



# A Pilot Study of a Student-Led Genetic Counseling Outreach Program for Underrepresented Minority High School Students



GENETIC COUNSELING

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## Introduction

Genetic counselors strive to serve patients of all races and ethnicities. However, the widening gap between the number of genetic counselors from underrepresented minority (URM) groups and the increasing minority populations with whom they work continues to challenge the field (1). Pipeline programs designed to provide educational and career support can be used in the recruitment of URM students, especially in mitigating barriers experienced by prospective students, including lack of awareness and knowledge as well as a late introduction to the field (2). Research has supported that outreach for genetic counseling that begins before or during high school may help to maximize recruitment into the profession (2, 3). Therefore, the aim of this study was to design and implement a student-led outreach model for URM high school students specific to the Kean University Genetic Counseling Graduate Program. The results of this study may be used to inform existing or future outreach and mentorship programs specific to the field of genetic counseling.

## Methods and Materials

### Study Overview



#### Participants

- Participants were students from a high school in a city in which ~50% of the population identifies as an URM
- Participants were enrolled in biology or chemistry courses, and/or part of the school's STEM Pathway program

#### Study Instruments

- Pre- and post-event surveys were developed for this study
- Surveys collected demographic information and gauged changes in awareness and knowledge of and interest in, genetic counseling using a combination of single-answer objective response, multiple select box, Likert-scale, and open-ended response questions
- The educational event entailed giving a 45-minute presentation about genetics and genetic counseling to participants

#### Data Analysis

- Analysis of quantitative data was conducted using Wilcoxon signed-rank and Fisher's Exact tests through SPSS Statistics software version 28.0.1.1.

## Results

Median Analyses Between Pre- and Post-Event Surveys: Total Correct Responses to Knowledge Questions

|   | p value |
|---|---------|
| A. Total Number of Correct Responses to Knowledge Questions | <0.001* |

Median Analyses Between Pre- and Post-Event Surveys: Individual Knowledge Questions

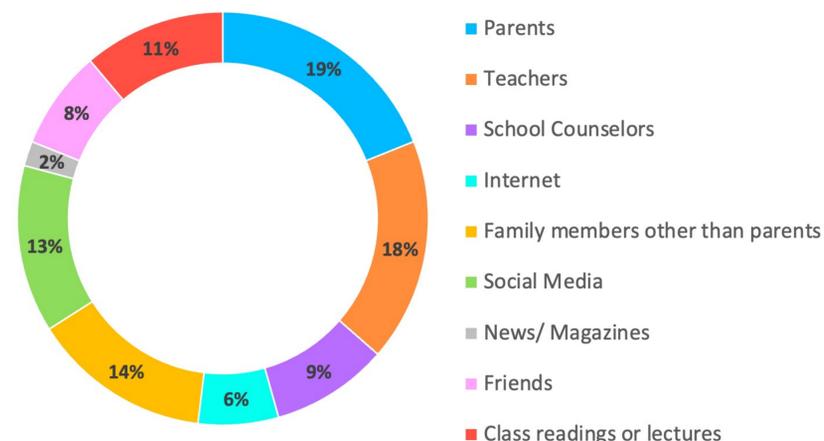
| Question   | Type of Question   | p value |
|--|--------------------|---------|
| Q1. How many total chromosomes do humans typically have?   | General genetics   | 0.050*  |
| Q2. All mutations in a gene are harmful to our health.   | General genetics   | 0.046*  |
| Q4. Genetic counselors are health-related professionals, but are not doctors.                                    | Genetic counseling | 0.004*  |
| Q6. Which of the following is used during a genetic counseling session to look for patterns in a family history? | Genetic counseling | <0.001* |

B.

Median Analyses Between Pre- and Post-Event Surveys: Interest Questions

| Question   | p value |
|--|---------|
| C. S4. I am interested in pursuing genetic counseling as a career. | 0.004*  |

Sources of Career Information Responses



D.

## Highlights

- Majority of participants identified as URM (>70%)
- Respondents reported parents as their main source of information about careers
- 68% of participants had never heard of genetic counseling
- Students that had heard of genetic counseling were informed by teachers and internet sources
- Statistically significant increases in knowledge and interest in genetic counseling (Tables A, B, C) following the intervention

## Conclusions

The majority (>70%) of participants identified as a URM based on race or ethnicity. The demographic characteristics of the sample population is comparable to the demographic characteristics of the larger city in which the research took place. Analysis of demographic and career-related questions revealed that URM students may be selecting or considering careers well before college, potentially even before high school. In addition, parents were selected as the most significant source of career information. Therefore, utilizing parents as important vehicles for outreach to high school students should be considered for outreach efforts going forward.

Prior to the study, most individuals came to awareness about genetic counseling through teachers and internet sources (25%, 22%), suggesting that short term outreach efforts should be directed toward these avenues. Increases in the median values between pre- and post-event survey responses to knowledge and interest-based questions were statistically significant. In particular, these increases were seen in the total amount of correct responses to knowledge questions, 4 out of 8 individual knowledge questions, and 1 out of 4 interest questions (Tables A, B, C). Collectively, the intervention was successful at increasing minority high school students' awareness and knowledge of, and interest in the field of genetic counseling.

The study adds important findings to the body of literature that explores different methods in which to increase racial and ethnic diversity within genetic counseling. Information gleaned from this study may be used to inform outreach efforts going forward for both the field of genetic counseling as well as other health professions.

## References

1. Channaoui et al. (2020). *J Genet Counsel.*, 29(2), 166-181.
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3. Kumaravel et al. (2011). *J Genet Counsel.*, 20(6), 559-571.

## Acknowledgements

I would like to thank Dr. Pyatt and Dr. Hayes for providing guidance and structure in the formation of my thesis.