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Abstract

Regional medical campuses (RMCs) were initially established to address a projected physician shortage and have gained popularity throughout the country in also providing unique medical educational experiences. Despite the increasing prevalence of RMCs and progress toward meeting these needs, the overall perceptions of RMCs by faculty and students at the associated main campus have yet to be fully explored. In an attempt to address this gap, we administered a survey to both main campus and RMC students and faculty inquiring about perceptions of its associated RMC, including relative student competencies and opportunities for academic success at the RMC compared to their main campus counterpart. Furthermore, we paired these subjective perceptions with objective Match data, USMLE Step 1 and Step 2 CK results, and research output data in order to better substantiate or challenge these viewpoints. Not only did we find significant differences in a variety of perceptions surrounding the RMC and its associated students, but we also identified overall negative viewpoints of RMC-trained students by main campus students and faculty. Looking more deeply, RMC students surveyed were found to believe their RMC may be even more negatively perceived by main campus faculty than actual responses indicated. Contrary to the prevailing views by main campus students and faculty, Match data revealed no significant differences between successful acceptance into both primary care and surgical specialties across both campuses. Furthermore, there were no significant differences between USMLE Step 1 and Step 2 CK scores or research output across both campuses. This study identifies several unexpected perceptions of a successful RMC curriculum and its students held by main campus students and faculty responding to a survey. However, such viewpoints do not correlate with objective evidence, suggesting the presence of bias. Results suggest the need to further explore and define cross-campus perceptions between main campuses and their RMCs with objective metrics while also considering the potential unintended effects of cross-campus bias.

Introduction

While the overall purpose and role of a regional medical campus (RMC) has evolved since the inception of the concept in the 1970s, an RMC is traditionally described as a medical education program offering a portion or the entirety of an institution's four-year curriculum in a location separate from the main campus.[1] RMCs were initially established with the intention of increasing enrollment and providing an educational experience distinct from the main campus.[1] In 2006, in response to a projected physician shortage, the Association of American Medical Colleges (AAMC) called for a 30% increase in U.S. medical school enrollment by 2015.[2] In 2016, a survey conducted by the AAMC highlighted the role of RMC expansions in helping to address this call, as 40% of U.S. medical institutions had at least one RMC, an increase of 6% from 2011 alone.[3,4] Furthermore, roughly 21% of schools indicated having

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intentions to either create an RMC or expand upon an existing RMC.[5]

Despite the growth of RMCs and their initial function to address the anticipated physician shortage, medical institutions report variable reasons for creating an RMC. These include serving state and local needs, committing to a distributed educational model, increasing class size in underserved areas, increasing collaboration with resource-rich regional community health systems, and diversifying student exposure to different practice types.[3] Beyond the reasons for starting a RMC, Hays (2006) outlined ten guiding principles to successfully build and sustain an RMC. These include: building strong community support, providing a suitable structure, constructing an appropriate curriculum, establishing faculty role models, effectively recruiting student candidates, ensuring high-quality learning, providing adequate opportunities to pursue desirable postgraduate training, fostering research development, facilitating a sustainable model, and encouraging consistent re-evaluation of the program.[6] Ensuring objective student performance comparability between the main medical campus and its associated RMC is essential throughout this process.[7] Utilizing these guiding principles, RMCs have been shown to be effective in providing high-quality medical education, while simultaneously increasing care to the surrounding local communities.[8,9]

Following training at an RMC, medical students' preferential specialty selections can be quite variable. While some RMC Match data have indicated a preference for primary care specialties,[10,11] RMC Match data from other institutions have refuted this claim[12] or even indicated that RMC graduates have a greater predilection for surgical specialties.[13] While there are a multitude of factors that can influence a medical student's specialty preference,[14] medical school culture[15] and a student's assigned mentor or role model can play a pivotal role in the overall decision process.[12,16] Additionally, acceptance into a desired residency program based on both specialty and location have been significantly associated with United States Medical Licensing Examination (USMLE) Step scores.[17] Taken together, the importance of providing an inclusive culture, a diverse set of mentors and role models, and a comprehensive and effective medical curriculum are essential to empower students with the ability to attain a desired residency position.

Since the inception of RMCs in the 1970s, no studies have investigated perceptions of RMC-trained students by RMC-based attending physicians compared with perceptions by the associated main medical campus faculty. Furthermore, no studies have looked into student perceptions of their colleagues at either RMCs or main medical campuses. In this study, we look at the prevailing views and student outcomes from a novel regional campus, the University Park (UP) campus of Penn State College of Medicine. As an extension of the Hershey, Pennsylvania-based Penn State College of Medicine, the UP curriculum track is located in State College, Pennsylvania and situated adjacent to the Penn State University undergraduate main campus. Both the Hershey and University Park campuses are located in suburban environments, with the UP campus in closer proximity to rural communities and the Hershey campus closer to urban communities. Originally, the UP campus was established as a two-year curriculum track in 2012, allowing students to complete their third- and fourth-year clinical rotations at this regional site. It was not until 2017 when the current four-year UP curriculum track replaced the existing two-year curriculum track, with the inaugural class graduating in 2021.

By administering a survey to UP and Hershey students and faculty, we aimed to identify and compare prevailing views and understanding of the UP curriculum track, the process for acceptance into the curriculum, the type of student that may gravitate to the curriculum track, and the UP curriculum's role as part of the Penn State College of Medicine. We compared the perceived number of students that matched into surgical and primary care specialties with objective Match data from the first two inaugural classes of the four-year UP curriculum track (2021, 2022), as well as Match data from the corresponding Hershey curriculum (2021, 2022). Furthermore, we assessed the perceived competency level for students from each campus in basic science, clinical science, health system science, health humanities, bedside skills, and surgical skills. Additionally, this survey assessed the perceived opportunities for research and subsequent publication, as well as the opportunities for leadership, and the degree of leadership involvement. Moreover, perceived

advantages for AΩA selection, advising support, and the overall perceived level of advantages for achieving success in medical school were assessed. Finally, objective differences in USMLE Step 1 and Step 2 CK performance, as well as research output, were assessed among students between the two campuses.

Methods

UP Curriculum Track Background:

In 2017, the four-year UP curriculum replaced the existing two-year curriculum (2012-2017). Upon acceptance to Penn State College of Medicine, student candidates are offered the opportunity to submit a secondary application to the UP campus. Additionally, students are made aware of an annual scholarship that would help to support them during their four years at the UP campus. Along with the invitation, a link is provided which details the overall curriculum and unique aspects of the UP curriculum track. Upon submitting a supplemental application, students are subsequently interviewed and competitively chosen by current UP faculty and students.

The foundation of this novel four-year curriculum track is early, longitudinal patient interactions and self-directed small-group learning. During the first year, small-group class sessions are paired with longitudinal outpatient primary care clinic experiences. In the second (M2) year, students begin longitudinal integrated clerkship (LIC) experiences, with student-selected clinical and surgical specialty preferences considered. While replacing the traditional block clerkship schedule, clinic and operating room clerkship experiences are provided longitudinally throughout the M2 year and may vary day-by-day based on the medical and surgical specialty. Most of these clerkship experiences are completed at the local hospital and clinics in State College, where the regional medical campus is located. However, a one-week inpatient pediatrics experience and a two-week inpatient psychiatry experience are completed at the same clinical sites as the Hershey campus medical students. At the end of the second year, students return to the classroom for basic science classroom didactics and USMLE preparation activities, while also having the opportunity for continued medical specialty exploration through direct clinical experiences.

During this third year, students complete USMLE Step 1. By the start of the fourth year, students fall in line with their Hershey counterparts to complete their acting internships and electives, conduct research, complete USMLE Step 2 CK, submit their residency application, and complete the interview process. Throughout their four years in the UP curriculum track, students are both permitted and encouraged to pursue research and clinical experiences at the Hershey campus, with temporary free housing provided to interested M1-M4 students. Similarly, Hershey students have the opportunity to complete acting internships and elective rotations at the UP campus.

Survey Distribution:

Two separate surveys were designed for the Penn State College of Medicine Hershey and UP students and faculty. A separate Hershey campus survey was sent August 2022 via REDCap to 590 M1-M4 Hershey students and 765 Hershey faculty (Figure 1). A UP survey was sent July 2022 via REDCap to 46 M1-M4 UP students and 78 UP faculty. A reminder email was sent two weeks following the initial email. Overall, participants were given three weeks to respond to the survey.

Responses were completely anonymous with no identifying information other than the general demographic information that was provided voluntarily within the survey. No financial incentives were provided for responding. Three of the questions in both the UP survey and the Hershey survey allowed for free responses.

The Hershey survey asked general demographic information, including whether the responder was a student or faculty member and whether they had interactions with UP students and faculty in general or only in clinical settings. Hershey students were specifically asked whether they were an MD or dual-degree student, as well as their current year of enrollment. Hershey faculty were specifically asked to identify the number of years they had been a faculty member, as well as whether they were in a surgical or non-surgical specialty. Subsequently, both Hershey students and faculty were asked about their views of the UP curriculum track in terms of its overall purpose, the type of student they believe may gravitate to the curriculum track, and the various

competencies of the UP students in comparison to their Hershey student counterparts.
The UP survey asked the same demographic information and included the same questions about how UP students and faculty viewed the relative competency of UP students compared to their Hershey student counterparts. Additionally, UP students were asked how they believed Hershey faculty would perceive them as medical students compared to their Hershey counterparts, and how they believed Hershey campus faculty viewed the UP curriculum track overall.

Match Data:
Match data from 2021 to 2022 were collected for the UP curriculum track. Match data from the Hershey curriculum from 2021 to 2022 were also collected. Primary care and surgical specialty Match rates were compared. Primary care specialties were defined as Family Medicine, Internal Medicine, Internal Medicine/Pediatrics, and Pediatrics, and certain combined specialties (Emergency Medicine/Internal Medicine, Pediatrics/Anesthesiology, Pediatrics/Psychiatry). Surgical specialties were defined as General Surgery, Interventional Radiology, Neurosurgery, Obstetrics and Gynecology, Ophthalmology, Orthopedic Surgery, Otolaryngology, Plastic Surgery, Surgery Preliminary, Thoracic Surgery, Urology, and Vascular Surgery.

Figure 1: Hershey Survey.

Survey Questions
Q1: Are you a student or a faculty member at the PSCOM Hershey Campus?
Q2: Are you an MD or dual degree student?
Q3: In what year of school are you currently enrolled?
Q4: How many years have you been a faculty member? (specify in years)
Q5: Is your medical specialty a surgical or non-surgical specialty?
Q6: Have you ever directly (in-person or Zoom) interacted with University Park medical students?
Q7: Have you ever directly (in-person or Zoom) interacted with University Park medical students in a clinical setting?
Q8: Have you ever directly (in-person or Zoom) interacted with University Park faculty?
Q9: Have you ever directly (in-person or Zoom) interacted with Hershey faculty in a clinical setting?
Q10: Have you ever directly (in-person or Zoom) interacted with University Park faculty in a clinical setting?
Q11: How would you rate your understanding of the University Park Curriculum?
Q12: What is your understanding of how PSCOM medical students become accepted to the University Park program?
Q13: What type of medical student do you believe gravitates toward the University Park Campus?
Q14: What is your perception of the role of the University Park Campus for PSCOM education? (select one or multiple)?
Q15: In comparison to Hershey PSCOM medical students, how well do you think University Park PSCOM medical students match into primary care specialties?
Q16: In comparison to Hershey PSCOM medical students, how well do you think University Park PSCOM medical students match into surgical specialties?
Q17: In comparison to Hershey PSCOM medical students, do you think University Park PSCOM medical students have more opportunities for research (e.g., faculty availability, ongoing projects, project availability)?
Q18: In comparison to Hershey PSCOM medical students, how do you think University Park PSCOM medical students compare in terms of the number of research publications?
Q19: In comparison to Hershey PSCOM medical students, do you think University Park PSCOM medical students have more opportunities for leadership (e.g., student clubs, leading extracurricular activities)?
Q20: In comparison to Hershey PSCOM medical students, how do University Park PSCOM medical students generally compare in terms of leadership involvement (e.g., student clubs, leading extracurricular activities)?
Q21: In comparison to Hershey PSCOM medical students, how do University Park PSCOM medical students generally compare in terms of understanding basic science concepts?
Q22: In comparison to Hershey PSCOM medical students, how do University Park PSCOM medical students generally compare in terms of clinical competence?
Q23: In comparison to Hershey PSCOM medical students, how do University Park PSCOM medical students generally compare in terms of understanding health systems concepts?
Q24: In comparison to Hershey PSCOM medical students, how do University Park PSCOM medical students generally compare in terms of understanding health humanities concepts?
Q25: In comparison to Hershey PSCOM medical students, how do University Park PSCOM medical students generally compare in terms of their anatomy knowledge?
Q26: In comparison to Hershey PSCOM medical students, how do University Park PSCOM medical students generally compare in terms of their surgical skills?
Q27: In comparison to Hershey PSCOM medical students, how do University Park PSCOM medical students generally compare in terms of their "bedside" skills?
Q28: In comparison to Hershey PSCOM medical students, how do University Park PSCOM medical students generally compare in terms of advantages toward selection for AOA Medical Honor Society?
Q29: Compared to Hershey Campus students, University Park Campus students have ____ support for advising and mentorship for UP students.
Q30: Compared to Hershey Campus students, University Park Campus students have ____ advantages to achieving success in medical school for UP students.

Converting Survey Data to Numerical Data:
Survey questions 13 and 15-30 each had four options: more, less, equal, or unsure. For example, question 15 was “In comparison to Hershey PSCOM medical students, how well do you think UP PSCOM medical students match into primary care specialties?” The answers were “More frequently into primary care specialties for UP students,” “Equal frequency into primary care specialties,” “Less frequently into primary care specialties for UP students,” and “Unsure.” These answers were converted into numbers to denote the order of the first three responses. Every answer containing “more,” “better,” or “greater” was counted as a 1. Every answer containing “equal” was counted as a 0. Every answer containing “less” or “lower” was counted as -1. “Unsure” answers were not counted, neither towards the sample size nor the mean or variance of group opinions. Using the Mann-Whitney test to analyze the data, no distance between the three categories were imposed upon.

Groups of Interest:
The comparisons of interest were Hershey and UP students, as well as Hershey and UP faculty. Responses within these groups were consolidated to find a mean and standard deviation for each question. Additionally, UP students were also asked what they thought Hershey faculty would think. Their responses were also tested against the actual Hershey faculty responses.

Step 1 and Step 2 CK Data:
USMLE Step 1 and Step 2 CK scores for the graduating cohorts of 2021-2023 for UP and Hershey students were compiled. Hershey and UP students' scores were compared using an independent samples t-test with a Levene's test.

Research Output:
Research output for the graduating classes of 2021-2022 for the UP curriculum track and Hershey track were collected utilizing PubMed®. Students were categorized according to whether they had a first-author publication in a journal associated with PubMed®, as well as whether they had any publication in a journal associated with PubMed®. The resulting Hershey and UP student publication categories were compared using a chi-square test.

Tests of Significance:
Independent samples t-test: The null hypothesis of the independent samples t-test is that there are no differences in the means of two groups. If the resulting *p*-value is less than 0.05, the null hypothesis can be rejected, and we can assert a statistically significant difference between the groups. Levene's test for equality of variances was first calculated to determine if the t-test results should be based on equal variances assumed or not assumed.
Mann-Whitney U test: The null hypothesis of the Mann-Whitney U test is that there are no differences between the distribution function of the two groups. There are no assumptions of the distributions of the variables. If the resulting p-value is less than 0.05 we can reject the null hypothesis and assert there is a statistically significant difference between the two groups. This test was used across every group of interest, except when comparing Match data.
Chi-square test: The null hypothesis of the chi-square test is that there are no differences between the distribution function of the two groups. There are no assumptions of the distributions of the variables. If the resulting p-value is less than 0.05 we can reject the null hypothesis and assert there is a statistically significant difference between the two groups. This test was used when comparing Match data and research output between Hershey and UP students.

Results

Participation:
A total of 103 Hershey students responded, resulting in a response rate of 17.5%. Of the Hershey student responses, 29.4% were MS1s, 25.5% were MS2s, 22.5% were MS3s, 18.6% were MS4s, and 3.9% were MD/PhD students. A total of 37 UP students responded, resulting in a response rate of 80.4%. Of the UP student responses, 29.7% were MS1s, 16.2% were MS2s, 29.7% were MS3s, and 24.3% were MS4s. A total of 79 Hershey faculty responded resulting in a response rate of 10.3%. Of the Hershey faculty responses, 24.1% were from surgical fields and 75.9% were from non-surgical fields, with a mean of 15.61 years served as a faculty member (SD 10.02). A total of 30 UP faculty responded, resulting in a response rate of 38.5%. Of the UP faculty responses, 30% were from surgical fields and 70% were from non-surgical fields with a mean of 12.13 years served as a faculty member (SD 6.68).

Cross Campus Interactions and Understanding:
Among the Hershey students responding, 81.4% had interacted with UP students, with 19.4% of Hershey students having interacted with UP students in a clinical setting. Of the responding Hershey students, 35.9% had interacted with UP faculty, with 2.9% doing so in a clinical setting. In terms of understanding the UP curriculum, 5.8% of Hershey students were extremely familiar, 10.7% were moderately familiar, 33.0% were somewhat familiar, 28.2% were slightly familiar, and 22.3% were not at all familiar.
Among the UP students responding, 100% had interacted with Hershey students, with 51.4% interacting with Hershey students in a clinical setting. Of the UP students responding, 86.5% had interacted with Hershey faculty in-person or via Zoom, with 62.2% interacting with Hershey faculty in a clinical setting. In terms of understanding the Hershey curriculum, 2.7% of UP students were extremely

familiar, 35.1% were moderately familiar, 32.4% were somewhat familiar, 24.3% were slightly familiar, and 5.4% were not at all familiar.

Among the Hershey faculty responding, 62.2% had interacted with UP students, with 28.0% doing so in a clinical setting. Among Hershey faculty, 61.3% had interacted with UP faculty, with 28.0% doing so in a clinical setting. In terms of understanding the UP curriculum, 6.1% of Hershey faculty were extremely familiar, 19.5% were moderately familiar, 18.3% were somewhat familiar, 17.1% were slightly familiar, and 39.0% were not at all familiar.

Among the UP faculty responding, 86.5% had interacted with Hershey students, with 74.2% doing so in a clinical setting. Among UP faculty, 87% had interacted with Hershey faculty, with 53.3% doing so in a clinical setting. In terms of understanding the Hershey curriculum, 12.9% of UP faculty were extremely familiar, 29.0% were moderately familiar, 22.6% were somewhat familiar, 25.8% were slightly familiar, and 9.7% were not at all familiar.

Acceptance into the UP Curriculum Track and Type of Student:

A total of 89.2% of Hershey students and 97.3% of UP students recognized that a supplemental application in addition to the Hershey campus application was necessary to be accepted into the UP curriculum track. However, only 43.9% of Hershey faculty and 48.4% of UP faculty correctly recognized that a supplemental application in addition to the Hershey campus application was necessary for acceptance in the UP curriculum track.

The question regarding perceptions of the UP campus' role in a Penn State College of Medicine education allowed for multiple selections. A total of 36.9% of Hershey students, 14.3% of UP students, 39.0% of Hershey faculty, and 32.3% of UP faculty believed the UP curriculum track serves to "provide medical education to students interested in primary care specialties." Additionally, 28.2% of Hershey students, 8.6% of UP students, 25.6% of Hershey faculty, and 29.0% of UP faculty believed the UP curriculum track serves to "provide medical education to students interested in rural medicine." Furthermore, 89.3% of Hershey students, 94.3% of UP students, 51.2% of Hershey faculty, and 67.7% of UP faculty believed the role of the UP curriculum track is to "provide a smaller group learning environment." In total, 31.1% of Hershey students, 17.1% of UP students, 32.9% of Hershey faculty, and 29.0% of UP faculty believed the role of the UP curriculum track is to "provide an outlet to expand the class size of the PSCOM MD program." Those "unsure" of the role of the UP curriculum track were 4.9% of Hershey students, 2.9% of UP students, 24.4% of Hershey faculty, and 12.9% of UP faculty.

Hershey Student and UP Student Responses:

A comparison of Hershey and UP student responses is shown in Table 1. Hershey campus students were more likely to indicate that the UP curriculum track attracts less competitive students and that UP students are more likely to match into primary care specialties, less likely to match into surgical specialties, have fewer number of research publications, less likely to have opportunities for leadership, have less leadership involvement, have less understanding of health system concepts, display less surgical skills, and experience fewer overall advantages to achieving success in medical school. UP students were more likely to indicate they have better clinical competence, better understanding of health humanities concepts, and better bedside skills, but less understanding of basic science concepts and less anatomy knowledge.

Comparing Hershey Students and UP Students Responses

Questions	Hershey, mean (SD)	UP, mean (SD)	P-value
Q13: Type of Medical Student	-0.13 (0.51)	0.258 (0.58)	**<0.01****
Q15: Primary Care Specialties	0.27 (0.59)	-0.114 (0.47)	**<0.01*****
Q16: Surgical Specialties	-0.43 (0.59)	0.03 (0.47)	**<0.01*****
Q17: Opportunities for Research	-0.30 (0.75)	-0.14 (0.72)	0.24
Q18: Number of Research Publications	-0.31 (0.63)	-0.03 (0.59)	**0.03***
Q19: Opportunities for Leadership	-0.34 (0.77)	0.60 (0.73)	**<0.01****
Q20: Leadership Involvement	-0.12 (0.76)	0.54 (0.56)	**<0.01****
Q21: Basic Science Concepts	-0.07 (0.43)	-0.52 (0.57)	**<0.01****
Q22: Clinical Competence	0.00 (0.57)	0.83 (0.38)	**<0.01****
Q23: Health Systems Concepts	-0.07 (0.47)	0.47 (0.56)	**<0.01****
Q24: Health Humanities Concepts	0.08 (0.39)	0.60 (0.50)	**<0.01****
Q25: Anatomy Knowledge	-0.22 (0.47)	-0.76 (0.50)	**<0.01****
Q26: Surgical Skills	-0.26 (0.55)	0.11 (0.63)	**0.01***
Q27: Bedside Skills	0.09 (0.51)	0.85 (0.36)	**<0.01****
Q28: AOA Selection	0.08 (0.66)	0.25 (0.59)	0.25
Q29: Support	0.48 (0.68)	0.68 (0.58)	0.13
Q30: Advantages	-0.07 (0.57)	0.33 (0.68)	**<0.01****

Table 1: Comparison of Hershey and UP student responses. Key: -1 = less; 0 = equal; +1 = more. SD: standard deviation. *p-value <0.05; **p-value <0.01, ***p-value <0.001.

Hershey Faculty Responses and Perceived Hershey Faculty Responses by UP Students:

A comparison of actual Hershey faculty responses with perceived Hershey faculty responses by UP

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students is shown in Table 2. UP students indicated that they perceived Hershey faculty to believe that UP students had less understanding of basic science concepts, less anatomy knowledge, and less surgical skills, but more advantages for AΩA selection.

Comparing Hershey Faculty Responses to Perceived Responses by UP Students			
Questions	**Hershey, mean (SD)**	**UP, mean (SD)**	**P-value**
Q17: Opportunities for Research	-0.52 (0.61)	-0.62 (0.65)	0.33
Q18: Number of Research Publications	-0.35 (0.66)	-0.56 (0.58)	0.21
Q19: Opportunities for Leadership	-0.34 (0.80)	0.00 (0.79)	0.05
Q20: Leadership Involvement	-0.17 (0.73)	0.16 (0.77)	0.07
Q21: Basic Science Concepts	0.05 (0.44)	-0.74 (0.45)	**<0.01****
Q22: Clinical Competence	-0.23 (0.59)	-0.03 (0.74)	0.23
Q23: Health Systems Concepts	-0.05 (0.48)	-0.17 (0.60)	0.30
Q24: Health Humanities Concepts	0.07 (0.46)	-0.07 (0.65)	0.30
Q25: Anatomy Knowledge	-0.08 (0.50)	-0.67 (0.48)	**<0.01****
Q26: Surgical Skills	-0.29 (0.58)	-0.66 (0.48)	**0.01***
Q27: Bedside Skills	0.11 (0.51)	-0.07 (0.67)	0.229
Q28: AOA Selection	-0.22 (0.42)	0.27 (0.77)	**0.01****
Q29: Support	0.13 (0.84)	0.34 (0.65)	0.33

Table 2: Comparison of Hershey faculty responses with perceived Hershey faculty responses from UP students. Key: -1 = less; 0 = equal; +1 = more. SD: standard deviation. *p-value <0.05; **p-value <0.01, ***p-value <0.001

Hershey and UP Faculty Responses:

A comparison of Hershey faculty and UP faculty responses is shown in Table 3. Hershey faculty were more likely to indicate that the UP curriculum track attracts less competitive students with UP students being more likely to match into primary care specialties, less likely to match into surgical specialties, have less opportunities for research, have fewer opportunities for leadership, have less leadership involvement, have less clinical competence, have fewer advantages for AOA selection, and have less support for advising and mentorship.

Comparing Hershey Faculty and UP Faculty Responses			
Questions	**Hershey, mean (SD)**	**UP, mean (SD)**	**P-value**
Q13: Type of Medical Student	-0.41 (0.61)	0.00 (0.49)	**0.01****
Q15: Primary Care Specialties	0.50 (0.51)	0.19 (0.40)	**0.02***
Q16: Surgical Specialties	-0.58 (0.50)	-0.10 (0.54)	**0.00****
Q17: Opportunities for Research	-0.52 (0.61)	-0.05 (0.78)	**0.02***
Q18: Number of Research Publications	-0.35 (0.66)	-0.17 (0.58)	0.33
Q19: Opportunities for Leadership	-0.34 (0.80)	0.50 (0.74)	**<0.01*****
Q20: Leadership Involvement	-0.17 (0.73)	0.32 (0.67)	**0.02***
Q21: Basic Science Concepts	0.05 (0.44)	-0.09 (0.61)	0.30
Q22: Clinical Competence	-0.23 (0.59)	0.13 (0.63)	**0.03***
Q23: Health Systems Concepts	-0.05 (0.48)	0.10 (0.54)	0.29
Q24: Health Humanities Concepts	0.07 (0.46)	0.18 (0.40)	0.35
Q25: Anatomy Knowledge	-0.08 (0.50)	-0.33 (0.49)	0.08
Q26: Surgical Skills	-0.29 (0.58)	-0.14 (0.54)	0.39
Q27: Bedside Skills	0.11 (0.51)	0.32 (0.65)	0.13
Q28: AOA Selection	-0.22 (0.42)	0.37 (0.51)	**<0.01****
Q29: Support	0.13 (0.84)	0.62 (0.64)	**0.02***
Q30: Advantages	-0.15 (0.59)	0.04 (0.65)	0.22

Table 3: Comparison of Hershey and UP faculty responses. Key: -1 = less; 0 = equal; +1 = more. SD: standard deviation. *p-value <0.05; **p-value <0.01, ***p-value <0.001.

Match Data:

Hershey students matched into 32 different specialties from 2021 to 2022 with 34.5% matching into a primary care specialty and 23.3% matching into a surgical specialty.

Hershey students matched into the following nine primary care specialties: *Family Medicine, Internal Medicine, Internal Medicine/Emergency Medicine, Internal Medicine/Pediatrics, Internal Medicine/Preliminary Year, Internal Medicine/Psychiatry, Pediatrics, Pediatrics/Anesthesiology,* and *Pediatrics/Psychiatry*.

Hershey students matched into the following 11 surgical specialties: *Cardiothoracic Surgery, General Surgery, General Surgery/Preliminary Year, Neurosurgery, Obstetrics and Gynecology, Ophthalmology, Orthopedic Surgery, Otolaryngology, Plastic Surgery, Urology,* and *Vascular Surgery.*

Additionally, Hershey students matched into the following 13 other specialties: *Anesthesiology, Child Neurology, Dermatology, Diagnostic Radiology, Emergency Medicine, Interventional Radiology, Neurology, Other/Research, Pathology, Physical Medicine and Rehabilitation, Psychiatry, Radiation Oncology,* and a *Transitional Year*.

UP students matched into 13 different specialties from 2021 to 2022 with 29.2% matching into primary care specialties and 29.2% matching into surgical specialties.

UP students matched into the following five primary care specialties: *Family Medicine, Internal Medicine,*

Internal Medicine/Pediatrics, Pediatrics, and Pediatrics/Anesthesiology.
UP students matched into the following three surgical specialties: *General Surgery, Obstetrics and Gynecology,* and *Ophthalmology*.
Additionally, UP students matched into the following five other specialties: *Dermatology, Emergency Medicine, Neurology, Physical Medicine and Rehabilitation, and Psychiatry*.
Comparing 2021-2022 Match data, there were no significant differences between matching into primary care specialties ($\chi 2 = 0.280$, $p = 0.597$) and surgical specialties ($\chi 2 = 1.497$, $p = 0.338$) between Hershey and UP students.

Step 1 and Step 2 CK Data:
Comparing Step 1 results for graduating cohorts of 2021-2023 for UP and Hershey, Levene's test was not statistically significant ($F = 0.01$, $p = 0.93$), so results were based on equal variances. Step 1 scores were not statistically significantly different between the three graduating cohorts of 2021-2023 for UP and Hershey ($t = 0.927$, $df = 379$, $p = 0.35$).
Comparing Step 2 CK results for the graduating cohorts of 2021-2023 for UP and Hershey, Levene's test was not statistically significant ($F = 0.17$, $p = 0.68$), so results were based on equal variances. Step 2 CK scores were not statistically significantly different between the three graduating cohorts of 2021-2023 for UP and Hershey ($t = 0.35$, $df = 461$, $p = 0.73$).

Research Output:
Comparing research output for the graduating cohorts of 2021-2022 for UP and Hershey, there were no significant differences between the number of students with first author publications ($\chi 2 = 0.105$, $p = 0.746$) or the number of students with publications ($\chi 2 = 0.005$, $p = 0.943$).

Discussion

Comparing the average responses between Hershey and UP students, as well as between Hershey and UP faculty illustrates numerous significant differences in the perceptions of the UP curriculum track and its student body. The majority of Hershey student and faculty responses revealed relatively more negative views about the UP curriculum track and students compared to UP student and faculty responses (Tables 1 and 3). When comparing actual Hershey faculty responses with how UP students perceived Hershey faculty would respond, the *expected* responses are even more negative than the *actual* responses from Hershey faculty (Table 2). This suggests UP students felt they would be judged even more harshly by Hershey faculty than the responses indicated, perhaps endorsing a perception by UP students that their campus is not fully understood by the faculty at the main campus. Indeed, 74.4% of Hershey faculty indicated they had only "somewhat, slight, or no understanding" of the UP curriculum track.

Objective 2021-2022 Match data for both Hershey and UP students revealed there were no significant differences between the proportion of Hershey and UP cohorts matching into primary care or surgical specialties. This directly contradicts the stated perceptions by both Hershey students and faculty (Tables 1 and 3). Again, the survey data suggests a lack of cross-campus understanding of the RMC curriculum track that may contribute to inaccurate assumptions about the RMC. Despite Match data indicating that UP students successfully matched into surgical specialties at a level comparable to their Hershey counterparts, average survey responses by Hershey students and faculty indicated a pervasive view that UP students are more likely to match into primary care specialties rather than surgical specialties. One explanation for this could be related to UP students completing most of their surgery clerkship with general surgeons at the RMC. Although all teaching physicians have an academic appointment in their respective specialty department, this does not guarantee they will be known to the faculty in that department located at the Hershey campus. Alternatively, there could simply be a negative perception of or bias toward RMC surgical training.
Several past studies have found that RMC-trained students demonstrate a preponderance for choosing a career in a primary care specialty.[10,11] However, one of these studies indicated that the majority of their regional campuses are designed to serve predominantly rural populations,[10] a stark contrast to the predominant suburban community in which the UP curriculum track resides. In contrast to that study's findings, another study found that its rurally-based

RMC had a high student predilection for surgical specialties.[13] Despite the UP curriculum track having a significant proportion of surgically-oriented students, as demonstrated by Match data, there is also a perception among Hershey-based faculty that UP students may be less competitive, may be less likely to match into surgical specialties, may attain fewer research publications, may express inferior surgical skills, and may have fewer advantages for medical school success compared to their Hershey counterparts (Table 3). Despite these negative subjective viewpoints of UP students, our study indicates there are no significant differences in Step 1 and Step 2 CK scores, first author publications, and overall publications between UP and Hershey students. These objective metrics indicate that the perception among Hershey-based faculty that UP students may be less competitive with fewer research publications is unfounded. Regardless, these Hershey faculty viewpoints could prove to be a significant barrier for UP students interested in pursuing a surgical specialty. As such, identifying this apparent bias and addressing it through efforts to increase understanding of the RMC is critical to creating an equitable and inclusive educational experience.[12,16] The overall perceived negative Hershey faculty viewpoints regarding UP students could potentially impact the overall Penn State College of Medicine culture, subsequently influencing the UP student specialty selection process, career mentorship, strength of letters of recommendation, and selection for honors and awards, such as AΩA and Gold Humanism Honor Society.[15]

These findings illustrate a variety of significant differences between the Hershey and UP students and faculty regarding the perception of the UP curriculum track and its student body. Results also suggest a significant lack of cross-campus understanding of the students and curricula that predominate at the RMC. Ironically, this lack of insight and understanding has created inaccurate cross-campus perceptions that do not correlate with actual outcomes. This argues for efforts to increase cross-campus insight and understanding with specific attention to how unfounded biases may negatively impact students that train at an RMC.

Limitations of our study include a smaller UP faculty and student sample size due to the smaller size of the RMC. Furthermore, this study only included physician faculty to allow for a more direct comparison between clinical faculty at Hershey and UP. Non-clinical faculty may have responded significantly differently than did clinical faculty. Additionally, our Match data comparison was restricted to the classes of 2021 and 2022, since the four-year UP curriculum track was implemented in 2017. While this UP Match data is promising, it should be interpreted with caution due to the limited number of students analyzed (24 in total, average of 12 per year). Of note, surgical skills as well as involvement in scholarship activities and student groups were unable to be assessed between institutions; future studies should objectively measure these variables when determining if there is bias present. Finally, the results of our study are limited to the context of only a single regional medical campus.

Conclusion

These study results suggest that even at a presumably successful RMC, with clearly positive objective metrics, unstated biases by main campus students and faculty in regard to students and curricula at the associated RMC may exist. This is likely due to limited understanding and awareness across campuses regarding the success of RMC students. Moreover, incorrect assumptions about the purpose of the RMC and the type and quality of the student that gravitates to the RMC may be contributing factors. Despite RMCs originally serving as a solution to address a growing physician shortage[2] and provide unique educational experiences,[1] our findings suggest that both main campus faculty and students may maintain a different, and unsubstantiated perspective of RMCs and its student cohort. While we were able to provide objective Match data that directly contradicts some of these views, future studies will need to incorporate a more diverse set of objective data (e.g., student group involvement) to substantiate or disprove these perceptions. If a relative deficiency is truly present among a specific RMC student cohort, interventions accompanied by subsequent objective evaluations are necessary. Likewise, if main campus faculty and student biases are identified then educational efforts

to increase more accurate cross-campus perspectives are indicated. Finally, future studies are needed to elucidate the underlying cause of potentially negative subjective perceptions held by main campus faculty and students. By identifying and addressing the principal reasons for negative RMC perceptions, medical colleges can strive toward a common goal of instilling a cohesive, equitable, and inclusive educational culture that supports the professional goals of both the RMC and main campus.

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