INSTRUCTIONAL DESIGN AND ASSESSMENT

A Palliative Cancer Care Flexible Education Program for Australian Community Pharmacists

Safeera Yasmeen Hussainy, PhD, BPharm,^a Jennifer L. Marriott, PhD, BPharm,^a
Jill Beattie, PhD, MNurs,^{a,b} Roger L. Nation, PhD, MSc,^a and Michael J. Dooley, BPharm^{a,c}

^aDepartment of Pharmacy Practice, Monash University, Melbourne, Australia

^bHuman Behaviour & Health Research Unit, Flinders University, Australia

^cAlfred Health, Pharmacy Department, Victoria, Australia

Submitted June 16, 2009; accepted July 26, 2009; published March 10, 2010.

Objective. To implement and evaluate a flexible palliative care education program for Australian community pharmacists.

Design. After identifying pharmacists' education needs, the program content and format were developed. This included identifying expert writers to create modules, assigning education and palliative care specialists to review content, and designing Web hosting of materials. The program was comprised of 11 modules and 79 activities.

Assessment. An average of 28 responses was posted for each of the 20 noticeboard activities. Of the 60 pharmacists who began the program, 15 contributed to the discussion group, with an average of 3 posts each. Participants' responses to an online questionnaire indicated the program addressed their education needs and improved their knowledge and confidence in providing palliative cancer care.

Conclusion. A program that pharmacists could access at a time and place convenient to them via the Internet was developed. Pharmacists indicated the program positively impacted their practice.

Keywords: professional development, evaluation, palliative care, pharmacists, continuing education, community pharmacy

INTRODUCTION

The International Pharmaceutical Federation (FIP) defines continuing professional development (CPD) as "the responsibility of individual pharmacists for systematic maintenance, development, and broadening of knowledge, skills, and attitudes, to ensure continuing competence as a professional, throughout their careers."¹ Included is the stated emphasis that CPD should be an ongoing cyclical process of self-appraisal. In Australia, pharmacists are required to undertake a minimum of 20 hours of CPD annually, based on self-identified needs. Pharmacists are not mandated to engage in specific areas of CPD; however, they are expected to perform a broad range of activities that are capped, as no single activity type is likely to meet all of a pharmacist's CPD needs. Nevertheless, CPD in Australia, regularly provided to pharmacists by professional organizations, often is focused on the management of chronic conditions such as asthma, diabetes, and cardiovascular diseases. In compar-

ison, although they interact on a regular basis with patients who receive palliative care, most pharmacists have received little education and CPD in this area and perceive that they have inadequate knowledge, confidence, and/or skills to contribute significantly to the palliative care of patients.^{2,3}

Primary care pharmacists in Australia require education in palliative care as they are among the most readily accessible health professionals to patients in the ambulatory setting.⁴ They interact with up to 80% of palliative care services users, who are patients, and their caregivers visiting pharmacies to obtain symptom control prescription medicines and nonprescription products. Primary care pharmacists also require CPD in palliative care to enable them to be part of the palliative care health team,⁵ and in turn support improved patient care and treatment.^{3,6} When pharmacists are appropriately trained and included as integrated members of the team, they can intervene effectively to improve pharmaceutical care for palliative care patients.⁷

Continuing professional development for pharmacists in palliative care should consider that practitioners are adult learners who are busy health professionals with many other commitments.⁸ While many primary care

Corresponding Author: Safeera Yasmeen Hussainy, PhD, BPharm(Hons), Monash University, Pharmacy Practice, Melbourne, Victoria, Australia. Tel: +61399039176. E-mail: safeera.hussainy@pharm.monash.edu.au

pharmacists prefer traditional education (eg, lectures, workshops) over alternative learning methods (eg, video-conferencing, experiential placements, flexible online programs),^{3,9} this concept is changing. Pharmacists are beginning to see the benefit of undertaking palliative care education through less traditional formats such as flexible online programs offering ease of access.¹⁰⁻¹³

Few online education programs in palliative care have been developed for health professionals,^{14,15} and none could be found for pharmacists. This is significant given that the need has been identified for pharmacist education in this area locally, providing the impetus for the study reported here. This paper details the design and development of a flexible online palliative cancer care education program for Australian primary care community pharmacists. The aim of the program was to address pharmacists' education needs in this area, thereby improving their knowledge and confidence. Because cancer is the most common reason for palliation in Australia,⁵ the program specifically dealt with palliative cancer care.

DESIGN

The study was approved by the Monash University Standing Committee on Ethics in Research Involving Humans, and the Mercy Health and Aged Care Research Ethics Committee. Figure 1 provides an overview of the components in stages 1 - 3 that were relevant to the design, development, and evaluation of the education program.

To assist in identifying the palliative cancer care education needs of the Australian community, its pharmacists, and the program curriculum, an Expert Reference Group (ERG) was formed. The ERG was comprised of health professionals with expertise in palliative cancer care, higher education, and community pharmacy practice. The group agreed that curriculum design would be developed using 3 consecutive research methods: literature review, mail survey, and focus groups (Figure 1, stage 1). The findings of the mail survey¹³ and focus groups¹⁶ have been previously reported, detailing the modules that were included in the education program (Table 1) and their content. These results along with adult learning literature were reviewed, and as a result, the adult learning principles listed below were embedded into the curriculum design.⁸ Adult learners, who use a variety of learning styles, must:

- consider it important to acquire new knowledge, skill, or attitude before undertaking learning;
- have a need to be self-directed in their learning;
- have more and varied experiences than young people;
- be ready to learn what will help them cope with real-life situations;

- have a problem-centered orientation to learning;
- be motivated by social relationships, external expectations, personal advancement, escape or stimulation, and cognitive interest.

An education framework was designed to underpin the curriculum. The framework was based on the 5 concepts described in Figure 1, stage 2, program design.

Program Development

To develop the palliative cancer care program, the ERG and focus group participants identified potential module writers, reviewers, editors, and Web site consultants through palliative care referrals. The education program content and format were then developed in the stages described below.

Module writing and review. Ten writers with palliative cancer care and education expertise wrote the program material (Table 1). To guide their writing, they were provided with module writers' guidelines developed in stage 1. ERG members reviewed all module drafts. Three separate reviewers (an oncologist, a palliative cancer care hospital pharmacist, and an anesthetist) also reviewed all program material for information accuracy; and a palliative care nurse consultant reviewed Module 8. The pharmacist editor provided valuable feedback about content relevance, appropriateness, and applicability to community pharmacy practice.

Program activities. Seventy-nine activities classified in 5 categories described in Figure 1, stage 2, program development, were included in the program. This included the case studies also detailed in Table 2.

Web site design, hosting, and review. A Web consultant designed a user-friendly Web site, including noticeboard and discussion group facilities, and transferred the program content to the Internet. The noticeboard enabled pharmacists to submit and self-review their answers to certain activities. After review, the Web site was endorsed for "live" operation at www.pallpharmacists.com.

CD-ROM production. A CD-ROM of the education program was produced and sent to participants, along with other program information, to enable them to work from a computer without connecting to the Internet. Interactive program elements requiring an Internet connection, such as the notice board and discussion group, were not included on the CD-ROM.

The program was delivered to survey pharmacists (group 1) who had identified their palliative cancer care educational needs in stage 1 and had expressed an interest in undertaking the program;¹⁶ and a group of pharmacists (group 2a) in the western suburbs of Melbourne, Victoria, identified by palliative care patients/caregivers recruited from a palliative care service located in the same area.¹⁷

Figure 1. Overview of stages in creating a continuing professional development program for pharmacists in palliative cancer care.

EVALUATION AND ASSESSMENT

After pharmacists completed the education program, program evaluation was conducted using an online questionnaire (available on request) that consisted of 25 questions on pharmacists' perceptions of the program. The questions required yes/no answers or responses on a Likert scale ranging from strongly disagree (0) to strongly agree (10). Participants were also asked how long it took to

complete the program and how it could be improved. Space was provided for additional written comments.

Pharmacists' responses to the questionnaire were analyzed using summary statistics produced by the statistical software package, R, version 0.1, (R: A Language and Environment for Statistical Computing, R Foundation for Statistical Computing, Vienna, Austria). Additional comments made by pharmacists were thematically analyzed

Table 1. Background of Writers Who Contributed to the Content of a Continuing Professional Development Course for Pharmacists in Palliative Cancer Care

No.	Module	Writers' Background
1	Getting the most from the program	Consultant nurse educator
2	Introduction: Principles of palliative cancer care	Palliative care community clinical nurse consultant
3	Management of cancer pain	Palliative care consultant physician
4	Management of non-pain symptoms and side effects of treatment	Palliative care hospital clinical nurse consultant
5	Complementary and alternative medicines used by patients with cancer	Complementary medicines industry consultant, naturopath, pharmacist
6	Methods of medication administration	(1) Palliative care community clinical nurse consultant (2) Consultant pharmacist
7	Access to palliative cancer care medicines	Hospital senior pharmacist
8	Psychosocial care	Psycho-oncologist consultant physician
9	Communication with patients, caregivers, and families	(1) Hospital palliative care nurse educator (2) Consultant nurse educator
10	Ethical issues	Palliative care consultant physician
11	Working in partnerships to enhance patient care	Consultant nurse educator

using NVivo, version 2.0 (QSR International, Melbourne, Australia).

Sixty pharmacists began the program. Participants who completed the program ($n = 34$) accessed the Web site from 3 to 53 times. Fifty-three percent logged on from 21 to 40 times. Thirty participants accessed the Web site 139 times on weekends, 50 accessed the Web site 607 times between 8:00 AM and 7:59 PM, and 30 accessed the Web site 254 times between 8:00 PM and 7:59 AM. Participants who infrequently accessed the program online studied most of the material from the CD-ROM instead.

Regarding the noticeboard activities, which participants responded and how often were not charted, as responses were not designed to be reviewed by anyone other than the participants. There were 22 and 39 responses to each of the 20 activities, with a mean number of 28.4 responses per activity.

Table 3 shows the 10 topics given to the discussion group at program commencement, 7 of which were based on discussion group activities. While participants created no new major topics, subtopics evolved from each established major topic, resulting in 26 discussion group topics/subtopics.

All participants who completed the program ($n = 34$) responded to the online program evaluation questionnaire. Nine participants who partially completed or withdrew from the program ($n = 9$) faxed responses, and these were consistent with the responses of participants who completed the program. Thirty-three of the 34 participants who completed the program rated their improvement in knowledge and contribution to the management of palliative care patients as 6 or higher, and 75% rated these aspects as 8 or higher. Fifty percent of participants

rated the program's impact on pharmacist-initiated changes as 5 to 6. The average level of agreement was 5.5. As to whether their understanding of the roles of community pharmacists and other people in the delivery of palliative cancer care services had increased, 75% of participants rated the effect of the program material as 7 or higher, with a mean rating of 8.

Responses indicated the Web site was easy to navigate, the instructions were adequate, and the links within the program assisted learning. The average response for the 3 positive statements was approximately 8, and 25% of participants rated these aspects 9 or higher. The links within the program did not appear to distract pharmacists' learning. Nineteen participants commented about the ease of navigating the Web site; however, others encountered difficulties, including inability to view the entire Web page on a computer screen without scrolling, difficulty navigating links on the Web site, and difficulty accessing the discussion groups.

While the majority of participants found that the resources discovered by accessing the links were helpful and interesting, and could be saved for personal or customer use, some participants reported that following the links was time consuming and repetitive, especially within the 20 hours allocated to complete the program. The average response to whether participants found the subject material generally new to them was approximately 6. Participants' average rating of the success of the program in encouraging critical review and analysis of clinical practice was 7.5, with 50% of participants responding 7.5 or higher.

The average rating for the usefulness of the activities, answers to activities, and practice points was 8. The use of

Table 2. Program Case Studies Included in a Continuing Professional Development Program for Pharmacists in Palliative Cancer Care

Case Study	Module No.
Registered nurse requesting a review of medicines	1
Home management and planning for emergency care	2
Managing and dying at home	2
Difficulty diagnosing type(s) of pain and stabilizing pain	3
Lung cancer, shame and stigma, and complementary and alternative medicines (CAM)	4
Pain, nausea, medicines, patient and family stress	4
Multiple symptom management	4
Medication safety and storage issues	6
Differentiating different types of pain	6 & 10
Psychosocial issues	8
Communication enabling the delivery of quality care	9
Applying communication strategies	9
Managing language difficulties	9
Speaking about what is important to the patient	9
Benevolence and collusion	9
Someone to talk to	9
Principles of professional pharmacy conduct and patient management	10
Cultural and religious beliefs at end-of-life	10

key messages to guide learning of topics was rated less than average. The middle 50% of responses ranged from 6 to 8 for the usefulness of the noticeboard. In contrast, the average response was less than 4 for the usefulness of the discussion group. The degree of agreement, however, was more widespread, indicating that some participants found the discussion group helpful. Reasons given for not accessing the discussion group included lack of time, unfamiliarity with the technology, difficulty accessing or using the discussion group, and having worked mainly from the CD-ROM. Seventy-five percent of participants rated all of the modules, except module 1 (mean 6.5), as 7 or higher. Module 3 (mean 8.9) and module 4 (mean 8.6) were the most useful, followed by module 9 (mean 8.3), module 6 (mean 8.2), and module 8 (mean 8.1).

Participants felt they increased their consultation with patients (mean 7.1) and caregivers (mean 6.9) more than with any other group. The median values suggested that other pharmacists, general practitioners, nurses, and the patient's hospital were consulted to the same extent as before. Eight participants commented on their consultation

and collaboration with others. Most indicated that there was little opportunity to consult because of rare contact with patients and caregivers, and because pharmacists' potential was underrecognized by doctors and nurses.

Over half of the participants (53%) took 16 to 25 hours to complete the program, 38% took 26 to 40 hours, 6% completed it within 11 to 15 hours, and 3% took more than 41 hours. The average completion time was 21 to 25 hours. Nearly all participants who completed the program (97%) stated that they would recommend it to other community pharmacists, and only 1 participant was undecided (3%).

Pharmacists commented that the program was a valuable, useful resource, possibly ahead of its time. Examples of how it impacted their practice included use of program material to inform doctors prescribing narcotics, developing staff and client folders based on the resources within the program, and feeling more confident to proceed further with palliative care service provision.

The evaluation of this program demonstrated that the flexible online palliative cancer care education approach had a positive impact on the knowledge, confidence, and practice of Australian community pharmacists. This substantiated findings from previous palliative care programs for other health professionals.¹⁸⁻²⁹ With improved knowledge, pharmacists felt more confident in communicating with palliative care patients and caregivers and contributing to their medication management. Even though this finding is limited by the small number of participants who completed the program, it is positive, as many palliative care patients and caregivers have reported that difficulty in communicating with health professionals is a contributing factor to dissatisfaction with care.³⁰⁻³²

In contrast to their communications with patients and caregivers, pharmacists' interactions with their peers, doctors, and nurses remained about the same; however, 2 participants consulted dietitians. While the majority of participants felt that there had not been an increase in the frequency of pharmacist-initiated changes as a result of their participation in the program, the examples provided by some pharmacists about implementing their learning indicated otherwise. Where pharmacist-initiated changes did not occur, this was because there was little opportunity to consult with patients or caregivers, as indicated by pharmacists' additional comments in the program evaluation questionnaire. Lack of opportunity, however, may be a problem that is specific only to palliative care patients, as this group of consumers have conditions that are progressive, unpredictable, and often require unanticipated hospitalization.

Content of the program was shown to be satisfactory, as the majority of pharmacists reported that all of the modules were useful. They found the program relevant

Table 3. Discussion Group Topics/Subtopics - Total Number of Posts (n = 86) and Number of Times Viewed (n = 869)

Discussion Group Topics/Subtopics	Number of Posts		Number of Times Viewed ^a
	Submitted by Participants	Total	
General questions and answers			
Nausea and vomiting	0	1	12
Module 10.5 ^a	1	1	11
Medication deliveries	1	2	35
Saliva production and radiotherapy	1	2	23
Possible problems in service delivery	2	4	56
Palliative care nursing services	4	7	74
Chemotherapy's effect on the vagina	1	2	31
Breast cancer statistics	1	2	16
Recognizing depression	1	2	14
Duty of care			
Legal and administration requirements	2	4	59
Complementary and alternative medicines (CAMs) duty of care ^b	4	4	42
Medication reviews	1	1	16
Communication with non-English speaking patients			
Non-English speakers – a solution?	1	2	4
CAM			
CAM beliefs	5	8	66
Duty of care & CAM ^b	1	1	17
Cost issues for patients			
Cost of medication	4	9	54
Morphine 400mg ^c	1	2	13
Off-label use of medicines			
Off-label issues	3	5	47
Tramadol	1	2	8
Unknown ^d	1	1	13
Opioid supply requirements			
Activity 3H discussion group	7	10	67
Electronic learning material			
Using the discussion group for learning	1	3	21
Finding your way around	0	1	10
Noticeboard	3	7	91
Pharmacy palliative care services			
Palliative care services	3	4	46
Finding the time			
Going to be away for part of the time	0	1	23
Totals	50	86	869

^a By participants, the moderator, and program manager.

^b Subtopics had similar names but the issues discussed were different.

^c This subtopic was created by a participant who responded to Activity 10.B. Other participants' Activity 10.B. responses were made under "Cost of medication."

^d The participant who created this subtopic did not create a name for it.

to community pharmacy practice, valuable for deepening their understanding of palliative care issues, and useful for encouraging critical reflection and self-appraisal, allowing for revision of what they already knew. Participants also reported that they would recommend the program to other community pharmacists in Australia indicating that regular CPD program updates are useful, and pharmacists may benefit from them. Some partici-

pants, however, commented that certain topics and modules were covered too extensively. The advantage of flexible online programs, however, is that they allow participants to engage with the material in a depth and breadth that is suitable to their education needs, interest, and self-perceived level of knowledge, as was achieved by the study pharmacists and reflected by the varying time taken to complete the program.

Pharmacists' education needs also appeared to be met as a range of strategies (eg, videos, text, and asynchronous and synchronous communications) were incorporated in the program and appreciated by the pharmacists. Still, the design of the program may require some minor modification as indicated by program evaluation comments. For example, participants commented that following all of the links in the program was time consuming but did not distract from their learning. Links were included to enable pharmacists to refresh their knowledge and understand the information being acquired. An explanation prior to starting the program may have been valuable, stating that following all of the links (internal, between modules, and external, to outside resources) was not mandatory but based on the participant's educational interests. Instructions for returning to where they were before following the link may have been helpful as well, with a list of the external links provided as a separate section. One participating pharmacist thought the program could have included animation to make learning more interesting. Previous online programs have incorporated video vignettes of patients, caregivers, or health professionals who most often introduce a case study to participants.^{14,15} Vignettes were not incorporated into the education program developed in this study because several other learning strategies were included; vignettes would have required broadband Internet connection and the time and cost to develop them would have been significant. Vignettes should be included in future online programs to determine their value for pharmacists who learn through visual means.

Program cost and travel were not issues in this study. Participants were not required to pay for the program, and its flexible online format meant that participants did not have to travel to learn. While the program required a computer, participants could access the online program anywhere, which was appealing to pharmacists in rural and remote areas who often must travel long distances to attend CPD activities.³³ It is not known, however, whether pharmacists predominantly used the program at work or from home, as the Web site did not collect these data. The program's flexibility and ease of access was supported by the fact that participants accessed the Web site on all days of the week, both during the day and at night. Some of participants, however, used the CD-ROM version of the material rather than the online version for reasons undocumented. These pharmacists may have had limited Internet access or were more familiar and comfortable with this learning method as many Australian CPD seminars are recorded on CD-ROM and sent to pharmacists who are members of professional organizations. A limitation of learning from the CD-ROM only, however, was that phar-

macists could not access the noticeboard and discussion group facilities.

A noticeboard was included in the program because such facilities promote self-assessment and reflective learning.¹⁰⁻¹² The noticeboard appeared to be valuable as participants engaged often with its activities. Participants were resistant to using the facility as intended, however, despite instructions in the supporting material, because they became frustrated at being unable to view others' responses without submitting a post; thus, they used the noticeboard as a discussion tool to interact with others. Participants may have viewed noticeboard engagement as a competitive exercise, allowing the construction of responses that were acceptable rather than meaningful to their own learning.

In contrast to previous studies where noticeboards and discussion groups have been used equally, participants in this study used the discussion group less frequently.^{12,34} Just over half of the posts were entered by 25% of the 60 participants who commenced the program. Participants did not use the discussion group as often as expected, as only 26.9% of community pharmacists who responded to the mail survey in stage 1 indicated that they preferred this learning format.¹³ Nevertheless, a discussion group was included in the program as this mode of learning is an effective learning strategy once participants are comfortable with online consultation and communication.³⁵⁻³⁸ Even though efforts were made to improve study participants' ease in using the discussion group by providing instructions in the supporting material and on the Web site, engagement with the discussion group remained low. It is unknown whether pharmacists were resistant to use this learning format because its access required a different password, or for other reasons such as not fully understanding its purpose.

Aside from the few difficulties associated with accessing and using the noticeboard and discussion group, some participants became frustrated with the online format and wanted a hardcopy program manual, despite the provision of a print facility, CD-ROM, and online participation guideline. Pharmacists may have wanted a manual to refer to while performing other activities at work or home, or for future reference. This indicates that some pharmacists still prefer traditional formats, or, while willing to undertake flexible education, would like it to be supplemented with other delivery styles. Use of flexibly delivered programs may need to be supplemented by more traditional in-depth workshops to decrease barriers to pharmacist involvement and improve CPD activity uptake in Australia.³³ Participants similarly suggested that the discussion group

could be supported with once-weekly workshops to provide pharmacists with the opportunity to meet other palliative care professionals, discuss issues, and check the appropriateness of their recommendations. Only group 2 pharmacists from Melbourne, Victoria, however, would have been invited to attend these workshops. Locating palliative care health professionals in every other capital city of Australia would have been logistically difficult.

Introducing Web-based education programs takes time to adjust to when pharmacists are more familiar with hardcopy, off-line learning methods. Thus, pharmacists need time to familiarize themselves with online education and realize its benefits, which is possible only when more programs delivered in this way become available. Another study therefore needs to be conducted to determine the impact of CPD education in palliative cancer care on a larger, representative sample of Australian community pharmacists. The flexible online education program developed, in conjunction with supplementary learning methods to sustain the interest and motivation of some pharmacists, should be included in the additional study. Funding by the Australian government to remunerate pharmacists for their services and time could potentially improve acceptance of the education program. The program material may also be suitable for integration into national undergraduate pharmacy curricula.

SUMMARY

A problem- and evidence-based palliative cancer care program was designed and developed for Australian community pharmacists, who reported that the program addressed their education needs, improved their knowledge and confidence, and positively impacted their practice. Pharmacists were also satisfied with the program format; however, the need for such flexible online education programs to be supported with other delivery styles was recognized.

ACKNOWLEDGEMENT

This study was funded by the Australian Government Department of Health and Aging as part of the Third Community Pharmacy Agreement, and was undertaken for the first author's PhD program. The authors would like to thank their collaborators, Dr. Julia Fleming, Dr. Simon Wein, Dr. Maria Pisasale, and Mr. William Scott, as well as the module writers and reviewers, the Web site consultant, and the pharmacists, for undertaking the palliative cancer care education program. Also, thanks to Jenny McDowell from the Faculty of Pharmacy and Pharmaceutical Sciences, Monash University, for her assistance in preparing this manuscript.

REFERENCES

1. FIP Statement of Professional Standards Continuing Professional Development, International Pharmaceutical Federation, Vienna.
2. Furstenberg CT, Ahles TA, Whedon MB, et al. Knowledge and attitudes of health care providers toward cancer pain management: a comparison of physicians, nurses, and pharmacists in the State of New Hampshire. *J Pain Symptom Manage*. 1998;15(6):335-349.
3. McIntyre WJ, Hopkins DD, Wolfe JJ. Assessing pharmacists' knowledge of cancer pain. *J Pharm Care Pain Symptom Control*. 2000;8(2):75-83.
4. Benrimoj SI, Roberts AS. Providing patient care in community pharmacies in Australia. *Ann Pharmacother*. 2005;39(11):1911-1917.
5. Clinical Oncology Society Of Australia, The Cancer Council Australia, National Cancer Control Initiative. *Optimizing Cancer Care in Australia*. Melbourne: National Cancer Control Initiative, 2002.
6. WHO definition of palliative care, World Health Organization, Geneva. <http://www.who.int/cancer/palliative/definition/en/>. Accessed January 27, 2010.
7. Needham DS, Wong IC, Campion PD. Evaluation of the effectiveness of UK community pharmacists' interventions in community palliative care. *Palliat Med*. 2002;16(3):219-225.
8. Knowles M. *The Adult Learner: A Neglected Species*. 4th ed. Texas: Gulf Publishing Company; 1990.
9. Sellick SM, Charles K, Dagsvik J, Kelley ML. Palliative care providers' perspectives on service and education needs. *J Palliat Care*. 1996;12(2):34-38.
10. Carr-Chellman A, Duchastel P. The ideal online course. *Br J Educ Technol*. 2000;31(3):229-242.
11. Brush R. Effective web design and core communication issues: the mission components in Web-based distance education. *J Educ Multimedia Hypermedia*. 2001;10(4):357(11).
12. Barb S, Thomas M, Merrill H. Online learning: from information dissemination to fostering collaboration. *J Interact Learning Res*. 2001;12(1):105-143.
13. Hussainy S, Beattie J, Nation R, et al. Palliative care for patients with cancer: What are the educational needs of community pharmacists? *Support Care Cancer*. 2006;14:177-184.
14. Harris JM, Salasche SJ, Harris RB. Using the Internet to teach melanoma management guidelines to primary care physicians. *J Eval Clin Pract*. 1999;5(2):199-211.
15. Hulsman RL, Wynand JGR, Janssen M, Winn AMW. Interact-Cancer: the development and evaluation of a computer-assisted course on communication skills for medical specialists in oncology. *Patient Educ Couns*. 1997;30:129-141.
16. Hussainy S, Marriott J, Beattie J, et al. Using focus groups to develop the curriculum for a palliative cancer care online educational program for community pharmacists. *Pharm Educ*. 2009;9(2):73-79.
17. Hussainy S, Marriott J. Recruitment strategies for palliative cancer care patients. *IJPP*. 2009;17:369-371.
18. Finlay IG, Higginson IJ, Goodwin DM, Cook AM, Edwards AG, Hood K, et al. Palliative care in hospital, hospice, at home: results from a systematic review. *Ann Oncol*. 2002;13 Suppl 4:257-264.
19. Ferrell BR, Juarez G. Cancer pain education for patients and the public. *J Pain Symptom Manage*. 2002;23(4):329-336.
20. Thain C, Wyatt D. A review of a multiprofessional cancer course. *Eur J Cancer Care (Engl)*. 2002;11(2):82-90.
21. Fins JJ, Nilson EG. An approach to educating residents about palliative care and clinical ethics. *Acad Med*. 2000;75(6):662-665.
22. Ferris FD, Von Gunten CF, Emanuel LL. Ensuring competency in end-of-life care: controlling symptoms. *BioMed Central Palliat Care*. 2002;1(1):5.

23. Suh ES, Bartlett G, Inguanti M, Folstad J. Evaluation of a pharmacist pain management education program and associated medication use in a palliative care population. *Am J Health-Syst Pharm.* 2004;61(3):277-280.
24. Wee B, Hillier R, Coles C, Mountford B, Sheldon F, Turner P. Palliative care: a suitable setting for undergraduate interprofessional education. *Palliat Med.* 2001;15(6):487-492.
25. Plymale MA, Sloan PA, Johnson M, LaFountain P, Snapp J, Sloan DA. Cancer pain education: the use of a structured clinical instruction module to enhance learning among medical students. *J Pain Symptom Manage.* 2000;20(1):4-11.
26. Sloan PA, LaFountain P, Plymale M, Johnson M, Montgomery C, Snapp J, et al. Implementing cancer pain education for medical students. *Cancer Pract.* 2001;9(5):225-229.
27. Boakes J, Gardner D, Yuen K, Doyle S. General practitioner training in palliative care: an experiential approach. *J Palliat Care.* 2000;16(2):11-19.
28. Regnard C. Using videoconferencing in palliative care. *Palliat Med.* 2000;14(6):519-528.
29. van Boxell P, Anderson K, Regnard C. The effectiveness of palliative care education delivered by videoconferencing compared with face-to-face delivery. *Palliat Med.* 2003;17(4):344-358.
30. Kirk P, Kirk I, Kristjanson L. What do patients receiving palliative care for cancer and their families want to be told? A Canadian and Australian qualitative study. *BMJ.* 2004;328(7452):1343-1350.
31. Lecouturier J, Jacoby A, Bradshaw C, Lovel T, Eccles M. Lay carers' satisfaction with community palliative care: results of a postal survey. South Tyneside MAAG Palliative Care Study Group. *Palliat Med.* 1999;13(4):275-283.
32. DiMatteo MR, Hays RD, Sherbourne CD. Adherence to cancer regimens: implications for treating the older patient. *Oncology.* 1992;6(2 Suppl):50-57.
33. Marriott J, Duncan G, McNamara K. Barriers to pharmacist participation in Continuing Education in Australia. *Pharm Educ.* 2007;7(1):11-17.
34. Poon W-C. A study of Web-Based Learning (WBL) environment in Malaysia. *Int J Educ Manage* 2004;18(6):374-385.
35. McLellan H. Online discussions. *Global E-Journal Open Flexible Distance Educ.* 2001;1(1):39-45.
36. Militiadou M. Computer-mediated communication in the online classroom. *Int J Educ Telecommun.* 2001;7(4):407-419.
37. Nicol D, Minty I, Sinclair C. The social dimensions of online learning. *Innovations Educ Teach Int.* 2003;40(3):270-280.
38. Quinn P. Towards maximizing learning through online environments. *Aust J Adult Learning.* 2000;40(1):34-48.