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Research article

Validity and reliability of an application review process using dedicated reviewers in one stage of a multi-stage admissions model

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ABSTRACT

Introduction: With increased emphasis placed on non-academic skills in the workplace, a need exists to identify an admissions process that evaluates these skills. This study assessed the validity and reliability of an application review process involving three dedicated application reviewers in a multi-stage admissions model.

Methods: A multi-stage admissions model was utilized during the 2014–2015 admissions cycle. After advancing through the academic review, each application was independently reviewed by two dedicated application reviewers utilizing a six-construct rubric (written communication, extracurricular and community service activities, leadership experience, pharmacy career appreciation, research experience, and resiliency). Rubric scores were extrapolated to a three-tier ranking to select candidates for on-site interviews. Kappa statistics were used to assess interrater reliability. A three-facet Many-Facet Rasch Model (MFRM) determined reviewer severity, candidate suitability, and rubric construct difficulty.

Results: The kappa statistic for candidates' tier rank score ($n = 388$ candidates) was 0.692 with a perfect agreement frequency of 84.3%. There was substantial interrater reliability between reviewers for the tier ranking (kappa: 0.654–0.710). Highest construct agreement occurred in written communication (kappa: 0.924–0.984). A three-facet MFRM analysis explained 36.9% of variance in the ratings, with 0.06% reflecting application reviewer scoring patterns (i.e., severity or leniency), 22.8% reflecting candidate suitability, and 14.1% reflecting construct difficulty.

Discussion and conclusions: Utilization of dedicated application reviewers and a defined tiered rubric provided a valid and reliable method to effectively evaluate candidates during the application review process. These analyses provide insight into opportunities for improving the application review process among schools and colleges of pharmacy.

Introduction

The volume of applications received annually for admissions consideration by schools and colleges of pharmacy, as well as other health profession degree programs, highlights the critical need for a valid and reliable process that identifies the most competitive candidates. In the 2014–2015 admissions cycle, 133 colleges and schools of pharmacy received 76,525 applications.¹ In the same admissions cycle, medical schools and entry-level baccalaureate nursing programs received close to one million applications for

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210,072 available seats.^{2,3} After reviewing multiple health professions admissions processes, Salvatori⁴ argued that “admissions process[es] that provide a thorough, fair, reliable, valid, and cost-effective assessment of applicants remains an elusive goal for health profession education programs”.

The process of identifying and admitting students who align with the institution's mission and values has become more complicated in recent years amid the evolving health care environment. While previous academic performance and grade point average (GPA) best predict academic achievement, variance in academic performance remains unexplained, and accurate predictors of clinical performance remain unclear.⁴ This means that other variables, perhaps non-cognitive or non-academic skills such as work experience, interpersonal skills, empathy, and ethical integrity, are contributing to both academic and clinical performance outcomes.⁴ Consequently, numerous calls have been made for curricular reform within health profession education programs to focus on non-cognitive or non-academic skills.⁵⁻⁸ It is therefore incumbent upon schools and colleges of pharmacy, as well as other health professions degree programs, to develop valid and reliable admissions processes to identify candidates who are most likely to succeed both as students in the program and as future practitioners, especially as more emphasis is placed on the importance of non-cognitive attributes in the workplace.⁴

A substantial body of literature emphasizes the importance of student selection at health professions schools,⁹⁻¹² including but not limited to the importance of academic criteria, interview performance, and applicant characteristics. However, research specifically examining the reliability and validity of the application review process remains limited. Previous efforts have been made to assess interrater reliability within the application review of the admissions process at various health profession education programs.¹³⁻¹⁵ Peeters et al.¹³ evaluated interrater reliability of admissions essays within a doctor of pharmacy (PharmD) admissions process utilizing intraclass correlations and standard error of measurement for agreement over a five-year period. The authors found that rubric implementation and subsequent reviewer training improved interrater reliability. Additionally, the authors discovered that utilization of a smaller scoring scale when implementing rubrics to evaluate admissions essays enhanced precision, and rubrics utilizing larger scoring scales bolstered false confidence in score precision.¹³

Youdas et al.¹⁴ retrospectively investigated the reliability and validity of admissions committee members' evaluations of applicants' essays into an entry-level physical therapy program. This program allowed the examiner to develop a global or subjective impression of the applicant's potential and considered this impression along with academic variables such as pre-professional grade point average (GPA), personal references, and previous volunteer or work experience. Utilizing kappa coefficients to estimate interrater reliability and validity of the examiners' judgments of an applicant's essay, the authors concluded that the examiners' judgments showed poor reliability (kappa: 0.15–0.42). Poor reliability was attributed both to the lack of clear guidelines used applicants to prepare the essay and by examiners to evaluate the essay. Thus, the authors concluded that the current form of the essay was neither reliable nor valid by itself when used by admissions committee members to predict future academic success within the entry-level physical therapy program.¹⁴

Gilliland et al.¹⁵ described a medical school admissions process that consisted of a three-step review process followed by an admissions committee deliberation. For those applicants that met the required eligibility and academic performance standards, two committee members independently evaluated supplementary application materials, including an essay. Interview invitations were based largely on academic performance, written statements, letters of recommendation, personal attributes, and other information contained in the application. After personal interviews were conducted, three voting admissions committee members independently reviewed the applicant's information and provided a tertiary review. Each tertiary reviewer summarized the applicant with a few sentences or short paragraph. The authors examined these reviews and could qualitatively identify fourteen themes present within the tertiary reviews with high interrater reliabilities (kappa: 0.55–1.00). The authors concluded that identifying themes or characteristics highly valued by an institution and integrating these into the application review process could improve efficiencies.¹⁵

The University of North Carolina at Chapel Hill (UNC) Eshelman School of Pharmacy redesigned its PharmD curriculum to transform pharmacy education through early immersion experiences and non-academic skill development.^{16,17} The new curriculum places a renewed emphasis on non-academic attributes and prompted the development of a new three-stage admissions process to ensure the best candidates were selected for the new curricular outcomes.¹⁶ The reengineered admissions model was critical as the school transformed its PharmD curriculum to emphasize active engagement, foster scientific inquiry and innovation, and immerse students in patient care early in their education.¹⁷ As part of the new admissions model, three dedicated non-pharmacist application reviewers were hired and trained to review applications during the PharmD admissions process. The purpose of this study was to evaluate the validity and reliability of dedicated application reviewers within the school's application review stage of the new multi-stage admissions model that places a renewed emphasis on non-academic attributes.

Methods

Admissions design and implementation

The new admissions model consisted of three stages: an academic evaluation (stage 1), an application review (stage 2), and a multiple-mini interview (MMI) (stage 3) (Figure 1).^{16,18} A focus on identifying certain non-academic or professional constructs while increasing efficiency was the hallmark of the new admissions model. Historically, members of the admissions committee reviewed candidates' applications for admission to the school. Over the years, various rubrics were developed to assess constructs the committee felt were important for success in the program (e.g., pharmacy work experience, community service, leadership experience). Admissions committee members were trained on how to use the rubric to evaluate candidates, and each application was independently reviewed by two members of the committee; however, scores often differed widely between the two reviews making it

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