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Predicting USMLE Step 2 Scores Using Results from the NBME Shelf Exams

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Abstract

Background

In February of 2020 the sponsors of the USMLE examinations, which includes the NBME and the Federation of State Medical Boards (FSMB) decided to change the scoring system of the USMLE Step 1 from a three-digit numeric score to a Pass/Fail outcome[1]. The basis of this change was made to "address concerns about Step 1 scores impacting student well-being and medical education"[2]. Historically, the three-digit numeric score from Step 1 has been one of the top determining factors for admission into residency[3]. This change will cause a shift in the priority of objective and subjective factors about applicants that residency program directors use to assess medical students. The purpose of this study is to further assess the correlation between core clerkship NBME Shelf exam scores with performance on the USMLE Step 2. Predicting performance on the USMLE Step 2 is of more importance now that the Step 1 scoring system was changed to a Pass/Fail outcome. We expect that the scores on the NBME shelf exams will be correlated to the overall performance on USMLE Step 2, further supporting the conclusions of the previous study by Zahn et al[4].

Methods

Data containing students' performance on the USMLE Step 2 and NBME Shelf exams was obtained from Blackboard and One45. In order to protect student confidentiality, data will be de-identified at the point of collection by supervising faculty. From the clerkship assessment score (professionalism, clinical knowledge, shelf exam, etc.) each component will be standardized and converted into a z-score. The NBME Shelf Exams and USMLE Step 2 score will also be converted into a standardized z-score. Standardized USMLE Step 2 T-scores will be substituted in place of NBME Shelf T-scores and final grading computation will analyze the frequency of each grade type (Honors, High Pass, Pass, Fail). Linear regression will be used to determine the correlation between USLME Step 2 scores and performance on the Clerkship Shelf Exams. To assess the effect size of the regression equation, a squared correlation coefficient (R^2) will be computed between scores of the USLME Step 2 and NBME Shelf Exams.

Results

Data collection complete after update to IRB research proposal was approved. Data analysis underway with preliminary results expected in early Spring 2021.

Conclusion

Further analysis of the data is required for proper conclusions to be drawn.

Background:

Medical schools in the U.S. utilize the United States Medical Licensing Exam (USMLE) Step 1 and Step 2 exams as objective measures of the performance of its students. The USMLE Step 1 exam is typically taken after the second year of medical school and it has a minimum passing score of 196, with an average score of 230[5]. The USMLE Step 2 Clinical Knowledge (CK) exam is typically taken after the third year of medical school, prior to the due date for residency applications during the fourth year. The minimum passing score for the Step 2 CK is 210, with an average score of 242[5]. These licensing exams are important not only for their utility in objectively assessing students' performance but also because obtaining at least a minimum passing score is required prior to U.S. medical licensure.

Medical students rotating through their core clinical clerkships are assessed and graded on their basis of clinical knowledge, skills, and professionalism. The core clinical clerkships include Pediatrics, OBGYN, Family Medicine, Psychiatry, Internal Medicine, and Surgery. Medical schools in the U.S. use the National Board of Medical Examiners (NBME) Clinical Subject "Shelf" exams to assess the knowledge component of students' final clinical clerkship grade. The NBME shelf exams can constitute between 25-50% of the final clerkship grade of medical students. Prior studies have supported the correlation between USMLE Step 1 scores and subsequent performance on core clerkship NBME Shelf exams. Data supporting the correlation between core clerkship NBME exam scores with performance on the USMLE Step 2 is limited.

In February of 2020, the sponsors of the USMLE examinations, which includes the NBME and the Federation of State Medical Boards (FSMB) decided to change the scoring system of the USMLE Step 1 from a three-digit numeric score to a Pass/Fail outcome[1]. The basis of this change was made to "address concerns about Step 1 scores impacting student well-being and medical education"[2]. Of note, the scoring system did not change for any other exam, whether provided by the USMLE or NBME. Historically, the three-digit numeric score from Step 1 has been one of the top determining factors for admission into residency[3]. This change will cause a shift in the priority of objective and subjective factors about applicants that residency program

directors use to assess medical students. It is safe to assume that the scores for the Step 2 CK will now be of more importance for residency program directors. Zahn et Al (2012) reported a moderate-to-large positive correlation between NBME subject exams and USMLE Step 2[4]. The purpose of this study is to further assess the correlation between core clerkship NBME Shelf exam scores with performance on the USMLE Step 2. Predicting performance on the USMLE Step 2 is of more importance now more than ever given that the Step 1 scoring system was changed to a Pass/Fail outcome. We expect that the scores on the NBME shelf exams will be correlated to the overall performance on USMLE Step 2, further supporting the conclusions of the previous study by Zahn et al. We also aim to assess a number of different factors that may provide insight into performing better on the USLME Step 2. These factors include the order by which the core clinical clerkships were taken, examination date of USMLE Step 2, and current overall GPA.

Methods:

Study Context

This study was approved by the Institutional Review Board at The University of Texas Rio Grande Valley School of Medicine (UTRGV SOM). The UTRGV SOM matriculates approximately 50 students annually, graduating its inaugural class in May 2020. The four-year curriculum at the UTRGV SOM includes the first two years of basic science by means of lecture followed by two years of clinical studies. The year of core clinical clerkships, of which performance in each is assessed by the NBME clinical subject exam, is the third year in the curriculum.

This study consisted of 90 UTRGV SOM medical students of the 2020 and 2021 graduating classes. NBME clinical subject exams were taken immediately after completion of each clerkship. Students take the USMLE Step 2 based on their personal preference and dates very significantly. Most students do take the Step 2 prior to the due date of residency applications, which is typically September of the academic year.

Statistical Analysis

The primary outcome variables were the scores on the USMLE Step 2 CK exam. The independent variables were the NBME Clinical Subject exam scores for each of the core clerkships that students completed in their third year of the clinical curriculum. The students' overall GPA was an additional independent variable. Data containing students' performance on the USMLE Step 2 CK and NBME Shelf exams was obtained from Blackboard and One45. In order to protect student confidentiality, data will be de-identified at the point of collection by supervising faculty. From the clerkship assessment score (professionalism, clinical knowledge, shelf exam, etc.) each component will be standardized and converted into a z-score. The NBME Shelf Exams and USMLE Step 2 score will also be converted into a standardized z-score. Standardized USMLE Step 2 T-scores will be substituted in place of NBME Shelf T-scores and final grading computation will analyze the frequency of each grade type (Honors, High Pass, Pass, Fail). Linear regression will be used to determine the correlation between USLME Step 2 scores and performance on the Clerkship Shelf Exams. To assess the effect size of the regression equation, a squared correlation coefficient (R^2) will be computed between scores of the USLME Step 2 and NBME Shelf Exams.

Results:
Data collection complete after update to IRB research proposal was approved. Data analysis underway with preliminary results expected in early Spring 2021.

Discussion/Conclusions:
Conclusions cannot be determined at this time

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