



Interprofessional pain education: definitions, exemplars and future directions

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Summary points^{1–6}

1. The management of pain frequently requires healthcare professionals (HCPs) to work together; thus, educational preparation should afford them opportunities to learn about the management of pain together.
2. Survey data suggest that most HCPs' curricula do not provide opportunities for learners to come together to learn about pain and understand their professional roles.
3. Despite the growth of published evaluations of interprofessional education (IPE) and pain, the ability to draw firm conclusions has been hampered by the lack of methodological heterogeneity across studies.
4. New directions in IPE and pain include innovative pedagogical approaches, web-based learning, standardised patients and simulated learning.
5. Harnessing the political agenda can offer a valuable opportunity to raise the profile and prominence of pain education for HCPs.

Introduction

This paper explores what we currently know about interprofessional education (IPE) and pain education at the undergraduate (pre-licensure) level and after qualification, possible impacts of such approaches and possible future directions in this developing and expanding field. The focus is on published work in English rather than a discussion of individual programmes and organisations that support IPE and pain.

The notion of IPE has been defined by the Centre for the Advancement of Interprofessional Education (CAIPE) as 'when two or more professions learn with, from and about each other to improve collaboration and the quality of care'.¹ IPE aims to improve care by promoting teamwork and strengthening a shared understanding of roles between professional groups.² There has been a growing emphasis on the importance of health professionals learning together. In 2010 the World Health Organization published a landmark document, *The Framework for Action on Interprofessional Collaboration and Practice*, which highlighted the current status of interprofessional collaboration around the world and emphasised the need for leaders of

health and education to work together in preparing a 'collaborative practice-ready' health workforce. Pain education features as one of the global exemplars³ (p. 40) of the Canadian National Health Sciences Students' Association, which championed IPE.

What do we know about IPE and pain?

Evidence for IPE

The evaluation of IPE and pain education is a critical component for our understanding of the most effective educational approaches. The authors were able to

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locate just one systematic review aimed to assess the efficiency of IPE on the pain documentation of professionals and the effect of this on the pain intensity reported by patients.⁴ Just four studies were included, and although two studies demonstrated no significant changes in patient outcomes, the others revealed significant improvements. Owing to the heterogeneity of methods, integration of results was not feasible. Given the paucity of reviews related to IPE in pain education, we have drawn on systematic reviews in the area of IPE in general. There have been several reviews of IPE that draw variable conclusions and frequently cite a paucity of robust evaluations.⁵⁻⁷ Hammick et al.⁸ undertook a systematic review of what they viewed as the 'best evidence', which they achieved by restricting the discussion to 21 of the strongest evaluations of IPE published from the 399 evaluations that they reviewed. Their conclusion makes positive reading as learners participating in IPE generally responded well to the experience: they learnt knowledge and skills necessary for collaborative practice and there were positive changes in behaviour, service organisation and patient/client care. They identified several recommendations for future IPE evaluations including a need for more evaluations of IPE in real and simulated practice settings to elicit potential mechanisms that lead to positive behaviour changes. More recently, and in a less optimistic tone, Scott et al.,⁹ in an update of an earlier systematic review of IPE, concluded that owing to the small number (six were included in the review) and heterogeneity of the studies, as well as the methodological limitations, no firm conclusions could be drawn about the effectiveness of IPE. This is disappointing and the authors recommend the following to rectify the situation:

More rigorous IPE studies (i.e. those employing randomised controlled trial (RCTs), controlled before and after (CBA) or interrupted time series (ITS) designs with rigorous randomisation procedures, better allocation concealment, larger sample sizes, and more appropriate control groups) are needed to provide better evidence of the impact of IPE on professional practice and healthcare outcomes.

The task of providing studies that fulfil these attributes is challenging on a number of fronts. In particular, there are the methodological challenges of conducting such studies in the midst of busy curricula, competing timetables and a paucity of time; all known barriers in themselves to IPE. It is evident that opportunities for learners to engage in IPE remain limited, as indicated in the survey data from undergraduate (pre-licensure) programmes in the UK and Canada.^{10,11}

IPE and pain

Pre-licensure IPE can pose challenges for implementation and evaluation,^{8,12} which may explain the predominant focus in publications on post-licensure professionals.^{5,13} Moreover, students' negative perceptions about interprofessional interaction have been evident early in their programme despite IPE modules.¹⁴ Pain assessment and management provide an excellent model for interprofessional teaching and learning because of pain's prevalence across divergent groups and its potential complexity requiring interprofessional involvement. However, the question then becomes the degree to which pain content is a component of required curricula in health science faculties (HSFs). Two recent cross-sectional studies emphasise a lack of attention to this complex healthcare issue in health science curricula.^{10,11}

Mandatory pre-licensure pain content was surveyed in the HSFs of 10 major Canadian universities, including medicine ($n = 10$), nursing ($n = 10$), dentistry ($n = 8$), pharmacy ($n = 7$), physical therapy ($n = 8$) and occupational therapy ($n = 6$) (response rate 79%).¹¹ Veterinary medicine content was surveyed for comparison. Only 32.5% of respondents (HSFs) could identify specific hours allotted for pain course or clinical content, and of these only a few could identify designated hours for interprofessional learning. In contrast, veterinary students received on average three times more pain-related hours than HSF students and, specifically, five times more hours than the HSF medical students. A similar study in the UK surveyed 19 higher education institutions delivering 108 programmes across dentistry, medicine, midwifery, nursing, occupational therapy, pharmacy, physical therapy and veterinary science (response rate 69%).¹⁰ Designated pain content across programmes averaged 12 hours, although the wide variation may have skewed this result (2–158 hours). Veterinary science and physical therapy reported the highest number of hours. Similar to Canadian results, IPE was minimal (19%, $n=14$) and involved mainly sharing content with some profession(s) in large lectures. In both countries the content emphasis was considerably less for pain assessment, which is essential to management, compared with neurophysiology and management strategies such as pharmacology. Mezei and Murinson¹⁵ found significant gaps between recommended pain curricula and pain education content in American and Canadian medical schools. Medicine graduates form a large group of future practitioners, yet pain education for this medical student group was described as limited and fragmented.

Despite these initiatives there remains a disappointing presence of pain education in the scientific

programme content of international pain conferences. One of the authors (EC) reviewed the content of poster abstracts that had been accepted for the International Association for the Study of Pain (IASP's) World Congress, held in Montreal in 2010. The review focused on those abstracts reporting initiatives involving pain education aimed at healthcare professionals (HCPs). It revealed that of the 1951 posters submitted just 11 pertained to pain education. Interestingly, five of these involved initiatives with a range of HCPs and four of these took place in developing countries. The challenges of delivering pain education in developing countries, with limited educational resources, may necessitate HCPs learning together about pain management. Bond¹⁶ reports on a comprehensive range of pain education issues and how these have been addressed through the IASP. One significant achievement is the IASP's Developing Countries Working Group, which has been distributing funds since 2005 on behalf of the IASP. To date it has supported 57 one-year pain education projects across 32 countries. Applicants for grants are encouraged to consider projects that are multidisciplinary, although this is not essential. Although this does not ensure that interprofessional learning takes place, it encourages bringing clinicians together to learn about pain.

Although unrelieved pain continues to be a significant problem, undergraduate educational programmes tend to include little content related to pain. Standards for professional competence strongly influence curricula and have the potential to ensure that health science students have the knowledge and skill to manage pain in a way that also allows them to meet professional ethical standards.¹¹ Undergraduate pain competencies that ensure that students graduate with basic pain skills and knowledge are important and yet are minimal or not in place for these professions.¹¹ These required competencies could influence professional bodies and ultimately have the greatest impact on education and practice. Specific collaborative competencies suggested by Barr et al.⁵ are relevant to this context and include recognising and respecting the roles, responsibilities and competence of others in relation to one's own, and knowing when, where and how to involve these other professionals. Building these into undergraduate curricula as well as the early clinical experiences of recently qualified professionals is recommended to reinforce the importance of collaborative efforts to changing practices.¹⁷

Challenges of evaluating IPE

To demonstrate that IPE makes a difference to patient care is challenging. Although this is often seen as the ultimate goal, and ideally would be the ambition of

those delivering pain education in an interprofessional context, such evaluations are frequently beset with challenges. An evaluation of an interprofessional workshop for the management of persistent pain, with a particular focus on the concerns of providers about opioid abuse, utilised a comprehensive variety of measures.¹⁸ The evaluation included self-efficacy to manage patients with persistent pain, interprofessional communication, utilisation of local resources and prescribing of opioids (physicians and dentists only). Questionnaires and focus groups were used to collect evaluation data. Overall, participants rated highly the workshops and there were significant gains in self-efficacy. However, it was not possible to collect objective data identifying any changes in opioid prescribing as permission to evaluate changes in opioid prescribing was not given by the physicians. Such barriers negate valuable information that is essential to understanding the most effective methods of delivery of pain IPE and, in particular, the impact on behavioural change. There are important challenges in evaluation research for IPE and pain, which highlights the significance of providing good-quality research that demonstrates improved patient care.

At the level of curriculum design, iterative methodology requires an in-depth analysis of learning outcomes. However, there are significant challenges with the evaluation of IPE and this is definitely true at the undergraduate/pre-licensure level.^{12,19} The predominant model of programme evaluation in HCP education is based on outcomes such as the commonly used Kirkpatrick's evaluation model.^{20,21} In the University of Toronto Curriculum model,^{18,21-22} Kirkpatrick's four levels has provided the framework for the evaluation methods, which included the Daily Content and Process Questionnaire (*reaction*), Pain Knowledge and Beliefs Questionnaire (*learning*) and Comprehensive Management Plan Evaluation (*transfer*). It was not possible to evaluate the impact on clinical practice, which is the highest level of Kirkpatrick's model.

A literature review and analysis of survey instruments used to evaluate learner outcomes in continuing IPE was recently undertaken to establish a clear picture of the IPE evaluation instruments employed in the literature.²³ Using the Kirkpatrick/Barr hierarchy of learner outcomes²⁴ they were unable to find a single instrument to comprehensively assess all IPE learner outcomes. They found that few instruments directly measured higher levels of learning, such as changes in behaviour, effect on the organisation and impact on patient outcomes, but often relied on the learner's perspective of the impact. Rather than one comprehensive evaluation tool the authors recommended an evaluation questionnaire toolkit, comprising standardised questions that could be used across a variety of

contexts. Although the importance of measuring the impact of learning on patient outcome has been highlighted, several studies have challenged this notion.

Barr et al.'s⁵ systematic review of evidence for IPE suggests that one of the five key recommendations for interprofessional initiatives is to develop competency and capability-based models designed to change behaviour in addition to knowledge and attitudes. To address this in our pain curriculum,^{19,22} we developed a comprehensive management plan task and criteria for evaluation that provided interprofessional students with a mock clinical situation to apply their learning. Although, ideally, it is preferable to assess outcomes in a real clinical situation, this is difficult with the complexity of clinical environments and varying student curricula. Slack²⁵ has suggested that the evaluation of education programmes should focus on process rather than outcomes because patients' responses are dependent on multiple factors not always under the educator's control. Nevertheless, evaluating the retention of changes in students' knowledge and beliefs and their ability to work collaboratively in a clinical context is a goal that requires creative methods. Dubrowski and Morin²⁰ also suggest that insight into processes, as well as outcome data, is needed to provide more insight/understanding into processes by which a programme achieves, or fails to achieve, the desired outcomes. In summary, there is in this area a need for more research that utilises standardised instruments and which can be applied across different contexts.

New directions in IPE and pain

This section identifies several areas that highlight new directions or achievements that are considered important in the delivery of pain IPE. Starting with the classroom we briefly consider some innovative interactive methods of pain education delivery that capture IPE and pain and extend the classroom to include web-based options. We then move to consider global connections and how formal programmes are connecting institutes across the world, recognising regional and diverse needs. Finally, we look at the political arena and how we might become more astute by tapping into political opportunities that can enhance the message.

Innovations in educational delivery

Improved technology and increased access has encouraged the development of online learning and spurred the development of a range of pain education learning opportunities, with many of them web based. Understanding the successful components of online

pain programmes, especially those encouraging inter-professional collaboration, can enhance the quality of delivery for those planning pain education. Following a meta-analysis, it was concluded that there is a dearth of research that has identified the effective elements of web-based education.²⁶ In a detailed paper Waterston²⁷ describes the evaluation of a four-day blended learning (face-to-face and online) pain IPE programme, with 323 students completing an online evaluation and a further nine teams being followed up for more detailed review. The study aimed to identify factors that students found helpful – in their teams and when using the online interprofessional case study and discussion forums – in appreciating the contribution of other professions. Not all students evaluated the learning positively and the main findings suggest the following as important considerations: tuition support from the facilitator; preferences for online learning; appropriate group size (8-13); interesting and appropriate case studies in relation to their own professional background; the group task and technical aspects such as responsiveness of the computer; and technical ability to manage synchronous and asynchronous discussion. This study contributes an understanding of the factors that need to be considered when delivering online pain IPE.

Regardless of the delivery method, successful outcomes from an IPE experience require an interactive element that is authentic and customised.⁸ Various forms of simulation and web-based resources are being developed to enhance learning and encourage interactive reflection. Authentic patient content scripts can be constructed that are situated in an interprofessional complex care to highlight pain learning objectives.²⁸ Video vignettes can be created not only to carry the script narrative, but also to simulate real-world authenticity within the web-based environment. Related illustrative, visual commentaries and associated auditory explanations facilitate knowledge translation to practice, underlining best practices. Standardised patients and other simulation models have been used in our experience to achieve interprofessional students' rehearsal and integration of complex affective and cognitive skills required to address gaps in pain knowledge and beliefs.¹⁹ The deteriorating patient simulation model piloted successfully to improve health professionals' pain assessment skills²⁹ is now being trialled with undergraduate health science students.

An exemplar of innovations in the delivery of learning that moves beyond countries is the Pain Management Research Institute at the University of Sydney (Sydney, Australia), which provides online postgraduate pain education and has done so since 1999.³⁰ Recognising the global context of pain management, competition for students and the challenges

of institutional fee structures and the impact on viability, they have developed a range of strategic alliances with overseas institutions. In their paper they describe some of the processes of internationalising their Master's programme and the benefits, challenges and opportunities afforded by these alliances. They suggest that online and distance pain education provides the potential for meaningful interaction between HCPs at an international level. As such, they put the delivery of international interprofessional pain education on the map.

Political considerations

There are opportunities to raise the profile for pain IPE by harnessing the political agenda to give it greater prominence. It appears nonsensical that chronic pain accounts for one of the biggest health burdens, both personal and financial, yet it is rarely ranked alongside cardiovascular disease and diabetes. This mismatch is challenging, but there are opportunities to utilise political levers and raise the awareness of pain in the eyes of the public as well as the politicians. Health science students receive minimal pain education, yet these students become clinicians who teach the next generation. Increasingly, scientific journals are documenting the limited pain education as being a major challenge to change the pain relief statistics in the United States.³¹ The Institute of Medicine has recommended expanding and redesigning pain education in order to transform the current culture of inadequate management.³² Policy changes in education in both undergraduate pain curricula and postgraduate organisational educational initiatives and patient care monitoring would facilitate better pain management for patients.³³

Globally, the IASP has been instrumental in raising the awareness of 'freedom from pain as a human right', along with the World Health Organization and the United Nations.^{34,35} Initiatives such as these gain media attention and permit conversations between policy makers and professionals involved in pain. The importance of harnessing pain to the national agenda cannot be overemphasised. When the British Pain Society launched its UK survey of pain education in health professionals' curricula, the foreword was written by Sir Liam Donaldson (then Chief Medical Officer for England). In his Annual Report for 2009 he had focused on the inadequacies of chronic pain and one of the recommendations called for undergraduate HCPs to learn together about chronic pain.³⁶ This provided an ideal opportunity to raise the profile of the inadequacies of education for health professionals through a government publication and medical leader.

Pain societies have previously included education in their mandates, but how that was translated within and

outside of scientific meetings was unclear. A recent phenomenon in several societies has been the establishment of a Special Interest Group with a focus on education, including at the international level. As well, a working group at the international level is working on an interprofessional pain curriculum to be used with uniprofessional curricula. The degree to which these are implemented needs to be monitored, and this will be the next challenge.

Summary and conclusion

This review has offered some insights to the challenges facing those endeavouring to deliver interprofessional pain education. It comes at a time when numerous studies have highlighted the inadequacies of HCPs' pain education, but there remains a lack of literature that has focused on taking pain education from a uniprofessional perspective to an interprofessional one. We have highlighted some of the pressing concerns around the provision of interprofessional pain education related to those teaching pain and the competencies required. Finally, we have considered new directions in interprofessional pain education, which included not only innovative educational models but how organisations are harnessing the shortfalls in HCPs' education to the political arena. It is evident from this paper that there remains a lack of published material that has considered the evaluation of IPE and pain, and this warrants further research in this area. It is anticipated that this paper has provided a contemporary understanding of the issues facing those delivering interprofessional pain education as well as kindling continued commitment and enthusiasm.

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Multiple choice**1. Which educational method offers the best opportunity for interprofessional education?**

- (a) A large lecture to medical and nursing students on pain mechanisms.
- (b) A small group discussion with social workers, nursing and physical therapists.
- (c) A seminar presentation to surgical and medical students on pharmacology.
- (d) A web-based module on physical therapy for persistent pain.

2. Which one of the following statements best reflects the challenges for interprofessional education evaluation?

- (a) Time and funding requirements.
- (b) Confounding variables in a clinical environment.

- (c) Deciding the most opportune time for data collection after educational intervention.
- (d) Recruiting sufficient participants and finding appropriate clinical sites.

3. What have students in an interprofessional online learning environment identified as most important to their learning?

- (a) Library support for resources.
- (b) Preferences for online learning.
- (c) Experience of the facilitator with an online learning environment.
- (d) Relationship with other members of the group.

Answers

1: (b); 2: (b); 3: (b).