

Applicability of Entry-to-Practice Examinations for Optometry in Canada

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Abstract

High-stakes assessments for entry-to-practice are critical tools used by the optometric profession's regulatory bodies to assure safe, effective, and ethical practice by their respective registrants. In 2019, the College of Optometrists of Ontario approved the acceptance of the United States (US) entry-to-practice examination for optometry, the National Board Examiners in Optometry (NBEO[®]), as an acceptable alternative assessment for the Canadian entry-to-practice examination, the Optometry Examining Board of Canada (OEBC). However, this decision was not unanimously supported in stakeholder feedback. In this paper, the development and structure of the two assessments are described. A global consensus framework is applied to identify the appropriateness of the assessments for Canada, and a similar change in entry-to-practice in the field of nursing is examined for contextual correlates. Although intrinsically satisfactory for their respective jurisdictions, the NBEO[®] does not appear to satisfy the critical criteria of validity, equivalency, and acceptability for Ontario or, more broadly, Canada. Cultural and systemic differences between the Canadian and US healthcare systems were also identified as additional barriers. Lastly, major future vulnerabilities for the profession lie in the availability of an entry-to-practice examination for both Anglophone and Francophone Canadians.

KEY WORDS:

Assessment, clinical competence, optometry, educational measurement, healthcare education

In North America, healthcare professions operate under a system of self-regulation, where the regulatory bodies, colleges or boards, strive to assure safe, effective, and ethical practice by their respective registrants (Canada)/licensees (United States). They do this by making decisions about entry-to-practice requirements, professional standards and appropriate discipline.^{1,2} While healthcare is primarily the domain of the provincial governments in Canada, the Colleges of Optometry in each province are members of the Federation of Optometric Regulatory Authorities of Canada (FORAC/FAROC) which facilitates “discussion, exchanging information, providing a national voice and communicating with others about legislation, registration, standards of practice, continuing competence and any other issues related to the health care system.”³ As such, FORAC has a specific interest in ensuring that the entry-to-practice requirements for optometry in each province are appropriate and consistent.

The question of whether a candidate has the appropriate abilities to practice optometry in Canada is determined using a set of examinations that, if passed, will indicate that the candidate meets entry-level standards after an appropriate educational program. In North America, there are two principal agencies that provide these examinations for optometry. For Canada, the Optometry Examining Board of Canada (OEBC) provides a national examination for entry-to-practice.⁴ In the US, the National Board of Examiners in Optometry (NBEO[®]) administers an examination for entry-to-practice.

In 2019, the College of Optometrists of Ontario (COO) began accepting the NBEO® as an entry-to-practice examination for the province, as an alternative to the OEBC examination. The British Columbia College of Optometrists had already been accepting either examination for entry-to-practice purposes. Stakeholder feedback was sought, and expressions of both concern and support were shared with the COO.

COMPETENCY

A summative (decision-making) assessment in healthcare must be developed and implemented in a way that the result of the assessment will provide information such that the correct decision is made about a candidate's suitability for independent practice. It is important to note that an assessment's quality is not independent of the culture⁵, the context or the education of the candidate attempting the examination.⁶

There has been a shift away from assessing a list of topics that are taught in schools (content areas) to assessing the competencies or abilities that are needed in practice.⁷ The development of healthcare education and assessment based on needed abilities of practitioners (competency-based programs) has been a response to public and professional concerns regarding problems with quality and safety that plague the delivery of healthcare.^{8,9} Competencies define the complex abilities of the practitioner. They reflect an integration of the knowledge, skills and attributes of the healthcare practitioner and form a framework for assessing performance;⁸ in addition, they are the current basis of healthcare education for most Western countries.¹⁰

In several healthcare professions in North America, including medicine,¹¹⁻¹⁴ pharmacy,^{15,16} dentistry,¹⁷ and nursing,¹⁸ competency-based assessment has been adopted as a component of the requirements for licensure. However, in optometry, entry-to-practice assessments have been slower to adopt a competency-based approach.

ENTRY-LEVEL COMPETENCY

The entry-level practitioner does not need to have expert-level abilities. "Professional competence is the habitual and judicious use of communication, knowledge, technical skills, clinical reasoning, emotions, values, and reflection in daily practice for the benefit of the individual and community being served."¹⁹ Becoming an expert in a field is a developmental process and entry-to-practice competence is not at the expert level.

Faucher²⁰ described a model of this development process in the domain of optometry, in which there are 5 levels of professional expertise: novice, intermediate, competent, advanced and expert. Novices are "beginners," and have some theoretical knowledge that is applied by following rules. Intermediate-level learners can adapt rules, but not in a flexible way such that they do not see the full picture. Entry-to-practice occurs at the competent level, where there is an ability to make decisions with attention to patient-centeredness (involving the patient in decision-making). While a competent individual is not at the end of the development process, not all practitioners proceed to the advanced (understand complexity better) and expert levels (faster processing of multiple stimuli using a pattern recognition approach).²⁰ The aim of an entry-level examination, therefore, is to determine if the candidate has met the criteria of entry-level competency.

The purpose of this paper is to describe a framework for the good assessment (examination) of entry-level competency and compare the components of each assessment as it applies to the Canadian context (using validity theory) and thereby address concerns raised by stakeholders.

METHOD

Global Consensus Framework for Good Assessment²¹

Norcini et al. developed a global consensus framework for good assessment in healthcare in 2010; this was updated in 2018.²¹ The framework reflects seven criteria by which to judge a good assessment:

1. *Validity or coherence*: the assessment is appropriate for a particular purpose and is supported by a coherent body of evidence.
2. *Reproducibility, reliability, or consistency*.
3. *Equivalence*: the assessment is the same across different cycles of testing.
4. *Feasibility*: the assessment is practical, realistic, and sensible.
5. *Educational effect*: the assessment motivates those who take it to prepare in a fashion that has educational benefit.
6. *Catalytic effect*: the assessment drives future learning forward and improves overall program quality.
7. *Acceptability*: stakeholders find the assessment process to be credible.

When considering regulators as stakeholders, Norcini states that to accurately determine if a candidate has met the entry-level competency standard, validity-coherence and reproducibility-consistency, and equivalence are paramount.²¹ In the analysis described in this paper, all of the criteria except educational and catalytic effect are considered, where possible.

Kane's Validity Framework^{22,23}

To assess the validity and reliability criteria, we adopted Kane's validity framework. Test formats and systems of assessment (such as a board examination) are not inherently valid. Our understanding of validity has changed from considering separate types of validity to a single concept of construct validity. In Kane's framework²², validity is a structured argument in support of the interpretation of the score. It is not an all-or-nothing concept and is a combination of logical argument and empirical investigation.

There are four components to this validation argument: scoring, generalization, extrapolation, and implications.^{22,23} This framework can be applied to different assessment formats like multiple-choice questions, assessment of clinical skills or an Objective Structured Clinical Assessment (OSCE). There is overlap between the evidence for each component.

Scoring determines that there is evidence that the assessment data collected on each candidate (e.g., check sheets, global rating scales and multiple-choice questions) have been scored accurately and collected appropriately. Also, the conditions of the examination should be standardized. Standardized patients (actors in a performance-based assessment) and the examiners should be trained appropriately in scoring methods. If candidates have access to test content (e.g., cheating), no interpretation can be made about the score and this serves as a significant threat to validity. The items should be subject to item analysis.

Generalization focuses on how well a selected sample of items (questions) represent all of the possible questions that could have been included. This is the relationship between the test scores and the true scores. The true score is the score that the candidate would receive if completing an unlimited number of assessments of the same type. However, any test is of necessity only a sample of the content domain. Therefore, the test items should, be representative of the domain and consider the likelihood of obtaining similar scores if new items are used. Adequate sampling for the test items can be achieved using an appropriate blueprint. This concept also includes the reliability or reproducibility of the numeric scores. Reliability requires a sufficient number of test items. Statistical methods such as classical test theory or generalizability theory can be used to help elucidate the source of errors in the total score.

Extrapolation looks at a sample of observations and generalizes it to the real-world. How these scores represent real-world performance is paramount. Items should be developed that authentically represent a problem. They should undergo review and piloting to ensure appropriateness to the candidates. Extrapolation also includes blueprinting. Empirical evidence for extrapolation may only be the extent to which the stakeholders agree with the interpretation.

Implication speaks to the interpretation of the evidence in making a decision. This aspect of validity is achieved by appropriately determining the cut-off score (passing score) for the examination. Several procedures may be used to determine the cut-off score (pass/fail decisions) and the decision on which procedure to use rests with the organization delivering the assessment. Unfortunately, very little is known about what happens to candidates who pass or fail a summative assessment, which could provide a post-hoc evaluation of the interpretation of the evidence.

The relationship between the procedures of analysis used for the entry-to-practice examinations are shown in Figure 1.

The OEBC Assessment

The OEBC administers their summative assessment in two parts – a case-based multiple-choice written examination (MCQ) and an objective structured clinical examination (OSCE). The OSCE is a timed, simulated, performance-based examination where candidates rotate from one station to the next and are expected to perform a series of clinical tasks in each station.²⁴ The OSCE controls for the patient presentation and the bias of the examiner to measure competencies such as psychomotor skills, diagnosis and planning/management, while also being able to capture competencies that cannot be assessed in a written format such as communication, professionalism and patient-centeredness.^{12,25} Cases are developed by practitioners to represent a problem authentically.²⁶

The NBEO Assessment

The NBEO[®] administers their assessment in three parts – Part I Applied Basic Science (ABS), Part II (Patient Assessment and Management), and Part III Clinical Skills Examination (CSE).²⁷ In aggregate, the examinations are intended to assess the cognitive, psychomotor, affective, and communication skills that are essential for entry-level optometric

practice.²⁸ Prior examination updates are described in “Part I Basic Science Item Reengineering Pilot Report of the August 2004 Administration”²⁹ and the “NBEO® Examination Restructure Task Force”³⁰ report in 2006. The written examinations for Parts 1 and 2 are defined by discipline and condition, and Table 1 shows the content matrix.

Figure 1: Procedure of Analysis for OEBC and NBEO Entry-to-practice Examinations

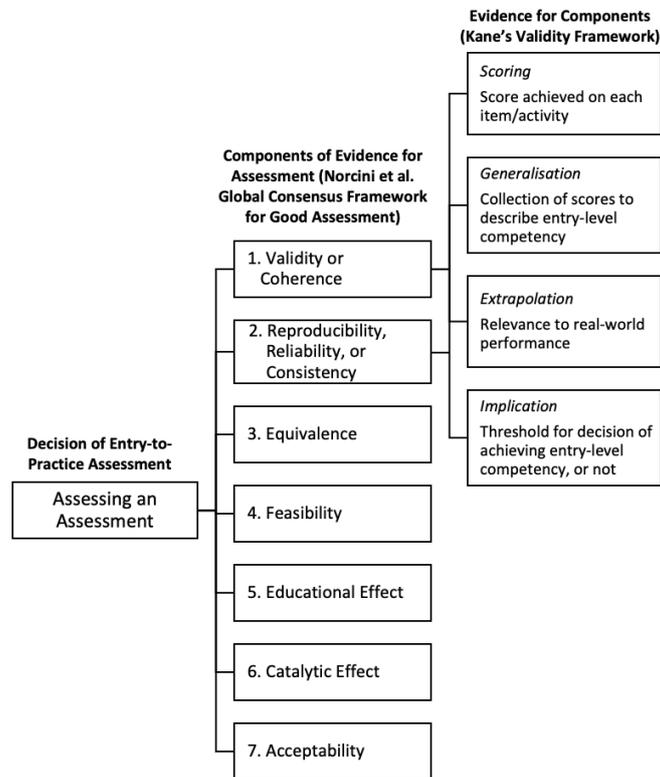


Table 1: Structure of the NBEO® blueprint³⁶

Condition Areas (applies to Parts 1, 2, and 3) 1. Refractive status/sensory processes/oculomotor processes 2. Normal health/disease/trauma		
Disciplines Part 1 ABS	Disciplines Part 2 PAM	Skills Part 3 Clinical Skills Exam
Anatomy Biochemistry/physiology Immunology/microbiology/pathology Optics Pharmacology	Clinical presentation Clinical correlation of basic science principles Diagnosis Treatment/management Legal issues/ethics/public health	Communication skills Affective skills Psychomotor skills Clinical observation & reporting skills

RESULTS

OEBC – Validity: Scoring

A review of the psychometrics for each question and the assessment as a whole is an internal process for the agency administering the assessment and allows the performance of the assessment itself to be reviewed. These processes identify items that do not perform appropriately, such as having a low pass score or items that inversely correlate candidate scores on a particular question with their scores on the test as a whole (i.e., where overall poor-performing candidates choose an answer correctly disproportionately to overall high-performing candidates). The overall reliability is determined using Livingston’s criterion-referenced coefficient alpha.³¹

OEBC – Validity: Generalization

The OEBCs competency profile (the set of abilities of the entry-level practitioner)⁴ was developed with guidance by a consultant using a team of optometrists, including academics, who were considered to be representative subject matter experts (SMEs). The set of competencies was then confirmed using a survey of all optometrists in Canada and modified accordingly. Table 2 lists the nine areas of optometric practice that emerged from this process and Table 3 shows the relative number and weighting of the competencies assessed in each area. The competency profile was last updated in 2015.⁴

Table 2: *Nine Areas of Optometry Practice (Competencies) as described by the OEBC^{4,32}*

Entry Level Optometry	
A1	Communication
A2	Professionalism
A3	Patient-centred Care
A4	Assessment
A5	Diagnosis and Planning
A6	Patient Management
A7	Collaborative Practice
A8	Scholarship
A9	Practice Management

Table 3: *Blueprint for the Examination as described by OEBC*

Practice Area	Number of Competencies	Weighting (%)
A4 Assessment	12	22.8
A6 Patient Management	10	17.7
A3 patient-centred Care	8	14.6
A5 Diagnosis & Planning	7	13.8
A1 Communication	5	8.9
A2 Professionalism	4	8.0
A7 Collaborative Practice	4	6.1
A9 Practice Management	3	5.2
A8 Scholarship	2	2.9
Total	55	100.0

The competencies are mapped to the assessment format that is most appropriate (MCQ or OSCE). Items are then developed based on each competency area's importance and frequency as judged by practicing optometrists in Canada.⁴ This is the blueprinting process. Specifically, the blueprint includes practice areas such as "Communication, Professionalism and Patient-Centred Care" in addition to the traditional clinical areas of "Assessment, Diagnosis and Planning, Patient Management, and Practice Management."³²

OEBC – Validity: Extrapolation

For item development, the OEBC only uses practitioners who are trained by consultants to write items that are appropriate and at entry-level competency. The examination reflects the expected competencies, despite differences in the scope of practice between provinces.

The OEBC emphasizes a patient-centred approach to care – highlighting shared decision-making processes with the patient, involving the patient’s family and support persons in care decisions where appropriate, and applying conflict resolution strategies in patient communication. During the OSCE, authentic and consistent clinical situations for observation of communication skills, professionalism, and patient-centeredness are delivered using Standardized Patients (SP) who are trained actors. Simulators are used to assess technical skills and provide a consistent assessment between candidates.

OEBC – Validity: Implication

The pass/fail cut-off score used by the OEBC is determined by the Angoff method, which relies on SMEs to evaluate the content of each item and then predict how many candidates with entry-level competency would answer the item correctly. The average of the SMEs predictions for an item becomes its predicted difficulty. The sum of the predicted difficulty values for each item averaged across all SMEs and items on an assessment is the recommended Angoff cut-off score.

OEBC – Consistency & Equivalency

The OEBC uses simulations to assess technical skills during the OSCE. Contemporary healthcare assessment has adapted the technology for high-fidelity simulations. Simulation-based assessment (SBA) is “the use of any device (e.g., a simulator) or set of conditions, such as a standardized patient examination, that attempts to evaluate healthcare providers’ clinical competence authentically.”³³ Simulation has been used for decades in high-risk fields like aviation, military and power plant operation for both training and assessment to achieve improvements in safety.³⁴ A simulator can present the same clinical findings or scenario consistently to any number of candidates. The same cannot be said for, as an example, a person with weak fusion due to a binocular vision condition. Several cover tests would break their fusion down, and they would become strabismic. For an assessment to be reliable, the patient and the examiner effects should be controlled so that the primary variability is in the performance of the candidate.³⁴ Simulators can also produce a wide range of patient problems on demand and assess the candidate’s ability to diagnose a critical presentation such as, for example, a third nerve palsy with a dilated pupil. As early as 2010, Holmboe et al.⁹ suggested that “sufficient evidence exists to incorporate more SBA into regulatory practices”.

NBEO – Validity: Scoring

For the evaluation of outcomes, internal and external committees are used to review the process (National Board Examining Review Committee nominated by ARBO).³⁵ Individual items are reviewed to determine if they should be retained in the calculation of the score, and all candidate feedback on each question is discussed and acted upon as needed. Reliability statistics were not readily available.

NBEO – Validity: Generalisability

The Job Analysis Survey Report for the National Board of Examiners in Optometry²⁸ describes the process by which Alpine Testing Solutions applied a “survey methodology to evaluate and inform the content specification and blueprint development process.” The current test blueprints are described by the content matrices based on a prior job task analysis survey conducted in 2004.³⁶ The NBEO[®] has a series of examination committees and councils tasked with oversight for monitoring and maintaining the appropriateness of the entry-to-practice content.

The condition areas, disciplines and skills were updated in 2016. The process used the current framework used by NBEO[®] in lieu of a clean slate for blueprint development. Typically, job analysis begins with a focus group of SMEs to develop a content outline that serves as the basis of the survey. “Because the NBEO[®] examination development committees and councils already monitor and update the content of the current content matrices, this step was omitted and the current content matrices were used as the basis for the survey.”²⁸ Since the NBEO[®] relied on a prior framework, the examination missed an opportunity to incorporate a more contemporary competency profile of abilities of an entry-level practitioner.

The framework guidance included: “1. Summarize the current Conditions, Condition Areas, Disciplines and Skills, 2. Obtain updated weights for Conditions, Condition Areas, Disciplines and Skills, and 3. Identify any Conditions, Condition Areas, Disciplines or Skills that should be added or removed.”²⁸ The weightings remained relatively unchanged following the job analysis survey. However, given the decision to use the existing framework for the blueprint, Alpine²⁸ did recommend a post-hoc consultation with SMEs. The intent was to convene a task force of representatives of the Association of Regulatory Board of Optometry (ARBO), the Association of Schools and Colleges in Optometry (ASCO), and the NBEO[®] to review the job task analysis and to make recommendations to the NBEO[®] Board of Directors. To our knowledge, there has been no published report of the outcomes or recommendations from the task force.

NBEO Validity – Extrapolation

The NBEO[®] uses practitioners from various modes of practice as well as academics to write items. They are trained by staff to write items that are appropriate and at entry-level.

NBEO Validity – Implication

The NBEO[®] publishes pass/fail standard settings for each part.³⁷ Part I describes the use of a Nedelsky/Minimum Pass Index³⁸, whereas Part II and III describe a cut-off score process.³⁹ More recently, an ARBO report described the use of the Angoff method for determining the cut-off score. Instead of using a percentage of entry-level candidates, they used a yes/no method.^{29,40}

NBEO – Consistency & Equivalency

The NBEO[®] has retained the traditional model of skills testing with ‘live’ patients at the National Center for Clinical Testing in Optometry (NCCTO).⁴¹

FEASIBILITY

The OSCE, used by the OEBC, is widely used in high-stakes assessment in healthcare, such as national board examinations, and is also used extensively in undergraduate and postgraduate healthcare training in North America and abroad.^{42,43} The OSCE is currently the most-used performance-based assessment with the feasibility and flexibility to assess a variety of domains of competence simultaneously and produce valid and reliable results.⁴⁴ In terms of the assessments being sensible and practical for delivery of the assessments, both the OEBC and NBEO[®] are feasible.

ACCEPTABILITY

Acceptability of either the OEBC or NBEO[®] entry-to-practice examination refers to the credibility of the exam in the view of various stakeholders.

While each testing agency follows a process to validate content, the practitioners used to provide context are limited to their own countries. In other words, the OEBC worked with Canadian optometrists to develop assessments that reflect their practice in Canada, while the NBEO[®] worked with American optometrists to develop assessments that reflect their practice in the United States.

There are differences between the US and Canada in the practice of optometry including the legislated scope of practice, availability and naming of pharmaceuticals, standards of practice, regulations and the system of healthcare.

In the US, Jobson Publishing distributes an annual addendum to the Review of Optometry entitled Clinical Guide to Ophthalmic Drugs.⁴⁵ Dr. Bitton, from the University of Montreal, partnered with Jobson to provide a Clinical Guide to Ophthalmic Drugs 2016: Addendum for Canadian Optometrists⁴⁶, which was the last year this was published for Canada. Though not exhaustive, a comparison of the 2016 lists for the two countries across almost every major drug category reveals differences in availability, bottle sizes, concentrations of the active ingredient, and even different names for the same formulation. Generally, there are more options for brand-name pharmaceuticals in the US than in Canada. If we consider ocular allergy medicines for acute care as an example, six additional drugs with different active ingredients were available in the US that were not available in Canada in 2016.

Regarding contact lenses, the Centre for Ocular Research and Education (CORE) at the University of Waterloo School of Optometry & Vision Sciences publishes an on-line resource related to contact lenses and solutions available in Canada and the US.⁴⁷ Using the advanced search feature, one may quickly identify differences in the availability of products by manufacturer (e.g., Essilor produces gas permeable contact lenses for myopia in the US that are not available in Canada). Periodically, contact lenses may be approved by Health Canada in advance of the US Food and Drug Administration (FDA); CooperVision’s MiSight lens for myopia control is a recent example.⁴⁸

A review of the literature did not provide any direct evidence, for or against, that the NBEO[®] is appropriate for the Canadian context. However, the experience of the nursing profession, described below, is perhaps the best indirect evidence available for the latent effects on the assessment of the approach to healthcare and the context in which that healthcare is being delivered.

The National Council Licensure Examination – Registered Nurses (NCLEX-RN[®]) was adopted by Canadian Nursing regulators in 2011 to replace the Canadian Registered Nurse Exam (CRNE) as the entry-to-practice examina-

tion. The National Council of State Boards of Nursing, Inc. (NCSBN[®]), based in the US, published two studies to support the applicability of the NCLEX-RN[®] test plan to the Canadian candidate population.⁴⁹ Since 2015, 9 of 10 provinces in Canada exhibited a significant drop in candidate pass rates¹⁸ for first-attempt Canadian writers compared to first-attempt US writers (2015:69.7% vs 84.5%, $p < 0.001$);⁵⁰ an adverse impact on public perception of the profession,⁵¹ and concerns about the appropriateness of adopting the US examination for the Canadian context were evidenced.¹⁸

The Council of University Programs in Nursing Ontario (COUPN) and the Council of Universities' Office of Health Sciences (OHS) issued a request to conduct an independent review of the NCBSN[®] studies "to assess whether they provide sufficient evidence to conclude that the NCLEX-RN[®] is applicable to the Canadian testing population."¹⁸

In one study⁵², NCBSN[®] addressed candidate population comparability by comparing the competency statements from the Canadian and US regulatory boards based on a framework of knowledge, skills, and abilities. Their second study was an update of a 2011 survey, similar to a self-reported job task analysis for entry-level practice, which compared the activity statements from the US context to the national competency statements for Canada.⁴⁹

Salfi and Carbol¹⁸ used four questions to guide the work of their review. The first two questions were related to the studies published by NCSBN in 2012 and 2014, respectively. The latter two questions were:

1. What are the similarities and differences between Canada and America?
2. Can the NCLEX[®] fairly test the competencies needed in Canadian nurses?

Salfi and Carbol¹⁸ considered the US activity statements to be "more prescriptive and directive in nature, versus collaborative," and suggested that "... the patient is the object of care, rather than the partner" as suggested by the Canadian competency statements.

Two areas appeared to have a weaker agreement between the US activity statements and Canadian competency statements – service to the public and professional self-regulation. Salfi and Carbo¹⁸ state that "... the two competency areas lie at the heart of the differences between the US and the Canadian healthcare systems and, in all likelihood, these structural differences lead to differences in the way that nursing competencies and expectations are framed in the two systems," and that "surface similarities in competency statements may mask actual differences in practice."

Salfi and Carbol¹⁸ determined that there was insufficient evidence to support that the NCLEX-RN[®] was an appropriate assessment tool for Canadian entry-level nurses because "Expectations in terms of practice are different, and language and cultural differences all lead to test results that are not reflective of what test takers have 'come to know' as a result of their personal, cultural, professional and educational experiences." Using the work of The Center for Advanced Research on Language Acquisition's Intercultural Studies Project⁵³, Salfi et al. stated that "Culture, which can be defined as shared patterns of behaviours and cognitive constructs that are learned by socialization, which distinguish those of another group cannot be overlooked, especially now that some of the differences between entry-to-practice nurses in Canada and the US have been highlighted."¹⁸

Canadian optometry shares a similar philosophy regarding practice as the nursing profession: "... an emphasis on client-centred care (more recently referred to as person-centred care), and it is a priority of all entry-level registered nurses to plan nursing care in collaboration with clients, and to meet mutually agreed upon outcomes along the continuum of care."^{18,54} Coupled with distinct healthcare systems, it is clear that cultural values and context are different between Canada and the US and, as evidenced by the nursing experience with the adoption of the NCLEX-RN[®], this difference can affect entry-level competency decisions.

ACCEPTABILITY – STAKEHOLDERS

The decision to accept the NBEO[®] cited by the COO was "... To improve choice, accessibility, and flexibility for applicants seeking registration with the College." Speaking to the heart of the resulting schism, the Manitoba Association of Optometrists response was most succinct: "While admirable, this does not seem to be part of a regulatory body's mandate in protecting the public." As part of their process, the COO held an open comment period with results published on the website⁵⁵, including a response from the Ontario Fairness Commissioner.

Favourable responses did acknowledge the convenience and lower cost of taking one set of examinations that would cover both Canada and the US, and shared experience that the examinations appeared equivalent when a candidate took both OEBC and NBEO[®].

However, significant opposition across Canada was also shared, including express opposition from professional associations and regulatory colleges, among other stakeholders. Among the principal themes were the “ability to control its own destiny within the Canadian healthcare system is of paramount concern.” (Canadian Association of Optometrists), and there was an appreciation that the National Competency Profile and examination for entry-level optometry in Canada for “safe, effective, and ethical practice....” was developed in Canada for the Canadian context, including the opportunity to take the examination in French or English. The next generation of optometrists (Canadian Association of Optometry Students) recognized that “We are looking less and less to America for leadership in Optometry and instead, growing the opportunities in Canada.” Also, FORAC identified that “the central pillar of FORAC’s strategic plan is to work towards one single and Canadian national entry-to-practice exam that is accepted by all the provinces.” Other concerns were related to the potential adverse consequence to the OEBC as an alternative examination if the NBEO[®] was to be more widely adopted. A decreasing candidate pool of US-trained Canadians may result in increased costs or dissolution of the OEBC due to higher costs.

Norcini²¹ refers to “... current members of the profession (e.g., consultant physicians), professional bodies (e.g., Medical Colleges), regulators (e.g., Medical Council), and the government (e.g., Ministries of Education and Health)” as stakeholders. Easily substituted in the example would be optometrists, professional associations, colleges as regulators, and the government. While regulatory bodies have the jurisdiction to effect decisions within their purview, the implications across jurisdictions should also be weighed. Given the relatively small size of the profession of optometry in Canada, the feedback shared with the COO during the open comment period resulted in several responses from regulators and professional associations.⁵⁵ The majority of regulator responses expressed opposition to the move to accept the NBEO[®] as equivalent to OEBC.

The Office of the Fairness Commissioner (OFC) in Ontario supported the College’s decision to accept the NBEO[®] in addition to the OEBC for entry-to-practice examination. However, it also acknowledged that the potential dissolution of the OEBC might create accessibility barriers, which would necessitate a reversal in support. Specifically, “... Failure to offer an exam in French by the COO to an applicant would be a breach of s.86(1) of Schedule 2 of the Regulated Health Profession’s Act, 1991,” if the “... OFC finds the potential fee increase will pose an accessibility barrier for those candidates wanting to write the Canadian OEBC exam,” and if the “... OFC finds accessibility barriers will exist for those candidates who for various personal reasons may be denied entry to the United States, who would be otherwise qualified to write the OEBC (sic) exam and be eligible for registration in Ontario.” Ultimately, “the OFC opposes adopting a foreign exam as the sole accepted exam for professional registration in Ontario.”

DISCUSSION

Adopting the NBEO[®] entry-to-practice examination in Ontario in 2019 has created uncertainty for registrants, the profession, and the public. In this paper we applied a Global Consensus Framework for good assessment²¹ and Kane’s validity framework²² to evaluate the applicability of each assessment, OEBC and NBEO, as an entry-level competency evaluation for practice in Canada.

Table 4 summarizes the evidence regarding the validity and reliability considered for each assessment. The applicability of the validity and reliability components of the OEBC are specific to Canada and assess higher-order assessment and management skills using the OSCE. Perhaps to address this point, in 2019, NBEO[®] embarked upon a systematic evaluation of the Part III Clinical Skills Examination to seek stakeholder input and evaluation of best practices in healthcare assessment – the “Patient Encounters and Performance Skills (PEPS)”. The impetus for the update is partly a reflection of the evolving scope of optometric practice, as well as a recognition that assessment of straightforward skills may not fully address the competencies required of contemporary practice. The PEPS examination consists of 10 scenario-based patient encounters with standardized patients and two skill stations covering five essential skills (gonioscopy, tonometry, biomicroscopy, dilated biomicroscopy, and binocular indirect ophthalmoscopy).⁵⁶ The restructured examination focuses on clinical decision-making and addresses competencies of clinical assessment and interpretation, management and documentation, skills, patient education, and communication and professionalism over a range of different clinical presentations.⁵⁶ As of December 2020, the PEPS assessment is undergoing pilot testing and has a projected implementation of 2022/2023.⁵⁷

Table 4: Evidence for validity and reliability of OEBC and NBEO® Assessment using Kane’s validity framework^{22,23}

	OEBC	NBEO®
Scoring	<ul style="list-style-type: none"> • MCQ and OSCE (skills and higher reasoning) • Question developers trained to write questions and do assessments for entry-level competency in Canada • Assessors trained for OSCE stations • Bilingual (French and English) 	<ul style="list-style-type: none"> • MCQ and skills performance • Question developers trained to write questions and do assessments for minimally qualified level in USA • English only
Generalization	<ul style="list-style-type: none"> • Content for Blueprinting • Competency statements developed by SME. Validated by survey of Canadian practitioners. • These statements are used to determine the examination content 	<ul style="list-style-type: none"> • Content for Blueprinting • Job task analysis of conditions, disciplines and psychomotor skills. Not updated by a team of SMEs. • These statements are used to determine the examination content.
Extrapolation	<ul style="list-style-type: none"> • Canadian competency statements • Canadian practitioners with support of psychometrician • No correlation with other measures • Simulations for greater reliability • Internal review process using Livingstone coefficient 	<ul style="list-style-type: none"> • US job task analysis • US practitioners and educators with support of psychometrician • No correlation with other measures • Live patients • Internal and external review process (reliability method not published)
Implications	<ul style="list-style-type: none"> • Cut-Score standard setting • Angoff method • Criterion-referenced 	<ul style="list-style-type: none"> • Cut-Score • Yes/no variation of the Angoff method • Criterion-referenced

In terms of equivalency, which addresses the consistency of the assessment across cycles, the use of simulators and trained actors in the OSCE assessment creates a consistent assessment across candidates and the integration with higher order assessment and management reduces the weighting of the performance of a clinical skill. This is one reason why the OEBC, which incorporates OSCEs, might be considered a more contemporary assessment than the NBEO® assessment, particularly since OSCEs are a ubiquitous assessment tool in other healthcare professions such as medicine, nursing, and pharmacy. On the other hand, use of “real” patients might be argued to create a more authentic evaluation of the clinical skill. In adopting the global consensus approach to an assessment for entry-level practice, the equivalency criterion to provide consistent evidence for entry-to-practice decision was given greater weight than a more authentic evaluation of the clinical skill. Besides the potential ethical concerns about the appropriateness of using “real” patients as assessment resources, the appropriate use of the measurement with respect to assessment and management appears to be more pertinent to addressing competency and patient safety.

Lastly, when examining acceptability, we noted that there was opposition to accepting the NBEO® from an array of stakeholders, which has implications regarding the credibility of the assessment as an entry-level competency assessment for Canada. In addition, the parallels drawn with the nursing profession highlight how cultural and systemic differences between the Canadian and US healthcare systems, which in nursing was reflected in entry-to-practice expectations, can affect the overall decision in a high-stakes assessment. Coupled with the potential loss of a viable, bilingual OEBC assessment preventing potential barriers to access, this is a threat to the assessment system for FORAC.

CONCLUSION

Although intrinsically satisfactory for their respective jurisdictions, the NBEO® does not appear to satisfy the critical criteria of validity, equivalency and acceptability for Ontario or, more broadly, Canada. On these bases we conclude that the NBEO®, in its current form, is not an appropriate alternative entry-to-practice assessment for Canada. ●

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