

Genetic Counseling Training Program Admissions Teams and Racial and Ethnic Diversity:
Surveying the Gatekeepers

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ABSTRACT

Genetic Counseling Training Program Admissions Teams and Racial/Ethnic Diversity: Surveying the Gatekeepers

A thesis presented to the Graduate Program in Genetic Counseling

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A racial and ethnic diversity gap has been observed between the healthcare workforce and the populations it serves. This gap is especially striking within the genetic counseling workforce, with the most recent Professional Status Survey (PSS) demonstrating 95% White membership. Despite years of documented efforts on behalf of the genetic counseling profession to diversify its workforce, the diversity gap has seen very minimal improvement since the inception of the field in 1969. Notably missing from this research are the voices of genetic counseling training programs. The aim of the study was to survey genetic counseling program directors and program admissions teams to gain insight into their views and perceptions of, and efforts to increase diversity in the profession. Eighty-two program admissions team members participated in our survey. We found that most respondents did not think the genetic counseling profession had advanced enough with respect to diversity (97.5%), and that racial and ethnic minorities were not well represented in the profession (95.1%) or the healthcare field at large (64.2%). Financial considerations emerged as the top-rated barrier to diversity as well as one of the most important factors in increasing diversity. An overwhelming majority (84%) agreed that

in order to meet parity in genetic counseling, admissions standards need to be lowered. The majority of respondents (92%) agree that they engage in diversification endeavors and over half (55%) report they perform well in this respect. Respondents rated training programs, NSGC, and genetic counselors as a whole, as bearers of the greatest responsibility for diversifying the workforce. Our findings show considerable support for diversification, though substantial variability in strategies to achieve this. A collaborative approach between stakeholders to implement low cost but high-impact strategies, such as mentorship and educational outreach is recommended.

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INTRODUCTION

Background

National conversations across the United States in the first two decades of the 21st century have been ripe with themes of justice and equity. It has been well documented that in terms of access, uptake, and outcomes, non-White members of our society are less likely to receive preventative healthcare services, often access lower-quality care, are offered more limited care options, and experience worse healthcare outcomes (Hicken et al., 2018; Loggins et al., 2018; Canedo et al., 2018; Beck et al., 2014; CDC – Health Disparities and Inequalities Report, 2013). The relatively nascent field of genetic counseling has not been immune to this phenomenon (Hunt and de Voogd, 2005; Schaa et al., 2015;). In addition, racial and ethnic minorities are less likely to take part in bio-banking and clinical trials pursuant to genomics (Cohn et al., 2017; Ewing et al., 2015; Kim and Milliken, 2019).

The Institute of Medicine report of 2003, *Unequal Treatment*, stated that health and healthcare disparities emerge from stereotypes, prejudice and bias (Smedley et al., 2003). A commonly suggested solution to these disparities is to increase minority representation in the healthcare workforce (Cohen et al., 2003). With the changing demographics in the United States, slated to become an ethnic majority country by 2040, it is likely that genetic counselors (and healthcare providers in general) will render services to individuals with racial or ethnic backgrounds different from their own. Thus, it becomes ever more critical that the genetic counselor be aware of and sensitive to how a person's culture (as well as their identity groups'

historical and lived experience in the medical system) might influence perception of illness and risk, how healthcare choices are made, and how to treat all Americans with the utmost respect to their language spoken, cultural beliefs, and perceptions.

Cultural humility in healthcare is a critical virtue in the provision of patient-centered care, and the assurance of healthcare quality and safety. The notion of cultural humility cannot be taught or learned through academic pathways such as textbooks and lectures alone, but rather, real-world interactions with, and exposure to others of diverse backgrounds to one's own. Moreover, research suggests that provider-patient interactions are more successful and more satisfying for patients when there is racial or ethnic concordance (Saha et al, 1999; LaVeist, and Carroll, 2002; LaVeist and Nuru-Jeter, 2002; Cooper et al., 2003; Chen et al., 2005; Street, et al., 2008; Waibel et al., 2018; Hill et al., 2018; Arendt and Karadas, 2019). This concordance is not only a result of the provider's geographic location, but of patient choice, meaning that minority patients actively seek providers that reflect their own backgrounds (Cooper-Patrick, 1999; LaVeist, and Carroll, 2002). The racial and ethnic concordance phenomenon has also been seen within the realm of genetic counseling (Schaa et al., 2015). It is not to be suggested that non-minority genetic counselors do not or cannot contribute to minority patients or conversely, that minority genetic counselors are conferred cultural humility just by virtue of being from ethnic or racially diverse backgrounds. However, it remains that there is increased patient utilization, satisfaction, and quality of services when there is racial or ethnic concordance between patients and their providers. Furthermore, increasing minority representation in leadership, management and policy-making roles can effect needed change for the future of minorities receiving genetic services in the U.S. healthcare system, as well as expand research initiatives to include, or even prioritize topics relevant to minority Americans.

A brief review of demographic data from the past 20 years within the genetic counseling profession demonstrates that the profession both lacks racial and ethnic diversity, and has failed to make significant strides to remediate, despite focused efforts. The National Society of Genetic Counselors (NSGC) Professional Status Survey (PSS) reported that its membership identified as 93% White in 2000, and 92% in 2018, while analysis of PSS data prior to 2000 fluctuated between 91-94% (Mittman and Downs, 2008). While related health professions also face challenges in representational disparity, genetic counseling ranks last in comparison (Table 1). Interestingly, Social Workers (Black/African American) and Clinical Lab Technicians (Black/African American and Latino) seem to have made some strides in integrating their demographic workforce suggesting that it may be useful to learn from these relative successes.

Table 1: Racial and Ethnic Disparities in Allied Health Professions, U.S.*

	White	Black/African American	Asian American/Pacific Islander	Hispanic/Latino
General Population	60.7%	13.4%	5.8%	18.1%
Physicians/Surgeons	72%	8.2%	18.1%	6.8%
Social Workers	69.5%	23.5%	4%	14%
Physician Assistants	86%	4.7%	7.9%	5.1%
Registered Nurses	76.7%	12.3%	8.7%	6.9%
Occupational Therapists	82.9%	8.7%	6.4%	6.2%
Physical Therapists	78.2%	5.3%	14.7%	5%
Clinical Lab Technicians	71.2%	17.1%	9.4%	11%
Genetic Counselors	92%	1%	8%	2%

Table 1: Race Demographics of General Population and Healthcare Occupations. Sources: United States Census Bureau, Race and Hispanic Origin Report, 2017; United States Department of Labor, Bureau of Labor Statistics, 2017; NSGC Professional Status Survey, 2018 (PSS).

*American Indian/Alaskan Native, historically had near zero representation in the genetic counseling profession and are under 1% of medical providers.

Research exists which attempts to explain why the continuing scarcity of racial and ethnic minority representation in genetic counseling exists despite years of efforts to diversify. These include efforts such as investigating real and perceived barriers, minority awareness and interest in the profession, the genetic counseling pipeline, and recruitment practices (Agrawal et

al., 2005; Kumaravel et al., 2011; Lega et al., 2005; Mittman and Downs, 2008; Oh and Lewis, 2005; Schoonveld et al., 2007; Smith et al., 1993; Wolfe-Schneider et al., 2009). Three broad categories emerge as the major contributors to the genetic counselors' diversity gap: awareness of the profession, financial considerations, and pre-professional education and preparation. As responses to these observations, specific recommendations to improve diversity within the profession have been suggested which span broad educational, research, and institutional recommendations (Kumaravel et al., 2011; Lega et al., 2005; Mittman and Downs, 2008; Oh and Lewis, 2005; Schoonveld et al., 2007; Wolfe-Schneider et al., 2009). For example, Wolfe-Schneider et al. (2009) found that even when controlling for wealth, African American students reported lower standardized test scores and GPA when compared to their White counterparts. Genetic counseling programs use these criteria in their admissions process thus creating a blanket barrier against African American student admissions. The authors recommended that training programs should place less emphasis on these criteria and more emphasis on other admissions criteria such as personal interview, leadership activities, and letters of recommendation. A complete table of recommendations curated from the literature can be found in Appendix B.

Notably missing from this research are the voices of genetic counseling training programs. Given that training programs independently select, train, and graduate the next generation of genetic counselors, it is important to learn about their views on diversity, perceived barriers to increasing diversity, what strategies they find effective, and the degree to which they acknowledge and address issues of diversity within their own programs. As of 2019, there are 49 programs in the United States and Canada, with one more in the pipeline awaiting accreditation (Program Directory, ACGC, 2019). There is little to no research available about the specific

strategies or approaches taken by training programs to increase racial and ethnic diversity within their incoming class cohorts. Furthermore, there is a lack of research that directly reports on this group's perception of diversity, barriers to achieving diversity, and perceived roles and responsibilities. Lastly, with the volume of research making recommendations across many different stakeholders, it is unclear who, if anyone, bears the responsibility for undertaking these proposals.

Study Aims

The purpose of this study was three-fold; 1) to gain insight on genetic counseling admissions teams' views about diversity and their program's values; 2) investigate what strategies and barriers they find important or significant with regards to diversification; 3) to learn how admissions teams contribute to or ameliorate the diversity gap by documenting any and all diversification efforts. By focusing in on current viewpoints of admissions teams on the diversity gap, we strove to improve understanding of the role and perceived responsibility of genetic counseling training programs.

METHODS

Participants

Upon receipt of approval from the Brandeis University Institutional Review Board (IRB Protocol #19049), a letter of invitation was sent to the Association of Genetic Counseling Program Directors (AGCPD) listserv on November 30th, 2018. At the time the survey opened there were 148 subscribers to the listserv. Two reminder emails were distributed, and the survey was open to collection for 8 weeks. The letter invited all members of program admissions teams in the United States and Canada who would be involved in the 2019 admissions cycle to take the survey. Admissions team members involved in one or more of the following roles were eligible to participate: reviewing applications, interviewing, making recommendations for applicant ranking, and finalizing applicant ranking for the National Match (Genetic Counseling Admissions Match, AGCPD, 2019). In addition to completing the survey, the members of this listserv were asked to disseminate the survey link to admissions team members meeting the eligibility criteria.

Instrumentation and Procedure

The survey consisted of questions designed after a careful review of the literature. Included in the review were articles, both research and commentary, from 1987 to 2018 having any discussion about ethnic or racial minority representation specifically in genetic counseling and where relevant, in medical schools. Several themes surfaced that guided the design of the survey, thus dividing the survey into six sections: 1) views about diversity, 2) program values

and identity, 3) perception of barriers to diversification in genetic counseling, 4) perception of their program's efforts to diversify, 5) documentation of tangible diversification efforts, and 6) individual diversification efforts. Questions offered Likert-scale measurement of perceptions and views, rank ordering options, and open response questions.

The section on documentation of tangible diversification efforts was entirely adapted from the literature, drawing upon existing diversification strategies, or specific recommendations made for genetic counseling training programs. Based on the same literature review, six matrices were created for the survey that captured broad categories of diversification recommendations from the literature: 1) Hiring or partnering with a diversity officer or office, 2) dissemination of written materials promoting the career, 3) presenting the career, 4) providing outreach education, 5) targeted minority recruitment, 6) additional recommendations not otherwise categorized. A full table providing examples of how questions were informed by the literature scan can be found in Appendix A. Since less than 50 programs exist and minorities represent a very small fraction of the profession, demographic information was limited to protect participants' anonymity. A copy of the survey is available in Appendix C.

RESULTS

SPSS version 25 was used to conduct the statistical analysis. Descriptive statistics were presented with frequency tables for nominal and ordinal variables. Some variables were recoded into more meaningful groups. For example, length of time in admissions was an open response question, therefore answers were grouped into four categories delineating years of experience in admissions. Bi-variate and multi-variate analyses were conducted including t-tests, chi-square, ANOVA, and regression analyses. A p value ≤ 0.05 was considered statistically significant.

1. Demographics

We received 101 responses to the survey. Only surveys with 50% or more completion were counted in the data analysis, leaving 82 surveys available for analysis. Since it was not feasible to collect information on how many non-AGCPD listserv members received the survey from listserv members, a response rate could not accurately be calculated. The demographic characteristics of the respondents are summarized in Table 2. Respondents were predominantly program directors/co-directors (31.8%), professors/adjunct professors of any rank (22.7%), or assistant program directors (18.2%), and largely did not identify as minorities in the genetic counseling profession (88%). A sizeable fraction of participants had between 0 and 4 years of experience in admissions over their career (48.1%).

Table 2

Respondent Demographics			
Length of Time in Admissions	n	% of sample	Minority Frequency
0-4 years	39	48.1	6
5-9 years	16	19.8	2
10-19 years	14	17.3	1
20+ years	12	14.8	
Program Role			
Program Director/Co-Director	21	31.8	
Associate Director	3	4.5	
Assistant Director	12	18.2	2
Medical Director	2	3	
Professor/Instructor	15	22.7	4
Multiple Roles	5	7.6	1
Other	8	12.1	
Not a Program Member	13	16.3	2
Self-Reported Minority Status			
	n	%	
Yes	9	12	
No	66	88	

2. Views about Diversity

a. Perceptions of Diversity in Genetic Counseling and the Healthcare Field

Nearly all respondents either disagreed or strongly disagreed that genetic counselors were ahead in diversity when compared to other healthcare professions (97.5%). Similarly, nearly all respondents either disagreed or strongly disagreed that racial and ethnic minorities were well represented in the genetic counseling field (96%). When asked if racial and ethnic minorities were well represented in the healthcare field at large, 64.2% of respondents either disagreed or strongly disagreed. However, self-reported minorities (srM's) tended to agree with this question (77.8%), while self-reported non-minorities (srNM's) tended to disagree or strongly disagree (71%); this relationship was statistically significant ($p=0.019$). Additionally, a respondent's length of time in admissions had a significant relationship to whether they agreed or disagreed with this statement ($p=.017$). More than half of respondents

(range: 68.8%-75%) having between 5 years of experience and beyond, disagreed or strongly disagreed. Respondents with 0 to 4 years of experience were divided, with 53.8% disagreeing and 46.2% agreeing, that racial and ethnic minorities are well represented in the healthcare workforce at large (Figure 1).

Figure 1:

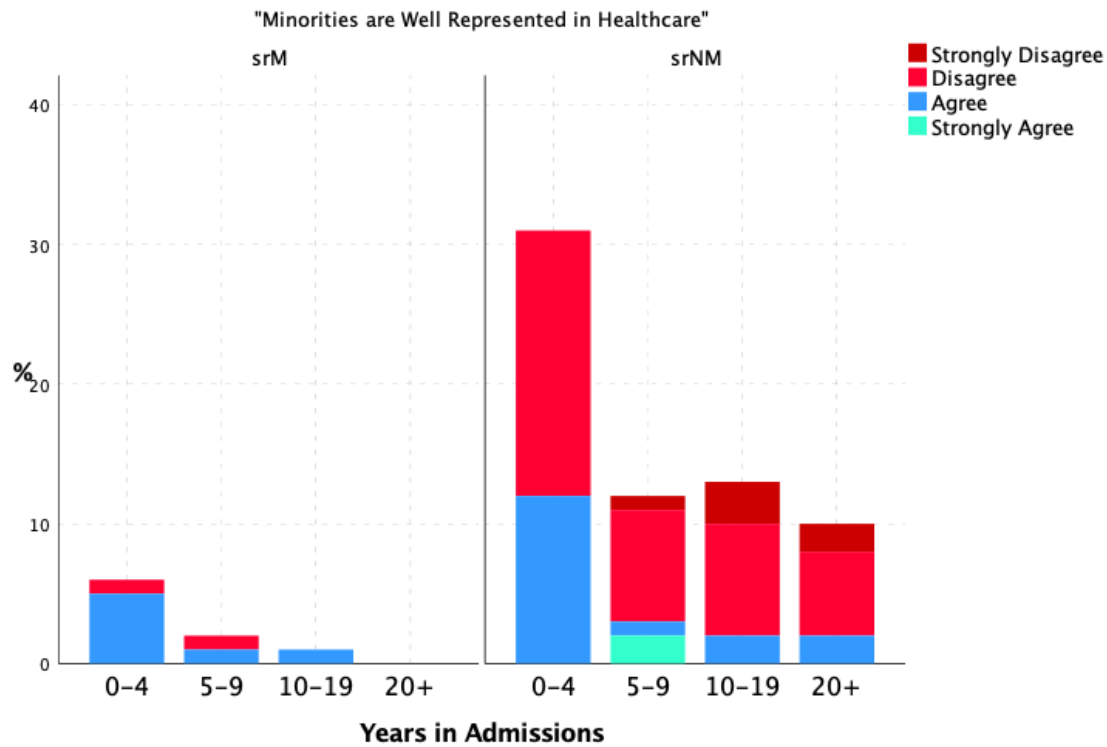


Figure 1: About 64% of all respondents disagreed that minorities are well represented in the healthcare workforce. Self-reported minorities tended to agree with this statement (77.8%) compared to self-reported non-minorities who tended to disagree (71%); this finding was significant ($p=0.019$). Respondents with five years of admissions experience and beyond tended to disagree with this statement, compared to those with 0-4 years' experience, who were more divided on the issue; this finding was significant ($p=0.017$).

Almost 63% of all respondents disagreed or strongly disagreed when asked if racial and ethnic diversity was highly prioritized by the genetic counseling profession at large. However, when asked if genetic counseling organizations such as NSGC highly prioritize racial and ethnic diversity, the respondents were evenly split in

agreeing/strongly agreeing and disagreeing/strongly disagreeing (50% each exactly). There were no significant differences, years of experience nor self-reported minority status, on the extent of agreement or disagreement with this statement.

b. Why Diversity Matters

Respondents tended to agree or strongly agree that diversifying the genetic counseling profession is essential for increasing excellence of the profession (91.4%) and providing better care for patients and their families (92.6%). Respondents tended to disagree or strongly disagree that diversity initiatives were mostly important for issues related to minority health (65.0%) and satisfying politically correct ideals (87.6%). Lastly, 100% of respondents either agreed or strongly agreed that it is important to have a diverse genetic counseling class.

c. Increasing Diversity within the Genetic Counseling Profession

On a scale of increasing importance from 1 to 10, the strategies rated as most important for increasing diversity within genetic counseling training programs were: increasing diversity within the applicant pool (9.14/10), increasing awareness of the profession among racial and ethnic minorities (8.51/10), and providing financial aid, awards, or scholarships for racial and ethnic minorities (8.25/10). Lastly, almost 84% of respondents agreed or strongly agreed that in order to meet parity in recruitment to genetic counseling training programs, admissions standards would need to be lowered. A table of diversification strategy ratings can be found in Table 3.

d. Accountability for Diversification in Genetic Counseling

When asked where the accountability for the diversification of the genetic counseling profession should fall, the stakeholders most often selected were genetic counseling training programs (90.2%), the NSGC(87.8%), and all genetic counselors (82.9%). When diving deeper into the respondents' sense of responsibility, 74% agreed or strongly agreed that since there is a very low attrition rate for students within genetic counseling training programs, program leaders are directly responsible for who becomes the next generation of genetic counselors given their role in the selection process.

3. Program Values and Identity

When asked if a student with unsatisfactory academic performance can still possess the qualities of mind and spirit to become a successful genetic counseling student or genetic counselor, 79.7% agreed or strongly agreed. A respondent's length of time in admissions strongly predicted whether they agreed or disagreed with this statement ($p=.000$); respondents with experience between 0-4 years and 5-9 years tended to agree or strongly agree, and respondents with 10-19 or 20+ years tended to disagree.

When asked what values defined a respondent's program's identity, three items were ranked most important on average: curriculum (8.19/10), academic reputation and competitiveness (7.56/10), and a student's personal and professional development (7.03/10). Diversity and inclusion were given a lower ranking of 5.26 out of 10, and affordability was ranked lowest of all values (4.26/10).

Table 3

Mean Importance for Racial and Ethnic Diversification Strategies	
Strategy	Mean Rating
Increasing diversity in the applicant pool	9.15
Increasing awareness of the profession through site visits, written materials, outreach education, and marketing strategies	8.52
Providing financial aid, awards, or scholarships	8.21
Providing a mentorship network within the STEM pipeline*	7.70
Addressing issues of individual and institutional implicit bias	7.33
Creating a subcommittee within NSGC whose purpose is to oversee development, implementation, and evaluation of diversification efforts	6.92
Generating incentives for programs/institutions to devote more time and resources to diversification efforts	6.39
Increasing the number of genetic counseling programs	5.15
Creating a “chief diversity officer” or a like position within every program whose purpose is to oversee development, implementation, and evaluation of diversification efforts	5.10

Table 3: Survey Question, “Please indicate the extent to which each of the following are important for increasing diversity within genetic counseling training programs.” Mean ratings are out of 10; 10 = extremely important, 1 = not at all important

** This item was part of a different question matrix that read, “Please rate the effectiveness of each of the following minority recruitment strategies for genetic counseling training programs.” Because of word choice issues, this result should not be emphasized as strongly as the other items on this table.*

4. Perception of Barriers to Diversification in Genetic Counseling

a. Perceived Barriers

Three barriers were perceived to function against the adequate representation of racial and ethnic minorities more than others: financial barriers to higher education (7.56/10); lack of minority presence among the faculty (6.68/10); and access to or availability of quality pre-professional education (6.64/10); A full table of mean ratings for barriers is included in Table 4.

b. *Admissions Practices*

The majority of respondents (80.8%) disagreed or strongly disagreed that an application with a GPA or GRE score lower than a certain threshold is discarded without full review. Respondents that agreed they engage in this practice rated the following factors for increasing diversity within training programs as less important than those that disagreed with this statement: providing financial aid, award or scholarships (A = 6.43, SD = 8.96, p=.011); addressing issues of individual and institutional implicit bias (A = 5.88, SD = 8.26, p=.049); increasing awareness of the profession (A = 7.14, SD = 8.96, p=.032).

Table 4

Barriers Functioning Against Diversity within Genetic Counseling	
Barrier	Mean Rating
Tuition/Financial barriers to higher education	7.38
Access to/Availability of quality pre-college education	6.16
Lack of minority presence among the faculty	6.00
Stringent admissions criteria	5.04
Minority recruitment requires special funds	4.29
Minorities may lack knowledge about “preferred” etiquette of application procedures, networking, and career building	3.64
The Match System	2.11
Minorities are typically not academically competitive in the sciences	1.67

Table 4: Question, “To what extent do each of the following barriers function against the adequate representation of minorities within genetic counseling?” Mean ratings are out of 10; 10 = a great deal, 1 = not at all

5. Diversification Efforts

a. *Perception of Respondent’s Program’s Efforts in Diversity*

The majority of respondents (92%) agreed or strongly agreed that their program makes targeted efforts to increase, improve, and maintain racial and ethnic minority representation in their students; 3.8% (n=3) reported that they

were unaware of any efforts in this respect. When asked to rate their program's performance on recruiting racial and ethnic minorities, 55.9% of respondents agreed that their program performed well, 27.3% disagreed, and 16.9% were not aware of how their program performs. There was no significant relationship between how a respondent perceived their program's engagement in diversification efforts or their performance at these efforts, and the tangible documented efforts reported.

b. Documentation of Tangible Program Diversification Efforts

On average, each respondent reported that their program engages in five total diversification efforts (N=74; Mean = 5.07, Std. Dev. = 3.67, Range = 1 to 17). Respondents reported their program engages in at least one effort per matrix (this does not include the "miscellaneous" matrix, which did not have a "none of the above" option). There was not one matrix that statistically differed from the others in selection frequency. Twenty participants (N=49) selected "none of the above" at least once across matrices; seven participants selected "none of the above" across all matrices. A complete table of documented efforts can be found in Table 5.

c. Documentation of Individual Diversification Efforts

Many respondents (70.6%) agreed or strongly agreed that they personally participate in ongoing continuing education classes or workshops relating to issues in diversity. Around half of respondents (51.3%) agreed or strongly agreed that they explore resources available within their institutions to aid in their program's efforts to promote diversity. More than half of respondents (68.5%)

agreed or strongly agreed that they commonly discuss issues related to diversity with their peers, with srNM's more likely to do so ($p=.002$).

Almost 57% of respondents disagreed or strongly disagreed that they remain current on minority recruitment literature, best practices, and national standards. The extent to which a respondent agreed or disagreed with this statement was related to their views on increasing diversity within training programs. Respondents that strongly agreed felt that creating or maintaining a “Diversity Officer” position within the program was more important for increasing diversity (9.33) than those that disagreed (4.31; $p=.005$).

DISCUSSION

In addition to gathering the views and values of training program admissions teams, this investigation sought to describe whether training programs play a role in the diversity gap that exists within the genetic counseling profession and other allied health professions. To create the Diversity Gap index, the Cronbach alpha coefficient was calculated for reliability purposes; that coefficient was large enough to combine selected questions into one index. Multiple regression analysis used length of time in admissions and program role as predictor variables, but no statistically significant relationship was found.

Views on Diversity

Almost all respondents agreed that genetic counselors were not ahead in diversity when compared to other allied health professions and that minorities were not well represented in the healthcare field at large. However, there was more variability when reporting representation in healthcare as a whole. Because of limited documented demographic information, the variability of opinion cannot be explained except in terms of years of experience and minority status. Admissions members that had between 5 and 20+ years of experience tended to disagree that minorities were well represented in healthcare, while those with 0-4 years of experience were more divided on the issue. This may reflect years of experience in the profession and more familiarity with the history of diversity efforts and outcomes in healthcare professions. Additionally, self-reported minorities (srM's) stood out in that they tended to agree that minorities were well represented in healthcare. It could be speculated that since the diversity gap

is particularly striking in genetic counseling, that srM's might overestimate the performance in diversity among allied professions.

Even though the majority of admissions members acknowledged that the genetic counseling field is not sufficiently diverse, this view stands in contrast with the fact that over half of respondents perceived their program to perform well with respect to diversification efforts. Perception of program performance was purposely asked at a general level; therefore, future studies should more scrupulously investigate why program admissions teams self-report satisfactory performance while also holding the view that the workforce is not diverse. The sentiment that genetic counseling is not sufficiently diverse is not novel, as it was described as early as 1993 when Smith et al. acknowledged that while the membership in genetic counseling had representatives from every ethnic group living in the U.S. at that time, the percentage of individuals from each group was far from matching the general population. Subsequent studies have pointed out the persistence of this issue (Lega, et al., 2005; Oh and Lewis, 2005; Schoonveld et al., 2007; Wolfe Schneider et al., 2009 Kumaravel et al., 2011; Mittman and Downs, 2008). For example, Mittman and Downs (2008) conducted a comprehensive review of diversification efforts within the genetic counseling field from 1979 to 2006, which were markedly plentiful. However, if tracking NSGC membership (from the inception of collecting demographic information in 1991-1992), non-White membership fluctuated between 5.8-9.0% during this time period.

The great majority of respondents agreed that diversity was important for professional excellence and better patient care and disagreed that it is only for minority health or to satisfy a politically correct ideal. This illustrates that participants were concerned about diversity for the “right” reasons, namely that workforce diversity improves facets of provider cultural humility,

leading to quality patient care and workplace relationships, and that increased workforce diversity would enable increased access to care (Cohen, 2003; Macdowell et al, 2010; Williams et al, 2011; Saha, et al. 1999), among other benefits. These same benefits from diversity have also been reported in the education setting from K-12 to college-aged levels (Juvonen et al., 2018; Rizvi et al., 2019; Wells et al., 2016).

In so much as 100% of respondents recognize the benefits of a diverse genetic counseling class, diversity was ranked 5th on average as a program value, behind curriculum, academic reputation and competitiveness, and a student's personal and professional development. Programs could consider developing strategies devoted to infusing diversity, equity and inclusion (DEI) factors into multiple aspects of the program's mission, including infusion of DEI into highly valued areas such as curriculum and student development. By doing so, programs stand to increase the visibility of DEI as part of the program's identity, thereby attracting prospective students of diverse backgrounds and identities.

Strategies for and Barriers to Diversity

Three strategies emerged as the most important toward increasing diversity: increasing diversity within the applicant pool, providing financial interventions, and increasing awareness of the profession. Respondents identified financial barriers, access to or availability of quality pre-professional education, and lack of minority presence in training program faculty as the top 3 barriers. These results fall in line with what we see most commonly reported in the literature as both strategies and barriers (Kumaravel et al., 2011; Lega et al., 2005; Mittman and Downs, 2008; Oh and Lewis, 2005; Schoonveld et al., 2007; Wolfe-Schneider et al., 2009).

Throughout the analysis, financial considerations emerged repeatedly in many situations. It was the number one barrier with the highest rating above all others and listed in the top three

strategies important for increasing diversity. However, affordability was ranked last on the list of program values. This is most likely because it is not within the control of programs to set tuition and other fees. This might suggest that providing financial intervention is seen more distally, than say admissions standards, which are proximal factors programs can directly influence. When an issue is seen distally, it might reduce the urgency or pressure to seek solutions since it is perceived to be outside the sphere of control. For example, the emphasis of financial resources with respect to racial and ethnic minority recruitment fortifies a long-held stereotype that minorities tend to be poor, therefore if financial interventions are seen distally, it becomes much easier to stand behind the view that more cannot be done to recruit minorities because it costs money that is not available or attainable.

This same view holds true for the factors composing the ‘pipeline defense,’ i.e., if there are no racial or ethnic minorities in the pipeline, the program can’t admit or hire more minorities (Cross, 1994). While it is true that there are fewer minorities in the genetic counseling pipeline, the issue with the pipeline defense is that it assumes there is only one pipeline. Although Oh and Lewis (2005) delineated a pipeline for genetic counseling, it failed to include other sources from where minorities (and non-minority students, for that matter) could be recruited. For example, instead of relying on the chance discovery of the field, programs could do more to recruit from related fields such as social workers, research nurses, etc. (Lega et al., 2005). Another possibility is to recruit foreign-born or foreign-trained health professionals, that for one reason or another, cannot work in their field in the United States (Mittman and Downs, 2008). The pipeline defense is one more mechanism under which accountability can be delegated away from program admissions teams. As long as financial considerations and pipeline factors are seen as both

barriers and solutions, it is easier to reject the burden of accountability for resolving genetic counseling's diversity problem.

Recommendations made specifically for training programs are abundant in the literature, though very few of them relate to financial interventions (Kumaravel et al., 2011; Wolfe-Schneider et al., 2009; A full list of recommendations curated from the literature can be found in the Appendix B). In a career where finding resources for patients is highly emphasized throughout training and practice, it is worthwhile to consider applying the same skillset to seeking resources and strategies that are high impact but low cost to aid in the endeavor to diversify. For example, one of the top two rated strategies for increasing diversity is increasing awareness of the profession through site visits, written materials, outreach education, and marketing strategies (Table 3). Programs might consider a mandatory project or assignment for genetic counseling graduate students to visit high schools and middle schools in minority-rich areas or create written materials for dissemination at minority-rich colleges, K-12 schools, or local clinics and community centers. Prospective applicants can also increase the visibility of the genetic counseling profession with educational outreach aimed at raising comprehension of basic genetic principles and/or awareness of genomic medicine. Connecting graduate students and alumni with prospective students may improve success and sustainability of outreach efforts. We do not know to what extent educational outreach is valued by admissions teams when reviewing applicants, however this may have multiple benefits to applicants, programs and the profession: 1) educational outreach may be a more attainable experience for applicants in comparison to other relevant experiences such as job shadowing; 2) putting prospective applicants in contact with current students and alumni provides a pathway for the mentorship that survey respondents recognize as a need; 3) increases the visibility of the program and of the profession, particularly

if applicants have interest in connecting with minority-rich areas (with whom they may or may not share a minority identity). This suggestion has a double benefit in that it offers a ‘just’ opportunity to minority applicants while also potentially effecting change in accessibility of genetic education.

Considering the genetic counseling pipeline is somewhat unique, long, and complex (Oh and Lewis, 2005), early awareness is key, supporting the need for awareness strategies to occur not just in minority-rich areas, but to occur at earlier ages. Additionally, providing mentorship is a strategy with high impact and relatively low cost. It costs time resources certainly, but otherwise can be quite inexpensive, and the interactions between mentor and mentee can be invaluable for both parties (Altonji et al., 2019; Hamilton et al., 2019; Ngo and Whipple, 2019; Peretomode and Ikoya, 2019; Shaw, 2005; Whitla et al., 2003). Of note, admissions members with 20+ years of experience statistically differed from those with 5-9 years of experience with regards to mentorship programs, rating them as less effective. The difference in opinion is worthwhile to explore considering that admissions teams may consist of members with varying degrees of experience. Generational differences have been observed in genetic counseling (Reiser et al., 2019), therefore it could be that those with less experience may find it challenging to introduce new strategies, with new ideas potentially being met with resistance by more seasoned colleagues, or that admissions members with more longevity feel that this has been tried and hasn’t “moved the dial.”

Table 5: Documentation of Diversity Efforts Extracted from Relevant Literature to Genetic Counseling Training Programs and the Frequency of Program Engagement

Recommendation and Sources		Freq. N=82	
EDUCATIONAL (Kumaravel et al., 2011; Lega et al., 2005; Mittman and Downs, 2008; Schoonveld et al., 2007; Smith et al., 1993; Wolfe-Schneider et al., 2009)	Dissemination of Written Materials	Minority-rich* elementary schools	2
		Minority-rich middle schools	3
		Minority-rich high schools	16
		Minority-rich colleges and universities	34
		None of the above	25
	Presenting the Career	Minority-rich career fairs	29
		Minority-rich graduate school fairs	26
		Minority-rich elementary schools	3
		Minority-rich middle schools	8
		Minority-rich high schools	23
	Outreach Education**	None of the above	20
		Life science teachers	27
		Psychology/Social science instructors	7
		Guidance/Career counselors	13
		Local clinics/Private practices	2
INSTITUTIONAL (Kumaravel et al., 2011; Lega et al., 2005; Mittman and Downs, 2008; Oh and Lewis, 2005; Smith et al., 1993; Wolfe-Schneider et al., 2009)	Diversity-related position or partnership	None	27
		Employs a C.D.O./M.A.O.	5
		Partners with a C.D.O./M.A.O.	36
		Partners with recruiters	14
	Targeted Minority Recruitment	None of the above	27
		Institutional marketing efforts	29
		Webinars/Open houses	18
		Enrichment/Summer programs	13
		Web presence/Social media	7
	Other	None of the above	19
Minority fund or scholarship		19	
	Reserved program slot for minorities	4	
	RESEARCH		
(Mittman and Downs, 2008; Schoonveld et al., 2007)	Self-Evaluation	Conducts periodic needs assessment	21
NO EFFORTS MADE	N = 49	Selected in 1 matrix	20
		Selected 2 matrices	9
		Selected in 3 matrices	7
		Selected in 4 matrices	6
		Selected in all matrices	7

This table was directly adapted from recommendations made directly to genetic counseling training programs, program leaders, and admissions teams from the literature (Kumaravel et al., 2011; Lega et al., 2005; Mittman and Downs, 2008; Oh and Lewis, 2005; Schoonveld et al., 2007; Smith et al., 1993; Wolfe-Schneider et al., 2009).

*Respondents were instructed that whenever the word “minority” was seen, to consider racial and ethnic minorities only.

** All items in this category contained additional language such as “at minority-rich institutions” or “with access to high volumes of minority patients”

C.D.O. = Chief Diversity Officer

M.A.O. = Multicultural Affairs Officer

A vast majority of respondents felt that in order to meet parity in recruitment, lowering admissions standards was necessary. Data on admissions standards were not collected and therefore it is not possible to name which standards should change, such as academic aptitude, volunteer and shadowing experience, personal statement, or other factors. Potential reasons for this view include unintentional reinforcement of stereotypes related to sub-par academic merits within ethnic and racial minorities, or overt recognition of the structural barriers that persist education, or lack of opportunity for pre-professional development. The reception of this question might also be partly explained by the fact that 79.7% of respondents were in agreement that qualities other than academic performance were important when regarding an individual's potential to succeed in genetic counseling. This finding suggests that there is recognition that the current admissions standards are more readily attainable by individuals in the majority and that taking a more holistic and possibly flexible view of an applicant's merits for admission might lead to more diversity within training programs. However, it should not be lost that another interpretation is the underlying stereotype that minorities (either as a whole or within certain subgroups) are unable to meet rigorous admissions criteria. Finally, we should also recognize that the definition of racial and ethnic minorities is subjective and dependent on context.

Accountability

Throughout the literature devoted to diversity within genetics, there are calls for action to various stakeholders in confronting the diversity gap (Kumaravel et al., 2011; Lega et al., 2005; Mittman and Downs, 2008; Oh and Lewis, 2005; Schoonveld et al., 2007; Smith et al., 1993; Wolfe-Schneider et al., 2009). Despite the spotlight on multiple stakeholders, there has yet to be a unified endeavor to ameliorate the disparity. No one stakeholder, or collaboration of stakeholders, has taken on the expressed goal to exclusively focus on diversity issues in the

genetic counseling profession. Which leaves unanswered the question of ‘who is responsible’ to undertake this duty. As early as 1993, Smith et al. stated, “A joint effort between the NSGC and genetic counseling training program directors could be made to advance the recruitment of minorities.” Nearly 26 years later, we see the exact same sentiment illustrated by this survey. The onus to increase diversity in the genetic counseling field must take the shape of a collaborative effort more so than having the responsibility assigned to one group, and it seems that the opinion on who those collaborators should be hasn’t changed in over two decades. The fact that diversity and workforce enhancement go hand-in-hand emphasizes the role of the NSGC. The NSGC has recently included diversity and inclusion as part of the 2019-2021 Strategic Plan and has initiated the formation of a Diversity and Inclusion (D&I) Taskforce. With NSGC serving as the profession’s voice and potential rallying point, other entities such as the AGCPD and the Accreditation Council for Genetic Counseling may further the cause by emphasizing D&I in admissions and recruitment (in the case of AGCPD), as well as curriculum (AGCPD and ACGC).

Training programs’ role in this effort is further supported by the finding that 75% of participants agree that programs are directly responsible for graduating the next generation of genetic counselors. Although it is apparent that training programs are the only body that can train and graduate genetic counselors, this survey suggests that program directors and their associates don’t feel the burden is entirely on their shoulders. Those that accepted the training programs’ accountability strongly supported the creation of a “Chief Diversity Officer” position, as well as generating incentives for programs and institutions to devote more time and resources to the issue and maintaining a mentorship program. These individuals seem to recognize that although they hold power, they rely on the support of others, such as the institution that hosts their

program or the NSGC. In other words, the data suggests that respondents may view themselves as the leaders on this issue, but that they cannot do it alone.

Documentation of Efforts

The overwhelming majority of respondents felt that their programs were involved in some sort of diversification effort, and slightly more than half felt that they performed well in this respect. This survey was limited in investigating views and efforts specific to racial and ethnic minorities. Programs that felt they did well in terms of diversity may have been including other facets of diversity in their assessment such as sexual orientation, disability status, sex, etc. As mentioned earlier, there was no relationship between a respondents' perception of their program's efforts and the actual amount of efforts reported.

The fact that each respondent's program engaged in at least 5 efforts is promising, but this study did not gauge the longevity, frequency, or success of these initiatives. The consistent demographic homogeneity within programs and the profession suggest that these reported efforts may not be working or that the efforts are new and have not yet made a measurable impact by the PSS. Future studies should take a deeper dive into evaluating these strategies and their outcomes. Performing a periodic needs assessment with regards to diversity was selected 21 times by survey participants. Future studies should request access to these data to more accurately assess program success and progress across the profession while gaining a deeper understanding of the challenges, some of which may be unique to each program. Additionally, in order to more completely assess success of diversity initiatives, a professional discussion should define what success looks like. When is adequate diversity achieved and how is this measured?

Limitations and Future Directions

The study was limited in sample size which restricted our ability to draw out statistically significant differences within the trends that we noted. The exact response rate cannot be calculated given our sampling method as AGCPD listserv members were asked to extend the invitation to admissions team members meeting eligibility criteria who were not part of the listserv membership and we did not track how often the survey was forwarded. Additionally, in order to protect anonymity, particularly for self-reported minority participants, respondents were not asked to disclose their program affiliation and therefore we do not know how many programs were represented in this survey, nor how many participants came from the same program. Open responses indicated that at least a few participants were affiliated with Canadian programs. These same participants expressed concern that some the questions on this survey were not applicable to them. Some expressed concern that Canada does not have the same diversity issues as these United States. Future studies should discern between countries to further explore this issue.

Future studies are needed to take a closer look at current admissions practices and views of such practices to better understand whether certain standards constitute an unattainable challenge for prospective minority applicants. Our survey suggests that most programs have implemented multiple efforts to increase racial and ethnic diversity, however little is known about the outcomes of these strategies. We also encourage dissemination of high-impact, low-cost recruitment strategies either through peer review publication or regional and national conferences. Finally, this study was limited to examining views on ethnic and racial diversity

from the point of view of admissions teams and could be expanded in the future to better understand applicant experiences.

Conclusions

The genetic counseling community recognizes the importance of diversity, but the absence of any widespread, organized diversification initiative and presence of many individual, isolated, inchoate diversification strategies illustrates the need for a collaborative entity (or creation of one) to claim responsibility of this professional goal and dedicate the necessary time, bodies, and resources toward creating a sustainable and excellent diversification endeavor. Although program leadership is in a unique position to effect great influence on the demographics of the profession, it is unreasonable to presume that they should assume the entire burden for diversification. It would be equally unreasonable to presume that this group bears no role in the static demographic identity of the profession; there is still a significant degree of responsibility and power that programs and program leaders possess to catalyze change in the diversification of the field, in a sense, putting them in a position to own their role as “gatekeepers” to the genetic counseling profession.

As genetic counseling training programs evaluate the evolving needs of the profession into the 21st century and emerging training issues, they must consider the substantial lack of parity of the profession with the populations it professes to serve. Our findings suggest a considerable awareness of this need though an over-emphasis on high-cost, distal factors such as lack of scholarships, shifts the focus away from higher-impact, proximal factors such as mentorship and educational outreach, which call upon human resources (time) but are considerably lower in cost. Lack of diversity stands to greatly compromise access to and quality of care, potentially widening health disparities in genomic medicine. It will also jeopardize the

professions' ability to attain its stated goals such as ensuring that “the maximum population benefits from advances in precision medicine (Riconda et al., 2018),” while fostering the ability to effectively communicate about genetic services while exhibiting empathy and providing emotional support. Lastly, unless diversification of the genetic counseling profession is made a priority, the profession will remain one of least inclusive allied health professions.

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APPENDIX A

Survey Concepts and Support from the Literature

Observation	Literature	Research Question	Section
Perceptions spanned full spectrum from 'Lack of diversity' to 'Ahead in diversity'	Oh and Lewis, 2005; Schoonveld, et al., 2007; Mittman and Downs, 2008; Warren, 2011	Do genetic counselors believe lack of diversity is a relevant professional issue?	1 – Views about Diversity
Various stakeholders (training programs, NSGC, etc.) were identified to drive diversity efforts	Smith et al., 1993; Lega et al., 2005; Schoonveld, et al., 2007; Mittman and Downs, 2008; Wolfe-Schneider et al., 2009; Kumaravel, 2011	Who is ultimately responsible for the diversification of the genetic counseling profession?	
Research showed that Medical schools' self-reported excellence in diversification efforts was contradicted by data proving otherwise	Agrawal et al., 2005	At a general level, will programs agree that they make an effort to recruit minorities? Do they perceive success in these efforts?	2 – Program's own Diversity Perceptions
Diversification strategies found in practice within medical schools or academic health centers Recommendations for diversification strategies are made for genetic counseling training programs	Smith et al., 1993; Agrawal et al., 2005; Schoonveld et al., 2007; Mittman and Downs, 2008; Wolfe-Schneider et al., 2009; Kumaravel, 2011;	In which of these diversification efforts do training programs engage?	3 – Documentation of Diversification Efforts
At a micro level, some individuals reported taking personal steps to address diversity issues, such as exploring resources available within their institutions to aid in efforts to promote diversity	Mittman and Downs, 2008; Kumaravel, 2011	Do individual members of training programs address diversity or personally do something about it?	4 – Individual Efforts
Barriers described in the literature to explain lower minority representation (e.g., academic performance, financial barriers)	McGaghie, 1990; Smith et al., 1993; Agrawal et al., 2005; Lega et al., 2005; Schoonveld et al., 2007; Mittman and Downs, 2008; Wolfe-Schneider et al., 2009; Kumaravel, 2011;	What do training programs perceive to be the largest barriers?	5 – Barriers
A qualitative exploration of medical schools, found that admissions practices were discrepant from purported program values A review of genetic counseling training program websites express the desire for well-rounded, diverse applicants	McGaghie, 1990 The primary author systematically reviewed 46 genetic counseling training program websites in November 2018 for indicators of program values	Which values do programs feel they are defined by? What do programs value in an applicant/interviewee?	6 – Program Values

APPENDIX B

Recommendations Curated from the Literature

Agrawal, J. R., et al. (2005). Progress and pitfalls in underrepresented minority recruitment: Perspectives from the medical schools. *Journal of the National Medical Association*, 97(9), 1226–1231.

- Focus on faculty diversity
- Place less emphasis on standardized scores such as GPA and GRE as admissions criteria

Kumaravel, S. N., et al. (2011). "Enriching the Genetic Counseling Recruitment Pipeline: A National Cross-Sectional Study of Public High School Counselors." *Journal of Genetic Counseling* 20(6): 559-571.

- Have a booth at a school career day fair
- Present at a professional conference
- Utilize the following resources: information packets, brochures, guest lecturers, Internet resources
- Target school counselors in minority-rich areas and provide them with resources
- NSGC should create an open-access part of their website including information about scholarships, why diversity is important to the field, and contact information for GCs with interest in diversity issues
- Use of social media to target minority high school students

Legu, M., et al. (2005). "Who Are the Next Generation of Genetic Counselors? A Survey of Students." *Journal of Genetic Counseling* 14(5): 395-407.

- Recruit at the high school level
- Graduate programs should foster a learning environment that is sensitive to the needs of minorities
- Collaborations with high schools and colleges to incorporate the genetic counseling profession into a lecture or course
- Programs should target school guidance counselors
- Programs should enter partnerships with employers to create a flexible part-time curriculum for employees in allied health professions

Mittman, I. S. and K. Downs (2008). "Diversity in Genetic Counseling: Past, Present and Future." *Journal of Genetic Counseling* 17(4): 301-313.

- NSGC should have a dedicated web page targeted at high school and middle school students
- Recruitment materials should be targeted at minorities with factors important to minorities
- Programs must foster an inclusive and equitable learning environment
- Appoint a chief diversity officer
- A uniform data collection plan should be implemented that tracks trends in applications, enrollment, attrition, performance, career trajectory, etc.
- Freshman and Sophomore biology university students should be targeted and mentored to apply to genetic counseling programs
- Target foreign-trained health professionals
- Programs should remain current regarding minority recruitment literature, best practices and national standards.
- Minority students should be paired with diverse faculty from within the field or a related field who share their interests
- Programs should conduct a periodic needs assessment campaign to identify new and persistent barriers to accessing the profession and devise solutions to address them
- Creation of an interactive web environment promoting a career in genetic counseling
- Practicing genetic counselors should be involved in local career fairs
- Target minority students from universities and colleges

Oh, T. and L. J. Lewis (2005). "Consideration of Genetic Counseling as a Career: Implications for Diversifying the Genetic Counseling Field." *Journal of Genetic Counseling* 14(1): 71-81.

- Target high schools and middle schools, especially those that are minority-rich
- Recruit from psychology and other related majors in universities

Schoonveld, K. C., et al. (2007). "What Is It Like to Be in the Minority? Ethnic and Gender Diversity in the Genetic Counseling Profession." *Journal of Genetic Counseling* 16(1): 53-69.

- Focus on recruitment at the high school level
- Programs should strive to provide mentors or create communities where minority GC students can interact
- Target individuals in allied health professions seeking a career change
- Target school guidance counselors or academic advisors, especially those at minority-rich institutions
- Program leadership should be engaged in on-going multiculturalism training
- Programs should have a method of self-evaluation, done with the assistance of the ABGC
- Create written materials promoting the profession and the role of minorities in genetic counseling

Smith, S. C., et al. (1993). "Minority recruitment into the genetic counseling profession." *Journal of Genetic Counseling* 2(3): 171-181.

- A joint effort between the NSGC and genetic counseling training program directors could be made to advance the recruitment of minorities
- Introduce students to practicing minority genetic counselors who can then serve as mentors and guides
- Find ways to make financial assistance information available at the best time for potential applicants
- Participate in lectures, seminars, career day fairs at local colleges and high schools
- Genetic Counseling Training Programs should find out how to be included in The Annual Guide to Graduate Studies (also known as Peterson's Guide)
- Genetic counselors could serve as assistant university minority recruitment officers and advisors
- Use SAT demographics for the purpose of recruitment
- Establish minority student summer internships with genetic counselors
- Recruit students from non-biological majors
- Stimulate interest in students in junior or senior high school or by their first 2 years of undergraduate training

Wolfe Schneider, K., et al. (2009). "A Cross Sectional Study Exploring Factors Impacting Recruitment of African American College Students into the Genetic Counseling Profession." *Journal of Genetic Counseling* 18(5): 494-506.

- Use multiple targeted marketing strategies
- National Society of Genetic Counselors (NSGC) [should] create a separate career and resource section on their website to target prospective students at the college and high school levels
- Participate in job and career fairs
- Genetic counseling training programs may need to place less emphasis on test scores and GPA and a greater emphasis on other admissions criteria, such as the personal interview, letters of recommendation, and/or leadership activities
- Providing financial assistance to attend graduate school, such as scholarships, paid internships, and/or tuition remission
- Financial barriers could be addressed by identifying sources of institutional and private funding
- Recruitment information should emphasize current salary, and information about the ability of genetic counselors to spend time with family
- Online recruitment strategies may be effective for reaching underrepresented student groups
- Focusing efforts on advancement opportunities within the profession i.e., the development of a doctoral degree
- Integrating information regarding the career of genetic counseling into the curriculum of college courses

APPENDIX C
Survey Instrument

Genetic Counseling Admissions Teams and Diversity

Whenever the word “DIVERSITY” is used, please assume ethnic or racial diversity.

Whenever the word “MINORITY” is used, please assume an individual belonging to an ethnic or racial minority.

This survey is not measuring other factors in diversity such as gender, disability, sexual orientation, etc.

Q1 Are you, or were you ever, involved in (select all the apply):

- Reviewing applications for potential genetic counseling interviewees
- Deciding which genetic counseling applicants to offer an interview to
- Interviewing genetic counseling applicants
- Providing input when ranking/offering a slot to a genetic counseling applicant
- Directly ranking applicants/offering a slot to a genetic counseling applicant
- None of the above

Q2 How long have you been involved in admissions over the course of your career in general? Please answer in months or years (ex: 3 years, 18 months).

Q3 Are you currently a member of a genetic counseling training program's faculty?

Yes → Skip Logic 3Ya

No → Skip Logic 3Na

Q3Ya What is your position within the program?

Q3Na What is your current position?

- Program Director/Co-Director
- Associate Director
- Assistant Program Director
- Medical Director
- Professor/Adjunct Professor (Any rank)
- Other, please describe
- Prefer not to answer

Q4 Do you identify as a minority in the field of genetic counseling?

- Yes
- No
- Prefer not to answer
- I am not in the genetic counseling field

Q4a Please use this space if you would like to expand on your answer to the previous question.

Q5 How many members make up your program's leadership team (i.e., Program director/Co-director, assistant program director, medical director, etc.)? Please answer numerically.

Q6 How many individuals are involved in the admissions process (i.e., reviewing applications, selecting applicants for interview, interviewing applicants, providing input when ranking/offering a slot to a student, or directly ranking students/offering a slot to a student)? Please answer numerically.

Q7 Please indicate the degree to which you agree or disagree with the following statements:
(Strongly Disagree, Disagree, Agree, Strongly Agree)

- a) Compared to other healthcare professions (physicians, nurses, lab techs, psychologists, etc.), genetic counselors are ahead in diversity
- b) Racial and ethnic minorities are well-represented in the genetic counseling profession
- c) Racial and ethnic minorities are well-represented in the healthcare workforce
- d) Racial and ethnic diversity is highly prioritized in the genetic counseling profession

Q8 Please indicate the degree to which you agree or disagree with the following statements:
(Strongly Disagree, Disagree, Agree, Strongly Agree)

- a) Increasing diversity in genetic counseling is mostly important for issues related to minority health
- b) Diversifying the genetic counseling profession is essential in increasing excellence in the profession
- c) Diversifying the genetic counseling profession is essential to provide better care to patients and families
- d) Diversity initiatives for genetic counseling are mainly organized to satisfy a politically correct ideal
- e) Genetic counseling organizations, such as NSGC, highly prioritize ethnic and racial diversity in genetic counseling

Q9 Please indicate the degree to which you agree or disagree with the following statement:
(Strongly Disagree, Disagree, Agree, Strongly Agree)

Since there is a very low attrition rate for genetic counseling training programs, program leaders are directly responsible for who becomes the next generation of practicing genetic counselors.

Q10 Please indicate which of the following **should be responsible** for diversifying the genetic counseling profession. Select all that apply.

- NSGC
- ABGC
- Genetic Counseling Training Programs
- Colleges/Universities and public/private K-12 Schools
- Regional Genetic Counseling Organization(s)
- Genetic Counseling Students
- All Genetic Counselors
- Other, please specify

Q11 Please indicate the extent to which each of the following are important for increasing diversity within genetic counseling training programs. (0-10; 0 = Not at all important, 10 = Extremely important)

- a) Increasing diversity in the applicant pool
- b) Increasing the number of genetic counseling training programs
- c) Providing financial aid, awards, or scholarships for minority students
- d) Addressing issues of individual and institutional implicit bias
- e) Increasing awareness of the profession among minorities through site visits, brochures or written materials, outreach education, and marketing strategies
- f) Generating incentives for programs/institutions to devote more time and resources to diversification efforts
- g) Creating/Fostering a "Chief Diversity Officer" or "Multicultural Affairs Officer" position within every program, whose purpose is to oversee development, implementation, and evaluation of all diversity efforts
- h) Creating/Fostering a subcommittee within NSGC whose purpose is to oversee development, implementation, and evaluation of all diversity efforts
- i) Other, please be specific

Q12 Please rate the effectiveness of each of the following minority recruitment strategies for genetic counseling training programs. (0-10; 0 = Not at all effective, 10 = Extremely extremely effective)

- a) Site visits to colleges and universities
- b) Providing financial aid, awards, or scholarships for minority students
- c) Early targeting efforts to middle schools and elementary schools
- d) Providing a mentorship network for minority students in the STEM pipeline
- e) Partnerships with community organizations, education or labor state departments
- f) Dissemination of educational written materials or brochures describing the profession
- g) Providing outreach education to school/college instructors and career/guidance counselors to promote the profession in their institutions
- h) Other, please be very specific

Q13 Please indicate the degree to which you agree or disagree with the following statement:
(Strongly Disagree, Disagree, Agree, Strongly Agree)

Our program makes targeted efforts to increase, improve, and maintain minority representation in our students

Q14 Please indicate the degree to which you agree or disagree with the following statement:
(Strongly Disagree, Disagree, Agree, Strongly Agree)

Our program performs well with respect to recruiting minority students.

Q15 Please select all of the following that are true about your program.

- Our program has a diversity officer/Multicultural affairs officer
- Our institution has a diversity officer/Multicultural affairs officer that we work with
- Our program partners with diversity recruiters
- We do not have or work with a diversity officer/Multicultural affairs officer
- Other, please describe in detail

Q16 Our program disseminates brochures, mails pamphlets, or provides some form of written information about the genetic counseling career to:

- Minority-rich High schools
- Minority-rich Middle schools
- Minority-rich Elementary schools
- Minority-rich Colleges/Universities
- Our program does not disseminate career information in any format to any entity with a high minority presence
- Other, please describe in detail

Q17 Please select all of the following that are true about your program.

Our program presents the genetic counseling career at:

- Minority-rich Career fairs
- Minority-rich Graduate school fairs
- Minority-rich High Schools
- Minority-rich Middle Schools
- Minority-rich Elementary Schools
- Other, please describe in detail
- Our program does not present the career to any entity with a high minority presence

Q18 Please select all of the following that are true about your program.

Our program provides outreach education about the genetic counseling career to:

- Biology/Life science instructors at minority-rich institutions
- Psychology/Social science instructors at minority-rich institutions
- Guidance/Career counselors at minority-rich institutions
- Local pediatric or family clinics with high volumes of minority patients
- Local private practices with high volumes of minority patients
- Other, please describe in detail
- Our program does not provide outreach education to any entity with a high minority presence, or to individuals/entities with increased access to minorities

Q19 Please select all of the following that are true about your program.

- Our program participates in institutional marketing efforts to attract minority students
- Our program hosts webinars or open houses targeted at attracting minorities
- Our program hosts enrichment programs/summer programs targeted at attracting minorities
- Our program hosts a website or participates in a web presence, such as social media, specifically targeted at attracting minorities
- Our program has some other recruitment effort targeted at minorities. Please describe in detail.
- Our program does not participate in targeted minority recruitment efforts

Q20 Please select all of the following that are true about your program.

- Our program has a special fund or scholarship for minority students
- Our program reserves spots for minority students
- Our program conducts a periodic needs assessment that identifies new and persistent barriers to minority representation in our program

Q21 Please indicate the degree to which you agree or disagree with the following statements:
(Strongly Disagree, Disagree, Agree, Strongly Agree)

- a) I remain current on minority recruitment literature, best practices, and national standards
- b) I commonly discuss issues related to diversity with my peers
- c) I explore resources available within our institution to aid in our efforts to promote diversity
- d) I participate in ongoing continuing education classes or workshops relating to issues in diversity

Q22 Please use this space to include any additional diversification strategies or efforts made by you or on behalf of your program that has not been previously mentioned.

Q23 Please indicate the degree to which you agree or disagree with the following statement:
(Strongly Disagree, Disagree, Agree, Strongly Agree)

If an application has a GPA/GRE lower than a certain threshold, I do not continue to review it under any circumstances

Q24 To what extent do each of the following barriers function against the adequate representation of minorities in genetic counseling? (0-10; 0 = Not at all, 10 – A great deal)

- a) Access/Availability to quality pre-college education
- b) Tuition/Financial barriers to higher education
- c) The Match system
- d) Stringent admissions criteria
- e) Lack of minority presence among the faculty
- f) Minority recruitment requires special funds
- g) Minorities are typically not academically competitive in the sciences
- h) Minorities may lack knowledge about the “preferred” etiquette of application procedures, networking and career building

Q25 Please indicate the degree to which you agree or disagree with the following statement:
(Strongly Disagree, Disagree, Agree, Strongly Agree)

A student with unsatisfactory academic performance can possess the qualities of mind and spirit to become a successful genetic counseling student/genetic counselor

Q26 Please indicate the degree to which you agree or disagree with the following statement:
(Strongly Disagree, Disagree, Agree, Strongly Agree)

It is important to have a diverse genetic counseling class.

Q27 When thinking of what defines your program, please rank the following from most important to least important to your program's identity (Please click and drag your selections. 10 = most important, 1 = least important)

- a) Curriculum
- b) Academic Reputation/Competitiveness
- c) Nurturing/Welcoming Environment
- d) Affordability
- e) Diversity and Inclusion
- f) Emphasis on advocacy/disability/patient or family experience
- g) A student's personal and professional development
- h) Affiliations with prestigious medical/research institutions
- i) Research and Dissemination
- j) Other, please be specific

Q28 Please indicate the degree to which you agree or disagree with the following statement:
(Strongly Disagree, Disagree, Agree, Strongly Agree)

In order to meet parity in recruitment to genetic counseling graduate programs, we will need lower admissions standards.

Q29 Please use the following space to expand on any of your answers or if you would like to make any comments.