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From books to the bedside: post-graduation impact of 'Week On the Wards' on medical education

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Abstract

Background The transition between preclinical and clinical years during medical school has been shown to be challenging. Cooper Medical School of Rowan University (CMSRU) implements one required two-week-long shadowing program for first and one one-week-long shadowing program for second-year medical students called Week On the Wards (WOW). The goal of this study is to ascertain whether students who completed the WOW curriculum found it beneficial over the long-term. Specifically, we want to evaluate alumni's impression of the program's influence on career, specialty choice, professional development, personal development, and confidence.

Methods To evaluate our program, we developed, validated, and distributed a survey via email in the autumn of 2023. Our population included alumni from the classes of 2019–2022, irrespective of race and gender. After following steps for survey development, it was validated via focus group using qualitative methods. The survey consisted of 19 questions answerable on a 5-point Likert scale, a "Yes/No/Unsure/Maybe" section, and an optional open-ended response question. Descriptive analysis was done to report the percent responses.

Results The survey was emailed to 353 alumni, with 72 completed responses returned. Majority of respondents agreed or strongly agreed that the WOW program showcased the importance of teamwork in medicine (80.6%), helped them learn to apply medical knowledge (77.8%), influenced their decision regarding which residency/specialty they chose (72.2%), provided an example of how teamwork in medicine is necessary for patient safety and effective care (66.6%), and increased their confidence in their networking skills (66.6%). Alumni nearly unanimously agreed that the WOW program was a useful part of their medical school education (93.1%) and that it should be continued for future classes (94.4%).

Conclusion Our results highlight the sustained importance of early preclinical exposure to clinical environments in students' future career decisions, in their understanding of the clinical applications of learned preclinical topics, and the importance of teamwork in medicine.

Keywords Medical education, Shadowing program, Early clinical exposure, Survey, Alumni

Introduction

Studies show that the most challenging transition in medical education is from preclinical to clinical training [1, 2]. This phase in medical education induces stress, anxiety, and psychiatric symptoms among students due to unfamiliarity with the clinical learning environment and lack of sufficient practical skills [3, 4]. The concept of "early clinical exposure" (ECE) was introduced as early as

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1940 in medical education to facilitate students' understanding of comprehensive patient care and mitigate the stress of the transition from the preclinical to clinical years [5]. Beyond reduction of anxiety and stress, ECE leads to increased confidence and motivation as well as provides better context for preclinical coursework [6]. Research indicates that implementation of a shadowing program that allows medical students to go into a clinical setting prior to their clinical rotations eases the transition from preclinical to clinical practice and better prepares students for clinical training [2, 7]. Shadowing programs allow students to have realistic experiences of their future careers and to acquire insight to the everyday flow of healthcare and teamwork [8]. Moreover, early exposure to different clinical specialties and direct patient contact may aid students' decisions as to what clinical specialty and residency program they would like to enter [9]. Shadowing programs add little cost to the organizing institution, to execute and maintain, by using existing resources [2].

The "Week On the Wards" (WOW) clinical education program at Cooper Medical School of Rowan University (CMSRU) in Camden, New Jersey, is an opportunity for medical students in the preclinical years (first and second year) to gain clinical experience. During the first year, all students spend a week rotating through the core specialties of Pediatrics, Obstetrics and Gynecology, Emergency Medicine, Critical Care Medicine, General Surgery, and Internal Medicine (WOW1) (Appendix 1). Students also attend a 2-h interprofessional education session designed to develop collaborative physicians with clear communication skills by working with students in other disciplines, such as social work, pharmacy, law, and nursing. Part of the WOW1 program also included training in Lean Six Sigma. The goals of the first year WOW program are to provide early exposure to various medical specialties, to demonstrate the link between the first two years of medical school and the actual practice of medicine, to allow a reflective exchange of ideas in the context of the inpatient environment and emphasize the role of teamwork in medicine, and to equip the healthcare learner with the attitudes, knowledge and skills needed to work effectively in a collaborative practice.

During the second year, students are given the opportunity to choose a single specialty/subspecialty from 35–40 different options to immerse themselves in for a week (WOW2). During each week, students are assigned to work with attending and resident physicians of a single specialty, to guide them in the unique work flow of that specialty. The goals of the second year WOW program are to provide early exposure to a specific medical specialty and to allow a reflective exchange of ideas and interprofessional teamwork. Students are expected to learn to synthesize and present key elements of patient care while adjusting to the lifestyle of a physician. Additionally, students will be able to apply the knowledge gained in the first two years to provide safe and effective patient care, all while learning to work with multidisciplinary teams. They will also identify the core skills and attitudes needed for the specialty and reflect on how the experience impacts their professional development.

Incorporating a two-week program into the first year and a one-week program into the second year of the medical school (Phase 1) curriculum proves challenging. The already limited curricula time in the first two years, along with requirements such as laboratory experience and self-directed learning time, leads to the shortening of other basic science courses. Integrating the WOW program into students' schedules requires both creativity and a strong belief in the program's proven value from its initiation. Immediate evaluation post-completion of the program to assess students' perceived benefits and academic takeaways has been consistently positive since the program's inception. For the classes of 2019–2022, the short-term feedback found that over 86% of students viewed the WOW1 program to be "very good" or "excellent" and over 81% agreed or strongly agreed that their experiences in the program provided them with examples and applications of concepts learned up to that point of their medical educations. For the WOW2 program, greater than 89% of students found it to be "very good" or "excellent" and more than 85% agreed or strongly agreed that their experiences in the program resulted in a better understanding of their future career goals. These evaluations demonstrate to the Phase 1 curriculum designers that the WOW program is a treasured and vital piece of medical students' experiences and learning. However, while students praised the program immediately after completion, it is unknown if the benefits students obtained during the program are persistent throughout the remainder of their medical education and beyond.

The purpose of this study is to evaluate the continued impact of the WOW experiential learning program in the first and second year of medical school on alumni, after 3–6 years of active rigorous clinical experience, as they reflect back on the remainder of their medical education, career, specialty choice, professional development, personal development, and confidence. The rationale behind this study is to evaluate the long-term benefits or impacts of this new program and to enhance justification of the program's continuation for future students. While the WOW program maintains its popularity among students immediately after their participation, this study will elucidate any additional measurable benefits students obtain regarding their future careers as physicians over the long-term. We hypothesize that alumni of CMSRU view the

WOW program as a useful component of their medical education because the program provides early exposure to a clinical environment that allows them to not only participate in hands-on learning from healthcare providers, but also begin to develop foundational skills required to become a whole physician beyond the books. To achieve this objective, we sought to generate and validate a novel survey instrument, as a review of the literature did not yield an existing tool that adequately assesses our goals.

Methods

Study population

This was a cross-sectional study of CMSRU alumni from the classes of 2019–2022 performed in the fall of 2023. Eligible subjects completed the WOW program 3–6 years prior to this study. A total of 353 alumni were eligible to participate in the study. The only exclusion criterium for our study was if an alumnus/a did not have available contact information [6 alumni were excluded]. The Rowan University Institutional Review Board (IRB) deemed this study in the exempt category as no identifiable data was collected.

Survey development

Using Boateng and co-investigators' best practices guide for survey development and validation [10], three investigators initially developed a novel 24-question survey to assess alumni's views on the value of the WOW program. In alignment with their "Phase 1: Item Development" description, a literature search for existing survey instruments to assess our main objective did not reveal any valid options. Consequently, we found it necessary to develop a unique survey to accurately evaluate our study goals. Existing survey instruments primarily focused on programs for students in their clinical years and assessed short-term goals, whereas we aimed to evaluate the long-term effects of a preclinical program. Our 5 domains included: 1) application of pre-clinical knowledge, 2) future career influence, 3) personal and professional development, 4) teamwork in medicine, and 5) work-life balance. Investigators' item generation phase produced questions for a demographic section, a section on alumni students' perspectives on the WOW program assessed on a five-point Likert scale, a "Yes/No/Unsure/Maybe" section, and an optional open-ended question. We chose to use existing and established scale instruments, as they would accurately examine the domains under investigation.

This developed survey was then validated. First, we reviewed with an expert in qualitative research and consolidated the number of questions to 19 with more efficient representation of the domains of interest. Pre-testing of the survey questions was done through cognitive interviews, which utilized a focus group of four current fourth-year medical students at CMSRU. Current fourth-year students were selected as the sample target population due to their completion of the WOW program during their preclinical years and short time since their completion. Investigators met with the four volunteers who were asked to fill out the 19-questions survey while they were being timed. Thereafter, an in depth discussion of each question helped determine the appropriateness and intent of the questions for the target population. Changing the wording of some questions to reflect what the intent was helped maintain the robustness of responses. We were able to determine the approximate amount of time it would take to complete the survey to share with our prospective participants during the recruitment phase. As a result of this focus group, the number of questions in the validated survey was maintained at 19 (Appendix 2). We instructed our survey subjects to not consider their Lean Six Sigma training in their responses.

Data collection

Potential participants were recruited via email using a unique link that prevented one participant from submitting multiple responses. The survey was administered through REDCap, a secure, password protected environment with access limited to the study team. Demographic information was collected on age, sex, and race/ethnicity. Over three months, the survey was open and six email reminders were sent. All data was reported in aggregate and confidentiality was protected.

Statistical analysis

Descriptive analysis was done to report the percent responses. Participant responses to the optional open-ended question were qualitatively analyzed for apparent themes. Inter-rater reliability was established by parallel independent analysis, comparison of assigned themes, and discrepancies were resolved with discussion between the three investigators.

Results

Baseline characteristics of respondents

A total of 72 out of 353 eligible alumni completed the survey, yielding a response rate of 20.4%. The majority of respondents were 30 years of age or younger (66.7%), White or European (68.1%), and cisgender female (52.8%) (Table 1). Respondents represented 14 different medical specialties, with the most pursuing Internal Medicine with or without a fellowship (18.1%) (Table 1). The demographic information of the CMSRU student population

Table 1 Demographics of Respondents and CMSRU Population

		Our Population (N/%)	CMSRU Population (Overall N/%, Range 2019–2022)
Age (years)	≤ 30	48 (66.7%)	163 (46.3%, 15.6–86.2%)
	> 30	24 (33.3%)	168 (53.7%, 13.8–84.4%)
Respondents in Each Graduating Class	2019	12 (16.7%)	N/A
	2020	18 (25.0%)	
	2021	20 (27.8%)	
	2022	22 (30.6%)	
Race	Black or African American	4 (5.6%)	32 (10.3%, 2.1–20.3%)
	Asian	19 (26.4%)	102 (30.0%, 20.8–43.6%)
	White	49 (68.1%)	162 (49.0%, 42.0–61.8%)
	Other	3 (4.2%)	18 (5.6%, 3.2–9.1%)
	Prefer not to answer	2 (2.8%)	16 (4.9%, 2.6–7.2%)
Gender	Cisgender Female	38 (52.8%)	186 (56.7%, 47.9–63.8%)
	Cisgender Male	30 (41.7%)	143 (42.8%, 36.2–51.1%)
	Transgender / Gender Variant/ Non-conforming	2 (2.8%)	Data not collected
	Prefer not to answer	2 (2.8%)	2 (0.01%, 0–0.01%)
Specialty chosen after graduation	General Surgery	9 (12.5%)	25 (5.2–12.8%)
	Internal Medicine	13 (18.1%)	88 (23.7–29.2%)
	Pediatrics	11 (15.3%)	41 (7.2–18.1%)
	Emergency Medicine	10 (13.9%)	47 (8.2–20.8%)
	Other[a]	26 (37.7%)	141 (26.4–48.5%)

[a] see Appendix 3. for more detailed specialty information

for the classes of 2019–2022 is also presented in Table 1 for comparison.

Respondents' perspective on the WOW program

Overall, subjects had very positive responses about the WOW program (Table 2). Majority agreed or strongly agreed that the WOW program helped them apply medical knowledge (77.8%), influenced their decision regarding which residency/specialty to go into (72.2%), showcased the importance of teamwork in medicine (80.6%), increased their confidence in their networking skills (66.6%), provided a taste of work-life balance in inpatient facilities (73.6%), and provided an example of how teamwork in medicine is necessary for patient safety and effective care (66.6%). Alumni were neutral about the WOW program's influence on their confidence in their medical practice skills (48.6%). Participants were split in that they either felt neutral (40.3%) or agreed/strongly agreed (48.6%) that the WOW program increased their confidence in patient communication skills.

Alumni nearly unanimously agreed that the WOW program was a useful part of their medical school education (93.1%) and that it should be continued for future classes (94.4%) (Fig. 1).

Open-Ended Responses

A total of 28 respondents provided general comments and feedback on the WOW program (38.9%). Themes of these comments were strongly positive (Table 3). Majority of those who chose to respond, mentioned that the WOW program provided good clinical exposure during their preclinical years (58.9%). Other themes noted were influence on specialty decisions (37.5%), increased motivation (32.1%), and providing a break from the lecture setting (21.4%). Several commenters noted that the WOW program was "an invaluable experience" and that the program was "inspiring and exciting." One commenter noted that the WOW program "reminded us why we went into medicine and what we are working towards. [The WOW program] allowed us to re-energize and come back to pre-clinicals with renewed love for medicine." Another alumnus commented that they "remember LOVING them [WOW 1 and WOW2] and feeling like [they were] finally getting to do what [they] came to med school to do. [They] remember telling [their] friends and family all about them, in advance, during, and after. [They] remember feeling valued in the hospital and intensely curious about everything around [them]." 7.1% of commenters remarked that the WOW program was

Table 2 Likert Scale Questions on the WOW Program

Statement	Survey Domain	Strongly Disagree or Disagree (N/%)	Neutral (N/%)	Agree or Strongly Agree (N/%)
The WOW program helped me better apply the medical knowledge acquired during my first and second years of medical school to real-life clinical scenarios	Application of pre-clinical knowledge; personal and professional development	7 (9.8%)	9 (12.5%)	56 (77.8%)
The exposure to different medical specialties provided during the WOW program influenced my decision regarding which residency/specialty program to go into or not to go into	Future career influence; personal and professional development; work-life balance	8 (11.1%)	12 (16.7%)	52 (72.2%)
The WOW program showcased the importance of teamwork in medicine	Teamwork in medicine	4 (5.6%)	10 (13.9%)	58 (80.6%)
Participation in the WOW program increased my confidence in networking with other healthcare professionals, such as possible mentors and attendings	Future career influence; personal and professional development; work-life balance	4 (5.6%)	20 (27.8%)	48 (66.6%)
Participation in the WOW program increased my confidence in my medical practice skills	Application of pre-clinical knowledge; personal and professional development	10 (13.9%)	35 (48.6%)	27 (37.5%)
Participation in the WOW program increased my confidence in my patient communication skills	Personal and professional development; teamwork in medicine	8 (11.1%)	29 (40.3%)	35 (48.6%)
The WOW program provided a taste of the work-life balance experienced in inpatient facilities	Future career influence; personal and professional development; work-life balance	9 (12.5%)	10 (13.9%)	53 (73.6%)
The WOW program provided an example of how teamwork in medicine is imperative for patient safety and effective patient care	Future career influence; personal and professional development; teamwork in medicine	7 (9.8%)	17 (23.6%)	48 (66.6%)

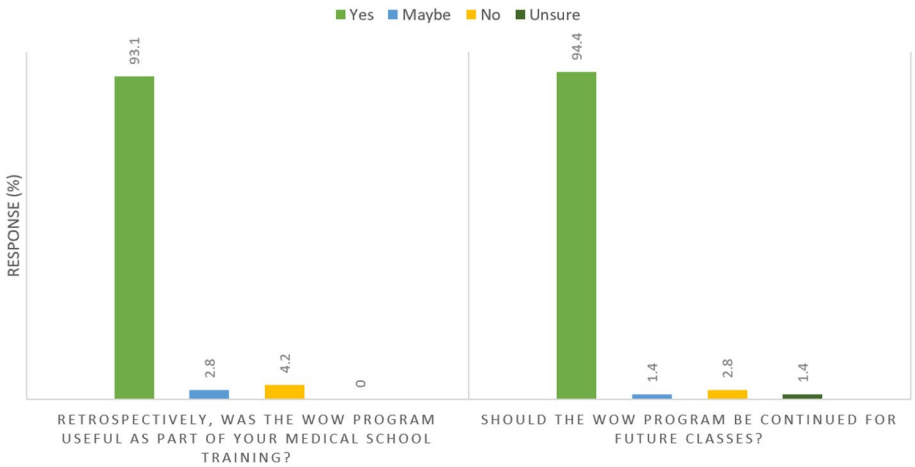

Fig. 1 Participants' Subjective Opinion on the WOW Program

Table 3 Themes of open-ended comments

Theme	Percent of commenters who mentioned this theme in their comments
The WOW program provided good clinical exposure	58.9%
The WOW program influenced their decision on their future specialty	37.5%
The WOW program motivated them to excel during the rest of their preclinical years and their remaining time as a medical student	32.1%
The WOW provided a much-needed break from the preclinical classroom setting	21.4%
The WOW program provided an opportunity for students to contextualize knowledge obtained in their preclinical years	14.3%
The WOW program provided excellent networking opportunities	10.7%
The WOW program was not helpful for clinical skill development	7.1%
The WOW program was not helpful during preclinical years	7.1%
The WOW program increased confidence in clinical settings	5.4%
The WOW program provided clinical experience different from that experienced before medical school	3.6%

not helpful for clinical skills development and was not useful during their preclinical years.

Discussion

The WOW program's enduring impact extends far beyond its initial popularity among graduates, as alumni attest to its invaluable role in enhancing their medical education long after completion. Alumni overwhelmingly support the continuation of the WOW program for future classes, citing its pivotal role in applying preclinical knowledge, fostering teamwork, providing clinical exposure, and motivating academic excellence throughout their medical school journey. These findings underscore the importance of ECE for medical students, demonstrating its sustained benefits up to six years postgraduation, according to our alumni feedback.

In congruence with previous research on ECE, our study indicates that the exposure provided by the WOW program influenced alumni's specialty decision and provided a taste of work-life balance experienced in inpatient facilities [8, 9]. The wide variety of specialties offered during preclinical years in the WOW program is unique among shadowing programs and is and was very appreciated by medical students and alumni. One commenter let us know that the WOW program "introduced [them] to [their] current specialty, which [they] likely would have not considered otherwise… [They are] glad [they] had this experience early in medical school, as otherwise [they] would have not had this rotation until fourth year of medical school." Another alumnus noted that "to this day, [they] talk about this experience on applications and boast about how valuable it was to [their] peers in residency who did not get to experience this when they were in medical school at different institutions." Comments like these illustrate that despite the WOW program's relatively short

duration of two weeks, it strongly impacted the specialty that students chose.

Other studies on shadowing programs during preclinical years have also shown to better prepare medical students for their clinical rotations and aid their decision as to their future career specialty [2, 3, 7, 11, 12]. For example, Penciner hosted a voluntary eight hour emergency medicine observership for first- and second-year medical students. Immediately following completion, 85% of program participants completed the survey and reported that the program was worthwhile and over half indicated that the program changed their perspective and interest in emergency medicine as a field [9]. While their study supported the importance of ECE, the program was voluntary and only assessed participants' attitudes toward emergency medicine at the conclusion of the program. Our WOW program at CMSRU, designed to provide first and second-year medical students with ECE, exposes students to a large variety of clinical specialties and is a required component of the Phase 1 curriculum. In addition, our study focused on long term outcomes of the WOW program to determine if attitudes towards the program after completion actually reflect career choices students made upon graduation. Other studies on ECE typically limited assessment metrics to student confidence levels, interest in particular specialties, and overall satisfaction with the program [13, 14]. Janeway and colleagues developed a questionnaire to examine their service learning project in general surgery for first-year medical students. Their pre- and post-test 28 item questionnaire covered the concepts of participants' perceptions of surgery and educational experience, social determinants of health, participants' reflections on their medical education and the service learning program, and general feedback on the program [15]. While we utilized similar evaluation questions for the WOW program, the programs' unique aspects, including the variety of specialties offered and the early preclinical exposure it provides, necessitated additional evaluation metrics. We wanted to assess the objectives of the WOW program outside of program perceptions, including how the program impacted their confidence in various skills and their understanding of the importance teamwork and patient safety in healthcare.

The validity of our survey was confirmed by the neutrality of responses to survey questions beyond the purpose of the WOW program. Participants did not feel strongly that the WOW program increased their confidence in their clinical practice skills. Given that the WOW program is primarily a shadowing program, it is not surprising that participation in the program did not necessarily allow students adequate time to practice these skills enough to increase their self-reported confidence. However, respondents were split as to whether they felt strongly or neutral that the WOW program increased their confidence in their patient communication skills. These results may be due in part to the various specialties in which students participated. For example, students who shadowed in largely surgical subspecialties may have felt that they had less time to practice their patient communication skills as opposed to students in specialties like Internal Medicine / Primary Care.

Despite the program's overall positive reception, 2.8% of participants provided constructive feedback. They suggested that tailoring the program to accommodate students with a predetermined specialty interest during their preclinical years could enhance the experience. For instance, students who already know their desired specialty might benefit from an alternative experience, such as a research-focused week. While this may be a reasonable option for the small proportion of students it applies to, evidence indicates that many students change their minds about their specialty after exposure to different fields, particularly during their clinical years. By offering exposure to various specialties, the WOW program encourages students to consider specialties they might not have previously contemplated. Research has shown that only about 18–44% of students maintain their initial specialty choice throughout their medical education [16, 17]. The Association of American Medical Colleges (AAMC)'s Report on Residents published that between 48–51% of medical students from 2019–2022 changed their minds about their specialty after exposure to different fields, particularly during their clinical years [18–20]. By offering exposure to various specialties, the WOW program encourages students to consider specialties that were not previously considered. A future consideration could include better ways to identify students that are dead certain of their specialty choice from those who are more likely to change, and provide an alternative more desired experience for them. However, the goals of the WOW program extend beyond influencing specialty choice. They include exposing students to the core fields of medicine that impact public health, introducing them to diverse interprofessional teams, demonstrating effective teamwork, and emphasizing the importance of patient safety and holistic patient-centered care. Program directors are committed to ensuring that all students experience the hospital workflow and interact with various members of the multidisciplinary healthcare team, regardless of their specialty interest. The importance of being a team player is considered as crucial, if not more so, than academic achievements. Studies have shown that not only does interprofessional teamwork improve patient outcomes and leads to more efficient use of resources, but also healthcare workers serving on a team

are more successful and have higher job satisfaction than those who do not [21, 22]. Therefore, healthcare professionals who excel in interprofessional teamwork and communication have higher human capital and may be more valuable to potential employers [23].

A notable strength of our study is the longitudinal assessment of the program's impact, conducted several years after participants completed it, unlike most published studies that evaluate perspectives immediately post-completion [3, 11–14]. While our program's popularity among students was well established from feedback obtained promptly following completion, we sought to assess the long term benefits of our program. Alumni of CMSRU, who were resident or attending physicians at the time of our survey, continued to express strong support for the WOW program, highlighting its essential role in their medical education. By incorporating alumni feedback into quality improvement processes, the WOW program will be optimized to provide a vital and enriching experience during the preclinical years.

We acknowledge that this study has limitations, especially the low response rate. Therefore, our results must be interpreted with caution as it may not be generalizable. However, this response rate is comparable to other educational survey studies evaluating programs and curricula remote from program completion [11]. Most studies evaluating novel programs surveyed their participants immediately at the conclusion of the program, while our survey was sent 3–6 years after completion. We were limited by the only method of contact being email for the alumni, and not all emails were active at the time of survey administration. Another limitation is recall bias as some respondents had participated in the WOW program > 5 years out. Voluntary response bias may have influenced our results. Alumni with strong opinions or feelings about the program are more likely to respond, and we were unable to determine if those with a favorable outlook were more inclined to participate. It was reassuring that the demographics of our participants was similar to the demographics of the classes as a whole. Even though we asked the survey respondents not to consider their Lean Six Sigma training in their replies, there could be still be some confounding effects. Finally, as a shadowing program, student experience could be varied by the healthcare professionals and environment in which they participated.

Conclusion

The novel WOW program continues to be an overwhelmingly useful part of preclinical medical education. The majority of the responses were positive, with only 2.8% expressing caution or negativity. It influenced medical students' decisions on their future specialty and provided invaluable motivation to continue through the rest of their preclinical and clinical years. Alumni of the WOW program up to six years after participation agreed that the program had a positive impact on their medical education and should be continued for future classes.

Abbreviations

CMSRU	Cooper Medical School of Rowan University
WOW	Week On the Wards
ECE	Early clinical exposure
IRB	Institutional Review Board
AAMC	Association of American Medical Colleges

Supplementary Information

The online version contains supplementary material available at https://doi.org/10.1186/s12909-024-06167-7.

Supplementary Material 1.

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Clinical trial number

Not applicable.

Authors' contributions

AR contributed to the development and distribution of the survey, running the focus group, analyzing the survey data, running descriptive analysis of the open ended responses, preparing Fig. 1 and Tables 1, 2 and 3, and writing the manuscript. KE contributed to the development of the survey, running the focus group, analyzing the survey data, running descriptive analysis of the open ended responses, preparing Tables 1, 2 and 3, and writing the manuscript. MK contributed to the development of the survey, guidance and mentorship throughout the project, and writing the manuscript. All authors read and approved the final manuscript.

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Data availability

All data generated or analyzed during this study are included in this manuscript.

Declarations

Ethics approval and consent to participate

The Rowan University Glassboro/CMSRU Institutional Review Board (IRB) deemed this study in the exempt category, #PRO-2022–211.

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

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