

Article

A Blended Active Learning Pilot: A Way to Deliver Interprofessional Pain Management Education

Victoria Wood ^{1,*}, Lynda Eccott ² and Lesley Bainbridge ¹

¹ College of Health Disciplines, University of British Columbia, 400-2194 Health Sciences Mall, Vancouver BC, V6T 1Z3, Canada; E-mail: lesleyb@mail.ubc.ca

² Faculty of Pharmaceutical Sciences, University of British Columbia, 2405 Wesbrook Mall, Vancouver BC, V6T 1Z3, Canada; E-mail: lynda.eccott@ubc.ca

* Author to whom correspondence should be addressed; E-Mail: victoria.wood@ubc.ca; Tel.: +1-604-822-8693; Fax: +1-604-822-2495.

Received: 22 October 2013; in revised form: 16 November 2013 / Accepted: 21 November 2013 / Published: 27 November 2013

Abstract: This article presents an innovative approach to interprofessional education that places learning in the context of a specific clinical area that is relevant to pharmacy students as well as students from a number of other health professions; in this case pain management. Interprofessional pain education that teaches a team approach to pharmacy students is essential for improving pain management practices. The interprofessional education model presented, based on a pilot of a series of interprofessional pain management modules, is designed to be flexible, using a modular format that incorporates both online and face-to-face learning. The model was developed as a means of overcoming some of the challenges, such as scheduling, which make the integration of interprofessional education into curricula difficult. This technology enabled education model has been piloted and implemented with groups of pharmacy students who were placed into teams with students from other disciplines such as medicine, nursing, and social work. This article presents the educational strategy and its development; describes the interprofessional pain management modules; discusses findings from three pilot evaluations of the modules; shares lessons learned; and highlights the strengths of the approach.

Keywords: blended learning; interprofessional education; flexible learning

1. Introduction

According to a growing body of literature, “human service professions are facing problems so complex that no single discipline can possibly respond to them effectively” ([1], p. 28). Complex conditions, such as chronic pain, require a comprehensive approach where professions, such as pharmacy, collaborate with other health professionals from different disciplines to provide seamless care. One in five Canadians report experiencing chronic non-cancer pain, making it critical that future healthcare practitioners receive pre-licensure pain education in order to ensure that they are competent in pain management when they enter the workplace [2]. Interprofessional education helps to ensure that future health professionals develop competencies, in the form of knowledge, skills, attitudes, and judgments that will enable them to work collaboratively to be able to provide the kind of comprehensive pain assessment and management that is required.

However, in the course of their education, many health professional students, including pharmacy students, receive few opportunities to learn with, from and about other disciplines [3]. While the importance of providing pharmacy students with the opportunity to engage in interprofessional learning is well recognized [4,5], pharmacy programs throughout Canada struggle to find common times with other programs to bring students together and to find room for interprofessional learning in curricula that are already full. Interprofessional education is frequently extracurricular, leaving the formal curricula to concentrate on discipline specific clinical knowledge and skills.

This article presents the development, pilot and evaluation of a series of interprofessional pain management modules that teach about pain using an interprofessional approach in order to ensure that learners: (a) share the same commitment to pain management; (b) understand the different pain management strategies and resources available; (c) collectively understand the biopsychosocial aspects of pain; (d) begin to work together to manage pain as well as the underlying disease or condition; and (e) learn to treat pain holistically. The modules incorporate a hybrid approach of online and face-to-face learning in a way that may help overcome some of the challenges of interprofessional education using pain management as a common anchor for interprofessional learning.

Continual demands on curricula that are already full make it difficult to implement entire courses dedicated to interprofessional learning. A modular approach was identified as a way of facilitating the structural integration of interprofessional pain management content into any number of curricula. Blended active learning, where technology facilitates interaction, was identified as a way of further reducing the scheduling and logistical problems that come with training vast numbers of learners from different professions in one place at one time [6]. Over the past twenty years, online learning has become increasingly dominant in pharmacy education [7]. Today, students are well versed in the use of online technology and have access to the resources necessary for supporting this type of learning.

2. Methodology

The modules were developed by university partners with experience in interprofessional education and community partners from pharmacy, counseling psychology, dentistry, medicine, nursing, occupational therapy, physical therapy, and social work working in the area of pain management.

These partnerships helped ensure that content was relevant to both pharmacy students and students from a range of other disciplines. The resulting *Interprofessional Pain Management Modules* consist of a preparatory module and two interactive content modules, each with online and face-to-face components. Three pilots of the modules were conducted in order to evaluate the effectiveness of this model for interprofessional education.

An initial draft of the preparatory module and module one was piloted (Pilot #1) with 37 students from pharmacy (7), nursing (8), physical therapy (4), occupational therapy (7), medicine (9), and social work (2) as an elective opportunity. At the end of the module participants completed a survey asking them to rate their satisfaction with the online delivery of the modules overall, their interprofessional learning, and their learning about pain management, using a 5-point Likert scale (strongly disagree; disagree; neutral; agree; strongly agree). Open-ended questions asked them what they liked most about the modules. A thematic analysis of the qualitative data indicated what about the modules could be improved. Using inductive content analysis, investigators read and analyzed the qualitative data and engaged in line-by-line coding, using students' words and phrases as units of analysis. The investigators met to compare and contrast codes, identify similarities and differences, and cluster the codes into themes.

Participants were also administered a standardized interprofessional learning scale, pre and post-participation, which was designed to measure changes in their attitudes about interprofessional collaboration [8]. However, as has been found with other short interprofessional education interventions, there were no significant differences [9]. Therefore, the focus of this, and the two subsequent pilot evaluations, was on participants' perceived effectiveness of the model as an interprofessional education intervention. Participants in pilots #2 and #3 were not asked to complete the learning scale, as this made the evaluation too onerous and did not yield meaningful results.

Analysis of the data from the first pilot revealed possible modifications that would improve the experience for students. Modifications made to the preparatory module, module one, and subsequently during the development of module two included:

- (1) Enhancing the visual appeal and interactivity of the online components;
- (2) Incorporating an introductory one-hour face-to-face session prior to the online component of modules one and two;
- (3) Engaging student groups in a team building activity that enabled them to explore the roles and responsibilities of each profession in the assessment and management of pain during the introductory face-to-face sessions; and
- (4) Providing students with an opportunity to set ground rules for engaging in the online component during the introductory face-to-face sessions.

2.1. The Modules

The final version of the modules consisted of the following:

Preparatory Module: Prior to engaging in the first module, learners had to complete a one-hour self-directed online preparatory module. This module provides learners from different disciplines, who may be at different stages in their learning, with a common foundation for learning related to pain.

Audiovisual content covers the history of pain; mechanisms of pain; what happens when pain is transmitted; types of pain; and how pain is experienced.

Module One—The Lived Experience of Pain. This module focuses on the psychosocial factors that contribute to the lived experience of pain. It highlights the importance and value of an interprofessional approach to pain care, while allowing learners to examine their own attitudes and beliefs about pain and pain management. The online component of Module One begins with an introduction during which students watch a short video of an individual who has experienced pain sharing their story. Five videos were created, each showing a different person sharing their unique experience. Students were placed in interprofessional teams each of which was assigned one of the stories to review. Over one week, teams worked through a series of reflective questions about the video using an asynchronous, online discussion forum. Through the discussion forum, student teams reflected on the impact pain had on the individual's life; how well the person's health care team collaborated; the importance of communication across professions and with the person living with pain; and how care could have been improved. The module culminated in a second face-to-face session that brought teams back together to compare and contrast the different cases presented in the online videos. Both face-to-face sessions, along with the online discussions, were facilitated by an instructor with experience delivering interprofessional learning. Because the online component was developed by experts in pain management, this expertise was not necessary for the module facilitator.

Module Two - The Assessment and Management of Pain: The second module in the series focuses on interdisciplinary perspectives of assessment and management of pain. In this module learners are exposed to the benefits, challenges and complexities of an interprofessional collaborative approach to pain management and have the opportunity to explore the different professions' approaches to assessing and working with patients to help them to manage their pain. The module incorporates a case presented by a standardized patient that reflects a variety of health contexts. The module began with an introductory face-to-face session during which students receive their team assignment; engaged in a team building exercise; and developed ground rules for their online collaboration. The online part of the module begins with a didactic component that highlights the importance of an interprofessional approach to pain management; provides an overview of assessment tools; and gives information about current management and treatment options. Student teams were each assigned a context of care to focus on during their discussion of the online case, which included a critical care hospital setting; the acute care hospital setting; a rehabilitation setting; and the community. Each team watched a different video of the same standardized patient, in which she shares information about her pain management needs in their assigned context of care. An asynchronous discussion forum allowed teams to discuss a series of reflective questions specific to their video. Once teams completed the online component of the module, they came together for a face-to-face session that gave them an opportunity to develop a collaborative interprofessional pain management plan for the standardized patient at that particular intersection of her care. They then had the opportunity to learn from teams that focused on different contexts of care and consider how they would ensure continuity of care across settings and time.

2.2. Pilots

A second pilot of the modified preparatory module and module one (Pilot #2) involved 29 students from pharmacy (7), nursing (4), physical therapy (5), occupational therapy (11), and dentistry (2). An initial pilot of module two (Pilot #3), which was developed based on the feedback received from the first module one pilot, engaged 21 students from pharmacy (5), nursing (1), occupational therapy (11), physical therapy (2), dentistry (1), and dietetics (1). The participants from these pilots were asked to complete the same online survey used in Pilot #1, with the exception of the learning scale.

3. Results

Data from all three pilots was compared.

3.1. Quantitative data

According to the evaluations of all three pilots, over 90% of students “agreed” this learning experience:

- Enhanced their understanding of pain management;
- Delineated important problems related to pain management;
- Presented diverse perspectives on the subject matter;
- Enhanced their understanding of interprofessional teamwork in the management of pain; and
- Covered content important to their future practice.

They agreed it was an overall meaningful experience and would recommend it to other learners. Over 96% of respondents in all three pilots agreed the learning experience was enhanced by its interprofessional approach and 100% agreed that the course fostered knowledge and understanding of other disciplinary perspectives related to the content.

However, according to MacNeill *et al.*, [10] to be effective, both interprofessional education and online learning require radical shifts in traditional views of content delivery, learner interactions, facilitation techniques, and technical knowledge and support. Therefore, the evaluation of the three pilots focused on the effectiveness of the delivery model and the way in which it utilized blended active learning. Table 1 outlines the percentage of learners that “agreed” or “strongly agreed” with five key statements related to the delivery method were compared across the three pilot cohorts. There was a significant change in participants’ perceptions about the effectiveness of the online group work across the three pilots. As modifications to the modules were made, participants’ perceptions about the online group work improved.

3.2. Qualitative Data

Data collected from the open-ended questions “What did you like most about this course?” and “What about this course could be improved?” provided further insight into the quantitative data.

A number of respondents in the first pilot indicated that they “really enjoyed interacting with students in other health care disciplines and the discussions that occurred” [Pilot #1 participant]. They felt “the topic is relevant to all disciplines across all settings” [Pilot #3 participant]. Students seemed to “really enjoy the interprofessional aspect and the in person discussions and informal

presentations” [Pilot #2 participant]. Many participants indicated that they “really gained perspective on the many different roles within an interprofessional group regarding the treatment of pain. The initial activities and discussion groups were very informative as well as the debriefing sessions” [Pilot #2 participant]. Students appreciated “meeting others from diverse healthcare backgrounds and sharing our roles when it comes to pain management” [Pilot #3 participant] during module two, which gave them the opportunity to develop a collaborative pain management plan.

Table 1. Perceptions about the delivery method across three cohorts.

Evaluation Criteria	% that agreed/strongly agreed			P-value
	Pilot #1 (Preparatory Module and Module One) N = 33	Pilot #2 (Modified Preparatory Module and Module One) N = 28	Pilot #3 (Module Two) N = 21	
The online preparatory module was useful preparation subsequent learning	78%	96%	65% (students did not have to complete this if they participated in module one)	0.388
It was important to have an introductory face-to-face session	No introductory session	78%	62%	0.209
The online delivery was effective	69%	85%	52%	0.291
The online group work worked well	15%	64%	60%	0.000
The course was organized in a logical fashion	72%	89%	90%	0.070

Another aspect of the modules that participants particularly liked was “listening to the personal story of chronic pain” [Pilot #1 participant]. They thought “the [patient] stories were emotional allowing you to actually feel their pain” [Pilot #1 participant]. Participants thought the videos made “the person come alive with their stories instead of being mere objects to be healed” [Pilot #2 participant]. During the pilot of module two, which incorporated a standardized patient, participants “thought that the online story was very useful for putting a face to the story at hand” [Pilot #3 participant]. Participants “liked the online discussions and how each group had responsibility for [the standardized patient's] healthcare during the different recovery phases (*i.e.*, CCU, acute, rehab, community). This helped to create a more realistic approach to providing client care. As well, it showed her progress through time and how different treatment approaches would be needed depending on her state of health” [Pilot #3 participant].

Many participants in the first pilot “did not find the online discussions very worthwhile or effective” [Pilot #1 participant]. Participants indicated that they would like “more face-to-face time!!!” [Pilot #1 participant]. Participants in the first pilot also indicated that they would have liked a better

“understanding of how to use the online system to interact with each other” [Pilot #1 participant]. This cohort did not participate in an introductory session prior to the online component. Subsequent cohorts had an introductory session during which they discussed how they would engage in the online component of the module. Several thought that “a face-to face session first to establish a connection between participants” [Pilot #1 participant] would be beneficial, which prompted this modification. The second pilot took place after the modifications were made to the preparatory module and module one. While there were fewer comments about the online component, several participants in the second pilot “didn’t think the online discussion was very effective” [Pilot #2 participant]. For some “the online discussion never happened in my group, and I’m not certain how you could improve that. Maybe give another week in between the face-to-face sessions?” [Pilot #2 participant]. Participants were keen to have more interaction.

Unfortunately, our server went down during Pilot #3, which hindered students’ ability to participate in the online component. The second face-to-face session was postponed to allow more online discussion once the servers were repaired. Students found “technical difficulties and the rescheduling of the second face-to-face session took away from the continuity of the course” [Pilot #3 participant]. Despite this, several participants indicated that they “liked the online education component teaching about pain management” [Pilot #3 participant]. Fortunately, students recognized that “it was unfortunate that there were technology glitches. If the tech glitches were fixed, it would have helped the course run much more smoothly [Pilot #3 participant].

4. Discussion

Evaluations from three different pilots, in between which modifications were made to the modules based on previous feedback, indicate that online interprofessional education needs to be of high quality; be integrated with face-to-face learning; use content as a vector; and focus on real situations.

4.1. Online Components must be of High Quality

Initial participant satisfaction data suggested changes for online components of the modules. Satisfaction increased after modifications were introduced in the second pilot. The amount of text was reduced and replaced with narration, and diagrams and animations were added to improve the online visual appeal and interactivity. Improvements in student perspectives of the online components of the modules between the two pilots demonstrated how important it is for the online components of online learning modules to be of a high quality, professional, visually appealing, engaging and interactive.

4.2. Need for Face-to-Face Interaction

While an online modular format has advantages, ensuring collaboration among learners across locations and time poses challenges. Quality online interaction takes time [11]. When time is limited, some face-to-face interaction can speed up relationship formation [12]. Face-to-face interaction has been found to be an essential component of quality interprofessional education [13,14]. During the second pilot, module one began with an hour and a half introductory face-to-face session. Here learners met the interprofessional team they were to collaborate with and engaged in a team building activity

which had them explore the roles of each profession in the assessment and management of pain. Student teams also had the opportunity to develop ground rules and a collaboration plan for the online component of the module, as a way of increasing their intrinsic motivation to be engaged online [14]. The importance of incorporating face-to-face components cannot be underestimated. An initial face-to-face meeting appears to be an effective way of building strong relationships to ensure team accountability, cohesion and effectiveness of team interactions [15].

4.3. The Importance of Content

Using pain as an anchor for interprofessional learning appeared to be an effective approach to interprofessional education. The evaluation results indicated that the modules have the potential to provide students with valuable knowledge about pain management using an interprofessional approach. All respondents agreed that the modules fostered knowledge and understanding of other disciplinary perspectives related to the content.

4.4. The Power of Real People Sharing Their real Stories

Quality interaction, especially online, is largely dependent on learners' motivation to contribute—learners are more likely to feel intrinsically motivated if there is a strong sense of meaning generated by the team's work and there is a sense that their work has an impact [13]. Clinical cases enable students to examine real-world situations and challenge them to apply new knowledge to formulate innovative solutions [14]. The videos of people living with pain allowed students to learn from their expertise and experiences of health, through which “students [can] become more sensitive to the needs of vulnerable populations, and their assumptions and attitudes [may] improve significantly with respect to chronic illness” ([15], p. 69). The use of patient stories enabled learners to see how pain affects a person's life; hear examples of how ineffective pain management practices can exacerbate the situation; and learn about how a collaborative approach to care can improve patient outcomes. The blended learning approach allowed us to incorporate the patient voice in a sustainable way.

Limitation of the study: This study constitutes a preliminary look at this model of interprofessional education and is limited by its small sample size. However, feedback from three different cohorts strengthens the findings. Further exploration of changes in attitudes that result from such an intervention is one area for future research worth exploring. As noted, it has not been possible to find significant differences in attitude change with such a sort intervention. The research team is in the process of conducting a longitudinal study that will look at changes in attitude after participation in a number of interprofessional education activities. A comparison of attitudes across disciplines could also be an area worth exploring further.

5. Conclusions

The pilot evaluations indicate that the modules have the potential to provide valuable learning about both interprofessional collaboration and pain management. Educating students from different professional programs together will help to ensure that they appreciate both the similar and unique approaches that other professions use to assess and involve patients in the management of their pain.

Offering this learning throughout the student's entry-level education will reinforce the importance of effective, collaborative pain management and give this vital aspect of patient care the profile it has lacked in traditional health professional curricula.

Currently these modules are offered as elective learning experiences but the hope is to make the modules a mandatory component of the health and human service programs' curricula. As post-secondary institutions across Canada struggle to find common times across programs to bring students together and to create room for interprofessional learning in curricula that are already full, this innovative hybrid, modular approach to interprofessional education that incorporates both online and face-to-face learning will facilitate its integration into existing curricula.

Acknowledgments

We would like to acknowledge the valuable contributions of our Pain Management Committee, in particular Janice Muir and Brenda Poulton.

Conflicts of Interest

The authors declare no conflict of interest. Funding for this project was received from the University of British Columbia Teaching and Learning Enhancement Fund.

References and Notes

1. McCallin, A. Interprofessional practice: Learning how to collaborate. *Contemp. Nurse* **2005**, *20*, 28–37.
2. Watt-Watson, J.; Peter, E.; Clark, A.J.; Dewar, A.; Hadjistavropoulos, T.; Morley-Forster, P.; O'Leary, C.; Raman-Wilms, L.; Unruh, A.; Webber, K.; *et al.* The ethics of Canadian entry-to-practice pain competencies: How are we doing? *Pain Res. Manag.* **2013**, *18*, 25–32.
3. Bainbridge, L.; Nasmith, L.; Orchard, C.; Wood, V. Competencies for Interprofessional Collaboration. *J. Phys. Ther. Educ.* **2010**, *24*, 6–11.
4. Watt-Watson, J.; Hunter, J.; Pennefather, P.; Librachd, L.; Raman-Wilms, L.; Schreiber, M.; Leila, L.; Jennifer, S.; Thuan, D.; Allan, G.; *et al.* An integrated undergraduate pain curriculum, based on IASP curricula, for six Health Science Faculties. *Pain* **2004**, *110*, 140–148.
5. Kavanagh, T.; Watt-Watson, J.; Stevens, B. An examination of the factors enabling the successful implementation of evidence-based acute pain practices into pediatric nursing. *Child Health Care* **2007**, *36*, 303–322.
6. D'Eon, M. A blueprint for interprofessional learning. *Med. Teach.* **2004**, *26*, 604–609.
7. Oandasan, I.; Reeves, S. Key elements for interprofessional education. Part 1: The learner, the educator and the learning context. *J. Interprof. Care* **2005**, *19*, 21–38.
8. Memorial University. Collaborating for Education and Practice: An Interprofessional Education Strategy for Newfoundland and Labrador Project Student Module Survey. Available online: <http://www.med.mun.ca/getdoc/5e45a5b4-a824-43d6-ba38-aa6edc83150e/HC-Final-Report-June-2008.aspx> (accessed on 25 November 2013).

9. Eccott, L.; Greig, A.; Hall, W.; Lee, M.; Newton, C.; Wood, V. Evaluating students' perceptions of an interprofessional problem-based pilot learning project. *J. Allied Health* **2012**, *41*, 185–189.
10. MacNeill, H.; Reeves, S.; Hanna, E.; Rankin, S. The Community of Inquiry Framework: A Pertinent Theory of Online Interprofessional Education? In *Interprofessional E-Learning and Collaborative Work: Practices and Technologies*. Bromage, A., Clouder, L., Thistlethwaite, J., Gordon, F., Eds.; Information Science Reference: Hershey, PA, USA, 2010.
11. Chidambaram, L. Relational development in computer-supported groups. *MIS Quart.* **1996**, *20*, 143–470.
12. Warkentin, M.E.; Sayeed, L.; Hightower, R. Virtual teams *versus* face-to-face teams: An exploratory study of a web-based conference system. *Decis. Sci.* **1997**, *28*, 975–996.
13. Kirkman, B.L.; Rosen, B.; Tesluk, P.E.; Gibson, C.B. The impact of team empowerment on virtual team performance: The moderating role of face-to-face interaction. *Acad. Manage. J.* **2004**, *47*, 175–192.
14. Parsell, G.; Bligh, J. Educational principles underpinning successful shared learning. *Med. Teach.* **1998**, *20*, 522–529.
15. Towle, A.; Bainbridge, L.; Godolphin, W.; Katz, A.; Kline, C.; Lown, B.; Madularu, I.; Solomon, P.; Thistlethwaite, J. Active patient involvement in the education of health professionals. *Med. Educ.* **2010**, *44*, 64–74.

© 2013 by the authors; licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution license (<http://creativecommons.org/licenses/by/3.0/>).