work Speech pathology	Quantitative Structured post-placement questionnaire	Weekly half-day seminars over a 6-week placement Case visits, discussion and review	Identified the importance and impact of interdisciplinary interaction Valued opportunity to interact with students from other disciplines and rural experience Broke down negative stereotypes about other professions, rural work and ageing
Charles et al. 2006 Canada	To evaluate the Interprofessional Rural Program of British Columbia	120 Medicine Nursing Pharmacy Occupational therapy Other allied health Physical therapy Speech pathology Social work	Quantitative program evaluation Pre–post IPE survey	2-day orientation module for placement (average length 12 weeks) Weekly IP rounds and group meetings Professional shadowing Learning journal Team community project	Increased understanding of IPC, roles and skills of other health professions, teamwork and rural practice needs Opportunity to participate in full continuum of care
Cragg et al. 2010 Canada	To test an IPE approach involving normal clinical placements in a rural hospital	14 Nursing Medicine Physical therapy Spiritual care	Mixed methods Pre–post IPE survey	Weekly 1 hour guided IPE sessions (5–12 sessions) Structured case-based, learning sessions Face-to-face interaction Interpersonal and small group skills	Students recognised the need to understand others' roles, values, approaches and vocabulary Students were enthusiastic and valued weekly IPE meetings Students and preceptors identified they would practice differently as a result of the project
Goodrow et al. 2001 USA	To describe the development, implementation and outcomes of the Community Partnerships Program	258 Allied health Medicine Nursing Public health	Mixed methods longitudinal study over 7 years Surveys Interviews	IPE activities embedded in community primary health placement comprising one day per week for 2 years and 16 weeks in year 3. Interactive learning exercises, field trips, population research and intervention projects	Greater respect for roles Developed positive attitudes towards IPC Students perceived the program added value to the placement experience Catalyst for the development of Master of Public Health program Increased interest in primary care and rural careers: nursing program revised to focus on primary care Enhanced university–community relationships
Gum et al. 2013 Australia	To report on the Integrated Multidisciplinary Model of Education in Rural Settings program	5 Nutrition and dietetics Paramedic Speech pathology	Mixed methods utilising complexity theory framework Surveys	Fortnightly sessions included case studies, role plays, journal club, work shadowing, guest speakers Use of clinical log and reflective writing. Rural placement: 6–12 months	Increased understanding of collaborative practice Transformation of interprofessional relationships and sense of how professional roles can complement others Increased communication skills and understanding of rural health care and community life
Hayward et al. 2007 USA	To report students' perceptions of interdisciplinary health care practice in a facilitated, community based practicum experience: the Idaho State University Senior HealthMobile Project	102 Dietetics Nursing Occupational therapy Physical therapy Other allied health	Quantitative Pre–post IPE Longitudinal 3 years Community-based conceptual framework for development of IPC	Orientation session with faculty and project partners Introduction to interdisciplinary team functions in a rural setting Online IPE module and group forum Placement varied: 2–16 weeks	Greater understanding of professional competence, autonomy, cooperation, resource sharing and community needs Increased awareness of other professions/roles Nurses scored lower in two areas: professional competence/ autonomy and cooperation and resource sharing Promoting IPE remains a challenge
Howell et al. 2011 USA	To report on the Rockcastle Project: interprofessional clinical education and practice in a rural medical centre	3 Communication disorders Occupational therapy Physical therapy	Pilot study Mixed methods Survey: pre–post IPE Qualitative feedback	Orientation session Weekly IPE activities/case conferences Develop and present IP plan of care Checklist of IP activities to complete 4-week placement	Overall increase of positive perceptions of other disciplines; Increased knowledge of other roles and IPC; Increased awareness of essential community healthcare resources
Leshabari et al. 2012 Tanzania	To describe and evaluate a pilot program to train professional students to work collaboratively with each other and healthcare staff	16 Environmental science Medicine Nursing Pharmacy	Pilot program Qualitative Debriefing interviews Reflections	Orientation to IPE 1 day in community hospital Develop and present IP care plans Debriefing Individual reflections	Increased understanding of values/ethics, roles and responsibilities for IPC, interprofessional communication, teamwork and team-based care IPC enhanced patient care Increased awareness of public health issues Identified that IPE champions must be supported
Lockhart et al.	To report the perceptions and experiences of health	23 Dietetics	Mixed methods Pre–post surveys	1-week immersion program	Increased IPC and professional growth and cultural awareness

	staff			Debriefing Individual reflections	Increased awareness of public health issues Identified that IPE champions must be supported
Lockhart et al. 2003 Australia	To report the perceptions and experiences of health care students who took part in a multidisciplinary rural placement program: Country Week	23 Dietetics Health promotion Human communication science Medicine Nursing Occupational therapy Pharmacy Physiotherapy	Mixed methods Pre-post surveys Individual and group discussions	1-week immersion program Multidisciplinary rural placement in rural farming and indigenous community	Increased IPC and professional growth and cultural awareness Greater understanding of IP roles/responsibilities, primary healthcare and issues of delivery in marginalised setting
Loury et al. 2013 USA	To report on an interprofessional rural course focused on vulnerable or underserved communities	40 Clinical and rehabilitative health sciences Medicine Nursing Pharmacy Psychology Public health Social work	Quantitative Post-course surveys Community-based participatory research	Two semesters Orientation to course and community Fieldwork Develop community health plans Research projects Presentation	Increased role awareness and appreciation for IPC Greater awareness of community health issues Established relationships within the rural community
Mareck et al. 2003 USA	To report on interdisciplinary community education at Minnesota Rural Health School	239 Dentistry Medicine Nursing Occupational therapy Pharmacy Physician assistants Public health Physical therapy Social work Speech pathology Veterinary medicine	Quantitative Pre-post surveys Written evaluations of students, faculty and site coordinators	2-day orientation retreat Community service learning projects Case studies Community experience Online learning modules Student Objective Structured Clinical Exams	Increased understanding of team member roles, strengths and weaknesses of IP team Increased confidence working as part of team and understanding of rural community culture Increased recruitment to rural practice
McNair et al. 2005 Australia	To outline a rural interprofessional program, evaluation methods and student outcomes	109 Medical Nursing Physical therapy Pharmacy	Mixed methods IPE surveys: Pre-post/follow-up 12 months	Pre-post tutorials Shadowing Consultations Online forum Develop collaborative clinical community project IPE model for activities Placement: 2-week rural community, mixed groups	Increased knowledge and understanding of roles Improved teamwork skills Reinforced students' belief in the value of IPC Greater understanding of personal IPC strengths and weaknesses Strengthened nursing and allied health students' intention to work in rural health
Medves et al. 2008 Canada	To describe and evaluate the Professionals in Rural Practice Course	65 Education Nursing Medicine Occupational therapy Physical therapy Theology	Mixed methods Community action program evaluation research IEPS Focus groups Videotaped assessment: interview analysis, group presentations, reflections	8-week IPE course x 3 hour classes followed by 2 days of rural community fieldwork Small-group activities, guest speakers, lectures, assignments IPE literature informed model for activities	Students were enthusiastic about the IPE course and valued small-group learning, although some were unprepared for interactive learning Students demonstrated increased understanding of other professional roles and identities, the importance of IPC and the rural context of health care
Mpofu et al. 2014 South Africa	To report the perceptions of students in an IPE program and its influence on their intention for future practice within rural South African communities	17 Natural medicine Nursing Physical therapy	Mixed methods questionnaire Validated modified RIPLS Focus groups	5-month rural immersion placement	Students reported increased knowledge and understanding of IPE, collaboration and teamwork, self-growth and understanding about other roles and alternative patient care approaches Positive attitudinal change to other professions Most (69%) identified rural as preferred community of practice
Mu et al. 2004 USA	To report on students' perceptions of training in the Continuous Connection: Consortium for Rural, Interprofessional Training program	111 Occupational therapy Physical therapy Pharmacy	Mixed methods Pre-post IEPS Observation summary On-site summary Reflective journal Group debriefing	Short term, 2-day field placement or long-term 3 month placement Information session and workbook Monthly dinner meetings Fieldwork, community visits, local activity, shadowing	IPE training increased students' regard for IPC, communication skills, understanding, appreciation and respect for other professionals' roles, and awareness and respect for the Native American community
Neill & Powell 2009 USA	To describe the outcomes of an innovative program developed to deliver mobile health and wellness services to older adults residing in rural Idaho	255 Audiology Clinical psychology Health and nutrition science Health education Nursing Occupational therapy Pharmacy Physical therapy Physician assistant Public health	Quantitative survey	2-16 weeks rural placement Assess and provide service delivery for older adults in rural community	Developed respect and valued the contributions of other professions, communication and cooperation skills Developed positive perceptions of ageing, appreciated the opportunity to provide services to well seniors and practice geriatric clinical skills Increased interest in working with older adults Identified that faculty were supportive and helpful
Opina-Tan 2013 Philippines	To describe the activities of interprofessional teams and student perceptions of the family case management IPE initiative	19 Medicine Nursing Occupational therapy Physical therapy Speech pathology	Pilot project Mixed methods Post-placement survey Qualitative thematic analysis	Orientation IP planning meeting Weekly IP meetings Attendance at community meetings IP project and report on family case management 6-8 weeks placement	Increased understanding about IPC and appreciation of IP roles Provided patient-centred care and service to the community Students felt it was a unique learning opportunity
Prout et al. 2014 Australia	To examine the process of learning among health science students during iCounts: iMedics: a 4-week	27 Health promotion Health science Medical imaging	Qualitative Reflective journal, debrief	Orientation weekend interprofessional program 1-week immersion in rural community	Increased understanding of professional roles, self and Indigenous/cultural and health access issues Learning in context was a transformative

				6–8 weeks placement	
Prout et al. 2014 Australia	To examine the process of learning among health science students during 'Country Week': a 1-week intensive experiential interprofessional education program	27 Health promotion Health science Medical imaging Nursing Physiotherapy Pharmacy Social work	Qualitative Reflective journal, debrief Journal of teaching, learning and observations Triangulation of data	Orientation weekend interprofessional program 1-week immersion in rural community Provide health care to Aboriginal community	Increased understanding of professional roles, self and Indigenous/cultural and health access issues Learning in context was a transformative experience
Pullon et al. 2016 New Zealand	To report student learning experiences of a rurally located, clinically based interprofessional program and compare responses from participating students with those from a cohort of non-participating peers	111 Dentistry Dietetics Medicine Nursing Occupational therapy Pharmacy Physiotherapy	Controlled quasi-experimental Mixed methods Pre–post logic model survey Focus groups Survey of non-participants Applies Kirkpatrick (2006) model of program evaluation	E-learning platform for pre-reading, resources and online discussion Community projects 5-week clinical rotation, students shared accommodation	IPE group were better prepared, with improved knowledge and confidence in IPC and contribution to quality of care Increased knowledge of rural environment, cultural issues and chronic conditions Improved ability to incorporate cultural values and skills into practice Changes were significantly greater than in non-IPE control group
Shannon et al. 2005 USA	To report the evaluation of an interdisciplinary rural health education program: Student Attitudes, Career Intent and Perceived Quality	1360 Clinical psychology Dentistry Dental hygiene Medicine Nursing Occupational therapy Pharmacy Physical therapy Physician assistant Social work	Quantitative Post-rotation Questionnaire	Interdisciplinary seminar 2–4 times per month Community service activities Placement 6–12 weeks in rural setting	Increased understanding of professional roles, awareness of social responsibility and interest in rural health Greater understanding of the needs of poor/indigent population Nursing students most confident in becoming active part of community
Sisson et al. 2012 USA	To report the impact of the Rural Interprofessional Experience on perceived knowledge and attitudes of medical and pharmacy students toward rural practice	292 Medicine Pharmacy	Mixed methods Pre–post survey	Online lectures, panel discussion, group activities, guest speakers, interactive lectures, IP presentation 1-day rural community visit Undertake community assessment and IP projects	Increased perceived knowledge of rural IP healthcare team and rural health issues Rural IPE experience highly valued
Sisson et al. 2012 USA	To report the impact of the Rural Interprofessional Experience on perceived knowledge and attitudes of medical and pharmacy students toward rural practice	292 Medicine Pharmacy	Mixed methods Pre–post survey	Online lectures, panel discussion, group activities, guest speakers, interactive lectures, IP presentation 1-day rural community visit Undertake community assessment and IP projects	Increased perceived knowledge of rural IP healthcare team and rural health issues Rural IPE experience highly valued Support of faculty and communities identified Interest in rural practice reduced in students with rural background
Wakely et al. 2013 Australia	To report the evaluation of monthly interprofessional modules delivered in a department of rural health	38 Medicine Nursing Nutrition and dietetics Occupational therapy Physiotherapy Radiation science	Pilot study Quantitative RIPLS	Monthly half-day IP modules Placement: from 2 weeks to 1 year in rural setting, varied according to discipline	Positive changes in attitudes to teamwork and collaboration and professional identity, no change for roles and responsibilities
Whelan et al. 2008 Australia	To report on the development, design, implementation and evaluation of the Rural Interprofessional Program Education Retreat initiative	59 Medicine Midwifery Nursing Pharmacy	Mixed methods Pre–post questionnaire: validated modified RIPLS Focus groups	2 day workshop of rural scenarios with expert rural clinicians in IP teams Simulation: multi-station circuit, use of hi/ low fidelity and simulated patients, role-play	Positive shift in understanding of IPC, roles and skills of other professions Increased understanding of value of collaboration and team work for problem solving, improving patient outcomes and professional networking

IEPS, Interdisciplinary Education Perception Scale. IPC, Interprofessional collaboration. IPE, interprofessional education. RIPLS, Readiness for Interprofessional Learning Scale.

Results

The 27 studies reviewed were undertaken in seven countries: Australia (10), USA (10), Canada (3), and one each from New Zealand, Tanzania, South Africa and the Philippines. Despite geographical, cultural and health system differences, the studies reviewed were all concerned with developing collaborative interprofessional practice-ready graduates. Data were collected in similar ways, utilising a range of procedures such as student surveys, focus group discussions and/or debriefing. Two studies also utilised direct observation: one through the use of facilitators⁵¹, the other by video capture⁵². A mixed methods approach was adopted in 15 of the studies, nine were quantitative, and three qualitative. Eleven applied a controlled pre–post study design. Only one longitudinal study was reported⁴³. There were no randomised controlled trials related to IPE in the rural context although one quasi-experimental study with a comparator group of non-participating students was reported⁵³. Some studies utilised validated survey tools: three used the Interdisciplinary Education Perception Scale (IEPS), one used the Readiness for Interprofessional Learning Scale (RIPLS), two used a modified version of the RIPLS and one used the Team Performance Scale. Other studies utilised

customised survey tools; however, the development, pilot testing and psychometric properties of these instruments were not reported.

Settings

The IPE activities were undertaken in a combination of university and rural placement settings including hospitals, community health centres and other community venues. The settings ranged from an immersion simulation exercise at rural sites in Australia^{54,55} to a mobile outreach program that promoted access to primary health care for an underserved migrant population in the USA⁵⁶. The most common setting for IPE activities was community-based primary care where students identified healthcare needs and developed related activities. Several studies – one in Canada, one in Australia and two in the USA^{43,56-58} – emphasised that the community were joint participants in the IPE activities and provided support for the IPE undertaken. Loury and colleagues⁵⁶ noted that the growth of a collaborative team requires community partners, students and faculty to share common goals. Brewer⁵⁹ reported that although their program received funding support from the local area health education centre, financial constraints may impact on programs.

Participants

Overall, the 27 studies reviewed reported IPE activities involving a total of more than 3800 students. The number of participants in each ranged from three⁶⁰ to 1360⁶¹. All studies except for one⁶² included students from at least three professions. Although nursing and medical students predominated, collectively the IPE studies reviewed included students from 36 disciplinary fields. There were several 'outlier' groups, such as theology, veterinary medicine, natural medicine and human communication science. Student demographics were rarely identified and academic levels were reported inconsistently. Students' participation in IPE was predominantly voluntary and not mandated as part of their undergraduate course.

Interprofessional learning activities

The nature of the rural clinical learning environment in a range of settings and countries provided rich and varied interprofessional learning opportunities for students to engage with other disciplines and participate in a broad range of IPE activities. Some IPE initiatives were a 'one-off' or pilot^{44,60,63-65}, several programs had been offered successively for 3 years or more^{39,55,57} and two for 10 years^{66,67}. Regardless of the country of origin, the most frequent IPE activities were seminars, tutorials, discussion groups ($n=21$, 84%), case presentations ($n=11$, 44%) and community projects ($n=11$, 44%).

The most utilised IPE format was an initial orientation or discussion followed by interacting with clinicians during placement. This practice-based role-modelling format was considered conducive to developing a greater understanding of teamwork, interprofessional communication and collaborative practice^{52,68}. Community-based participatory research was a key element of one program which involved students writing scholarly papers, posters and attending conference presentations⁵⁶. The timeframes dedicated to IPE activities varied considerably, for example a one-day rural community visit, a structured weekly program over two semesters and a whole-of-course program for 3 years (Table 2).

Outcomes

All 27 studies reported a range of positive learning outcomes. The most common outcomes assessed were students' attitudes toward IPE, knowledge of and respect for roles of other professions and development of collaborative skills such as communication, shared decision-making and conflict resolution. All studies reported evidence of changes in the attitude or perception of students. Two studies reported the breaking down of ageing stereotypes and increased interest in working with older adults^{59,69}. Three studies reported increased student understanding of the diverse needs of the rural community and intent to practice rurally^{39,61,66}. In contrast, Sisson and Westra found that although the rural IPE experience was highly valued, interest in rural practice was reduced in students with a rural background⁶².

Only one study reported the longitudinal assessment of change in behaviour or attitudes⁴³. Using the IEPS pre-test-post-test instrument, Hayward and colleagues⁴³ reported a significant difference ($p \leq 0.001$) in changes in behaviour and attitudes for all students over a 3-year period. There were also statistically significant differences between discipline

categories: nursing students scored lower than other disciplines regarding professional competence and autonomy and on cooperation and resource sharing within and across disciplines ($p \leq 0.011$).

Engagement in IPE enabled students to develop a greater understanding of their own and other professional roles, the value of other professions and the importance of teamwork (Table 2). Students found being involved in the full continuum of care that occurs in rural settings beneficial and gained greater understanding of the complexity of rural healthcare issues and practice^{63,70-73}. Likewise, local clinicians and communities reported positive benefits from having students and developed a greater understanding of IPE, students' needs and the complexities of placement^{43,67}.

Discussion

This review summarises and synthesises the research available about the nature of and potential for IPE initiatives offered to undergraduate students undertaking rural placements, the students involved and the outcomes achieved in order to develop a more comprehensive understanding of IPE in the rural context. The rural setting was chosen because of the drive to build placement capacity by increasing students' exposure to expanded settings, including rural practice^{15,40}, the collaborative nature of this environment and the reliance in rural practice of sustaining effective interprofessional relationships^{34-36,41}. Inevitably, the context of learning environments influences the capacity of agencies to provide IPE and the type of IPE opportunities available. The variation between studies reveals the heterogeneity of rural clinical learning environments and eclecticism of IPE programs as reported in other IPE reviews^{4,16,22}, but also similarities and relevance across different jurisdictions. The differences also reflect alternative ways that placements are configured, IPE is conceptualised and the types of students that are 'connected' to engage in IPE. The similarities in focus may partially reflect the international uptake of the WHO framework².

A range of activities were undertaken, from seminar-based group discussions to observation-based learning where students were closely engaged with the community. However, although Barr and colleagues⁷⁴ identify simulation as a modality for IPE, it featured in only four of the studies reviewed. As simulation is being increasingly adopted in academia and clinical practice settings⁷⁵, its use and potential in rural IPE warrant further investigation.

Recently, there has been a focal shift in the mainstream literature to underpin IPE with theoretical foundations^{23,76}. According to Barr and Low 'all IPE is more coherently planned, consistently delivered, rigorously evaluated and effectively reported when it is built on explicit and clear theoretical foundations'⁷⁶ (p.18). Only two of the studies reviewed provided a clear outline of the theoretical framework employed^{44,52}.

Scheduling and sequencing IPE activities were considered challenging but critical for meaningful collaboration to occur. The challenges of scheduling IPE activities are not unique to rural practice and have been identified as problematic in other settings^{7,77-79}. In the studies reviewed, IPE activities were invariably developed by academics and not always in collaboration with clinical leaders and clinicians. Where clinicians were involved in the development of IPE, there was a greater focus and acceptance of these activities, which in some instances led to ongoing programs^{66,67}. Four studies identified implementation and sustainability issues related to lack of funding and staffing^{52,53,66,79}.

Few studies reported the validity or reliability of evaluation instruments. Researchers that reported the validity of instruments principally used those with established psychometric rigour, such as IEPS and RIPLS. However, there is some debate over the utility and psychometric integrity of these instruments for measuring outcomes of IPE⁸⁰. This debate highlights the need to review existing instruments for their validity and relevance to the rural context. Additionally, the lack of description of the evaluation instruments used undermines replication. The findings reported most frequently were individual student outcomes: increased IP understanding, respect for professional roles and IPC, and a sense of how individual professional roles can complement others. These learner-focused outcomes reflect those reported in other reviews^{81,82}. While most studies identified improved communication skills and transformed relationships between student groups, other outcomes included increased understanding of rural health issues and healthcare needs⁸³⁻⁸⁵.

There is some evidence that IPE provided in context in a clinical learning environment has more impact on learning outcomes than classroom-based IPE^{11,85}. The benefit of IPE situated within the clinical learning environment is

consistent with the need for students to have work-integrated learning experiences that immerse them in the actualities of everyday practice^{85,86}. In the workplace setting, students can engage professionally with clinicians, including those from other disciplines, begin to unravel the elements of being interprofessional and develop an understanding of IPC in context^{11,35,44,85}.

Although the level of IPE evidence available in the rural context precludes the development of a robust conceptual framework, there are signposts in the literature to guide those interested in providing IPE in rural settings. These include the need to assess the local rural IPE landscape – that is, the opportunities and resources potentially available, such as:

- identifying local interprofessional learning opportunities
- incorporating primary care into student placements
- identifying IPE leaders/champions to facilitate the planning, organisation and development of activities and programs
- exploring simulation resources suitable for IPE
- accessing discipline experts (eg visiting specialists)
- involving local communities
- providing opportunities for students to share meaningful IPE experiences with other disciplines.

This review contributes a more comprehensive understanding of the nature of and potential for IPE available to students in rural clinical learning environments; however, there are a number of limitations.

Limitations

Although all 27 of the studies reviewed reinforced the value of providing IPE in the rural setting, this review is limited by the lack of IPE research in this context, the heterogeneity of studies, limited use of validated tools and the dearth of longitudinal evidence. Such variation mitigates meta-analysis, limits understanding of the benefits of IPE in rural settings over time and, specifically, its relationship to IPC. The integrative review process allows for synthesis of all of the data from primary sources regardless of level of evidence; however, lower levels of evidence preclude the findings being generalised. While only one study was quasi-experimental and reported control groups⁵³, Stone argues that this type of research may not be optimal for evaluating IPE⁸⁷. According to Stone, the use of randomised controlled designs in this sphere 'where there are too many variables that cannot, and in most cases probably should not be controlled for'⁸⁷ (p.263) would limit the studies undertaken and the knowledge gained.

Although the literature search was extensive, some studies may have been missed by the search strategy because of the content of titles and abstracts, those published in languages other than English. Others may have been missed due to lack of information, or because of researcher bias. The reviewers are invested in the field and therefore may have unwittingly ascribed bias to the review process. To mitigate bias and promote rigour, advice was sought from a research librarian, and the authors individually searched for additional articles, independently reviewed the articles and collectively discussed the findings. Another limitation was that this review focused on IPE opportunities for students from different disciplines undertaking rural placements to interact, engage and learn with and from other students. As such, it does not address the opportunities the rural clinical learning environment affords for students to work individually within a small interdisciplinary team or the potential of other learning environments to provide IPE. Finally, although the scope of the review focused on profiling the IPE initiatives provided to students rather than exploring the challenges and barriers, some findings suggest these warrant further investigation.

Conclusion

This review reinforces the immaturity of the concept of IPE in the rural context. It addresses an important gap in the existing IPE literature and provides Australian and international evidence that a range of IPE initiatives are available to diverse student groups undertaking placements in rural practice settings. The findings demonstrate the potential that rural settings can offer for promoting IPE to students; the outcomes achievable such as interprofessional understanding, professional respect for other roles, collaboration and teamwork; and greater understanding of the collaborative and interprofessional nature of rural practice. Rural clinical learning environments afford a rich resource

whereby students and practitioners can create constructive and transformative IPE experiences. This review contributes new insights to inform the practice of IPE in rural areas and provides a compelling case supporting the development, trialling, evaluation and translation of IPE in the rural context. Furthermore, this review proposes a research agenda to help build and develop a conceptual framework that could support rural IPE. The agenda includes higher level research that examines the prerequisites for optimising IPE opportunities, the challenges to developing sustainable IPE programs, the potential for simulation-based IPE in rural settings and the impact of IPE on IPC and health outcomes over time.

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