Improving medication management of palliative care patients:

Enhancing the role of community pharmacists

Volume 1: FINAL REPORT

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Background and rationale for the study

Community pharmacists have become increasingly involved in disease state management of conditions such as hypertension, diabetes and asthma(1-4). These chronic conditions involve the use of medicines and other therapeutic regimens with which community pharmacists are familiar and comfortable. Compared with palliative care, the medication management of these conditions are relatively straightforward. In contrast, medicines used in palliative care, are often prescribed ‘off-label’(5) for pain and symptom management, with more complex and rapidly changing medication regimens. For example, many opioids are prescribed for palliative care patients in doses and quantities that are beyond the range commonly seen in community pharmacy. Increasing the involvement of community pharmacists in the multidisciplinary management of palliative care patients is therefore more complex.

Palliative care is “an approach that improves the quality of life of patients and their families facing the problem associated with life-threatening illness, through the prevention and relief of suffering by means of early identification and impeccable assessment and treatment of pain and other problems, physical, psychosocial and spiritual”(6). Palliative care most commonly relates to patients who have cancer(7-9). While the acute treatment of their condition (e.g. chemotherapy) and initiation of their palliative regimen usually occurs in hospital, 70-80% of patients who receive palliative care are at home(7, 9), and most of these people receive ongoing medication from their community pharmacist. Thus, people requiring palliative care are already interacting with community pharmacists for the provision of prescribed medicines (e.g. opioid analgesics, anti-emetics) and over-the-counter products (e.g. laxatives, saliva substitutes). Pharmacists are frustrated at not being able to provide the highest level of care possible to people requiring palliation in the community(10). Previous research has shown that health care professionals who have inadequate training and knowledge in palliative care are less able to contribute to the effective management of patients in the community(11-14) and as a consequence, unnecessary patient suffering(15) may occur.

Partnerships among hospital-based palliative care specialists, general practitioners, community palliative care nurses and community pharmacists require development and integration(16). Absolutely fundamental to this development is an education program for community pharmacists to address their need for knowledge and skills - and increase their confidence in this area(17-19). The benefits of an educational program for general practitioners in cancer pain management have been demonstrated(20, 21). The benefits of similar educational programs for other health professionals in palliative care have also been demonstrated(21-27).

The impetus for this study arose from a concern that whilst community pharmacists have a strong grounding in basic pharmacology and therapeutics, they do not have the knowledge and skills to contribute confidently in the delivery of palliative care services to people living in the community. Therefore a need was identified for research into the development, implementation and evaluation of an online educational program for community pharmacists in palliative cancer care.
Aims and objectives

The aims of the project were to:

- Increase awareness among community pharmacists of the role of palliative cancer care as an integral part of the health care system and of the role of community pharmacists in delivery of medication management as part of palliative cancer care services.

- Improve access for people in metropolitan and rural communities to effective palliative cancer care services.

- Enhance the knowledge and skills of community pharmacists in medication management to allow them to work collaboratively with other members of the healthcare team, including palliative cancer care specialists and general practitioners.

- Provide the educational base for the development of palliative cancer care as a specialised professional service provided by community pharmacists who would work in collaboration with palliative cancer care specialists and general practitioners.

- Evaluate the impact of the educational program on the knowledge and skills of community pharmacists and on the management of a group of palliative cancer care patients receiving their pharmaceutical care through community pharmacy.

The specific objectives were to:

- Develop an online palliative cancer care educational program for community pharmacists.

- Determine if, as a result of improved knowledge:
  - Community pharmacists were better able to contribute to the management of palliative cancer care patients.
  - There was an increase in the frequency of pharmacists-initiated changes in drug therapy.
  - There was improved collaboration with other healthcare colleagues: including general practitioners and palliative cancer care specialists (doctors and nurses).
  - Patients and their carers had a better understanding of their medicines
  - There was a reduction in potential drug-related problems and improved compliance with medication regimens.

- Evaluate a web-based, flexible, palliative cancer care continuing education program, for wider use by community pharmacists throughout Australia.
Research approach

This was a three-stage iterative study where each stage built on and informed the next. Iterative research methodologies use a succession of questions-and-answer cycles to build a more comprehensive understanding of the case/situation under study\(^{(28)}\). Each stage contributed to building a more comprehensive understanding of the educational needs of community pharmacists in palliative cancer care and informed the development and evaluation of the online educational program. Figure 1 provides a schematic overview of the study design.

The three stages were:

Stage 1: Identification of the educational needs of community pharmacists in palliative cancer care

Stage 2: Development, review and delivery of the educational program

Stage 3: Implementation trial and evaluation of the educational program

A Project Reference Group (PRG) was formed, to provide expertise and guidance throughout all stages of the project. PRG members included the chief investigator and principal investigators who were representative of the organisations involved in the project, and included palliative care specialists from the Peter MacCallum Cancer Centre, Mercy Western Palliative Care (located in the western metropolitan Melbourne region), the Victorian College of Pharmacy (Monash University) and the Pharmacy Guild of Australia (Victorian Branch). The Project Staff worked closely with the PRG, meeting 6- to 8-weekly throughout the project.

Ethical approval for the project was granted by the Mercy Health and Aged Care Research Ethics Committee, and the Monash University Standing Committee on Ethics in Research involving Humans (SCERH).
Stage 1
Identification of the educational needs of community pharmacists in palliative cancer care

- Literature review
- Survey of Australian community pharmacists
- Nominal groups with key stakeholders

Stage 2
Development, review and delivery of the educational program

- Module Writer Guidelines
- Moderator Guidelines
- Pharmacists’ program information

Pharmacists and Palliative Cancer Care
online educational program and CD-ROM

Stage 3
Implementation trial

- Pharmacists’ knowledge questionnaires
- Documentation of patient interventions by pharmacists
- Post-program evaluation questionnaires
- Patient/Carer questionnaire

Figure 1: Overview of the research study
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Stage 1: Identification of the educational needs of community pharmacists in palliative cancer care

Methods

Three methods: literature review, survey using a structured questionnaire and nominal groups, captured the educational needs of community pharmacists related to palliative cancer care.

Key Findings from Stage 1

- The findings from these three methods identified the modules and key messages to be included in the educational program. The 11 modules included in the final module structure (which included from three to seven key messages) were:
  - Getting the most from the program
  - Introduction and principles of palliative cancer care
  - Management of cancer pain
  - Management of non-pain symptoms and side effects of treatment
  - Complementary and alternative medicines used by patients with cancer
  - Methods of medication administration
  - Access to palliative cancer care medicines
  - Psycho-social care
  - Communication with patients, carers and families
  - Ethical issues
  - Working in partnerships to enhance patient care

Drug interactions were discussed in various modules where relevant.

These modules were provided to the program writers who were palliative care pharmacists, doctors and nurses, to assist them in focussing their material; however, they were also instructed to utilise their expertise to refine the wording/presentation of the key messages where they felt necessary.

- The findings also showed that community pharmacists and palliative care stakeholders supported the development of a readily accessible online educational program in palliative cancer care. In addition, as the participants contributed to the identification of important areas to include in the program, their comments revealed that their awareness of the role of community pharmacists in the provision of palliative care services was increased.

Stage 2: Development, review and delivery of the educational program

Method

In Stage 2 of the study, a rigorous approach was applied to the development, review and identification of the modes of delivery of the educational program. Drawing on the findings from Stage 1 of the study, the program writers, educational writer, editor and reviewers ensured that the conceptual framework was reflected in the program material, and that the content was relevant to community pharmacists who had little knowledge and experience in palliative cancer care provision. A 20-hour, flexible, practice- and evidence-based education program that could be accessed online or from a CD-ROM, and which provided a print facility, was developed for busy practising community pharmacists. A
variety of learning activities provided various mechanisms for engaging with the material, including self-assessment, interaction with other participants through the Notice Board, and with palliative care specialists through the Discussion Group, as well as links to other relevant web sites.

Sixty pharmacists commenced the educational program:

- 50 pharmacists throughout Australia – referred to as the Educational Group (see below; Stage 3: Participants)
- 10 pharmacists who participated in Stage 3 of the study – referred to as the Evaluation Test Group (see below; Stage 3: Participants)

Thirty-four pharmacists completed the educational program:

- 30 Educational Group pharmacists
- 4 Evaluation Test Group pharmacists

Key Findings from Stage 2

Data accessed from the web site revealed that:

- The web-based mode of delivery of the educational program was successful in providing a mechanism for pharmacists to work at a time most convenient for them; the web site was accessed on weekends as well as early in the morning and late at night.
- Those who infrequently accessed the program online, undertook most of it from the CD-ROM.
- There was a high level of engagement with the Notice Board learning activities.
- There was a low level of engagement with the Discussion Group activities. This may be attributed in part to a confusion arising in registering to participate in the Discussion Group, and also because some participants chose not to contribute to the discussion; the latter was evidenced by low participation rates, but high reading rates of the posts.

Stage 3: Implementation trial and evaluation of the educational program

Methods

Four methods were used to evaluate the impact of the educational program.

1. Pre- and post-test knowledge questionnaires

A controlled pre-test/post-test design\(^\text{29-34}\) was used to assist in determining the impact of the educational program on the knowledge of Educational Group pharmacists and on Evaluation Test Group pharmacists in comparison to the Evaluation Control Group pharmacists (see below; Stage 3: Participants). Three questionnaires, to be completed at different times: pre-program, as soon as possible post-program and 3-months post-program (Educational Group and Evaluation Test Group only), were designed to identify the impact of the educational program on the knowledge of the participating pharmacists. As recommended by Blane\(^\text{29}\) et al and Newton\(^\text{35}\), half of the questions in the post-knowledge questionnaire were different to those in the pre-knowledge questionnaire. While the questionnaires were not exactly the same, the questions were designed to test the same learning outcomes relevant to the program module they arose from.
2. Documentation and assessment of pharmacists interventions

Pharmacists from both the Evaluation Control and Test Groups were required to document interventions performed with their designated palliative care patient and/or carer, commencing one month prior to the Evaluation Test Group starting the educational program. They continued documentation of interventions until one month after the Test Group completed the program.

Of the 36 pharmacies that were approached to participate in this phase of the study, 17 agreed and were able to because their patient was alive. Fifteen of the 17 pharmacies commenced documenting interventions; the remaining two pharmacies could not because their patient had passed away. Therefore, the number of pharmacies was limited and a high pharmacy/pharmacist attrition rate was witnessed. A total of 17 interventions were received from 7 pharmacists, involving 7 patient/carers.

3. Post-program patient/carer questionnaire

The aim of the researcher-administered questionnaire was to assess patients’/carers’ medication knowledge, recall of medical information and interaction with both the Evaluation Test and Control Group pharmacists. Of the 42 patients and/or carers who had agreed to participate in the study, nine were available and were invited to undertake the questionnaire. The remaining 33 patients and/or carers couldn’t participate because the patient had passed away and/or the pharmacy they visited to obtain medicines had declined participation. Therefore, the number of patients/carers was limited and a high patient/carer attrition rate (79%) was witnessed.

Of the nine patients and/or carers who were invited to undertake the questionnaire, six consented to do so. Those who declined participation were too ill, were undergoing treatment, or no longer visited the same pharmacy as they did at the beginning of the study. Five of the six patients and/or carers completed the questionnaire, and four of these five patients and/or carers interacted with pharmacist(s) who were in the Evaluation Control Group. The remaining patient who didn’t complete the questionnaire died before it could be administered.

4. Post-program evaluation

The aim of conducting the post-program evaluation was to determine the Educational Group and Evaluation Test Group pharmacists’ satisfaction with the program. This also included those pharmacists who partly completed the program. In addition, pharmacists’ perceptions of how the program impacted on their knowledge, interaction with other stakeholders and practice, was sought. A Post-program Evaluation was conducted soon after completion of the program, and again at 3 months.

Participants

The implementation trial involved evaluation of the impact of the educational program and involved two main groups of pharmacists and a group of palliative cancer care patients.

- The Educational Group pharmacists – were from metropolitan and rural areas around Australia. These pharmacists participated in the educational program, and completed a pre-, post-, and 3-month post-knowledge questionnaire. In addition they completed a post-program evaluation questionnaire soon after finishing the educational program; there was also a 3-month post-program evaluation.
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• The Evaluation Group pharmacists – were from the western metropolitan area of Melbourne. These pharmacists were approached following recruitment of the palliative cancer care patients and/or their carers, who were volunteers from the Mercy Western Palliative Care Service in metropolitan Melbourne. The ethical requirements and the study design required that patients/carers be approached and consent to participate in the study before recruiting the pharmacy they visited to obtain medicines. Barriers such as gatekeeping by nurses, and attrition rates due to increased illness and death of the patient, impacted on the availability of palliative care patients/carers to participate in the study, and in turn, on the number of pharmacists available to participate in the study. Consequently, the number of pharmacists available to participate in the study was limited.

  o Evaluation Test Group pharmacists – participated in the educational program, completed a pre-, post-, and 3-month post-knowledge questionnaire. They completed a post-program evaluation questionnaire soon after finishing the educational program; there was also a 3-month post-program evaluation. In addition, they documented their clinical interventions with patients or carers who visited their pharmacy. These clinical interventions were later assessed by an Expert Review Panel.

  o Evaluation Control Group pharmacists - did not participate in the educational program, but did complete a pre- and post-knowledge questionnaire, and documented their interventions with patients or carers who visited their pharmacy. These interventions were later assessed by an Expert Review Panel.

The Evaluation Test Group and Evaluation Control Group were designed to provide statistical comparison between the two groups in evaluating the impact of the educational program on pharmacists’ practice in relation to the type and number of interventions made with palliative care patients and their carers. In order to do this, sample size and power calculations required 15 participants in each group (Refer to Proposal Application Number: 2003-005, p. 7). However, these sample sizes were not able to be achieved, and statistical comparisons could not be conducted. Descriptive analyses were performed instead.

Key findings from the knowledge questionnaires

While the findings from the knowledge questionnaires are limited by the small sample of Evaluation Test Group and the Evaluation Control Group pharmacists who did the post-test, it was found that:

• There was a statistically significant difference in pharmacists’ pre- and post-test mean scores, across the three groups: Educational Group, Evaluation Test Group and Evaluation Control Group. Specifically, the pre- and post-test knowledge of pharmacists from the Educational and Evaluation Test Groups was significantly different from that of the Evaluation Control Group. The 3-month post-test mean scores were not calculated due to the small sample of the Educational Group (n = 26) and Evaluation Test Group (n = 3) pharmacists who completed the 3-month post-test.

• The educational program appeared to have positively impacted on both pharmacists’ short- and long-term knowledge of palliative cancer care. This was demonstrated by the statistically significant increases in the mean post-test scores relative to the mean pre-test scores for the Educational and Evaluation Test Groups alone and combined, and by the statistically significant increase in the mean 3-month post-test score.
relative to the mean pre-test score for the combined Educational and Evaluation Test Groups.

Key findings from the documentation and assessment of pharmacists’ clinical interventions

Findings from the documentation and assessment of pharmacists’ interventions revealed that:

- On face value, various types of drug-therapy problems were detected and resolved by pharmacists, but when reviewed closely, the majority of problems (15 of 17 interventions) related to the patient having difficulties in obtaining, or inappropriately using, medicines required for symptom control. This is not unusual given that many palliative care patients and their carers have reported not feeling confident about how to use medicines\(^{36}\), and that problems in accessing medicines because of sparse availability and cost\(^{37}\) have been documented as major barriers to the provision of care by health professionals.

- All of the interventions made by pharmacists to resolve problems were accepted by the person (patient/carer/doctor) with whom the intervention was made. The 100% acceptance rate achieved in this study compared favourably with other studies that reported from 82.9% to 97.0%\(^{38,39}\)\(^{40-43}\) in a variety of settings.

- The majority of interventions were judged by the Expert Review Panel as having a high to extreme level of risk. Therefore, pharmacists’ interventions were deemed significant: if the pharmacist hadn’t intervened, negative outcomes related to symptom control, patient/carer welfare and/or cost may have resulted.

- The Panel felt however, that for the majority of interventions, even though pharmacists’ identified the drug-therapy problem, their actions to resolve it could have been better. Thus, the Panel was challenged to appropriately assign the significance of most interventions.

- There was no apparent difference between the significance of interventions made by the Evaluation Test Group compared to the Evaluation Control Group pharmacists. This may be because of the small and unequal sample of pharmacists with whom the implementation trial was carried out. Consequently, findings from the documentation and assessment of interventions data are inconclusive regarding whether or not the educational program impacted on the quality of the interventions carried out.

- There was a moderate degree of variability in the Expert Review Panel members’ assessments of the level of risk associated with all interventions. In addition, in some cases, there was not enough information about the intervention to appropriately assess its significance. Variability in assessment was expected, as risk is a subjective measure, and assessment is based on the individual’s knowledge and experience, and in some cases there was not enough information about the intervention to appropriately assess its significance.

- Although the educational program did not appear to impact on the significance of pharmacists’ interventions, the ability and confidence of pharmacists to detect and resolve drug-therapy problems may have increased as a result of their increased knowledge illustrated by more interventions being made by the Evaluation Test Group during the program. However, due to the small sample size in the implementation trial,

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statistical analyses could not be performed on the intervention data. Pharmacists in the Evaluation Test Group, however, reported feeling more capable and better equipped to deal with palliative care patients and carers in general.

Key findings from the Post-program patient/carer questionnaire

Whilst only a small number participated in completing the researcher-administered questionnaire, findings revealed that:

- Patients’/carers’ medication knowledge and recall of medical information was very good. This is in contrast to previous studies\(^{(36, 44, 45)}\) which have reported palliative care patients’ and/or carers’ knowledge of medicines, in particular analgesics, to be poor.

- Polypharmacy was evident in patients, with an average number of seven medicines being taken. Polypharmacy has been previously documented in palliative care patients\(^{(46)}\), and often results in non-adherence\(^{(47, 48)}\).

- Although patients/carers in four of the five questionnaires reported that their interaction with, and the value of information provided by the pharmacist was excellent, they were also not fully aware of the role of pharmacists in providing information and advice, especially related to drug interactions and side effects of medicines. This is of concern, given that symptom management advice is a major role for community pharmacists in palliative care\(^{(49-51)}\). Those patients/carers who did contact the pharmacist, however, found the usefulness of advice given to be variable.

- Patients/carers suggested that to improve their service delivery, pharmacists need to leave the dispensary and hand out medicines rather than delegating this task, volunteer information rather than waiting to be asked, and provide more written information, supplemented with verbal advice. The Evaluation Test and Control Group pharmacists, however, reported that there was little opportunity to intervene or contribute to care because patients/carers were infrequently visiting the pharmacy to collect medicines, were happy with their treatment and were not experiencing any problems that required intervention. This suggests that pharmacists may not accurately perceive the extent of patient concerns regarding treatment and professional interaction issues.
Key findings from the Post-program evaluation

Findings from the post-program evaluation revealed that:

- The pharmacists who participated in the educational program not only increased their knowledge in palliative cancer care, but they also believed they were able to apply this knowledge to their practice in metropolitan and rural pharmacies throughout Australia.

- Pharmacists' reported an increased awareness of their responsibility and capacity to provide palliative care. This awareness extended to the realisation that the provision of palliative care services requires increased consultation time, which raised a concern that provision of these services may impact on the financial viability of community pharmacies.

- Participants found all of the modules useful; the most useful being 'management of cancer pain', 'management of non-pain symptoms and side effects', communication with patients, carers and families', 'methods of medication administration', and 'psychosocial care'. Participants considered the program to be a useful/excellent resource, which, after 3 months following completion, was still being accessed for information relating to, for example dosage changes, adjuvant therapy and use of opioids. The program was also reported to be particularly valuable in increasing their confidence to deal with misconceptions surrounding palliative care medicines.

- Whilst some of the participants were aware of the material covered in the program, they found that it was valuable for deepening their understanding of palliative care issues, allowed for revision of what they already knew, and was a useful resource, that encouraged critical reflection of their practice.

- Whilst there was general agreement that the website design and links assisted learning, suggestions for minor changes to assist viewing of the website pages and easier access to the Discussion Group were made.

- Pharmacists reported that they had increased their consultation with patients and carers, but consulted with other pharmacists, doctors and nurses to the same extent as they had done before participating in the program. In addition, two pharmacists consulted with dieticians.

- Pharmacists reported that communication with patients/carers had also improved, and that there was increased confidence and interactions with others. There was a clear indication that pharmacists' felt that their participation in the program had "certainly/definitely" increased their confidence in:
  
  - Assisting in the management of symptoms such as pain, nausea, constipation and mucositis
  - Speaking to patients more often, and providing more advice and information.
  - Answering palliative cancer-care related questions
  - Dealing with, and advising palliative care patients/families
  - Dispensing higher doses of opioids
  - Dealing with the emotional issues and concerns surrounding palliative care
  - Talking and working with other health care professionals, in particular doctors who prescribe opioids
  - Referring patients to other health care professionals
  - Finding and gathering resources from the program material and making these available to staff and patients/carers
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- While the program was reported to be valuable, with recommendations for others to complete it, pharmacists’ did find it very time consuming, requiring disciplined allocation of time to complete. The time frame of three months to complete the program was necessary due to the strict timelines of the research project. A number of suggestions for improvement of the program were suggested, the main one being to increase the timeframe for completion of the program.

- Some pharmacists’ reported little opportunity to apply the information gained from the program into practice, mainly because they had little contact with palliative care patients or their carers.

- With improved knowledge, they were better able to answer palliative cancer care-related questions, assist in the management of symptoms such as pain, nausea, constipation and mucositis, and collaborate with doctors who prescribed opioids in particular. Further, they gathered resources from the program material and made these available to staff and patients/carers.

Conclusion

This research project achieved its prime objectives: the development, implementation and evaluation of a practice-based and flexible online educational program in palliative cancer care for community pharmacists. The program was highly valued by the participating community pharmacists because it not only increased their knowledge and interaction with palliative care patients/carers, but it also impacted on their practice in metropolitan and rural pharmacies throughout parts of Australia. The educational program was shown to be a useful continuing education tool, thus providing the educational base for the development of palliative cancer care as a specialised professional service provided by community pharmacists. The aim of increasing the awareness among community pharmacists of their role in the delivery of medication management as part of palliative cancer care services was also achieved. Pharmacists reported an increased awareness of their responsibility and capacity to help patients and their carers. This awareness however, extended to the realisation that the provision of palliative care services required time, for which appropriate remuneration was required to maintain a viable pharmacy practice. Thus, the educational aims of the project were met (Refer to Sections 1.2.1 to 1.2.5 and Section 1.3.1 and 1.3.3). However, the results revealed that the specific objective of improving collaboration with other healthcare colleagues did not occur in the majority of pharmacists, but remained similar to that experienced prior to completing the program (Refer to Sections 1.3.2.3).

Whilst there was an increase in the frequency of pharmacist-initiated changes to drug therapy observed in Stage 3 of the project, the findings were inconclusive regarding whether the patients/carers had a better understanding of their medicines, with a reduction in potential drug-related problems and improved compliance with medication regimens, as a result of the pharmacists’ participation in the project. This was mainly due to the small sample sizes of both patients/carer and pharmacists. Thus, not all of the specific objectives were fully realised (Refer to Sections 1.3.2.2, 1.3.2.4 and 1.3.2.5).

This project resulted in the identification of a number of impediments to community pharmacist involvement and integration of community pharmacy practice into palliative care service provision. These included:

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- A lack of education/knowledge of the majority of community pharmacists in palliative cancer care
- Lack of remuneration for service provision
- Infrequency of palliative care patients/carers visits to community pharmacies
- Workforce patterns of community pharmacists

These barriers are discussed below with a focus on potential strategies for the provision of pharmacy-related palliative cancer care services. Indeed, there is a growing need for pharmacists to be able to provide cognitive services to patients with complex acute or chronic care needs that are managed in the community.

The findings from the project suggest that a number of the participating pharmacists felt that the continuing professional education of community pharmacists in palliative cancer care, via the online educational program developed, would only be truly worthwhile and valuable if there was adequate funding by the Australian Government for pharmacists to be remunerated for their services and time.

Most of the pharmacists involved in the implementation trial reported that they had fewer opportunities to make a difference to the care of their designated patient or carer, because of the infrequent visiting of the patient/carer to the pharmacy for prescription medicines and over-the-counter products. Some of the Educational Group pharmacists also reported that infrequent visiting of patients/carers to the pharmacy was a barrier to applying their newly gained knowledge in practice.

The findings indicate that the current model for the delivery of palliative care services to the community, that relies on patients/carers visits to the pharmacy, is not working effectively in the provision of specialised pharmacy-related palliative care services to people in the community. Clearly, the current model does not adequately enable pharmacists to contribute to medication management of patients who are receiving complex care in the community and who cannot present to the community pharmacy.

Patients with chronic conditions require frequent care\(^{(52)}\) and require expertise from multiple disciplines (including hospital, community providers and GPs working in partnership) to ensure that their needs are considered comprehensively\(^{(53)}\). The team-based management of patients and the provision of care in residential aged care and community settings is becoming increasingly important as the incidence of chronic disease associated with population ageing rises\(^{(52, 53)}\). Pharmacists in the community need to be able to provide medication management services to these patients and in many instances this cannot occur in the community pharmacy setting as witnessed in this project.

Further impediments include the increasing complexity of care and workforce related pressures. The burden of disease management impacts on the available time, and therefore opportunity, to provide palliative care services. This conclusion is supported by the 2005 Productivity Commission Report\(^{(52)}\) on Australia’s health workforce, which recognises that there are considerable pressures on all health professions, including community pharmacists. There is a shortage of pharmacists, who account for 3% of health professionals, with a growth in the number of those wishing to work part-time and in the number of females, who typically work fewer hours than their male counterparts\(^{(52)}\). It is therefore possible that pharmacists working full-time are busy managing the pharmacy, with little incentive, motivation and time available to deal with complex care patients based at home, as highlighted in this project regarding palliative care patients.
Consequently, as a result of the findings of this project, a new model for the delivery of pharmacy palliative care services (and other complex care services) to the community requires formulation.

The fundamental components of a model for the provision of cognitive clinical pharmacy services to complex care patients managed in the community that require consideration include:

1. Ability for pharmacists to provide cognitive services in the same location as that of other health professionals (for example, a patient with a chronic disease that precludes the person going to a community pharmacy requiring that the service may need to be provided in the home or in a community practice site).

2. Ability to provide the cognitive services on more than one occasion to the same patient.

3. An accreditation program that facilitates the provision of clinical pharmacy services to complex care patients (this may require a targeted educational program such that developed for this project).

4. Provision of “case conferencing” services to community treatment centres (for example, pharmacist involvement at the palliative care service).

The provision of this model not possible under the funding arrangements of the Fourth Guild/Government agreement. Further research should be undertaken to demonstrate the evidence in support of the development of a funding model to enable the provision of these services.

In the interim, community pharmacists from both urban and rural areas in Australia who are enthusiastic and dedicated to contribute towards the delivery of palliative cancer care services are encouraged to:

1. Become accredited to conduct medication management reviews (MMRs).

2. Undertake the online educational program developed in this project, as feedback from the pharmacists who completed it indicated that it is a highly valuable and excellent resource.

3. Liaise with palliative care services or centres to provide complex care\(^{(53)}\) to patients and carers in the community, in conjunction with other health professionals as part of the multidisciplinary team.

**Recommendations**

The recommendations arising from this research are presented under four strategic areas:

1. Education
2. Pharmacy practice
3. Further research
4. Policy
1. Education

**Key finding**

The pharmacists who completed the online educational program found it to be valuable in
depthening their understanding of palliative care issues, and it was relevant to community
pharmacy practice. With improved knowledge, the pharmacists believed they were better
able to answer palliative cancer care-related questions, assist in the management of
symptoms such as pain, nausea, constipation and mucositis, and work in collaboration
with doctors, who prescribe opioids. In addition, those pharmacists who were involved in
identifying the education needs of community pharmacists, and those involved in the
assessment of pharmacists' interventions became increasingly aware of the important
role of community pharmacists in palliative cancer care. It is therefore recommended that:

**Recommendation 1a**

National implementation of the online educational program occurs as a
continuing professional development program for community pharmacists in
palliative cancer care.

**Key finding**

The patients/carers who participated in this study supported the role of the community
pharmacist in the palliative cancer care team. Whilst they interacted with community
pharmacists, they were not fully aware of their role in providing information and advice
regarding drug interactions and side effects. Therefore it is recommended that:

**Recommendation 1b**

An education strategy for consumers in the role of community pharmacists in
providing information and advice regarding medicines, adverse effects and drug
interactions related to palliative cancer care be developed and implemented.

**Key finding**

The doctors, nurses and hospital pharmacists who participated in this study supported the
role of the community pharmacist in the palliative cancer care team. Through their
participation in the research project, they reported an increased awareness of the
community pharmacists' role in palliative cancer care. Therefore it is recommended that:

**Recommendation 1c**

An education strategy for health care professionals working in palliative care
services and centres, on the role of community pharmacists as valuable
members of the health care team in the provision of palliative cancer care
services be developed and implemented.

**Recommendation 1d**

An educational and accreditation program be explored that enables the
provision of complex care pharmacy services to patients in the community that
targets specific complex therapeutics.
Key finding

Currently there is a project being undertaken\(^{(54)}\) to include general information on palliative care in all undergraduate curricula of medical, nursing and allied health programs in Australia. However, the online program developed in this research project is more specific to pharmacists and their practice, and would prepare pharmacy students and pre-registrants adequately. The pharmacists who completed the program developed in this project recommended that other pharmacists, including students of pharmacy, also complete the program. It is therefore recommended that:

**Recommendation 1e**

Support for the inclusion of the online educational program in undergraduate curricula for pharmacy students and pre-registrants be sought.

2. Pharmacy practice

Key finding

This project resulted in the identification of a number of impediments to community pharmacist involvement and integration of community pharmacy practice into palliative cancer care service provision. These included:

- A lack of education/knowledge of the majority of community pharmacists in palliative cancer care
- Lack of remuneration for service provision
- Infrequency of palliative care patients/carers visits to community pharmacies
- Workforce patterns of community pharmacists

It is therefore recommended that:

**Recommendation 2a**

A coherent and equitable model for delivery of pharmacy-related palliative care services to the community be implemented. This would involve training, including the on-line educational program, as an integral component of the preparation of community pharmacists for this role.

**Recommendation 2b**

A model of care be developed for the provision of cognitive clinical pharmacy services to complex care patients managed in the community who require more intensive pharmacy services than is able to be provided under the existing medication management review programs.

**Recommendation 2c**

A model of care be developed that provides cognitive pharmacy services in the same location as that of other health professionals and that facilitates the provision of these services on multiple occasions.
**Executive summary**

**Recommendation 2d**

A model of care be developed that facilitates the provision of “case conferencing” pharmacy services to community treatment centres

3. Further research

**Key finding**

The post-program patient/carer questionnaire used to assess the medication knowledge, recall of medical information, and interactions with pharmacists may be of use to assess the knowledge and views of patients with other chronic illnesses, with a view to assessing their educational needs and targeting education and health care services accordingly. It is therefore recommended that:

**Recommendation 3a**

Further validation be conducted of the post-program patient/carer questionnaire developed for this project to assess the medication knowledge, recall of medical information, and interactions with pharmacists/other health professionals of patients/careers with other chronic illnesses.

**Recommendation 3b**

Further research should be undertaken to demonstrate evidence in support of the models of care proposed in Recommendation 2 and exploration of the funding arrangements to remunerate pharmacists for these services.

4. Policy

**Key Finding**

The pharmacists found the educational program to be a relevant and valuable resource and felt that allocation of continuing education points would be an encouragement for more pharmacists wishing to complete the program. It is therefore recommended that:

**Recommendation 4a**

The Pharmacy Guild of Australia formally recognise the educational program as part of their Quality Care Pharmacy Program Continuous Quality Improvement (QCPP CQI) process, and allocate points for completion of the various modules in the program.
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LIST OF ABBREVIATIONS
AND DEFINITIONS
# List of abbreviations and definitions

## ABBREVIATIONS

<table>
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<tr>
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<th>Full Form</th>
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<tr>
<td>AIHW</td>
<td>Australian Institute of Health and Welfare</td>
</tr>
<tr>
<td>CMI</td>
<td>Consumer Medicines Information</td>
</tr>
<tr>
<td>CPE</td>
<td>Continuing Professional Education</td>
</tr>
<tr>
<td>MMR</td>
<td>Medication Management Review</td>
</tr>
<tr>
<td>MWPC</td>
<td>Mercy Western Palliative Care service</td>
</tr>
<tr>
<td>NGT</td>
<td>Nominal Group Technique</td>
</tr>
<tr>
<td>NVivo</td>
<td>QSR NUD*IST Vivo, Version 2.0</td>
</tr>
<tr>
<td>PRG</td>
<td>Project Reference Group</td>
</tr>
<tr>
<td>PSA</td>
<td>Pharmaceutical Society of Australia</td>
</tr>
<tr>
<td>RDNS</td>
<td>Royal District Nursing Service</td>
</tr>
<tr>
<td>SPSS</td>
<td>Statistical Package for the Social Sciences, Version 11.5 software</td>
</tr>
<tr>
<td>TGA</td>
<td>Therapeutic Goods Administration</td>
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## OPERATIONAL DEFINITIONS

<table>
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<td>D.O.C.U.M.E.N.T.</td>
<td>Is a classification system for drug-therapy problems, where each letter of the abbreviated word represents a drug-therapy problem category: Drug selection; Over or underdose prescribed; Compliance; Untreated indications; Monitoring required; Education or information; Non-clinical; Toxicity or adverse reaction (Peterson et al., 2003).</td>
</tr>
<tr>
<td>Educational Group pharmacists</td>
<td>Those Australian community pharmacists who undertook the online educational program, but who were not involved in the implementation trial.</td>
</tr>
<tr>
<td>Evaluation Control Group pharmacists</td>
<td>Those community pharmacists who were involved in the implementation trial, but who did not undertake the online educational program. (However, they were offered the opportunity to do the educational program once the implementation trial was completed.)</td>
</tr>
<tr>
<td>Evaluation Test Group pharmacists</td>
<td>Those community pharmacists who undertook the online educational program, and who were involved in the implementation trial.</td>
</tr>
<tr>
<td>Key informants</td>
<td>Well-situated people, or people with expertise, in the area under study(^{[55], p. 178}).</td>
</tr>
<tr>
<td>Polypharmacy</td>
<td>The taking of five or more medicines(^{[55]}) or twelve or more daily does of medicines(^{[57]}).</td>
</tr>
<tr>
<td>Project Reference Group</td>
<td>Provided expertise and guidance in all phases of the research project. Included the chief investigator and principle investigators, who were representative of the organisations involved in the project: palliative care specialists from the Peter MacCallum Cancer Centre, Mercy Western Palliative Care (located in the western metropolitan Melbourne region), the Victorian College of Pharmacy (Monash University) and the Pharmacy Guild of Australia.</td>
</tr>
<tr>
<td>Snowball, or chain sampling technique</td>
<td>An approach which uses key informants, to locate other people with experience or expertise in the area of under study with a view to recruitment(^{[55], p. 176}).</td>
</tr>
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INTRODUCTION
1 Introduction

1.1 Background

Community pharmacists have become increasingly involved in disease state management of conditions such as hypertension, diabetes and asthma. These chronic conditions involve the use of medicines and other therapeutic regimens with which community pharmacists are familiar and comfortable. Compared with palliative care, the medication management of these conditions are relatively straight forward. In contrast, medicines used in palliative care, are often prescribed ‘off-label’ for pain and symptom management, with more complex and rapidly changing medication regimens. For example, many opioids are prescribed for palliative care patients in doses and quantities that are beyond the range commonly seen in community pharmacy. Increasing the involvement of community pharmacists in the multidisciplinary management of palliative care patients is therefore more complex.

Palliative care is “an approach that improves the quality of life of patients and their families facing the problem associated with life-threatening illness, through the prevention and relief of suffering by means of early identification and impeccable assessment and treatment of pain and other problems, physical, psychosocial and spiritual”. Palliative care most commonly relates to patients who have cancer. While the acute treatment of their condition (e.g. chemotherapy) and initiation of their palliative regimen usually occurs in hospital, most of these people receive ongoing medication from their community pharmacist. Thus, people requiring palliative care are already interacting with community pharmacists for the provision of prescribed medicines (e.g. opioid analgesics, anti-emetics) and over-the-counter products (e.g. laxatives, saliva substitutes).

The impetus for this study arose from a concern that whilst community pharmacists have a strong grounding in basic pharmacology and therapeutics, they do not have the knowledge and skills to contribute confidently in the delivery of palliative care services to people living in the community. Consequently, the primary goal of this research was to develop, trial, and evaluate an online educational program for community pharmacists in palliative cancer care.

1.2 Aims of the research project

The aims of the project were to:

1.2.1 Increase awareness among community pharmacists of the role of palliative cancer care as an integral part of the health care system and of the role of community pharmacists in delivery of medication management as part of palliative cancer care services.

1.2.2 Improve access for people in metropolitan and rural communities to effective palliative cancer care services.

1.2.3 Enhance the knowledge and skills of community pharmacists in medication management to allow them to work collaboratively with other members of the...
healthcare team, including palliative cancer care specialists and general practitioners.

1.2.4 Provide the educational base for the development of palliative cancer care as a specialised professional service provided by community pharmacists who would work in collaboration with palliative cancer care specialists and general practitioners.

1.2.5 Evaluate the impact of the educational program on the knowledge and skills of community pharmacists and on the management of a group of palliative cancer care patients receiving their pharmaceutical care through community pharmacy.

1.3 Specific objectives

1.3.1 To develop an online palliative cancer care educational program for community pharmacists.

1.3.2 To determine if, as a result of improved knowledge:

1.3.2.1 Community pharmacists were better able to contribute to the management of palliative cancer care patients.

1.3.2.2 There was an increase in the frequency of pharmacists-initiated changes in drug therapy.

1.3.2.3 There was improved collaboration with other healthcare colleagues: including general practitioners and palliative cancer care specialists (doctors and nurses).

1.3.2.4 Patients and their carers had a better understanding of their medicines

1.3.2.5 There was a reduction in potential drug-related problems and improved compliance with medication regimens.

1.3.3 To evaluate a web-based, flexible, palliative cancer care continuing education program, for wider use for community pharmacists throughout Australia.

1.4 Significance of the research

Palliative care service provision in Australia occurs in three settings; in the community, in designated palliative care or hospice facilities, and within acute care hospitals\(^{(37)}\). Community settings include the patient’s home or a community living environment such as an aged or supported care facility. Some patients in the course of their illness may receive palliative care in all three settings, whilst others may be seen in only one or two environments, depending on their needs.

Approximately 70-80% of patients who receive palliative care, are at home\(^{(9)}\). Professionals who have inadequate training and knowledge in palliative care are less able to contribute to the effective management of patients in the community\(^{(11-14)}\). Community healthcare practitioners who are not specifically trained in palliative care lack the
knowledge of symptom management, which can become a significant contributor to unnecessary patient suffering\(^{(15)}\).

Most palliative care patients, or their carers, interact to various degrees with community pharmacists for the provision of prescription medicines and over-the-counter products. Community pharmacists are accessible primary health care providers and since they have a strong grounding in basic pharmacology and therapeutics, they have the potential to contribute to the care of people receiving palliative care in the community\(^{(58)}\). A study in the United Kingdom has shown that community pharmacists working as part of a multidisciplinary team can contribute to the effective management of palliative care patients living at home\(^{(59)}\).

A number of studies however, have found that most community pharmacists do not have the knowledge, skills and confidence to contribute optimally to the delivery of palliative care services to people living in the community\(^{(13, 60, 61)}\). Community pharmacists’ knowledge and attitudes towards cancer pain management were surveyed in the United States of America\(^{(13, 61)}\), as were their perspectives and concerns about dispensing opioids for the management of chronic pain\(^{(60)}\). Furstenberg et al (1998) reported that pharmacists were least knowledgeable about pain assessment when compared to physicians and nurses, and responded inappropriately to statements about doses, routes and schedules of opioid administration. Even though the majority of pharmacists saw patients with cancer pain either daily or weekly, they rated their training as fair or poor, and felt uncomfortable managing cancer pain\(^{(13)}\). Greenwald and Narcessian\(^{(60)}\) indicated that pharmacists were reluctant to stock opioids due to concerns about federal or state investigation, and they were apprehensive about dispensing large quantities of opioids to patients with cancer. McIntyre et al\(^{(61)}\), reported that pharmacists had more knowledge of “ancillary therapy” than of “cancer pain,” “addiction” and “opioid dosing”\(^{(61)}\).

Community pharmacists need to be more fully cognisant of over-the-counter medicines (e.g. laxatives, non-steroidal anti-inflammatories, saliva substitutes) that may be used by palliative care patients for symptom control. Pharmacists also require a comprehensive knowledge of the prescription medicines used in this group of patients, particularly as many are used ‘off-label’ from the licensing approval by the Therapeutics Goods Administration (TGA) in Australia, and outlined in Consumer Medicines Information (CMI) leaflets. It has been reported that 85% of palliative care patients receive at least one medicine prescribed ‘off-label’\(^{(5)}\).

Pharmacists are frustrated at not being able to provide the highest level of care possible to people requiring palliation in the community\(^{(10)}\). It is well recognised that the transition between hospital and the home is not always smooth and seamless. Many palliative care patients may suffer because of discontinuity of care in our healthcare system and a particular difficulty can arise when people from rural areas return to their homes after receiving treatment at a metropolitan hospital\(^{(16)}\).

Partnerships among hospital-based palliative care specialists, general practitioners, community palliative care nurses and community pharmacists require development and integration\(^{(16)}\). Absolutely fundamental to this development is an education program for community pharmacists to address their need for knowledge and skills - and increase their confidence in this area\(^{(17-19)}\). The benefits of an educational program for general practitioners in cancer pain management have been demonstrated\(^{(20, 21)}\). The benefits of similar educational programs for other health professionals in palliative care have also been demonstrated\(^{(21-27)}\). The online delivery of education in general, is relatively new, and is being increasingly appreciated by health professionals because it can be easily accessed at times most convenient for them\(^{(62-65)}\).
A significant part of the first stage of the research plan for this project was aimed at determining the educational needs of Australian community pharmacists in palliative cancer care. The second stage involved the design, development and delivery of a flexible, problem-based educational program for community pharmacists. These two stages were forerunners to the third stage which involved an implementation trial and evaluation of the impact of the online educational program.
STUDY DESIGN
2 Study design

This was a three-stage iterative study where each stage built on and informed the next. Iterative research methodologies use a succession of questions-and-answer cycles to build a more comprehensive understanding of the case/situation under study\textsuperscript{(26)}. Each stage contributed to building a more comprehensive understanding of the educational needs of community pharmacists in palliative cancer care. A number of methods (literature review, survey, nominal groups, and expert assessment of interventions) and multidisciplinary informants (pharmacists, patients/carers, doctors, and nurses) contributed throughout the project to inform the development and evaluation of the online educational program. Refer to Figure 2 for an overview of the research project.

The three stages were:

Stage 1: Identification of the educational needs of community pharmacists in palliative cancer care

Stage 2: Development, review and delivery of the educational program

Stage 3: Implementation trial and evaluation of the educational program

A Project Reference Group (PRG) was formed, to provide expertise and guidance throughout all stages of the project. PRG members included the chief investigator and principal investigators who were representative of the organisations involved in the project, and included palliative care specialists from the Peter MacCallum Cancer Centre, Mercy Western Palliative Care (located in the western metropolitan Melbourne region), the Victorian College of Pharmacy (Monash University) and the Pharmacy Guild of Australia. The Project Staff worked closely with the PRG, meeting 6 to 8-weekly throughout the project.

Ethical approval for the project was granted by the Mercy Health and Aged Care Research Ethics Committee, and the Monash University Standing Committee on Ethics in Research involving Humans (SCERH).

As issues arose during the study, methodological changes were made to the original proposal in consultation with the Pharmacy Guild of Australia, and were met with approval by the ethics committees. These changes are outlined in Appendix A and discussed in Sections 3.1 and 6.2.
Figure 2: Overview of the research study

*Note: The Educational Group and the Evaluation Test Group both completed the educational program, and completed pre- and post-knowledge questionnaires.
METHODS
3 Methods

3.1 Stage 1: Identification of educational needs of community pharmacists in palliative cancer care

Three methods were chosen to assist in the identification of the educational needs of Australian community pharmacists, and the design of the educational program curriculum and modes of delivery:

- Literature review
- A mail survey using a structured questionnaire
- Nominal groups using the nominal group technique\(^{(66)}\)

Methodological changes from the original proposal

Determination of Australian community pharmacists’ educational needs was originally planned to be undertaken through interviews and focus groups with key stakeholders. However, interviews were not conducted because it was concluded that a larger number of community pharmacists throughout metropolitan and rural Australia could be reached more quickly and cost effectively through the distribution of questionnaires. Consequently, the results from 108 community pharmacists throughout metropolitan and rural Australia provided data to assist in determining the educational needs of community pharmacists. The authors’ contend that this number of responses could not have been achieved by interview. It is acknowledged however, that as with all methods of data collection, there are limitations of conducting surveys; for example, questions cannot be asked to clarify any comments made by respondents.

Nominal groups\(^{(66)}\) were conducted with key stakeholders (doctors, nurses and pharmacists), from a variety of palliative care settings: specialists working in palliative care clinics and community services; community pharmacists; and, hospital pharmacists working in association with other palliative care specialists. Nominal groups rather than focus groups were chosen as the preferred method, because a consensus of opinion, without peer pressure, was required to inform the educational program. The nominal group technique\(^{(66)}\) provided a more unbiased method of reaching consensus than focus groups would have done (Refer Section 3.1.3).

On the advice of key informants (Mercy Western Palliative Care Service staff and review by the PRG), palliative care patients and their carers were not recruited to participate in Stage 1 of the project. Previous experience of those working in the community with people requiring palliative care revealed that many of the patients would have had very little interaction with pharmacists during the early stages of their illness. Therefore, an interview would most likely yield very little of the information that was required to inform the development of the educational program. Patients and their carers were however, involved in Stage 3: the implementation trial and evaluation of the program.
3.1.1 Literature review

3.1.1.1 Aim of the literature review

The aim of the literature review during this stage of the study, was to explore the medical and health education literature to identify areas previously found to be important for learning about palliative cancer care. These areas were then used to inform the development of the questionnaire used to elicit community pharmacists’ views of what was important to them to learn about, in relation to palliative cancer care (Refer to Section 3.1.2).

3.1.1.2 Literature search strategy

The literature search strategy was conducted in 3 phases. These phases are described below.

3.1.1.2.1 Phase 1

Following brainstorming sessions by Project Staff and the PRG (whose members included experts in palliative care and in education), four major topics related to palliative cancer care were identified as being crucial for community pharmacists to learn more about:

- introduction to palliative care
- symptom management
- complementary and alternative medicines and therapies
- drug delivery devices and approaches used in palliative care

Three major topics related to the education literature were also identified to inform the development and delivery of the educational program:

- educational needs of community pharmacists and other health professionals in palliative care
- principles of adult learning
- palliative care educational programs currently available for health professionals.

These seven topics informed the basis for the literature search strategy.

3.1.1.2.2 Phase 2

The researcher then conducted an open-ended search for information on each of the seven topics mentioned above, as well as for information on any other palliative care issues identified by the literature as being important for pharmacists to learn about, and on any other aspects of educational program development and delivery for adult learners.

The key words detailed in Appendix B were used to search various electronic databases (e.g. Cinahl via Ovid), electronic journal databases (e.g. Ingenta Journals) and web engines (e.g. Google), and were used either separately or in combination.
Inclusion criteria were original papers (research studies, reviews, and descriptive papers) published in 1980 and after, and in the English language. The search was restricted to papers published from 1980 onwards because very little was written about palliative care, a relatively new health care field, before this time.

3.1.1.2.3 Phase 3

The reference lists of the papers retrieved in phase 2 were then reviewed for further information on each of the seven topics. The same inclusion criteria described above in phase 2 was used.

An additional electronic search of palliative care journals (e.g. *Journal of Palliative Care, Palliative Medicine, Journal of Symptom and Pain Management*) was undertaken to elicit information (particularly related to symptom management and palliative care educational programs) that may have been missed during the initial search in phase 2. The same search strategy described above in phase 2 was used.

Manual searches of references related to palliative care (e.g. *Therapeutics in Terminal Cancer, The Oxford Textbook of Palliative Medicine, The Blue Book of Palliative Care*) and to adult learning (e.g. *The Adult Learner: A Neglected Species*) were also employed. Information retrieved from these references acted as an impetus for re-searching the search engines and databases named in Appendix B.

3.1.1.3 Analysis of the literature

Information gathered from all sources was assessed for relevance to:

- the seven topics identified in phase 1 of the search strategy
- other issues related to community pharmacists and palliative cancer care
- the development and delivery of educational programs in general

Following evaluation of the information, it was then compiled into a literature review. The information was coded and categorised according to each of the seven major topics, then themed into various sub-headings under each of these topics. The seven topics were renamed for the purposes of the literature review (Refer Appendix C), and were used to inform the development of the community pharmacists’ survey instrument (Section 3.1.2).
3.1.2 Survey of key stakeholders: Metropolitan and rural community Australian pharmacists

The aim of the survey of Australian community pharmacists was to identify what they perceived to be important to learn about in relation to palliative cancer care.

3.1.2.1 Questionnaire design and piloting

While other studies\(^{(13, 60, 61)}\) have reported actual and perceived educational needs of pharmacists in palliative cancer care, no survey instrument was found to be suitable for this study. Consequently, the questionnaire was developed from a comprehensive review and thematic analysis of the literature (Refer Section 3.1.1).

To assess the face validity of the questionnaire, that is, if it was relevant, reasonable, and unambiguous\(^{(67)}\) in it's ability to elicit what is important to include in an educational program about palliative cancer care, it was piloted in a number of stages.

i) Following extensive development, the content of the questionnaire was reviewed and refined by the PRG to reflect the content areas of current palliative cancer care practice. Particular attention was also taken to ensure the format and appearance of the questionnaire was user-friendly and easy to complete.

ii) The questionnaire was piloted with a convenience sample\(^{(55)}\) of three pharmacists from the participating university, and minor changes to wording were made.

iii) The revised questionnaire was piloted with another convenience sample of five pharmacists from the hospital and community setting; three from metropolitan Melbourne and two from rural Victoria. Minor changes were made to add clarity and decrease ambiguity of the questions.

The questionnaire used in this study (Appendix D) sought information pertaining to pharmacists':

- Demographics (gender, age, area of practice [urban/rural] and years of practice).
- Educational needs in palliative cancer care by rating the importance of learning more about 18 palliative cancer care topics and self-perceived level of knowledge of the same topics using the 5-point Likert scales developed.
- Preference for format(s) for an educational program.
- Willingness to participate in an online educational program.
- Perceptions regarding their practice of palliative cancer care.

Respondents were provided with the opportunity to make additional comments (Appendix D, Qu.8 and Qu.11) if they wished.
3.1.2.2 Survey sample and recruitment

To assist in determining the educational needs of community pharmacists, a random sample of community pharmacies throughout Australia was purchased from the Pharmacy Guild. Western metropolitan Melbourne was excluded from this sample because community pharmacists in this area were to be involved in Stage 3 of the study. The sample was prepared based on proportional representation of pharmacies from each State and Territory and from urban and rural communities\(^{(68)}\). Determination of the numbers of questionnaires to be sent to each State and Territory was based on the latest available pharmacy labour force figures by the Australian Institute of Health and Welfare\(^{(68)}\). Determination of urban and rural was based on the Australian Standard Geographical Classification (ASGC) method of classifying urban and rural, where major urban is defined as a population of more than 100,000; urban is a population of 1,000 to 99,000; and rural is a population of 999 or less\(^{(69)}\). For this survey sample, major urban and urban were collapsed into one category.

As the aim of this exploratory survey was to confirm, or refute, the findings from the literature (Section 4.1.1) on the educational needs of community pharmacists, 100 questionnaires were required. The survey was not intended to represent the pharmacy profession as a whole, but to represent pharmacists from different states and territories and urban and rural communities in Australia. Based on previous experience, questionnaire return rates have been found to be extremely variable. Therefore, allowing for a return rate of 10%, the aim was to distribute 1,000 questionnaires. In consideration of the educational objective of the project (Refer to Section 1.3), it was decided that it would be more appropriate to send more than one questionnaire to 500 pharmacies, rather than sending one questionnaire to 1,000 pharmacies. This is because the pharmacists in these pharmacies were also being offered the opportunity to participate in the educational program at a later date. Thus, if more than one pharmacist per pharmacy participated in the education program, they could support each other during the program. Consequently, a total of 1,050 questionnaires were sent to 500 pharmacies. Three questionnaires were included for those pharmacies owned by three or more pharmacists; this was not duplicated where these pharmacists owned more than one pharmacy.

In addition, it was predetermined that if the survey generated significant information that had not been identified from the literature, more questionnaires would be distributed, or reminders would be sent to those pharmacies who had not responded. However, this was not required.

Each pharmacy received a package containing:

- At least two questionnaires (Appendix D)
- A letter of invitation (Appendix E)
- Explanatory Statement (Appendix F)
- A separate slip for registering their interest to participate in the educational program at a later date (Appendix G)
- Reply paid envelopes

At the end of four weeks, 108 (10.3%) completed questionnaires were returned. Refer to Section 4.1.2 for the results of the survey.
3.1.2.3 Survey analysis

Quantitative data was analysed using Statistical Package for the Social Sciences (SPSS) version 11.5 software.

To determine the overall importance that pharmacists placed on each topic (Appendix D, Qu.5), and their overall level of knowledge of each topic (Appendix D, Qu.6), the mean rating of each topic was calculated.

The mean ratings for the importance of learning more about the topics and level of knowledge of the topics were then ranked in descending order (Table 9). The ranking for the importance of learning more about a topic was then compared to the ranking for the level of knowledge of a topic to determine any correlations that may exist between the two.

To investigate if there were significant (p ≤ 0.05) differences according to gender and area of practice (urban/rural) in pharmacists’ ratings of the importance to them of learning more about the topics and their level of knowledge of the topics, one-way between-groups and within-groups analysis of variance (ANOVA) were conducted. To investigate if there were any significant (p ≤ 0.05) differences in pharmacists’ ratings according to age and years of practice, the Bonferroni and Tamhane’s T2 post-hoc tests(70) and a bivariate correlation were conducted, respectively.

Additional comments that were made by the pharmacists (Appendix D, Qu.8 and Qu.11) were independently analysed by two researchers. Thematic analysis involved the researchers each reading through the comments, coding the responses, and categorising emerging themes and issues. They then compared analyses for similarities and differences. Similar themes emerged, resulting in seven categories being identified (Section 4.1.2.6 and Appendix H).

The results of the survey were reviewed by the researchers and the PRG, and the eight most important modules were identified (Table 1).

3.1.2.4 Use of survey results

A summary of the findings of the survey and the draft modules were provided to the nominal group participants prior to their participation in the group meeting (Table 1).
3.1.3 Nominal groups with key stakeholders

Following on from the survey of community pharmacists, the aim of conducting nominal groups with key stakeholders was to identify what they considered to be important for inclusion in a palliative cancer care educational program for community pharmacists.

3.1.3.1 Choice of method

The objective of conducting the nominal groups was to validate, add to, and refine the findings from the literature (Section 4.1.1) and the survey of Australian community pharmacists conducted earlier (Section 4.1.2).

The specific goal was to:

- Elicit new ideas for the content of the educational program (in addition to those given in the draft modules [Table 1]).

- Seek consensus, regarding the modules to be included, as well as the key messages to be covered in each of those modules, with a view to focusing the educational program writers on the content material to cover.

Drawing on Delbecq, Van de Ven, & Gustafson\(^{[71]}\), the nominal group technique was chosen as a method for conducting the group meetings because the process has been found to be a valid and reliable method for aggregating the judgements of individual members that reduces bias from peer pressure\(^{[72],[74]}\), and decreases errors in judgemental accuracy without resorting to a regression towards a majority position\(^{[71]}\). judgemental accuracy is the ability of a group to arrive at a decision which accurately reflects the group’s preferences\(^{[71]}\). The nominal group technique has been used widely to aid decision-making in various settings such as health\(^{[75],[76]}\), education\(^{[77],[78]}\), and industry\(^{[79]}\). Key elements in the process involve:

a) Having individual members of the group make independent judgements.

b) Expressing these individual judgements mathematically by rank-ordering items.

c) Using the mean value of independent judgements as the group’s decision, rather than using the mean based on sample size (thus weighting the independent votes of the individual members, each of whom bought different expertise to the group).

d) Feeding back the results of individual judgements, talking over these results, and revoting.

3.1.3.2 Participant selection and recruitment for the nominal groups

When considering participant selection for group processes, it is important to acknowledge that the composition of the group influences the social interaction and the extent that individual members conform to the pressure of other members\(^{[71]}\). The more homogenous the group in terms of social background, level of education, knowledge, and experience, the more confident individuals are likely to be in voicing their opinion\(^{[71],[74]}\). Heterogenous groups therefore, are often undesirable\(^{[80]}\). Consequently, the participants
of each nominal group were selected according to commonality rather than diversity\(^{81, 82}\). Diversity in stakeholder groups was still required, and this was achieved between groups.

A stratified purposeful sample\(^{55}\) of health care practitioners was sought with the aim of capturing the views of various stakeholder groups (doctors, nurses and pharmacists), from a variety of palliative care settings: specialists working in palliative care clinics and community services, community pharmacists; and, hospital pharmacists working in association with other palliative care specialists.

Using a snowball (chain) sampling technique, key informants (doctors, nurses, and pharmacists from the PRG, the Peter MacCallum Cancer Centre, the Pharmacy Guild of Australia (Victorian Branch), the Eastern Palliative Care Service and the Royal District Nursing Service (RDNS) servicing the Peninsula Hospice Service) identified a number of general practitioners, palliative care specialists, and community and hospital pharmacists with expertise and an interest in palliative care. This information was publically available through palliative care networks. Potential participants were invited by telephone, or email with telephone follow-up, and the project was explained. Those who registered an interest in participation were sent an **Explanatory Statement** and **Consent Form** (Appendix I and J respectively) and given the opportunity to ask further questions before giving their consent to participate.

### 3.1.3.3 Sample

Twenty-five health care practitioners participated in the nominal groups:

- a) General practitioners \((n = 2)\) and specialist palliative care physicians \((n = 4)\)
- b) Palliative care community nurses \((n = 12)\) servicing two different palliative care services \((n = 7\) and \(n = 5)\) in metropolitan Melbourne. Separate meetings were held for each group due to the workload commitments of, and geographical distance separating the nurses.
- c) Community pharmacists \((n = 4)\) and hospital palliative care pharmacists \((n = 3)\).

The characteristics of the stakeholders are given in Section 4.1.3.1, Tables 10 and 11.

### 3.1.3.4 Design and piloting of the nominal group process

#### 3.1.3.4.1 Development of the questions to be addressed by the nominal groups

A three-stage process drawing on the earlier findings of the project was used to refine the nominal group questions (Refer Appendix K). Participants were asked the following two questions:

i) Consider the draft of the educational program for community pharmacists that you have been given; what modules do you think need to be included in the program?

ii) What are the 3 key messages that need to be addressed in each of the modules?
3.1.3.4.2 Overview of the nominal group technique used in this project as a result of piloting the process

Four distinct phases were conducted (Refer 3.1.3.5.2 for details):

i) Nominal phase
ii) Structured discussion phase
iii) Independent voting phase
iv) Groups’ decision phase

The process was piloted with 5 postgraduate pharmacy students from the participating university. A modification was made to the process because of confusion among the participants with the scoring system; however, this was later reversed, and the scoring system validated by Delbecq, Van de Ven and Gustafson\(^{(45)}\) was re-instituted.

Two researchers conducted the nominal group meetings: one facilitated the process and the other acted as an observer/notetaker/audio-recorder.

3.1.3.5 Conducting the nominal group meetings

The nominal group process involves data collection and analytical processes that produce results during the actual meeting. The results of one phase are used in the next phase of the meeting. Therefore, the results of these discrete phases are reported as appendices throughout the explanation below.

3.1.3.5.1 Participant preparation

Each participant received a package containing:

- Information about the study (Appendix L) including:
  - The aims of the educational program.
  - The results of the community pharmacists’ survey and discussions from the PRG.
  - A draft of the module structure for the educational program (Table 1).
- Ethical requirements: Explanatory Statement (Appendix I), Consent Form (Appendix J).

3.1.3.5.2 The nominal group process

The four nominal groups were held over a one and half week period, and took two hours each. The timing and venue of the meetings was selected in an effort to meet the demanding schedules of the participants, and remuneration for time and travel was provided.

Introduction and presentation of the question

After welcoming participants the facilitator explained the importance of the group task and of each members’ contribution, how the groups’ output would be used and the nominal group process. Participants were also reminded to put forward their suggestions in
context of the total time (20 hours) allocated for pharmacists to complete the educational program. Written consent was obtained, and participants were asked to introduce themselves.

Participants were required to answer the two questions within the time allocated:

1. Consider the draft (Table 1) of the educational program for community pharmacists; what modules do you think need to be included in the program?; and

2. What are the three key messages that need to be addressed in each of the modules?

Table 1: Draft module structure for the educational program

<table>
<thead>
<tr>
<th>Module number</th>
<th>Module</th>
<th>Time allocation (hours)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Palliative cancer care</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>Management of cancer pain</td>
<td>4</td>
</tr>
<tr>
<td>3</td>
<td>Common symptoms presenting to community pharmacists</td>
<td>4</td>
</tr>
<tr>
<td>4</td>
<td>Complementary and alternative therapies used by patients with cancer</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td>Methods of drug administration and access to palliative care medicines</td>
<td>1</td>
</tr>
<tr>
<td>6</td>
<td>Psychosocial care and communication with patients and families</td>
<td>1</td>
</tr>
<tr>
<td>7</td>
<td>Working in partnership and conducting medication management reviews to enhance patient care</td>
<td>1</td>
</tr>
<tr>
<td>8</td>
<td>Using critical reflection to enhance patient care</td>
<td>1</td>
</tr>
</tbody>
</table>

For question 1): What modules do you think need to be included in the program? the four phases of the nominal group technique were conducted.

**Phase 1: The nominal phase**

During this phase “the collection of individuals is a group ‘in name only’, or ‘nominally’, since verbal exchange”, a usual characteristic of groups, does not occur until the next phase(71).

Participants were asked to spend 5 to 10 minutes to individually and silently generate any new module ideas. They then engaged in a ‘round-robin’ feedback session, stating each of their ideas in turn; these were recorded on a flip chart, and numbered, in no particular order, for all participants to see. Round-robin recording means going around the table and asking for one idea from one participant at a time and recording it on the flip chart before going onto the next person(71).

**Phase 2: The structured discussion phase**

This phase involved discussion and clarification of each of the new ideas presented by group members.

Each recorded new module was discussed to obtain clarification and evaluation. Where wording indicated the expression of the same idea, the participants agreed to collapse
these into one module heading. Discussions were audiotaped and later transcribed verbatim.

**Phase 3: The independent voting phase**

This phase involved individuals independently voting on each of the ideas; the independent judgements were then mathematically expressed and recorded, then used to guide further discussion.

From the numbered list of new modules generated, with the addition of the draft modules previously given (Table 1), individuals were asked to privately choose eight they considered the most important and write these on the piece of paper provided. Thus the ranking (prioritisation) process had begun.

Taking each of these eight modules in turn, the participants then silently ranked them from 1 (least important to learn about) to 8 (most important to learn about). Thus, the second ranking (prioritisation) process was carried out. Refer to Appendix M for an example of one of the pharmacist’s choice of the eight most important modules.

Repeating the round-robin process, each person’s individual judgements were recorded next to the number of the corresponding module on the flip chart. These were expressed mathematically by ordering items based on their aggregate score, to give participants a feel for the group priority. These results were then discussed by the group. Each group’s ranking of module priorities is shown throughout Appendix N.

For question 2): **What are the three key messages that need to be addressed in each of the modules?**

The same four-phased process was to be carried out to identify the key messages for the eight most important modules selected by the group in response to question 1). However, the process used for question 2) was refined. During phase 3, participants were originally required to rank the three most important key messages for the module in question; however, due to time constraints, this did not occur. Instead, the key messages were recorded under each of the modules, and participants discussed their ideas. They were also asked to state what they felt was the single most important message for the module: “If you had one key message that you wanted to get across, what would it be?”

**Phase 4: The groups’ decision phase**

This phase occurred after the nominal group meetings, and involved collating the results of each group into a collective group finding.

Following the meetings, the researchers collated the module results for each group and calculated the mean value of each module based on the number of judgements made. The key messages were recorded from the flip charts. Participants were then sent the results of their own group’s findings for review and validation (Appendix N). Minor comments and additions were made and five additional key messages were added.

Each group’s results were then collated to arrive at the overall module findings from conducting the nominal group process (Appendix O).
3.1.3.6 Further analysis and review of the nominal group data

Following validation by each of the nominal groups, thematic analysis of the key messages for each module was conducted independently by two of the researchers. This involved the researchers each reading the key messages to gain an overview, and coding, collating and collapsing the responses to avoid overlap of key messages. The researchers then compared analyses for similarities and differences. Similar key messages emerged under each of the modules, repetition of themes were eliminated and some re-wording for clarification occurred.

Review of the nominal group findings

The modules identified by the nominal group members, and their key messages, were sent to the PRG for peer review. With a view to increasing face validity and decreasing ambiguity, the PRG was asked to refine the ‘form’ (or wording) of the key messages. To guide this review, they were asked to consider the same question that was put to the nominal group members: “If you only had 10 minutes to get your message across to a community pharmacist about a module topic, what 5 key points/messages would you say?” A small number of minor changes were made.

During review the modules were ‘collapsed’, for example by including “nausea and vomiting” in the “management of non-pain symptoms” module and embedding “diet and nutrition” throughout the program where relevant (Refer to Appendix O). This was done with a view to adhering to the time allocated for pharmacists to complete the program and to the presentation of the program content according to a hierarchical structure, so that pharmacists could explore modules and their various topics in a non-linear fashion using the online links provided. Four additions were made as a result of the PRG refining the presentation of the key messages.

To complete the review process, the modules, together with their key messages were included in the Module Writers Guidelines (Appendix P). Each of the module writers, who were palliative care expert doctors, nurses, and pharmacists, were instructed to focus their content on addressing the key messages. In addition, they were invited to use their own expertise where appropriate, to refine the key messages. These early drafts were reviewed by the educational reviewer to ensure that they reflected the results of the earlier developmental stages of the educational program. In this way, the findings from the nominal groups, community pharmacists’ survey and literature review, were combined along with analysis by the researchers and review by the PRG, to develop the content for the educational program.
3.2 Stage 2: Development, review and delivery of the educational program

This stage of the research project focussed on embedding the information gained from Stage 1 (Section 3.1) into an educational framework, including format, structure and content.

3.2.1 Design of the educational program

Using the iterative research approach, the literature review, survey of a sample of Australian community pharmacists, and the results from the nominal groups, each provided information that built upon the preceding information, to inform the conceptual framework, content and format guidelines for the expert module writers and the educational writer.

3.2.1.1 The conceptual framework underpinning the educational program

Drawing on the educational literature and the results of Stage 1 of the project (Section 4.1), the conceptual framework underpinning the educational program included the following concepts:

- Practice-based
- Problem-based
- Holistic
- Evidence-based
- Goal, audience and time focussed

The writers were advised to embed these concepts into the educational material.

3.2.1.1 Practice-based

The practice-based considerations were that:

a) The content needed to focus on key messages for the types of problems, or symptoms with which palliative care patients and their carers may present at a community pharmacy.

b) Content was to be reduced to 5 to 10 need-to-know dot points or practice points. The writers were encouraged to ask themselves: “If you had 10 minutes to get the point across to the pharmacist – what would you say about that area and how would you write it?”

c) Text (reading information) was to be kept to a minimum.

d) Writers were encouraged to use case studies/examples, activities, quick-check self-assessment exercises, communication with others e.g. by encouraging posting to the Notice Board (Refer Section 3.2.3.5.3), or to the interactive Discussion Group (Refer Section 3.2.3.5.4), to assist effective and time efficient learning.
e) Whilst module design would vary, writers were provided with the following points to assist them in deciding what areas to include, or to what other modules they may make a link. Those points showing an * were required to be included in all modules, where applicable:

- Key messages*
- Pharmacological interventions
- Non-pharmacological interventions
- Prescribing points
- Practice points*
- Adherence issues
- Contraindications
- Drug interactions, including with food
- Adverse effects
- Financial considerations
- Ethical issues
- Psycho-social considerations
- Administration instructions
- Assessment points
- Patient counselling
- Continuity of care/working in partnership issues
- Screening considerations
- Nutritional aspects

f) Web links or further reading resources were to be used for the ‘nice to know’ content areas.

g) The program was not designed to teach pharmacists everything about palliative cancer care. Rather it was designed to cover information that may commonly present to the community pharmacist.

h) It was assumed that pharmacists had direct access to the Australia Medicines Handbook\(^{87}\), the Therapeutic Guidelines Palliative Care\(^{68}\) and the Therapeutic Guidelines Analgesic\(^{69}\). Therefore, rather than repeat this information within the program, utilisation and reference to these texts was advised.

i) Use of web site links were encouraged, for example Palliative Care Australia and the various Palliative Care Associations in each State and Territory. In addition, the writers were reminded that the Cancer Council sites also contained various research-based guidelines which may be of use as resources.

3.2.1.2 Problem-based

Problem-based learning considerations included:

a) Acknowledgement that patients presenting in health care situations, such as community pharmacies, rarely present with simple, easy to solve problems or issues. There is rarely one ‘right’ way of doing things.

b) The use of real-life case studies (with appropriate changes to ensure anonymity), supported by appropriate information, resources, activities and self-tests to enable participants to:
Methods

- Identify what they need to know
- Find the information out for themselves
- Realise that there are times when they need to share ideas and seek consultation or collaboration with others, e.g. via the Notice Board (Refer Section 3.2.3.5.3) or interactive Discussion Group (Refer Section 3.2.3.5.4).

3.2.1.1.3 Holistic

Holistic considerations included:

a) The use of information, case studies, activities and resources to encompass the whole person and the multitude of problems, symptoms and medicines that they may be prescribed, or taking.

b) Ensuring that family/carer issues were covered, where appropriate.

c) Making links to other modules, where appropriate.

3.2.1.1.4 Evidence-based

Evidence-based considerations included ensuring that:

a) Content within the modules was based on the best available evidence at the time of writing.

b) Where expert opinion was used, the basis for the opinion(s) was substantiated.

c) Where there were differences in the evidence and/or opinion in treatment/management options, advantages and disadvantages of the different treatment options, with rationales, was discussed.

d) The pharmacists were referred to appropriate resources to enable them to problem solve in the practice situation.

e) Resources, especially those used from the Web, had been evaluated by the writer as being evidence-based.

3.2.1.1.5 Goal, audience and time-focused

The writers needed to ensure that:

a) The contents of the modules met the aims of the program (that is, to increase the community pharmacist’s knowledge about palliative cancer care), and addressed the key messages. The goal was not to teach them everything about palliative cancer care.

b) Considerations were to be included for the two groups of community pharmacists that would be participating in this program:
Methods

- Those who completed surveys throughout urban and rural Australia
- Those in western metropolitan Melbourne, as part of the implementation trial

c) The content was covered in the appropriate breadth and depth for community pharmacists, some of whom would be business owners as well as practising pharmacists. Therefore information and resources to assist their decision making skills during a busy, long, working day was required.

d) The writers kept within the time allocated for their individual module(s). To guide the breadth and depth of their writing, each module was allocated an approximate time for completion, and key messages had been provided (Refer Appendix N).

3.2.1.2 Educational program writing guidelines

The module writers were provided with Module Writers Guidelines (Appendix P) to focus their writing. These guidelines included the following information:

- Aims of the program.
- Description of the program audience: busy practising community pharmacists, in both urban and rural Australia.
- Time frame for completion of the program: 20 hours, over 12 weeks, with each module allocated a specific timeframe.
- The conceptual framework underpinning the program.
- A list of all of the modules for the program.
- A draft overview of the key messages to guide the breadth and depth of the content of each of the modules.
- An example of the structure of the program, for example the inclusion of:
  - Text
  - Case studies (Some case studies were provided, and writers were encouraged to provide others based on their experience)
  - Learning activities, including critical reflective activities
  - Postings to the Notice Board
  - Interactive forum in the form of a moderated Discussion Group
  - Additional recommended resources
- The web-designer’s guidelines.
- Information on writing conventions (e.g. use of plain English), referencing conventions and writing for the Web.

The writers were also provided with a list of references and articles from the literature review conducted in Stage 1 of the project.
3.2.2 Development and review of the educational material

Once the program modules and key messages were identified (Refer Appendix N), the development of the content and format of the educational program was undertaken in seven stages:

i) Module content writing by expert palliative care writers (Section 3.2.2.1.1).

ii) Educational review for relevance, inclusion of appropriate learning strategies, and user-friendly format by the educational reviewer (Section 3.2.2.1.2).

iii) Editorial review for correctness of grammar, spelling, and consistency in format of the completed material by consultant editor (Section 3.2.2.1.3).

iv) Expert review by palliative care specialists, for completeness, correctness and accuracy of information, including providing any additional information related to drug interactions and side effects (Section 3.2.2.1.4).

v) Web development and hosting by the consultant web designer, ensuring that the developed materials were displayed on the web site (Section 3.2.2.1.5).

vi) Review of web site by the Project Staff and PRG (Section 3.2.2.1.6).

vii) Production of CD-ROM by the consultant web designer (Section 3.2.2.1.7).

3.2.2.1 Recruitment of educational program developers

Key informants from the PRG and the nominal group participants (Section 4.1.3.1) identified a number of potential expert palliative care module writers, reviewers, editors and web designers. This information was publically available through palliative care networks. Potential developers were invited by telephone, or email with telephone follow-up, and the project and development requirements were explained. Those who agreed to develop various aspects of the educational program were engaged and contracted to do so.

3.2.2.1.1 Writers

Nine writers with expertise in palliative cancer care were engaged to write the program material. The Project Manager also wrote two of the modules. Table 2 outlines the writers’ disciplinary backgrounds.
Table 2: Program writers: Disciplinary backgrounds

<table>
<thead>
<tr>
<th>Module</th>
<th>Content</th>
<th>Writer</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Getting the most from the program</td>
<td>Project Manager/consultant nurse educator</td>
</tr>
<tr>
<td>2</td>
<td>Introduction: Principles of palliative cancer care</td>
<td>Palliative care community clinical nurse consultant</td>
</tr>
<tr>
<td>3</td>
<td>Management of cancer pain</td>
<td>Palliative care consultant physician</td>
</tr>
<tr>
<td>4</td>
<td>Management of non-pain symptoms and side effects of treatment</td>
<td>Palliative care hospital clinical nurse consultant</td>
</tr>
<tr>
<td>5</td>
<td>Complementary and alternative medicines used by patients with cancer</td>
<td>Complementary medicines industry consultant, naturopath, pharmacist</td>
</tr>
<tr>
<td>6</td>
<td>Methods of medication administration*</td>
<td>1) Palliative care community clinical nurse consultant; 2) Consultant pharmacist</td>
</tr>
<tr>
<td>7</td>
<td>Access to palliative cancer care medicines</td>
<td>Hospital senior pharmacist</td>
</tr>
<tr>
<td>8</td>
<td>Psychosocial care</td>
<td>Psycho-oncologist consultant physician</td>
</tr>
<tr>
<td>9</td>
<td>Communication with patients, carers and families*</td>
<td>1) Hospital palliative care nurse educator; 2) Project manager/consultant nurse educator</td>
</tr>
<tr>
<td>10</td>
<td>Ethical issues</td>
<td>Palliative care consultant physician</td>
</tr>
<tr>
<td>11</td>
<td>Working in partnerships to enhance patient care</td>
<td>Project Manager/consultant nurse educator</td>
</tr>
</tbody>
</table>

*Two writers wrote these modules

3.2.2.1.2 Educational review

The Project Manager, who was also the educational reviewer, worked closely with the module writers and reviewed various drafts of the modules to ensure that refinements made to the key messages continued to reflect the findings from the nominal groups. In addition, early drafts were reviewed for relevance to community pharmacists, inclusion of appropriate learning strategies, and user-friendly format.

3.2.2.1.3 Editor

An editor was engaged to ensure grammatical correctness of the material, and to ensure continuity of language and format throughout the program. The editor was also a pharmacist, who provided valuable feedback about the relevance, appropriateness and applicability to community pharmacy practice, of the content material.

3.2.2.1.4 Reviewers

Various members of the PRG reviewed various modules as they were being written. Following completion of the writing and editing phase, two reviewers (an oncologist and palliative cancer care hospital pharmacist) were engaged to review the program material for accuracy of information. An anaesthetist who is a member of the Faculty of Pain Medicine was also engaged to ensure adverse effects of medicines and drug interactions were included throughout the program. A palliative care nurse consultant was engaged to review Module 8: Psycho-social care.
3.2.2.1.5 Web designer

A consultant was engaged to host the web site and develop the online educational program, including the provision of a Notice Board and Discussion Group facility.

3.2.2.1.6 Review of the web site

The PRG and the Project Staff reviewed the web site. Minor typographical changes were made; the web site was then endorsed for ‘live’ operation.

3.2.2.1.7 Production of the CD-ROM

Once the program material was endorsed, a CD-ROM was produced and sent to the participating pharmacists. Refer to the front page of this report for the CD-ROM.

In summary, a rigorous approach was applied to the development, review and identification of the modes of delivery of the educational program. Drawing on the findings from Stage 1, the program writers, editor and reviewers ensured that the conceptual framework was reflected in the program material, and that it was relevant to community pharmacists who had little knowledge and experience in palliative cancer care service provision. A flexible, problem- and evidence-based program was developed, that could be accessed online or from a CD-ROM. In addition, facilities were also provided which allowed for printing the material. A variety of learning activities provided various mechanisms for engaging with the material, including self-assessment, interaction with other participants through the Notice Board and Discussion Group, and links to other web sites.

3.2.3 Delivery of the educational program

3.2.3.1 Modes of delivery

The educational program was designed to be delivered online, with internet links to various other sites where applicable. In addition, a CD-ROM of the program was provided to enable pharmacists to work from a computer without always connecting to the internet, thus saving them connection costs. The program material could also be printed, thus enabling those who prefer to study/learn from hard copy, to do so. Table 3 outlines which areas of the program could be accessed from where, and this was given to participants.
Table 3: What could be accessed from the internet versus the CD-ROM

<table>
<thead>
<tr>
<th>What can you do?</th>
<th>From where?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Read the Program material</td>
<td>☑ ☑</td>
</tr>
<tr>
<td>Print sections</td>
<td>☑ ☑</td>
</tr>
<tr>
<td>View the activities</td>
<td>☑ ☑</td>
</tr>
<tr>
<td>Use the spaces provided with some activities, to write text</td>
<td>☑ ☑</td>
</tr>
<tr>
<td>Follow Internet links to other sites</td>
<td>☑ ☑</td>
</tr>
<tr>
<td>Follow links to material on the CD</td>
<td>☑ ☑</td>
</tr>
<tr>
<td>Submit responses to activities to the Notice Board</td>
<td>☑ ☑</td>
</tr>
<tr>
<td>Post to / join / interact with, the Discussion Group</td>
<td>☑ ☑</td>
</tr>
<tr>
<td>Communicate technical issues to the web designer</td>
<td>☑ ☑</td>
</tr>
<tr>
<td>Communicate / give feedback, to the Project Manager</td>
<td>☑ ☑</td>
</tr>
</tbody>
</table>

= can do from CD-ROM  ☑ = facility not available on CD-ROM

Inclusion of learning activities throughout the program with the associated Notice Board and moderated Discussion Group support mechanisms, was a particularly important part of the educational program design (Refer Section 3.2.3.5).

The pharmacists were able to participate in the program in their own time, at a time of the day (or night) that was most convenient for them. They could also cover the program material in any order they wished, according to their individual learning needs and styles. Thus, the program design provided mechanisms for the participants to work through the program material in a variety of ways. For example, they could start from Module 1 and work through to Module 11; or, they could have looked at the contents of each module by referring to the Section: ‘Overview of the modules’, and work through them in any order. This overview included the titles of each module, a list of key messages for each module, and a list of the activities covered in each module. Alternatively, the participants were provided with a list of case studies and a separate list of activities from which to select the topics they wished to study.

3.2.3.2 Educational program sample

The specific objective of the delivery, and consequently, the evaluation of the program, was to determine whether the Pharmacists and Palliative Cancer Care online continuing education program is suitable for wider use for community pharmacists throughout Australia (Section 1.3.3).

Sixty pharmacists commenced the educational program:

a) 50 Educational Group pharmacists; who were not involved in the implementation trial
b) 10 Evaluation Test Group pharmacists; who were involved in the implementation trial (Section 3.3)

These two groups of pharmacists were to undertake the online educational program, complete pre- and post-knowledge questionnaires, and a post-program evaluation questionnaire. Refer to Figure 3 for an illustration of the two different groups to whom the educational program was delivered.

For recruitment of the Educational Group pharmacists and the Evaluation Test Group pharmacists, refer to Section 3.2.3.3 and Section 3.3.3.4 respectively.
Methods

Figure 3: Pharmacists participating in the educational program: Educational Group and Evaluation Test Group

Note: The Evaluation Test Group pharmacists also participated in the implementation trial.
3.2.3.3 Recruitment of the *Educational Group* pharmacists

Of the 108 pharmacists who completed the questionnaire in Stage 1 of the project (Section 3.1.2), ninety-eight pharmacists registered their interest in participating in the online educational program. A *Letter of Invitation* to participate in the program was sent as an email attachment (Appendix Q). Those pharmacists who did not respond to the letter of invitation were contacted either by email again, fax or telephone, with a follow-up telephone call; their participation in the program was explained and they were sent an *Explanatory Statement* (Appendix R) and *Consent Form* (Appendix S). Some pharmacists were unable to be contacted because they no longer worked at the pharmacy for which contact details were available, or because they were on holiday leave.

3.2.3.3.1 Issues identified with emailing

a) Many pharmacists deleted the first email sent, because they had been receiving a lot of SPAM. Accordingly, the title of subsequent emails described the project more accurately and read: MONASH UNIVERSITY: Palliative cancer care project. This succeeded in attracting their attention.

b) Where a pharmacy email address was given (rather than an individual’s email address), the person who completed the survey was not necessarily the person who opened the email. Thus, the people who originally registered their interest, were followed up by telephone to see if they received the email.

c) Some pharmacists were on leave. Only those who would be returning during the recruitment phase were able to be contacted by telephone.

d) Some of the pharmacists who received the recruitment information, circulated this information to other pharmacists in their pharmacy chain, who then chose to participate in the program. This was identified from consent forms being received from pharmacists who had not previously registered their interest in participating in the program. These pharmacists were given the *Explanatory Statement* (Appendix R) and *Consent Form* (Appendix S), and were accepted into the program.

3.2.3.3.2 Reasons pharmacists chose not to participate in the program

a) Lack of time.

b) Already committed to another education program, such as smoking cessation/Medication Management Review (MMR).

c) Going to be away during the time of the program; holidays or overseas conferences, or other training programs.

d) ‘Back-log’ already of continuing professional education commitments; mostly due to being away on holiday or overseas conferences.

e) Retired / semi-retired and wanted to spend time pursuing leisure pursuits.
Methods

Recruitment of the *Evaluation Test Group* pharmacists is discussed in Section 3.3.3.4 and Section 3.3.3.5.

### 3.2.3.4 Commencement and undertaking of the educational program

The *Educational Group* and *Evaluation Test Group* pharmacists were sent the following.

a) A welcome letter prior to commencement of the program, with two attachments (Appendix T) to help them on their way. The letter also contained the pharmacist’s ID for access to the online program and for identification on their pre- and post-knowledge questionnaires.

b) The Pre-knowledge questionnaire (Appendix U) was also included for them to complete and return in a Reply Paid envelope.

c) The CD-ROM of the program was sent one week after the commencement date of the program. The aim was to encourage the pharmacists to explore and familiarise themselves with the online version first, and use the Notice Board and interactive Discussion Group (which were not active on the CD). Instructions on how to use the CD, suggested timelines for completion of the modules and notification of allocation of Continuing Professional Education (CPE) points was included (Appendix V).

d) In response to feedback about the awarding of CPE points, an Evidence of Completion Sheet was sent out 4 weeks after commencement of the program, to enable pharmacists to document their progress through the program and provide evidence for the allocation of CPE points, according to which modules they completed (Appendix W).

The program officially commenced on 15th March 2005, and was to be completed by 15th June 2005. An extension of time was given to enable more pharmacists to complete the program (Refer Section 3.2.3.5.1). However, while the final completion date was extended by 2 weeks, to 30th June 2005, some participants delayed returning their Post-knowledge questionnaire and Program Evaluation questionnaire until they finished the program. Consequently, the online program was still being accessed until the end of July 2005.

### 3.2.3.5 Support mechanisms whilst undertaking the educational program

#### 3.2.3.5.1 Follow-up and technical support

Pharmacists participating in this trial of the educational program had agreed to complete it in 12 weeks; therefore, it was important to support them during this short time frame.

One week after the educational material was sent to participants, follow-up by email and telephone confirmed that all had received the material. Clarification regarding use of the Notice Board (Refer Section 3.2.3.5.3) and interactive Discussion Group (Refer Section 3.2.3.5.4) was made because some pharmacists were unfamiliar with these learning strategies.
Methods

At four weeks, email communication occurred, with a reminder of timelines and provision of the Evidence of Completion Sheet (Appendix W). The Evidence of Completion Sheet was designed and provided following informal feedback from some of the pharmacists. Following this email, more pharmacists accessed the Discussion Group.

Half-way through the program further contact was made by email, reminding pharmacists that they were at the half-way mark, with suggestions that they ‘block’ out ‘chunks’ of time to undertake the program, acknowledging that their commitment to the program was valued. Pharmacists were also reminded that their feedback about the program would be sought, in due course. Some pharmacists responded to this email, stating that they were behind in achieving the suggested timelines. The Project Manager responded to these concerns and encouraged pharmacists to continue with the program if they still wished to. Other pharmacists indicated that the program had already impacted on their practice and that they were using some of what they had learnt, offering examples of their use in practice. These pharmacists gave written consent to use this information in any publications related to the project.

With 16 days to the completion date of 15th June 2005, further contact was made via email, and a clarification of the awarding of CPE points was made in response to informal questions from some of the pharmacists. Responses indicated that, with a little more time, some of the pharmacists thought that they would complete the program. An extension to the 30th June 2005 was therefore arranged.

The Project Manager was available seven days a week for extended hours, by email, telephone and mobile telephone, to answer any questions and relay any technical problems or issues to the web designer. Various participants made use of this service. There was also a facility to email technical issues online to the web designer.

3.2.3.5.2 Learning activities

Research\(^{90-94}\) shows that the most effective learning occurs through interaction with learning materials. Therefore learning activities and case studies throughout the program were designed to assist learning and stimulate engagement with the subject material. The Notice Board and Discussion Group provided a variety of professional activities to enhance the participants’ retention of the program material.

There were 65 learning activities throughout the program.

- Notice Board activities \((n = 22)\)
- Discussion Group activities \((n = 5)\)
- Multiple-choice questions \((n = 6)\)
- Other activities \((n = 32)\), included reading information, reflective exercises and accessing other sites on the Internet.

Only the Notice Board activities and Discussion Group participation were anonymously documented by the Microsoft ACCESS databases underpinning the web site.

The aim of the activities was to encourage the participants to:

- Complete those activities that were of most interest to them, and that they needed to learn most about.
- Access Internet resources.
• Collect local palliative care resources.
• Answer multiple-choice and short answer questions, based on the program information and case studies. Some responses were to be submitted to the Notice Board to encourage sharing of ideas, while other responses encouraged individual engagement with the learning material.
• Ask questions, discuss various issues and get prompt replies by joining the Discussion Group.

3.2.3.5.3 Notice Board

Twenty-two of the learning activities specifically encouraged the participants to submit their responses to the Notice Board. The aim of the Notice Board was to provide a mechanism for:

• Engagement with the learning material. The participants could answer questions posed in the activities by writing them in the spaces provided, and print these off for later reference.
• Self-assessment. The participants could also check their answers by following links to the recommended answers to assess their own progress. The participants were also able to compare their responses with those of others. Only the comments were visible, not the names of the authors who submitted them.

3.2.3.5.4 Interactive moderated Discussion Group

Five of the learning activities specifically encouraged the participants to discuss issues related to the program material by interacting with others in the Discussion Group. The aim of the moderated Discussion Group was to:

• Encourage collaboration, consultation and networking with each other, the moderator and a range of palliative care specialists.
• Address day-to-day professional practice issues related to palliative cancer care.
• Encourage engagement with the subject material to enhance learning.

By posting, or writing in the Discussion Group section of the program, participants were provided with a mechanism for interacting with other community pharmacists, sharing their own knowledge and experiences, asking questions and receiving valuable input from palliative care specialist physicians, nurses and pharmacists. A hospital pharmacist with ready access to palliative care literature and a range of specialists, moderated the Discussion Group.

The participants were advised that the moderator’s role was one of facilitation, and that the moderator would:

• Facilitate various discussions according to areas they wished to discuss and debate.
• Access palliative care specialists to join the discussion where this was required.

Directions for how to use the Discussion Group were able to be accessed online from the main menu bar on the web site; however, participants were also given a guide for communication related to online collaboration, prior to commencing the program (Appendix T, Attachment B).
The moderator was given directions from the web designer on how to technically conduct the Discussion Group, and input from the Project Staff regarding the process of facilitating learning (Appendix X).

The CD-ROM of the *Pharmacists and Palliative Cancer Care* Program is attached in a pocket to the front page of this report. Refer to Appendix V for the instructions for its use.
3.3 Stage 3: Implementation trial and evaluation

The implementation trial involved evaluation of the impact of the educational program on:

- Pharmacists’ knowledge in palliative cancer care: The knowledge of pharmacists in the Educational Group, and the Evaluation Test and Control Groups, was assessed.
- Pharmacists’ satisfaction with the educational program: The opinions of pharmacists in the Educational Group and the Evaluation Test Group were sought soon after they completed the program, and again at 3-months following completion of the program, regarding their satisfaction with the program content and presentation.
- Pharmacists’ interactions with their designated palliative care patients and carers: Interventions made by pharmacists in the Evaluation Test and Control Groups were assessed. Researcher-administered questionnaires with the patients and carers were also conducted.

3.3.1 Specific objectives of the implementation trial

The specific objectives (Section 1.3.2) of the implementation trial and evaluation were to determine if, as a result of improved knowledge (following completion of the educational program):

a) Community pharmacists were better able to contribute to the management of palliative care patients.

b) There was an increase in the frequency of pharmacists-initiated changes in drug therapy.

c) There was improved collaboration with other healthcare colleagues: including general practitioners and palliative care specialists (doctors and nurses).

d) Patients and their carers had a better understanding of their medicines.

e) There was a reduction in potential drug-related problems and improved compliance with medication regimens.

In order to achieve these objectives, comparisons between the knowledge and professional interactions of pharmacists in the Evaluation Test Group and Evaluation Control group were planned.

3.3.2 Data collection strategies

As illustrated in Figure 2 and Figure 3, the implementation trial and evaluation (Stage 3) involved a number of participants:

- Palliative care patients and/or their carers.
Methods

- **Evaluation Test Group** pharmacists: who participated in the educational program and documented their interventions with patients/carers.

- **Evaluation Control Group** pharmacists: who did not participate in the educational program, but documented their interventions with patients/carers.

- **Educational Group** pharmacists throughout Australia: who participated in the educational program, but did not participate in documenting interventions with patients/carers.

A number of data collection strategies were also used:

- **Evaluation Test Group** and **Evaluation Control Group** pharmacists' documenting their patient interventions, and assessment of those interventions by the Expert Review Panel (Refer to Appendix Y for the pharmacists' training manual, documentation forms, and the Expert Review Panel assessment forms)

- Pre-knowledge questionnaire, completed by both the **Evaluation Test Group** and **Evaluation Control Group** before the **Evaluation Test Group** pharmacists commenced the educational program. This questionnaire was also completed by the **Educational Group** pharmacists (Appendix U).

- Post-knowledge questionnaire, completed by both the **Evaluation Test Group** and **Evaluation Control Group** after the **Evaluation Test Group** pharmacists completed the educational program. This questionnaire was also completed by the **Educational Group** pharmacists (Appendix Z). Further, this Post-knowledge questionnaire was repeated again at 3 months by the **Evaluation Test Group** and the **Educational Group** only. This 3-month post-knowledge questionnaire also included an evaluation question to identify further impact of the program on pharmacists' practice (Appendix AA).

- Post-program evaluation questionnaire, completed by both the **Evaluation Test Group** and the **Educational Group** pharmacists (Refer Appendix AB).

- Patient/carer questionnaire, completed by patients/carer of both the **Evaluation Test** and **Evaluation Control Group** pharmacists, after the Evaluation Test Group pharmacists completed the educational program (Appendix AC).

Refer to Figure 1, Stage 3, for a diagrammatic overview of these data collection strategies.

### 3.3.3 Recruitment strategy: Evaluation Test and Control Group pharmacists and their palliative care patients/carers

#### 3.3.3.1 Choice of and engagement with the study site(s)

The Eastern and Western Palliative Care Services in Melbourne were considered as potential sites from which patients/carers could be identified and recruited to participate in the study. Only the Mercy Western Palliative Care (MWPC) service, however, was approached, based on the knowledge and experience of some of the investigators that the patients and carers utilising the service generally have a lower socioeconomic status than those living in the eastern suburbs, as well as a poorer understanding of their medicines. It was therefore envisaged that patients and carers living in the western...
suburbs would benefit more from participating in the study. Research\(^{(95)}\) has shown that palliative care patients who are financially burdened find it harder to ‘cope’ in general, and may benefit from increased interventions from health professionals.

The MWPC service was also considered ideal because it has three sites of operation in Melbourne (Sunshine, Werribee and Essendon), and recruiting patients and carers from all of these sites would ensure that a wide geographical area of Melbourne would be engaged. The MWPC service extended their written support for the study, and they offered their assistance to recruit patients/carers into the study (Refer to Section 3.3.3.3).

Following approval of the study by the Mercy Health and Aged Care Research Ethics Committee, and the Monash University Standing Committee on Ethics in Research involving Humans (SCERH), meetings were conducted to inform the MWPC nursing team about the study, enlist their support, and outline how their assistance would be required to identify and recruit patients and carers (Refer to Section 3.3.3.3).

### 3.3.3.2 Patient/carer and pharmacies/pharmacists exclusion and inclusion criteria

The patient/carer inclusion criteria were initially identified as:
- patients/carers newly admitted to the MWPC service;
- patients \( \geq 20 \) years old;
- patients with a diagnosis of cancer;
- patients with a prognosis of \( \geq 3 \) months; and
- patients/carers who visit \( \leq 2 \) pharmacies to obtain medicines.

The pharmacies/pharmacists inclusion criterion was:
- working 20 hours per week in a pharmacy located in the western metropolitan area of Melbourne.

### 3.3.3.3 Process of recruiting patients/carers

MWPC service has a monthly admission rate of 100 to 150 patients. It was therefore estimated that recruiting 20 patients or carers per month, from October to December 2004 (to give a total of 60 patients or carers) would be a realistic goal, in order to achieve the statistical number of 30 pharmacies (15 pharmacies in the Evaluation Test Group and 15 pharmacies in the Evaluation Control Group) for the study. A sample size and power calculation conducted earlier (Refer to proposal 2003/005) revealed that in order to provide statistical comparison between the two groups in evaluating the impact of the educational program on pharmacists’ practice, in relation to the type and number of interventions made with palliative care patients and their carers, 15 pharmacies were required in each group.

The researchers planned to approach patients or carers in person, by visiting the patient or carer’s home with the nurse, however, the staff were reluctant to allow this, because they were concerned that the patients or carers may feel pressured or too overwhelmed to participate. Studies\(^{(96)}\) have shown that palliative care health professionals such as doctors and nurses can be very protective of patients in their care when approached to participate in research. Therefore, the MWPC nurses approached patients and carers.
using the inclusion criteria detailed in Section 3.3.3.2 and the recruitment process outlined in Figure 3.

**Patients are admitted to MWPC**
- MWPC nurse explains study to patient/carer in brief.
- Nurse determines, using their clinical expertise, if patient can/can’t consent; if can’t, approach patient’s carer.
- Give the Information package, containing Letter of invitation, Explanatory statement, Consent form and Revocation of Consent form to the patient/carer to review in their own time.
- Record if patient/carer indicates yes/no to participate, and convey response to the liaison person at MWPC.

**Patients/carers contact researchers**
- Researcher explains and clarifies study and involvement to patient/carer.
- Answers any questions that the patient/carer asks.
- Record if patient/carer indicates yes/no to participate, and convey response to the liaison person at MWPC.
- Gain consent – ask patient/carer to sign two copies of the consent form, one of which they keep and the other they post to the researchers.
- Notify liaison person at MWPC who will assign a code number for the patient/carer.
- Contact pharmacy(ies) that patient/carer visits to obtain medicines to recruit pharmacists.
- Allocate alternatively- into Evaluation Test or Control Group (ensure they still agree to participate if they are in the Control Group).
- Notify patient/carer that their pharmacy has agreed to participate (or not).
- Inform the patient/carer and pharmacy of the date of commencement of the study.

**Research assistant (blinded to the allocation of groups) visits patient/carer’s home**
- Explains study again as needed.
- Answers questions.
- Shows consent form and ensures patient/carer still wishes to participate.

**If yes, administer questionnaire**
- If patient/carer feels uncomfortable during administration of the questionnaire, they can speak to the researcher. They can withdraw from the study if they wish to.
- If patient/carer experiences difficulties in answering/understanding questions, researchers will consider restructuring questionnaire.

**If No (e.g. too ill/uncomfortable on that day), ask patient/carer if they are willing for the researcher to return another day.**
- If No, thank patient/carer and note that they (not their name) did not wish to participate.
3.3.3.4 Process of recruiting pharmacies/pharmacists

Upon receipt of the details of the pharmacy visited by the patient or carer, one of the researchers made several attempts to contact the pharmacist regularly-and-usually-in-charge (PRUIC), to briefly explain the project and determine their interest in participating (Figure 3).

Following this initial telephone contact, pharmacists were either:

- sent an information package by mail, and contacted one week later to determine whether they wished to participate; or
- were visited in the pharmacy where they worked, and the information package was discussed.

The information packages contained a Letter of Invitation (Appendix AD), Explanatory Statement (Appendix AE), and Consent (Appendix AF), and Revocation of Consent (Appendix AG), forms.

Registering their interest to participate and gaining consent took some time however, because a number of pharmacists needed time to consider whether or not they were able to commit the time required either to undertake the educational program if placed in the Evaluation Test Group, or to document interventions only, if they were allocated to the Evaluation Control Group.

3.3.3.5 Follow-up of patients, carers and pharmacists recruited for participation in the study

Following a four-month recruitment period, the participating pharmacies were randomly allocated (1:1) into the Evaluation Test Group (participating in the educational program) or the Evaluation Control Group (not participating in the educational program). Pharmacists who had agreed to participate and were working at the same pharmacy were therefore in the same group, and were required to interact with the same designated patients and/or carers.

The pharmacies were contacted again to ensure that they were still willing to participate in the project, in the group to which they had been randomly allocated. Thus, process consent was used. Process consent allows consent to be renegotiated at different stages of the interaction between the researcher and participant. It is suitable for longitudinal studies where participants are contacted on a number of occasions and consent needs to be re-established and renegotiated.

The patient/carer was then contacted to inform them of the pharmacy’s response to participation. The following situations occurred as a result:

- Where the patient or carer had consented to participate, the pharmacy said ‘no’; or
- Where the patient or carer had consented to participate, the pharmacy said ‘yes’; or
Where the patient or carer had consented to participate and the pharmacy said ‘yes’, but the patient passed away before the commencement of the study (Refer Section 4.3.1.3).

Where both the patient/carer and pharmacy had agreed to participate, the patient/carer was given the name of the pharmacist(s) who were enrolled in the study, and was requested to interact with that particular pharmacist(s) on their visits to the pharmacy. The patient/carer remained blinded to which group the pharmacy was in.

3.3.3.6 Problems identified with recruiting patients/carers and modifications made to the recruitment process and inclusion/exclusion criteria to resolve them

A number of problems were encountered with recruiting both patients/carers and pharmacies/pharmacists, some of which became unavoidable limitations of the study. These are outlined below, and discussed further in Section 6.

3.3.3.6.1 Difficulties experienced by nurses with estimating the patient’s prognosis and deciding the ideal time to explain the study

Although nurses used their clinical expertise to determine whether a patient or carer was suitable for the project, they later reported that estimating the prognosis of a patient was often difficult. Some nurses also felt that explaining the study on the first visit would overwhelm the patient or carer, whilst others felt that subsequent visits were not ideal because by this time it would be more difficult to engage the patient's/carer's interest.

3.3.3.6.2 Patients/carers not contacting the researchers to express their interest in participating

As highlighted in Figure 4, patients/carers were asked to ring the researchers to express their interest (or not) in participating; however, none did. This was not surprising, given that palliative care patients and carers become busy and involved, visiting numerous health professionals and institutions for care and treatments, and ‘putting into order’ their personal affairs. Research is of low priority to palliative care patients and carers\(^{(89)}\), and would have been so for the patients and carers approached in this study.

The researchers consulted the MWPC nurses on possible strategies to overcome this barrier to recruitment, and as a result, modifications were made to the recruitment process in late October 2004 (Refer to Figure 5: Modification 1). The nurses also reported that they found approaching patients or carers about the study a challenge, because the provision of care was their priority.

3.3.3.6.3 Inclusion/exclusion criteria for patients/carers and pharmacists/pharmacies

The recruitment rate was still slow; that is, the statistical goal of 20 patients/carers per month was not being achieved to obtain a sample of 30 pharmacies (Refer to Section 3.3.3.3), even after the changes to the original recruitment process had been employed (Figure 5). The inclusion criteria for patients/carers and pharmacists/pharmacies was therefore modified, in November 2004, in consultation with MWPC and the PRG, as shown in Figure 6: Modification 2.
Methods

Patients are admitted to MWPC
Same as process detailed in Figure 3

If the patient/carer says YES
If the patient/carer is UNDECIDED
If the patient/carer received the information package but has not responded

If the patient/carer wishes to participate, the nurse requests them to sign one of the consent forms, which the nurse then faxes to the researchers.

If the patient/carer does not indicate whether or not they want to participate, the nurse informs them that on the next visit, they are to let the nurse know whether or not they wish to.

Follow process as for the patient/carer who says YES
Follow process as for the patient/carer who says MAYBE or is UNDECIDED

The nurse will ring the patient/carer to ask them if they are still interested in participating.

- Nurses inform all patients/carers that if they agree to participate, they have the option of contacting the researchers themselves or vice versa.
- Record if patient/carer indicates yes/no to participate, and convey response to the liaison person at MWPC.

Nurse faxes signed patient/carer consent form to researchers

Researchers contact liaison person at MWPC
- Researchers rings liaison person for contact details of patients/carers
- Researchers ring those patients/carers who indicated that they would like to be contacted by the researchers (and those patients/carers who don’t contact researchers after having indicated to the nurse that they themselves will ring)

Researchers contact patients/carers or vice-versa
Same as process detailed in Figure 3 “Patients/Carers Contact Researchers”

Research assistant (blinded to the allocation of groups) visits patient/carer’s home
Same as process detailed in Figure 3

Figure 5: Modification 1 made to original recruitment process

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Note: The original recruitment process (Figure 3) was modified so that the researchers could ring the patient/carer once their written consent was obtained by the nurse to participate in the project.

<table>
<thead>
<tr>
<th>Modification of inclusion criteria for patients/carers:</th>
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<tbody>
<tr>
<td>• <em>From</em> newly admitted patients/carers - <em>To</em> all patients/carers admitted to the MWPC service</td>
</tr>
<tr>
<td>• From patients/carers who visit ≤ 2 pharmacies to obtain medicines - To those who visit any number of pharmacies</td>
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</table>

<table>
<thead>
<tr>
<th>Modification of inclusion criteria for pharmacies/pharmacists:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• <em>From</em> working 20 hours per week - <em>To</em> working 16 hours per week in a pharmacy.</td>
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</tbody>
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Figure 6: Modification 2 made to original recruitment process

3.3.3.6.4 Professional barrier to recruiting patients/carers directly, during home visits

After the second modification (Figure 6 was made, meetings took place with the MWPC nurses to:

- Inform them of the changes made to the patient/carer and pharmacy inclusion/exclusion criteria.
- Discuss strategies on how to recruit patients and carers.
- Decide on the when the best opportunity is to give patients/carers the information package.
- Remind the nurses that interpreters are available for non-English speaking patients/carers.

Again, although recruitment did improve, it still did not occur at the desired rate to achieve the statistical number of 30 pharmacies that were required for participation in the implementation trial (Section 3.3.3.3). The possibility of the researcher being allowed to approach patients/carers in person was discussed with the staff of MWPC once again; they felt that this was now appropriate and regretted not having consented to using this recruitment method initially.

Hence, a third modification was made to the recruitment process: one of the researchers was given permission in December 2004, for two to three days per week, to recruit patients or carers directly by visiting their home with the nurse. This method of recruitment was quick, effective and took place in conjunction with the nurses identifying and approaching patients/carers as before (Figure 4) Nurses reported that by having the researcher recruit patients/carers during home visits, only then were they able to realise the true benefit of the research project.
3.3.4.6.5 Number of days allocated to recruiting patients/carers during home visits

In an effort to further increase the number of patients or carers, and thus pharmacies/pharmacists, a final modification was made to the recruitment process: the researcher increased the number of days for recruitment to four days per week, and extended the recruitment period for an additional one and a half months (until mid-February 2005) than what was originally planned.

3.3.3.7 Problems identified with recruiting pharmacies/pharmacists and modifications made to resolve them

3.3.3.7.1 Pharmacists declining the offer of participating in the study

Where the pharmacy declined participation, pharmacists (either on first or subsequent contacts) gave the following reasons:

- Lack of time
- Already committed to another education program, such as smoking cessation/MMR.
- Going to be away during the time of the program; holidays or overseas conferences, training.
- Recently bought the pharmacy and need to invest time in running it (employing staff etc.)
- Personal reasons e.g. pregnancy.
- Retired/semi-retired, wanted to spend time pursuing leisure pursuits.

3.3.3.7.2 Pharmacists undecided about the offer of participating in the study

Some of the pharmacists who remained undecided about participating in the study expressed that they would have been willing to if CPE points were being awarded for undertaking the educational program. When some of the pharmacists were approached to participate, the program was not accredited by an external body such as The Pharmaceutical Society of Australia (PSA), and thus the allocation of CPE points was not confirmed.

However, approval was later sought from the PSA so that pharmacists could be awarded with CPE points. Hence, the professional development recognition of the program became an additional incentive for pharmacists to participate in the study.

3.3.3.8 Issues identified with follow-up of recruited patients/carers and pharmacists/pharmacists and modifications made to resolve them

Prior to, or soon after the pharmacies were randomised into the Evaluation Test or Control Groups, some of the participating pharmacies’ patients passed away. One of the researchers was informed about this by keeping in touch with the liaison person from MWPC on a weekly basis. Therefore, either another patient/carer who visited that pharmacy was recruited, or if another patient or carer was unavailable, the pharmacist was offered the opportunity to be transferred into the Educational Pharmacists Group to undertake the educational program.
Methods

Some patients passed away after the Evaluation Test Group commenced the educational program in March 2005, and another patient/carer was not recruited to interact with them during the course of the implementation trial.
3.3.4 Documentation and assessment of pharmacists’ interventions

The aim of requesting pharmacists to document their interventions with patients/carers, and having an Expert Review Panel assess these interventions, was to determine if there was an increase in interventions as a result of the pharmacists participation in the educational program, and also to determine the impact of the program on the nature of the interventions made by the participating pharmacists.

3.3.4.1 Basis for documentation and assessment of interventions

Formative documentation of clinical pharmacists’ activities and their impact on patient outcome is necessary for the development, justification and successful implementation of clinical pharmacy services\(^{(99)}\). Formative documentation involves documenting what the pharmacist does, and includes a record of the following information\(^{(99)}\):

- The information on which the pharmacist based decisions and actions.
- The decisions made by the pharmacist concerning drug therapy for a specific patient.
- The actions the pharmacist took to affect the patient’s drug therapy.

Hence, in addition to conducting the post-program patient/carer researcher-administered questionnaires, it was important to consider pharmacists’ interventions as part of the evaluation strategy, to enable the researchers to determine the impact of pharmacists’ improved knowledge in palliative cancer care on their clinical practice. This could be quantified by an increase in the frequency and type of contributions made by pharmacists in the Evaluation Test Group towards patient care, compared with those made by the Evaluation Control Group.

Pharmacists from both the Evaluation Control and Test Groups were required to document interventions performed with their designated palliative care patient and/or carer, one month prior to the Evaluation Test Group commencing the educational program (February 14\(^{th}\) 2005), continuing to document throughout the program (March 16\(^{th}\) – June 15\(^{th}\) 2005), and until one month after (July 14\(^{th}\) 2005) the Test Group completed the program. Hence the researchers were also able to determine whether or not the number and type of interventions made by pharmacists from both groups changed over the course of the project.

By documenting their interventions, pharmacists from the Test Group specifically were able to:

- Monitor and review their actions, and thus to make positive changes to their practice where necessary; and
- Monitor and review the recommendations they made to patients, carers and other health professionals.

To aid the descriptions of the methods used below, an overview of the intervention documentation and assessment process is presented in Figure 7.
Methods

Pharmacists trained on how to use the intervention tool

Pharmacists document drug-therapy problems and interventions using the intervention tool

Intervention documentation period: February 14th – July 14th 2005

Pharmacists fax completed intervention tools to researchers

Completed intervention tools reviewed by researchers

Pharmacist contacted for clarification and evaluation if necessary

Intervention documentation period monitored by researchers

Pharmacists contacted to:

- Encourage them to grasp the opportunity to intervene & continue documenting interventions.
- Forward the patient's medication history to determine the frequency of visits to the pharmacy for prescription medicines & over-the-counter products.

Completed intervention tools with patient medication histories collated by researchers

Expert Review Panel convened

Trained on:

- How to use the Expert Review Panel Assessment tool.
- How pharmacists used the intervention tool.

Pharmacists' interventions presented to Panel for review.

Significance of pharmacists' interventions judged by Expert Review Panel using the assessment tool

Figure 7: Overview of intervention documentation and assessment process
3.3.4.2 Design and piloting of the pharmacists intervention tool

3.3.4.2.1 Design of the pharmacists intervention tool

A literature search was conducted to find a validated classification tool that the Evaluation Test and Control Group pharmacists could use to document drug-therapy problems and the interventions made to resolve them. An intervention tool that had been previously used by Australian community pharmacists, and that also allowed pharmacists to record both clinical and non-clinical interventions, was desired. Several intervention tools\textsuperscript{[58, 40-43, 100-112]} were investigated for their relevance and applicability, however, only one\textsuperscript{[112]} was found to be suitable for this phase of the study.

D.O.C.U.M.E.N.T\textsuperscript{[112]} was identified as an ideal tool because it is validated, allows pharmacists to document drug-therapy problems and interventions (both clinical and non-clinical), and has been developed for use by Australian community pharmacists. The classification of drug-therapy problems in D.O.C.U.M.E.N.T is based on the Hepler and Strand classification\textsuperscript{[103]}.

A modified version of D.O.C.U.M.E.N.T, referred to as the intervention tool from hereon for the purposes of this methodology, was used by the pharmacists in this project to document drug-therapy problems and interventions. The major changes that were made to the original version as a result of peer-review and piloting, in order to meet the specific aims of this project, are illustrated in Appendix AH. These modifications were made to enable pharmacists to complete the tool with ease immediately after an intervention was made, and write enough information about the patient problem and their recommendations that would later facilitate assessment of the significance of the intervention by the Expert Review Panel.

The intervention tool (Appendix Y) developed may be considered to have advantages over other published instruments as it includes a wider range of clinical and non-clinical drug-therapy problem categories. This was facilitated by the broad intervention definition used (Refer to Section 3.3.4.3) and the free text for pharmacists to detail descriptions of the drug-therapy problem and their recommendations. The tool included ample choice of actions undertaken to resolve the problem, an ability to indicate how long it took to investigate and resolve the problem and whether the recommendation made was accepted or not.

3.3.4.2.2 Piloting of the pharmacists' intervention tool

The intervention tool (included with Appendix Y) was piloted with a group (\(n = 11\)) of:

- Hospital pharmacists (\(n = 9\)) from Peter MacCallum Cancer Centre; and
- Community and research/academic pharmacists (\(n = 2\)) from the participating university.

Both groups were trained on how to use the intervention tool. As part of their training, the hospital pharmacists group were asked to record interventions based on various scenarios invented by the researchers. Suggestions made by the group to modify the form were minor, and were included.
Both groups then piloted the form by documenting actual interventions for one week. Again, suggestions made to modify the form were minor, and were included.

3.3.4.3 Definition of intervention used in the project

There are several intervention definitions\(^{113-116}\). In this study, an intervention was defined as any action by the pharmacist that directly or potentially resulted in a change in patient management or therapy. This definition included activities where the pharmacist clarified a medication order, and activities that weren't related to medicines, prescriptions or prescribers. The definition was therefore widely applicable to all aspects of clinical and non-clinical pharmacy practice.

3.3.4.4 Training of study pharmacists on how to use the intervention tool

A training manual (Appendix Y) was developed to educate and assist the Evaluation Test and Control Group pharmacists to record interventions. One of the researchers visited pharmacists and, using the training manual:

- Explained why they were required to document interventions, for what duration, what to do with recorded interventions and who else to inform regarding the project.
- Emphasised that interventions should be documented immediately after occurrence.
- Explained that submitted interventions will be reviewed by the researchers first, before assessment by the Expert Review Panel, and that the researchers may need to contact them for clarification of detail.
- Showed and explained how to use the intervention tool, emphasising that they can document one or more problems associated with one drug only per form.
- Asked them to practice documenting interventions using the tool, based on various scenarios invented.
- Reviewed their answers to the scenarios and highlighted any errors made.

Pharmacists stated that the training session was useful in enhancing their understanding of how to use the intervention tool.

3.3.4.5 Process of submitting interventions to the researchers

Pharmacists were required to fax recorded interventions to one of the researchers. This method of communication was chosen so that the researcher could review the intervention and contact the pharmacist immediately, to resolve any questions or points of clarification. Also, if the pharmacist documented the intervention immediately after it occurred, the details would be fresh in their mind, and they would be therefore be able to provide accurate answers to the researcher’s questions.

The intervention documentation period was continually monitored by the researchers, as few interventions were being received from pharmacists: e-mail reminders were sent and telephone contact was made (Refer to Sections 3.3.4.5.1 and 3.3.4.5.2 below). During
this monitoring period, pharmacists commented that the intervention tool was simple to use, and wasn’t burdensome or time-consuming because they were able to complete it during business hours after an intervention was made. One pharmacist reported that they found the tool to be so useful in assisting their professional development that they documented interventions made with non-study patients and/or carers.

3.3.4.5.1 E-mail reminders

E-mail reminders were sent to pharmacists, whose patients were still alive, on a monthly basis, to encourage them to continue documenting interventions with patients/careers.

3.3.4.5.2 Telephone contact

The researchers contacted pharmacists, whose patients were still alive, twice during the intervention period, to determine any reasons for lack of documented interventions. The reasons that were given are highlighted in Section 4.3.2.3.

The pharmacists were requested to fax the dates on which medicines or over-the-counter products were supplied to their patient(s) and/or carer(s), in order to determine how often they visited the pharmacy over the entire study period.

3.3.4.6 Design and piloting of the Expert Review Panel Assessment tool

3.3.4.6.1 Design of the Expert Review Panel Assessment tool

A literature search was specifically conducted to find a validated tool that could be used by the Expert Review Panel to assess the interventions made by the study pharmacists. A tool that could be used by the Panel to not only assess the significance of the intervention, but also classify its risk, was desired.

Several assessment tools\(^{(39, 59, 112, 117-128)}\) were investigated for their relevance and applicability, however, only one\(^{(120)}\) was found to be suitable.

The Expert Review Panel assessment tool (included with Appendix Y) was developed based on guidelines created by Standards Australia International and Standards New Zealand, for managing risk in the health care sector\(^{(120)}\).

Standards Australia International and Standards New Zealand define risk as “the chance of something happening that will have an impact upon objectives, and is measured in terms of consequence and likelihood”\(^{(120)}\). Assessing risk was considered important because the researchers wanted the Panel to engage in a clinical peer review and quality improvement process: it was required that the Panel identify and analyse a wider range of issues when assessing pharmacists’ interventions, in a systematic way, to make informed decisions, in order to achieve improved outcomes.

The guidelines state that\(^{(120)}\):

- The level of risk is determined from the relationship between consequence and likelihood, which is usually set out in a table.
Methods

- Assessing the level of risk based on its consequence and likelihood is a qualitative process, because the reviewers use experience, judgement and intuition to make decisions, supported by whatever relevant information is available. However, the process should be carefully structured to use judgement consistently and in the best possible way, with explicit scales for likelihood and consequence.

- The value of qualitative analysis is enhanced when the determination of the level of risk is shared across a range of people with varying backgrounds and interests. One person’s view may be different from another’s and the contribution of many ideas may improve the usefulness of the outcome.

The researchers developed the Expert Review Panel assessment tool based on the above criteria. The tool was constructed so that the Panel could assess the negative consequences of the risk; the consequence scale reflected the losses or undesirable outcomes that might arise if the pharmacist didn’t intervene. That is, the effect on:

- Symptom control
- Welfare of the patient and/or family
- Cost

It was considered important that the Panel assess the projected impact of pharmacists’ interventions on these three parameters, because these are directly related to the palliative care patient and/or family’s quality of life.

The likelihood scale was designed so that the Panel could assess both the likelihood of the outcome without the pharmacist’s intervention, and the likelihood of the causative error re-occurring.

3.3.4.6.2 Piloting of the Expert Review Panel Assessment tool

The Expert Review Panel Assessment tool was piloted by:

- Two of the researchers assessing 12 interventions made during the intervention pilot (Refer to Section 3.3.4.2.2 above). The researchers found that the tool was easy to complete; they assessed the 12 interventions similarly. For the consequence scale, ‘development of minor/moderate/major’ symptoms was changed to ‘development of 1, 1-2 or >2 symptoms.’

- A group of three health professionals (GP, hospital pharmacist and risk management person) assessing 2 interventions invented by the researchers. The group found it difficult to assess likelihood as they felt there was insufficient information available, apart from the patient’s medication history. It was acknowledged that assessing likelihood is always difficult, as most often, information other than the patient’s demographic details cannot be provided. The group requested that the patient’s age and cancer diagnosis be provided to aid the assessment process by the Expert Review Panel.
3.3.4.7 Recruitment of Expert Review Panel Members

A stratified purposeful sample[55] of health care practitioners (general practitioner, palliative care physician, hospital and community palliative care nurses, hospital and community pharmacists) was sought with the aim of conducting an independent assessment of pharmacists’ interventions. The expertise of a person experienced in risk management was also required because their input would be valuable to the risk management theory underpinning the assessment tool.

Using a snowball sampling technique, key informants (doctors, nurses, and pharmacists from the PRG, the Peter MacCallum Cancer Services, the Eastern Palliative Care Service and the Royal District Nursing Service (RDNS) servicing the Peninsula Hospice Service) identified a number of general practitioners, palliative care specialists and community pharmacists with clinical expertise in palliative care. This information was publically available through palliative care networks. Potential participants were invited by telephone, or email with telephone follow-up, and given the opportunity to ask further questions about the project. Those who registered an interest in participation were sent written information about the project and subsequently gave written consent to participate. An honorarium was provided for their time and travel.

3.3.4.8 Process of assessment of interventions by the Expert Review Panel

The Expert Review Panel met at the participating university over one day to assess interventions made by the Evaluation Test and Control Group pharmacists. A presentation first took place to brief the Panel on the aims of the assessment process and on how the intervention tool was used by pharmacists, as well as to train them on how to use the Expert Review Panel assessment tool.

The Panel found that the assessment tool was easy to use. However, they were unable to assess some interventions appropriately because there was insufficient detail provided. This was expected, and is inevitable: it is always difficult to obtain sufficient information about an event and those involved when one is not present at the time of the consultation. While participant observation may have addressed this issue, it was impractical because of the unpredictable times at which patients/carers visited the pharmacies. The provision of the patient’s case or medical history may have been a more practical solution to overcome this limitation.

Each Panel member was provided with an information package, containing:

- A copy of the presentation.
- A copy of the intervention tool (included with Appendix Y).
- Copies of all of the interventions made by the pharmacists during the study period. Attached to each completed intervention form was the patient’s medication history and demographic details (age and cancer diagnosis).
- Copies of the Expert Review Panel Assessment tool to record their assessment of each intervention (included with Appendix Y).

Interventions were assessed using the following process:
• Each Panel member was asked to individually review each intervention.

• Participants then independently assessed the level of risk of each intervention, by rating its consequence and likelihood. They recorded their assessments using the Expert Review Panel Assessment tool.

• After individually completing their assessments, each member then stated their judgements in turn (round-robin feedback session).

• The Panel then discussed their assessments. They were not pressed to arrive at a consensus decision as each member’s judgement was considered to be of equal validity and importance, based on their knowledge of, and experience in, palliative care.

The round-robin feedback session and the discussion that followed were audiotaped and later transcribed verbatim.

In their feedback after the assessment process, some members reported that the process itself was informative and increased their knowledge of risk management in the healthcare setting. They also felt comfortable using risk as an outcome to assess the significance of pharmacists’ interventions.

### 3.3.4.9 Method of analysis of intervention and assessment data

In consultation with statisticians from Monash University, the following analyses were conducted:

a) Descriptive analysis of each intervention.

b) Descriptive analysis of the Expert Review Panel’s assessment of each intervention.

The interventions were not statistically analysed because the number of interventions received was small (Refer to Section 4.3.2.2).

The reasons for why interventions were not being received from pharmacists were also investigated (Refer to Section 4.3.2.3).
3.3.5 Post-program researcher-administered patient/carer questionnaire

3.3.5.1 Choice of method

The overall aim of the questionnaires was to assess participants’ medication knowledge, recall of medical information and interaction with the pharmacist. Researcher-administered questionnaires were chosen to elicit this information because the individual opinions and views of the patient and/or carer were desired.

The specific aim of the questionnaire was to determine whether patients/carers in the Evaluation Test Group had an improved understanding of their medicines, and improved adherence with medication regimens (Refer to Sections 1.3.2.4 and 1.3.2.5), compared to those in the Evaluation Control Group. This was not able to be determined, however, due to the small sample and uneven number of Test and Control Group patients/carers who completed the researcher-administered questionnaire (Refer to Section 3.3.5.4).

For patients or carers in the Evaluation Test Group, the pharmacist(s) working at the pharmacy they visited undertook the educational program and documented interventions. For patients or carers in the Evaluation Control Group, the pharmacist(s) documented interventions only and did not undertake the educational program.

3.3.5.2 Design and piloting of the researcher-administered questionnaire

3.3.5.2.1 Design of the questionnaire

A literature review was conducted to identify a validated and reliable tool developed for palliative care patients or patients with other chronic illnesses such as diabetes, asthma and hypertension, to assess their medication knowledge, recall of medical information, and/or interaction with the pharmacist or another health professional.

The tool developed by O’Connell and Johnson\textsuperscript{(129)} to evaluate medication knowledge in elderly patients was used in this study to develop five of the 17 questions (questions 5, 6, 7, 12 and 13) in the questionnaire (Appendix AC).

A semi-structured format was chosen over an open-ended format in order to appropriately assess participants’ medication knowledge, recall of medical information and interaction with the pharmacist. Participants were able to make additional comments related to the project or their care on completion of the questionnaire.

The literature indicates that palliative care patients and carers are vulnerable and sensitive\textsuperscript{(130-132)}, therefore in order to avoid burdening participants, the questionnaire was kept short.

The questionnaire developed in this phase of the study, may also be useful to other researchers to assess the knowledge and views of patients with other chronic illnesses (e.g. diabetes and hypertension), because, as indicated above, there is currently no such instrument available to aid research in these areas.
3.3.5.2.2 Piloting of the questionnaire

It was considered unethical to pilot the researcher-administered questionnaire with a sample of MWPC palliative care patients/carers, as they would have been dealing with issues of higher priority than research, and would have lacked the time required to participate\(^{(133)}\). Instead, the questionnaire was peer-reviewed for content and face validity by the PRG, and three academic pharmacists within the participating university.

The reviewers were asked to examine the purpose and wording of each question to ensure it was relevant to meeting the aims of the questionnaire and could be easily answered by participants. The sequence of the questions and the overall format of the questionnaire were also evaluated. Minor changes were made to the wording and sequence of some questions to reduce ambiguity.

3.3.5.3 Process of contacting patients/carers to participate in completing the questionnaire with the researcher

The researcher-administered questionnaires were conducted in the patient or carer’s home, where they could voice their opinion, and spend adequate time in answering questions, without the pressure that may occur in group meetings\(^{(72, 73)}\).

3.3.5.3.1 Contact with the patient/carer to organise participation in completing the questionnaire

Only the carers of the surviving patients previously recruited for the study (Section 3.3.3.3) were contacted to participate. When the patient/carer was contacted, process consent\(^{(97)}\) was used: the researchers explained the study again, and checked for their willingness and ability to participate. A day and time was subsequently organised.

Patients/carers were informed that a researcher would contact them a day before the scheduled date, and again on the day, to ensure they were still well enough and able to participate. This was felt necessary because palliative care patients often become unpredictably ill, and it was important to avoid any additional burden to them.

3.3.5.3.2 Recruitment of a research assistant to administer the questionnaire

A research assistant who was blinded to the Test and Control Group patients/carers, and who was a health professional with knowledge of and experience in palliative care, was recruited to administer the questionnaires. The researcher was briefed about the process, emphasising the ethical issues involved:

- That patients/carers may be under a great deal of emotional and physical stress, therefore there was a need to consider, and assess, how the patient or carer is coping during the process; and
- To allow plenty of time for quiet and slow introductions and to answer questions without rushing the patient/carer.
3.3.5.4 Method of analysis

In consultation with a Monash University statistician and the PRG, it was decided that differences in the medication knowledge, recall of medical information and interaction with the pharmacist between the Evaluation Test and Control Group participants could not be determined using statistical tests, because:

- Of the small sample size and the uneven number of Test and Control Group participants (Refer to Section 4.3.3); and
- It could not be ensured that patients/carers would recall only interactions with the project pharmacists.

The results of each questionnaire were descriptively analysed instead, and important findings are discussed in Section 4.3.3.
3.3.6 Pre- Post- and 3-month Post-program knowledge questionnaires

3.3.6.1 Choice of method

A pre-test/post-test design\(^{29-34}\) was used to assist in determining the impact of the educational program on the knowledge of Educational and Evaluation Test Group pharmacists (Section 1.3.2). Refer to Figure 2 for an illustration of the educational program target audience.

Pre-test/post-test designs have been used widely to document the services of a program or intervention, measure its outcomes, and demonstrate its success. Three questionnaires, to be completed at different times: pre-intervention, post-intervention and 3-months post-intervention, were designed to identify the impact of the educational program on the knowledge of the participating pharmacists (Table 4).

1) The Pre-knowledge questionnaire was used to determine a baseline level of knowledge prior to the Evaluation Test Group and Educational Group pharmacists commencing the educational program. The Evaluation Control Group also completed the Pre-knowledge questionnaire, to enable a control comparison with the Evaluation Test Group pharmacists.

2) A Post-knowledge questionnaire was administered as soon as possible after the Evaluation Test Group and the Educational Group pharmacists completed the program, to determine the short-term impact of the program on their individual level of knowledge. The questionnaire was administered at the same time to the Evaluation Control Group.

3) The Post-knowledge questionnaire was re-administered 3 months after the Evaluation Test Group and the Educational Group pharmacists completed the program, to determine the impact of the program on their individual level of knowledge over time. The Evaluation Control Group was not required to complete this questionnaire.

Table 4: Knowledge questionnaires completed by pharmacist group

<table>
<thead>
<tr>
<th>Knowledge questionnaires</th>
<th>Evaluation Test Group</th>
<th>Evaluation Control Group</th>
<th>Educational Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-intervention</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Post-intervention</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>3-month Post-intervention</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>
3.3.6.2 Questionnaire design

The questionnaires were designed using the problem-based learning principles that also underpinned the development of the educational program. This involved the use of case studies to assist in determining the impact of the educational program on the way the pharmacists would intervene in dealing with medication-related problems of the hypothetical patients presented in the case studies. Both multiple-choice and short-answer questions were included.

To ensure content validity, determining the number of questions to include in each questionnaire was based on identifying the number of questions needed to cover the content areas and focus of the program. For example, those modules that contained more information and were particularly relevant to community pharmacists, such as symptom control and pain management, were allocated more questions, and therefore marks. The content of the questions was determined after reviewing each of the modules and developing questions from the program material. To enable statistical comparisons, the total number of marks was consistent across all three questionnaires (or tests). The questions in each test were similar in degree of difficulty to avoid bias in any test. No test was considered to be easier or more difficult than any other. Table 5 illustrates the module content area, the estimated number of hours the pharmacists would take to complete those modules within the educational program, and the number of questions and marks allocated in each of the three tests.

The Pre-knowledge questionnaire contained 20 questions. The Post-knowledge questionnaires were developed from the Pre-knowledge questionnaire and contained 15 questions, half of which were repeated from the Pre-knowledge questionnaire. The questions that were repeated in the post-test were those that pharmacists did not answer well in the pre-test; some of these questions were exactly the same as those that were in the pre-test, and others were parallel or equivalent questions, similar in content and degree of difficulty. Blane et al.\(^{29}\) and Newton\(^{35}\) have suggested that parallel or equivalent test questions on the same material in the pre- and post-test can be more reliable in testing actual learning and that the repetition of the same test questions is not a solution to achieving comparability, because memorisation effects from the pre-test can influence the results of the post-test, without actual knowledge gains in the educational program. However, in this project, the time lapse between tests was considered such that memorisation effects, if any, would be minimal.

The 3-month post-test, however, included all of the same questions that were in the post-test, except one (Question 14, Appendix AA), because the researchers wanted to determine whether pharmacists had retained their knowledge over time. The researchers felt that three months between the two post-tests was a reasonable length of time, where the likelihood of pharmacists memorising questions would be minimal. Further, it was not until after completion of the study, that the pharmacists were provided with the answers to the tests.
Methods

Table 5: Number of questions and marks allocated to each module for each knowledge questionnaire

<table>
<thead>
<tr>
<th>Module Content</th>
<th>No. hrs</th>
<th>Pre-test</th>
<th>Post-test</th>
<th>3-month Post-test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>No. of</td>
<td>No. of</td>
<td>No. of</td>
</tr>
<tr>
<td></td>
<td></td>
<td>quest.</td>
<td>marks</td>
<td>quest.</td>
</tr>
<tr>
<td>Module 1: Getting the most from the program</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Module 2: Introduction: Principles of palliative cancer care</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Module 3: Management of cancer pain</td>
<td>4.5</td>
<td>4</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>Module 4: Management of non-pain symptoms and side effects of treatment</td>
<td>6</td>
<td>7</td>
<td>12</td>
<td>3</td>
</tr>
<tr>
<td>Module 5: Complementary and alternative medicines used by patients with cancer</td>
<td>1.5</td>
<td>2</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Module 6: Methods of medication administration</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Module 7: Access to palliative cancer care medicines</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Module 8: Psychosocial care</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Module 9: Communication with patients, carers and families</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Module 10: Ethical issues</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Module 11: Working in partnerships to enhance care</td>
<td>1</td>
<td>1</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>20</td>
<td>20</td>
<td>32</td>
<td>15</td>
</tr>
</tbody>
</table>

3.3.6.3 Piloting the questionnaires

3.3.6.3.1 Pre-knowledge questionnaire

The Pre-knowledge questionnaire was piloted and peer-reviewed:

1) To ensure face validity, a convenience sample of 7 pharmacists within the participating university piloted the questionnaire: 3 academics, one of whom works part-time in community pharmacy; 1 researcher with oncology experience; 3 doctoral candidates, two of whom work part-time in community pharmacies. Minor changes were made to some questions to reduce ambiguity.

2) To ensure both face validity and content validity, the PRG members were asked to review the revised questionnaire and check their answers with the Marking Guide to identify ambiguity and coverage of content areas. Feedback included allowing the acceptance of a wider range of correct answers to one of the questions, deleting
another question due to lack of clarity in the accompanying case study, and minor changes to wording to decrease ambiguity and increase relevance for community pharmacists.

Refer to Appendix U for a copy of the Pre-knowledge questionnaire that was administered.

3.3.6.3.2 Post-knowledge questionnaire

The Post-knowledge questionnaire was piloted and peer-reviewed:

1) To ensure face validity, a convenience sample of 3 experienced pharmacists from the Peter MacCallum Cancer Centre piloted the questionnaire. No changes were made to the questions.

2) To ensure both face validity and content validity, the PRG members were asked to review the questionnaire and check their answers with the Marking Guide to identify ambiguity and coverage of content areas. Feedback included allowing the acceptance of a wider range of correct answers to two of the questions, and minor changes to wording to decrease ambiguity and increase relevance for community pharmacists.

Refer to Appendix Z for a copy of the Post-knowledge questionnaire that was administered.

3.3.6.3.3 3-month post-knowledge questionnaire

This questionnaire was the same as the Post-knowledge questionnaire, except for one question (Question 14). Therefore, the questionnaire had already been piloted as stated above (Section 3.3.6.3.2). In addition, the questionnaire (Question 16) provided pharmacists with the opportunity to comment on their reflections about the program and how it may have impacted on their pharmacy practice over the past 3 months.

Refer to Appendix AA for a copy of the 3-month Post-knowledge questionnaire that was administered.

3.3.6.4 Sample

The recruitment strategy for the Educational Group pharmacists is detailed in Section 3.2.3.3. The recruitment strategy for the Evaluation Test Group and the Evaluation Control Group is detailed in Section 3.3.3. Table 21, Section 4.3.4, details the number of pharmacists who completed the pre-, post- and 3 month post-knowledge questionnaires by group.
3.3.6.5 Method of analysis

3.3.6.5.1 Marking the questionnaires

The same process was used for marking each of the questionnaires.

Initial marking of the questionnaires occurred using the peer-reviewed and piloted Marking Guides. The questionnaires were randomly divided into two groups and each group given to one of two researchers for marking purposes. Thus, two researchers working at the same time, individually marked the multiple-choice questions first.

To ensure consistency and reliability in marking, the short-answer questions were marked in two stages:

1) All of the same questions were marked (e.g. question 4), for all of the questionnaires, before going on to the next question, and so forth, until all short answer questions were marked, one at a time, for all of the questionnaires.

The researchers clarified answers to the short-answer questions as unexpected responses emerged. Following discussion and use of reference materials as necessary, agreement was made regarding which additional responses were to be accepted and those that would not be accepted. These were then documented in the Marking Guide. Thus, changes were made to the Marking Guide as appropriate answers to the questions asked, emerged. Refer to Appendix A1 for the pre-knowledge questionnaire Marking Guide.

2) The papers were then re-marked using the amended Marking Guide.

The individual marks were collated and entered into a SPSS database for statistical computations. The total mark was also added to a demographic database in preparation for providing the pharmacists their individual results following completion of the 3-month Post-knowledge questionnaire.

3.3.6.5.2 Statistical analysis

A Monash University statistician was consulted, and the following statistical analyses were conducted:

1. ANOVA (including the Scheffe and Tamhane post-hoc tests) to determine the mean score obtained by each group for the pre- and post-tests, and whether there was a significant difference between the groups’ mean scores. The significance level was defined as $p \leq 0.05$. A Kruskal Wallis Analysis (non-parametric ANOVA) was also conducted to confirm the results obtained by the ANOVA. The significance level was $p \leq 0.05$. These statistical tests were not performed for the 3-month post-test because of the small sample sizes obtained (Refer to Table 21).

2. One-sample t-test to investigate whether the difference (delta) between the following test mean scores were significantly different from zero. The significance level was $p \leq 0.05$: 
Methods

- The pre- and post-test mean scores (post-test score minus pre-test score) for each individual group, and for the Educational and Evaluation Test Groups combined.

- The post-test and 3-month post-test mean scores (3 month-post-test score minus post-test score) for the Educational and Evaluation Test Groups combined.

- The pre-test and 3-month post-test mean scores (3 month-post-test score minus pre-test score) for the Educational and Evaluation Test Groups combined.
3.3.7 Post-program evaluation

A Post-program Evaluation questionnaire was administered soon after the pharmacists completed the program, and a post-program evaluation question was included in the 3-month Post-knowledge questionnaire.

3.3.7.1 Post-program Evaluation questionnaire design and review

The aim (Section 1.3.3) of the Post-program Evaluation questionnaire conducted soon after completion of the program, was to determine the pharmacists’ satisfaction with the program and to obtain their opinion about the usefulness of the Pharmacists and Palliative Cancer Care online educational program for wider use for community pharmacists throughout Australia.

A number of distance education and online program evaluation questionnaires were reviewed\(^{134-138}\). Whilst none were found suitable for this project, they did inform the development of the Post-program Evaluation questionnaire, and similar questions were used in this project. This evaluation sought the pharmacists’ perceptions about the:

- Impact of the program on their knowledge of palliative cancer care.
- Frequency of their engagement with palliative cancer care patents, carers and other health care professionals.
- Structure and design of the program.
- Usefulness of the content of the program to their practice.

To ensure face validity the questionnaire was reviewed by the PRG for the appropriateness of the questions in providing information about the participants’ perceptions of the structure, content and design of the program and for its usefulness as a learning tool. A number of changes were made, resulting in a re-structuring of the questions. Following further review, the questionnaire was made available online after the completion date for the program (30\(^{th}\) June 2005).

The questionnaire was to be completed online, and consisted of 44 questions: two of the questions required yes/no responses, one encouraged comment about how the program could be improved, and the remaining questions required responses on a Likert scale ranging from zero (strongly disagree) to ten (strongly agree). A number of spaces were provided throughout for additional comments (Refer Appendix AB).

3.3.7.2 Post-program Evaluation questionnaire sample

Thirty-four pharmacists completed the Post-program Evaluation questionnaire: Educational Group \((n = 30)\); Evaluation Test Group \((n = 4)\).

For recruitment of the Educational Group and Evaluation Test Group pharmacists refer to Section 3.2.3.3 and Section 3.3.3, respectively.

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*Improving medication management of palliative care patients, 2005*
In addition, nine participants who partly-completed the program returned a Program Evaluation questionnaire, with answers provided only for those program modules which they completed: Educational Group ($n = 6$); Evaluation Test Group ($n = 3$).

### 3.3.7.3 Post-program Evaluation questionnaire analysis

The responses to the questionnaire were analysed according to the type of measure or variable employed.

For the two categorical yes/no questions, frequency tables displaying percentages of total respondents were employed. Where the variable was measured on the Likert scale, Box-and-Whisker plots with five number summaries were used to highlight the location and spread of the responses. A mean was also calculated. The analysis was based on summary statistics only, with the R statistical computing program$^{(139)}$ being used to produce the summary measures. Further statistical analysis was not possible due to the small sample size.

The responses to the ‘additional comments’ sections (Appendix AJ) were thematically analysed using the NVivo qualitative software system, and are reported in Section 4.3.5.11.

### 3.3.7.4 3-month Post-program evaluation

As discussed in Section 3.3.6.3.3, the 3-month Post-knowledge questionnaire included an open-ended question which sought the pharmacists’ reflections, over time (3 months), about the program and how it may have impacted on their pharmacy practice. Refer to Appendix AA, Question 16.

The responses to question 16 (Appendix AK) were thematically analysed using the NVivo qualitative software system and are reported in Section 4.3.4.11.
RESULTS AND DISCUSSION
4 Results and Discussion

4.1 Stage 1: Identification of educational needs of community pharmacists in palliative cancer care

4.1.1 Literature review

The aim of the literature review was to identify topics related to palliative cancer care that community pharmacists need to learn more about, and the results informed the development of the survey of Australian community pharmacists. In addition, the literature review identified educational topics to inform the development, design and delivery of the online educational program. The literature review was conducted in three phases (Refer to Section 3.1.1). This section reports the results of the literature review.

The seven topics identified as part of phase 1 (Refer to Section 3.1.1.2.1), to inform the basis for the literature strategy, are shown in Appendix B.

The information obtained from undertaking the literature search as part of phases 1 to 3 (Refer Section 3.1.1.2) was organised into a literature review. Appendix C highlights the contents of the literature review.

Eighteen topics considered important for community pharmacists to learn about in relation to palliative cancer care were chosen from topics 1, 2, 5, 6 and 7 of the literature review (Refer to Table 6). On the advice of the PRG, ‘psychosocial care’, ‘terminology used in palliative care’, and ‘conducting medicine reviews for patients’, which did not arise from the review of the literature, were included in the survey, because they were considered as pertinent as the other topics for pharmacists to learn about.

Thus, as a part of the iterative research process, the literature review findings were successful in informing the majority of topics for the survey used to identify the palliative cancer care educational needs of community pharmacists, including their preferences for the format of the online educational program.
Table 6: Eighteen topics selected from the literature review and input of the PRG for inclusion in the pharmacists survey*

<table>
<thead>
<tr>
<th>Survey Topic</th>
<th>Origin of survey topic – major literature review topic from which it was selected.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Principles of Palliative Cancer Care</td>
<td>1.</td>
</tr>
<tr>
<td>Causes of Cancer</td>
<td>5.</td>
</tr>
<tr>
<td>Incidence and Prevalence of Cancer</td>
<td>5.</td>
</tr>
<tr>
<td>Diagnosis and Staging of Cancer</td>
<td>5.</td>
</tr>
<tr>
<td>Common Cancers: Risk Factors, Presentation, Treatments, Prognosis</td>
<td>5.</td>
</tr>
<tr>
<td>Management of Cancer Pain</td>
<td>5.</td>
</tr>
<tr>
<td>Management of Non-Pain Symptoms/Side Effects</td>
<td>5.</td>
</tr>
<tr>
<td>Palliative Cancer Treatments</td>
<td>5.</td>
</tr>
<tr>
<td>Long Term Complications of Chemotherapy e.g. effects on fertility.</td>
<td>5.</td>
</tr>
<tr>
<td>Handling of Cancer Emergencies e.g. hypercalcaemia, haemorrhage.</td>
<td>5.</td>
</tr>
<tr>
<td>Drug Interactions with Palliative Cancer Treatments</td>
<td>5, 6, 7.</td>
</tr>
<tr>
<td>Complementary and Alternative Medicines used by patients with cancer e.g. homeopathic and herbal medicines, transcutaneous electrical nerve stimulation.</td>
<td>6.</td>
</tr>
<tr>
<td>Methods of Drug Administration in Palliative Cancer Care</td>
<td>7.</td>
</tr>
<tr>
<td>Access to Palliative Cancer Medications e.g. Pharmaceutical Benefits Scheme and Special Access Scheme “issues”.</td>
<td>1.</td>
</tr>
<tr>
<td>Psychosocial Care of patients</td>
<td>Added later by PRG and researchers</td>
</tr>
<tr>
<td>Communicating with patients and families</td>
<td>2.</td>
</tr>
<tr>
<td>Terminology Used in Palliative Care</td>
<td>Added later by PRG and researchers</td>
</tr>
<tr>
<td>Conducting Medicine Reviews for patients</td>
<td>Added later by PRG and researchers</td>
</tr>
</tbody>
</table>

*Pharmacists who responded to the survey (Refer to Section 4.1.2), rated the importance of learning more about, and their self-perceived level of knowledge of, these 18 palliative cancer care topics.
4.1.2 Survey of key stakeholders: Metropolitan and rural community Australia pharmacists

The aim (Section 1.3.1) of the survey of Australian community pharmacists was to identify what they perceived to be important to learn about in relation to palliative cancer care. The method for the questionnaire design, piloting and conduct of the survey is discussed in Section 3.1.2. This section reports the results of the survey.

Of the 1,050 questionnaires distributed (Refer to Section 3.1.2.2), a total of 108 questionnaires (10.3%) were returned after four weeks. Table 7 shows the distribution of responding pharmacists by State/Territory and urban/rural areas.

To ensure anonymity, pharmacists were not required to state the pharmacy for which they worked. The recruitment process revealed that pharmacists often work for more than one pharmacy, therefore the researchers did not plan to determine a match between the pharmacies that were sent the questionnaires, and the pharmacists from those pharmacies that responded.

Table 7: Distribution of responding pharmacists by State/Territory and urban/rural

<table>
<thead>
<tr>
<th>State/territory</th>
<th>Number of questionnaires returned</th>
<th>Number of pharmacies sent questionnaires</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Urban</td>
<td>Rural</td>
</tr>
<tr>
<td>New South Wales (NSW)</td>
<td>27</td>
<td>10</td>
</tr>
<tr>
<td>Victoria (Vic)</td>
<td>18</td>
<td>3</td>
</tr>
<tr>
<td>South Australia (SA)</td>
<td>17</td>
<td>2</td>
</tr>
<tr>
<td>Queensland (QLD)</td>
<td>14</td>
<td>4</td>
</tr>
<tr>
<td>Western Australia (WA)</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>Australian Capital Territory (ACT)</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Tasmania</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Northern Territory (NT)</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>85</strong></td>
<td><strong>23</strong></td>
</tr>
</tbody>
</table>

4.1.2.1 Demographics

The characteristics of respondents were reflective of current community pharmacy practice in Australia\(^{[140]}\). More than half of the respondents were male. Most pharmacists were 40 to 49 years old and the majority of pharmacists worked in urban pharmacies. The demographics of the pharmacists who completed the questionnaire are summarised in Table 8.
4.1.2.2 Educational needs

A broad spectrum of educational needs in palliative cancer care were identified (Table 9). Overall, pharmacists rated all 18 palliative cancer care topics as “important/very important/essential”; however when ranked, the topics they considered the most important were:

- Management of cancer pain
- Management of non-pain symptoms/side effects
- Drug interactions with palliative care cancer treatments

These educational needs identified by the survey pharmacists are generally consistent with those reported in other studies\(^\text{13, 60, 61}\). Furstenburg et al\(^\text{13}\) reported that pharmacists perceived their training in cancer pain management as fair or poor, and felt uncomfortable managing cancer pain, even though they were the most likely to see patients with cancer pain, compared to nurses and physicians. McIntyre et al\(^\text{61}\) reported that only 23% of pharmacists felt that their knowledge of cancer pain was adequate, and 76% thought that their expertise in cancer pain management needed improvement. Less than 1% described their knowledge of cancer pain as excellent. Similarly, as indicated above, the survey pharmacists identified “management of cancer pain” as an “essential” topic to learn more about and in which they require further training.

Pharmacists’ self-perceived level of knowledge of the 18 topics was “poor/good” (Table 9).

The topics they felt they had the least knowledge of, were:

- Handling of cancer emergencies
- Complementary and alternative medicines used by patients with cancer
- Methods of drug administration in palliative cancer care

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Table 8: Pharmacists characteristics (n = 108)

<table>
<thead>
<tr>
<th></th>
<th>Male (%)</th>
<th>Female (%)</th>
<th>Total (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>54.6</td>
<td>45.4</td>
<td>100</td>
</tr>
<tr>
<td>Age as at December 31st 2004, years</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21-29 years</td>
<td>3.7</td>
<td>7.4</td>
<td>11.1</td>
</tr>
<tr>
<td>30-39 years</td>
<td>9.3</td>
<td>12.0</td>
<td>21.3</td>
</tr>
<tr>
<td>40-49 years</td>
<td>19.4</td>
<td>20.4</td>
<td>39.8</td>
</tr>
<tr>
<td>50-59 years</td>
<td>13.0</td>
<td>5.5</td>
<td>18.5</td>
</tr>
<tr>
<td>60 years and over</td>
<td>9.3</td>
<td>0</td>
<td>9.3</td>
</tr>
<tr>
<td>Area of practice</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urban</td>
<td>41.6%</td>
<td>37.1%</td>
<td>78.7%</td>
</tr>
<tr>
<td>Rural</td>
<td>13.0%</td>
<td>8.3%</td>
<td>21.3%</td>
</tr>
<tr>
<td>Average years of practice as a registered pharmacist</td>
<td>21.6 years (range 0.5-48)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
In contrast to the studies by Furstenburg et al\(^{(13)}\) and Mcintyre et al\(^{(61)}\), the survey pharmacists reported their knowledge of cancer pain as being "good".

“Drug interactions with palliative cancer treatments”, “common cancers”, and “complementary and alternative medicines used by patients with cancer” were identified as topics that showed a large difference between their rankings for importance and knowledge. Pharmacists placed emphasis on the importance of learning more about these topics, but their perceived level of knowledge of them was poor. These findings suggested that pharmacists require more extensive training in these areas of palliative cancer care.

There were statistically significant differences in pharmacists’ ratings of the importance of learning more about, and their level of knowledge of, the topics according to their gender, age, rurality and years of practice, but these were of no practical importance to the design of the educational program because the program was always intended to be flexibly delivered. They have therefore not been included here.

Question 5 of the survey (Appendix D) also provided three spaces for pharmacists to add any other topics they thought should be included in the program. Five additional topics were added:

- palliative care for other disease states (rated essential)
- food and nutritional care (rated essential)
- stages of dying (e.g. anger, denial) (rated very important)
- support groups (rated very important)
- support and counselling for carers/family (rated very important)

One pharmacist questioned the relevance of “Long term complications of chemotherapy”, and suggested that links could be made with “psychosocial care” and “communicating with patients and families”, with the addition of “stages of dying”.
Table 9: Importance of learning more about and self-perceived level of knowledge of the topics

<table>
<thead>
<tr>
<th>Topic</th>
<th>Importance</th>
<th>Knowledge</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean rating (range)</td>
<td>Rank</td>
</tr>
<tr>
<td>Management of Cancer Pain</td>
<td>4.57 (3-5)</td>
<td>1</td>
</tr>
<tr>
<td>Management of Non-Pain Symptoms/Side Effects</td>
<td>4.49 (2-5)</td>
<td>2</td>
</tr>
<tr>
<td>Drug Interactions with Palliative Cancer Treatments</td>
<td>4.38 (3-5)</td>
<td>3</td>
</tr>
<tr>
<td>Common Cancers: Risk Factors, Presentation, Treatments, Prognosis</td>
<td>3.95 (2-5)</td>
<td>4</td>
</tr>
<tr>
<td>Principles of Palliative Cancer Care</td>
<td>3.89 (1-5)</td>
<td>5</td>
</tr>
<tr>
<td>Complementary and Alternative Medicines used by patients with cancer</td>
<td>3.80 (2-5)</td>
<td>6</td>
</tr>
<tr>
<td>Access to Palliative Cancer Medications</td>
<td>3.74 (2-5)</td>
<td>7</td>
</tr>
<tr>
<td>Terminology Used in Palliative Care</td>
<td>3.70 (1-5)</td>
<td>8</td>
</tr>
<tr>
<td>Palliative Cancer Treatments</td>
<td>3.65 (1-5)</td>
<td>9</td>
</tr>
<tr>
<td>Communicating with patients and families</td>
<td>3.61 (1-5)</td>
<td>10</td>
</tr>
<tr>
<td>Long-Term Complications of Chemotherapy</td>
<td>3.57 (1-5)</td>
<td>11</td>
</tr>
<tr>
<td>Methods of Drug Administration in Palliative Cancer Care</td>
<td>3.57 (1-5)</td>
<td>11</td>
</tr>
<tr>
<td>Psychosocial Care of patients</td>
<td>3.44 (1-5)</td>
<td>13</td>
</tr>
<tr>
<td>Handling of Cancer Emergencies</td>
<td>3.38 (1-5)</td>
<td>14</td>
</tr>
<tr>
<td>Conducting Medicine Reviews for patients (at home, in residential aged care facilities and hospices)</td>
<td>3.33 (1-5)</td>
<td>15</td>
</tr>
<tr>
<td>Diagnosis and Staging of Cancer</td>
<td>3.26 (1-5)</td>
<td>16</td>
</tr>
<tr>
<td>Causes of Cancer</td>
<td>3.22 (2-5)</td>
<td>17</td>
</tr>
<tr>
<td>Incidence and Prevalence of Cancer</td>
<td>2.91 (1-5)</td>
<td>18</td>
</tr>
</tbody>
</table>

a Ratings 1 to 5 for importance are defined as: 1 = Not important; 2 = Of some importance; 3 = Important; 4 = Very important; 5 = Essential

b Ratings 1 to 5 for knowledge are defined as: 1 = Nil; 2 = Very Poor; 3 = Poor; 4 = Good; 5 = Excellent

c The rankings are based on the mean ratings of the importance to pharmacists of learning more about the topic and their self-perceived level of knowledge of the topic
4.1.2.3 Preference for format(s)

Pharmacists preferred information as text (89.8%), case studies (80.6%) and self-assessed multi-choice questions (69.4%) as formats they would find valuable to use in the educational program. Open (12.0%) or moderated (26.9%) discussion groups were less preferred. All formats, however, were included in the educational program.

4.1.2.4 Willingness to participate in an online educational program

The majority of pharmacists (85.2%) reported that they were willing to participate in the educational program. Willingness to participate was not affected by whether pharmacists worked in urban or rural pharmacies. Pharmacists who were not willing (14.8%) stated that they did not have the time to undertake the program or did not have access to the internet.

4.1.2.5 Perception regarding their practice of palliative cancer care

The majority of pharmacists (71.3%) reported that they deliver palliative cancer care services; usually less-than-monthly (24.1%) or weekly (21.3%). Pharmacists working in urban and rural pharmacies reported the same frequency of delivery of palliative care services.

4.1.2.6 Additional comments

Of the 108 pharmacists who returned the questionnaire, 32 respondents provided additional comments (Appendix D, Qu.11). These comments fell into seven categories:

- Need for an accessible resource or program.
- Varying need for a community pharmacy palliative care service.
- Community pharmacists are an easily accessible resource for patients and families.
- Community pharmacist’s role in community in provision of palliate cancer care.
- Program design issues.
- Time constraints.
- Pharmacists’ recognition.

The respondents' detailed comments are provided in Appendix H and are summarised in the following sub-sections.

4.1.2.6.1 Need for an accessible resource or program

Pharmacists expressed a need for an accessible resource or educational program in palliative cancer care to enable them to enhance their role, and perhaps lead to accreditation of their service provision.

While other studies have identified the need for education in cancer pain specifically[13, 60, 61], this survey identified the need for a comprehensive educational program in palliative cancer care that covers a range of topics. The pharmacists reported that an educational program is needed because an increasing number of patients are being affected by
cancer, the majority of whom are being cared for at home. In addition, the pharmacists recognised that the medicines used to treat these patients are increasing in number and complexity, and often used in doses that are well beyond the usual dose range seen in community pharmacy.

Pharmacists were enthusiastic about being able to participate in the online educational program in palliative cancer care when it became available. Strong support for such a program was evident from their comments; examples of which are provided below:

- With increased knowledge I could potentially give value added benefit to my customers.
- I would strongly support any online palliative care educational program. Information on cancer is often hard to obtain.
- Definitely need to know more as many people are affected by cancer and we interact regularly with them or their carers.

Whilst one pharmacist reported that they did not have the opportunity to learn by observing prescription habits and interacting with palliative care patients, another reported that they were interacting on a regular basis with palliative care patients.

4.1.2.6.2 Varying need for a community pharmacy palliative care service

Responses revealed that the need for pharmacies to deliver palliative care services to the community was variable. One pharmacist stated that because pharmaceutical palliative care is shifting its focus from hospitals to the community, pharmacists will be required to give greater support to patients and their families or carers.

4.1.2.6.3 Community pharmacists are an easily accessible resource for patients and families: Pharmacists role

Improving pharmacists' knowledge in palliative cancer care is especially important given that the majority of responding pharmacists reported their involvement in delivering palliative cancer care services (e.g. filling dose administration units, delivering medicines, providing advice on medicine especially used for the relief of cancer pain) and recognised their role as being important and needing further development.

Pharmacists commented that their role in providing palliative cancer care services is important because they are an easily accessible community resource for patients and their carers. For example, one pharmacist stated that providing palliative care services leads to interactions with patients and their families that are challenging on many fronts and often very rewarding. In particular, one pharmacist reported that whilst patients found their doctors supportive, they often needed their medicines explained in a “simple way”. It was also noted that “more and more patients are relying on free health advice and information than ever before due to a health system not coping with demand”.

While pharmacists reported that they are an easily accessible resource for patients and carers, they also indicated that they lacked the necessary time. Creating the opportunity for patients and carers to discuss issues, if they wish, requires highly developed communication skills and adequate time. It is reported that palliative care patients are often dissatisfied with the communication process\textsuperscript{141, 142} because many health professionals lack the necessary time and skills to uncover and address issues. Inability
to discuss issues most often leads to patients and carers receiving insufficient information which adds to stress, frustration and uncertainty\textsuperscript{141}.

### 4.1.2.6.4 Program design issues

Pharmacists offered suggestions about the design of the educational program, including making it user-friendly, relevant and time efficient, and catering for all levels of prior knowledge. Although the inclusion of other topics such as palliative care for other conditions (e.g. motor neurone disease, cystic fibrosis and multiple sclerosis) was also suggested, pragmatically, this was not within the scope of the 20-hour program to be developed. The focus was on palliative care for cancer because this patient group is the most common. The fact that palliative care is provided for other conditions, however, is acknowledged in the program.

Three pharmacists expressed their inability to undertake an online program because they did not have access to the internet, while one pharmacist was not comfortable using the internet. Another pharmacist suggested the program be didactic, and requested that it be “conducted in a few locations” to save time travelling and allow for pharmacists who work late to attend. However, the purpose of the program was to provide a cost effective mechanism for the majority of pharmacists to access the program, at a time most suitable for them, with as little inconvenience as possible. The CD-ROM was provided for those who had access to a computer, but did not have easy access to the internet.

### 4.1.2.6.5 Time constraints

Six pharmacists reported that time was the major reason for not being able to register their interest in undertaking the educational program: “It is increasingly difficult for pharmacists to run their businesses and have the time to take in this information”. One pharmacist stated that they were interested in participating in the program, but that they might take a while to complete it.

### 4.1.2.6.6 Pharmacist’s recognition

Respondents expressed a need for pharmacists’ commitment to palliative care to be recognised. One pharmacist suggested that offering CPE points for completion of the program would increase its appeal and value to pharmacists. Two respondents felt that pharmacists should be accredited for the provision of palliative care services after having completed the educational program. It was felt that this accreditation would “allow pharmacists to become involved or included in palliative care hospital facilities to create referral systems to maintain interest and receive ongoing clients”.

An additional respondent suggested that pharmacists be remunerated for the provision of services, otherwise these services were best left to those health professionals who were paid to provide them (Refer to Appendix H).

While a return rate of 10.3% did not represent the profession as a whole, it showed that individual pharmacists across States/Territories and urban and rural communities felt an educational program in palliative cancer care was important and necessary. The survey supported the findings from the literature and provided additional topics which had already been considered by the PRG for inclusion in the educational program. The suggestion to
include “palliative care for other disease states” and “the stages of dying” (Refer to Section 4.1.2.2), were not within the scope of the education program to be developed. Thus, the survey did not generate new information that had not been previously identified. Accordingly, more questionnaires were not distributed and reminders were not sent to pharmacists.

In conclusion, this survey achieved its goal of providing valuable information for development of the educational program for community pharmacists in palliative cancer care. A number of limitations are, however, acknowledged. The conclusions drawn from the survey concerning pharmacists’ educational needs are limited because the questionnaire was designed to generate exploratory data only, and thus was distributed to a small sample of the pharmacist population in Australia. A more varied sample size may have been obtained by sending one questionnaire to a larger number of pharmacies. However, the decision to target a smaller number of pharmacies and approach more pharmacists within those pharmacies was done with a view to building educational ethos in those pharmacies where more than one pharmacist wanted to participate in the program; thus, pharmacists could support each other whilst doing the program. Additionally, the survey was related to a planned educational program therefore, those pharmacists who returned the questionnaire were a self-selecting group who may have been particularly interested in palliative cancer care and a desire to participate in the program. Pharmacists’ self-assessments of their level of knowledge of the topics may not be completely reliable because they may be unaware of the gaps in their knowledge about palliative cancer care. Although the 5-point Likert scales did differentiate to some degree, the perceived importance to pharmacists of learning more about a topic and their level of knowledge of the topic, using a 10-point Likert scale may have been more effective in gaining a deeper insight into the educational needs of the pharmacists.

As highlighted in Section 3.1.2.4, a summary of the findings of the survey and the draft modules were provided to the nominal group participants prior to their participation in the group meeting (Appendix L).
4.1.3 Nominal groups with key stakeholders

The purpose of the literature review and survey of Australian community pharmacists was to identify possible topics and subject material to be included in the educational program. More specifically, the aim of the nominal group meetings was to validate, add to, and refine the findings from the literature review and survey. The literature and the survey provided information on the kind of topics/modules that needed to be included in the educational program; the nominal groups were conducted with the intention of gathering information from experts in palliative cancer care about: 1) whether or not the topics/modules identified by the literature and the survey were appropriate; and 2) the key messages that needed to be communicated to pharmacists undertaking the program.

The method for conducting the nominal group process is discussed in Section 3.1.3. This section reports the results of the nominal group process.

Four nominal groups were conducted with 25 health care practitioners:

a) General practitioners \( (n = 2) \) and specialist palliative care physicians \( (n = 4) \)

b) Palliative care community nurses \( (n = 12) \) servicing two different palliative care services \( (n = 7 \) and \( n = 5 \) ) in metropolitan Melbourne. Separate meetings were held for each group due to the workload commitments of, and geographical distance separating the nurses.

c) Community pharmacists \( (n = 4) \) and hospital palliative care pharmacists \( (n = 3) \).

4.1.3.1 Nominal group stakeholder characteristics

The gender characteristics of the stakeholders are shown in Table 10. The female pharmacists outweighed the number of male pharmacists, which may be reflective of the increasing number of females in the pharmacy profession\(^{(140)}\). There were more male doctors, which is reflective of the medical profession. All of the nurses were female which reflects the female dominated nature of this health care discipline. However, while male nurses were invited to participate in the nominal groups, they chose not to.

Each of the groups was stratified by discipline, and both community and hospital practitioners participated, except for the nurses’ group. The majority of practitioners were experienced in palliative care, except for the pharmacists’ group. Refer to Table 11 for details.

Table 10: Nominal group characteristics: Gender

<table>
<thead>
<tr>
<th>Gender:</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pharmacists</td>
<td>2</td>
<td>5</td>
<td>7</td>
</tr>
<tr>
<td>Doctors</td>
<td>4</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>Nurses</td>
<td>0</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>6</td>
<td>19</td>
<td>25</td>
</tr>
</tbody>
</table>

*Improving medication management of palliative care patients, 2005*
Table 11: Nominal group characteristics: Areas of practice and palliative care experience

<table>
<thead>
<tr>
<th>Areas of practice at the time of participation</th>
<th>Number of stakeholders</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pharmacists</strong></td>
<td></td>
</tr>
<tr>
<td>Hospital pharmacy</td>
<td>1</td>
</tr>
<tr>
<td>Hospital pharmacy (oncology/palliative care)</td>
<td>2</td>
</tr>
<tr>
<td>Community pharmacy</td>
<td>4</td>
</tr>
<tr>
<td><strong>Average years of palliative care practice</strong></td>
<td></td>
</tr>
<tr>
<td>Hospital pharmacists = 2.5 years (range 2 - 3 years)</td>
<td>Unable to be determined for community pharmacists because of the irregularity of presentation of palliative care patients</td>
</tr>
<tr>
<td><strong>Doctors</strong></td>
<td></td>
</tr>
<tr>
<td>Palliative care specialist</td>
<td>4</td>
</tr>
<tr>
<td>General practice (GP)</td>
<td>2</td>
</tr>
<tr>
<td><strong>Average years of palliative care practice</strong></td>
<td></td>
</tr>
<tr>
<td>Specialists = 20 years (range 11 - 40 years)</td>
<td>Unable to be determined for GPs because of the irregularity of presentation of palliative care patients</td>
</tr>
<tr>
<td><strong>Nurses</strong></td>
<td></td>
</tr>
<tr>
<td>Palliative care community</td>
<td>10</td>
</tr>
<tr>
<td>General community</td>
<td>2</td>
</tr>
<tr>
<td><strong>Average years of palliative care practice</strong></td>
<td></td>
</tr>
<tr>
<td>Palliative care community nurse = 8.45 years (range 2 – 15 years)</td>
<td>Unable to be determined for general community nurses because of the irregularity of being allocated palliative care patients</td>
</tr>
</tbody>
</table>

4.1.3.2 Choice of modules and key messages

The nominal groups’ priorities for the most important modules and key messages are shown in Appendix N.

Appendix O shows the twenty-two modules that were identified by the nominal groups. The mean values ranged from 1 to 7.04. The five highest scoring modules were: ‘introduction and principles of palliative care’ (7.04), ‘management of cancer pain’ (6.88), ‘management of non-pain symptoms/side effects’ (5.82), ‘nausea and vomiting’ (5.20), and ‘ethical issues’ (4.72). Multiple key messages emerged for each of the 22 modules, and these are included in Appendix P.

4.1.4 Modules and key messages informing the expert module writers

Using the iterative research process, and analysing and combining the data from the nominal groups, community pharmacists’ survey and literature review, the final module structure of the educational program was developed, and comprised 11 modules. Each of the modules contain from three to seven key messages. Table 12 shows the modules and key messages for the Pharmacists and Palliative Cancer Care online educational program conducted from March to July 2005.
The final module structure (Table 12) was arrived at by the nominal groups’ confirming that the eight modules in the draft structure were appropriate, adding additional modules/topics that they thought were important, and finally, the PRG collapsing and separating certain modules (Refer to Section 3.1.3.6).

“Ethical issues” was identified by the nominal groups as a module that had not been considered previously and was added to the final educational program. Providing information to community pharmacists on ethical issues in palliative cancer care was important because they may be confronted with situations related to dispensing medicines or providing information where ethical dilemmas arise (e.g. diversion of opioids, end-of-life treatment such as sedation, double-effect). In such situations, pharmacists need to be able to decide what to do, and realise in whose interests a decision should be made. They must also be aware that there is an inherent interaction between a professional’s personal values and beliefs and their responses to various ethical questions, and that the process of communication is an important tool in working toward a resolution of a clinical dilemma.

“Getting the most from the program” was added to introduce participants to the program aims, resources and timelines.

The nominal group process also identified the key educational messages (Table 12) for each of the modules within the program. The minor changes to the key messages as a result of thematic analysis and review by the PRG were made to the wording, to add clarity, or a number of key messages were collapsed into one key message, which conveyed the same meaning. The key messages retained the original essence of the nominal group findings and were not changed any further before presenting them to the writers. The program writers drew on the research findings to focus their material, yet at the same time utilise their expertise to refine the wording/presentation of the key messages where they felt necessary.

Table 12: The modules and key messages for the online educational program

<table>
<thead>
<tr>
<th>Modules</th>
<th>Key messages</th>
<th>Estimated time allocation</th>
</tr>
</thead>
</table>
| Module 1 Getting the most from the program | • Finding your way around  
• Resources within the site  
• Resource folder  
• Critical reflection and analysis of practice  
• Finding the time  
• Recommended reading resources | 1 hour |
| Module 2 Introduction: Principles of palliative cancer care | • Palliative care:  
  ○ is holistic care  
  ○ is about symptom control and not cure  
  ○ involves multidisciplinary care  
• Suffering encompasses more than physical pain.  
• Palliative care encompasses more than cancer care; it includes a variety of end-stage illnesses.  
• Palliative cancer care involves navigating through the changing goals of care.  
• Palliative care involves managing the self as well as the patient and carer/family.  
• Palliative care is experience- and practice-based; this is reflected in the types of evidence used. | 1 hour |
### Table 12 continued: The modules and key messages for the online educational program

<table>
<thead>
<tr>
<th>Modules</th>
<th>Key messages</th>
<th>Estimated time allocation</th>
</tr>
</thead>
</table>
| Module 3 Management of cancer pain | • Pain relief is a human right.  
• The approach to pain management should be aetiological and individualised.  
• Patient involvement in their own pain management is crucial and requires education.  
• Good pain management is based on thorough assessment of the pain.  
• Strong pain requires strong analgesia.  
• Opioid side effects can be minimised and well managed.  
• Pain management needs to be systematised and coordinated. | 4½ hours |
| Module 4 Management of on-pain symptoms and side effects of treatment | • Recognising, monitoring and managing common symptoms will decrease distress.  
• Non-pharmacological and pharmacological management of common symptoms are both important.  
• Common symptoms that palliative care patients might present with to community pharmacists are:  
  • nausea and vomiting  
  • anorexia and cachexia  
  • constipation  
  • diarrhoea  
  • fatigue  
  • dyspnoea  
  • mucositis/stomatitis, dry mouth, dysphagia  
  • anxiety, depression, delirium  
  • fungating wounds  
• Patients may present with multiple co-morbidities.  
• Community pharmacists may help prevent palliative care emergencies. | 6 hours |
| Module 5 Complementary and alternative medicines used by patients with cancer | Pharmacists need to:  
• Know what complementary and alternative medicines (CAM) their patients are using.  
• Monitor the effectiveness of complementary and alternative medicines, including dietary supplements in palliative cancer care.  
• Recognise that there are complementary and alternative therapies that may assist pain relief, symptom control, and increase the comfort of patients.  
• Base advice on current evidence.  
• Refer patient/carers to the appropriate health care professional(s). | 1½ hours |
Table 12 continued: The modules and key messages for the online educational program

<table>
<thead>
<tr>
<th>Modules</th>
<th>Key messages</th>
<th>Estimated time allocation</th>
</tr>
</thead>
</table>
| Module 6  
Methods of medication administration | • Pharmacists need a working knowledge of how palliative cancer care medicines can be administered and used in the home.  
• The pharmacist's background in the pharmacology and pharmacokinetics of medicines can facilitate the use of optimal dosage forms (formulations) and routes of administration in palliative care medicine.  
• An adequate supply of appropriate products, equipment and information for the delivery of palliative cancer care medicines, by a variety of routes, needs to be provided.  
• Pharmacists need to be able to advise the patient and carer/family on the storage, safety and disposal of medicines and products. | 1 hour                     |
| Module 7  
Access to palliative cancer care medicines | • Ensure patients have timely access to required quantities of medicines.  
• Communicate and collaborate with other members of the palliative care team to ensure access and uninterrupted supply of medicines, including those medicines prescribed off-label.  
• Medication regimens may change frequently and may require 'urgent' supply of new medicines. | 1 hour                     |
| Module 8  
Psychosocial care | • Cancer creates or un masks the threat of suffering and death, both of which have significant psychosocial sequelae on the patient and the carer/family.  
• Patients and families with cancer have a higher incidence of:  
  o depression  
  o anxiety  
  o existential concerns  
  o guilt  
  o anger  
  o grief  
  o suicide  
• Family members also experience anticipatory grief, and bereavement.  
• Many primary carers express satisfaction with their role; however, others experience caring as a burden (caregiver burden).  
• Some cancer patients are at an increased risk of delirium and the carer/family usually suffers along with the patient.  
• The patient’s social and cultural background influences the psychological response.  
• The pillars of care are:  
  o active listening  
  o psycho-pharmacology  
  o effective triage | 1 hour                     |
Table 12 continued: The modules and key messages for the online educational program

<table>
<thead>
<tr>
<th>Modules</th>
<th>Key messages</th>
<th>Estimated time allocation</th>
</tr>
</thead>
</table>
| Module 9 Communication with patients, carers and families | • Effective communication can positively affect the psychological and physical status of the patient and their carer/family.  
• Communicating effectively with the patient and their carer/family assists health care practitioners to understand and obtain a ‘complete picture’ of the patient’s physical and psychosocial health status.  
• In palliative cancer care there is often the need to ‘speak the unspeakable’.  
• Effective communication refers both to the technique of communication and the content of the communiqué. | 1 hour |
| Module 10 Ethical issues | • The principles of human health care ethics provide background guidance, rather than discreet answers, to ethical questions in clinical practice.  
• Ethical questions require consideration of the unique aspects of the situation.  
• The process of communication is the most important tool in working toward a resolution of a clinical dilemma. With good communication, the varying perspectives and concerns of each party can be understood and acceptable solutions explored.  
• Personal values and beliefs affect ethical decision-making. | 1 hour |
| Module 11 Working in partnerships to enhance patient care | • Working in multiple partnerships is akin to multidisciplinary care, and is integral to the philosophy and provision of palliative care  
• A partnership approach enhances patient care.  
• Working in partnership means different things to different people.  
• The pharmacist is a key member of the palliative cancer care team.  
• The pharmacist has a role to play in contacting other members of the health care team, and in responding to requests from other members of the palliative cancer care team.  
• Review and assessment of the effectiveness of medicines is crucial.  
• Reviewing one’s own practice is important in evaluating the partnership approach. | 1 hour |

In conclusion, the nominal group technique was a valid and reliable research instrument\(^{[143, p.278-279]}\) for eliciting additional information and reaching consensus among the individual group members, and across health care stakeholder groups about the educational needs of community pharmacists in palliative cancer care. The highly structured process, which included mathematical calculation of participants’ individual judgements, was able to be replicated across the three groups\(^{[71] \text{pp.33 and 110}}\).

There are limitations, however, in using the nominal group process. The nominal group technique\(^{[144]}\):
1. Requires advance preparation, which means that it cannot be a spontaneous technique.
2. Can be time-consuming.
3. Tends to be limited to a single purpose, single-topic meeting.
4. Needs agreement from all participants to use the same structured method, which some people might resist.

To overcome limitation 2), the facilitators needed to be efficient and time-wise in conducting the nominal group process, with a view to obtaining comprehensive and quick results without burdening participants. Therefore, the technique was piloted, and it was thought that two hours, the ideal duration reported in the literature\(^{(148)}\), would be sufficient to conduct each nominal group. The researchers did adhere to the two hour timeframe, however, in doing so, had to refine the process. Thus, the key messages were identified, but not ranked (Section 3.1.3.5.2). To address limitations 3) and 4), participants were provided with information on the aims of the nominal groups before the meeting (Section 3.1.3.5.1). They were also informed that the nominal group technique would be used, and were comfortable with being involved in such a structured process. Providing this information to participants allowed them to focus their deliberations. Participants were also briefed about the nominal group process at the beginning of the meetings (Section 3.1.3.5.2). Finally, although limitation 1) holds true, the outcomes gained outweigh the time and effort that were required for preparation. Using other interactive processes (e.g. brainstorming, the Delphi technique) may have engaged participants in spontaneous dialogue, but would have been less effective in identifying the expert individuals’ preferences for the modules and key messages to be included in the educational program.

It is hoped that the findings of this part of the project will increase the confidence of other researchers, particularly healthcare educators, in using the nominal group process, in combination with other methods as part of the iterative research process, to aid decision-making regarding the selection of content material in the earlier stages of educational program design.
4.2 Stage 2: Development, review and delivery of educational program

4.2.1 The educational program

The CD-ROM of the online educational program is attached in a pocket to the front page of this report.

The process for the development, review and delivery of the online educational program is discussed in Section 3.2. The results of conducting the program are reported in the following section.

4.2.1.1 Completion of the educational program

Table 13 reports the number of pharmacists who completed the educational program from 15th March to 31st July 2005. Nine of Educational Group pharmacists who completed the program were from rural communities.

<table>
<thead>
<tr>
<th>Group</th>
<th>Commenced</th>
<th>Completed</th>
<th>Part-Completed</th>
<th>Withdrew</th>
</tr>
</thead>
<tbody>
<tr>
<td>Educational Group</td>
<td>50</td>
<td>30 (60%)</td>
<td>4 (8%)</td>
<td>16 (32%)</td>
</tr>
<tr>
<td>Evaluation Test Group</td>
<td>10</td>
<td>4 (40%)</td>
<td>3 (30%)</td>
<td>3 (30%)</td>
</tr>
</tbody>
</table>

Feedback from the pharmacists (from both groups) who partly completed the program indicated that annual leave, conference attendance, and home and work commitments, particularly where they were also responsible for running a pharmacy, prevented them from completing the program, even within the extended timeframe (Refer to Section 3.2.3.5.1). Those pharmacists who withdrew from the program, either before the commencement date, or very soon after commencing, gave similar reasons for not participating in the program: annual leave, conference attendance, and home and work commitments, however, one of the Educational Group pharmacists became ill, and withdrew. In addition, another Educational Group pharmacist withdrew from the program because of frustration with the online and electronic format. Whilst acknowledging that there was a print facility, this participant preferred the program to also be presented in hard copy format. The three Evaluation Test Group pharmacists who withdrew from the program, and worked in the same pharmacy, chose not to complete it following the death of their designated palliative care patient.

While any conclusions from such a small and unmatched sample size can only be tentative, it is important to note that 60% of the pharmacists in the Evaluation Test Group did not complete the educational program, whereas 60% of the Educational Group pharmacists did complete the educational program. As discussed in Section 3.2.3.3, the pharmacists who participated in the Evaluation Test Group were invited to undertake the program once the patient/carer visiting their pharmacy had agreed to participate in the study. In contrast, the Educational Group pharmacists registered their interest in undertaking the program following their participation in the earlier survey (Refer Section 3.1.2). Thus, the Educational Group pharmacists appeared to be self-motivated and had a desire to undertake the educational program and regularly use it as an information
source, even without interacting with specifically allocated patients/carers. On the other hand, a number of the Evaluation Test Group pharmacists appeared to be interested in undertaking the program only because the palliative care patient/carer visiting their pharmacy had agreed to participate. This group of pharmacists seemed to only want to refer to the educational material on a needs-basis; that is, if and when their patient/carer presented with a specific medication-related problem.

### 4.2.1.2 Process of working through the program

This section reports on the process of working through the program, based on web site data as well as comments provided by a number of the participants. An unanticipated result of providing support and communicating periodically with the pharmacists as they worked through the program (Section 3.2.3.5) was that they offered feedback about the program.

The information in this section is in addition to the findings obtained from the formal evaluation of the program via the Post-program Evaluation questionnaire (Refer Section 4.3.5).

#### 4.2.1.2.1 Accessing the web site

Fifty participants accessed the web site, a total of 861 times (including weekends), from 15th March to 31st July 2005. Those participants who completed the program \((n = 34)\) went online from 3 to 53 times; 53% of whom logged on from 21 to 40 times. Those who infrequently accessed the program online, undertook most of it from the CD-ROM instead.

The online activity data revealed that the web-based mode of delivery of the educational program provided a mechanism for pharmacists to work at a time most convenient for them, during the day or night and over a 24-hour period. Table 14 shows the number of different participants who accessed the web site during weekends (Saturdays and Sundays) and from 8am to 7.59pm, and from 8pm to 7.59am, Eastern Standard Time. The data was not able to provide information, however, about whether pharmacists' were working at a pharmacy or from home during these times.

Table 14 data includes those participants who completed the program as well as those who did not. All of the participants accessed the web site between 8am and 7.59pm (usual working hours), and the majority of participants also accessed the web site during weekends and between 8pm and 7.59am (outside usual working hours).

**Table 14: Times when pharmacists accessed the web site**

<table>
<thead>
<tr>
<th>Number of different participants</th>
<th>Number of times the web site was accessed from 15th March to 31st July 2005</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Weekends</td>
</tr>
<tr>
<td>33</td>
<td>139</td>
</tr>
<tr>
<td>50</td>
<td>-</td>
</tr>
<tr>
<td>30</td>
<td>-</td>
</tr>
</tbody>
</table>

* Includes weekends

**Improving medication management of palliative care patients, 2005**
Whilst the program commenced on 15th March and officially completed on 30th June 2005, the data revealed that 31 participants accessed the web site after 30th June, a total of 93 times. Accessing the website after the official completion date may have been due to:

- Some pharmacists still completing the program.
- Resourcing the program to answer the Post-knowledge questionnaire (which was allowed).
- Completing the online Program Evaluation questionnaire.
- Using the program as a resource.

These results indicate that the pharmacists accessed the online program during day-time and night-time hours and over weekends. Thus, the objective of providing a flexible educational program was achieved and pharmacists could learn whenever it suited them most.

**4.2.1.2.2 Participation and engagement with Notice Board activities**

The aim of the Notice Board activities was to provide a mechanism for engagement with the learning material and self assessment, therefore responses were deliberately anonymous, and recommended answers were provided. The responses to these activities were not designed to be reviewed or ‘marked’ by anyone other than the participant. Consequently, the aim was not to identify which participant responded, or how often. Initially, to encourage interaction, the participants could not view the Notice Board responses until they submitted a response themselves. However, an issue raised in the Discussion Group by one of the pharmacists who had already submitted responses, indicated that they found it time-consuming to submit again and again, before they could view others’ responses. As a result, the Notice Board was changed to allow participants to view responses without posting a response themselves. Afterwards, participants may have accessed the Notice Board to read other participants’ responses without having responded themselves.

Twenty-two of the activities in the program requested participants to anonymously submit their response to the Notice Board. There were from 22 to 39 responses to each of the various activities, with a mean number of responses of 28.4 per activity. Following periodic review of the responses to the Notice Board activities it became apparent that a number of participants were using the Notice Board more as an interactive forum, for example, for asking questions. Consequently, the Project Manager and the moderator responded on three occasions to the Notice Board comments.

The Notice Board data showed that there was a high level of engagement by the participants who responded to these activities, and that the activities were indeed used as a learning tool. For example, one participant who stated that they did not know the answer to a question, referred to other responses as well as the suggested answer, and then, in their own words, recommended the appropriate management. The majority of responses given were similar to the suggested answers, and were in accordance with accepted practice. However, two of the responses to a wound management question were of concern: one participant indicated that they would use a contraindicated dressing for a fungating wound, and another indicated that they did not know how Nilodor was used, stating that they were “not sure if it may irritate the wound”. Where the level of engagement appeared low, the responses were not focused on the question asked, or
they were vague and did not address the issue being raised. In addition, in response to one of the early reflective activities, one participant wrote: “subscribed to this program to give me pharmaceutical knowledge of for example dose combinations etc”. This response may have been an indication that the respondent did not expect the program to cover issues such as communication and working with doctors, nurses and other community pharmacists, which an important component of working in multi-disciplinary teams to achieve quality patient care.

Additionally, informal feedback from one of the participants indicated that they gave up on using the Notice Board, because they could not access it. On further questioning, this participant realised that they were trying to submit to the Notice Board from the CD-ROM, which was not possible off-line. Unfortunately, this was not revealed until after the program had been completed; thus, it is not known how many other participants may have also tried to do this, contrary to the written directions and table that had been provided (Refer Appendix V and Table 3).

Refer to Section 4.3.5.3.3 for the results of the Post-program Evaluation questionnaire related to the Notice Board.

4.2.1.2.3 Participation and engagement with the interactive, moderated Discussion Group

The aim of the interactive, moderated Discussion Group was to encourage collaboration, consultation and networking among participants, with input from expert palliative care specialists, in order to address day-to-day professional practice issues related to community pharmacy and palliative cancer care.

Ten topics were placed in the Discussion Group at the commencement of the program (Table 15). A General questions and answers topic provided a mechanism for participants to ask questions related to community pharmacy and palliative cancer care, stimulated by the program material. The moderator monitored the Discussion Group, and the results indicated that on two occasions participants’ questions were referred to others; one to an oncologist and another to a radiation oncologist who specialised in gynaecology. This mechanism for asking questions and having them answered promptly by palliative care specialists was shown to be a valuable feature of the moderated Discussion Group facility and an important component of this educational program.

The topics, Electronic learning material and Finding the time, were included because many of the participants had not participated in online educational instruction before. As they were also very busy people, the researchers wanted to quickly address any issues they may have had. For example, the issue of not being able to view the Notice Board responses without submitting a response was raised and dealt with promptly, using the Electronic learning material topic area. The other seven topics were included because they were raised as learning activities within the program modules. While no new major topics were created by the participants, sub-topics were created as issues emerged under the major topics present (Table 15).
Table 15: Discussion Group topics and sub topics: Number of replies and number of times viewed

<table>
<thead>
<tr>
<th>Topics and sub topics where comments were made by participants</th>
<th>Number of replies</th>
<th>Number of times viewed</th>
</tr>
</thead>
<tbody>
<tr>
<td>General questions and answers:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Nausea and vomiting</td>
<td>0</td>
<td>12</td>
</tr>
<tr>
<td>• Module 10.5</td>
<td>0</td>
<td>11</td>
</tr>
<tr>
<td>• Medication deliveries</td>
<td>1</td>
<td>35</td>
</tr>
<tr>
<td>• Saliva Production &amp; radiotherapy</td>
<td>1</td>
<td>23</td>
</tr>
<tr>
<td>• Possible problems in service delivery</td>
<td>2</td>
<td>56</td>
</tr>
<tr>
<td>• Palliative Care Nursing Services</td>
<td>5</td>
<td>74</td>
</tr>
<tr>
<td>• Chemotherapy's effect on the vagina</td>
<td>2</td>
<td>31</td>
</tr>
<tr>
<td>• Breast cancer statistics</td>
<td>1</td>
<td>16</td>
</tr>
<tr>
<td>• Recognising depression</td>
<td>1</td>
<td>14</td>
</tr>
<tr>
<td>Duty of care:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Legal and admin requirements</td>
<td>3</td>
<td>59</td>
</tr>
<tr>
<td>• CAM duty of care**</td>
<td>3</td>
<td>42</td>
</tr>
<tr>
<td>• Medication reviews</td>
<td>0</td>
<td>16</td>
</tr>
<tr>
<td>Communication with Non-English speaking patients:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Non English speakers -a solution?</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>Complementary and alternative medicines:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• CAM beliefs</td>
<td>7</td>
<td>66</td>
</tr>
<tr>
<td>• Duty of care &amp; CAM**</td>
<td>0</td>
<td>17</td>
</tr>
<tr>
<td>Cost issues for patients:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Cost of medication</td>
<td>8</td>
<td>54</td>
</tr>
<tr>
<td>Morphine 400mg</td>
<td>1</td>
<td>13</td>
</tr>
<tr>
<td>Off-label use of medicines:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Off label issues</td>
<td>4</td>
<td>47</td>
</tr>
<tr>
<td>• Tramadol</td>
<td>1</td>
<td>8</td>
</tr>
<tr>
<td>• Unknown</td>
<td>0</td>
<td>13</td>
</tr>
<tr>
<td>Opioid supply requirements:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Activity 3H discussion group</td>
<td>7</td>
<td>67</td>
</tr>
<tr>
<td>Electronic learning material:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Using the Discussion group for learning</td>
<td>2</td>
<td>21</td>
</tr>
<tr>
<td>• Finding your way around</td>
<td>0</td>
<td>10</td>
</tr>
<tr>
<td>• Notice Board</td>
<td>6</td>
<td>91</td>
</tr>
<tr>
<td>Pharmacy palliative care services:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Palliative care services</td>
<td>3</td>
<td>46</td>
</tr>
<tr>
<td>Finding the Time:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Going to be away for part of the time</td>
<td>0</td>
<td>23</td>
</tr>
<tr>
<td>Totals</td>
<td>58*</td>
<td>869*</td>
</tr>
</tbody>
</table>

*These numbers include replies and viewing by the Project Manager and moderator in monitoring the activity of the Discussion Group.

**Sub topics were of similar names, but the focus of the material covered was different.
Data from the web site showed that 15 participants made comments or raised issues in the Discussion Group from 1 to 8 times, with a mean of 3.2. In addition, comments were also made by the moderator \( n = 23 \), the project manager \( n = 16 \) and the web designer \( n = 3 \). Based on data from the web site, Table 15 also shows that 18 of the 26 topics/sub topics received a total of 58 replies. All of the topics/sub topics were viewed; a total of 869 times. The researchers were not able to determine, however, whether the topics were simply viewed, or whether reading and engagement with the material occurred, because log-on/log-off times were not recorded by the web site. In addition, the web site data did not differentiate the number of replies and number of times viewed by the Project Manager and the moderator, and consequently, these numbers are included.

Analysis of the interactions from the Discussion Group data revealed that very little consultation occurred. Collaboration and networking among the participants did not appear to occur at all; a finding which was also reported by one of the participants in the Program Evaluation questionnaire (Appendix AJ, Question 17b). Thus, the majority of the participants appeared to be reluctant to make comments or raise issues themselves, but they were motivated to read the postings of others (Refer Table 15).

Refer to Section 4.3.5.3.3 for the results and further discussion of the Post-program Evaluation questionnaire related to the Discussion Group.

4.2.1.3 Impact of the program

A number of participants \( n = 6 \) were eager to share their experiences, and this was done by email while they were working with the program (Refer Section 4.2.1.2). Of particular note, was the impact the program was already having on their practice. The following examples of how pharmacists were implementing their new learning were provided by the pharmacists:

- Able to answer questions about drug use and constipation with confidence.
- Suggested to a doctor that he tried patient on Endone first, as although Fentanyl was out of stock, I knew it was not appropriate as a starting point, and if Endone was OK but a lot was needed, it could still be used as breakthrough (with Fentanyl). Didn’t know that before.
- Feel confident that I know where to find the information, if not at my fingertips.
- Spoke to local palliative care nurse to try and find out what resources they have in [name of rural area].
- Both my business partner and I are doing the study, and this has brought us closer together.
- I’ve got a 52 year old male patient who has a recent diagnosis of advanced prostate cancer. I’ve been practicing sitting down with him, giving my full attention with no time limit. Also, his pain was being managed with Mist. Morphine, so was able to help with getting him onto some MS Cont in with Ordine for breakthrough pain.
- Basically just been giving people as much time as the want to talk, sitting with them, and I feel more able to counsel and be empathetic.
- More tuned in to the palliative care area now, and feel I can communicate better with doctors, patients etc now I have more knowledge and information behind me. Made me more confident in talking with patients on a personal level when talking about their concerns and worries etc whereas I wouldn’t have felt as comfortable before hand.
- I’ve been able to advise one customer going through chemo on treatment options for mucositis and dry mouth and another on vaginal dryness and its treatment.
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- Customer requested information on how to counter-act nausea from morphine. Was hoping that milk may help. Advised that she may try ginger but does not like the taste, reluctant to take the Travel Calm Ginger. Suggested she talk to doctor regarding Maxolon.
- Customer with prostrate cancer now moving onto MS Contin from Oxycontin. Have a better insight into his treatment and prognosis.
- Recommended palliative care to 2 customers yesterday....had to explain everything.
- I am now bookmarked as a member of a web site that I found most informative.
- When I mentioned that I was doing this course to a number of customers it produced lots of questions from many more people than I imagined. The rippled effect is quite amazing and I know I was able to help guide a few people.

Further results on how the program impacted on the pharmacists and stakeholders are reported in the next section: Section 4.3: the implementation trial and evaluation.
4.3 Stage 3: Implementation trial and evaluation of the educational program

The implementation trial involved evaluation of the impact of the educational program on:

- Pharmacists’ knowledge in palliative cancer care: The knowledge of pharmacists in the Educational Group, and the Evaluation Test and Control Groups, was assessed.

- Pharmacists’ satisfaction with the educational program: The opinions of pharmacists in the Educational Group and the Evaluation Test Group were sought soon after they completed the program, and again at 3-months following completion of the program, regarding their satisfaction with the program content and presentation.

- Pharmacists’ interactions with their designated palliative care patients and carers: Interventions made by pharmacists in the Evaluation Test and Control Groups were assessed. Researcher-administered questionnaires were also conducted with the patients and carers.

These methods are discussed in Section 3.3 and the results are reported in this section.

4.3.1 Results and Discussion of recruitment of Evaluation Test and Control Group pharmacists and their palliative care patients/carers

Figure 7 shows the number of patients/carers and pharmacies/pharmacists who:

- Were approached and agreed to participate in the project from October 2004-February 2005.

- Could continue to participate in the project, as of June 2005, when the implementation trial was nearing completion (i.e. when pharmacists in the Evaluation Test Group were due to complete the educational program).

These results show that the sample size of patients/carers who were approached to participate in the researcher-administered questionnaire was 9, and the sample size of the Evaluation Test Group was 10 pharmacists in 7 pharmacies, and 8 pharmacists in 7 pharmacies for the Evaluation Control Group. Therefore, based on the original sample size calculation of 30 pharmacies that were required to enable statistical comparisons between the two Evaluation Groups in the implementation trial (Refer to Section 3.3.3.3), there was a shortfall of 16 pharmacies. These small sample sizes of patients/carers and pharmacists were the main limitation of the research project (Refer to Section 6 for further details), as they did not provide enough power to conduct the statistical analyses that were required.

The small sample size of patients/carers and Evaluation Group pharmacists was due to ethical considerations which impacted on the method required for recruitment. That is, patients/carers were first recruited, who then identified their pharmacy/pharmacist for participation. If the patient/carer did not agree, the pharmacy could not be approached to participate, and vice-versa. Hence, a double-bind situation occurred. Further, as patients died, the motivation and number of pharmacists who were interested in, and continued to participate, decreased. This in turn limited the type of statistical tests that could be
performed on the data obtained from the different methods used to evaluate the impact of the educational program on pharmacists and patients/carers.

The problems encountered in recruiting both patients/carers and pharmacies/pharmacists into the project are summarised below, and are discussed further in Section 6.

- Gatekeeping: The MWPC nurses were very protective of their patients. They perhaps felt that the researcher would coerce the patient into taking part in the project. During early communication with the nurses however, the researcher made it clear that the researcher would be guided by the nurses in determining whether or not a patient/carer was suitable for the project, and only then would the researcher approach the patient/carer to participate. It was not until the nurses eventually allowed the researcher to visit with them, that the nurses realised that there was no exploitation of the patient/carer by the researcher.

- Attrition and appropriate timing: A high attrition rate (79%) of patients/carers was witnessed - less than a month after the commencement of the educational program, 33 of the 42 patients/carers who had agreed to participate could not, as the patient died and/or their pharmacist declined participation. Attrition of pharmacists also occurred when their designated patient died; they lost motivation to continue doing the educational program if they were in the Evaluation Test Group. The attrition of patients/carers, and consequently pharmacists, that occurred, between the commencement of recruitment to the commencement of the educational program, meant that more time was needed to recruit more patients/carers to obtain the sample size desired (Refer to Section 3.3.3.3). Hence, time became an issue. If the recruitment period wasn’t extended, it would have been likely that even the small number of patients/carers and pharmacies/pharmacists who agreed, and could participate, wouldn’t have been obtained.

- Study site: Although the western suburbs of Melbourne encompass a relatively large geographical area, a wider geographical area, encompassing a number of palliative care services may have resulted in the achievement of a larger sample size. Conducting a multi-centre study, however, was not within the scope of this project.

Similar difficulties have been experienced in other palliative care studies\(^{(96, 146-148)}\). The researchers involved in these studies suggest that overcoming these methodological and ethical challenges is not easy, given the nature of the illness and priorities of the patient, their carers (including health professionals) and family. Achieving a statistically significant number of patients/carers and pharmacies/pharmacists was not successful in this project mainly because of attrition and gatekeeping by nurses. In an attempt to overcome this, the researchers monitored the recruitment rate, and in response, modified the recruitment strategies used. An alternative approach would have been to invite pharmacists in western metropolitan Melbourne to participate, who then identified and recruited suitable palliative care patients visiting their pharmacy. However, this method may not have been approved by the ethics committees involved in the project, as patient/carer privacy issues may have been seen to have been breached. Future studies should consider broader multi-centre participation, allow for significant attrition when calculating sample size, and define inclusion criteria that can ensure a reasonable length of follow-up.
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Figure 8: Number of patients/carers and pharmacies/pharmacists approached, agreed, and could continue to participate in the implementation trial.
4.3.2 Documentation and assessment of pharmacists’ interventions

The aim of the Evaluation Test and Control Group pharmacists’ documenting their interventions and having these externally reviewed was to determine the impact of the program on the practice of pharmacists, as well as patient care, as compared with those who did not participate in the program. The method is discussed in Section 3.3.4 and the results are reported in this section.

4.3.2.1 Expert Review Panel characteristics

Seven practitioners from both hospital and community settings participated in the Expert Review Panel. The gender characteristics of the group are shown in Table 16. The majority of practitioners were experienced in palliative care; the average number of years of experience was 8 (Table 17).

Table 16: Expert Review Panel characteristics: Gender

<table>
<thead>
<tr>
<th>Gender</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pharmacists</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Doctors</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Nurses</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>3</td>
<td>4</td>
<td>7</td>
</tr>
</tbody>
</table>

Table 17: Expert Review Panel characteristics: Areas of practice and palliative care experience

<table>
<thead>
<tr>
<th>Areas of practice at the time of participation</th>
<th>Number of stakeholders</th>
<th>Average years of palliative care practice</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pharmacists</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hospital pharmacy</td>
<td>1</td>
<td>Hospital pharmacy = 16</td>
</tr>
<tr>
<td>Community pharmacy</td>
<td>1</td>
<td>Unable to be determined for community</td>
</tr>
<tr>
<td>Risk management</td>
<td>1</td>
<td>pharmacy &amp; risk management because of the</td>
</tr>
<tr>
<td></td>
<td></td>
<td>irregularity of presentation of palliative</td>
</tr>
<tr>
<td></td>
<td></td>
<td>care patients. However, the risk management</td>
</tr>
<tr>
<td></td>
<td></td>
<td>pharmacist indicated that their previous</td>
</tr>
<tr>
<td></td>
<td></td>
<td>experience in oncology and neurosciences</td>
</tr>
<tr>
<td></td>
<td></td>
<td>as a hospital pharmacist has them given</td>
</tr>
<tr>
<td></td>
<td></td>
<td>exposure to some patients.</td>
</tr>
<tr>
<td>Doctors</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Palliative care specialist</td>
<td>1</td>
<td>16</td>
</tr>
<tr>
<td>Palliative care specialist &amp;</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>General practice (GP)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nurses</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Palliative care hospital</td>
<td>1</td>
<td>16</td>
</tr>
<tr>
<td>Palliative care community</td>
<td>1</td>
<td>4</td>
</tr>
</tbody>
</table>
4.3.2.2 Number of interventions

Table 18 indicates that a total of 17 interventions were received from pharmacists during the study period.

Table 18: Total numbers of interventions received from pharmacists

<table>
<thead>
<tr>
<th>Group</th>
<th>Pre-program</th>
<th>During the program</th>
<th>Post-program</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evaluation Test</td>
<td>7</td>
<td>5</td>
<td>0</td>
<td>12</td>
</tr>
<tr>
<td>Evaluation Control</td>
<td>4</td>
<td>1</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>Total</td>
<td>11</td>
<td>6</td>
<td>0</td>
<td>17</td>
</tr>
</tbody>
</table>

4.3.2.3 Reasons why interventions were not being received from pharmacists

Pharmacists gave the following reasons for why they were not intervening or had not made any further interventions:

- The patient/carer rarely visits the pharmacy because they are in hospital or have gone on holiday.
- There is no need to intervene as:
  - The patient/carer is happy with their treatments and has no issues requiring attention.
  - Prescriptions brought in are mainly repeats.
  - The palliative care nurse is “looking after everything.”
  - There wasn’t much time between when the study commenced and the patient passed away.

4.3.2.4 Descriptive analysis of each intervention

Appendix AL and Appendix AM describe each intervention made pre-program and during the program, respectively. Appendices AL and AM include:

- The group the pharmacist was assigned to.
- The type of drug-related problem (DRP) detected by the pharmacist.
- A description of the problem.
- The pharmacist’s recommendation to resolve the problem.
- Whether the pharmacist’s intervention was accepted.

These results show that various types of drug-related problems were detected and resolved by pharmacists. The majority of problems (15 of 17 interventions) related to the patient having difficulties in obtaining, or inappropriately using, medicines required for...
symptom control, where the pharmacist provided verbal counselling, recommended an appropriate over-the-counter product, or consulted with the doctor to resolve the issue. This is not unusual given that many palliative care patients and their carers have reported not feeling confident about how to use medicines\(^{(36)}\). In addition, problems in accessing medicines because of sparse availability and cost\(^{(37)}\) are major barriers to the provision of care by health professionals.

Another barrier experienced by one of the pharmacists (Appendix AL, Intervention 1) was difficulty in communicating with the patient’s specialist, who seemed unapproachable and very rushed. This illustrates the importance of communication and liaison amongst the various hospital and community-based health professionals involved in the care of the patient, so that problems are addressed and resolved in a timely manner. Inadequate collaboration between members of the palliative care team has been identified in the literature\(^{(37)}\) as another major barrier to the delivery of good patient care.

Appendix AL and AM also illustrate that all of the interventions made by the pharmacists to resolve problems were accepted by the person (patient/carer/doctor) with whom the intervention was made. The 100% acceptance rate achieved in this study compared favourably with previous reports of 82.9\%\(^{(38)}\), 83\%\(^{(39)}\), 85.7\%\(^{(40)}\), 86.7\%\(^{(41)}\), 89\%\(^{(42)}\), and 97.0\% in various settings. However, as all of the documented interventions were accepted, it is not known whether pharmacists deliberately avoided not recording interventions that were not accepted or were partially accepted, even though they were asked to do so by ticking the relevant box in the intervention tool.

### 4.3.2.5 Descriptive analysis of the Expert Review Panel’s assessment of each intervention

Appendix AN details the results of the Expert Review Panel assessment process for each intervention:

- The group the pharmacist was assigned to.
- The actual or potential consequence or impact (range given) of the scenario or event if the pharmacist did not intervene.
- The likelihood of the scenario or event re-occurring (range given) for the same patient or for a different patient.
- The classification of risk (range given) based on the consequence/impact and the likelihood of re-occurrence, where the higher the risk, the more significant the pharmacist’s intervention.
- Comments made by Panel members, indicating the reasoning for their judgements and any issues identified during the assessment of the intervention.

These results show that there was a moderate degree of variability in the members’ assessments of the level of risk associated with all interventions. This was particularly prominent for interventions 6 and 15 where the risk was judged to be from low to extreme. Variability in assessment was expected, as risk is a subjective measure, and assessment is based on the individual’s knowledge and experience. The descriptors of consequence and likelihood were not rigid, thus further increasing subjectivity, and hence, variability. The researchers did not attempt to decrease variability however, and the Panel was not asked to arrive at a consensus decision, as reviewers in other studies\(^{(59, 118)}\) have done.
This was because each individual’s judgement was considered equally important and valid in the determination of the overall significance of the intervention. Whilst variability existed, however, the results of the assessment process additionally demonstrate that risk is a satisfactory measure to assess the significance of interventions made by pharmacists in the community and even hospital setting, and may be preferred over the consequence or ranking scales used in other studies\(^59, 117-119\).

It can also be seen that the majority of interventions were judged as having a high to extreme level of risk. Therefore, pharmacists’ interventions were deemed significant: if the pharmacist hadn’t intervened, negative outcomes related to symptom control, patient/carer welfare and/or cost may have resulted. For the majority of interventions, however, the Panel did not agree with the pharmacist’s decision and felt that enough was not done to adequately resolve the drug-therapy problem. This issue, along with others identified by the Panel during the assessment process, are described below.

### 4.3.2.5.1 Insufficient detail regarding the intervention

Even though the Panel was presented with the patient’s age, cancer diagnosis and medication history, they still felt that there was not enough background information about the patient and the interaction that occurred, to aid their assessment of some of the interventions.

The Panel wanted to know more about interventions 2, 5, 6, 8-11, and 14 (Refer to Appendix AO). Interventions 2, 5, 6, 11 and 14, and interventions 8-10, involved two different pharmacists, who interacted with the same patient on seven, and three, different occasions, respectively, throughout the entire study. These two pharmacists were contacted by telephone to obtain further information about the interventions; the information gathered is presented in Appendix AO. The researchers contend, however, that it is unlikely that the additional information obtained from these pharmacists had the potential to change the original assessment made by the Panel.

### 4.3.2.5.2 Lack of agreement with the pharmacist’s decision

Some Expert Review Panel members did not completely agree with the pharmacist’s decision (interventions 1, 2, 5-7, 9, 11 and 13-15). The reason for the difference in opinion between the Panel and the pharmacist are detailed in Appendix AN.

For example, the Panel felt that although interventions 2, 4-6, 11 and 14-17 were appropriate when examined as an isolated event, when reviewed in context, the pharmacist did not holistically review the patient, their symptoms and the medicines they were taking, to ensure continuity of care.

### 4.3.2.5.3 Intervention was a part of the pharmacist’s routine provision of care

Some Expert Review Panel members thought that some interventions (Appendix AN, 7-10 and 16-17) were a component of the pharmacist’s routine provision of care. These interventions involved the pharmacist offering drug information, contacting the GP for a prescription requested by the patient/carer, or delivering medicines to the patient’s home.

Table 19 summarises the significance of interventions (based on their classification of risk) made by pharmacists in the Evaluation Test Group, compared to those made by
pharmacists in the Evaluation Control Group. These results suggest that there was no apparent difference between the significance of interventions in the two groups of pharmacists. The most plausible reason for the lack of difference is the small and unequal sample of pharmacists with whom the implementation trial was carried out (Refer to Figure 7). Consequently, findings from the documentation and assessment of interventions data are inconclusive regarding whether or not the educational program impacted on the quality of the interventions carried out.

Although the educational program did not appear to impact on the significance of pharmacists’ interventions, the ability and confidence of pharmacists to detect and resolve drug-therapy problems may have increased as a result of their increased knowledge, as there appeared to be more interventions made by the Evaluation Test Group during the program (Refer to Table 18). This is not conclusive however, as there was a small number of pharmacists who participated in the implementation trial, and statistical analyses could not be performed on the intervention data. Pharmacists in the Evaluation Test Group, however, reported feeling more capable and better equipped to deal with palliative care patients and carers in general. This effect could not be sustained though, until one month after the program finished, because pharmacists’ patients had passed away. Pharmacists stated that for those patients who were alive the patient/carer was not visiting the pharmacy as they became progressively ill and bed-bound at home, or were hospitalised.
Table 19: Comparison of the significance of interventions made by pharmacists in the Evaluation Test and Control Groups

<table>
<thead>
<tr>
<th></th>
<th>Significance of intervention based on classification of risk* by Expert Review Panel</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Evaluation Control Group</td>
<td>L-M</td>
</tr>
</tbody>
</table>

*Classification of risk is defined as:
L - Low
M - Moderate
H - High
E - Extreme
4.3.3 Post-program patient/carer questionnaires

The aim of conducting a researcher-administered patient/carer questionnaire was to assess their medication knowledge, recall of medical information and interaction with pharmacists from both the Evaluation Test and Control Groups. The method regarding the administration of the questionnaire is discussed in Section 3.3.5 and the results are reported in this section.

Of the nine patients and/or carers (Refer to Section 4.3.1.3.1) who were invited to participate, six patients/carers consented. Those who declined participation were too ill, were undergoing treatment, or no longer visited the same pharmacy as they did at the beginning of the study.

Five of the six patients and/or carers completed the researcher-administered questionnaire. The remaining patient died before the date of participation.

Table 20 shows the demographic details related to each questionnaire. The number of pharmacists represents the number who worked at the pharmacy visited by the patient/carer and participated in the project.

Although differences in the medication knowledge, recall of information, and interactions of Evaluation Test and Control Group patients/carers could not be determined, the questionnaires in general, elicited important information related to these three aspects.

Results of participants' medication knowledge and recall of medical information are presented in Appendix AP. These results demonstrate that the medication knowledge and recall of medical information of this group of palliative care patients/carers was very good. This is in contrast to previous studies\(^ {36, 44, 45} \) of palliative care patients and carers, where poor knowledge and understanding of medicines, especially pain-relievers, have been reported.

It can also be seen from Appendix AP that although some of the participants indicated that they contacted the pharmacist for "advice on the management of unwanted effects of medicines", the usefulness of this advice was found to be variable. The pharmacist of the patient/carer in questionnaire 1 for example, did not undertake the educational program (Table 20), which provides detailed information on the management of constipation; the symptom for which they were asked advice. It is of concern that the remaining patients/carers who did not consult their pharmacist for advice about side effects and drug interactions, were unaware that they could, given that symptom management advice is an important role for community pharmacists in palliative care\(^ {49-51} \). Consumer education of the services that community pharmacists can provide to those people requiring palliative care is urgently needed (Refer to Recommendations, Section 8).

The results also show that polypharmacy was evident in patients in this study, with an average number of seven medicines being taken. Polypharmacy has been previously documented in palliative care patients\(^ {46} \), and often results in non-adherence. One study\(^ {45} \) reported that 60% of palliative care patients do not take their medicines, for various reasons such as unwanted effects. In this study, one patient reported forgetting to take a medicine, for which the pharmacist recommended a dose administration aid. Suggesting compliance aids is another important role for community pharmacists\(^ {149} \).
Appendix AQ shows participants’ views of their interactions with the pharmacist. In four of the five questionnaires, patients/carers reported that their interaction with, and the value of information provided by the pharmacist, was excellent. This contrasts with the number of suggestions (Appendix AR) offered by the same patients/carers for pharmacists to improve their service delivery. The difference in the opinions of patients/carers may be because they didn’t want to come across as being ‘too harsh’ on the pharmacist when rating their performance. Patients/carers may have also felt that a negative rating could affect their relationship with the pharmacist. As described in Appendix AR, participants suggested that pharmacists need to leave the dispensary and hand out medicines rather than delegating this task, volunteer information rather than waiting to be asked, and provide more written information, supplemented with verbal advice. It has been suggested that most palliative care patients/carers remember very little of what was conveyed\(^{4(5)}\), and value access to written information that they can read in their own time and at their own pace\(^{4(7)}\).

Although patients/carers made several suggestions related to how pharmacists can improve their service delivery (Appendix AR), pharmacists reported that there was little opportunity to intervene or contribute to care because: patients/carers were infrequently visiting the pharmacy to collect medicines; and patients/carers were happy with their treatment and were not experiencing any problems that required intervention. This finding, described in Appendix AS, along with other information on the intervention made the pharmacist with the patient/carer who completed the questionnaire, suggests that pharmacists may not accurately perceive the extent of patient concerns regarding treatment and professional interaction issues. In essence though, the suggestions made by patients/carers were related to roles that pharmacists are expected to undertake as a part of their routine provision of care.

In conclusion, pharmacists have the potential to improve the medication management of palliative care patients beyond these basic requirements, and above what was witnessed in this stage of the project. They can utilise their expert knowledge of medicines, pharmacology and therapeutics to monitor medication regimens, liaise with other health professionals in the palliative care team, and remain accessible to, and educate patients and carers, with the view of improving the patient’s quality of life and ensuring that they are satisfied with their care.
### Table 20: Demographic details of each questionnaire

<table>
<thead>
<tr>
<th>DEMOGRAPHICS</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Person(s) who completed the questionnaire</td>
<td>Male patient&lt;br&gt;Female carer (wife)</td>
<td>Female patient&lt;br&gt;Female carer (daughter)</td>
<td>Female patient&lt;br&gt;Female carer 2 (daughter)</td>
<td>Female patient&lt;br&gt;Male carer 1 (spouse)</td>
<td>Female patient&lt;br&gt;Female carer 2 (daughter)</td>
</tr>
<tr>
<td>Group</td>
<td>Control</td>
<td>Control</td>
<td>Control</td>
<td>Control</td>
<td>Test</td>
</tr>
<tr>
<td>Age (yrs) as of December 1(^{st}), 2005</td>
<td>Both were &gt; 60&lt;br&gt;Carer : 30-39</td>
<td>Patient : &gt; 60&lt;br&gt;Carer : 30-39</td>
<td>30-39</td>
<td>Patient &amp; Carer 1 : 50-59&lt;br&gt;Carer 2 : 21-29</td>
<td>&gt; 60</td>
</tr>
<tr>
<td>Time taken (mins)</td>
<td>60</td>
<td>45</td>
<td>60</td>
<td>70</td>
<td>25</td>
</tr>
<tr>
<td>No. of pharmacists</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>
4.3.4 Pre- Post- and 3-month Post-program knowledge questionnaires

Table 21 details the sample for each of the knowledge questionnaires.

**Table 21: Number of pharmacists who completed the pre- and post-knowledge questionnaires by group**

<table>
<thead>
<tr>
<th>Knowledge questionnaires</th>
<th>Evaluation Test Group (n = 10)</th>
<th>Evaluation Control Group (n = 8)</th>
<th>Educational Group (n = 50)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-intervention</td>
<td>10</td>
<td>7†</td>
<td>47*</td>
</tr>
<tr>
<td>Post-intervention</td>
<td>4‡</td>
<td>7</td>
<td>30**</td>
</tr>
<tr>
<td>3-month Post-intervention</td>
<td>3#</td>
<td>Did not complete questionnaire</td>
<td>26#</td>
</tr>
</tbody>
</table>

† One pharmacist was not offered the opportunity to complete the questionnaire due to a typographical error of omission in sending out the questionnaires; however, this pharmacist did participate in completing patient interventions

* Three pharmacists withdrew from the study prior to completing the questionnaire

** A further 17 pharmacists withdrew from the program prior to completion

‡ Six pharmacists were not included in the post-test data analysis because they did not complete both the pre- and post-knowledge questionnaires and the entire educational program

# One pharmacist from the Evaluation Test Group and four pharmacists from the Educational Group did not return the 3-month post-knowledge questionnaire

The mean pre- and post-test scores for each group are summarised in Table 22.
Table 22: Pre- and post-test** mean scores

<table>
<thead>
<tr>
<th></th>
<th>Evaluation Test Group</th>
<th>Evaluation Control Group</th>
<th>Educational Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-test mean score (range) for given sample size</td>
<td>23.10† (17-29)</td>
<td>17.00† (8-22)</td>
<td>20.38† (15-26)</td>
</tr>
<tr>
<td></td>
<td>n = 10</td>
<td>n = 7</td>
<td>n = 47</td>
</tr>
<tr>
<td></td>
<td>23.25* (17-27)</td>
<td>17.00* (8-22)</td>
<td>21.17* (15-26)</td>
</tr>
<tr>
<td></td>
<td>n = 4</td>
<td>n = 7</td>
<td>n = 30</td>
</tr>
<tr>
<td>Post-test mean score (range) for given sample size</td>
<td>26.75‡ (26-27)</td>
<td>19.00‡ (13-23)</td>
<td>25.77‡ (22-29)</td>
</tr>
<tr>
<td></td>
<td>n = 4</td>
<td>n = 7</td>
<td>n = 30</td>
</tr>
<tr>
<td>Difference (delta) between the pre- and post-test## mean scores</td>
<td>3.5#</td>
<td>2#</td>
<td>4.6#</td>
</tr>
</tbody>
</table>

** The 3 month post-test mean score for the Educational Group and the Evaluation Test Group was not calculated using ANOVA (Refer to Section 3.3.6.5.2 above)

## The differences (deltas) between the post- and 3 month post-test scores and the pre- and 3 month post-test mean scores are not shown in this table for the reason stated in **. The differences were calculated, however, when the one-sample t-tests were conducted, and are shown in Figures 8 and 9 respectively.

† Pre-test mean score for all pharmacists who completed the pre-knowledge questionnaire

* Pre-test mean score for pharmacists who completed both the pre- and post-knowledge questionnaires, and (in the case of the Evaluation Test Group and the Educational Group) the entire educational program

‡ Post-test mean score for pharmacists who completed both the pre- and post-knowledge questionnaires, and (in the case of the Evaluation Test Group and the Educational Group) the entire educational program

# The difference between the pre- and post-test mean score (post-test score minus pre-test score), where the post-test mean score was defined as ‡.

Both the ANOVA ($p = 0.02$) and Kruskal Wallis Analysis ($p = 0.015$) showed that there was a statistically significant difference in the pre-test mean scores across the three groups. Post-hoc analyses revealed that the level of knowledge of the Evaluation Test Group ($p = 0.002$) and the Educational Group ($p = 0.05$) was significantly different from that of the Evaluation Control Group. Care is needed in the interpretation of these ANOVA and Kruskal Wallis Analysis results because of the small sample sizes for the Evaluation Test Group ($n = 4$) and Evaluation Control Group ($n = 7$).

The results summarised in Table 22 also show the differences (delta values) between the mean pre- and post-test scores for each of the three groups. These differences between the mean pre- and post-test scores (post-test score minus pre-test score) are shown in Figure 8, together with the delta values for individual pharmacists who completed both the pre- and post-test questionnaires. The increase in the mean post-test score relative to the mean pre-test score was 4.6 (Educational Group) and 3.5 (Evaluation Test Group) for those who undertook the educational program and was 2 for the Evaluation Control Group.
The one-sample t-test showed that the difference between the mean pre- and post-test scores for the Educational Group was significantly different from zero (t = 7.86, p < 0.001, 95% C.I. = 3.45 to 5.88 marks), and is also illustrated in Figure 8. This same effect was not demonstrated for the Evaluation Test Group (t = 1.81, p = 0.11, 95% C.I. = -2.66 to 9.66 marks) and Evaluation Control Group (t = 1.87, p = 0.17, 95% C.I. = -0.62 to 4.62 marks); as noted above, however, the sample sizes for these groups were small.

Figure 8 also illustrates that the increase in the mean post-test score relative to the mean pre-test score was 4.5 for the combined Educational and Evaluation Test Groups. The one-sample t-test showed that this difference was significantly different from zero (t = 8.04, p < 0.001, 95% C.I. = 3.38 to 5.68 marks), and is also shown in Figure 8.

**Figure 9: Box-and-Whisker plot: Differences between pre- and post-test scores (post - minus pre-test scores) for individual pharmacists (actual difference), for each group (mean difference) and for the combined Educational and Evaluation Test Group (mean difference).**

The differences between the mean post- and 3-month post-test scores (3-month post-test score minus post-test score) and the mean pre- and 3-month post-test scores (3-month post-test score minus pre-test score) for the combined Educational and Evaluation Test Groups are shown in Figures 9 and 10 respectively, together with the delta values for individual pharmacists who completed the pre-, post and 3- month-test questionnaires, and the entire educational program. As demonstrated in Figure 9, there was a small decrease (-0.8) in the mean 3-month post-test score relative to the mean post-test score, however, this difference was not statistically significant from zero (t = -1.422, p = 0.17, 95% C.I. = -1.94 to 0.35 marks). In contrast, Figure 10 shows that there was an increase (3.6) in the mean 3-month post-test score relative to the mean pre-test score. The one-sample t-test showed that this difference was significantly different from zero (t = 5.57, p <
Results and Discussion

0.001, 95% C.I. = 2.27 to 4.91 marks). Again, care is needed in the interpretation of these one-sample t-test results because of the small sample size (n = 29) for the combined Educational and Evaluation Test Groups.

**Figure 10: Box-and-Whisker plot: Differences between post- and 3-month post-test scores (3-month post - minus post-test scores) for individual pharmacists (actual difference) and for the combined Educational and Evaluation Test Group (mean difference).**

**Figure 11: Box-and-Whisker plot: Differences between pre- and 3-month post-test scores (3-month post - minus pre-test scores) for individual pharmacists (actual difference) and for the combined Educational and Evaluation Test Group (mean difference).**

* The difference between pre- and 3-month post-test scores for the combined Educational and Evaluation Test Groups was significantly different from zero (p < 0.001).
As stated above, the results in Figure 8 show that the increase in the mean post-test score relative to the mean pre-test score for the Educational Group alone (4.6 marks) and for the combined Educational and Evaluation Test Groups (4.5 marks) was significantly different (p < 0.001) from zero. The increase (3.6 marks) in the mean 3-month post-test score relative to the mean pre-test score for the combined Educational and Evaluation Test Groups was also found to be significantly different (p < 0.001) from zero, as shown in Figure 10. However, care needs to be taken in concluding whether these results are practically significant, and are related only to the impact of the educational program on pharmacists’ baseline knowledge. The main limitation was the small sample of Evaluation Test Group (n = 4) and Evaluation Control Group (n = 7) pharmacists with whom the implementation trial was carried out.

The statistically significant increases in both the short- and long-term knowledge of those pharmacists who undertook the program (Educational and Evaluation Test Groups) are more credible in light of the feedback received from participants in the Post-program Evaluation questionnaire. The majority of pharmacists reported that the program increased their knowledge, and that they were better able to contribute to the management of palliative cancer care patients (Refer to Section 4.3.5.1). Pharmacists also commented that their consultation and collaboration with patients/carers had increased (Section 4.3.5.5), and that they used several resources recommended in the program, to further assist their learning (Section 4.3.5.3.4). In the 3-month Post-program Evaluation question (Question 16), one pharmacist indicated that they continued to use the program even after the project concluded, mainly for information on medicines used for pain management. Another even took the initiative to liaise with nurses and doctors working in local palliative care services, to develop and implement strategies (e.g. provision of emergency medication kits to nurses and doctors for use on home visits) that could potentially improve the medication management of their patients.
4.3.5 Post-program evaluation

The aim of conducting the Post-program evaluation was to determine the Educational Group and Evaluation Test Group pharmacists’ satisfaction with the program (Section 1.3.3). In addition, their perceptions of how the program impacted on their knowledge, interaction with other stakeholders and practice, was sought. A Post-program Evaluation questionnaire was conducted soon after completion of the program. Three months following completion of the program, a program evaluation question was added to the 3-month Post-knowledge questionnaire. The method for conducting the evaluation is discussed in Section 3.3.7 and the results are reported in this section.

The results of the Post-program Evaluation questionnaire are presented below. The results of the 3-month Post-program evaluation question, are presented in Section 4.3.5.11.

Post-program Evaluation questionnaire

All of the participants who completed the program \( n = 34 \) completed the Post-program Evaluation questionnaire: Educational Group \( n = 30 \); Evaluation Test Group \( n = 4 \). In addition, nine participants who partly-completed the program, or withdrew soon after commencing (Educational Group: \( n = 6 \); Evaluation Test Group: \( n = 3 \), faxed their responses to the Program Evaluation questionnaire; the results of which are reported in Section 4.3.5.10.

The results of the Post-program Evaluation questionnaire are presented in eight sections:

1. Was the program beneficial?
2. Did the web site assist in pharmacists’ learning?
3. Aspects of program design assisting engagement with the program material.
4. Which modules were useful and which were not?
5. Did pharmacists’ consultation/collaboration with others increase from doing the program?
6. How long did it take pharmacists to complete the program?
7. How could the program be improved?
8. Further comments about the program.

Appendices AT through to AZ show the questions that were asked for each of the eight sections above, along with the summary statistics from the participants’ ratings on an 11-point Likert scale. Box-and-Whisker plots have also been used in each of these Appendices to illustrate the responses and the spread of the responses given by the participants.

The results of the ‘additional comments’ made to specific questions are presented in the sections below, along with the quantitative results for those questions. Not all participants provided additional comments. Where comments to questions were made, but were not related specifically to the question asked, these results are presented with the results of question 25: Any other comments welcome. Refer to Appendix AJ for the data of all of the additional comments made.
4.3.5.1 Was the program beneficial?

Thirty-three of the thirty-four participants who completed the program rated their improvement in knowledge and contribution to the management of palliative care patients, as six or higher, with seventy-five percent of respondents rating these aspects as eight or greater (Appendix AT). Thus the majority of participants’ reported that their knowledge and contribution to the management of palliative care patients improved as a result of the educational program.

Fifty percent of the participants rated the program’s impact on pharmacist-initiated changes as five to six on the Likert scale (Appendix AT). The average level of agreement was 5.5 suggesting that participants’ were a little unsure as to whether the program increased the number of pharmacist-initiated changes in drug therapy for their palliative care patients. This correlates with the small number of interventions made by the Evaluation Test Group pharmacists, with their designated patients and/or carers (Refer to Section 4.3.2.2, Table 18).

In relation to whether their understanding of the roles of community pharmacists and other people in the delivery of palliative cancer care services had been increased (refer Appendix AT, Questions two and three), 75% of participants rated the effect of the program material to be seven or greater. The mean rating was eight.

These results indicate that the program had a positive effect on the participants. The knowledge, contribution to the management of palliative care patients, and understanding of the role of community pharmacists and other people in palliative cancer care have clearly improved. The number of pharmacist-initiated changes does not appear to have increased. This may be attributable to the lack of opportunity rather than a limitation of the program, and is supported by reports of the Evaluation Test Group pharmacists, as to why they were not intervening as frequently as was expected (Refer to 4.3.2.3).

4.3.5.2 Did the web site assist pharmacists’ learning?

Analysis of the data shows that the pharmacists’ felt the web site was easy to navigate, the instructions were adequate, and the links within the program assisted learning. The average response for the three positive statements was approximately eight (Appendix AU). A quarter of the participants rated these aspects nine or higher. The links within the program did not appear to distract the participants’ learning, as evidenced by the very little support this question received; which is a positive evaluation (Appendix AU, Question 7). The responses related to the Evaluation Test Group pharmacists were consistent with the Educational Group pharmacists.

Additional comments

Additional comments (Appendix AJ) regarding the ease of navigating the web site (Question 4b) revealed that participants’ (n = 4) found that: they could not view the entire web page without scrolling either left to right or up and down, which made learning time-consuming and frustrating; and that working online was often slow (n = 2), but with practice, participants soon learnt how to effectively use this online medium (n = 3). In
contrast, three participants commented that the web site was user-friendly and easy to navigate. One participant found that following links from one module to another to be “a bit tedious”; and another participant could not locate a .pdf file included with the program. Two participants commented that initially it was difficult to log on to the Discussion Group, but this was later resolved. Access to the Internet was a problem for some participants ($n = 3$), however, a change to Broadband in one pharmacy and using the CD-ROM instead overcame these difficulties.

Regarding the adequacy of the instructions within the program in directing learning (Question 5b, Appendix AJ), comments revealed that participants ($n = 2$) found that submitting responses to the Notice Board was an issue until they ‘sorted it out’; they did not state why it was an issue. Two participants however, found the instructions clear and easy to follow.

In relation to whether the links distracted participants from their learning (Question 7b, Appendix AJ), one participant found module links to be repetitive. In contrast, eight participants found that the resources discovered by accessing the links were very helpful/great/interesting. Three of these participants recognised the usefulness of the links as future resources for themselves and their clients, one of whom reported that they had already “used some of the links as a printout to give to customers”. Six participants also commented on the time consuming nature of following the links, particularly within the 20-hour timeframe allocated for completion of the educational program.

The results indicate that the flexible design and mode of delivery of the educational program was shown to be successful. The majority of the participants found the web site easy to navigate, the instructions adequate, and the links provided valuable resources. Following all of the links however, proved to be very time-consuming, even so, some of the participants printed these for clients, and/or kept them for later reference.

### 4.3.5.3 Engagement with the program material

#### 4.3.5.3.1 Familiarity with the program material and critical reflection and analysis

The average response to question eight: ‘The subject material was generally new to me’, was approximately six (Appendix AV). This indicates that the participants were aware of at least some of the material prior to commencement of the program. The average and distribution of responses indicate, however, that there was no-one who felt they knew the material intimately (Appendix AV, Box-and-Whisker plot). This is a significant and important outcome, as it suggests the content of the program was providing a valuable source of information.

The success in encouraging critical review and analysis of the participants’ own clinical practice shows the average score to be 7.5 in both cases (Appendix AV, Questions 9 and 10). Fifty percent of the participants responded 7.5 or higher, indicating they agreed that the material encouraged critical reflection and analysis.

**Additional comments**

Additional comments regarding the pharmacists’ familiarity with the program material revealed that although they knew some of the material ($n = 7$), participants’ ($n = 5$) found
that it was covered in more breadth and depth, allowed for revision of what they already knew, and was a useful resource where all the material was available together, in one area (Appendix AJ, Question 8b). One participant commented that the program material increased their awareness of the issues and problems encountered in palliative care that they had not considered before.

The results suggest that pharmacists’ seemed to be aware of the content (knowledge) required to provide palliative care services, therefore, they may also have been more aware of any gaps in their knowledge related to palliative cancer care, and this awareness regarding the knowledge required to provide palliative care services may have increased their interest in undertaking the educational program.

An important component underpinning the program was encouraging the participants to critically reflect upon, and analyse their own clinical practice. Additional comments (Appendix AJ, Question 10b) indicated that reflecting on their practice assisted two of the participants to communicate more effectively, both in writing and verbally, with their patients/carers. In contrast however, one participant felt that in some areas they were now more hesitant with their clients, and that they felt they needed to “work at” their communication skills. This finding is a positive reflection of the program and its ability to encourage self-awareness and identification of areas of practice that require improvement. Other participants ($n = 2$) found that self reflection was a valuable learning technique which allowed them to test themselves and really think about what they did in practice. Thus, the responses revealed that the material was successful in encouraging further self-appraisal.

### 4.3.5.3.2 Aspects of program design assisting engagement with the material

Questions 11 to 15 (Appendix AW) were designed to determine the usefulness of the design features such as key messages, case studies, activities, answers to activities, and practice points, in assisting participants’ engagement and learning of the program material.

The average rating for all of the above aspects of design, excluding the key messages, was eight, and the spread of the scores is also quite small (Appendix AW). This indicates that the participants rated these features as beneficial to their learning. However, use of the key messages to guide learning of topics was rated a little less than average, with a wider range of responses. The middle 50% band of respondents rated their use of the key messages from 2 to 7. The results indicate that the majority of participants did not use the key messages at the beginning of each module to look for the topics they wished to study, rather they appeared to work through the program in a linear fashion. While participants did not seem to use the key messages at the beginning of each module to guide their learning, there were a variety of other ways they could have accessed the material, according to their learning style. For example, they could click on an Activity or a Case Study, and through engagement with either of these, learn the subject material they thought most relevant to their learning needs.

The majority of the participants did however, find using the case studies, activities, answers to the activities, and the practice points useful, and they suggested that any revision of the program, include more of these.
4.3.5.3.3 Interactive activities

Questions 16 to 18 (Appendix AX) were designed to determine the usefulness of the interactive activities: the Notice Board and the Discussion Group, in assisting participants’ learning by interacting with others.

The results show that the Notice Board was a more useful method of engaging with the subject material (Appendix AX, Box-and-Whisker plot). The middle 50% of responses ranged from six to eight. In contrast, there appeared to be little use of the Discussion Group in networking with others about palliative care issues. The average response was less than four. The degree of agreement however, is more wide-spread, indicating that some participants found the Discussion Group helpful.

Additional comments

Additional comments regarding the use of the Discussion Group revealed that while it was a “great idea”, participants (n = 3) did not feel comfortable using it; however, they (n = 2) did like reading other participants’ responses on the Notice Board and in the Discussion Group (Appendix AJ, Question 17b). This finding is supported by the web site data in Table 15. Another participant reported that “although people were entering comments, there was no real networking or contacting each other”. In addition, some participants (n = 4) felt that they did not have time to engage in the Discussion Group, while others (n = 4) found that it was difficult to access and was not user-friendly because of formatting issues; for example, it was “hard to see what other people were saying”. This may have been due to the different topic areas and the sub-headings within them. One participant commented that they did not use the Discussion Group because they worked mainly from the CD-ROM; a reminder that the Discussion Group could only be accessed online.

In summary, the results of the Program Evaluation questionnaire, along with the web-based data, revealed that the aim of providing the Notice Board learning activities (Section 3.2.3.5.3) was achieved. Most participants who undertook the program engaged with the learning material by submitting responses to the Notice Board and viewing the suggested answers. Their responses indicated an understanding of the subject material. In addition, they reported that they found reading other participants’ responses helpful. This more passive form of learning, where participants’ prefer to read others’ responses rather than contributing themselves, commonly occurs in online educational programs(150-153). An unanticipated finding related to the Notice Board was that a small number of participants used this medium as an interactive forum by asking for input from others. Thus, there was some confusion between the aims of the Notice Board and of the Discussion Group. The inclusion of only one kind of facility to encourage communication and collaboration amongst participants may need to be considered during review of the program in its future implementation.

In contrast however, the aims of providing the Discussion Group facility (Section 3.2.3.5.4) were only partially achieved. The findings of the survey of community pharmacists in Stage 1 of the project (Section 4.1.2.3) alerted the researchers to this possibility, with only 26% of the survey pharmacists preferring Discussion Groups as a
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learning strategy. However, reports from the literature(150-153) suggest that interactive forums are a successful strategy once participants become comfortable with online consultation and communication. Indeed, those participants in this study who at first had difficulty accessing the Discussion Group, found that when they did, it was worthwhile. Even so, a review of the interactions showed that consultation and sharing of ideas was sparse, with participants preferring to view others’ communications in the Discussion Group, as they did with the Notice Board, rather than interacting themselves. Table 15 illustrates that the number of times a topic was viewed, was much more than the number of times participants actually responded to topics raised. Participants also reported that using the Discussion Group was time consuming. A limitation of the web site was that the mechanism for accessing the Discussion Group was confusing, with participants having to register a second time once they had already logged-on, to gain access, and this deterred some from further using the facility. This problem will be rectified when the program is more widely implemented.

4.3.5.3.4 Use of other resources

Question 19 sought information about other resources used by the pharmacists whilst working with the program material. The most popular resources that were reported were the Australian Medicines Handbook (82%) and the Therapeutics Guidelines (82%). The Australian Prescription Product Guide (APP Guide) was used to a lesser degree (38%). However, additional comments (n = 15) revealed that a variety of other resources were also used, the most common being MIMs/eMIMs (23.5%) and Micromedex (8.8%).

4.3.5.4 Which modules were useful and which were not?

Question 20 a) to k), required the participants to rate the usefulness of each of the modules. The results suggest that all of the modules were useful. In comparing the responses, Module 1 was found to be the least useful, with an average of 6.5 (Appendix AY). Modules 3 (mean 8.9) and 4 (mean 8.6) were rated the most useful, followed by Module 9 (mean 8.3), Module 6 (mean 8.2) and Module 8 (mean 8.1). (Refer to Table 12 for the topics covered in each of the modules). The ratings were all relatively consistent (except for Module 1), indicated by 75% of participants rating the modules 7 or higher (Appendix AY, Box-and-Whisker plot). Thus, all of the modules were useful, indicating that the choice of content material for the palliative cancer program for community pharmacists was appropriate.

4.3.5.5 Did pharmacists’ consultation/collaboration with others increase from doing the program?

Question 21 a) to g), sought information about whether pharmacists’ consultation or collaboration with others had increased from doing the program (Appendix AZ). The results indicate that the participants felt that they had increased their consultation with patients (mean 7.1) and carers (mean 6.9) more often than any other group. These findings suggest that the education program had a positive effect on the pharmacists in increasing their consultation/collaboration with patients and carers. However, the median values suggest that other pharmacists, general practitioners, nurses and the patients’ hospital were consulted to the same extent as before the participants did the program (Appendix AZ).
Additional comments

Additional comments revealed that participants (n = 2) also consulted with dieticians (Appendix AJ, Question 21h). Other participants (n = 2) commented that they were not consulting more with patients/carers because there were few palliative care patients visiting the pharmacy. This is in agreement with the reasons for why interventions were not being received from the Evaluation Test Group pharmacists (Refer to Section 4.3.2.3). Another participant reported that they had little opportunity to collaborate with other health care professionals. One participant did not feel that their communication with other palliative care professionals was going to change much, stating that there was a feeling that pharmacists were not highly regarded by other professionals, and that their potential for contribution was undervalued.

4.3.5.6 How long did it take for pharmacists to complete the program?

Question 22 asked how long the participants took to complete the program. Table 23 reveals that over half of the participants (53%) took 16 to 25 hours to complete the program, with a further 38% taking from 26 to 40 hours. However, 6% of participants managed to complete the program within 11 to 15 hours, while 3% of participants took more than 41 hours to complete the program. Thus, time taken to complete the program varied greatly, but many were able to complete it around the 20-hour time frame allocated. Nevertheless, the variation in completion times suggests that different people may have engaged with the program material in a variety of ways, and in varying depth. This finding is supported by other comments made by some of the participants, for example they did not follow all of the links in the program and they did not engage in the Discussion Group (Section 4.3.5.10).

Table 23: Time taken for participants to complete the program

<table>
<thead>
<tr>
<th>Hours</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>11-15</td>
<td>6</td>
</tr>
<tr>
<td>16-20</td>
<td>24</td>
</tr>
<tr>
<td>21-25</td>
<td>29</td>
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<td>26-30</td>
<td>14</td>
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<td>31-35</td>
<td>12</td>
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<tr>
<td>36-40</td>
<td>12</td>
</tr>
<tr>
<td>More than 41</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
</tr>
</tbody>
</table>

4.3.5.7 How could the program be improved?

Question 23 provided space for the participants to offer suggestions for improving the program. 47% of the participants offered a variety of suggestions, and some participants offered more than one suggestion (Appendix AJ). The suggestions were themed into the following recommendations.

4.3.5.7.1 Increase the time frame for completing the program and more guidance

Comments made by participants (n = 8) indicated that the time frame for completion of the program needs to be extended. This was reflected in their comments and suggestions regarding:
• The volume of material covered (including the number of links)
• The need for better navigation throughout the program
• A request for better guidelines on finding local resources
• A request that the modules be broken down into 15 minute blocks
• A lot of time is spent following links

One suggestion was directed to pharmacists rather than the program designers: “to realise that they need to sit down and work through this quietly – it is very hard to do it properly whilst serving customers”.

4.3.5.7.2 Review the relevance of material for community pharmacists

One participant reported that there was too much material on non-therapy issues, which was good background knowledge, but not particularly relevant to every day community pharmacy where provision of palliative cancer care services is still in its infancy. However, no examples were given of what was meant by ‘non-therapy’ issues. Another participant felt that “the program seems to have been aimed towards hospital pharmacists, not the community pharmacists it was supposed to be aimed at”. This participant suggested conducting a survey of community pharmacists to see what they actually do in practice, to inform the program. It is important to note however, that in Stage 1 of this project, the views of community pharmacists were sought by conducting the survey of Australian community pharmacists, and the nominal group meetings.

4.3.5.7.3 Provide more activities and case studies

Participants (n = 5) requested more case studies, more activities, and more engagement in the Discussion Group. Suggestions included supporting the Discussion Group by having a forum at the host site, and rather than waiting for participants to ask questions of palliative care specialists, having them stimulate a question and answer session via the Discussion Group. Other suggestions included providing better summaries at the end of each module, and a follow-up or refresher program after 3 to 6 months.

4.3.5.7.4 Provide a hard copy of the program

Two participants requested a hard copy of the program material, even though they could print various sections themselves.

4.3.5.8 Recommending the program to other community pharmacists

Question 24 asked if participants would recommend the program to other community pharmacists. All of the participants who completed the program stated that they would recommend the program. Although one pharmacist rated this question “unsure”, additional comments made by this participant indicated that they would recommend the program. These results support the value placed on the educational program by the pharmacists who completed it.

4.3.5.9 Further comments about the program

Improving medication management of palliative care patients 2005
Question 25 stated that *any other comments* by participants were welcomed. However, in earlier questions asked, participants also made more general comments. Consequently, this section summarises the results of question 25, as well as pharmacists’ general responses to the specific questions asked earlier in the questionnaire (Appendix AJ).

### 4.3.5.9.1 Valuable, worthwhile program

Participants’ responses \((n = 13)\) revealed that they found the program to be valuable and worthwhile, despite having to learn how to use the online format and the time limitation for completion. Comments were variable, but responses indicated that participants’ thought the program was: informative; useful; interesting; fine; excellent; fantastic. Six of these participants stated that working through the program was an enjoyable experience, and five said that they would recommend it to others. Comments were also made regarding the value of the wide range of topics covered, and support for the encouragement of critical thinking about practice throughout the program. However, although one of the participant’s found the program informative, interesting and useful, they stated that the site was cumbersome to navigate and a bit boring considering what can now be done with animation to make online learning more interesting.

### 4.3.5.9.2 Useful resources

Participants’ comments \((n = 2)\) indicated that they hoped the web site would be available as a future resource. Other participants \((n = 3)\) found the resources within the web site (e.g. charts, tables and links) useful for practice, as well as prompting further investigation related to palliative cancer care. One of these participants sent off and received a number of additional publications. However, another participant requested better guidelines for finding resources in their own area because they found this difficult, often coming across many “dead ends”, and going from one phone call to another. Two other participants requested the *Evidence of Completion Sheet* at the beginning of the program (Refer Section 3.2.3.4 d).

### 4.3.5.9.3 Program content issues

One participant would have liked more information on the roles of the other palliative care health professionals. Another participant requested more activities, multiple choice questions and case studies, thus supporting those participants who already requested these in their responses to question 23 (Refer Section 4.3.5.7.3). One participant commented that there was ambiguity in the questions in the practice points; however, there were no questions in the practice points. It is possible therefore, that the comment was directed at some of the questions in the activities, and this needs to be considered when the program is reviewed.

### 4.3.5.9.4 Online Program evaluation questionnaire

Only one participant commented on the way they worked through the program: that is, they started at the beginning and worked their way through it. Two of the participants commented that 15 minutes was not enough time to complete the program evaluation.
questionnaire online, because it did not allow them sufficient time to think about their answers, and it was difficult to complete between serving customers at work. This difficulty associated with undertaking the online evaluation questionnaire was raised early, and consequently, the time span allowed for completion was increased.
4.3.5.9.5 Current relevance of the program

While the relevance of the program for community pharmacists was raised in question 23, and reported in Section 4.3.5.7.2, in response to question 25, one pharmacist commented that the program was possibly ahead of its time, because presently, the role for community pharmacists is very limited. However, this participant also recognised that the pharmacy profession is starting to move in the direction promoted by the program.

4.3.5.9.6 Impact of the program on practice

Specific examples regarding the impact of the program were reported by four of the participants (one participant made more than one comment):

- The notes in relation to narcotic switching have been used to inform a doctor in prescribing
- Staff and client resource folders have been developed based on the resources within the program
- Increased confidence has been gained to proceed further with palliative cancer care service provision
- Uncertainty of how to implement palliative cancer care service provision has arisen, specifically in relation to the "short high pressure timeframe" within community pharmacy

In addition, one pharmacist felt that the case studies “were depressing and quite sad, which in real-life is a lot to carry while running a community pharmacy”.

Also refer to Section 4.2.1.3 for more examples of the impact of the program on practice.

4.3.5.10 Results from participants who partly-completed the program

Nine participants who partly-completed the program, or withdrew from the program soon after commencing, returned Program Evaluation questionnaires containing answers related only to the modules they had completed. The majority of the responses supported information already received from those participants who completed the entire program. For example:

- The program was interesting and helpful and they were learning a lot.
- There were too many links to cover in the time frame.
- Did not feel comfortable using the Discussion Group and Notice Board.

However, three of these participants provided additional information to inform further review of the educational program.

One of the participants who had completed the majority of the program still felt that it had not left them fully confident in pain and non-pain symptom management. Also, this participant was not sure that community pharmacists had the time to properly deal with the many issues in managing a palliative patient according to some suggestions made in the program, and suggested that the Australian health care system does not recognise the financial burden and extra stress placed on practising pharmacists.
Two of these participants would have preferred a hard copy manual of the program, because they preferred working off-line; printing the various sections took too long and became frustrating. One participant particularly enjoyed going over the material in bed at night to consolidate their learning. In addition, these participants also felt that the modules were too long with too many sub-sections, which made it difficult to work out where they were ‘up to’. However, these participants did find that the material was worthwhile and was covered in such depth that it increased their “scant knowledge immensely”, especially the information on pain and symptom management. One participant commented that it was a pity that they did not finish the program, but that they intended to continue to use the CD-ROM as a resource.

Critical reflection assisted two of the participants realise that community pharmacists have an important part to play in supporting palliative care patients and their carers, and that they were more aware of their responsibilities and capacity to be a part of the health care team.

Recommendations for improvement of the program included:

- Providing a hard copy of the program.
- More person to person contact.
- Workshops.
- Having a similar program for doctors and nurses on communication with other health professionals.

4.3.5.11 Results of the 3-month Post-program evaluation question

Twenty-eight of the 34 pharmacists who completed the educational program completed the 3-month Post-program evaluation question: Educational Group (n = 25), Evaluation Group (n = 3). Note however, that twenty-nine participants completed questions 1 to 15 of the 3-month Post-knowledge questionnaire, but one participant did not complete the Post-program Evaluation question included in this questionnaire (Appendix AA, Question16). Pharmacists were asked for their reflections about the program, and how they felt it may have impacted on their pharmacy practice over the past three months (Appendix AK, Question 16). The participants’ detailed responses are provided in Appendix AK, and are summarised in the following sub-sections.

4.3.5.11.1 Useful worthwhile resource

Many of the participants’ responses (n = 19) revealed that they considered the program to be a useful/excellent resource, which was still being accessed for information, for example, on dosage changes, adjuvant therapy, and use of opioids. One pharmacist reported that they were now able to understand “difficult prescriptions’ wording” regarding palliative care treatments, and they no longer found these “confronting”. Another pharmacist reported that the program was particularly valuable in increasing their confidence to deal with misconceptions surrounding palliative care medicines. While the majority felt that the program was relevant to their practice, one pharmacist felt that generally, the information was covered in too much depth, and two others felt that the complementary and alternative medicines module was covered in too much depth and that “not all areas of the course were relevant e.g. the parenteral administration of drugs”, respectively.
4.3.5.11.2 Increased confidence and interactions with others

There was a clear indication from the analysis of participants’ responses (n = 12) that three months after completion of the program they felt that it had “certainly/definitely” increased their confidence in:

- Dealing with, and advising palliative care patients/families
- Dispensing higher doses of opioids
- Dealing with the emotional issues and concerns surrounding palliative care
- Talking and working with other health care professionals
- Referring patients to other health care professionals
- Finding resources

As a result of the increased confidence, pharmacists reported being more proactive and interacting more with patients/carers; they felt that these interactions could make a positive difference to patient care. While some pharmacists reported interacting more with other health care professionals, others felt that pharmacists were still not recognised as part of the palliative care team. However, one pharmacist was working closely with community health palliative care staff and Department of Veterans Affairs staff to increase emergency access to medicines in rural areas.

4.3.5.11.3 Improved communication with patients/carers

Pharmacists’ responses (n = 6) indicated that there was an improvement in their communication with patients/families. For example, pharmacists reported that they were:

- Speaking to patients/carers more often, and providing more advice and information.
- Asking more understanding questions, which they found relaxed the patient/carer
- Listening more and changing their personal approach to patients/carer.
- Showing more empathy and understanding toward patients’/carers’ issues.

In addition, one pharmacist found that there had been occasions where the relief in a carer’s face was observable, because the pharmacist was able to “empathise with their situation and know where/who to refer” the carer to.

4.3.5.11.4 Application limited in practice

Some of the pharmacists’ (n = 7) responses indicated that they felt that they had little opportunity to apply the information gained from the program into practice. Reasons for this varied. For example one pharmacist felt that community pharmacists were not really considered as part of the health care team at this stage, especially in relation to palliative care, which is a specialised area. However, the same pharmacist reported that with more pharmacists becoming accredited to conduct medication management reviews, the involvement of pharmacists in health care teams is increasing, and that it will take time for further recognition of their skills. Some pharmacists (n = 4) reported that because they have little contact with palliative care patients or their carers, they were unable to apply the information from the program. One pharmacist, who reported having a “good relationship” with a number of cancer patients regarding the use and supply of morphine, found “that most of the information in the course was not applicable” to their practice. It would have been useful to explore this response further, however, this was not possible,
and is acknowledged as a limitation of using questionnaires to evaluate participants’ views.

4.3.5.11.5 Time consuming

While pharmacists reported that the program was valuable, and recommended that others to undertake it, they \((n = 9)\) found it to be time consuming, requiring disciplined allocation of time to complete. The time frame of three months to complete the program was necessary due to the strict timelines of the research project. A recommendation has therefore been made to allow for the program to be completed over 12-months (Refer Section 8).

4.3.5.11.6 Suggestions

Suggestions for improvement of the program included:

- Better indexing and search facility within the web site.
- Regular updates; however it was not clear if the suggestion was for online updates or face-to-face.
- More information on dealing with professionals’ stress.

In summary, the web-based data and the results of the evaluation of the education program show that the participants did access the program on all days of the week, during both the day and night-time hours (Table 14), and a number of participants worked mainly from the CD-ROM. This finding supports the accessibility and flexibility of the program in reaching pharmacists located in any area of Australia, at a time convenient to them. More clarity may be required however, in reminding future participants that viewing the Notice Board, Discussion Group and making Internet links cannot be done off-line, from the CD-ROM. While the print facility was used by participants, some still wanted a hard copy manual of the program. This will need to be considered when implementing the program, and cost adjustments will need to be made accordingly. In addition, the support mechanisms while completing the program were considered important in clarifying issues as they arose (such as access to the Notice Board and Discussion Group), and also in providing moral support to participants as some of them wished to share their examples of applying the program material to clinical practice. However, suggestions from some of the participants indicated that they would have liked more support in the form of accompanying workshops, forums, more personal contact, and more involvement of palliative care specialists to stimulate question and answer sessions in the Discussion Group.

Participants reported that the program material, while not generally new to them, was relevant to community pharmacy practice, and valuable for deepening their understanding of palliative cancer care issues. In addition, they reported that they felt their level of knowledge had increased as a result of their participation.

Although the majority of pharmacists who completed the Post-program Evaluation questionnaire reported that they did not think there had been an increase in frequency in pharmacist-initiated changes as a result of their participation in the program, the examples of the impact of the program (Refer to Section 4.2.1.3) indicated that for a number of pharmacists this was not the case. As revealed in the implementation trial (Section 4.3.2.3), and supported by additional comments of the participants in the Post-
program Evaluation questionnaire, where pharmacist-initiated changes did not occur it may have been because there was little opportunity to consult with patients/carers. While pharmacist-initiated changes to patient care may not have occurred, participants reported that they did increase their interaction with patients/carers, whilst their interactions with other pharmacists, doctors, and nurses remained about the same, with two participants consulting dieticians.

Completion of the educational program had a positive impact on the practice of the pharmacists (Refer to Sections 4.2.1.3 and 4.3.5.9.6). With improved knowledge, they were better able to answer palliative cancer care-related questions, assist in the management of symptoms such as pain, nausea, constipation and mucositis, and collaborate with doctors in prescribing morphine in particular. Further, they gathered resources from the program material and made these available to staff and patients/carers. However, by increasing their awareness of the needs of patients in palliative cancer care, and the community pharmacists’ role as a member of the palliative care team, a number of issues arose. For example, some of the pharmacists were uncertain about how palliative cancer care service provision, with the need for more individual time being spent with clients and collaboration with other health care professionals, could be implemented and remain financially viable in busy community pharmacies that already required much of their time.

Suggestions for improving the program included:

- Increasing the time frame for completing the program.
- Providing more learning activities and case studies.
- Providing a hard copy of the program.
- Providing more personal contact, for example through workshops and forums at the host site.
- Review of the relevance of the program material for busy community pharmacists.

These suggestions have been incorporated into the project recommendations (Section 8).

A limitation to the evaluation of the educational program was the small sample size of participants who completed the program. A larger sample of Educational Group pharmacists may have been achieved in the Educational Group by notifying a larger number of community pharmacists throughout Australia that the program was available, by distributing more questionnaires to a larger number of pharmacies. However, because the program was being implemented for the first time, this strategy was not considered appropriate. Consideration must also be given to the fact that those pharmacists who withdrew from the program or only partially completed it, did so because of other professional development and family commitments (Refer Section 4.2.1.1). Obtaining a larger sample size for the Evaluation Test Group pharmacists was found to be very difficult (Refer Section 6.1).
4.4 Implications of the research findings for pharmacy-related palliative cancer care service provision and community pharmacy practice

This project resulted in the identification of a number of impediments to community pharmacist involvement and integration of community pharmacy practice into palliative cancer care service provision. These included:

- A lack of education/knowledge of the majority of community pharmacists in palliative cancer care
- Lack of remuneration for service provision
- Infrequency of palliative care patients/carers visits to community pharmacies
- Workforce patterns of community pharmacists

These barriers are discussed below with a focus on potential strategies for the provision of pharmacy-related palliative cancer care services. Indeed, there is a growing need for pharmacists to be able to provide cognitive services to patients with complex acute or chronic care needs that are managed in the community.

The findings from the project suggest that a number of the participating pharmacists felt that the continuing professional education of community pharmacists in palliative cancer care, via the online educational program developed, would only be truly worthwhile and valuable if there was adequate funding by the Australian Government for pharmacists to be remunerated for their services and time.

Most of the pharmacists involved in the implementation trial reported that they had fewer opportunities to make a difference to the care of their designated patient or carer, because of the infrequent visiting of the patient/carer to the pharmacy for prescription medicines and over-the-counter products. Some of the Educational Group pharmacists also reported that infrequent visiting of patients/carers to the pharmacy was a barrier to applying their newly gained knowledge in practice.

The findings indicate that the current model for the delivery of palliative cancer care services to the community, that relies on patients/carers visits to the pharmacy, is not working effectively in the provision of specialised pharmacy-related palliative care services to people in the community. Clearly, the current model does not adequately enable pharmacists to contribute to medication management of patients who are receiving complex care in the community and who cannot present to the community pharmacy.

Patients with chronic conditions require frequent care\(^{52}\) and require expertise from multiple disciplines (including hospital, community providers and GPs working in partnership) to ensure that their needs are considered comprehensively\(^{53}\). The team-based management of patients and the provision of care in residential aged care and community settings is becoming increasingly important as the incidence of chronic disease associated with population ageing rises\(^{52, 53}\). Pharmacists in the community need to be able to provide medication management services to these patients and in many instances this cannot occur in the community pharmacy setting, as witnessed in this project.

Further impediments include the increasing complexity of care and workforce related pressures. The burden of disease management impacts on the available time, and
therefore opportunity, to provide palliative care services. This conclusion is supported by the 2005 Productivity Commission Report\(^{(52)}\) on Australia’s health workforce, which recognises that there are considerable pressures on all health professions, including community pharmacists. There is a shortage of pharmacists, who account for 3% of health professionals, with a growth in the number of those wishing to work part-time and in the number of females, who typically work fewer hours than their male counterparts\(^{(52)}\). It is therefore possible that pharmacists working full-time are busy managing the pharmacy, with little incentive, motivation and time available to deal with complex care patients based at home as highlighted in this project regarding palliative care patients.

Consequently, as a result of the findings of this project, a new model for the delivery of pharmacy palliative care services (and other complex care services) to the community requires formulation.

The fundamental components of a model for the provision of cognitive clinical pharmacy services to complex care patients managed in the community that requires consideration includes:

1. Ability for pharmacists to provide cognitive services in the same location as that of other health professionals (for example, a patient with a chronic disease that precludes the person going to a community pharmacy requiring that the service may need to be provided in the home or in a community practice site).

2. Ability to provide the cognitive services on more than one occasion to the same patient.

3. An accreditation program that facilitates the provision of clinical pharmacy services to complex care patients (this may require a targeted educational program such as that developed for this project).

4. Provision of “case conferencing” services to community treatment centres (for example, pharmacist involvement at the palliative care service).

The provision of this model is not possible under the funding arrangements of the Fourth Guild/Government agreement. Further research should be undertaken to demonstrate the evidence in support of the development of a funding model to enable the provision of these services.

In the interim, community pharmacists from both urban and rural areas in Australia who are enthusiastic and dedicated to contribute towards the delivery of palliative cancer care services are encouraged to:

1. Become accredited to conduct medication management reviews (MMRs).

2. Undertake the online educational program developed in this project, as feedback from the pharmacists who completed it indicated that it is a highly valuable and excellent resource.

3. Liaise with palliative care services or centres to provide complex care\(^{(53)}\) to patients and carers in the community, in conjunction with other health professionals as part of the multidisciplinary team.
LIMITATIONS
6 STUDY LIMITATIONS

Methodological issues that arose during this project which may act as potential limitations are discussed in this section.

6.1 Implementation trial and evaluation sample size (Stage 3)

The implementation trial and evaluation sample size of both patients/carers, and pharmacists (Evaluation Test and Control Groups), was the main limitation of the research project. The small sample size did not provide enough power to conduct the planned statistical analyses. Therefore the researchers were unable to demonstrate that as a result of pharmacists’ improved knowledge (Refer to Section 4.3.4), the number and significance of interventions they were making with patients/carers increased (Refer to Sections 3.3.4.9 & 4.3.2.2), and as a result, the medication knowledge of patients/carers increased (Refer to Section 3.3.5.4).

The number of patients/carers recruited into the project determined the number of pharmacists that were approached, and consequently participated. The small number of patients and carers who were identified, agreed and subsequently were able to participate, directly affected the motivation and number of Evaluation Group pharmacists who were interested in participating, and continued to, in the implementation trial. A small number of pharmacists consented to participate in the trial to begin with, with most from the Evaluation Test Group not being able to complete the educational program because their patient passed away. This in turn limited the statistical tests that could be performed on the intervention, pre- and post-test, and post-program patient/carer questionnaire data, which affected their methodological rigor in evaluating the educational program and its impact on both pharmacists and patients/carers.

An alternative approach would have been to invite pharmacists in western metropolitan Melbourne to participate, and then identify and recruit suitable palliative care patients who visited their pharmacy. However, this method may not have met with approval by the ethics committees involved in the research project, because patient/carer privacy issues may have arisen. The authors contend that even if this alternative strategy was employed, similar difficulties may still have been experienced.

Although a number of modifications were made to address the various problems encountered in recruiting patients, carers and pharmacists, the statistical number of 30 pharmacies was not achieved (Section 3.3.3.3). Numerous other palliative care studies have also failed to recruit sufficient numbers of patients, had high attrition rates, and much missing data\(^{96, 146-148}\). Therefore, there seems to be a set of inherent problems associated with conducting palliative care research, especially randomised controlled trials (RCTs). The researchers involved in these previous palliative care studies suggest that overcoming these methodological and ethical challenges is not easy, given the nature of the illness and priorities of the patient, their carers (including health professionals) and family. As alluded to above, similar challenges were encountered in this project, and were briefly described in Section 4.3.1. They are discussed in detail below.
6.1.1 Gatekeeping

The MWPC nurses were protective of their patients, despite the researchers’ efforts to overcome this barrier to recruitment by conducting regular meetings with the nurses to inform them about the project and enlist their support. The nurses were initially reluctant for one of the Project Staff to directly recruit the patient/carer during home visits, even though the researcher was a pharmacist, and thus a health professional aware of the sensitivity issues surrounding research involving palliative care patients. It was clear at this stage that the nurses did not see the pharmacist as a member of the palliative care team, who could potentially contribute to the care of their patients via research. The nurses perhaps felt that the researcher would coerce the patient into taking part in the study. It was made clear, however, that the researcher would be guided by them in determining whether or not a patient/carer was suitable for the study, and only then would they approach the person to participate. On the visits, the nurses realised this and felt that having the researcher recruit directly was the best strategy, and involved no exploitation of the patient and/or carer.

Thus, ‘gatekeeping’\(^{146, 98, 133}\) by the nurses added considerably to the difficulties of patient recruitment, and affected the sample size obtained. Gatekeeping may have also taken away from patients/carers the opportunity to make autonomous informed decisions about participating in the study.

6.1.2 Attrition and appropriate timing

Longitudinal studies in palliative care have high attrition rates; that is, a decreasing sample size at subsequent assessment points due to drop-out or withdrawal\(^{146}\). In this project, less than a month after the commencement of the educational program, thirty-three of the 42 patients/carers who had agreed to participate could not, as the patient had passed away and/or their pharmacist declined participation. A high attrition rate (79\%) of patients/carers was therefore witnessed.

There were four months between the commencement of recruitment (October 2004) and the beginning of the study (February 2005). Even though the nurses assisted in identifying patients with a prognosis of greater than three months, many patients passed away before the study began. Additionally, attrition of pharmacists occurred. The pharmacy visited by the patient/carer did not always agree to participate even if the patient/carer did, therefore, the patient/carer could not participate. This resulted in a need to recruit additional patients/carers.

Further, if a patient passed away and another patient/carer was recruited for that pharmacy, there were occasions when that second patient also passed away. If an additional patient/carer could not be recruited, this affected the pharmacists’ motivation because they did not want to continue participating in the study without any interaction with the patient/carer. Patients continued to pass away over the study period (February-June 2005), and this again affected some of the pharmacists’ motivation to continue doing the educational program if they were in the Evaluation Test Group.

Thus, time became an issue. In the time between the commencement of recruitment to the commencement of the educational program, numerous patients died, and therefore more time was needed (and hence the recruitment period was extended) in an effort to recruit more patients/carers to obtain the sample size desired. If the recruitment period wasn’t extended, it would have been likely that even the small number of patients/carers
and pharmacies/pharmacists who did agree, and could participate, wouldn’t have been obtained.

6.1.3 Study site

Although the western suburbs of Melbourne encompass a relatively large geographical area, a wider geographical area, encompassing a number of palliative care services may have resulted in the achievement of a larger sample size. Whilst conducting a multi-centre study was not within the scope of this research project, it may however have meant that patients/carers in rural Victoria would have been provided with the opportunity to participate in this stage of the project; many patients in rural areas can experience poorer health, and greater difficulties accessing health services, coping, and understanding their medicines (154), than those living in urban areas.

In conclusion, recruitment of palliative care patients and their carers is difficult, and achieving a statistically significant number was not successful in this project mainly because of attrition and gatekeeping by nurses. In an attempt to overcome this, the researchers monitored the recruitment rate, and in response, modified the recruitment strategies used. The implementation trial, specifically the documentation and assessment of interventions and the patient/carer questionnaires, were included in this study at the request of the granting body review panel. Future studies should consider broader multi-centre participation, allow for significant attrition when calculating sample size, and define inclusion criteria that can ensure a reasonable length of follow-up.

6.2 Evaluating the impact of community pharmacists on providers of palliative care services

A modification was required to one aspect of Stage 3 of the project, which was approved by the Pharmacy Guild of Australia. It was originally proposed that in Stage 3 of the project that the impact on providers of palliative care services would be sought. The views of other key stakeholders were to be obtained through a questionnaire (Proposal Application Number: 2003-005, p.7), however, it was not possible to measure the impact of community pharmacists’ palliative cancer care service provision on other providers of palliative care services.

It was planned that a questionnaire be sent to key stakeholders who had had contact with the Evaluation Test and Control Group pharmacists whilst they were participating (or not) in the educational program. The views of general practitioners, palliative care physicians, community palliative care nurses, and hospital pharmacists, regarding any change in interaction with the participating pharmacists would be investigated. Unfortunately, this was unable to be conducted.

In most cases, the patient/carer interacted with more than one of the participating pharmacists; it was therefore difficult for a key stakeholder of that patient, to recall the interactions of individual pharmacists within a pharmacy. Additionally, the implementation trial data revealed that in some cases, a given patient had more than one pharmacist, and not all of these pharmacists had interacted with the stakeholder. Consequently, data would have been collected on some pharmacists and not others, resulting in an incomplete data set.
The accuracy and reliability of the data would also be decreased because information about the pharmacist’s interaction and its impact on the key stakeholder was being sought after a considerable time (up to 12 weeks) may have elapsed since the interaction took place. Accordingly, information recalled may have related to an interaction with another pharmacist, or may have been biased towards a particularly good, poor or recent interaction only. An overview of the sum of the interactions with the stakeholder was desired. In addition, stakeholders would have been interacting with pharmacists who were not participating in the project. This became evident from feedback received from interaction with the participating pharmacists, as they reported that it would be difficult for the stakeholder to know whether the pharmacist was in the project or not.

Furthermore, the earlier intervention data received, showed that only three pharmacists had contacted patients’ doctors, a total of 6 times. Consequently the researchers were not receiving the information needed to recruit adequate numbers of key stakeholders from which to gain meaningful data.

The information regarding the impact of pharmacists’ interactions on key stakeholders was captured however, through the post-program questionnaires conducted with patients/carers. As key stakeholders, patients/carers provided their views of their interaction with the Evaluation Test and Control Group pharmacists; data was also collected on their knowledge of the medicines they were taking (Refer to Section 4.3.3). In addition, information on interactions with other key stakeholders (e.g. doctors) was obtained from the Evaluation Test and Control Group pharmacists’ records of the interventions they made with patients/carers. Further, the post-program evaluation questionnaire provided information from the Educational and Evaluation Test Group pharmacists on whether their interactions with a variety of stakeholders (e.g. doctors, nurses and other pharmacists), was less, the same, or had increased as a result of undertaking the educational program.
7 CONCLUSION

This research project achieved its prime objectives: the development, implementation and evaluation of a practice-based and flexible online educational program in palliative cancer care for community pharmacists. The program was highly valued by the participating community pharmacists because it not only increased their knowledge and interaction with palliative care patients/carers, but it also impacted on their practice in metropolitan and rural pharmacies throughout parts of Australia. The educational program was shown to be a useful continuing education tool, thus providing the educational base for the development of palliative cancer care as a specialised professional service provided by community pharmacists. The aim of increasing the awareness among community pharmacists of their role in the delivery of medication management as part of palliative cancer care services was also achieved. Pharmacists reported an increased awareness of their responsibility and capacity to help patients and their carers. This awareness however, extended to the realisation that the provision of palliative care services required time, for which appropriate remuneration was required to maintain a viable pharmacy practice. Thus, the educational aims of the project were met (Refer to Sections 1.2.1 to 1.2.5 and Section 1.3.1 and 1.3.3). However, the results revealed that the specific objective of improving collaboration with other healthcare colleagues did not occur in the majority of pharmacists, but remained similar to that experienced prior to completing the program (Refer to Sections 1.3.2.3).

Whilst there was an increase in the frequency of pharmacist-initiated changes to drug therapy observed in Stage 3 of the project, the findings were inconclusive regarding whether the patients/carers had a better understanding of their medicines, with a reduction in potential drug-related problems and improved compliance with medication regimens, as a result of the pharmacists’ participation in the project. This was mainly due to the small sample sizes of both patients/carer and pharmacists. Thus, not all of the specific objectives were fully realised (Refer to Sections 1.3.2.2, 1.3.2.4 and 1.3.2.5).

This project resulted in the identification of a number of impediments to community pharmacist involvement and integration of community pharmacy practice into palliative cancer care service provision. These included:

- A lack of education/knowledge of the majority of community pharmacists in palliative cancer care
- Lack of remuneration for service provision
- Infrequency of palliative care patients/carers visits to community pharmacies
- Workforce patterns of community pharmacists

These barriers are discussed below with a focus on potential strategies for the provision of pharmacy-related palliative cancer care services. Indeed, there is a growing need for pharmacists to be able to provide cognitive services to patients with complex acute or chronic care needs that are managed in the community.

The findings from the project suggest that a number of the participating pharmacists felt that the continuing professional education of community pharmacists in palliative cancer care, via the online educational program developed, would only be truly worthwhile and valuable if there was adequate funding by the Australian Government for pharmacists to be remunerated for their services and time.
Conclusion

Most of the pharmacists involved in the implementation trial reported that they had fewer opportunities to make a difference to the care of their designated patient or carer, because of the infrequent visiting of the patient/carer to the pharmacy for prescription medicines and over-the-counter products. Some of the Educational Group pharmacists also reported that infrequent visiting of patients/carers to the pharmacy was a barrier to applying their newly gained knowledge in practice.

The findings indicate that the current model for the delivery of palliative cancer care services to the community, that relies on patients/carers visits to the pharmacy, is not working effectively in the provision of specialised pharmacy-related palliative care services to people in the community. Clearly, the current model does not adequately enable pharmacists to contribute to medication management of patients who are receiving complex care in the community and who cannot present to the community pharmacy.

Patients with chronic conditions require frequent care\(^{(52)}\) and require expertise from multiple disciplines (including hospital, community providers and GPs working in partnership) to ensure that their needs are considered comprehensively\(^{(53)}\). The team-based management of patients and the provision of care in residential aged care and community settings is becoming increasingly important as the incidence of chronic disease associated with population ageing rises\(^{(52, 53)}\). Pharmacists in the community need to be able to provide medication management services to these patients and in many instances this cannot occur in the community pharmacy setting, as witnessed in this project.

Further impediments include the increasing complexity of care and workforce related pressures. The burden of disease management impacts on the available time, and therefore opportunity, to provide palliative care services. This conclusion is supported by the 2005 Productivity Commission Report\(^{(52)}\) on Australia’s health workforce, which recognises that there are considerable pressures on all health professions, including community pharmacists. There is a shortage of pharmacists, who account for 3% of health professionals, with a growth in the number of those wishing to work part-time and in the number of females, who typically work fewer hours than their male counterparts\(^{(52)}\). It is therefore possible that pharmacists working full-time are busy managing the pharmacy, with little incentive, motivation and time available to deal with complex care patients based at home as highlighted in this project regarding palliative care patients.

Consequently, as a result of the findings of this project, a new model for the delivery of pharmacy palliative care services (and other complex care services) to the community requires formulation.

The fundamental components of a model for the provision of cognitive clinical pharmacy services to complex care patients managed in the community that require consideration include:

1. Ability for pharmacists to provide cognitive services in the same location as that of other health professionals (for example, a patient with a chronic disease that precludes the person going to a community pharmacy requiring that the service may need to be provided in the home or in a community practice site).

2. Ability to provide the cognitive services on more than one occasion to the same patient.
3. An accreditation program that facilitates the provision of clinical pharmacy services to complex care patients (this may require a targeted educational program such as that developed for this project).

4. Provision of "case conferencing" services to community treatment centres (for example, pharmacist involvement at the palliative care service)

The provision of this model is not possible under the funding arrangements of the Fourth Guild/Government agreement. Further research should be undertaken to demonstrate the evidence in support of the development of a funding model to enable the provision of these services.

In the interim, community pharmacists from both urban and rural areas in Australia who are enthusiastic and dedicated to contribute towards the delivery of palliative cancer care services are encouraged to:

1. Become accredited to conduct medication management reviews (MMRs).

2. Undertake the online educational program developed in this project, as feedback from the pharmacists who completed it indicated that it is a highly valuable and excellent resource.

3. Liaise with palliative care services or centres to provide complex care\(^{(63)}\) to patients and carers in the community, in conjunction with other health professionals as part of the multidisciplinary team.
RECOMMENDATIONS
8 RECOMMENDATIONS

The recommendations arising from this research are presented under four strategic areas:

1. Education
2. Pharmacy practice
3. Further research
4. Policy

1. Education

The pharmacists who completed the online educational program found it to be valuable in deepening their understanding of palliative care issues, and it was relevant to community pharmacy practice. With improved knowledge, the pharmacists believed they were better able to answer palliative cancer care-related questions, assist in the management of symptoms such as pain, nausea, constipation and mucositis, and work in collaboration with doctors, who prescribe opioids. In addition, those pharmacists who were involved in identifying the education needs of community pharmacists, and those involved in the assessment of pharmacists’ interventions became increasingly aware of the important role of community pharmacists in palliative cancer care. It is therefore recommended that:

Recommendation 1a

National implementation of the online educational program occurs as a continuing professional development program for community pharmacists in palliative cancer care.

This may involve:

- Increasing the awareness of community pharmacists of their role in palliative cancer care, via various media, including educational leaflets distributed by the Pharmacy Guild of Australia. Particular emphasis may be placed on those pharmacists who are accredited to conduct Medication Management Reviews.

- Implementing a marketing strategy to ensure community pharmacists throughout Australia are aware of the educational program, can access it, and will be provided with Continuing Professional Education Points for completing all or part of it. Pharmacists need to be provided with information of the benefits of undertaking the program, including the experiences and feedback obtained from those who participated in the present study.

- Increasing the timeframe to 12 months for completion of the program, and evaluate pharmacists’ satisfaction with the program content and presentation, and its impact on their knowledge, in a manner similar to what was done in the present program.

- Including a hard-copy manual of the educational program, as suggested by some of the participants, to further assist pharmacists in their learning.

- Availability of financial resources to review the program in 2007, by external reviewers (academics, researchers, and palliative care experts).
Key finding

The patients/carers who participated in this study supported the role of the community pharmacist in the palliative cancer care team. Whilst they interacted with community pharmacists, they were not fully aware of their role in providing information and advice regarding drug interactions and side effects. Therefore it is recommended that:

Recommendation 1b

An education strategy for consumers in the role of community pharmacists in providing information and advice regarding medicines, adverse effects and drug interactions related to palliative cancer care be developed and implemented.

Key finding

The doctors, nurses and hospital pharmacists who participated in this study supported the role of the community pharmacist in the palliative cancer care team. Through their participation in the research project, they reported an increased awareness of the community pharmacists’ role in palliative cancer care. Therefore it is recommended that:

Recommendation 1c

An education strategy for health care professionals working in palliative care services and centres, on the role of community pharmacists as valuable members of the health care team in the provision of palliative cancer care services be developed and implemented.

This may involve:

- Collaborating with professional bodies in medicine and nursing to inform them of the role of community pharmacists in palliative cancer care. This education may take place in the form of leaflets distributed by the Pharmacy Guild of Australia, in conjunction with seminars or workshops.

- Highlighting examples of pharmacists’ interactions with other health professionals that took place during this study, and combining this with evidence from the literature indicating the potential role of community pharmacists as part of the palliative cancer care team.

Recommendation 1d

An educational and accreditation program be explored that enables the provision of complex care pharmacy services to patients in the community that targets specific complex therapeutics.

Key finding

Currently there is a project being undertaken[54] to include general information on palliative care in all undergraduate curricula of medical, nursing and allied health programs in Australia. However, the online program developed in this research project is more specific to pharmacists and their practice, and would prepare pharmacy students and pre-registrants adequately. The pharmacists who completed the program developed in this
project recommended that other pharmacists, including students of pharmacy, also complete the program. It is therefore recommended that:

**Recommendation 1e**

Support for the inclusion of the online educational program in undergraduate curricula for pharmacy students and pre-registrants be sought.

This may involve:

- Approaching the Deans of Pharmacy of undergraduate programs, either directly or through the Committee of Heads of Pharmacy Schools of Australia and New Zealand (CHPSANZ), to consider inclusion of the online educational program as a component of their curricula.

2. **Pharmacy practice**

**Key finding**

This project resulted in the identification of a number of impediments to community pharmacist involvement and integration of community pharmacy practice into palliative cancer care service provision. These included:

- A lack of education/knowledge of the majority of community pharmacists in palliative cancer care
- Lack of remuneration for service provision
- Frequency of palliative care patients/carers visits to community pharmacies
- Workforce patterns of community pharmacists

It is therefore recommended that:

**Recommendation 2a**

A coherent and equitable model for delivery of pharmacy-related palliative care services to the community be implemented. This would involve training, including the on-line educational program, as an integral component of the preparation of community pharmacists for this role.

**Recommendation 2b**

A model of care be developed for the provision of cognitive clinical pharmacy services to complex care patients managed in the community who require more intensive pharmacy services than is able to be provided under the existing medication management review programs.

**Recommendation 2c**

A model of care be developed that provides cognitive pharmacy services in the same location as that of other health professionals and that facilitates the provision of these services on multiple occasions.
Recommendation 2d

A model of care be developed that facilitates the provision of “case conferencing” pharmacy services to community treatment centres

3. Further research

Key finding

The post-program patient/carer questionnaire used to assess the medication knowledge, recall of medical information, and interactions with pharmacists may be of use to assess the knowledge and views of patients with other chronic illnesses, with a view to assessing their educational needs and targeting education and health care services accordingly. It is therefore recommended that:

Recommendation 3a

Further validation be conducted of the post-program patient/carer questionnaire developed for this project to assess the medication knowledge, recall of medical information, and interactions with pharmacists/other health professionals of patients/carers with other chronic illnesses.

This may involve:

- Validation of the questionnaire in other health care settings, with other complex care patients (e.g. diabetics, asthmatics).

Recommendation 3b

Further research should be undertaken to demonstrate evidence in support of the models of care proposed in Recommendation 2 and exploration of the funding arrangements to remunerate pharmacists for these services.

4. Policy

Key Finding

The pharmacists found the educational program to be a relevant and valuable resource and felt that allocation of continuing education points would be an encouragement for more pharmacists wishing to complete the program. It is therefore recommended that:

Recommendation 4a

The Pharmacy Guild of Australia formerly recognise the educational program as part of their Quality Care Pharmacy Program Continuous Quality Improvement (QCPQ CQI) process, and allocate points for completion of the various modules in the program.
DISSEMINATION OF RESULTS
9 DISSEMINATION OF RESULTS

Publications


Conference presentations


Hussainy SY, Beattie J, Nation RL, Dooley MJ, Fleming J, Wein S, Pisasale M, Scott WJ and Marriott JL. Development of an online educational program in palliative care care for community pharmacists: Using the nominal group technique (NGT) to assist in determining content material. 8th Australian Palliative Care Conference, Sydney, August 2005.


Further papers for publication are currently being developed from the research outcomes.
10 REFERENCES

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