

Self-assessment of competence in a community pharmacy setting

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Abstract

Background: The Royal Pharmaceutical Society of Great Britain is currently introducing continuing professional development (CPD) as a means of ensuring the competence of its members. An investigation into the influences of pharmacists' characteristics on self-assessed competence will help identify pharmacists who may need support with CPD. The aim of this study was to explore the influences on the self-assessed competence of community pharmacists.

Methods: A piloted postal questionnaire measuring self-assessed competence was sent to 179 community pharmacists.

Results: Groups of pharmacists based in demographics were identified (K means cluster analysis). ANOVA and *post hoc* tests revealed that pharmacists who were female, younger and working for national chains of pharmacies assessed themselves to be more competent than male owners of independent pharmacies in the "Patient Care" ($F = 3.710, p < 0.05$, Scheffé $p < 0.05$) and "Personal" competency clusters ($F = 4.360, p < 0.05$, Scheffé $p < 0.05$).

Discussion: Male, older pharmacists, who own their own pharmacy, need support to increase their confidence in their skills, knowledge and abilities.

Keywords: Competence, self-assessment, community pharmacy

Introduction

Competence has been defined as the ability to carry out a job or task, whereas competency is a quality or characteristic of a person related to effective performance (Whiddett & Hollyforde, 1999). In clinical practice, it is a combination of task-orientated competence and the behaviourally related competencies that are required to deliver quality care to the patient (Rethans, Sturmans, Drop, Van der Vleuter & Hobus, 1991). Maintaining a high level of clinical knowledge does not make a person a competent practitioner; it is how this knowledge is applied in conjunction with other skills that determines competence. A competency framework is a collection of competencies thought to be essential for effective performance. They are grouped into clusters and have associated behavioural indicators.

In business, organisations have been producing and implementing competencies for the past 20 years; they are used commonly as a performance review tool, in training and development, and in skills analysis (Whiddett & Hollyforde, 1999).

The need for regulation aimed at maintaining the competence of healthcare professionals has been highlighted with reports such as the Kennedy Report in 2001 (Department of Health, 2001) and the introduction on clinical governance and its components of accountability, clinical risk management, remedy of poor performance and continuing professional development (CPD) (Department of Health, 1999). These drives, coupled with increasingly well-informed and sceptical public opinion, make clear the need for healthcare professionals to ensure they are "fit for purpose".

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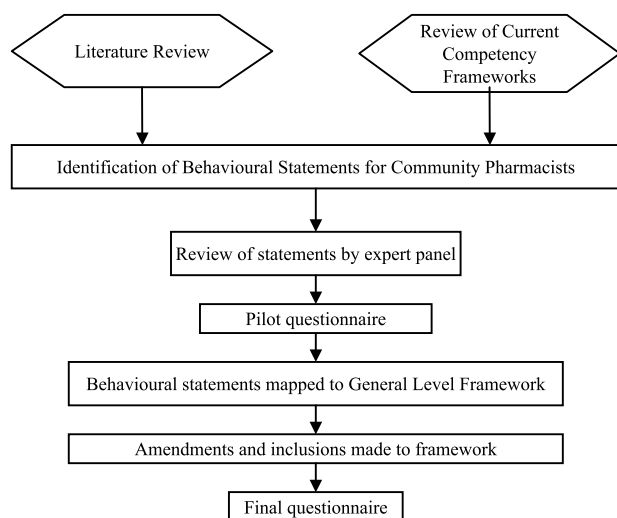


Figure 1. The development of the behavioural statements used in the questionnaire.

As professionals, pharmacists have at present the privilege of self-regulation; the governing body, the Royal Pharmaceutical Society of Great Britain (RPSGB), should ensure that all its members are competent. Previously this was ensured through a period of training and the requirement to pass an examination before registering as a pharmacist. However, the rapid development of new technological advances in medicines and changes in policy mean that a professional qualification no longer implies that a person is competent to complete the tasks and duties for which they were initially trained; learning and development are ongoing processes. Therefore, the RPSGB is currently introducing CPD as a means of ensuring the competence of its members, such that by 2006, all pharmacists on the practising register will have to undertake mandatory CPD. It is claimed that through CPD, pharmacists can demonstrate to the National Health Service (NHS), employers and the public that they are continually improving their competence. In order to be competent practitioners, pharmacists will have to be able to identify their competency gaps or learning needs. One of the major barriers to the introduction of CPD is the lack of a framework to help pharmacists identify their learning needs; success in needs assessment is dependent on the knowledge and understanding of the competencies required to undertake a job effectively. In addition, many primary care and community pharmacists work in isolation and are not subject to regular performance appraisals; they rely on their own understanding of the competencies required to undertake a job effectively and self-assessment of their own competence. An investigation into the influences of characteristics on self-assessed competence will help identify pharmacists who need support with obtaining CPD.

Recent research has described an evidence-based approach to the design and evaluation of a competency framework to facilitate the development of pharmacy practitioners at a general level in hospital pharmacy: The General Level Framework (GLF) (McRobbie, Webb, Bates, Wright & Davies, 2001). The performance of the individual is evaluated using a rating scale, which provides a powerful formative stimulus. The authors reported an improvement in individual performance where the framework was applied, which was sustained over a 12-month period (Antoniou et al., 2004). The benefits were related directly to the framework's explicit and structured description of the key required competencies. This framework has been utilised and developed to capture the activities undertaken by other areas of the profession and is currently being evaluated in community and primary care pharmacies. The new framework has been used in this study to develop a questionnaire to measure pharmacists self assessment of competence.

Aim

The aim of this study was to explore the influences on the self-perceived competence of community pharmacists.

Objectives

The objectives of the study include:

- Designing a self-assessment postal questionnaire to determine community pharmacists' perception of their clinical and professional competence, and;
- Exploring the influence of pharmacists' characteristics on their self-assessed competence.

Materials and methods

Questionnaire development and design

The questionnaire development and design process is shown in Figure 1. A literature review of NHS policy, professional body strategy and research documents relating to the current and future roles of primary care and community pharmacists was undertaken. Medline was utilised using the search terms "competence", "competency", "community pharmacy", "primary care pharmacy", and "role". Additionally, the Internet sites of the Department of Health, the RPSGB and the National Prescribing Centre were searched for relevant policy documents; and the Internet and manual searching identified current competency frameworks for pharmacists. The frameworks identified and used were, competencies for pharmacists working in primary care produced by the National Prescribing Centre (NHS Executive and National Prescribing Centre, 2000); key areas of competence for all pharmacists listed in the RPSGB's CPD document (RPSGB, 2003); the general level competency

framework for junior pharmacists developed by McRobbie et al. (2001); a competency framework for advanced practice pharmacists (Meadows et al., 2004; Department of Health, 2005).

The literature search and analysis of competency frameworks determined a list of behavioural statements that describe the competencies expected of community pharmacists. A panel of pharmacists with expertise in community practice, primary care pharmacy, research and education reviewed these behavioural statements to identify any overlap between statements and any omissions. These behavioural statements were formatted into a questionnaire and piloted amongst community pharmacists in Camden and Islington PCTs (Mills, Bates, Davies & Lyall, 2004). Statements were clarified as a result of the pilot questionnaire and were then mapped onto the existing General Level Competency framework for pharmacy practitioners (McRobbie et al., 2001). Amendments and additions to this framework were made to produce the new GLF.

This new GLF was used to design the questionnaire for this study. The questionnaire comprised two sections: section one collected demographic data from the respondents; section two comprised the 81 behavioural statements taken from the new GLF. Respondents were asked to assess how often they demonstrated the behaviour described in the statement, the response categories were: "always", "usually", "sometimes", "never"; these same categories were used in the evaluation of the original GLF (Antonioni et al., 2004) and in the pilot questionnaire (Mills et al., 2004).

Study area and sample

The study was based within four Primary Care Trusts (PCTs) in the North East sector of the Strategic Health Authority in London: Barking and Dagenham, City and Hackney, Havering, and Tower Hamlets. Questionnaires were sent to all community pharmacy premises in these four PCTs. Pharmacy premises and addresses were identified through the NHS website for local pharmacy services (<http://www.nhs.uk/england/pharmacies/>); 179 pharmacy premises were located in the four PCTs.

Administration of the postal survey

The postal questionnaire and cover letter with a self-addressed freepost envelope were addressed to "The Pharmacist in Charge" and sent to all community pharmacy premises in the four PCTs. Two follow-up questionnaires were administered at 2- and 4-week intervals to encourage response.

Data handling

All collected data were coded, anonymised and entered into a database created using Statistical Package for Social Science version 12.01. Ten percent of the cases were randomly selected and checked for

typing and coding errors. No errors were found, so it was assumed that minimal typing or coding errors were present in the whole database. The response categories in the questionnaire were given numerical values for analysis: 1 = never, 2 = sometimes, 3 = usually, 4 = always. Non-parametric tests, χ^2 , Mann-Whitney *U*-test, Kruskal-Wallis *H*-test and Spearman's ρ -test, were employed for descriptive and inferential statistics. Homogeneity analysis by means of alternating least squares (HOMALS), K means cluster analysis and one way ANOVA were employed to explore the relationships between case characteristics and self-perceived competence.

Results

The postal survey questionnaire was sent to 179 pharmacists. In total 90 pharmacists responded (50% response rate). For the individual PCTs the response rates were: Barking and Dagenham 86%, Havering 51%, Tower Hamlets 26%, and City and Hackney 47%.

Section 1: Demographics of the respondents

Of the pharmacists, 27% ($n = 24$) were female. More than half (55%) of the pharmacists were employees, and of these 67% ($n = 33$) were pharmacy managers, 14% ($n = 7$) second pharmacists and 18% ($n = 9$) locum pharmacists. Of the respondents, 63% ($n = 55$) worked in independent pharmacies, 14% ($n = 12$) worked in a non-national chain pharmacy (more than five pharmacies in a chain), and 24% ($n = 21$) in large national chain pharmacies. For further analysis the non-national chain pharmacies were included with the large national chain pharmacies in one group as "chain". Of the pharmacists, 64% ($n = 57$) had or were planning to build a consultation area in their pharmacy. Personal additional appointments ranged from memberships in PCT Board through Local Pharmaceutical Committee to Pharmacy Forum; however, 82% ($n = 71$) of respondents did not have any additional appointments. Of the respondents, 25% ($n = 19$) held a post-graduate qualification, most in a pharmacy related field; 7% ($n = 5$) of these qualifications were PG certificates, 9% ($n = 7$) were PG diplomas and 9% ($n = 7$) were Master's degrees. Of the pharmacists, 9% ($n = 7$) were currently studying for a postgraduate qualification, half in a pharmacy related field. Only 40% ($n = 35$) of the respondents kept a CPD record.

Whilst pharmacists provided a median of two additional services, for example smoking cessation, 11% ($n = 10$) of the pharmacists claimed that they did not provide any additional services. The PCTs had provided the training for most of these services. The respondents had undertaken a median of four learning activities in the past two years, three had undertaken none. The respondents' median age was

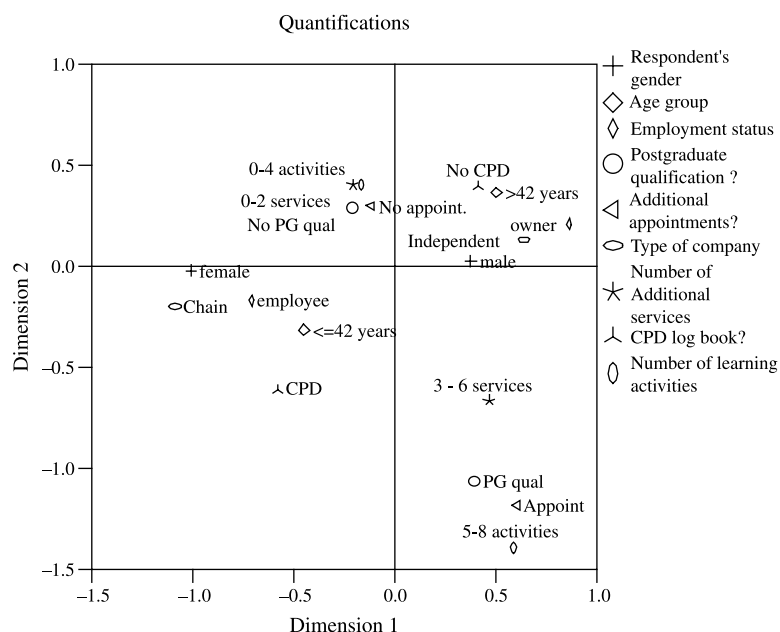


Figure 2. HOMALS quantification output displaying relationships between demographics.

42 years, ranging from 23 to 67 years. The median year for qualification in the UK was 1987, ranging between 1959 and 2004. The median length of time in the current post was 7.3 years, ranging from 1 month to 45 years; due to the positively skewed distribution of the variable the mean was 10.2 years.

Some variables were dichotomised prior to entry into a homogeneity analysis (HOMALS), for example the age group variable was created using the median age (42 years). HOMALS quantifications were explored, and demographics were excluded if they contained small numbers, or were considered outliers. The HOMALS solution yielded two dimensions (Figure 2). Dimension 1 (Eigen value of 0.271) could be described as the demographic dimension and discriminates between gender, employment status and type of company the respondent is working for (discrimination measures 0.374, 0.603 and 0.680, respectively). Working as an employee in a pharmacy chain and being female load negatively and being a male owner of an independent pharmacy load positively on dimension 1. These findings are corroborated by the results of the non-parametric tests employed to test for differences between the demographic groups. Pharmacy owners were more likely to be men than women ($\chi^2 = 5.282, p < 0.05$). Men were also more likely to work in independent pharmacies than women ($\chi^2 = 11.978, p = 0.001$). Dimension 2 (Eigen value of 0.203) is the personal motivation dimension and discriminates between additional appointments, postgraduate qualification and number of learning activities undertaken (discrimination measures 0.318, 0.291 and 0.556, respectively). Holding additional appointments,

obtaining a postgraduate qualification and participating in a greater number of learning activities loads negatively on dimension 2, and the opposite characteristics load positively. The results of the non-parametric tests employed to test for differences between the demographic groups corroborate this. Pharmacists who had (or were currently studying) for a postgraduate qualification were more likely to report participation in a greater number of learning activities ($\chi^2 = 5.664, p < 0.05$) than those who did not have a postgraduate qualification. Similarly, respondents who had an additional personal appointment were more likely to report a greater number of learning activities ($\chi^2 = 13.600, p = 0.001$) than those who did not have such appointments.

Age, number of additional services provided and keeping a CPD record contribute to both dimensions in the HOMALS solution (Figure 2). However, the non-parametric tests showed that employees were younger (Mann-Whitney $z = -4.338, p < 0.0005$), had qualified in the UK more recently (Mann-Whitney $z = -4.473, p < 0.0005$), and had been working in their current post for a shorter time (Mann-Whitney $z = -4.826, p < 0.0005$) than pharmacy owners. Pharmacists who worked in independent pharmacies, as an employee or owner, were older (Mann-Whitney $z = -3.536, p < 0.0005$), had qualified earlier (Mann-Whitney $z = -3.428, p < 0.0005$), and had been working in their current post for a longer time (Mann-Whitney $z = -4.896, p < 0.0005$) than those who worked in chain pharmacies. A correlation was observed between age and length of time in the current post (Spearman's $\rho = 0.747, p < 0.0005$), the older

Table I. Mean patient care competency cluster scores.

	Overall	Age group		Gender		Employment		Type of company	
		<=42 years	> 42 years	Women	Men	Owner	Employee	Independent pharmacy	Pharmacy chain
Patient care cluster	3.30	3.30	3.01	3.51*	3.19	3.19	3.38	3.27	3.34
Need for drug	3.04	2.89	2.79	3.08	3.03	2.95	3.13	3.10	2.92
Selection of drug	3.36	3.44*	3.28	3.63*	3.26	3.26	3.47	3.35	3.44
Drug specific issues	3.50	3.46	3.11	3.72*	3.41	3.38	3.61	3.50	3.55
Provision of drug product	3.91	3.81	3.83	3.93	3.90	3.88	3.94	3.90	3.94
Patient consultation	3.18	3.26	2.97	3.30	3.14	3.10	3.25	3.18	3.18
Monitoring drug therapy	3.01	3.10	2.72	3.29*	2.91	2.95	3.06	2.94	3.13
Medicines information	3.17	3.29*	2.70	3.50**	3.03	3.05	3.29	3.12	3.30
Evaluation of outcomes	2.50	2.53	2.25	2.67	2.44	2.44	2.57	2.49	2.52

Difference is statistically significant at the 0.0005 (**), 0.01 (*), and 0.05 (#) level (exact, 2-tailed).

Table II. Mean personal competency cluster scores.

	Overall	Age group		Gender		Employment		Type of company	
		<=42 years	> 42 years	Women	Men	Owner	Employee	Independent pharmacy	Pharmacy chain
Personal cluster	3.42	3.56	3.13	3.61*	3.34	3.29	3.51#	3.34	3.53#
Organisation	3.38	3.58	2.98	3.58#	3.31	3.26	3.47	3.35	3.43
Communication	3.44	3.61	3.25	3.67*	3.36	3.38	3.51	3.42	3.48
Teamwork	3.48	3.60	3.30	3.73**	3.39	3.45	3.51	3.44	3.57
Professionalism	3.40	3.52	3.08	3.60*	3.31	3.27	3.49#	3.28	3.58**

Difference is statistically significant at the 0.0005 (**), 0.01 (*), and 0.05 (#) level (exact, 2-tailed).

Table III. Mean problem solving competency cluster scores.

Overall	Age group		Gender		Employment			Type of company	
	<=42 years	>42 years	Women	Men	Owner	Employee	Independent pharmacy	Pharmacy chain	
	Problem solving cluster	3.43	3.00	3.42	3.28	3.20	3.41#	3.25	3.43#
Gathering information	3.56	3.28	3.52	3.40	3.33	3.51	3.40	3.48	
Knowledge	3.29	2.81	3.19	3.11	2.97	3.27*	3.02	3.30*	
Analysing information	3.39#	2.83	3.33	3.13	3.14	3.22	3.13	3.27	
Providing information	3.54	3.17	3.62	3.40	3.38	3.52	3.44	3.51	
Follow-up	3.37	2.92	3.75**	3.29	3.38	3.45	3.38	3.48	

Difference is statistically significant at the 0.0005 (**), 0.01 (*), and 0.05 (#) level (exact, 2-tailed).

the pharmacist the longer they had been working in their current post. It was observed that women were younger (Mann–Whitney $z = -3.366$, $p = 0.001$), had qualified more recently (Mann–Whitney $z = -2.596$, $p < 0.01$), and had held their current posts for a shorter time (Mann–Whitney $z = -2.125$, $p < 0.05$) than men. Women, employees and those who worked in chain pharmacies were more likely to keep a record of their CPD activities ($\chi^2 = 4.517$, $p = 0.05$; $\chi^2 = 7.142$, $p < 0.05$; $\chi^2 = 13.121$, $p = 0.001$, respectively) than men, owners and those working in independent pharmacies, respectively. Older pharmacists and those who qualified earlier were less likely to have a portfolio (Mann–Whitney $z = -2.216$, $p < 0.05$, Mann–Whitney $z = -1.958$, $p = 0.05$, respectively) than younger pharmacists and those who had qualified more recently. Pharmacists who possessed a postgraduate qualification were no more likely to keep a CPD record ($\chi^2 = 0.194$, $p > 0.05$) than those who did not have such a qualification. Pharmacists who provided a greater number of services were also more likely to have or be planning to build a consultation area in their pharmacy ($\chi^2 = 7.876$, $p < 0.05$). Pharmacy chains were less likely to have consultation area ($\chi^2 = 8.690$, $p < 0.05$) than independent pharmacies. Independents tended to provide more services than pharmacy chains, although this was not statistically significant.

Section 2: Self-perceived competence

The questionnaire used behavioural statements from the new GLF. This framework comprised 4 competency clusters, 28 competencies and 81 behavioural statements. The four clusters were: “Delivery of Patient Care Competencies”, “Personal Competencies”, “Problem Solving Competencies”, and “Management and Organisation Competencies”. The behavioural statements in the questionnaire were grouped into these clusters for analysis. Overall respondents in this study perceived themselves to be more competent in the “Personal Competencies” (Tables I–IV). However, the mean cluster responses are all within the “usually” response. Generally, there was more variation in the means for the competencies in the “Delivery of Patient Care Cluster” (Table I) than in the other competency clusters; the mean responses range from “sometimes” for the “evaluation of outcomes competency”, to “always” for the “provision of drug product competency”. There was little variation between the competency means for the “Personal Competency Cluster” (Table II); all the competency means are within the “usually” response. Whilst all the competency means are within the “usually” response in the “Problem Solving Cluster” (Table III), it was interesting to note that the respondents perceived themselves to be more competent at providing general information than in their clinical knowledge. There was slightly more variation in

Table IV. Mean management and organisation competency cluster scores.

	Age group		Gender		Employment			Type of company	
	<=42 years	>42 years	Women	Men	Owner	Employee	Independent pharmacy	Pharmacy chain	
	Overall								
Management and organisation cluster	3.20	3.30	3.43	3.13	3.15	3.23	3.18	3.22	
Clinical governance	3.25	3.32	3.54**	3.13	3.15	3.36	3.18	3.41#	
Service provision	3.33	3.42#	3.59*	3.23	3.26	3.40	3.25	3.48	
Budget setting and reimbursement	3.18	3.17	3.31	3.14	3.15	3.20	3.18	3.17	
Organisations	3.20	3.33	3.40	3.15	3.14	3.26	3.24	3.14	
Training	2.98	3.16	3.08	2.94	2.97	2.99	2.98	2.98	
Staff management	2.89	3.12#	3.33**	2.73	2.86	2.94	2.77	3.12#	
Procurement	3.44	3.54	3.54	3.41	3.40	3.48	3.45	3.43	

Difference is statistically significant at the 0.0005 (**), 0.01 (*), and 0.05 (#) level (exact, 2-tailed).

the means for the “Management and Organisation Cluster” (Table IV), with the mean for the “staff management competency” being just below three; however, the majority of the competency means were still within the “usually” response.

The mean competency and competency cluster scores for the different characteristics of pharmacists were calculated, and those that significantly influenced self-perceived competence are shown in Tables I–IV. These characteristics included age, gender, employment status and type of company. In addition, pharmacists who had been in their current posts for a shorter amount of time perceived themselves to be more competent in the “knowledge competency” in the “Problem Solving Cluster” (Spearman’s $\rho = 0.431$, $p < 0.0005$). Pharmacists who had a postgraduate qualification perceived themselves to be more competent in “patient consultation” (Mann–Whitney $z = -1.972$, $p < 0.05$) and “evaluation of outcomes” (Mann–Whitney $z = -2.307$, $p < 0.05$) competencies in the patient care cluster than those who did not have a postgraduate qualification.

Table I shows the mean patient care competency scores for the different characteristics in the Patient Care cluster. Gender had the most pronounced affect on self-perceived competence; females perceived themselves to be more competent overall in the “Patient Care Competency Cluster” (Mann–Whitney $z = -2.966$, $p < 0.01$) than males. The individual competencies in which females perceived themselves to be more competent than males were: “medicines information” (Mann–Whitney $z = -3.539$, $p < 0.0005$); “selection of drug” (Mann–Whitney $z = -2.789$, $p = 0.005$); “drug specific issues” (Mann–Whitney $z = -2.638$, $p < 0.01$); and “monitoring drug therapy” (Mann–Whitney $z = -2.942$, $p < 0.005$). Although age group did not influence self-perceived competence in the cluster overall, it did affect the “selection of drug” and “medicines information” competencies, where younger pharmacists perceived themselves to be more competent than older pharmacists (Mann–Whitney $z = -2.746$, $p < 0.001$; $z = -2.752$, $p < 0.001$, respectively).

Table II shows the mean scores for the different characteristics in the “Personal Competency Cluster”. Gender, employment status and the type of company the respondent was working for had a significant effect on overall “Personal Competency Cluster” score. In the “Personal Competency Cluster” females scored higher (Mann–Whitney $z = -2.880$, $p < 0.01$) than males, employees scored higher (Mann–Whitney $z = -2.319$, $p < 0.05$) than pharmacy owners, and respondents who worked in chain pharmacies scored higher (Mann–Whitney $z = -1.993$, $p < 0.05$) than those who worked in independent pharmacies. Furthermore, pharmacists who worked in chain pharmacies (Mann–Whitney $z = -3.209$, $p = 0.001$) and employees (Mann–Whitney $z = -2.374$, $p < 0.05$) perceived

themselves to be more competent in the “professionalism competency” than their counterparts. Females scored higher than males in all the individual competencies in this cluster: “teamwork” (Mann–Whitney $z = -3.357$, $p = 0.001$); “professionalism” (Mann–Whitney $z = -2.743$, $p < 0.01$); “communication” (Mann–Whitney $z = -2.556$, $p < 0.01$); and “organisation” (Mann–Whitney $z = -2.080$, $p < 0.05$).

Table III shows the mean scores for the different characteristics in the “Problem Solving Competency Cluster”. Employment status and the type of company the respondent was working for had a significant effect on the overall “Problem Solving Competency Cluster” score. Employees scored higher (Mann–Whitney $z = -2.329$, $p < 0.05$) than pharmacy owners, respondents who worked in chain pharmacies scored higher (Mann–Whitney $z = -2.067$, $p < 0.05$) than those who worked in independent pharmacies in this cluster. In addition, pharmacists who worked in chain pharmacies (Mann–Whitney $z = -2.609$, $p < 0.01$) and employees (Mann–Whitney $z = -2.717$, $p < 0.01$) perceived themselves to be more competent in the “knowledge competency” than their counterparts. Females perceived themselves to be more competent in the “follow-up competency” (Mann–Whitney $z = -3.408$, $p = 0.001$) than males, and younger pharmacists perceived themselves to be more competent in “analysing information” (Mann–Whitney $z = -1.970$, $p < 0.05$).

Table IV shows the mean scores for the different characteristics in the “Management and Organisation Competency Cluster”. Perhaps surprisingly, employment status did not have a significant influence on self-perceived competence in this cluster. None of the characteristics had a significant effect on the self-perceived overall cluster score. However, those who worked in chain pharmacies scored significantly higher in “clinical governance” (Mann–Whitney $z = -2.029$, $p < 0.05$) and “staff management” (Mann–Whitney $z = -2.286$, $p < 0.05$) competencies than those who worked in independent pharmacies. In addition, women scored higher than men in “clinical governance” (Mann–Whitney $z = -3.131$, $p = 0.001$), “staff management” (Mann–Whitney $z = -3.451$, $p < 0.0005$) and “service provision” (Mann–Whitney $z = -2.483$, $p < 0.05$) competencies. Younger pharmacists perceived themselves to be more competent in “service provision” and “staff management” than older pharmacists (Mann–Whitney $z = -2.288$, $p < 0.05$; $z = -2.244$, $p < 0.05$, respectively).

In order to further investigate the influences on self-perceived competence, K means cluster analysis was performed to identify groups of pharmacists sharing characteristics. The characteristics used were those that significantly influenced self-perceived competence as discussed above. In addition, maintaining a CPD record was included due to its associations with

the other characteristics. All of these variables contributed significantly to the solution (ANOVA, $p < 0.0005$). Four groups emerged from the cluster analysis comprising the following characteristics:

Group 1	($n = 44$)	Male, older, owner of an independent pharmacy, with at most a postgraduate certificate and not maintaining a CPD record.
Group 2	($n = 22$)	Female, younger, manager or second pharmacist working for a large national pharmacy, with no postgraduate qualifications, but maintaining a CPD record.
Group 3	($n = 11$)	Male, manager, with either a postgraduate diploma or a masters degree. Age, type of company and maintaining a CPD record were unimportant characteristics in this group.
Group 4	($n = 13$)	Male, owner of an independent pharmacy, with either a diploma or Masters degree, and not maintaining a CPD record. Age was unimportant in this group.

One way ANOVA was used to compare the mean score for each competency cluster between these four groups of pharmacists. There was a significant difference between the groups in the “Patient Care Competency Cluster” ($F = 3.710$, $p < 0.05$) between Groups 2 and 4 (mean = 3.43 and 2.88, respectively, Scheffé *post hoc* test $p < 0.05$); the “Personal Competency Cluster” ($F = 4.260$, $p < 0.01$) between Groups 2 and 4 (mean = 3.61 and 3.17, respectively, Scheffé *post hoc* test $p < 0.05$). There was a significant difference between the groups in the “Problem Solving Competency Cluster” ($F = 3.541$, $p < 0.05$) but *post hoc* tests revealed no difference between the individual groups. There was no significant difference between the groups in the “Management and Organisation” cluster.

Discussion

The general response rate of 50% was acceptable and was within the range of response rates (20–90%) achieved in other published surveys amongst community pharmacists (Smith, 2002). However, the response rate in the Tower Hamlets PCT was only 11%: another questionnaire was being administered in the area at the same time as this postal survey which may have affected the response rate.

In the 2003 pharmacy workforce census it was found that 10.5% of community pharmacists were owners (RPSGB Research and Development Division, 2004); however, in the study sample this was 45%. Furthermore, in this sample, the majority of respondents worked in independent pharmacies, implying that there are proportionally more independent pharmacies in these areas of London than nationally. A large majority

of the respondents were male, despite a workforce census in 2002 finding that almost equal numbers of females and males worked in community pharmacy (Hassell, 2003). Pharmacy owners were more likely to be males than females, which is in keeping with the 2002 workforce census (Hassell, 2003). The 2002 workforce census found that there are more females in the younger age groups than males (Hassell, 2003), which is reflected in this survey: pharmacy is becoming a profession demographically dominated by females.

Dimension 1 in the HOMALS analysis (Figure 2) discriminates between gender, employment status and type of company worked for. Women were more likely to be younger and be employees in chain pharmacies than men. There may be more job opportunities for younger pharmacists in these pharmacies: independents are less likely to need to employ a manager if the owner is a pharmacist. However, there were more male respondents than female (73% male, 27% female) which may account for this finding.

Dimension 2 in the HOMALS analysis (Figure 2) discriminates between characteristics influenced by personal motivation: The number of different learning activities that the pharmacist has undertaken in the last two years, whether the pharmacist holds a postgraduate qualification, and whether the pharmacist holds any additional appointments. Pharmacists with postgraduate qualifications, or who had additional appointments were more likely to undertake more learning activities than those with no postgraduate qualification or no additional appointments. This might be explained by the following considerations: pharmacists with a postgraduate qualification might have reported this learning as a learning activity; pharmacists who hold additional appointments are likely to attend more meetings and these might be reported as learning activities. It is interesting that keeping a CPD record is not discriminated by dimension 2 (personal motivation dimension), as pharmacists who participated in more learning activities were more likely to keep a portfolio. These pharmacists may have become more aware of the need to start keeping a portfolio in advance of the implementation of mandatory CPD recording in the UK 2005, due to their participation learning activities. On the other hand, the fact that they participate in more learning activities suggests that they are more motivated learners and are; therefore, more likely to keep a CPD record than other pharmacists.

Older pharmacists were less likely to keep a CPD record than younger pharmacists, who may have been keeping a CPD record whilst studying at university and who continued this habit. This reflects previous research findings which found that pharmacists who have registered after 1990 were increasingly likely to participate in CPD and that pharmacists who registered before 1990 were less likely to see the value of CPD for updating professional knowledge and skills (Bell, Maguire & McGarland, 2002). In addition, older

pharmacists were more likely to be owners and/or work for independents and pharmacists working in chain pharmacies were found to be more likely to keep a portfolio. The study by Bell, Maguire & McGarland (2002) found that pharmacists working for multiples were more likely to see the benefits of participation in CPD; it seems that multiples provide support for their employees to undertake CPD. Females were more likely to keep a CPD record than males. This was also found by Bell et al. who report that females are more likely to see the benefits of CPD than males. The barriers to CPD are well documented and include lack of time, lack of remuneration and lack of understanding; the first two are perhaps most relevant to independent community pharmacists (Mottram, Rowe, Gangani & Al-Khamis, 2002). It seems that older, male pharmacists who own their pharmacy may need more support to participate in CPD.

The pharmacists perceived themselves to be overall more competent in the "Personal Competencies" than in the other three competency clusters (Tables I–IV); this may be because the median age of the respondents was 42 years. The "Personal Competencies" include communication skills, team working and personal organisation. These competencies may increase over time as people learn through experience; older pharmacists have had more time to develop their personal competencies. Within the "Delivery Patient Care Competency Cluster" (Table I), the respondents perceived themselves to be more competent in the "provision of drug product" competencies than "monitoring drug therapy", "need for the drug" and "evaluation of outcomes" competencies. This may not be surprising since community pharmacy has traditionally focused on dispensing medicines rather than monitoring outcomes of drug therapy. As the emphasis of the community pharmacy contract concerns a shift towards provision of services, one of which is medicines management, pharmacists will be monitoring patient care in their daily work and might gain competency in these areas of "Delivery of Patient Care".

Characteristics which had the most influence on self-perceived competence included age, gender, employment, and type of employing company (Tables I–IV). Surprisingly, those who held a postgraduate qualification perceived themselves to be more competent only in two areas within the "Delivery of Patient Care Cluster" than those who did not hold such a qualification. It is expected that postgraduate courses in pharmacy should enhance pharmacists' competence in delivering patient care and in the "knowledge" competency of the "patient care" cluster. It could be that studying for a postgraduate qualification makes pharmacists more aware of the level of competence expected of them in these areas and, therefore, more aware of their competence gaps. However, no discrimination was made between the field of the postgraduate qualification, which might not have been pharmacy related.

Gender and age group had the largest effect on self-perceived competence in the “Delivery of Patient Care Cluster” (Table I). This might be explained by attitudes to and participation in CPD. Bell et al. (2002) found that when asked if CPD would ensure a higher quality of patient care, those pharmacists registered after 1990 and female pharmacists were more likely to agree. In addition, CPD was recognised by both these groups as an excellent means by which pharmacists can update their professional knowledge and skills. Females and younger pharmacists were more likely to keep a CPD record and assessed their overall competence in the delivery of patient care cluster as “always”, whereas older and male pharmacists assessed themselves at the “usually” level of competence. This may be a reflection of the confidence that younger practitioners have in their skills, knowledge and abilities, perhaps due to their participation in CPD, or it may be that older pharmacists are more cautious in their self-assessments.

The competencies in the personal cluster include personal organisation, such as punctuality and time management, communication with patients and other healthcare professionals, teamwork within the pharmacy and with the wider healthcare team, and professional issues such as confidentiality and participation in the CPD cycle. Females, employees and those working for pharmacy chains perceived themselves to be more competent in this cluster overall (Table II). Again, this may be influenced by participation in CPD. In the study by Bell (2002) females and those working for multiples were more likely to agree with the statements “engaging in CPD would make pharmacists more confident and professional in their approach to patients” and “engaging in CPD would make pharmacists more confident in their approach to other healthcare professionals”. In addition, company policies in pharmacy chains may influence pharmacists’ competence in these areas. For example, the “professionalism competency” includes behavioural statements regarding CPD; the company may require their employees to keep a CPD record and the employees may have regular appraisals of their learning needs with their managers, whereas pharmacy owners and employees in independent pharmacists may lack these. Furthermore, the high self assessment in the “professionalism competency” of pharmacists working for pharmacist chains might be a reflection of the corporate nature of their working environments.

Employment and the type of the company the respondents were working for had an effect on the “Problem Solving” competency scores (Table III). Those who worked in pharmacy chains in particular, and those who were employees in general, perceived themselves to be more competent than their counterparts. Employees and those working in pharmacy chains scored higher in “knowledge competency” in this cluster than owners and those working in

independent pharmacies. Employees were younger and had qualified more recently than owners; the knowledge attained during the undergraduate pharmacy course is more recent for the younger pharmacists. Perhaps owners have had to focus on running a successful business than keeping up to date with their clinical knowledge.

Gender affected self-perceived competence in three of the competencies in the Management and Organisation cluster, and age group and type of company on two of the competencies (Table IV). Interestingly, younger pharmacists and females perceive themselves to be more competent in “service provision” than older pharmacists, yet older pharmacists and male pharmacists are more likely to be owners or work for independent, which provide more additional services than pharmacy chains, although this was not significant.

The results of the K means cluster analysis and one way ANOVA showed a significant difference between Group 2 (younger, female, working for a large national chain, with no postgraduate qualification but maintaining a CPD record) and Group 4 (male, owners with a postgraduate diploma or masters but not maintaining a CPD record), with Group 2 perceiving themselves to be more competent in the “Patient Care” and “Personal” competency clusters than Group 4. It is interesting that no difference was found between Groups 1 and 2, Group 1 being similar to Group 4, except that Group 1 are older and have a lower class of postgraduate qualification, if any at all. This further suggests that participation in CPD leads to increased confidence in competence, but that having studied for a postgraduate qualification might make the pharmacist more aware of competence gaps and so more cautious in a self-assessment of competence. It also confirms the difference in self-assessed competence between men and women, since Group 2 was the only female group. The results of this analysis suggest that it is male owners of pharmacies who are not engaging in CPD, lack confidence in their competence, particularly in patient care.

Conclusion

Gender seemed to have the biggest influence on self-perceived competence, with females perceiving themselves to be more competent than males. Age group, type of company worked for and employment status were also influential with younger pharmacists, and those who are employees in pharmacy chains perceiving themselves to be more competent than older owners. However, females are also more likely to be younger and employed by pharmacy chains; is it gender dominating the influence of these characteristics on self-perceived competence or vice versa? These characteristics seem to influence attitude to CPD (Bell et al., 2002), with younger, female

pharmacists working for multiples perceiving the benefits of CPD more than their counterparts. It seems that participation in CPD increases confidence and leads to a higher self-assessed competence. However, there is currently little evidence to show that participation in CPD leads to an increase in actual competence. Studying for a postgraduate qualification should increase actual competence, but pharmacists in this sample who had a postgraduate qualification had a lower self-assessed competence than those who did not. Perhaps pharmacists studying postgraduate qualifications need more support putting their learning into practice. More work is needed to further explore the influences of these characteristics on self-assessed competence, and to investigate the relationship between self-assessed and actual competence. However, this study shows that male, older pharmacists, who own their own pharmacy, need support to increase their confidence in their skills, knowledge and abilities, and to engage in CPD.

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