Canadian Medical Education Journal
Revue canadienne de l'éducation médicale

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Simulation dans les entrevues d'admission : expériences des candidats et prédiction du rendement au sein des programmes de formation

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Volume 15, numéro 5, 2024

URI : https://id.erudit.org/iderudit/1115346ar
DOI : https://doi.org/10.36834/cmej.78961

Aller au sommaire du numéro

Éditeur(s)

Canadian Medical Education Journal

ISSN

1923-1202 (numérique)

Découvrir la revue

Citer cet article

Wildermuth, A., Battista, A. & Anderson, L. (2024). Simulation in admissions interviews: Applicant experiences and programmatic performance prediction. *Canadian Medical Education Journal / Revue canadienne de l'éducation médicale*, *15*(5), 45–53. https://doi.org/10.36834/cmej.78961

Résumé de l'article

Contexte : Les entrevues d'admission sont fréquemment utilisées pour évaluer les qualités personnelles et interpersonnelles requises pour une pratique médicale réussie. L'utilisation de la simulation au cours des entrevues afin d'engager les candidats dans des scénarios médicaux réalistes afin d'évaluer ces attributs est nouveau. Cette étude évalue les perceptions des candidats à l'égard de la simulation dans le cadre de mini-entrevues multiples (MEM) et rend compte des performances ultérieures des étudiants dans le cadre du programme de formation.

Méthodes : Les candidats au programme d'adjoint médical ont été invités à répondre à un sondage anonyme après l'entrevue, qui comprenait une question à réponse ouverte au sujet de leur expérience en matière d'admission. Nous avons choisi d'analyser qualitativement la question à réponse ouverte. En outre, les paramètres de réussite des étudiants ayant bénéficié de MEM incorporant la simulation ont été comparés à ceux des cohortes précédentes admises par le biais d'entrevues traditionnelles.

Résultats : Les candidats qui ont passé des entrevues simulées dans le cadre des MEM ont eu moins d'incidences d'événements professionnels majeurs, ont progressé plus rapidement dans le programme et ont obtenu des taux de réussite similaires à ceux des candidats qui ont passé des entrevues traditionnelles. Plusieurs thèmes ont émergé, mettant en lumière des réponses variées des candidats aux MEM par simulation, notamment la mise en valeur des forces et de la passion, le sentiment d'équité, l'accès au corps professoral du programme et l'impact sur la certitude.

Conclusions : L'utilisation de la simulation dans les entrevues d'admission est un outil précieux pour évaluer les qualités personnelles d'un candidat dans un contexte clinique. Les candidats admis à l'aide de la simulation ont obtenu de meilleurs résultats dans le cadre du programme que les candidats admis à l'aide d'entrevues traditionnelles. La perception qu'ont les candidats de la simulation dans les entrevues est utile lors de la conception de l'expérience d'admission.

Canadian Medical Education Journal

Original Research

Simulation in admissions interviews: applicant experiences and programmatic performance prediction

Simulation dans les entrevues d'admission : expériences des candidats et prédiction du rendement au sein des programmes de formation

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Published ahead of issue: Jun 25, 2024; published: Nov 13, 2024. CMEJ 2024, 15(5) Available at https://doi.org/10.36834/cmej.78961

Abstract

Background: Admissions interviews are frequently used to assess personal and interpersonal attributes required for successful medical practice. Using simulation in interviews to engage applicants in realistic medical scenarios to assess these attributes is novel. This study evaluates applicant perceptions of simulation within multiple mini-interviews (MMI) and reports on subsequent student program performance.

Methods: Physician assistant (PA) program applicants were invited to complete an anonymous post-interview survey that included one free-response question about their admissions experience. We chose to qualitatively analyze the free-response question. Additionally, success metrics of students who experienced simulation-based MMI were compared to prior cohorts who were admitted using traditional interviews.

Results: Applicants undergoing simulation-based interviews in MMI had decreased incidences of major professionalism events, greater on-time program progression, and similar board pass rates compared to applicants who experienced traditional interviews. Several themes, highlighting the applicants' varied responses to the simulation-based MMI, emerged including showcasing strengths and passion, feelings of fairness, accessing program faculty, and impacts on certainty.

Conclusions: The use of simulation in admissions interviews is a valuable tool for assessing an applicant's personal attributes in a clinical setting. Applicants admitted using simulation had improved programmatic performance compared to applicants admitted using traditional interviews. Applicants' perceptions of simulation in interviews are helpful when designing the admissions experience.

Résumé

Contexte : Les entrevues d'admission sont fréquemment utilisées pour évaluer les qualités personnelles et interpersonnelles requises pour une pratique médicale réussie. L'utilisation de la simulation au cours des entrevues afin d'engager les candidats dans des scénarios médicaux réalistes afin d'évaluer ces attributs est nouveau. Cette étude évalue les perceptions des candidats à l'égard de la simulation dans le cadre de mini-entrevues multiples (MEM) et rend compte des performances ultérieures des étudiants dans le cadre du programme de formation.

Méthodes : Les candidats au programme d'adjoint médical ont été invités à répondre à un sondage anonyme après l'entrevue, qui comprenait une question à réponse ouverte au sujet de leur expérience en matière d'admission. Nous avons choisi d'analyser qualitativement la question à réponse ouverte. En outre, les paramètres de réussite des étudiants ayant bénéficié de MEM incorporant la simulation ont été comparés à ceux des cohortes précédentes admises par le biais d'entrevues traditionnelles.

Résultats : Les candidats qui ont passé des entrevues simulées dans le cadre des MEM ont eu moins d'incidences d'événements professionnels majeurs, ont progressé plus rapidement dans le programme et ont obtenu des taux de réussite similaires à ceux des candidats qui ont passé des entrevues traditionnelles. Plusieurs thèmes ont émergé, mettant en lumière des réponses variées des candidats aux MEM par simulation, notamment la mise en valeur des forces et de la passion, le sentiment d'équité, l'accès au corps professoral du programme et l'impact sur la certitude.

Conclusions : L'utilisation de la simulation dans les entrevues d'admission est un outil précieux pour évaluer les qualités personnelles d'un candidat dans un contexte clinique. Les candidats admis à l'aide de la simulation ont obtenu de meilleurs résultats dans le cadre du programme que les candidats admis à l'aide d'entrevues traditionnelles. La perception qu'ont les candidats de la simulation dans les entrevues est utile lors de la conception de l'expérience d'admission.

Introduction

Admissions interviews are frequently a component of the admissions process for graduate health professions training programs, including medical, physician assistant, and pharmacy school.[1] In fact, 99% of all United States medical schools include an interview in their admissions process, and nearly 97% of physician assistant (PA) programs currently report utilizing admissions interviews.[2,3] These interviews offer programs improved opportunities to verify application information, gather additional information not available in application artifacts, make decisions, and recruit applicants.[2] Interviews can also provide insight into an applicant's personality and interpersonal skills, attributes which are challenging to assess using traditional academic metrics like grade point average (GPA) and standardized test scores, and other application materials like personal statements.[4]

A 1991 study by Tutton was one of the first published on the use of panel interviews as a potential adjunct to the existing admissions process.[5] Tutton reported on an Australian medical school that previously relied solely on academic metrics as the primary applicant selection method but which sought additional tools to address growing concerns that academic metrics alone may not predict success in medical school or clinical practice.[5] The medical school compared the results of semi-structured interviews to the California Psychological Inventory assessment, a tool that identifies and quantifies interpersonal traits, to elucidate whether interviews measured something different than academic metrics measured.[5] The semi-structured panel interview was strongly correlated with the California Psychological Inventory, effectively measuring interpersonal skills. Further, the study showed that interview scores had little overlap with prior academic metrics.[5] A 1995 publication from a New Zealand medical school explored the correlations between panel interviews and academic metrics.[6] Similar to their Australian counterparts, this medical school also traditionally used only academic metrics and standardized test scores to admit medical students. However, they noted that 9% of these students, representing the top 1-3% of the academic pool, did not successfully complete medical school.[6] A study concluded that panel interviews' ability to assess interpersonal skills was not something previously assessed in academic metrics and was reasonable to include in the admissions process.[6]

As the purpose of interviewing is to elucidate personal attributes and interpersonal skills, generally parts of an applicant's identity that are harder to teach or change, it is critical to ask questions or create situations that will generate this information. Traditional interview questions like "Why do you want to be a [specific profession]?" or "What is your greatest strength and weakness?" do not allow the interviewer to assess personal attributes generally thought to be important in medicine, such as empathy, integrity, professionalism, and positive regard for patients. Further, answers to traditional questions are often rehearsed, generating inadequate and frequently similar responses from applicants that fail to highlight programmatic fit and which may not represent the applicant's actual attributes.[11] Traditional questions, even if they address desired personality traits, do not necessarily translate to possessing that trait or utilizing it in a professional healthcare setting. It can be challenging to identify best-fit applicants for a program using these questions; interviewers are often forced to make decisions based more on applicant likability than an applicant's personal attributes.

The selection of applicants into health professions programs is a high-stakes process, and admissions interviews are particularly high stakes. They are nearly always the last step in the admissions process. As such, it is critical that admissions interviews are developed and used to identify applicants with the personal attributes that are most valuable to both students and professionals. For training programs, identifying individuals who will be successful students is of critical importance, as training programs typically only matriculate students once a year. If a student decelerates, withdraws, or is dismissed, it can result in lost tuition for the school, heavy time and mental burdens on the faculty charged with remediating failing students, and a heavy psychological and financial burden on the student.

Holistic admissions has emerged as a best practice for admissions. Holistic admissions refers to approaching the entire admissions process, from recruitment to matriculation, with the applicants' life experiences, personal attributes, and academic metrics in mind.[7] There are several reasons why the holistic review of applicants is preferred. First is that the traditional weight placed on standardized test scores and GPA may not accurately predict student success and may actually disadvantage non-traditional or underrepresented students.[8] Holistic admissions have also been touted as a way to increase

enrollment and retention for underrepresented students. This is especially important as an alternative to directly considering race as a preference factor, which was deemed unconstitutional in the United States by the 2023 Supreme Court decision on affirmative action in admissions.[8] Another reason to consider holistic interviewing is that the holistic review process includes interview modalities that are mission-based and evaluate both an applicant's life experiences and personal attributes.

While other interview modalities, like panel interviews, can evaluate an applicant's experiences and attributes, multiple mini-interviews (MMI), are designed to be highly structured, fair, and grounded in a program's mission and values. MMIs are increasing in popularity and practice as higher learning institutions seek to evaluate applicants more holistically overall.[8] Multiple mini-interviews (MMI) are station-based interviews wherein applicants rotate among several stations on a timed schedule of approximately 4-10 minutes per station and answer a question or complete a scenario at each station (example in Appendix A).[9] Typically there are 4-12 stations included in an MMI, and each station is scored by an independent evaluator with scores from each station used to calculate a final applicant score.[9] MMIs are thought to be the most structured of all interview methods as the station content is standardized and typically mission- and/or profession-based and is conducted by multiple interviewers.[2,9] Perceptions of MMI by both applicants and interviewers are generally positive regarding fairness, reduced opportunity for bias, and allowing for adequate differentiation among candidates.[10]

The use of MMI can help identify the personal traits necessary to navigate the health professions. The use of situational-judgment questions, where applicants navigate a hypothetical scenario, can be an extremely effective method of identifying whether an applicant possesses the personal attribute(s) necessary to succeed in specific situations.

Employing simulations as a component of situational judgment tests

Simulations, which aim to provide a student with a simplified reproduction of a real setting or structured system, provide new opportunities to teach and assess individuals. Many simulations require participants to make decisions, solve problems, and communicate and negotiate with each other.[12,13] Participants are expected to react to the situation in a way that is consistent with how they see themselves and others in the situation.[12,14] Furthermore, simulations are constructed for and by healthcare professionals who, through design decisions, inculcate practice norms of the clinical setting into the simulated setting.[13] These norms often reflect values and cultural norms that are important to or reflect practices of the local community.

Given these characteristics, even though simulations are designed and intended to operate within a consistent set of parameters, the autonomy afforded to participants' engagement is influenced by their own perspectives and experiences. Similarly, because participants make their own choices about how and when to proceed, this results in the generation of a wider range of responses from applicants, thus limiting the challenges associated with too many similar responses from applicants. Furthermore, while applicants can prepare for simulations, they cannot rehearse simulations in the way they can rehearse standard interview questions. In fact, simulations run counter to standard questions in that they are constructed by the participant as they engage with the simulated context, make decisions, and use cultural tools and artifacts.

Study purpose

The use of simulation as part of a MMI offers an opportunity to assess applicants as they navigate a realistic setting. It is critically important that applicants be assessed on their personal attributes rather than medical or scientific knowledge, the latter of which they will learn if matriculated into the program.

Research questions

1. When compared to traditional admissions interviews, what, if any, trend differences in common programmatic markers of success and board examination pass rates were noted?
2. What are applicants' experiences of MMI encounters incorporating simulation during the admissions process?

Methods

A midwestern PA program admissions utilizing the MMI interview process included eight admissions interview stations, two of which utilized simulation and standardized patients. Over a period of six half-days, applicant interviews were conducted in a simulation lab. Applicants were given two minutes to read a scenario and eight minutes to navigate the scenario with a standardized patient. A trained evaluator was in the room observing the

encounter and scoring the interview on a rubric. The rubric evaluated personal attributes of the applicant that the station was specifically intended to elicit. Evaluators were trained on the assessment and did not consider medical, legal, or scientific accuracy, even if the applicant was wrong. Evaluators represented a diverse group of health care practitioners representing eight professions including physician, nurses, PAs, and medical librarians, among others. Evaluators included providers from both the community and the institution. All evaluators were trained on implicit bias, holistic admissions, and the specific interview process being used. Standardized patients were also trained for the encounter and did not assess the applicant. An example of a sample MMI station utilizing standardized patients can be found in Appendix A. IRB approval (710-18-EX) was obtained from the university.

Measures

Programmatic outcomes of students matriculated using the MMI process were compared to two prior cohorts of students admitted using panel interviews. Programmatic outcomes were compared, including incidence of major professionalism events (MPE) that required program intervention, time to graduation, and PA National Certification Examination (PANCE) pass rates. These measures are considered critical characteristics of student success and professional success. Demographics collected included age, gender, military service, race, state residency, cumulative GPA, and science GPA. Demographic differences were compared using independent t-tests and chi-square tests to evaluate any differences between groups.

All participants were sent a follow-up survey about their admissions interview experience. Participants received these surveys after their interview process and before being notified of an admissions decision. In addition to several multiple-choice questions about interview processes and procedures, the survey contained a free-response prompt that asked, “If you would like to provide feedback or suggestions regarding any aspect of the interview process, we welcome your insight.” Free text responses were included in qualitative analysis if they made any reference to MMI and if their content was substantive enough for analysis. Responses related to non-relevant issues like snack options were not included for analysis. Free text responses were coded by the authors via an inductive coding process. All authors engaged in multiple reads of the data which led to the development of two primary codes, valence and frame, as well as relevant themes.

Results

Participants were 192 interviewed applicants to a PA program at a large midwestern academic medical center. Of these 192, a class of 66 students were accepted in rank order based on their cumulative MMI station scores. No students in this class experienced a major professionalism issue requiring adjudication by the program’s Progress and Promotions Committee in their didactic year after matriculation. This contrasts with the two prior years’ cohorts admitted using panel interviews and traditional questions in which 4.8% (*n* = 3 of 62) and 5.5% (*n* = 3 of 55) experienced a major professionalism issue requiring adjudication within their didactic year. Additionally, only 6.4% (*n* = 4 of 62) students in the MMI cohort were unable to progress on-time through the didactic year of the program for academic reasons. During the two prior years’ cohorts of panel interviews, 8.0% (*n* = 5 of 62) and 10.1% (*n* = 6 of 55) of the class was unable to progress with their cohort during their didactic year for academic reasons. All students who completed the program, including those admitted with panel interviews and MMI, ultimately passed the Physician Assistant National Certifying Examination (PANCE) and the PA board exam for certification. The two cohorts admitted using panel interviews had a 100% first time PANCE pass rate. The cohort admitted using MMI, whose didactic and clinical years were profoundly impacted by the COVID-19 pandemic, had a 98% first-time PANCE pass rate.

Participant experiences

Of the 192 candidates who were interviewed, 120 (63.1%) completed the survey. Of these 120, 65 candidates (54%) responded to the free response prompt. Of those free response comments, 50 (77%) were included because they referenced the MMI and contained substantive text. Responses were first coded for valence, which refers to the pleasantness or unpleasantness of a stimulus. Free response comments were identified as having positive, negative, and contemplative valence.[15] Those comments were then coded by perceived frame (whether the experiences were viewed as gains or losses).

Applicants whose comments had either a positive or contemplative valence reported both gains and losses associated with their MMI experience. Applicants whose comments had only a negative valence noted only losses associated with their MMI experience. There were several

themes among the applicants' perceived gains and losses. These include Showcasing Strengths and Passion, Feelings of Fairness, Accessing Program Faculty, and Impacts on Certainty. Figure 1 displays the relationship between applicant comments' valences, perceived gains and losses, and associated themes.

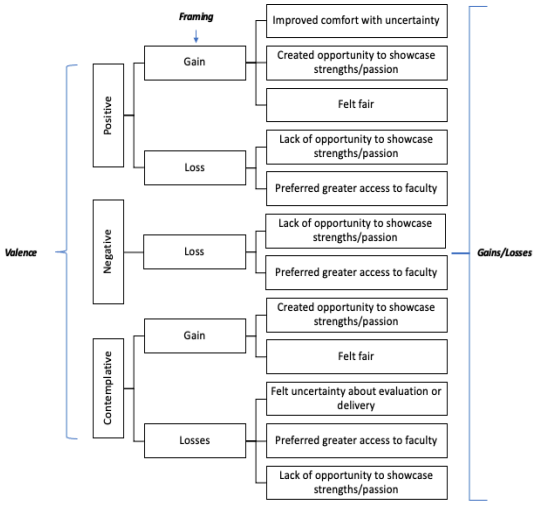

Figure 1. Qualitative analysis of participant comments by valence, perceived frame, and perceived gain or loss.

Showcasing strengths/passion

Applicants whose comments were coded as having all three types of coded valences (positive, negative, or contemplative) noted feeling that the MMI led to both positive and negative experiences related to showcasing their strengths and passion. Respondents noted that the MMI had the ability to help them showcase their strengths, including both clinical and interpersonal skills, as well as passion for their work. One participant wrote:

> *I enjoyed the MMI style of interview very much. I believe it that it allowed your program to see many different strengths that I have as an applicant. I liked how I was able to convey my strengths through taking action in the interviews themselves. I also enjoyed that the situations were things that would actually happen when practicing as a PA.*

Another noted a positive aspect of the MMI was the ability to show their strength by completing scenarios aimed at assessing their skills:

> *The MMI questions hit a broad range of topics and I feel were looking for key characteristics in applicants which could be effectively evaluated in this format. I particularly enjoyed the stations where we "acted" out a scenario with a patient because it allowed my interviewer to see how I would fit into the role as a PA with regards to my interpersonal skills and showing compassion for my patients.*

Still others commented on the ability of the MMI to assess important non-clinical skills. One participant noted, "The multiple mini-interviews were very creative and a great alternative to gauge an applicant's professionalism and communication skills. Research shows it is a better predictor of how well an applicant will do in PA school." This same participant, however, noted a loss associated with the MMI as well, offering the following critique of the MMI:

> *…the MMI doesn't give the applicant a chance to sell themselves to the institution without shoehorning it into a particular scenario. As an applicant, I would have welcomed an opportunity to expand on the experience I have (that I could not fit into the CASPA application) and to emphasize the certain characteristics that would make me an ideal candidate for acceptance.*

Another participant echoed this perceived loss by explaining they felt it prevented them from discussing their to-date personal achievements. The participant stated, "I was not a fan of the interview process that I underwent as it greatly underrepresented my accomplishments."

Several participants noted that the MMI both increased their ability to showcase their strengths while others expressed that the MMI decreased their opportunities for showcasing their strengths. One participant's response highlights this mix of responses by highlighting an initial disappoint with the process before realizing the opportunity the MMI provided:

> *On interview day, I was initially a little disappointed that the interview process solely included MMI questions. I felt like I did not have the opportunity to express my passion for medicine, share my unique background and perspective, or express my excitement to attend UNMC above other schools. However, as I reflected upon interview day, I realized that perhaps the MMI style did provide an opportunity to showcase myself in a way I otherwise would not be able to. I was able to approach each situation naturally and honestly. I was able to show my ability to creatively problem solve. Overall, I would not change anything about Interview Day.*

Numerous comments spoke positively of the authentic opportunity created for demonstrating aptitude in the clinical environment. Applicants generally liked being able to show their fit and ability to perform as a PA using MMI and simulation. The perceived losses nearly all referenced the inability to share personal experiences, achievements and accomplishments, and the reason(s) an applicant wanted to become a PA.

Feelings of fairness

Responses overwhelmingly highlighted fairness as a perceived gain of the MMI process. Fairness was cited by several applicants whose comments fell into both the positive and contemplative valence groups. One participant highlighted that because no personal information is shared during the MMI process, nearly all applicants have an identical experience and were evaluated based on their performance at stations, activities, or situational judgment questions. Another participant stated, "I feel that since the primary and secondary application provide most information concerning the applicant, the MMI interview format is the most fair (*sic*) way to evaluate the final selection of students." Others commented that having numerous evaluators added to the perceived fairness. A participant stated, "I like the MMI format because I think it allows for a more fair (*sic*) evaluation of candidates because we are being evaluated by multiple people." Overall participants felt the MMI format was a fair method for evaluating applicants.

Accessing program faculty

Participants identified access to program faculty to be an important perceived loss of the MMI process. This was true of participants whose comments were coded as having both negative and contemplative valences, but also for those who comments were mostly positive in nature. Participants largely perceived that access to faculty was lacking during the MMI process. Participant comments highlighted a desire for personal connection and the ability to connect with faculty and staff. One participant felt the process was positive, calling it creative and helpful for getting to know applicant personalities. However, the participant stated the drawback to the MMI "was not being able to get to know the faculty and staff better because there was no opportunity for conversation between the student and faculty."

Others noted the importance of getting to know their faculty and staff who would be involved in teaching and advising throughout their time in the program, with one participant mentioning, "I would have loved to meet more of the faculty and staff while interviewing in order to get a better understanding of who would be teaching/advising through matriculation." Another pointed to the importance of the faculty-student connection for an applicant deciding between multiple programs by stating, "I wish I had an opportunity to meet more of the faculty members during the program presentation because having a strong core faculty is a huge determining factor of which PA program I want to pursue." While there was time dedicated for applicants to meet faculty, this time was provided only after MMIs were completed and scored. Participants' responses identified this time as lacking, suggesting more opportunities for engagement between and amongst applicants, faculty, and staff.

Impacts on un/certainty

Certainty was described by those participants whose comments were coded as either positive or contemplative. Those participants commenting positively noted they gained an ability to better manage uncertainty through the MMI process. Those whose comments were coded as contemplative viewed the MMI process as one that created uncertainty for applicants.

Several participants noted they improved their ability to manage uncertainty through the MMI process. This was largely because the MMI process improved their comfort level with uncertain situations and asked them to act spontaneously or without much preparation for specific questions or activities. One participant stated, "I think the multiple mini-interview is a good way to evaluate how a person would actually act in a specific situation because it puts people on the spot and allows you to see their initial reaction." Another explained,

> *The format was conducive to interviewees displaying their best self, meaning the two-minute preparation time gave just enough time to collect our thoughts and formulate a good response, while also allowing for some degree of spontaneity in the interview.*

Other participants viewed the MMI process as one that created uncertainty, specifically about program delivery. While applicants spoke to the ability to be authentic and spontaneous in the MMI, they also expressed discomfort about not knowing which traits were being evaluated at each station. This is likely in contrast to traditional interview questions where the desired trait is either obvious or explicitly stated. One participant noted that

while the MMI experience was a positive one, they would like more feedback on evaluation:

> *It would be helpful to have some feedback at the end of the process to understand what [was] being evaluated during some of the activities/tasks. I think the overall experience was fantastic but as an applicant, it'd be great to know what I scored poorly on so I can work on that particular trait or skill.*

Participants felt uncertainty around the MMI process, specifically around evaluation criteria. However, most felt that this uncertainly led to an improved ability to manage uncertainty and a provided a more accurate picture of the applicant's skills. One participant summed up the experience as stressful but useful:

> *Although multiple mini-interviews were more stressful in a sense that I was not able to prepare for them in the same way, I feel that they showed more of who I am and how I respond to situations. A behavioral interview can be very rehearsed which might not provide the interviewer with an accurate picture of who the applicant is.*

Discussion

The use of a situational-judgment based MMI including simulation allowed for identification of candidates who were professional, adept at handling the rigors of training, graduated on-time, and passed the licensure examination. MMI use was not inferior, and may be superior, to panel interviews in determining how successful applicants will be as both students and professionals.

The applicant experience is an important consideration, as many candidates have a choice when deciding to attend a program. Most applicants perceived MMI positively and valued the fairness of the process, the opportunity to demonstrate their skills and navigate situations as a provider, and their improved comfortability with uncertainty. Most expressed enjoyment and appreciated that the program highlighted their skills and abilities beyond what was shared in their applications. Highlighting these things as a benefit of, and reason for doing MMI, may be beneficial to improving applicant perceptions of the interview experience while still allowing programs to benefit from the fairer and more effective MMI interview.

Perceived shortcomings of the MMI process included an inability to demonstrate professionalism and passion for becoming an PA as well as lack of access to faculty. Again, discussing the reason for a program using MMI, as well as the design of MMI, may address some of these concerns. Additionally, it is important to ensure there is space for applicants to interact with faculty once interviews are completed and scored. This interaction period is important for applicants as it allows them to learn more about the program, including its faculty, student support offerings, and programmatic outcomes which may help applicants with their personal decision-making process. Another perceived shortcoming was a lack of perceived feedback during the MMI process. It is unclear that feedback would improve applicants' future admission scores or MMI performances. However, as feedback is a common applicant request, programs might consider competency-level feedback that does not compromise the integrity of the MMI process.

Simulation is a valuable adjunct to the MMI process. Many applicants noted that they enjoyed the MMI stations with patients, as it allowed them to emulate PA work. Participants mentioned they learned from the experience and suggested MMI with simulation is a useful method for programs to learn about their applicant pool. A primary goal of interviewing is to determine which applicants will make good students and future providers. While oral questions have conventionally been used to elicit that information, these questions are a poor surrogate for recreating a clinical experience that highlights the presence or absence of desired applicants' traits in situ. If a program desires to know how applicants will respond in the clinical setting, the MMI with simulation provides a method for assessing this behavior.

This research, while contributing to a gap in the literature and highlighting a novel, fair approach to admissions interviews, does have limitations. This study compares applicants from two separate cohorts with different admissions interviews. Rigorous comparison of applicant demographics and entering characteristics showed no difference between groups, which allowed for group comparisons, an accepted strategy in existing literature. However, this strategy is inferior to a randomized controlled trial or crossover study. This type of research would be unethical and unapproachable due to time constraints on interview day.

Ideally this study would be replicated with data from several institutions to assess applicant outcomes and experiences more globally. This is a complex undertaking, as the admissions processes would need to be extremely similar, if not identical, between institutions. It would also require institutions to be fully transparent with one

another in their admissions practices. This poses a challenge as institutions may be considering many of the same applicants and may be hesitant to share their criteria and rubrics.

Despite this study's limitations, this study identifies the value of admissions interviews in predicting both student and professional success. This study also highlights the utility of the MMI and the usefulness of simulation in assessing applicant traits.

Conclusions

The use of simulation within MMIs is novel and is a valuable tool for assessing an applicant's personal attributes, such as communication and professionalism, in a clinical setting. These personal attributes are difficult to teach in adults who have developed these traits over years and who likely have little, if any training designed to improve these traits. Furthermore, the use of MMI and MMI with simulation creates a fair, valid, reproducible admissions interview system that supports on-time graduation, helps identifies applicants who are less likely to experience a major professionalism event during training, and helps identify applicants who will pass national licensure examinations. Programs should consider incorporating simulated clinical encounters as part of a holistic admissions review system to aid in identifying applicants who will become successful students and future professionals. Future studies may consider expanding this research across programs, comparing outcomes based on scores from MMI with simulation to those without simulation.

Conflicts of Interest: The authors have no conflicting or competing interests to declare.

Disclaimer: The views expressed herein are those of the author and not that of Uniformed Services University of the Health Sciences, the Department of Defense, Henry M. Jackson Foundation for the Advancement of Military Medicine, Inc., or other Federal Agencies.

Funding: This work is not the product of funded research.

Edited by: Lawrence Grierson, (section editor); Christina St Onge (section editor); Marcel D'Eon (editor-in-chief)

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Appendix A. Sample MMI station utilizing standardized patients.

Wrong Medication Station

Focus of station: This station is intended to be one that will allow an observer to evaluate the applicant's integrity, humility, professionalism, empathy, and ability to accept feedback. Medical knowledge should NOT be assessed as part of this station.

Applicant Door Note: You are seeing a patient at a follow-up appointment to see how he/she is doing after starting a new medication last week for anxiety. The triage note indicates the patient has felt "dizzy" since beginning the new medication but feels normal currently. When you review the electronic medical record prior to entering the room, you realize you prescribed the wrong medication. You prescribed hydralazine, a blood pressure lowering medication; you had intended to prescribe hydroxyzine, a medication to treat anxiety. The hydralazine you prescribed is likely causing the patient to be dizzy by dropping their blood pressure too low.

The patient is in the room waiting for you to discuss how they are doing. You need to inform them that they are on the incorrect medication and need a different one.

Instructions for the Interviewer:

1. You will be evaluating the applicant as they interact with the standardized patient. The SP will become visibly frustrated when the applicant delivers the news that they were prescribed the wrong medication. Please be prepared to assess the applicant's integrity, humility, professionalism, empathy, and ability to accept feedback.

2. The applicant has eight minutes to interact with the SP. After eight minutes a bell will sound, and you will have two minutes to complete the score sheet. **Do not give the applicants feedback.** Thank the applicant for their interview, and do not engage in any discussion with the applicant outside of the station materials.

3. Depending on the flow of the encounter, the SP may ask specific prompting questions if needed:

- How could I be prescribed the incorrect medication?
- What will you do to make sure it doesn't happen again?
- If I want to make a complaint, who can I speak to?

4. In assessing the applicant's attributes, consider the following issues. Note that these are guidelines and should not be considered comprehensive.

- Did the applicant inform the patient they made a mistake and that the wrong medication was prescribed?
- Did the applicant admit personal responsibility for the mistake?
- Did the applicant display remorse and empathy for causing this mistake?
- Did the applicant apologize for this mistake?
- Did the applicant receive feedback from the patient gracefully?