Performance in clinical therapeutics training of community pharmacists

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Abstract
Primary Care Trusts responsible for commissioning healthcare services in the UK are required to ensure that community pharmacists providing clinical medication reviews, an enhanced service, are appropriately trained before becoming accredited service providers. This training has not been defined. The aims of this study were to measure community pharmacists' performance in training for medication reviews, to explore factors influencing their performance, and to explore the pharmacists' perceptions of this training. Overall, 37 of the recruited 43 pharmacists completed the training at postgraduate certificate level in 2002. Pharmacists performing well in one module were likely to do so in others, indicating intrinsic competence. These pharmacists provided medication reviews in 2003 and 2004; 33 were interviewed in 2004. The interviewees perceived that whilst the training had been arduous, it had been beneficial for providing medication reviews and everyday practice. Further work is required to develop competencies and training for clinical medication reviews in community pharmacy.

Keywords: *Community pharmacy, medication reviews, performance in training, perceptions of training*

Introduction

As the role of pharmacists has shifted from compounding medicines through dispensing them to advising patients, their carers and other healthcare professionals (HCP) in their use, pharmacists need to develop and maintain expertise and competence in new areas, for example, in reviewing patients' medications for efficacy and continuing appropriateness (Department of Health, 2000; National Prescribing Centre, 2000; Department of Health, 2002, 2003). Pharmacists have been shown to be able to identify drug related problems which have been resolved with GPs (Granås & Bates, 1999; Mackie, Lawson, Campbell, Maclaren, & Waigh, 1999; Zermansky, Petty, Raynor, Freemantle, Vail, & Lowe, 2001). In 2001, the Department of Health recommended that every Primary Care Trust commissioning healthcare services locally, should support community pharmacists to offer services to the elderly

in using their medicines and to ensure they receive appropriate therapy (Department of Health, 2001a).

"Pharmacy in the Future" emphasised that patients should be confident in pharmacists' good advice (Department of Health, 2000). The Royal Pharmaceutical Society of Great Britain (RPSGB) and the Department of Health recommended clinical governance, comprising risk management, maintenance of competence and continuing professional development, as a means to improve pharmacy services (RPSGB, 1999; Department of Health, 2001b). The new community pharmacy contract for providing services funded by the National Health Service (NHS) was implemented in 2005 and outlined the essential and advanced services on a national level and enhanced services on a local level (Department of Health, 2005a). Provision of advanced services by community pharmacists require them to demonstrate competence through accreditation provided by

Higher Education Institutes (HEIs) or universities using a nationally agreed competency framework (Department of Health, 2004). This should ensure their competence to provide a high quality service.

Enhanced, locally commissioned services include, for example, clinical medication reviews, smoking cessation services and anticoagulant monitoring. While the PCTs commissioning enhanced services are required to ensure that these are provided by appropriately trained and qualified pharmacists (Department of Health, 2005), the competencies or the training required of pharmacists providing, for example, clinical medication reviews have not been defined. However, the service specification for clinical medication reviews suggested that training in medicines management, concordance and prescribing support provided by the Department of Health funded Centre for Pharmacy Postgraduate Education may support the provision of the service (Department of Health, Pharmaceutical Services Negotiating Committee, & NHS Confederation, 2005). Community pharmacists have participated in local training programmes lasting up to 7 days, comprising distance learning, workshops, supervised practice and support provided by local practice pharmacists, to become accredited medication review providers (MacLaren, Mackie, Lowrie, & Tennant, 2003; Hansford, Krska, & Gill, 2005; Holland, Lenaghan, Harvey, Smith, Shepstone, Lipp, Christov, Evans & Hand, 2005; Anonymous, 2006). However, the performance of community pharmacists participating in training for provision of medication reviews has not been evaluated. The primary aim of this study was to measure the training performance of a group of community pharmacists and to explore factors influencing their performance. The pharmacists were subsequently accredited to provide clinical medication reviews at level three. The second aim was to explore the pharmacists' perceptions of the training. Ethics approval was obtained for the medication review study (LREC (B&H) 167), but was not a requirement for this research around performance and perceptions of community pharmacists in the UK. The study protocol was peer reviewed.

Materials and methods

Pharmacists

In 2001, Barking and Dagenham, and Havering Primary Care Trusts (PCTs) recruited community pharmacists to provide a clinical medication review service to elderly primary care patients. All 80 community pharmacists working within the PCTs were invited to participate in the service development; 43 agreed to participate. Each recruited pharmacist had to complete approximately 300 h of training in clinical therapeutics at postgraduate certificate level

in 2002 before being accredited to provide medication review services. The medication reviews were due to start in 2002; but were delayed until 2003 and continued during 2004 (Mackie, Mohammed, Corleet, Laaksonen, Bates, Duggan Morrow, Patel & Krishek, 2005).

Performance in the training

All training for the pharmacists and assessment of course work were organised and provided by Robert Gordon University, Aberdeen where the principal investigator was located at the start of this study. The training comprised a two-day workshop on patient interviews and care planning, five distance learning clinical pharmacy modules at certificate level, and a one-day IT-training workshop to introduce a bespoke data collection software program developed at the Robert Gordon University. The workshop on patient interviews and care planning and the *Pharmaceutical care planning* module aimed to prepare the pharmacists to provide the clinical medication reviews. The therapeutics modules encompassed the treatment of major disease states: *Cardiovascular therapeutics 1 and 2*; *Endocrine therapeutics*; and an optional module, *Respiratory*, *Musculoskeletal* or *Gastrointestinal therapeutics*. Each of the modules was worth five credits. The training started with the *Pharmaceutical care planning* module and continued through the compulsory modules to the optional module. Pharmacists had to achieve at least 40% of the total mark in each of the five modules to become accredited. Whilst the pharmacists' ability to formulate and document pharmaceutical care plans was assessed in the *Pharmaceutical care planning* module, case studies with multiple choice questions, short answers and short essays were used in the assessment of the others.

Perceptions of the training

A semi-structured interview schedule was developed, comprising six questions that explored the pharmacists' in-depth perceptions of their training and medication review performance and participation in the Medicines Management project (Appendix I). For the purposes of this study findings pertaining to performance in training are explored. The schedule was reviewed for its face validity by two other researchers (Miles & Huberman, 1994). Telephone interviews were conducted with the pharmacists by the researcher in 2004 after the Medicines Management project was completed and the pharmacists had provided the service in 2003 and 2004. It was accepted that the telephone interviews might not yield the same depth of information as the face-to-face interviews. All interviewees consented for audio taping of the interviews that were transcribed verbatim.
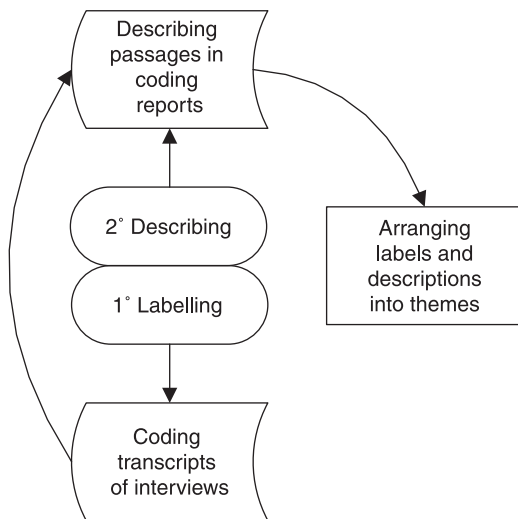
Figure 1. Flowchart of the processes involved in analysing the interviews.

Data handling and analysis

All collected data were stored safely, coded and anonymised; the pharmacists were not identifiable through any analysis. The data on training performance were entered onto an SPSS database 12.01 for statistical analyses. The entered data were cleaned; the ranges of codes were checked for outlying values, subsequently corrected. Ten per cent of randomly chosen cases was checked for coding errors. No errors were found, therefore, the number of coding errors could be assumed to have been minimal in the whole database. For testing of differences in frequencies X^2-test was used and associations between nonparametric variables Spearman's ρ was used (Field, 2000). Multiple correspondence analysis or HOMALS was employed to explore relationships and differences between multiple categorical variables (Grassi, Rezzani, Biino, & Marinoni, 2003). The relationships between variables are described in a twodimensional space by assigning numerical values to categories of variables, revealing underlying structures between categories (Zanting, Verloop, & Vermunt, 2001; Grassi et al., 2003). Each category, for example

female or male gender, is plotted in the centre of the cases that belong to that category minimising the total distance between cases. Categories showing association are plotted close to each other; categories showing differences are plotted further apart.

The interview data were entered onto a database using NVivo 1.3 software for assistance of data storage, coding of the interviews and data retrieval once coded. The process of the qualitative analysis is presented in Figure 1. A grounded approach was employed in the descriptive analyses of the interviews, that is, the codes and themes were allowed to emerge from the interviews, rather than using a pre-defined coding frame (Miles & Huberman, 1994).

A preliminary coding frame was constructed based on the interview schedule and the interviews; the coding frame subsequently included codes emerging from the interviews. An iterative process was applied: transcripts stored in the database were coded for meaning; and reports comprising labelled passages generated with the software were coded by describing what was being said in the passages. The credibility of coding of the interviews was ensured by another researcher. Patterns of labels were grouped into themes.

Results

Pharmacists

Thirty-seven pharmacists completed their training successfully and became accredited as service providers in 2002. Two accredited pharmacists withdrew from the study due to personal reasons, leaving 35 pharmacists to provide the service in 2003 and 2004. One pharmacist refused to be interviewed claiming to be busy and another had retired; 33 pharmacists were interviewed in 2004. Table I summarises the pharmacist characteristics.

The median year of graduation (BPharm or BScPharm) was 1984 and the median year of starting at the current employment was 1991. For further analyses length of time since graduation and length of tenure were dichotomised around the median score.

Table I. Pharmacist characteristics.

Characteristic		Training 2002 % (*n/N*)	Interviews 2004 % (*n/N*)
Gender	Female	22 (8/37)	21 (7/33)
	Male	78 (29/37)	79 (26/33)
Employment	Employee	47 (17/36)	47 (15/32)
	Owner	53 (19/36)	53 (17/32)
Primary care trust	Barking and Dagenham	57 (21/37)	55 (18/33)
	Havering	43 (16/37)	45 (15/33)
Additional appointment	Appointment	17 (6/36)	19 (6/32)
	No appointment	83 (30/36)	81 (26/32)
Additional qualification	Qualification	25 (9/36)	28 (9/32)
	No qualification	75 (27/36)	72 (23/32)

Table II.   The performance of pharmacists in the training.

	Module	Mean (%)	Median (%)	Range (%)
Compulsory	*Pharmaceutical care planning*	72	74	41–96
	Cardiovascular therapeutics 1	59	60	40–82
	Cardiovascular therapeutics 2	63	64	40–90
	Endocrine therapeutics	66	66	40–92
Optional	*Gastrointestinal therapeutics (n = 4)*	70	65	60–88
	Musculoskeletal therapeutics (n = 10)	57	55	44–72
	Respiratory therapeutics (n = 23)	70	68	50–86
Total	Cumulative	65	66	47–79

Performance in the training

The clinical training results are presented in Table II. Results of the *Pharmaceutical care planning* module were approximately normally distributed, whereas the distributions of the results in the other compulsory modules were bimodal. The marks of the compulsory modules ranged greatly between 40 and 96%, whereas the marks of the optional modules varied less. For further analyses training results were dichotomised around the median score.

HOMALS was employed in the analysis of the training results to illustrate relationships between variable categories. Quantifications of the categorical variables were explored. The results of the optional modules were excluded from the analysis as categories with low numbers may distort HOMALS quantifications. Only four and ten pharmacists had selected *Gastrointestinal* and *Musculoskeletal therapeutics*, respectively. To have included 23 pharmacists who chose *Respiratory therapeutics* would have potentially skewed the results. In a two-dimensional solution the *Pharmaceutical care planning* training results contributed to dimension two (eigenvalue = 0.228), length of time since graduation, and the other training results contributed to dimension one (eigenvalue = 0.304), length of tenure contributed to both dimensions, gender and employment status did not discriminate on either dimension (Figure 2).

The three therapeutics modules contributed to the same dimension, indicating that similar type of knowledge was attained through these modules. Indeed, *Cardiovascular therapeutics 2* results correlated positively with *Cardiovascular therapeutics 1* and *Endocrine therapeutics* (Spearman's $\rho = 0.549$, $p < 0.0005$; Spearman's $\rho = 0.547$, $p < 0.0005$, respectively). The categories of results to *Endocrine* and *Cardiovascular 2* therapeutics grouped closer together with *Pharmaceutical care planning*, instead of with *Cardiovascular therapeutics 1*. *Pharmaceutical care planning* results correlated positively with *Endocrine therapeutics* and *Cardiovascular therapeutics 2* (Spearman's $\rho = 0.526$, $p = 0.001$; Spearman's $\rho = 0.354$, $p = 0.032$, respectively).
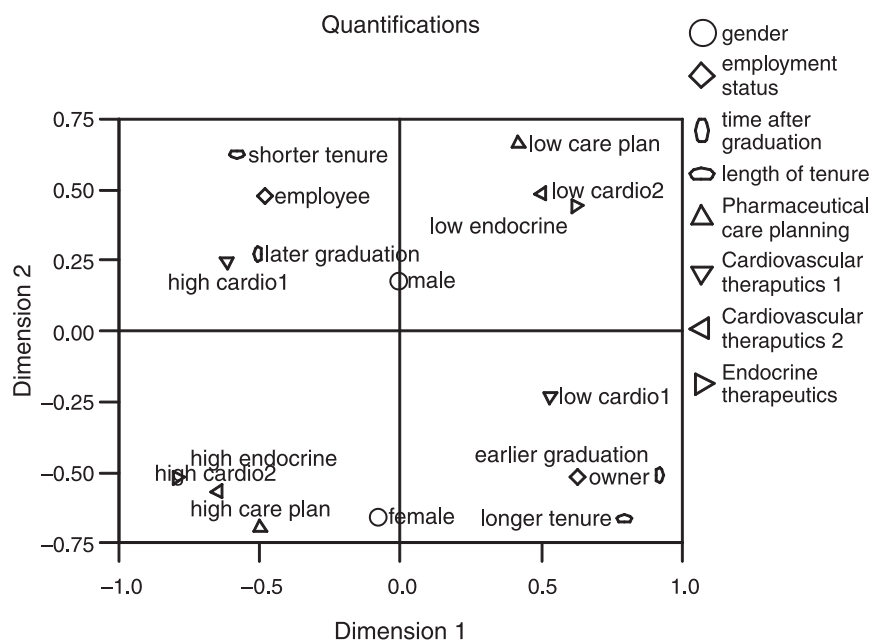

Figure 2.   Quantifications of the training results and pharmacist characteristics.

Whilst the categories of results to *Cardiovascular therapeutics 1* were grouped close together with time since graduation and employment status, the categories of the results to the modules did not correspond with characteristics, though female pharmacists seemed to have a tendency towards higher results. Whilst employees and those who had graduated more recently tended to achieve higher results in the *Cardiovascular therapeutics module 1*, the differences were not statistically significant (χ^2 tests, $p > 0.05$). Those who held an additional qualification tended to achieve higher results in the *Pharmaceutical care planning* module; not significant (χ^2 test, $p > 0.05$). Having attained similar knowledge earlier did not seem to help with the training.

Perceptions of the training

A summary of the perceived benefits of as well as problems with, the training emerging from the interviews with the community pharmacists is displayed in Table III.

While the pharmacists had been expected to complete their training in 5 months, they required 9 months for completion. Indeed, many thought that the training had been difficult and required a lot of work. Nonetheless, they had been motivated to complete the training. The training had been useful and helpful; it had prepared pharmacists for providing medication reviews. The knowledge the pharmacists had acquired was not only applicable for medication reviews, but also had impacted their everyday practice. The training had also given confidence:

> I actually really enjoyed [the training] when I was doing it. Even though it was extra work, you know, weekends and evenings, I did actually feel quite motivated doing it.
>
> 1002, female, section 16

I've used [the knowledge], I mean, I suppose in an unofficial capacity I use it now in the everyday work that comes along. Because you look at the prescriptions and occasionally I've actually spoken to the GP and said: "You know, do you think this is right?" [...] It makes you look at the scripts and it gives you more insight into the prescriptions and it makes you think "They really shouldn't be having this lot of stuff. They really should be doing it some other way." It gives you more insight into what is going on.

> 1024, male section 16

The median year of graduation was 1984; education and training of pharmacy undergraduate students have changed markedly in the last 20 years with reforms in curricula (Hanning, Price, Scanlan, Silverthorne, Cantrill, Hey, Freeborn & Cook, 2002). What pharmacists had been taught at the university had prepared them for pharmacy work at that time and what they had to learn during this clinical training may have been completely new to them. Additionally, although many of the pharmacists had participated in continuing education activities, they may not have participated in learning at certificate level. Some pharmacists needed more support in their training than was possible through distance learning:

> The courses themselves are not particularly easy, they are quite difficult as well. We did try to get some help from local colleagues on certain things we didn't understand.
>
> 1042, male, section 16

Some perceived that the training had included unnecessary information. As they perceived that the training had been developed for pharmacists in hospitals, they did not need to learn everything for community pharmacy:

> Some of [the training], some of it was a bit too technically geared to the hospital side. With regard

Table III. The perceptions of the training received.

	Category	Opinion
Training: describes the perceptions of the clinical training for medication review service	Benefits of the training	The pharmacists perceived the training had been beneficial because: it had been useful and helpful as preparation for providing medication reviews, it had increased or refreshed pharmacists' knowledge, it had an influence on practice and patient care, it gave confidence for practice, and it had prompted reflection on learning needs
	Problems with the training	The pharmacists perceived the training had had its downside because: it had been extra work, it had been a difficult and intense course, and it was perceived to have been aimed for hospital work and too detailed for community pharmacy

to some of the cardiac work, was really kind of what the hospitals do when patients have heart attacks, and how to read ECGs and things like that which probably isn't relevant. It's nice to know as background but we're never going to actually be involved in that.

<div align="right">1007, male, section 15</div>

The training for a particular service should be relevant in order to keep pharmacists motivated to learn. Pharmacists do need to achieve appropriate understanding of illnesses and their treatment if they are to provide medication reviews competently. It is possible though that pharmacists may have different learning needs which should be taken into consideration when developing services and training. One of the younger pharmacists felt the training did not contribute anything new; it had been a revision of what had been previously learnt:

> It's not something new, it's something that we've already learnt at Uni. But it just probably was refreshing your memory and, you know.
>
> <div align="right">1033, female, section 18</div>

Three pharmacists did not provide medication reviews because their local GP did not participate or their perceived workload prevented them from providing an additional service. Six others were not able to use the laptop computer given to them for the service provision and did not review patients' medicines. These pharmacists thought that providing the service in addition to completing the training would have given them more experience and had a greater impact on their practice:

> Because I wasn't enrolled with the actual seeing of patients, [attained skills and knowledge] sort of melted into the background.
>
> <div align="right">1020, male, section 16</div>

Two pharmacists who did provide the service did not think the training had been enough to become a competent medication reviewer. They felt pharmacists should learn more before becoming accredited and suggested that a complete clinical pharmacy course was appropriate:

> I think [the training] was possibly not OK for people who didn't have initial [...] background. [...] I think they needed more than just reading about 4 or 6 modules and then becoming a whatever, medicines management pharmacist. [...] I think that the modules are not going to make everybody an expert, if you ask 10 of them; the person will just get the basic out of the modules that you need. [...] I think it was just that you train people and then put them in there without actually

evaluating to see how much they know or how they perform before releasing them into the place. I think that's what it was, just 6 modules and then here you are, you're an expert then you just have to speak to the GPs and give them advice. So, more training I think. I would have gone for a full year part time training, just the same as the clinical pharmacist. [...] I think people just learn on the surface whatever it is. It's just very basic and very unfinished, gone.

<div align="right">1041, male, section 16</div>

Discussion

Overall the project or the intervention was successful: most pharmacists completed the training. Pharmacists performing well in one module were likely to do so in others. While the pharmacists perceived that the training had been difficult, they showed determination to attain this accreditation, perhaps also to improve their professional satisfaction.

Strengths and limitations

The recruitment of the pharmacists was restricted to those working within the Barking and Dagenham, and Havering PCTs. They had been recruited by the PCTs and may have been self-selected and, therefore, may have held perceptions not representative of a wider population of the training. However, due to the high level of commitment required of them, training and providing medication reviews over a long period of time, randomisation was not possible. Hence, a pragmatic approach to sampling was applied. Furthermore, calculating the size of a representative sample was not possible as the Barking and Dagenham, and Havering PCTs limited the size of the group to around 40 pharmacists. Whilst this study involved quantitative methods, qualitative methods were also employed which require intensive work, restricting the sample size further but allowing detailed study (Smith, 2002). However, the range of performance in training varied from poorer to better, suggesting that despite self-selection the sample may have been representative of a larger population. Pharmacists were contacted a minimum of three times in an attempt to persuade them to interview. Attrition of respondents was expected (Smith, 2002), pharmacists may have changed jobs over time or decided not to participate. While the attrition of some pharmacists was unfortunate, most pharmacists continued their participation in the project throughout the study. They may have felt obliged to participate or felt their experience had to be expressed.

Performance in and perceptions of the training

While training has been provided for community pharmacists reviewing patients' medication, comprising of training up to six weekend workshops (Krass & Smith, 2000; Benrimoj, Langford, Berry, Collins, Lauchlan, Stewart & Ward, 2003a,b; Benrimoj, Peacocke, Whitehead, Kopecny, Ward, & Emerson, 2003c; MacLaren et al., 2003; Hansford et al., 2005; Anonymous, 2006), few studies have reported pharmacists, performance in training. In one study, 23 community pharmacists became accredited, whereas eight failed to perform at an acceptable level (MacLaren et al., 2003). In the current study, the training results were not associated with any specific pharmacist characteristics, perhaps due to the small sample size. In general, pharmacists achieving higher results in one module were likely to do so in the others, conversely, achieving lower results in one module was associated with other lower results. However, HOMALS showed that pharmacists' performance in *Cardiovascular therapeutics 1* grouped further apart from *Endocrine* and *Cardiovascular 2 therapeutics*, than *Pharmaceutical care planning*. The assessment method changed between the first module, *Pharmaceutical care planning*, and the second module, *Cardiovascular therapeutics 1*. The change of the assessment method may have influenced the training results in the latter; in the subsequent two modules, the pharmacists may have grown accustomed to the new types of assignments. The range of training performance varied less in the optional modules than in the compulsory modules. Pharmacists may have chosen the optional module for their own interest or for their patients' benefit or because they were familiar with the subject and wanted to make sure that they passed.

Larsson, Holmstrom, Lindberg, and Rosenqvist (2004) suggested that perceptions of one's role may influence learning and development of competence in trainee anaesthetists. Similarly, the pharmacists achieving lower results in training may not have been motivated to change their role in community pharmacy. In this service development project, the pharmacists were accredited if they had achieved at least 40% of the marks in all five modules. However, this level of performance indicates a pass mark and may not guarantee good performance in providing clinical medication reviews, and ultimately patient safety. This raises an interesting point about competence in practice and achievement in an academic examination, both of which are needed for a pharmacist to be "fit for purpose". Individual differences, as well as motivation or a lack of it, influences learning (Burris, 1976). The pharmacists may have needed more support and feedback in their training to perform better, also suggested for smoking cessation training (National Institute for Health and Clinical Excellence, 2005). These differences in performance in training may have an impact on the quality of medication reviews, indicating further need for individual support throughout the training and continuing this support at the early stages of service delivery.

Pharmacists are expected to prove their competence before being able to provide advanced services, medicines use review and prescription intervention service, designed to support patients' use and knowledge of their medicines (Department of Health, 2005). The assessment is based on competencies in the General Level Competency Framework (Antoniou, Webb, McRobbie, Davies, Wright, Quinn & Bates, 2005; Mills, Laaksonen, Bates, Davies, & Duggan, 2005). In contrast, the Department of Health has not give any guidance to PCTs on the assessment of competencies required for providing enhanced services, for example, clinical medication reviews (Department of Health, 2005). The distance learning course at certificate level gave the pharmacists extensive training on four areas of therapeutics with less emphasis on counselling skills. A demand for also training pharmacists in counselling was highlighted by a recent report into smoking cessation training (National Institute for Health & Clinical Excellence, 2005), suggesting that specific training in counselling may enable pharmacists to provide many services.

The phases between training and service provision were longer than originally planned. Had they been shorter, the pharmacists may have been more positive about the training. Many thought that the training had been arduous, implying pharmacists' lack of clinical knowledge and suggesting challenges for future service developments and the implementation of the advanced and enhanced services. Nonetheless, most were motivated to complete the training. The training had been beneficial to the pharmacists; they were able to provide medication reviews. The experience they attained was not only applicable for medication reviews but had impacted their everyday practice and given them confidence. The perceptions and experiences of training may have influenced the service provision, implying the need for developing appropriate training for clinical medication reviews.

In this cohort, the median year of graduation was 1984; since education and training of pharmacy undergraduate and postgraduate students have changed markedly. An initial individual assessment of pharmacists' skills and knowledge or competence may be appropriate instead of requiring everyone to complete the same training for any particular service. Different types of training, perhaps with more extensive studies in therapeutics or more focussed training in a certain therapeutic area, such as diabetes or anticoagulation services, relevant to local patients (Department of Health, 2006), combining distance learning with workshops and theoretical studies with

practical learning and individual feedback, need to be studied to find the most suitable and effective method of training. Perhaps currently offered clinical medication review training for community pharmacists does not support pharmacists to become competent in providing medication reviews at level three. Therefore, the effect of performance in medication review training on performance in providing medication reviews requires further study to evaluate the appropriateness of the training.

Conclusion

This research showed that community pharmacists are willing to study to provide a new service and ultimately change their role within primary care. Pharmacists performing well in one module showed good performance in others, implying innate competence. The training enabled the pharmacists to provide medication reviews to elderly patients and to integrate their new skills and knowledge into their everyday practice. Whilst the training by distance learning was perceived to have been beneficial for both providing medication reviews and everyday practice, some pharmacists perceived that it had been a difficult and intensive course. Research into optimal training for providing medication reviews is required.

Acknowledgements

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Appendix I. Interview schedule

Question 1	There have been some problems in providing the medication review service. Did you experience any problems? Did you interview patients?
Question 2	What did you think about the training you completed? In comparison with providing the service?
Question 3	How do you feel about the patient interviews and care planning? Becoming better with experience?
Question 4	Did you write GP referrals? How did you feel about writing them? If not why?
Question 5	Were you given feedback on the GP referrals? How did you feel about given feedback/not given feedback?
Question 6	What do you think about providing the medication review service in the future?