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Assessment of Pharmacists' Patient Care Competencies: Validity Evidence from Ontario (Canada)'s Quality Assurance and Peer Review Process

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Maintenance of competence is integral to health care practitioners' continuing professional development. The adequacy and value of indirect assessment of competence (through, for example, learning portfolios or attendance at educational events) has been questioned. Direct assessment (such as written tests of clinical knowledge or objective structured clinical examinations, OSCEs) has been advocated as a more meaningful indicator of a practitioner's competence. This paper describes the Ontario (Canada) College of Pharmacists' experience with direct assessment through the Peer Review/Quality Assurance process. This process consists of a self-assessment questionnaire, ongoing maintenance of a learning portfolio, a written test of clinical knowledge, and an OSCE. Each year, a randomly selected group of pharmacists in Ontario undertake the Peer Review process. After five years of operation, 992 pharmacists had participated in this program; 86% of participants met or exceeded standards and were encouraged to continue with their own professional development while 14% of participants did not meet standards in identified assessment areas, and were directed to a peer-assisted process to facilitate professional development. Findings suggest individuals who were educated outside Canada or the United States, those in community pharmacy practice, and those who had been in practice 25 years or more demonstrated greatest difficulty in meeting standards. The implications of these results for pharmacy practice and professional development are discussed as are issues related to direct and indirect assessment of clinical skills.

Keywords: Direct assessment; Maintenance of competence; Competency assessment; Pharmacy education

BACKGROUND

Given their important mandate in society, professionals are expected to maintain and demonstrate competency within their field over the course of their professional life. Competency statements have been described as a method by which expectations of professional practice may be articulated, for the benefit of practitioners, and for the public they serve (Bashook and Parboosingh, 1998). While the totality of work in a profession cannot be reduced to a series of observable or measurable activities, such statements can provide a template against which standards of practice may be developed. It should, of course, be noted that competency and performance are not interchangeable terms; competency refers to what a professional *can do*, while performance relates to what a professional *actually does* in practice, based on a variety of contingencies and mitigating factors (Campbell, 1996).

The development of competency-based assessment frameworks for practicing health care professionals has been debated in some professions and settings (Cunnington and Norman, 2000; Lim *et al.*, 2002). On its face, the notion that health care professionals ought to continuously demonstrate minimal standards of professional practice provides reassurance to the public who relies upon them for safe, effective, and efficient service and care provision (Cannon and Waters, 1993). This reassurance must be balanced against the needs of health care professionals themselves to maintain professional autonomy and judgement, and not to be subject to unnecessarily intrusive surveillance (Norcini, 1993; Norcini *et al.*, 1996). While most regulated and licensed health care professionals have had to prove their competency to a variety of educational and regulatory bodies prior to receiving

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a license, ongoing demonstration of competency may be somewhat less systematic and rigorous (Manning, 1987; Dunn *et al.*, 1988; Kremer, 1991; Davis *et al.*, 1997). In an era of heightened accountability for all professionals (and particularly those involved in health care), striking a reasonable and appropriate balance between the public's and individual's expectations may be difficult (Page *et al.*, 1995; Norcini *et al.*, 1996).

Benson (1991) has stated that an optimal competency-based assessment system consists of fair, transparent, and objective criteria for comparison, and a fair, transparent, and objective method for evaluating each criteria. Competency statements put forth by professional associations, educational institutions or regulatory bodies provide the backbone for the former, but do not necessarily provide a vehicle for addressing the latter. Bashook and Parboosingh (1998) have proposed a model for competency-based assessment in medicine, one in which measurable elements of professional practice are described through a series of performance levels or indicators.

The challenge in developing a systematic method for assessing ongoing competency of practicing health care professionals is significant (Fielding *et al.*, 1992). As a professional's practice and interests evolve, specialization, whether formally recognized and credentialed or not, may occur. The common fund of knowledge and skill set that is appropriately and effectively tested at the entry-to-practice level is somewhat more diffuse as practitioners mature and develop niches or interests. Another major challenge involves the high-stakes nature of assessment of practicing professionals; the notion of "re-testing" is anxiety provoking given the reliance most individuals place on their profession and the livelihood they earn from its practice (LaDuca *et al.*, 1997). Any perceived threat to these may be met with apprehension, resistance or outright hostility.

Despite these challenges, regulatory bodies (acting on behalf of the public to ensure accountability of professional practice) in many professions are developing competency-based assessment systems for practitioners. Within the profession of pharmacy, different models of assessment have been proposed and developed, reflecting the broader issues and debate within other health care professions (Fielding *et al.*, 1981; 2001).

COMPETENCY-BASED ASSESSMENT IN PHARMACY

In most English-speaking countries, the practice of pharmacy is regulated by local or national authorities. While the role of the pharmacist varies from country to country, in most instances pharmacists are responsible for the safe and effective distribution of pharmacologically active substances. In some circumstances, this mandate may extend to the "prescribing" of medications. In most circumstances, pharmacists dispense medications under a prescriber's authority, and also provide advice to patients regarding treatment of self-limiting conditions, and counsel them on the appropriate use of prescribed medications. Most pharmacists will also play an important role in evaluating the safety and appropriateness of prescriptions, alerting prescribers to potential errors or problems before patients actually receive medications.

As health care professionals, pharmacists are often seen as an integral part of the health care delivery system, particularly in an era of greater reliance on medications and pharmacotherapy. The responsibility pharmacists assume for their decisions is significant: in many cases, the pharmacist may be the only health care professional an individual has contact with prior to assuming responsibility for self-care and medication-management. Consequently, the need to ensure ongoing competency of pharmacists assumes great significance within the health care system.

Most jurisdictions (such as New Zealand, Canada, the United States and the United Kingdom) have developed and adopted competency statements to reflect broad principles and local application of professional practice. In most jurisdictions, competency assessment of practitioners has, until recently, been indirect. Examples of indirect assessment include records of attendance at continuing education events or compulsory educational upgrading. There is no evidence that such indirect approaches produce meaningful changes in practice or contribute to the maintenance of competency of a practitioner (Davis *et al.*, 1999). Consequently, there has been increasing interest in developing competency assessment systems that are more direct, meaningful measurements of clinical skills and performance.

Within pharmacy, direct assessment may be described as the direct measurement of expected knowledge, skills and values commensurate with competency statements and standards of practice, through valid and reliable assessment methods. Entry-to-practice level practitioners in pharmacy (and in most health professions) expect to undergo frequent, rigorous testing of their competency as they develop their professional knowledge base and skill sets. Direct assessment at this level often relies upon a variety of methods, ranging from pen-and-paper tests to direct observation in a clinical setting to use of objective structured clinical examinations (OSCEs). Pharmacy (and many other professions) now requires all three forms of assessment prior to

licensure or registration (Austin *et al.*, 2003a,b). Of importance is the use of these forms of direct assessment as complements to (rather than replacements for) other, indirect forms of assessment.

While students who are becoming professionals expect to be tested frequently to ensure they are meeting progress milestones and competency expectations, professionals may object to such testing once they have already obtained licensure. They may suggest that such a process is time-consuming, insulting, and may ultimately not provide any assurance regarding competency. It may also be argued that competency at entry-to-practice may be more clearly defined and measurable; as professionals develop through their career and specialize their practice niches, generic competency statements may not be fair or applicable. Having demonstrated competency through direct assessment at entry-to-practice ought to be sufficient since other methods (e.g. periodic employment-based performance reviews, mechanisms for addressing complaints from the public through regulatory bodies, and simple market-place pressures) provide adequate assurance of competency in the field. Cunnington and Norman (2000) have commented on the paradox involved in competency-based assessment by noting that its strengths—fairness, transparency and objectivity—are exactly why it may not correlate to actual real world clinical practice which is contingency-driven, subjective, and highly dependent upon personal relationships.

Despite these objections, the changing landscape of regulation in pharmacy practice around the world is driving towards competency-based assessment. Thus far, most jurisdictions have adopted indirect assessment such as the learning portfolio, which relies upon self-reporting of evidence to support maintenance of competency. Few jurisdictions have developed or widely implemented direct assessment methods, although many note the example of commercial pilots, who must re-certify on a periodic basis through flight simulations, as a best-practices example for direct assessment.

In 1991, all health professions in Ontario (Canada's largest province, home to 11 million people) were affected by sweeping changes to the regulations aimed at improving accountability and transparency to the practice of self-regulating health care professions. A major component of this regulatory change involved development and implementation of a *Quality Assurance* process for health care professionals (including pharmacists) to provide public assurance of competency. The regulatory body for pharmacy practice in Ontario, the Ontario College of Pharmacists (OCP) governs the professional practice of approximately 9600 licensed pharmacists, as well as systematically accrediting 2800 pharmacies across the province. Building upon an existing program of inspections and assessment of pharmacies, OCP developed a *peer assessment* system of pharmacists' practices to address regulatory requirements for on going Quality Assurance of its members.

OCP initiated a process of defining, developing and refining competencies and standards of practice for the profession, based on a set of national competencies articulated by the National Association of Pharmacy Regulatory Authorities of Canada (an umbrella organization representing provincial pharmacy regulators). OCP competencies for pharmacists were grouped into six broad categories or units (Table I). A brief description of each competency unit was generated to provide pharmacists and the public with a common vocabulary and set of expectations for defining competency in pharmacy practice.

As part of the direct assessment of each pharmacist's competency the College moved away from the continuing education credit model that had existed for over thirty years. The CE model in Ontario encouraged each pharmacist to attend a minimum of twenty accredited hours of pharmacy-specific education; while attendance occurred in many cases, there was no requirement that learning or impact on practice be demonstrated. Consistent with reports in the literature (Davis *et al.*, 1999)

TABLE I Standards of practice for pharmacists in Ontario, Canada

Standard 1	The pharmacist, using unique knowledge and skills to meet a patient's drug-related needs, practices patient-focused care in partnership with patients and other health care providers to achieve positive health outcomes and/or to maintain or improve quality of life for the patient
Standard 2	The pharmacist practices within legal requirements and ethical principles, demonstrated professional integrity, and acts to uphold professional standards of practice
Standard 3	The pharmacist identifies, evaluates, interprets and provides appropriate drug and pharmacy practice information to achieve safe and effective patient care
Standard 4	While respecting the patient's right to confidentiality, the pharmacist communicates and educates to provide optimal patient care and promote health
Standard 5	The pharmacist, in collaboration with the designated manager or hospital pharmacy manager, manages drug distribution by performing, supervising or reviewing the function of selection, preparation, storage and disposal of drugs to ensure safety, accuracy, and quality of supplied products
Standard 6	The pharmacist applies knowledge, principles, and skills of management as they pertain to the site of pharmacy practice, with the goal of optimizing patient care and inter-professional relations

suggesting this model was not meaningful and exerted no measurable impact on practice, OCP moved away from the continuing education model towards the continuous professional development (CPD) model. The learning portfolio provides an ongoing opportunity for pharmacists to identify personal learning gaps, articulate learning goals, identify alternatives for addressing these goals, and document attainment of goals and their impact on professional practice. Each year, 20% of all pharmacists who are in active, patient-care practices are randomly selected to complete a self-assessment survey and summary of their learning activities based on their learning portfolio.

OCP also developed and implemented a model for peer assessment of pharmacists' patient-care competencies (Austin *et al.*, 2003b). The remainder of this paper will outline the process by which peer assessment has been implemented, review five years of data from peer assessment, discuss the implications of this models in pharmacy, and provide conclusions and recommendations.

METHODS

Development of the peer assessment process was undertaken in collaboration with numerous stakeholders, including practitioners (in both community and hospital practice), university-based faculty members, representatives from various professional advocacy organizations, as well as public (lay) members of the OCP Council. College staff acted as resource people and facilitators; development, implementation, and refinement of the program was the responsibility of members of the profession. In developing this peer assessment process, OCP recognized that the existing inspection of pharmacies addressed Standards 2 (related to legal requirements within the pharmacy), 5 (related to drug distribution practices) and 6 (related to the managerial role of the pharmacist). Consequently, direct peer assessment would be required to assess Standards 1, 3, and 4, all related to pharmacists' patient care activities. In order to assess these Standards, a written test of clinical knowledge and an objective-structured clinical examination (OSCE) were developed.

Developing Valid Test Items

The decision to develop a peer assessment model involving a written test of clinical knowledge and an OSCE was taken with caution, recognizing that it may be perceived as threatening to some pharmacists, particularly those who were not be familiar with testing methods involving multiple-choice questions or patient simulations using actors. To assuage pharmacists' concerns and to ensure that each individual item—each clinical case or scenario, each multiple choice question, and each OSCE station—was informed by Standards of Practice, significant effort was undertaken to construct items that possessed both high face and content validity.

All items had to be depictions or simulations of real-life pharmacy practice situations that would be relevant to daily practice. Traditional entry-to-practice assessment in pharmacy using multiple choice questions and/or OSCEs often focus on specific knowledge items or tasks in an isolated manner. Since practitioners' knowledge and skills tend to be holistic and integrated, items that served to isolate and test only specific skills and knowledge-rather than general practice as a pharmacist-may be seen as inappropriate. In addition to serving as an assessment, this instrument would also need to be sufficiently robust in content to be able to serve a diagnostic function in identifying knowledge and skills gaps that could be addressed through remedial education and training.

Thus, in developing valid items for peer assessment, great attention was paid to the notion of adequately and realistically representing typical, daily practice for pharmacists. Specific tasks, such as medication history taking, or providing education and recommendations to patients, would be embedded in all items, rather than isolated and tested separately in different questions or stations. Such an approach allows pharmacists an opportunity to demonstrate a broad repertoire of knowledge and skills in all stations rather than segregating them in a manner that may be viewed as arbitrary and artificial by practicing pharmacists.

Another key element of developing valid assessment items is the development process itself. Since Quality Assurance was defined as a peer assessment process (that is, peers reviewing peers, rather than academic or expert-driven reviews of a pharmacist's practice), item development became a peer driven process. Practicing pharmacists are involved in all stages of item construction. Face and content validity are established through use of peer-driven teams to develop cases, review items, and set standards using widely accepted judgmental methods described by Angoff and Ebel (Ebel and Frisbe, 1986). All assessors are practicing pharmacists-not academics, experts, or regulators.

Though time consuming and costly, the effort made to ensure validity of items and the Quality Assurance process itself is essential. Within the high-stakes context of peer assessment of licensed practitioners, failure to attend to validity may compromise the value of the process in the eyes of the profession and call into question the nature of the assessment entirely.

Peer Assessment Methodology

This model for assessment utilizes standardized testing methods. A Quality Assurance review consists of a 110-min open-book written test of clinical knowledge containing 15 cases and 60 multiple choice questions and an OSCE consisting of 5–12 min simulated patient interviews. During the Quality Assurance review, other non-assessed events are included, such as an orientation and debriefing programme, and a Learning Portfolio sharing session. In total, the Quality Assurance review takes approximately 6 h (including breaks and lunch).

Each year, 20% of pharmacists were randomly selected and required to submit their self-assessment and survey report of their continuing professional development activities. This randomly chosen pool of participants is selected from the register of active pharmacists in the province of Ontario. From this group who had submitted their self-assessments, approximately 240 pharmacists were randomly selected annually to participate in the Quality Assurance review. Pharmacists who were selected were required to attend. Peer assessment was undertaken four times each year over a five year period, with cohorts of 60 pharmacists, at the College's offices in Toronto (Canada). To ensure fairness and facilitate attendance, the College paid reasonable travel and accommodation expenses for participants from outside of the Toronto area.

Numerous supports and resources were in place to assist pharmacists in preparing for the peer assessment. A website has been developed with a sample 15 case, 60 question multiple choice test of clinical knowledge, and an accompanying answer and rationale key. A video has been developed outlining the process of standardized patient interviewing, and this is distributed to all participants (and is available to all other interested pharmacists). Numerous continuing educational events have been developed to inform pharmacists about the process of peer assessment, and articles outlining the process have been published on a regular basis in *Pharmacy Connection*, the journal of the Ontario College of Pharmacists.

Reporting of Results

Based upon the competency statements related to patient care, pharmacists were assessed on the following four components of practice:

(a) application of clinical knowledge;
(b) ability to gather information;
(c) management of patients' drug-related needs (including education);
(d) communication skills.

The written test of clinical knowledge was used to assess application of clinical knowledge (a), while the OSCE was used to assess all four components. Assessment in the OSCE consisted of both analytical (i.e. checklists requiring assessors to note whether a specific behavior was observed or not observed) and global (or a holistic scale of communication and interpersonal skills) scoring. Global scoring formed the basis of assessment of communication skills (d); communication skills were assessed using five, five point scales with definitional anchors in the area of verbal communication, non-verbal communication, empathy, degree of logic/focus/coherence, and overall demonstration of knowledge and skills.

Assessment in the OSCE was based on 12 min simulated patient interviews; based on pilot data indicating sufficient reliability, one trained pharmacist-assessor is used. Data from similar OSCEs suggest an additional pharmacist-assessor does not contribute significantly to the reliability of the process, nor does use of simulated patients as assessors (Parboosingh and Gondocz, 1993).

All assessment in the Quality Assurance was criterion-referenced. Cut scores for pass and fail are established *a priori* based on the judgmental model described by Ebel, through establishment of minimum performance levels (MPLs). Standard setters, all of whom are pharmacists from a variety of practice backgrounds and from different demographic cohorts, evaluated each item or clinical skill/task to be performed. This results in an MPL for each item. The sum of all individual items produced the MPL for the assessment instrument—either the written test or the OSCE station; that is the pass/fail cut score. This procedure resulted in a criterion-referenced cut score derived from the consensus of a group of representative pharmacists—the very essence of Peer Review. This procedure is widely used and accepted for assessment in board and licensing examination in the health professions (Hambleton, 1995).

Individuals who passed both the OSCE and the written test of clinical knowledge have, by definition, met or exceeded minimum performance levels established by panels of their peers, and consequently were deemed to have met competency standards in the four areas being assessed: clinical knowledge, gathering information, patient management and education, and communication. Those candidates who did so were designated to the *Self-directed* track for continuing professional development, and were encouraged to continue using their learning portfolio with additional reassurance that their process for lifelong learning had resulted in them meeting competency standards. Candidates failing to meet standards in clinical knowledge or communication, or two or more components, were designated to the *Peer Assisted* track.

These individuals were invited to meet with a panel of their peers, along with staff from OCP, to discuss remedial education and a plan for achieving standards in a reasonable period of time. Those falling below standards only on gathering information or on patient management were provided with educational resources and were required to develop and implement their own remedial education plan. Those in the Peer Assisted track were also required to successfully complete a reassessment within a reasonable period of time.

RESULTS

From 1996 to 2001, 992 pharmacists had participated in peer assessment, corresponding to approximately 12% of active pharmacists in Ontario. Of this group, 789 (79.5%) were community practitioners, 163 (16.4%) were hospital pharmacists, and the remained 40 (4.1%) practiced primarily in other areas (e.g. industry, academic or government). Seventy-nine (8.0%) participants had graduated from pharmacy school within the previous 5 years; 311 (31.4%) had graduated within previous 6–15 years; 305 (33.2%) graduated within the past 16–25 years; and 273 (27.5%) had graduated more than 25 years earlier. These percentages are reflective of the pharmacist population in Ontario.

Eighty-six percent of participants met or exceeded standards in all four assessment areas, and were thus designated to the Self-directed track for continuous professional development. Fourteen percent of participants had difficulty meeting standards in one or more of the assessment areas and were consequently designated to the Peer-assisted track. Most participants in the Peer-assisted track were able to undertake remedial education and skills training within one year and successfully completed a reassessment.

Descriptive statistics and reliability coefficients demonstrate this assessment model and instruments used were adequately reliable; Cronbach's alpha coefficients of 0.67–0.83 (with Standard Error of Means ranging from 5.0 to 8.7) provide evidence for moderate to high internal consistency of assessment components.

The results provide important information regarding factors affecting overall performance in this peer assessment. As illustrated in Table II, there is a clear trend towards categorization in the Peer-Assisted group as a function of years since graduation. Table III illustrates that graduates from North American universities (Ontario, other provinces in Canada and the United States) are more frequently categorized in the Self-Directed group than graduates from other parts of the world (e.g. Europe, Asia, Africa, etc.). Table IV illustrates that pharmacists who cite hospital as the primary site of practice are more likely than colleagues in community practice or another area of pharmacy to be categorized in the Self-Directed group. Tables V and VI present means (and standard deviations) of performances across all four components of the practice review, as a function of years since graduation, place of graduation, and site of practice (independent variables). Three separate one-way analyses of variance (ANOVA) were employed to test for differences between groups on these independent variables with Clinical Knowledge, Gathering Information, and Management Strategies as the dependent variables. The results are summarized in Table V. Similar analyses were conducted for Overall Knowledge/Skills, Empathy, Logic, Focus and Coherence, Verbal Abilities, and Non-Verbal Abilities. These results are summarized in Table VI.

To investigate the evidence of concurrent, criterion-related validity, the data were subjected to exploratory factor analysis. For the purposes of this analysis, the Communications assessment area was subdivided into its constituent sub-areas: overall knowledge and skills, empathy, logic/focus/coherence, non-verbal communication skills, and verbal communication skills. The remaining three assessment areas (clinical knowledge, gathering information, and patient management strategies) were retained. As a result, eight assessment areas (five communication sub-areas plus the remaining three) were inter-correlated using Pearson product-moment correlations. The resulting correlation matrix was decomposed into three principal components based both on empirical (eigen-values greater than one, total percent of the variance accounted for, examination of a scree plot) and theoretical grounds meaning of the components and their cohesiveness). There were three components accounting for 87.7% of the total variance. These three components were then rotated to the normalized varimax criterion (convergence required five iterations). Results of these analyses are presented in Table VII.

TABLE II Outcome of performance by year since Graduation

	0–5 Years	5–15 Years	16–25 Years	>25 Years	Totals
Self-directed	78 (98.7)	290 (93.2)	296 (90.0)	193 (70.7)	857 (86.4%)
Peer-assisted	1 (1.3)	21 (6.8)	33 (10.0)	80 (29.3)	135 (13.6%)
Column total	79 (8.0)	311 (31.4)	329 (33.2)	273 (27.5)	992 (100%)

TABLE III Outcome of performance by place of Graduation

	Ontario, Canada only	Canada (other) or USA	Another Country	Totals
Self-directed	483 (89.6)	222 (92.5)	150 (71.1)	855 (86.4%)
Peer-assisted	56 (10.4)	18 (7.5)	61 (28.9)	135 (13.6%)
Column total	539 (54.4)	240 (24.2)	211 (21.3)	990 (100%)

The dominant factor that accounts for 70.4% of the common variance appears to underlie general oral communication skills, and is therefore labeled "Communication Skills" (Factor 1). This factor has large loadings from the five sub-areas of the communication assessment of the OSCE, as well as from the patient management strategies assessment. Factor 2, accounting for 9.4% of the variance was labeled "Patient Management" and consists of gathering information, management strategies, and knowledge and skills. Factor 3, accounting for 7.9% of the variance, has only one loading from clinical knowledge. It is noteworthy that there are split loadings from information gathering on Factors 1 and 2, as well as from patient management strategies (also on Factors 1 and 2).

These results provide strong evidence of three coherent factors where common processes are shared on two theoretically related factors-Communication Skills and Patient Management Strategies. Thus, these results provide evidence of discriminate validity (i.e. the three factors indicate that separate processes of communication, patient management and clinical knowledge are assessed) as well as convergent validity (i.e. the assessments that are theoretically proposed to intercalate do in fact do so, e.g. the five sub-areas of the communication assessment all load on Factor 1).

DISCUSSION

The main findings from the present study were: (1) notable and significant differences between the groups in performance based on years in practice, place of graduation, and location of practice; and (2) identification (through the factor analysis) of three coherent and theoretically meaningful factors.

As discussed previously, content validity of the assessment components is strong, and enhanced through the use of a very careful and deliberate strategy for developing items, one involving a large number of pharmacists reflective of the diversity and maturity of professional practice. All assessment tasks were grounded in competency statements articulated by OCP; these statements themselves are the product of broad input from the profession.

The pass/fail cut score determination for both the written test and the OSCE were based on the MPL approach. Both the Ebel and Angoff methods rely on a series of micro-judgments made by standard-setters over many items and over many skills and tasks. While the standard-setting process requires substantial resources and efforts, it did produce a reliable and valid set of cut scores for making pass/fail decisions.

Several factors contributed to the between group differences reported above. For example, a consistent decline in performance across all assessment components with years since graduation may be related to at least two possible explanations. The first (and arguably more generally accepted) is the notion that practitioners fail to sufficiently engage in the number and type of learning activities necessary to maintain optimal professional practice as they get older. Anecdotal conversations with candidates encountering difficulty with the peer assessment support this assumption, and point to the need to assist pharmacists to develop the ability to engage in self-assessment, goal setting, and finding appropriate resources to help them meet their professional development needs and goals. A second, related explanation for the present results is the view that professional practice is primarily shaped by the initial professional training an individual receives. Given the significant ways in which pharmacy practice has evolved over the years, those individuals trained in more restrictive scopes of practice would more likely encounter difficulties with an assessment model embedded in a more expansive view of what pharmacy practice should currently reflect. As an example, at one time pharmacists were specifically discouraged from describing side effects of medications to patients as, at that time, this was considered to be within the physician's scope of practice, not the pharmacist's. Today, standards of

TABLE IV Outcome of performance by location of current primary practice setting

	Community pharmacy	Hospital pharmacy	Other practice	Totals
Self-directed	667 (84.5)	156 (95.7)	35 (85.4)	858 (86.4%)
Peer-assisted	122 (15.5)	7 (4.3)	6 (14.6)	135 (13.6%)
Column total	789 (79.5)	163 (16.4)	41 (4.1)	993 (100%)

TABLE V Means (±standard deviations) sorted by key demographic factors in non-communication assessment areas

	Years since Graduation				Place of Graduation			Site of Practice		
	0–5	6–15	16–25	>25	Ontario, Canada	North America	Outside North America	Community pharmacy	Hospital pharmacy	Other
Clinical knowledge	135.8 ± 11.3	131.6 ± 14.1	128.2 ± 14.9	**113.4 ± 20.2**	129.1 ± 17.1	128.8 ± 14.1	**113.7 ± 18.8**	124.3 ± 18.4	**133.1 ± 12.6**	124.9 ± 19.3
Gathering information	137.9 ± 23.8	135.0 ± 26.8	134.4 ± 26.4	**125.5 ± 26.7**	134.2 ± 26.7	134.7 ± 25.0	**126.5 ± 27.9**	131.0 ± 27.1	**140.3 ± 24.3**	135.6 ± 24.6
Management strategies	134.2 ± 21.4	131.4 ± 24.4	128.1 ± 25.3	**114.8 ± 28.6**	127.4 ± 26.5	128.2 ± 23.1	119.3 ± 29.8	125.4 ± 26.9	129.8 ± 25.5	121.7 ± 25.6

Bold: $p < 0.01$.

TABLE VI Means (±standard deviations) sorted by key demographic factors in communication assessment areas

	Years since Graduation				Place of Graduation			Site of Practice		
	0–5	6–15	16–25	>25	Ontario, Canada	North America	Outside North America	Community pharmacy	Hospital pharmacy	Other
Overall knowledge/ skills	141.6 ± 22.0	138.5 ± 26.6	131.7 ± 27.5	**115.6 ± 29.9**	134.5 ± 28.5	134.1 ± 26.3	**115.0 ± 28.8**	128.3 ± 29.4	**139.0 ± 26.2**	130.0 ± 28.3
Empathy	149.0 ± 23.2	145.1 ± 29.0	139.4 ± 26.7	**126.6 ± 28.5**	143.6 ± 27.5	140.9 ± 27.6	**122.3 ± 27.7**	136.3 ± 28.8	**148.4 ± 26.0**	138.6 ± 31.5
Logic, focus and coherence	143.8 ± 21.9	141.0 ± 28.3	133.7 ± 27.1	**118.4 ± 29.0**	137.4 ± 28.4	135.7 ± 27.1	**116.6 ± 27.8**	131.2 ± 29.3	**140.0 ± 26.7**	129.5 ± 31.0
Verbal abilities	161.3 ± 20.2	158.4 ± 27.5	151.0 ± 26.2	**140.4 ± 27.3**	157.5 ± 25.1	155.6 ± 23.6	**130.0 ± 27.4**	148.9 ± 27.7	**161.4 ± 23.3**	154.4 ± 29.9
Non-verbal abilities	157.0 ± 22.3	155.5 ± 25.0	148.5 ± 23.7	**136.7 ± 27.7**	152.5 ± 24.7	151.7 ± 23.9	**132.8 ± 24.7**	146.3 ± 25.2	**156.6 ± 24.6**	148.6 ± 32.7

Bold: $p < 0.01$.

TABLE VII Factor matrix of assessment component (rotated to the normalized varimax criterion)

Assessment component	Factor 1 Communication skill	Factor 2 Patient management	Factor 3 Clinical knowledge
Gathering information		0.915	
Patient management	0.511	0.556	
Clinical knowledge			0.940
Communication sub-areas			
Non-verbal expression	0.913		
Verbal expression	0.892		
Empathy	0.871		
Focus/logic/coherence	0.821		
Knowledge and skills	0.741	0.502	
Percent of Variance (Total=87.7)	70.4	9.4	7.9

practice have evolved to recognize the expectation for pharmacists to engage in dialogue with patients about all aspects of their medications.

The weaker performance of internationally trained pharmacists points to a number of possible factors. The most important of these factors likely relates to English as a Second Language (ESL). Given the emphasis the peer assessment places on communication skills, it is not surprising that many of the individuals in the internationally trained group encountered difficulties. A second factor contributing to this group's weaker performance may reflect the differences in pharmacy practice found between Canada and their home country. For example, in many countries, pharmacy education and practice places a greater emphasis on the science of pharmacy, such as pharmacology, medicinal chemistry, or pharmaceutics, with relatively little attention to the patient-pharmacist relationship.

The stronger performance displayed by hospital pharmacists was not an anticipated finding for this project. Interestingly, hospital pharmacists have frequently described the peer assessment process as being too rooted in a community pharmacy perspective. The stronger performance of the hospital group across all assessment areas may reveal some important differences in the nature of practice between the two groups. For example, while one may anticipate that community pharmacists may encounter more patients during the course of routine practice, the sheer number of patients encountered may severely constrain the duration and quality of the pharmacist-patient interaction. As a consequence, some community pharmacists may develop overly abbreviated patient-interaction styles that do not allow them an opportunity to sufficiently develop and demonstrate important verbal, non-verbal, empathetic, or coherent communication skills.

The factor analysis provides evidence of empirical validity of the basic theoretical constructs relevant to the practice of pharmacy. The various assessments do measure unique and independent domains. The factor analysis provides evidence for discriminate validity of the measures (i.e. they discriminate between domains of measurement such as communication skills, patient management strategies, and clinical knowledge). The dominant factor for the assessment is communication skill or relevant information/knowledge. Three clinical skills measures-overall knowledge and skills, gathering information, and patient management strategies-clearly load on a single factor (Patient Management), while clinical knowledge results in a separate factor. The split loadings of knowledge and skills, and patient management strategies, provide support for convergent validity as they load on the Communication Skills factor as do the other four sub-areas of the communication assessment-non-verbal and verbal expression, empathy, and logic/focus/coherence. These empirical results support the contention that the direct assessment method and tools developed for this program do indeed assess basic communication skills, patient management strategies, and clinical knowledge necessary for safe and effective pharmacy practice.

A significant question for Quality Assurance purposes remains unanswered: has peer assessment actually changed or improved the quality of pharmacists' services to the public? The nature of the peer assessment model for this program is such that real patients and real situations are simulated but not actually assessed. The Quality Assurance process is currently undergoing an external review of the impact of practice review on pharmacists' behaviors.

CONCLUSION

Assessment of competency of health care professionals has been discussed and debated for several decades. With increasing pressure to improve accountability within self-regulating health-care professions, and to demonstrate maintenance of competency, the need to develop systematic, valid and reliable direct assessment measures has increased.

Like other professions, pharmacy has utilized different methods to assess competency, but at the entry-to-practice level and not for licensed practitioners. The high-stakes nature of the process for licensed practitioners' points to the need to ensure that ecological validity is high in order to optimize acceptance by the profession and to provide reassurance to the public that results do indeed matter.

The peer assessment model developed by the Ontario College of Pharmacists is unique in that it applies to all pharmacists in the province who are working in patient-care practices. On a random basis, pharmacists are selected to undertake direct assessment as a way of assessing the sufficiency of the continuous professional development activities they have undertaken and documented in their learning portfolio. Assessment items and instruments are built upon competency statements articulated by the profession, and practicing pharmacists are integrally involved in the process as item developers, reviewers, standard-setters and assessors.

This unique model of peer assessment has identified factors that may affect professional development in pharmacy, including years since graduation, place of graduation, and location of practice. This may be applicable to other health care professional groups working to develop models for assessment of competency and identification of individual practitioner's learning needs.

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