



INTRODUCTION

The objective of the Underserved Youth Medical School Outreach (UYMSO) Program is to increase exposure to medicine and increase competency in basic medical principles for students enrolled in middle school and high school in underserved schools in the Denver area. Students completed an informative, educational, and enjoyable day at Rocky Vista University College of Osteopathic Medicine – Colorado (RVUCOM-CO) with carefully scheduled stations where students were exposed to the basics of getting into medical school, CPR, ultrasound, suturing, and human anatomy. All stations were carefully and intentionally designed by former science teachers who have created curriculum for classrooms students in the past. Students completed anonymous pre and post surveys to gauge their understanding of both the road to medical school acceptance and the basics of CPR, ultrasound, suturing and human anatomy.

As investigators, we hypothesize, with careful control of surveys and procedures, that students who complete the UYMSO curriculum at RVUCOM-CO will demonstrate an increased competency in basic science principles, will display increased interest in medicine, and will report an increased confidence in their ability to become physicians.

METHODOLOGY

Student doctors Jessica McArthur and Joseph Nathanson designed the UYMSO program for middle and high school students consisting of four stations. Students enter the building and are fitted for a white coat for the day and given a passport to keep track of their activities. They take white coat pictures and fill out a pre-survey. Next, they engage in four science skills stations, eagerly working to complete their passports. After they finish the four stations, they are taken on a tour of the RVUCOM-CO campus. Last, they take a post-survey and leave with an RVU goodie bag.



Figure 1 Students practicing CPR techniques.



Figure 2 Students learning about the heart in the anatomy lab.



Figure 3 Student practicing suture techniques.



Figure 4 Student practicing ultrasound techniques.

METHODOLOGY CONT.

Stations

CPR

Students are taught the basics of CPR including compression technique, breath compression ratio, and steps to take in order to help someone requiring CPR. They are then given time to practice on CPR dummies with a partner. Figure 1.

Ultrasound

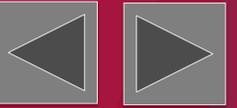
Students are split into small groups and shown different components of the abdomen, chest, and eye. They are taught the basics of ultrasound including different probes to use, coloring of various structures, and techniques on how to explore different parts of the body. Figure 2.

Suture Clinic

A student doctor demonstrates suturing techniques on a banana peel. Students are then paired with a student doctor to practice suturing and knot-tying. Figure 3.

Anatomy Lab

Student doctors lead stations on the heart, brain, lungs, and spinal cord. Students rotate with a small group through different stations, learn the basics of each organ, and are able to touch and hold the organs. Figure 4.



METHODOLOGY CONT.

Surveys

The pre-survey has a series of questions about their exposure to medicine, interest in medicine, as well as questions about the topics they would learn that day. The post-survey asked identical questions to assess the effectiveness in the program in exciting them about medical school as well as teaching them various skills and concepts.

Passport

Each student receives a passport booklet with a list of skills and facts to demonstrate during the four stations. Each item must be signed off by a student doctor. If the student completes all the items by the end of the day, they are put into a raffle for a gift card. The purpose of the passport is to focus on key take-aways from each station and increase overall student engagement.

Tour

Student doctors lead the students around the campus and converse about the journey to medical school. Students are shown the anatomy lab, clinical skills lab, auditoriums, cafeteria, and more. They talk about classes to take in high school and college, as well as the hard work and dedication required to pursue a career in medicine. Further, students are encouraged to ask questions about what it's like to be a medical student during this time.

Goodie Bags

At the end of the program, students were given bags with a framed white coat photo and other RVU memorabilia.

PRELIMINARY RESULTS

Results were statistically significant showing that students demonstrated increased competency in basic science principles, improving from an average of 25% to 82% overall and increased interest and confidence in the pursuit of medicine as a career, increasing over 1.3 points on a 5-point Likert scale.

For science competency, the scores of the pre-survey (M = 1.96 (25%), SD = 1.04, n = 26) were hypothesized to be lower than the scores of the post-survey (M = 6.54 (82%), SD = 1.48, n = 26). This difference was significant, $t(50) = -12.93$, $p = 7.16E-18$ (one-tail). Specifically, shown in Figure 5, are the results are broken down by topic.

Further, shown in Figure 6, the scores of the Confidence in Career in Medicine scale pre-survey (M = 2.93, SD = 1.05, n = 10) were hypothesized to be lower than the scores of the interest and confidence scale post-survey (M = 6.30, SD = 1.95, n = 10). This difference was significant, $t(18) = -6.14$, $p = 4.21E-06$ (one-tail).

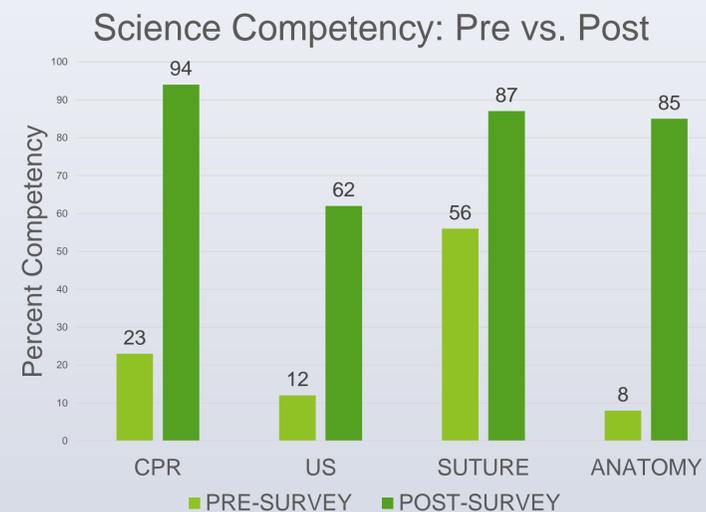


Figure 5 Student survey results on science competency sections on the pre-survey (light green) and post-survey (dark green) in CPR (cardiopulmonary resuscitation), US (ultrasound), suture, and anatomy.

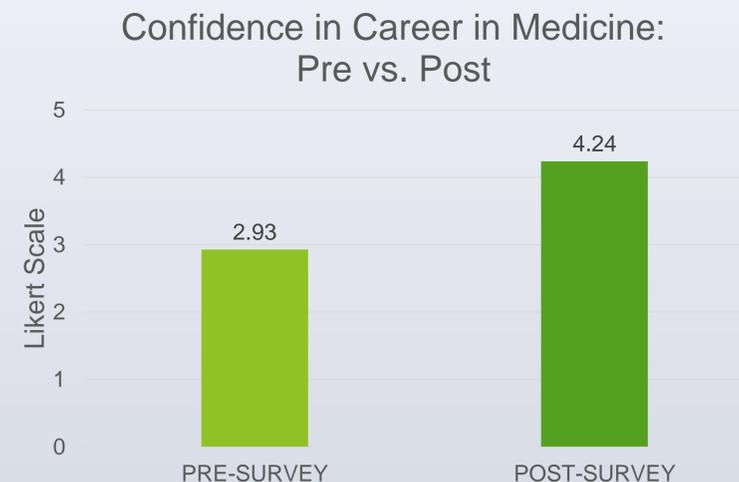


Figure 6 Student survey results on "Confidence in Career in Medicine" sections on the pre-survey (light green) vs. post-survey (dark green).

IMPLICATIONS

Our results suggest that the UYMSO program can have an immediate, positive impact on underserved Denver youth. Exposure to medicine in a strategically planned set of stations showed to increase science competency as well as interest and confidence in a future in medicine. We plan to further develop this program to reach more underserved youth in their critical teenage years in hopes to increase the number of underserved children pursuing a medical career.

FUTURE DIRECTIONS

We currently have over 200 students scheduled to participate in the UYMSO program this year with more schools pending. We are increasing our sample size to further confirm the success of our program in providing a fun, transformative day for underserved youth of the Denver area. We are developing our curriculum into scripted lesson plans and working with OMS I student leaders to keep each station consistent and make the program sustainable for years to come. We also plan to share our ideas with like-minded medical students across the country in order to further spread the impact of this program on our underserved youth.



REFERENCES

Co. Danner, O. K., Et al. (n.d.). Hospital-based, Multidisciplinary, youth mentoring and medical exposure program positively influences and reinforces health care career choice: "The Reach One Each One Program early Experience" [Abstract]. *American Journal of Surgery*, 213(4), 611-616

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Additional Pictures and Videos

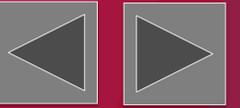


Figure 7 Students learning about heart and lungs.



Figure 9 (left) Interest in medicine.

Figure 10 (right) Overall experience.



Figure 13 Students practicing suture techniques.



Figure 8 Students learning about the brain.



Figure 11 Students practicing suture techniques.



Figure 12 Students get hands on experience with brain.



Figure 14 Students practice using microphones in lecture hall.