

Running Head: BIOMEDICAL CAREERS PROGRAM

IN THEIR OWN VOICE: A QUALITATIVE STUDY OF THE
BIOMEDICAL CAREERS PROGRAM AND ITS IMPACT ON UNDERREPRESENTED
STUDENTS IN THE HEALTH PROFESSIONS

By

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ABSTRACT OF THE DISSERTATION

**IN THEIR OWN VOICE: A QUALITATIVE STUDY OF THE
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By

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There is a long history of efforts to improve the number of underrepresented students in higher education, including those in the various health profession fields. In particular, given the changing demographics in the United States, there has been an increase in the number of initiatives to provide access, scholarships, and funding to underrepresented students in high school and college pipeline programs leading to health care careers. This qualitative study focuses on the Biomedical Careers Program (BCP), an intervention created to help increase access of minority student populations into the health professions at the Rutgers Robert Wood Johnson Medical School (RWJMS). It examines student perspectives in the form of interview data, to determine how BCP effects the preparation of underrepresented students for medical school. The purpose of this study is to provide participants of BCP with a voice and utilize those real stories to inform existing and future programs with similar goals. Evidence demonstrated four main findings on how BCP prepares underrepresented students for medical professions via the transmission of cultural and social capital: 1) informal mentorship and guidance, 2) social learning through clinical exposure, 3) academic study, and 4) social interaction. This study also reveals implications for practice, not only for other institutions and professionals who work with pipeline programs, but also recommendations for improvement within BCP.

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DEDICATION

I dedicate my dissertation to all of the students who are in the pursuit of an education, especially those aspiring to enter medical school or another health profession as well as those who are the first in their family to go to college. Our society needs a set of diverse, caring and professional health care practitioners. Although the journey is not easy, never give up on your dreams!

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CHAPTER I

INTRODUCTION

Description of Problem

“Since the civil rights movement and other initiatives of the 1960s, efforts have been made to increase access to and opportunities in higher education for less advantaged youths and other groups, such as women and members of ethnic minorities” (Baker & Velez, 1996, p.82). There is a long history of efforts to improve the number of underrepresented students in higher education. This is particularly important in the health professions for several reasons. First, is the changing population of the United States. Lowe & Pechura (2004) provide evidence that the U.S. is experiencing significant demographic transformation, especially considering the fact that minorities compose the fast-growing sector of the total population. Even more pressing is the prediction on the future growth of this country:

By 2010, Hispanics, African Americans, Native Americans and Asian Pacific Americans will make up 32 percent of the population, and 48 percent of the population by 2050. Health professionals need to have the cultural competence to address the health needs of diverse populations and to improve the quality of care for minority populations. The lack of providers in disadvantaged minority communities continues to be a critical impediment to health care access. (Lowe & Pechura, p. 13, 2004)

Second, it is clear that the percentage of underrepresented minorities in the health field is not comparable to the percentage of minorities in the entire United States (Lowe & Pechura, 2004). In addition, the representation of minorities in the various health professions has remained minimal over time (Lowe & Pechura, 2004). Another reason for the emphasis on improving the number of underrepresented students within the health professional schools is the evidence that physicians of underrepresented groups are much more likely to practice in areas that serve a larger portion of minority populations (Lowe & Pechura, 2004). “Studies on sociocultural barriers to health care services show that members of minorities are more likely to seek services

from, and follow the medical advice of, minority providers. This is particularly true in the case of non-English speaking patients” (Lowe & Pechura, 2004, p. 1). Finally, goals of improving the health care of the overall population are tied to the overall recruitment and retention of underrepresented physicians (Butler, 2011). Thus, programs such as the Biomedical Careers Program (BCP) are responsive to real and growing need in the health care system and American society at large.

There is much debate about how to define an underrepresented minority. For the specific purpose of this study, the most relevant definition is taken from the Association of American Medical Colleges (AAMC), which was founded in 1876 as a non-profit organization, and currently represents all of the accredited U.S. and Canadian medical schools as well as a majority of teaching health systems, medical centers, and academic societies, and known as a leader within the academic medicine community (“About the AAMC,” n.d.). The AAMC originally defined underrepresented minorities (URM) in medicine as belonging to one of the following four groups: African Americans, Mexican Americans, mainland Puerto Ricans, and Native Americans (“Underrepresented in Medicine Definition,” n. d). However, in 2004, the AAMC formed a committee to review its original URM definition due to the Supreme Court decision in *Grutter v. Bollinger, et al.*, which ruled that schools could use race to support the recruitment of a diverse student population (“Enriching Medicine Through Diversity,” n.d.). Ultimately, the AAMC decided that it was best to expand its URM definition from a fixed collection of groups into a broader continuum based on the changing demographics of our society. Therefore, the current definition of URM that the AAMC utilizes is, “those racial and ethnic populations that are underrepresented in the medical profession related to their numbers in the general population” (“Underrepresented in Medicine Definition,” n.d.).

With the growing need for a larger number of minorities within the health field, there have been a number of initiatives to increase access, including an increase in funding to provide students access to programs, scholarships, and high school and college pipeline programs. Additionally, a greater number of medical schools have established initiatives to increase the number of underrepresented students admitted into medical school. “Any effort to correct the deficiency of students admitted and, ultimately the number, who will become practicing physicians, will have an impact on improving healthcare delivery to minority patients” (Butler, 2011, pg. 543). These efforts go back as far as the 1970s, including an initial effort made by the AAMC to increase the representation of Black medical students from 5% to 12% (Butler, 2011). Studies show that even with an increase in the acceptance rates to medical schools, matriculation rates have remained bleak (Butler, 2011). The AAMC and the American Medical Student Association (AMSA) are two of the many national organizations that have remained dedicated to the goal of increasing the number of underrepresented minorities in medical education; however, funding is necessary to continue with initiatives aimed at accomplishing this goal. In a time where federal funding has been cut significantly for pipeline programs, the federal government, medical schools, and several involved agencies have scrutinized the initiatives currently utilized to increase access to underrepresented students within the different health programs. However, there are very few evaluation studies of these pipeline programs to demonstrate their impact on the participants or provide information on how the components of the programs function.

Thus, this research will focus on a qualitative study of the Biomedical Careers Program (BCP), an intervention created to help increase access of the minority student population into the health professions at the Rutgers Robert Wood Johnson Medical School (RWJMS). Qualitative evaluations “typically describe and assess what was intended (goals and objectives), what

happened that was unintended, what was actually implemented, and what outcomes and results were achieved” (Patton, 2008, p.5). Additionally, an evaluation can provide insight into the worth or value of a particular program, policy, or practice (Patton, 2008). By conducting a qualitative study of the BCP, I hope to describe the program from a student perspective as well as identify information that can be utilized by the stakeholders to improve the BCP initiative that RWJMS has had in place for over thirty years and provide guidance for similar existing and planned initiatives.

Biomedical Careers Program

One pipeline program initiated in 1979 to help recruit and retain talented college students of underrepresented backgrounds into the medical profession is the Biomedical Careers Program (BCP) at UMDNJ-Robert Wood Johnson Medical School, now Rutgers Robert Wood Johnson Medical School. The program, which specifically targets undergraduates who are economically and/or educationally disadvantaged, was initiated as a Health Careers Opportunity Program (HCOP) and still remains in operation today despite several cuts of funding. From 1979 to 2011, the BCP was funded through a combination of HCOP (a federal grant), NJ EOF, and private foundations grants; however, the federal funding was lost in 2011. Therefore, after 2011, the medical school decided to assume financial responsibility for the continuation of the program as part of its effort to increase the diversity of medical students (Ford, 2014).

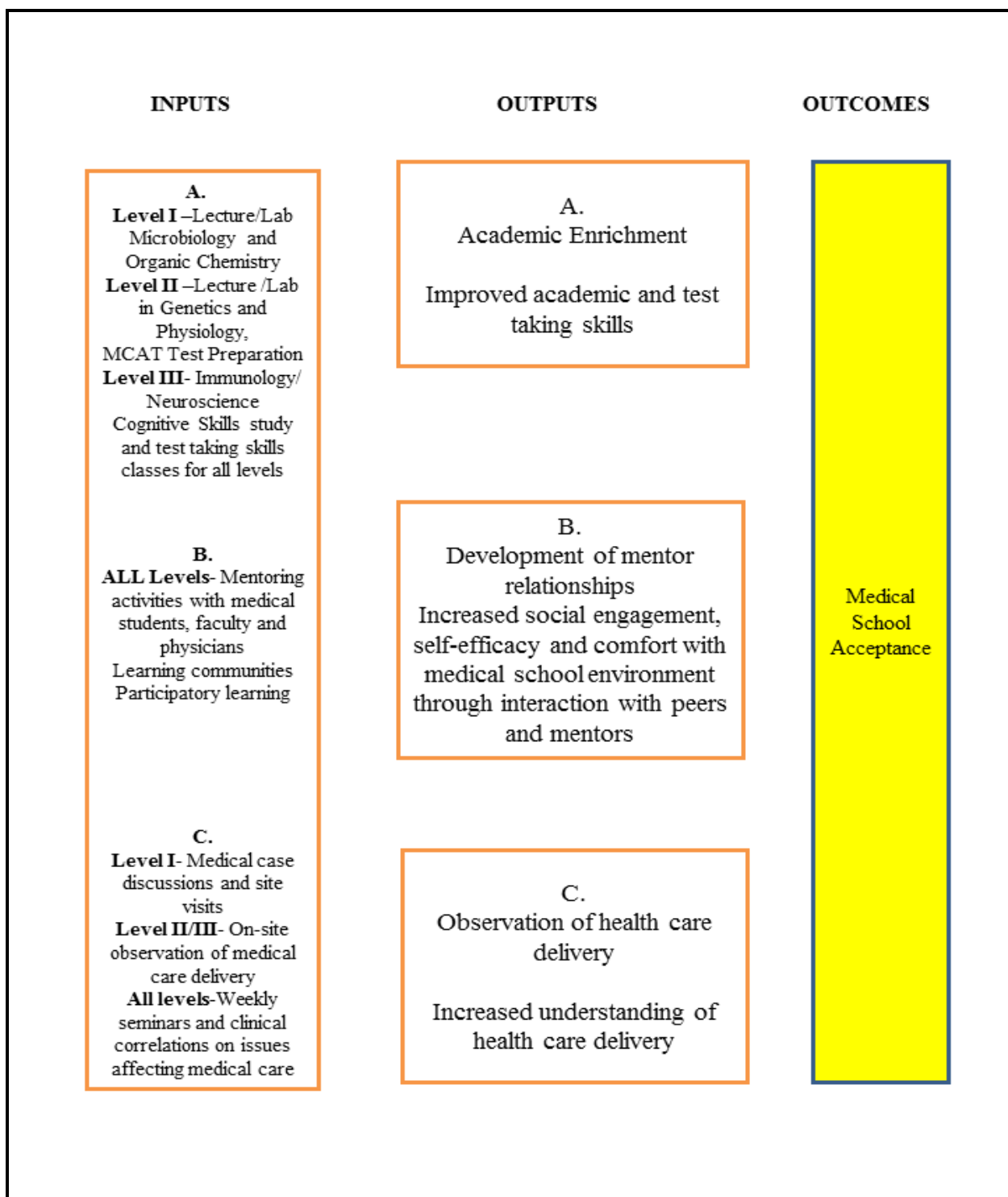
Although initially beginning as a small program servicing a handful of motivated and bright, underrepresented students in their preparation for entry into medical school, it has expanded considerably over the past 35 years. Additionally, the program has expanded to include preparation for admission into various health professions aside from medicine, although medical school is still at the forefront of its intended goals (Ford, 2014). Since its inception,

1,323 students have participated in the program; of which, 453 are physicians and 79 are currently in medical school (Ford, 2014). The BCP, which is administered out of the Office of Special Academic Programs at the medical school, continues to serve as a key component of the minority recruitment effort undertaken by the medical school.

BCP is a six-week academic enrichment program that takes place during the summer, where undergraduates ranging from sophomores to seniors, are selected to undergo a series of science enrichment and health-oriented activities. Students have the ability to apply to participate in the program for 1, 2, or 3 summers since the program has three levels (see below “Program Logic Model” for more information), allowing them the opportunity to build their skills progressively throughout their undergraduate experience. While the program has expanded its services over the years, it has also undergone some other revisions over the last thirty-five years of operation. For example, up until 2006, the program consisted of 8 weeks and admitted up to 75 students; however since 2007, the student capacity was lowered to 50 and the program was shortened to 6 weeks (Ford, 2014). Another example of a revision involves the type of shadowing opportunities that have been available to students in the program. Luckily, the program’s administrative staff has done an excellent job in keeping data on the program over the last thirty-five years to document the changes that have taken place. More information regarding the program, including its logic model and design, will be shared below.

Program logic model. To better understand the Biomedical Careers Program, a logic model of the program’s process and outcomes has been included below in Figure 1 (Ford, 2014). A logic model is the depiction of a program theory by laying out “the expected sequence of steps going from program services to client outcomes” (Rossi, Lipsey, & Freeman, 2004, p. 94). The logic model below displays the inputs, outputs, and outcome for the BCP program.

Figure 1. The BCP Logic Model. (Ford, 2014).



The inputs are comprised of the following in a six week period: science courses, MCAT preparation, cognitive skills study and test taking classes, mentoring, clinical experience, and seminars. These inputs differ based on the level of the program that a student is enrolled in; there are three levels, each offering different areas of focus for the student based on where they are academically. The outputs of the program consist of three areas: academic enrichment and skill development, social engagement, and observation of and increased understanding of the health care delivery system. The intended outcome of the BCP is very simple: preparation and acceptance into medical school. The rationale of the BCP is that through participation in key academic and social components, students who have experienced disparities in their preparation for medical school can utilize this enrichment to supplement their undergraduate education so that they may apply and be accepted into medical school in the future (Ford, 2014). Ultimately, the goal of the program is to increase the number of underrepresented students gaining admission into medical school by preparing students in the three areas described above.

Admission process for BCP. The program website and staff offered information on the admission process for BCP. In order to be considered for admission into BCP, a student must apply to the program, typically between January and March of that cycle. The process includes completing an application, which requests information on the applicant's demographic and educational background. To verify a student's educational history, the student must submit a transcript from every undergraduate institution attended. In the event a student has less than one year of college when applying, a high school transcript must be submitted. In addition to an application and transcripts, a student must also submit an essay and two letters of recommendation (Ford, 2014). See Appendix A for a complete listing of the admission guidelines from the previous 2014 application cycle (Ford, 2014).

In order to be considered for admission, students must meet the eligibility criteria, which have evolved over the last thirty-five years since the program's inception. The BCP admission committee has utilized the AAMC definition of underrepresented racial and ethnic groups to determine BCP eligibility. As previously mentioned, up until 2000, the AAMC defined underrepresented minorities (URM) in medicine as belonging to one of the following four groups: African Americans, Mexican Americans, mainland Puerto Ricans, and Native Americans ("Underrepresented in Medicine Definition," n.d.). This definition also included "families having incomes at or below the poverty level as set by the USDA" (Ford, 2014). However, the AAMC's definition of underrepresented groups changed in the 2000s, permitting for each medical school to determine which groups were considered underrepresented in their respective region. Most important was the shift from utilizing race as an eligibility criterion to focusing on one's educational or economic background to determine need (Ford, 2014). Thus, in determining the appropriate eligibility for a program based in New Jersey, the admission committee set the following criteria for BCP: "students who resided in Abbott or disadvantaged schools districts as determined by the NJ Department of Education or were eligible for support from the NJ Educational Opportunity Fund Program (EOF) are eligible" (Ford, 2014). See Appendix B for EOF eligibility requirements, provided by the program director Cindy Ford (2014).

In addition to considering income and school districts, the admission committee also considers each applicant's academic preparation prior to starting the program. A student's academic coursework prior to starting the program is considered since the program has three levels, each level designed to meet different needs based on where students are in their undergraduate career. The prerequisite courses, which are often associated with the typical

number of years of college attendance, that best meet the level necessary for a student to be successful in each level of the program are listed below in Figure 2, separated by level of the program. The respective prerequisite courses need to be completed to be eligible for a particular level of the program.

Figure 2. The BCP Admission Prerequisite Chart. (Ford, 2014).

Program Level	College Years Completed	College level courses completed
Level 1	1 year	1 semester- Biology or Chemistry 1 semester- college math or statistics
Level 2	2 years	2 semesters Biology lecture and lab /or microbiology lecture and lab 1 semester Organic Chemistry, preparing to take graduate admissions tests
Level 3	3 years	Genetics, Physics, preparing or have taken graduate admission tests

There is an admission committee that considers all applicants to determine who will be offered a place in the program each year. After ensuring that it is complete and that the student is eligible, each application is reviewed independently by two members of the committee. Reviewers complete a reviewer rating sheet to provide their feedback based on an applicant's academic qualifications and the probability that the program can best assist the student. Please see Appendix C for example of a reviewer rating sheet (Ford, 2014). Once all of the rating sheets are submitted, a committee meeting is held to discuss the applicants. For applicants where the two reviewers were unanimous in their decision, the committee accepts the recommendation. For applicants where there is not a unanimous decision, discussion takes place and the entire committee makes a final decision. The final step in this process is the notification of the

committee's decision to applicants and a request for each applicant to confirm whether they will attend the summer program or not. Since not every student accepts the spot in the program, there is the ability for an applicant to be offered admission from the program's waitlist (Ford, 2014).

Research Question

BCP, like most other pipeline programs, has never been formally studied. The purpose of this research study is to obtain information, in the form of student perspectives, to assess and evaluate the BCP's ability to effect the preparation of underrepresented students for medical school. With the growing number of students wanting to pursue medical school and the lack of underrepresented physicians in the field, it is important to research preparation programs designed to increase the number of underrepresented students entering medical school. While there is anecdotal evidence that BCP is a successful program, there have not been any attempts to formally evaluate it aside from an evaluation questionnaire that participants complete at the end of each program. Additionally, while the staff may feel that this program is successful in impacting underrepresented students interested in attending medical school, there is little evidence from the student perspective to confirm or deny this claim. That is, there has been no systematic evaluation of the relationship of the logic model of the program; the relationships, if any, between inputs and outputs. More importantly, there has not been an in-depth examination of how the program actually effects underrepresented students' preparation for medical school. This study will fill this gap in the literature by examining the BCP program in light of the research question: How does BCP (consisting of academic skill development, social engagement, and health care awareness) effect underrepresented students' preparation for medical school?

The results of this research study will inform stakeholders including the administrators within the Office of Special Academic Programs and Rutgers, grant funders, pre-health advisors,

and higher education institutions. They will gain valuable information on the processes and outcomes of BCP from the student perspective, primary users of the program's services.

Additionally, a goal of this research is to inform the literature since there is a lack of information readily available to those interested in assisting underrepresented students and their preparation for medical school through an official achievement program.

CHAPTER II

REVIEW OF LITERATURE

Currently, there is no literature available on the BCP program aside from descriptive information regarding the program, including eligibility criteria, application process, and relevant program details which can be found on numerous websites that promote this enrichment program. However, there is literature on enrichment pipeline programs for students interested in medical school. These programs vary in regards to areas of preparation, goals, partner schools, and student population, including pre-college and college level. Consequently, there have been several studies and even literature reviews completed on both pre-college and college level enrichment programs. Many studies have reported a positive association with the number of underrepresented students entering a medical school who have participated in an enrichment pipeline program or evidence of programs having some impact in diversifying the health professions (Carline, Patterson, & Davis, 1998; Strayhorn & Demby, 1999; Winkleby, Ned, Ahn, Koehler & Kennedy, 2009).

While there is significant literature available on this topic, the review of the existing literature has demonstrated a lack of qualitative evaluations; most studies have been quantitative and outcome driven, focused on the percentage of students graduating and moving on to health related professions (Cantor, Bergeisen, & Baker, 1998; Cairline et. al., 1998; Strayhorn & Demby, 1999; Tekian & Hruska, 2010; Winkleby et. al., 2009). In 2009, the United States Health and Human Services department completed a critical review of the literature pertaining to pipeline programs designed to improve racial and ethnic diversity in the health professions and found that there is a lack of studies that have assessed the specific ingredients of the individual pipeline program itself (U.S. Health and Human Services, 2009). A thorough review of the

literature published from 1966 to 1996, which consisted of approximately 20 enrichment programs specifically for underrepresented undergraduate students, found that evaluation results were difficult to interpret due to the lack of control groups and that there was a lack of evidence of which program components were actually effective (Carline et al., 1998). Therefore, this proposed study would address the lack of qualitative evaluations of college level enrichment programs with a focus on medical school preparation for underrepresented students that currently exist in the literature. It would also add to the literature by adding information about specific program components and the impact that each has from the student perspective.

Additionally, while reviewing the body of literature on enrichment programs targeted to connect college students to medical school, my research narrowed its focus on studies specifically related to underrepresented students and medical school preparation programs. Therefore, I have further filtered the available information into three main areas as they relate to the core of the BCP logic model: academic achievement, social engagement, and awareness of health care issues. Each of these main areas of literature will be further explored below. The last section in this chapter will discuss cultural and social capital as it relates to the program's logic model.

Academic skills development and preparation for medical school

Academic skills development is one of the components most commonly found while researching different programs aimed at increasing the number of underrepresented minorities entering the health professions. Much attention has been placed on the fact that inequalities within the education system in the United States exist and have significant impact on the trajectory of students looking to enter math as well as science intensive fields ("Improving diversity in the health professions," 2010). When identifying areas for funding or opportunities

to assist with increasing the number of underrepresented students entering the health professions, academic preparation is persistently one of the main themes. The Sullivan Commission, established in 2003 to make policy recommendations to address the lack of diversity within the health field, specifically recommended students be provided with academic enrichment opportunities in the sciences both within and outside of the classroom (W.K. Kellogg Foundation, 2004).

Therefore, due to the different, and often inequitable, levels of preparation among undergraduate students, pipeline enrichment programs consistently include an academic component as the foundation for what students experience in preparation for entering the medical field. The definition of academic preparation varies from program to program, which tend to focus on different aspects of preparing students academically such as learning study skills, preparation for the Medical College Admission Test (MCAT), and actual courses that include Physiology and Chemistry. Therefore, it is not a surprise that there was significant literature found on programs with a focus on academic preparation and achievement (Alexander, Chen, & Grumbach, 2009; Barlow & Villarejo, 2004; Carline et al., 1998; Ovink & Veazey, 2011; Shields, 1994; Thomson, Denk, Camacho, & Thompson, 1996; U.S. Health and Human Services, 2009). Carline et al. (1998) completed an extensive literature review on enrichment programs for undergraduate students projected to increase the representation of minorities in medicine and identified twenty such programs, acknowledging that there was probably at least two thirds of programs missing from this review. Out of the twenty programs identified, eighteen had an academic enrichment component, further illustrating the fact that academic enrichment is a substantial component of these types of programs.

A significant portion of the research on enrichment programs that has focused on academic preparation consisted of quantitative studies, where results were very much outcome driven (Alexander et al., 2009; Barlow & Villarejo, 2004; Winkelby et al., 2009). The focus of some of those studies was to assess the overall outcome of the program itself. Therefore, some studies compared the number of students participating in these programs, being accepted into medical school or another health related program, and ultimately matriculating versus nonparticipants (Cantor et al., 1998; Lewis, 1996; Pisano & Epps, 1983). Other studies have focused on answering questions, such as whether program participants have a better chance of persisting in the prerequisite courses needed for medical school (Barlow & Villarejo, 2004) or whether participants attained their career choice later in life (Philips, Mahan, & Perry, 1981).

Overall, most studies show positive outcomes supporting the need for continuation of these programs. Barlow & Villarejo (2004) determined that program participants in their study had a greater chance of persisting in the basic level math and science courses versus a comparison group. Carline et al. (1998) concluded that the medical school matriculation rate was high for those involved with the various enrichment programs. Another study demonstrated that program participants had higher GPAs and acceptance rates than non-participants (Pisano & Epps, 1983). Nevertheless, these quantitative studies results are often difficult to interpret since control groups are not used (Carline et al., 1998). Additionally, few studies measure the immediate effects of the programs' efforts (Carline et al., 1998). Subsequently, most programs have difficulty demonstrating that the program itself is responsible for the increase in admission of underrepresented minorities to medical schools (Carline et al., 1998).

Aside from the focus on quantitative data to demonstrate the effectiveness of programs and specifically the effect of the academic component of the program, there has been some

research completed that offers additional perspective on this topic. Ovink & Veazey (2011) utilized a case study approach to evaluate a summer program and found that more is needed than just academic support for underrepresented students. Therefore, programs should aim to provide more substance to their program in addition to the academic preparation, illustrating support for the BCP's logic model of a three-component program. Furthermore, there is a persistent call for more research to determine what programs actually do for successfully underrepresented students (Cantor et al., 1998; Carline et al., 1998; Ovink & Veazey, 2011; Shields, 1994). Shields (1994) calls for "further, more complete investigations into documents describing academic support available to premedical students at all educational levels" (p. 377) and that those investigations include qualitative analyses.

Social engagement and preparation for medical school

The second area of focus within the review of literature was on social engagement and preparation for medical school. Once again, the Sullivan Commission has played a significant role in addressing the lack of diversity in the health professions and has called on colleges and universities to support socio-economically disadvantaged students with an interest in health by providing an array of services, including mentorship and career counseling (W.K. Kellogg Foundation, 2004). For the BCP program, the social engagement component of the program refers to mentorship, including establishing relationships with faculty, physicians, and peer to peer. It also refers to the career counseling, preparation for the application process, and becoming acclimated to the medical school environment. However, the definition of social engagement differs from program to program, with most programs focusing on a specific element of social engagement. For example, out of the twenty enrichment programs that Carline

et al. (1998) identified within their literature review, only thirteen had an admission preparation component and only four had a mentoring component.

Mentorship, especially for underrepresented students, is a critical component within a pipeline program, as has been confirmed by several publications (Barlow & Villarejo, 2004; Carline et al., 1998; Kreuter, Griffith, Thompson, Brownson, McClure, Scharff, Clark, & Haire-Joshu, 2011; Lowe & Pechura, 2004). Kreuter et al. (2011) argue that successful strategies for those seeking to increase workforce diversity in the health professions include building a community of minority students and providing a diverse set of mentors. The W.K. Kellogg Foundation's Sullivan Report (2004) established that "a 1995 evaluation of the Minority Medical Faculty Development Program confirmed that the mentoring component was of exceptional importance" (p. 6). The U.S. Health and Human Services (2009) found that college research mentorship positively impacted the retention of particular subgroups of underrepresented minority students. However, there is a lack of literature on how the mentorship is set up or how the students feel in regards to the mentoring that takes place.

A second element of the social engagement component of the BCP program is admission preparation, which involves career counseling and a seminar series that focuses on skill building, financial planning, and preparation for the application process to the various health profession schools. There was even less information available on this aspect of a pipeline program. Aside from mentioning that a program provides skill building and assistance with the application process, there was no in-depth information found on how this element of the program functions, how it was implemented, what effect it has, or the value of this as perceived by the students, an area in the literature that can certainly be further enhanced.

Finally, out of all of the studies reviewed, not one addressed the need for students to become comfortable with the medical school environment, which is one key element of the social engagement component of the BCP program. For many students, the BCP program is the first time that they are stepping into a medical school and finally realizing that the possibility of attending medical school is tangible, along with which comes fears, pressures, and concerns. Therefore, this very specific element within the social engagement component of the BCP program can be further investigated in this evaluation and enhance the literature available on enrichment programs.

Understanding health care delivery and preparation for medical school

The final area of focus within the review of literature was on health care exposure and preparation for medical school. For the BCP program, developing an awareness of the delivery of medical care in underserved communities is critical and therefore program participants are exposed to various aspects of health care delivery, including clinical case discussion, volunteer work, clinical shadowing, and research. Philips et al. (1981) found that underrepresented students who participated in a summer program that focused on exposure to health care settings, where participants rotated through hospitals and teaching facilities, in addition to academic and interpersonal skills, were employed in health professions at a much greater proportion than a comparison group. Another study found that participants of a summer program, consisting of academic enrichment and clinical exposure “had higher GPAs and acceptance rates to health professions schools than non-participants” (Pisano et al., 1983). Barlow & Villarejo (2004) found that performing undergraduate research increased the probability of graduating. Despite a few studies on programs with a health care exposure component, it is evident that in comparison to the academic preparation and social engagement components of preparing underrepresented

students for medical school or other health related professions, this area has much less literature to review. Therefore, this qualitative study can certainly add to the literature by honing in on how this component of the BCP program functions, how it is implemented, and the value perceived by the students who participate.

Cultural and social capital

In reviewing the BCP's logic model, the key inputs of the program are: academic enrichment, social engagement, and understanding health care delivery. These three areas were investigated via the literature review in the sections of the chapter above. This study will use the concepts of social and cultural capital as theoretical tools to integrate the meaning of these program inputs. "Pierre Bourdieu examined how cultural capital . . . is passed on by families and schools" (Sadovnik, 2007, pg. 8). According to Bourdieu, cultural capital "suggests that, in understanding the transmission of inequalities, we ought to recognize that cultural characteristics of individuals and groups are significant indicators of status and class position" (Sadovnik, 2007, pg. 8). Additionally, Bourdieu proposes that schools pass on "specific social identities that either enhance or hinder" the life chances of their students (Sadovnik, 2007, pg. 8). Meanwhile, "social capital is the aggregate of the actual or potential resources which are linked to possession of a durable network of more or less institutionalized relationships of mutual acquaintance and recognition" (Bourdieu, 2007, pg. 88). Thus, the concepts of social and cultural capital are useful heuristics for the kinds of academic, social, and cultural resources embedded in the BCP program model. Considering what role social and cultural capital play, if any, in preparing underrepresented students for medical school will assist in answering the research question: How does BCP (consisting of academic skill development, social engagement, and health care

awareness) effect underrepresented students' preparation for medical school? The next chapter will focus on the research methods of this study.

CHAPTER III

RESEARCH METHODS

Research Design

Given that the purpose of this study is to understand the BCP program as an intervention to assist with increasing the number of underrepresented minority students entering the health professions, an improvement-oriented, formative approach will be utilized in this study.

“Improvement-oriented approaches tend to be more open-ended, gathering varieties of data about strengths and weaknesses with the expectation that both will be found and each can be used to inform an ongoing cycle of reflection and innovation” (Patton, 2008, p. 116). Considering that there has been no formal evaluation of the BCP program except for surveys given out to participants at the end of their experiences, it was imperative to complete this study and focus on the students’ voices and perspectives of the program.

The study utilized a case study approach, defined as “a qualitative approach in which the investigator explores a real-life, contemporary bounded system or multiple bounded systems over time, through detailed, in-depth data collection” (Creswell, 2013, p. 97). The BCP program served as the case and I utilized a range of methods to collect information on this case from the perspectives of students. It is my belief that using a case study approach was the best choice in understanding the BCP program from the student perspective to learn about the various components within the program, how the students value and experience each component of the program, and ultimately to inform the stakeholders of the inquiry outcomes. The details of the methodological approach will be further discussed below.

Sampling Strategy and Recruitment

This study took place at Rutgers University, specifically the Robert Wood Johnson Medical School (RWJMS). Rutgers University, which has over 65,000 students within the various campuses throughout New Jersey, was founded in 1766 and has since become “a leading national research university and the state’s preeminent, comprehensive public institution of higher education” (“Who We Are,” 2014). RWJMS, formerly part of the University of Medicine and Dentistry (UMDNJ) system, is now part of the Rutgers Biomedical and Health Sciences division of Rutgers University due to a monumental integration that took place between Rutgers and UMDNJ in 2013.

A purposeful sampling approach was utilized in this study. The BCP program is operated out of the medical school and therefore the sample of students that were involved in this study are former and current undergraduate participants of this summer college pipeline program. The only eligibility criterion utilized in recruiting participants was that they had to have completed one level of BCP in 2013 or 2014. I utilized two forms of data collection methods: open-ended, semi-structured interviews and program documents, which will be further explored below. In regards to sample size for the interviews, although I planned to recruit nine total participants, three participants who have completed each level of the BCP program, I ended up with seven participants, all except one whom had completed level two of the program. The BCP program serves three cohorts at the same time, each cohort undergoing particular elements of the three components that the program offers its participants. While I was unable to secure multiple participants who had completed each program level, I was able to secure a student who had participated in all three levels of the program, thereby giving me some participant data on all three levels. By interviewing students who participated in each of the different levels, I was able

to explore how the program effects underrepresented students' preparation for medical school, within the three varying levels, essentially investigating this multi-layer enrichment program. Thus, I was able to gather in-depth, descriptive information about the students themselves as well as their perspectives on the program.

After obtaining IRB approval, I sought out program participants to interview. I was able to recruit participants by obtaining a list of program participants from the past two years provided by the program director. From that list, an email was sent to students requesting their participation in the study. From that email request, seven students replied and confirmed their willingness to participate in the study by completing interviews with me; hence, the sample was self-selected. The interviews took place between December 2014 and March 2015. Table 1 below provides a demographic look at each of the seven participants, including gender, ethnicity, country of origin, whether the participant was born in the United States, and each of their intended health profession.

Table 1

Participants' Demographic Information

Pseudonym	Gender	Ethnicity	Country of Origin	Born in U.S.	Intended Health Profession
Alicia	Female	Hispanic	Philippines/U.S.- Puerto Rico	Yes	Medicine
Imani	Female	Black	United States	Yes	Medicine
Mackenzie	Female	Hispanic	Ecuador	No	Medicine
Derrick	Male	White	Egypt	No	Medicine
Amie	Female	Black	West Africa	No	Medicine
Dante	Male	Black	Nigeria	No	Medicine
Yvette	Female	Black	United States	Yes	Medicine

BCP aims to assist underrepresented students. In determining who qualifies to complete the program, it utilizes the current definition of underrepresented minority (URM) as defined by the AAMC: “those racial and ethnic populations that are underrepresented in the medical profession related to their numbers in the general population” (“Underrepresented in Medicine Definition,” n.d.). Hence, in looking at the table above, you will noticed that a majority of the students involved in this study self-identified as Black or Hispanic. There was one student who self-identified as White, but who was born in Egypt and thus would still constitute an underrepresented student based on the definition utilized by BCP.

In addition to demographic information, Table 2 below provides the academic and BCP information on each participant, including class year, cumulative GPA range, major, the year of BCP participation, the level of BCP last completed, the number of years completed with BCP, and if any other enrichment programs were completed. Lastly, a brief biography of each participant interviewed is provided in Appendix E.

Table 2

Participants’ Academic & BCP Information

Pseudonym	Class Year	Cumulative GPA	Major	Year Attended BCP	Level of BCP Completed	# of Years of BCP	Other Enrichment Programs
Alicia	Junior	3.0-3.49	Biology	2014	2	1	No
Imani	Senior	3.5-higher	Biology	2014	3	1	Yes
Mackenzie	Post-Bacc	3.0-3.49	Public Health	2013	3	3	No
Derrick	Junior	3.5-higher	Cell Biology & Neuroscience	2014	2	1	Yes
Amie	Junior	3.5-higher	Biology	2014	2	1	No
Dante	Senior	3.0-3.49	Biology	2014	3	1	No
Yolette	Senior	3.5-higher	Biology	2014	2	1	Yes

Data Collection

There were two main methods of data collection: semi-structured, open-ended interviews and a review of available program documents. In keeping with a case study design, multiple methods of data collection took place in order for the evaluator to build “an in-depth picture of the case” (Creswell, 2013, p. 162). These two methods allowed me as the researcher to build the case through the lens of the student.

Program Documents. As an administrator within this particular institution with a professional relationship with the program director, I had access to program documents. Therefore, I gathered program documents collected by the program, such as surveys already administered to previous BCP participants as well as other documents utilized in the program. By collecting and reviewing the program documents, I was able to obtain information about the program without having to rely on individuals for data. Program documents provided me with insight into the program inputs and activities over the course of the last two to three years. Additionally, the survey data already collected assisted me with creating an interview protocol to use with program participants. The program documents provided me with an insight into the BCP in order to complete this research study, including being able to provide the background context to the study.

Interviews. The second form of data collection and the most important to the study was the set of semi-structured, open-ended interviews that were conducted. The interviews took place at the institution and each participant completed a single interview. The method allowed me to not only gain the student perspective on the BCP program, but also learn more about each individual student. There were a set of focused questions designed for the interviews (see Appendix D); however, as the evaluator, I was able to probe for more information based on a

participant's response since the interview was meant to be semi structured. Seven students were interviewed, with each interview taking approximately one hour.

Interview questions were designed to encourage the student's voice and perspective on the program. In an attempt to gain deeper and richer descriptive information, the individual interviews were structured to gather both personal and programmatic information. The seven participants were asked to share their own stories, including factors leading to their pursuit of a health profession. Additionally, participants were asked specific questions related to the BCP program, including what they valued most from each experience. Interview questions were intended to not only answer the research question but also gather specific recommendations that students have for the improvement of the program, such as what did students expect from the program that they did not experience. With the advance consent of the student participants, all interviews were audio recorded and then transcribed verbatim for data analysis by a professional transcriber (see Appendix F for Informed Consent Form).

Data Analysis

During a qualitative study, data analysis is the “ongoing process involving continual reflection about the data, asking analytic questions, and writing memos throughout the study” (Creswell, 2009, p. 184). The first step in the data analysis process was to organize and prepare the data that is collected for analysis (Creswell, 2009), which included transcribing the interviews that took place. I enlisted the assistance of a professional transcriber and all seven interviews were transcribed. After the data was transcribed, I then reviewed each transcription to ensure accuracy, cross checking it with the audio recording. Once each transcription was reviewed, I then uploaded it to *Dedoose*, a web based research tool that allows for analysis of project data. Once the data was in *Dedoose*, I read through all the data to obtain an overall sense

of the information collected, writing memos about potential themes as well as codes. I looked for general ideas presented within the collected data, closely examined the data, and looked for persistent patterns and themes. After gaining a general sense of the information collected, I began a more detailed analysis of the data by coding.

I began coding each of the interview transcriptions, one transcript at a time and line-by-line, which initiated my codebook. The codebook (See Appendix G), which was an important aspect in analyzing the data collected, provided me with the opportunity to make sense of the data, an aspect of qualitative data analysis highlighted by Creswell (2009). As the codebook emerged, codes were refined as deemed necessary when reviewing each of the transcriptions. Mostly inductive coding was utilized; however, the literature review, in particular the empirical literature involving academic enrichment, social engagement, and understanding health care delivery, provided me with deductive codes to utilize when examining the data. After examining each set of data individually, I then looked across sources for further recurrent patterns to determine if more than one participant identified similar experiences in relation to the enrollment in BCP. Memos were written during the data analysis process to assist with the examining of the rich data that was collected.

To assist with the conclusion-drawing section of the analysis process, I utilized the charts provided by *Dedoose* to display the data and patterns in a much more illustrative manner, providing me with an explicit look at the common codes and themes that arose from all of the interviews. This provided me with the ability to develop higher themes. In addition, the interview data was compared to the program documents that were collected, which assisted with determining accuracy.

I ensured reliability by checking the interview transcripts to make sure there were not mistakes during the transcription process. Themes and direct quotes from the participants assisting in keeping the “students’ voice” when telling their stories and experiences within BCP. Each participant’s identity was been protected by creating an alias, to ensure that participants could be honest when sharing their experiences, while honoring their experience by sharing background information in addition to the data provided. To ensure validity, I utilized a validity strategy by employing the use of rich description, based on the interviews, to deliver the findings (Creswell, 2009). With the assistance of peers, I utilized “peer debriefing to enhance the accuracy of account” (Creswell, 2009, p. 192). I had two colleagues who I specifically relied on for peer review of my study and its findings, both of whom work in the university setting and work with a diverse population of students. While neither of my peers work specifically to advise pre-health students, both have great knowledge of the needs of college students in general.

Researcher’s Role

In this research study, I was not an outside researcher, as I currently work at the same institution as the research site. However, the university is very large, consisting of 4 divisions throughout the state of New Jersey, and I happen to work at a separate division. Therefore, I do not have any direct contact or impact on the program itself or the research site, Robert Wood Johnson Medical School. While I did not have a relationship with any of the research participants, my professional role at the university may have influenced the study, both in my role as the researcher as well as the participants’ willingness to share information with me about the program. I worked to alleviate this challenge by reassuring participants that their experiences would be exemplified as they had conveyed them as well as ensuring that their name would remain confidential so that there was no risk for encountering consequences for sharing their

perceptions. I also connected with the students by disclosing to them my professional role at another division of the institution, which is to advise pre-health students aspiring to enter health professions, to reassure them of my genuine interest in the subject matter.

Limitations

This study had limitations associated with the data collection methods utilized. For example, due to the small sample size, this study is not generalizable to other institutions. Secondly, I am not an outside evaluator; my role as the researcher and as an administrator at Rutgers may have had an impact the evaluation study itself. Students may not have wanted to disclose negative experiences or perspectives of the program due to my affiliation with the university even though I emphasized the fact that their participation in this study would not impact their relationship with the BCP and its staff. Despite having a small sample size, there was significant data collected, providing a vivid picture of what is taking place in this institution with its BCP program from the student perspective.

CHAPTER IV

RESEARCH FINDINGS

The Biomedical Careers Program (BCP) is a pipeline program initiated in 1979 to help recruit and retain talented college students of underrepresented backgrounds into the medical profession, offered by the Rutgers Robert Wood Johnson Medical School, through programmatic efforts offered to students in the summer. This study proposes to answer the following research question regarding the Biomedical Careers Program (BCP): How does BCP (consisting of academic skills development, social engagement, and health care awareness) effect underrepresented students' preparation for medical school? Chapter Four will present findings on how the Biomedical Careers Program effects underrepresented students' preparation for medical school, specifically through the transmission of cultural and social capital. While many themes were discussed during the interviews with program participants, four main themes stood out, all of which related to cultural and social capital. This chapter will present findings on the four main themes in which BCP prepares underrepresented students for medical professions: 1) informal mentorship and guidance, 2) social learning through clinical exposure, 3) academic study, and 4) social interaction.

The four findings demonstrate the transmission of social and cultural capital through BCP's programmatic efforts. An overview of cultural and social capital was discussed in Chapter 2 and will be briefly mentioned here. Pierre Bourdieu's work looked extensively at cultural capital and its role in enhancing or hindering the life chances of students (Sadovnik, 2007, pg. 8). The biomedical careers program prides itself in being an academic enrichment program, assisting with the preparation of undergraduate students who are underrepresented in medicine for medical and other health related programs. In considering how the biomedical

careers program effects underrepresented students' preparation for medical school, program participants confirmed that they were impacted by the knowledge received from the academic skill development component of the program, which will be further discussed below within the academic study finding. Whereas cultural capital is known for being transmitted by families and school, thereby causing stratification "depending on the period, the society, and the social class" (Bourdieu, 2007, pg. 86), the biomedical career program transmits one form of cultural capital to all of its program participants in the form of academic qualifications. In addition to cultural capital, Bourdieu also examined the role of social capital in providing individuals with valuable social networks to be successful, whether in a school or other type of institution (2007, pg. 88). Many of the program participants confirmed that they are first generation college students as well as the first in their families to attempt to pursue a career in the health field, particularly medicine, confirmed in the sample information provided in Chapter 3. Thus, for many, BCP was their first access to a set of networks that would connect them to the world of medicine. Hence, the findings that will be discussed below, specifically the themes of informal mentorship, clinical exposure, and social interaction confirm the transmission of social capital via this program. The next sections within this chapter will present the four main findings on how BCP prepares underrepresented students for medical professions via the transmission of cultural and social capital: 1) informal mentorship and guidance, 2) social learning through clinical exposure, 3) academic study, and 4) social interaction.

Factor 1: Informal mentorship & guidance

The first theme that emerged was the concept of mentorship and guidance. The Biomedical Careers Program does not have a formal mentorship component. However, program participants were affected by the informal mentorship and guidance received, whether it was through a relationship established with course professors, teaching assistants, the program

director, or health professionals such as physicians, nurses, and other professionals whom they met during shadowing and volunteer opportunities offered by the program. Participants' views on the mentorship received varied based on the significance, source, and site of the interaction. Students were not assigned a specific mentor in the program. Thus, the informal mentorship relationships established were a source of information and support for students interested in pursuing a career in the health field, particularly medical school. Each of these sub-themes will be further explored below.

Source of information. For many of the participants, the course professors and the teaching assistants in the program, who were medical school students, served as mentors and a source of information for questions specific to the program or about what to expect in the future as they persisted in their journey to get into medical school. Dante, a senior biology major, explained his experience with mentorship:

Basically the professors, the professors just talk to us, especially our mentor, she was also a neuroscience professor, so she always took time to, this class was three hours long, so she'd teach for probably teach for two hours and 30 minutes and the other half of the time she tries to talk to us about our research, our lives, like what's going on, what are we doing after school. So she broke it down for us really good, and she became really close to every single one of us. She explained everything cause she's been in med school too. She took a long time off from med school, she joined the FBI, she went to med school in the late 30's, somewhere in her 30's, or late 20's I think, but sometime late, she took a long time off but she came back and she just told us what we needed to do, how we should do it, how we need to study, how we need to take our boards, what it is to be a successful physician, what should we look out when we are shadowing. She basically just guided us through the whole program and it was really good having someone like that.

The idea that a mentor experienced obstacles in pursuit of achieving academic and professional goals resonated with Dante and most of the other participants. While some of the students mentioned a professor, most identified the teaching assistants in the program as mentors. Amie,

a junior biology major, describes the informal mentorship she received from second year medical school students:

I believe they were 2nd year students. So they were giving us an open eye on how the medical school process that we're applying to was and whatever we didn't understand class-wise they help us understand and it was another resource for us to use and to realize best because our teacher may not have the time but we can ask them or whatever problem we have, we talk to them about anything that they are able to or comfortable enough to answer.

Amie, like many of her peers, recalled how the teaching assistants answered many of the questions she had. For some this may seem like a simple task, but for these students, who may not have had another source to have their questions answered, this was extremely important. Thus, this program served as a primary source of information on figuring out how to get into medical school. "Getting to know the medical students that were TA's that's actually, that was really important because we used to ask them if we needed any help or any questions in terms of what it is to get to medical school and how it is to get to medical school," recalls Derrick, a junior cell biology and neuroscience major who participated in Level II of the program. One participant, Alicia, identified the teaching assistants as the most important of all the mentors in the program:

I think that the teaching assistants were the ones who were the biggest mentors especially to me because both of them were medical students but they're also the ones you keep in touch with and they're also the ones we spent a lot of time with even if it wasn't class time, like we have to study before our exam, but aside from that they were also just open to like 'hey during lunch time if you guys want to talk we're here' and you could talk to them, or they would eat there with us, things like that.

The participants of BCP also had substantial contact with the program director, who served as a point of contact and also provided guidance. Imani, a senior biology major who participated in Level III of the program, recalled a significant interaction with the program director who took time to explain to her and the rest of her peers the importance of the Institutional Review Board

process when completing research. Level III participants are expected to complete a research program and present on their findings at the end of the six-week program. However, for many, this was the first time they were learning about the intricacies of completing research, including the requirement that one must receive authorization in order to complete research. Although disappointed at the inability to undergo the Institutional Review Board process in order to complete the type of research they were interested in as a group, they were appreciative that the program director took the time to thoroughly review the process with them. Imani recalls:

We were discouraged by that, we wanted to have a simple patient survey and we thought it was so easy but we understood there's definitely a moral ethical side to our research that needs to be approved and it's not just a 1, 2, 3 thing that can be done, however, she mentored us about that process, even though we couldn't do it, even though we obviously wouldn't be approved by the time it was time for the symposium, we were mentored that should you want to do research like this, should you want to do a clinical trial survey, whatever it may be, this is the process that you will have to go through this and so we were informed and mentored about what we could do if we wanted to go that route, post graduation, or for a Masters degree or whatever it could be.

In addition to contact with faculty, medical school students, and program staff, participants were also exposed to professionals in the field. Through the opportunity to shadow and volunteer, students developed yet another informal mentorship. Imani, a Level III participant of the program, describes the mentorship she received:

I did receive mentoring and guidance in the program. Some of it was academically, you know, through the class work, building upon your knowledge whether it was neuroscience or immunology, and then also MCAT mentoring. Mentoring how to really tackle this exam and how to really overcome it and not be afraid of it and study for it effectively. Then also mentoring from the physicians at Chandler in terms of what medicine will look like in five or ten years and what to prepare yourself for, you know, I was told if there's any thought in your mind that you're going after medicine for money, if you're going after it for fame, if you're going after it for prestige, to kind of let that go, that medicine is so much bigger than that, it's more about that physician/patient relationship and really it's that 15-20 minute interaction that you have that really highlights your career and not anything else. So that mentoring was great. Then also, two of the physicians did BCP that were in Chandler so they were great mentors in terms of how to take advantage of the program, you know, who to keep in contact with, you

know, just people to never really forget and how they got through their journey was great as well, them telling you how they got through their journey.

Having contact with professionals in the field they are interested in entering provided participants with information that only experienced health professionals could provide.

Source of support and encouragement. Participants spoke frequently about the informal mentorship received serving as a source of support and encouragement. When connecting support and encouragement through mentorship, participants described mentors as sources of positive reinforcement, reassurance, a realistic and non-judgmental viewpoint, and the idea that making it to medical school is possible. Many of the participants described obstacles and challenges experienced along the way, and how the mentorship and guidance they received in the program was instrumental to their ability to persist.

Mackenzie, a student who has already completed her undergraduate degree and is currently a post-baccalaureate student, states that the most significant aspect of the program was the relationship that she developed with a mentor. She believes she would be lost without that relationship, which she described below:

That year I had a mentor that I met, she was a neuroscientist and she had just moved here from I forgot where, but she really brought it into the, she brought clinical into the study. She would let us do the eye exam or it was a physical exam and what to look for and why they do it and so now that when I went to my doctor I'd be like 'oh I know why they're doing this,' we learned about the pre neuro nerves and she was always open for questions. She was always supporting us and saying we could do it even though we may face obstacles it's still doable to do and I feel at that year I really needed that support just because it was just becoming harder and harder too with my grades and just family problems. The goal seemed a lot further than had it been in freshmen year I guess you could say, I was less motivated. So I feel like BCP III just kept me with my goal. I saw again why I liked medicine and why I really wanted to do it, which I found most helpful.

For Mackenzie, having someone tell her that "she could do it," provided her with the support and encouragement that she needed to move beyond personal obstacles as well as lack of motivation

she was experiencing at that point in her life. Mackenzie went on to explain some of the challenges she was experiencing at the time she participated in BCP Level III:

During that time my mom had just been unemployed and everything was a mess in my life so I didn't really, the goal of being able to go to medical school and everything was just becoming further and further away. Meeting her really helped me out because I could explain to her and she was a listening ear and she always supported me and always said that I could do it, and it just made it a lot easier to cope with everything that I had to do and it just got me up on my feet again.

As someone undergoing difficulty, Mackenzie credits the supportive relationship established with her professor in being able to cope with those obstacles and getting her back on track through encouragement.

Another participant who experienced some difficulty was Alicia, a junior biology major with a GPA ranging between a 3.0-3.4 (out of a 4.0 grading scale). For Alicia, and many of the program participants, there is concern, doubt, and anxiety in the belief that entering medical school is possible. However, informal mentorships through the program serve as a source of support and encouragement, even when grades may seem like a hindrance to entering medical school. Alicia, whose family is from the Philippines, described some of the cultural expectations to succeeding academically. She described the cultural implications related to being an older student and how others would impose negative judgement if one did not progress academically at a rapid pace. Alicia also shared that she believes she is not a top student and how that has impacted her self-esteem. For Alicia, while the best course of action might be taking some time off from school before applying to medical school, she is extremely frightened to do so. She connected her fears to the cultural expectations about academic achievement with which she was raised. Alicia then described the mentorship she has received and how that has positively impacted her:

So my genetics instructor and her assistant, I still talk to her she's great, so that was nice, our instructors who taught us the MCAT portions too, I still talk to them... That's nice that we have that relationship with them because of the program and they're people in medical school. So I talk to them, [about] how they prepared for it things like that and it's just nice to have someone who's gone through that too and then they're in it so you can see that it's doable and that it's possible.

Alicia went on to further explain the relationship she had with her mentors:

They gave me, you know, they give you knowledge of what you have to do and it's just, it's kind of matter of fact type of thing but they don't tell you that it's not possible, they never say that. They always say it's, they just tell you what to do and that it's doable and that they did it and yeah there's going to be struggles, it's always going to be hard, but even if it takes eight years, it's a matter of, you know, it's not a bad thing.

For Alicia, consistently hearing the message that entering medical school "is doable" and having that message reinforced by the fact that her mentors were able to achieve the goal that she is attempting to accomplish eased her stress and anxiety. Having access to both a supportive course instructor and teaching assistant, who was a medical school student, provided her with the encouragement she needed to take this overwhelming process and break it up into manageable segments.

Sharing of personal stories of individuals currently in medical school or already in the field provided participants with encouragement and reassurance that they too can make it. Alicia mentioned that her teaching assistant had an interesting story of his own; he was someone who had graduated with a lower GPA and did not go to medical school right away. Instead, her mentor worked for several years and entered medical school at the age of 32, reassuring Alicia and many of the other participants that one does not have to rush and that there is time to get into medical school, even if it does not happen immediately from college.

Yolette, a senior biology major who participated in Level II of the program, expressed how her mentorship with the teaching assistants provided her with a realistic viewpoint of the

path to medical school and helped cope with doubts about her ability to accomplish her goal.

She explained:

So I think the mentorship helped because it was more of a realistic view in terms of this is someone else's personal opinion, their thoughts, their experiences that they're sharing with me, to know that, to see a doctor in the hospital is one thing, but to see someone on the path to become a doctor and for them to let me know, share their experiences of how it was getting into medical school, and the process, and seeing that they had a lot of the same doubts that I had was just reassuring that I was not the only one that's feeling this way or that doesn't think it's this hard.

Yolette went on to further explain her perspective on the mentorship she received:

I think that the TA's being there was a good, was like a great impact on being able to get like direct support, not only because they were at the Robert Wood Johnson Medical School but just because I think they were a medical school in general, and they were able to just give us direct feedback. So for them to see us struggle and they struggle as well, but for them to encourage us to constantly to know like you're going to finish.

Aside from the mentorship and guidance received from the medical school students, Yolette also recalled encouragement received from one of the health professionals she had access to, a nurse who shared her personal journey into the field. Yolette describes this experience:

Yeah, so one of the nurses who didn't even think that she was going to go into medicine she thought it at first but then she kind of took years to stop and kind of, she said get her life together and then like go back to do it and like one of the head nurses that I was with as well they were both just very positive and they saw the drive in me to like want to do this and stuff, so they were always like giving positive reinforcement.

Hearing real stories from both students in medical school and individuals already in the field provided positive reinforcement and reassurance that entering medical school is possible, even when faced with personal challenges, obstacles, doubt and stress. The relationships fostered in the program provided participants with a positive and supportive environment as well as with the encouragement that they needed at that point in their academic career to enhance their level of motivation to stay on course with pursuing medicine.

Overall, despite the fact that the mentorship relationships established were informal, they gave participants the opportunity to learn about the path to entering the health field as well as what to look forward to as a professional. Additionally, mentorship provided participants with information as well as support and encouragement.

Factor 2: Social learning through clinical exposure

A second theme that arose from the data collected is social learning through clinical exposure. Albert Bandura's social learning theory posits that people learn by observing the behaviors and attitudes of others, including the consequences of those actions, in a social context (1977). Bandura explains that "most human behavior is learned observationally through modeling: from observing others one forms an idea of how new behaviors are performed, and on later occasions this coded information serves as a guide for action" (1977). Social learning, as it relates to the biomedical careers program, took place in several ways via the shadowing component of the program. This theme will be further explored below.

The biomedical careers program has a shadowing component that provides all of its participants, levels one through three, clinical exposure in a health setting, such as a hospital. Shadowing, as it relates to the health profession, involves observing health care professionals, such as physicians, while at work and interacting with patients. Students are not allowed to have hands-on experiences, as they do not have the education or experience to provide direct care. However, they are able to observe significant interactions among health professionals, as well as interactions between professionals and their patients. Derrick, a level two participant of BCP, describes his shadowing experience at a local hospital:

I was shadowing, we were shadowing residents in the SICU for neurosurgical intensive care unit after surgery, post surgeries and it was, we didn't do hands on experiences, we didn't have the hands on experiences. What we did, we went on rounds and there will be

two or three physicians talking about the patient and ordering medications and ordering final care.

Although unable to participate in hands-on experiences, Derrick was able to observe the physicians speaking to patients and the processes that took place in providing care, such as ordering of medications. Imani, a senior biology major who participated in level three of the program, describes another example of shadowing experience:

Sitting in the lunchroom with them because we were there from like 9:00 to 2:00 or 9:00 to 3:00, so you got to view, you got to go through the whole day from the time that a doctor comes in in the morning time and sets their coffee and oatmeal down to the time that they do the ten patients in the morning, they have their lunch, what do they talk about at the lunch table, from the time that the second half of the day might be the residents might be shadowing them as well or they might be overseeing the residents, so you see what happens in a debriefing meeting when the residents come back in, so it made you just see what a doctor can do. Not only do you go from practicing, but then you can go to teaching as well if you choose to do that and being a mentor and a guide for residents to follow after you. I was able to see all of it and that was great.

Imani was excited by the opportunity to see all that took place in a daily routine of a physician, from having a morning coffee, to seeing several patients, having lunch, and overseeing a debriefing meeting with other health care professionals. She was also excited to see that a physician could continue to serve as a mentor for others. The program participants were not in a position to provide direct care; however, they understood and valued the importance of observing others who are in the position that they aspire to be in the future.

All of the BCP participants had the opportunity to observe and learn the norms of the particular health care facility through shadowing. One participant, Imani, describes her experience shadowing at the Chandler Health Care Center in New Brunswick:

So through shadowing, through working at Chandler and being at Chandler, you got to practice some of that, the handshake, the washing of the hands, the introducing of yourself, the eye contact, not staring at the screen when the physician is copying down notes, and that helps out a lot because they did tell us there's people in medical school that don't know all of this.

For Imani, and many of the other program participants, shadowing offered her the opportunity to learn about the day to day norms that exist at a health care facility, such as washing one's hands and providing patients with an introduction instead of going right to diagnosing an issue. Not only did she observe those day-to-day norms, but she also practiced them, allowing her to become more comfortable in that setting. Shadowing provided Imani, along with all of the other program participants a more realistic look at the medical profession.

In addition to observing interactions between the physician and patient, students were also able to observe and learn from the interactions between the health care staff. Yolette, a senior biology major who participated in level two of the BCP program, described her experience while shadowing:

And that was another thing that I saw that was very surprising, you get the mindset that nurses are below the doctors, but everyone worked on the same level, there was no 'I'm the doctor, this is what I say.' The nurses were talking freely, openly, questioning things and the doctors were doing the same thing and it was always effective communication back and forth, there was always respect shown. Whenever there was a problem or someone didn't know the answer, there was someone else there whether it was a doctor or a nurse to fill in the gap.

Yolette began her shadowing experience with the assumption that nurses were seen as subservient to doctors. However, what she actually observed and found surprising, was the team-oriented interaction between doctors and nurses. She observed respectful interactions that involved two-way communication and discussion.

For many of the participants, the shadowing experience provided by the BCP Program provided the first opportunity to obtain clinical exposure since they did not have their own access and networks of exposure. Amie, a junior biology major, discusses her shadowing experience:

Okay so I shadowed [name of physician] so when I went there I couldn't shadow him the first day because he was in the OR and I wasn't OR certified, I was only volunteer certified so I shadowed there, I worked with their neurosurgical team. They were doing rotation and looking at the patients and I actually got exposed to a lot of things. Every

time I go there, I only went there twice, so within that same day we saw like 13 cases at least, they have like 30 of them, so I was able to see all these cases, different type of them, different type of strokes, different type of health related aspects that I didn't know but the nurse knows the disease because some things are related to your heart that may lead to brain diseases or injuries, so I was able to see those aspects that I didn't know prior to coming to the BCP program or participating in the BCP program which was great. So I realized it and I continue, I am still shadowing with them.

Amie was able to observe a great deal in a short shadowing experience in the program. As she mentions, she was able to see many different types of clinical cases and also observed the role of both nurses and physicians in the health treatment process. Amie was able to see firsthand various illnesses and how the body works, concepts she had previously only been exposed to in the classroom via textbooks. She also mentions that due to the program and building her networks, she has continued to shadow the same physician despite the program having concluded. Similarly to Amie, Derrick also gained connections by the shadowing opportunity he had through the biomedical careers program. Derrick recalled, "I made connections in the hospital, in fact I'm shadowing [name of physician], a neurosurgeon, now just because of BCP and how I got into shadowing and volunteering there. So that's how I was able to shadow him afterwards." Thus the BCP Program provided significant opportunities for students to acquire hands-on academic knowledge, learn, and observe the real-world clinical practices of a working hospital team and develop extended networks for a future career in health care after the completion of the program.

In discussing the significance of the shadowing opportunity as a component of the program, all of the participants agreed that the clinical exposure was the best part of the program.

Imani, a senior college student, expressed her satisfaction with the opportunity to shadow:

I feel like there's no other valuable, greater valuable experience than shadowing and literally walking behind the doctor the whole day and kind of just like closing your eyes and imagining yourself, 'hey this could be me one day' and literally that this can be us one day because sometimes that doctor in front of us was someone that went through the

BCP program, so they'll always turn around and say 'hey I was in your shoes' and you're looking back at them saying 'hey I want to be in your shoes,' so you're hiding that trade-off of identification with one another.

Imani emphasizes the value in the shadowing opportunity and how she was able to imagine herself in the role of a physician one day because of this opportunity. She was able to identify with the physicians, who could relate to her professional aspirations, sometimes as former participants in the BCP Program. Another program participant, Amie, who had not had the opportunity to shadow previously, recalled that the shadowing component of BCP was what she enjoyed the most from the program. Amie recalls:

Something that I, I didn't do it before, I didn't shadow a doctor before so doing that, working with the doctor and answering questions, asking questions and them being able to just help me understand the burdens of going through medical school and the burdens of seeing patients, working with different personnel but actually enjoying those burdens kind of related to what I will be able to do in the future. So that's what I keep emphasizing on the clinical aspect of it because that's what I enjoy the most out of the program.

Amie enjoyed the opportunity to speak with the physicians, not only about the cases she was observing, but also about the path to becoming a physician. Throughout her interview, she consistently brought up her shadowing experience because it had the most impact on her during her time in the program. Amie's story was yet again another example of a participant identifying with the health care professional that she shadowed, a sentiment shared by many. Mackenzie, a post-baccalaureate student who was able to participate and complete all three levels of the biomedical careers program, described her learning experience through the opportunity to shadow:

It was definitely the shadowing, just getting the real hands on experience, like only so much you can do reading a book and learning about it but I feel like as a student you need that experience of seeing how they work cause many times yeah you may love science but are you good as a people person, being able to handle different types of people, different ethnicities. I like that it was in New Brunswick because then you can see the different ethnicities that are around the area, different socio economic backgrounds that they come from, different problems that they might have, are they able to pay for

insurance, or do they don't have insurance so they only come when they're deathly ill. So I felt that not only got me to open my eyes towards what medicine has to offer but also the problems it has regarding being able to give good health care to not just those that can afford it but also to everyone and BCP III specifically, since I was working in the free health clinic got me to see that.

Mackenzie's experience was truly eye opening for her; she understands that to work in health care, one must really understand and appreciate working with others, especially working with diverse populations. Her learning opportunity extended beyond observing the doctor-patient interactions and also allowed her to think about larger issues in health care, such as the affordability of and access to health care. While Mackenzie, and the other participants, certainly learned of these health care issues during presentations and lectures presented in the program, it was the real-life experience that made these issues stand out.

Lastly, not only did program participants declare that the shadowing experience was the most enjoyable part of BCP, but they also affirmed that shadowing provided them with the confirmation and assurance that becoming a physician is exactly what they want to do. Alicia, a junior biology major, recalls her experience shadowing:

Yeah, that's I think that's a good thing because you're going to be working somewhere and you should be aware of what you're getting yourself into, and like I said, although I didn't shadow doctors but seeing how it is also, the dynamics they have, just further solidifies me wanting to go into the medical field and seeing myself working in that environment and enjoying it. I would talk to them and ask them if they genuinely enjoyed their jobs and they did and I want to feel that way about what I'm doing for the rest of my life. Figure out what I'm doing as my job, I want to be able to say I love it, I enjoy it and you know, so seeing people feel that way about what they were doing was just reassuring and positive. Even though I was just volunteering it was I enjoyed it, like I felt I enjoyed how they enjoyed it.

Although Alicia did not have the opportunity to shadow physicians, she was able to shadow other health care professionals, such as physical therapists. As someone interested in entering the health care field, she was intrigued to speak with professionals currently working in the field and excited to see how much they loved what they were doing. Alicia further shared, "I went in

there and naturally started asking questions, talk and that just, and it wasn't because I felt I had to ask questions or I felt I had to interact, it's just I didn't have to think about it, but I felt that me being natural in that state kind of also shows me, puts more confidence in the fact that I'm going towards what I want to do and it's something I really like have a passion for." Alicia's ease in transitioning into that clinical setting provided her with the assurance that she needed to confirm that the health care industry is the right fit for her. Additionally, her experience shadowing and observing others in the field solidified for her that she is making the right decision.

Another program participant, Mackenzie, had discussed a difficult journey during her undergraduate years, where her confidence had been shaken and she was unsure whether to persist in pursuing medical school. However, she expressed that her experience shadowing during level three of BCP was a turning point for her:

I got to shadow but it was in the hospital. It was a lot harder because obviously doctors are busy, which I can understand. But what that year then impacted me the most was I shadowed at a pediatric intensive care unit and I actually and fortunately got to see a patient brain hemorrhage and just seeing that and it was really impactful. I've never seen someone die in front of me, so it was really something that affected me. I guess it would be the silver lining and it was for the better because I don't know it just gave me further, it fortified the whole idea that I did want to do this career.

Once again, this example reiterates how the shadowing opportunity provided the students with a learning experience while further solidifying the intention to pursue medical school. Yolette, a senior undergraduate student who participated in level two of the program, detailed her experience with shadowing:

Yeah, so I definitely, as of right now, I do want to be an OBGYN, so going, having the opportunity to go into labor and delivery at Robert Wood Johnson there's three sections to labor and delivery. There's before birth, laboring, and then after birth, so just being there I was put on with a head nurse and she kind of just was very open to walking me through the process of what each department was for and a day there would be kind of like women that may have come in there for a check-up and don't realize they're in labor, or a woman that's actually in labor and knows it. So I think it was a very scary experience for me because it's like I said, I say I want to be an OBGYN but I don't know

how I would react to seeing someone deliver a baby. So witnessing that for the first time was just like, it was very emotional for me, but it also like I said, it was a confirmation again that this is what I want to do. So it was very open and just it was fast paced sometimes, but everyone working there and even the patients were just very open to explaining things to me, telling me their experiences and letting me watch the process.

Yolette's experience was a prime example of the opportunity provided to program participants.

As someone who is considering becoming an obstetrician/gynecologist, Yolette had the opportunity to experience it first hand and determine if it is really what she wants to pursue.

Despite feeling scared and not knowing what to expect, the experience solidified Yolette's intentions. Overall, the ability to experience working in the health field firsthand, observing the interactions, witnessing the real-life scenarios, and speaking with health care professionals provided the BCP participants with an incredible learning opportunity.

Factor 3: Academic Study

The third theme that emerged from the data collected is academic study. The biomedical careers program prides itself in being an academic enrichment program for assisting with the preparation of undergraduate students who are underrepresented in medicine for medical and other health related programs. The academic skill development component of the program consists of science courses, lab work, research, clinical experiences, MCAT preparation, and seminars. In considering how the biomedical careers program effects underrepresented students' preparation for medical school, program participants confirmed that they were impacted by the knowledge received from the academic skill development component of the program. The data acquired from program participants highlights two specific areas within the academic study theme, which will be further discussed below are: 1) knowledge from the classroom and 2) knowledge provided by workshops, both of which assisted in providing students with knowledge and awareness of what to expect in the future.

Knowledge from the classroom. While discussing the program, participants highlighted the academic component. One sub-theme that came up in discussions with the interviewees was the knowledge received from the specific classes they took while in the program. Students described their class experience as enjoyable and emphasized that they learned the material well. Amie, who took Genetics while in the program, stated that she enjoyed her class. Her experience is described below:

It wasn't a rigorous class, it was intense but our instructor... kept a warm atmosphere so it wasn't something that was a burden...[If] I enjoy the class everything follows really well... if I'm not enjoying the class I might.. be in a difficult position to pass the class.

Amie explained that although the Genetics course was intense, the professor's teaching methods, including the environment she promoted in the classroom, allowed her to learn the material well while enjoying the class. Amie confirms that her enjoyment of the class material has a direct impact on her ability to learn the material. She also reflected on her ability to learn from her past classroom experiences and compared it to her experience in the program. She was not the only student who felt this way. Two other program participants, Imani and Alicia, who are both biology majors but attended different levels of the biomedical careers program, confirmed that they enjoyed the classes offered by BCP. Alicia, who attended level two of the program, stated that she enjoyed her classes and credited their structure with being helpful in her learning. She describes her experience:

The [name of professor] is great and I liked the assessments he had and seeing how you study, how you learn and how we do like different study strategies, I felt those were very helpful and how to time manage. In fact the way he taught us to time manage which is something how I do now, my time I schedule is fit to that how he said, and you have daily planner and it's very organized. I have a Google calendar and I implemented that here, junior year after that, I implemented it for the summer because I wanted to organize because I not only was going to BCP I was also, I had to go home and I had chores to do, I had a job. So it just helped me structure my time.

Alicia explained how the biomedical careers program, specifically the class she took and the particular professor, assisted her with gaining other valuable skills to contribute to her academic success. Additionally, she learned more about herself through assessments that she took and also learned how to manage her time due to the particular professor she had. Alicia had shared with me that prior to attending BCP she was extremely stressed out, not eating or sleeping well. However, by attending BCP, she learned how to focus and set up a routine for herself that would allow her to study adequately while allowing her to also take care of herself. Alicia stated to me:

I sleep, I eat well, I go to the gym, those are things I wasn't doing when I was stressed out but now it's just in my routine, it's in my regiment. That's something that was important because they [BCP] also stressed mental health was important, how to manage your stress, things like that and we never really had a class on that ever until BCP which that part I really liked. I keep all the pamphlets that tell you how to manage things because I don't want to end up how I was sophomore year again, so I liked that.

While time management and other skills to assist in succeeding academically may seem trivial, these skills are extremely important and were it not for BCP, many of the students would not have learned this.

Another student, Mackenzie, who attended all three levels of BCP, spoke to me about her level three academic experience as it was the most vivid. She describes her experience:

I'm so used to seeing, while taking classes at [name of college] just basic science, you can't really relate it to medicine and you can get unmotivated by that cause you're [thinking] when is this really going to click, when is this going to work. I felt [that] the classes that I took that year [in BCP], they were able to bring it together, [you are] able to see how the diseases, using the basic sciences that you've learned, how those diseases work and how they impact others, and just brought it to a more holistic view of it.

Mackenzie had a hard time grasping the connection between science and medicine via the science courses she had taken at her college of enrollment. However, when she attended BCP and had the opportunity to take the courses offered by the program, she had a different experience. She now saw the connection between medicine and science due to how her

professor taught the material of the course. As she puts it, the BCP academic experience provided her with a more holistic view. Imani, a senior biology major, described her class experience in BCP. She shared that her neuroscience course professor took the group on a trip to Merck Pharmaceutical headquarters in New Jersey. Imani explains the trip:

We went and spent the day there. Our instructor made us feel that there's no pressure, it's okay to find out that medicine is not for you. If you're saying, hey I thought it was for me but it's not, let me show you a different area of medicine, maybe you want to get your Master's, maybe you want to get your Ph.D. in biochemical engineering or microbiology or whatever it can be and you can help develop the drugs that treat patients, you can help develop some of the sterilized equipment that will be used in the surgical room or operating room or whatever. So you got to see the different areas and that helped a lot taking that trip.

Imani appreciated the opportunity to explore other areas of medicine that would allow her to still remain in the health field but perhaps in a different area. Although Imani still intends to apply to medical school after her BCP experience, she valued the opportunity to go in person to Merck and learn about the various field in health. She also valued the ability to explore other options, such as earning a master or doctoral degree in an area related to medicine that would still afford on the opportunity to enter the health field. This, once again, offered students the ability to connect what they were learning in class with their future aspirations, connecting science to medicine.

Students in the program also credited the academic component in preparing them for their regular schooling experience. Many students highlighted the academic component as the part of the program that stood out. Yolette, who participated in level two of the program, describes her thoughts on the academic component of BCP:

I definitely think that the enrichment stands out, it definitely prepared me for genetics which I'm taking this semester, and I already feel like I'm a step ahead, as well as doing the MCAT prep there it's already got me in the mindset of how I should be thinking, how I should be approaching when I look at this section of the test or when I get to this certain type of question and also the highlight of being in the medical school was just, I can say

that I conquered a summer being there, so it was those three things that were really helpful.

Yolette shared how taking Genetics during the program prepared her for when she returns to her college and takes it as a course. This allowed her to feel as if she was a “step ahead” and reinforced her ability to successfully take the course in the fall semester.

Yolette mentioned another important piece of the academic component of the program: MCAT preparation. The MCAT, which stands for the Medical College Admission Test, is a dreaded exam that every student looking to enter medical school must take. The score on the exam has tremendous weight on a student’s acceptance or denial into medical school and therefore students put a lot of pressure on themselves to do well on it. Due to the importance of this exam, many students decide to take a preparatory course for the MCAT, which costs a significant amount of money, putting those with financial constraints at a disadvantage. Therefore, the fact that BCP provides MCAT preparation for level two participants is a significant highlight of the program and provides tremendous capital to students who attend the program. All of the level two program participants who were interviewed mentioned the MCAT preparation as a highlight of the program, including Yolette. Another student, Derrick, a junior who attended level two, also shared that he felt that he went back to his college after the summer program feeling he was a step ahead as well because of the courses he took. He stated, “For physiology I learned a lot, I didn’t expect I would learn that much in a shorter period of time but I was able to gain a lot and we had a good professor for physiology. MCAT preparation went well; it gave me a heads up and as they say wet my feet into MCAT preparation.” Another student, Alicia, described her experience with the MCAT preparation offered by the program:

I really liked the MCAT portion because we took a diagnostic test beforehand, and we took another one after. You could see how you developed and how you improved. I did [improve] and that was great because I did everything...the way they taught us, we

[complete] readings and things like that it... So going through that and seeing that you can improve in such a short amount of time showed me that I may start low, I didn't do well the first time, but I improved by 2 points. That is a big deal, or it's at least an improvement and just shows me like a month of preparation led me to do well on it. I liked testing it, being aware of what it was going to be like, what the MCAT is going to be like [since] that is the next step.

Alicia describes the fact that she was able to practice taking the MCAT during her time in the program. She was encouraged by the fact that she improved her score during a month of preparation, which reiterated to her the ability that she can be successful in taking the MCAT. Additionally, this portion of BCP provided her with advance insight and perspective into MCAT as she begins to prepare to take it.

The knowledge received in the classroom via the academic component of the program, which included different courses, MCAT preparation, and self-assessments, assisted in the transmission of cultural capital. Whereas most students might gain this knowledge and set of academic skills through their previous academic experience, this was not the case for the students in the program who fell behind in their regular college classes and were struggling to stay on track in their pursuit of medical school. The ability to learn in a safe and warm environment, while also practicing the skills acquired in a rigorous but enriching academic experience, provided students with the reinforcement and "academic qualification" that they too can achieve their goal of entering the medical field.

Knowledge provided by workshops. The second sub-theme that arose within this academic study finding was the significance of the workshops held weekly to discuss various health issues and topics, exposing students to many areas of medicine as well as ethical dilemmas in medicine. For Derrick, the workshops provided guidance and perspective. Yollette found the workshops to be enriching, especially when there were individuals from the medical field or from different areas in medicine that came in to speak to program participants. Another

student, Mackenzie, who had the opportunity to attend all three levels of BCP, also described the workshops as providing guidance. She explains:

I had a lot of workshops which I found really helpful. The main one that I can remember is financial aid in medical school and how to be able to pay for it, which I found to be really helpful cause many people just want to go to med school, but I know that I need to start thinking about money cause I'm the one that's going to be paying for all of it. So I found those workshops to be helpful. They also did workshops involving different fields involving family medicine and different fields that are not just specialties, which I found to be very informational.

For Mackenzie and many of the other program participants, the knowledge disseminated during those workshops, including information on how to pay for medical school, was instrumental in their ability to see themselves moving forward in their desired path to pursue medical school. Additionally, as highlighted by most of the program participants interviewed, students enjoyed and got a lot out of hearing from individuals representing various fields of medicine, which provided further insight into medicine. Mackenzie further explained:

The workshops are actually a lot of fun... you got to see the different aspects of different medicines as a student, obviously you know some [students] like surgery and like all those high end [fields] but you never get to see how is a life of a gynecologist or how is the life of someone that practices family medicine, someone that has their own office as compared to working in the hospital. Things that are going to come, decisions that you are going to have to make once you're at that point and [the workshops] really gets you to see the whole path that you are going to have to face and instead of just being able to get into medical school.

For Mackenzie, the workshops were not only “fun” but also provided her with knowledge of various fields of medicine. Additionally, the workshops provided her with insight on life beyond getting into medical school. As a mature student, she realizes that the journey is not just about getting into medical school, but also to determine how life will be for her after medical school, such as examining the differences between working in a hospital versus having your own practice. This type of information and insight is not easily accessible to program participants, most of which who were interviewed had shared that they did not have any relatives in the

medical field. Therefore, workshops, such as the ones described by BCP program participants, are critical to their understanding and ability to enter the field.

Amie, a junior biology major who participated in level two of the program, discussed the fact that she is now considering pursuing public health due to a workshop she attended while in the program. She describes this experience:

Except the workshop that we attended, they were discussing the public health aspect and at first I didn't have any expectation of what I would see or what they would present to me. I see the disparity in the health care concerning African Americans and also Hispanics and non-whites, and how probably a different financial background impacts the kind of healthcare you receive and the different resources that are available. Some things I knew before but the workshop showed me a different angle and with that and also from having this notion of pursuing an MPH [master in public health] in medical school within that regard because I can relate to it, because it's happening in my neighborhood and I can relate to it because the financial instability in my country impacts the kind of health resources that they have there. So I can see myself pursuing public health because it's directly affecting me and all those around me within the neighborhood that I live in within these states and back home [West Africa] they're all relatable.

Amie made it very clear that the workshops were essential to her experience in BCP. She was able to relate the information she received from a particular workshop that focused on public health issues to her own experience in her neighborhood, but also in her home country of West Africa.

Overall, the experience in attending courses and various workshops offered by BCP provided students with knowledge and awareness of what to expect in the future, something that students were unable to obtain from family or their school of enrollment. As Derrick mentioned to me during his interview, the program assisted with knowing what one will face when you become a medical school student and then hopefully a physician. The interest in medicine already exists in students who are admitted into the program; however, where the program has an impact is in the ability to expose the students to a whole new side of the field that they had not had access to previous to this experience. Thus, cultural capital was transmitted via the

classroom experiences and workshops exposing students to knowledge and awareness of the medical field as well as of what to expect in the future. They no longer are “outsiders” but now have had this experience to cement their feet in this field.

Factor 4: Social Interaction

The fourth and final theme that emerged from the data collected was the social interaction that took place from participating in the program, specifically the social networks that they were exposed to and developed by their participation in BCP. Many of the program participants confirmed that they are first generation college students as well as the first in their families to attempt to pursue a career in the health field, particularly medicine. Thus, for many, BCP was their first access to a set of networks that would connect them to the world of medicine. The data acquired from participants highlights three specific sub-themes within the umbrella of social interaction, which will be further examined below are: 1) diversity, 2) peer support, and 3) sense of belonging and comfort.

Diversity. The first distinguishing characteristic of social interaction within the program that students highlighted in discussing BCP was the diversity of students in attendance. BCP sets out to serve underrepresented students, as defined by the American Association of Medical Colleges (AAMC), who are interested in pursuing a career in the health field. Therefore, the program director and admission committee are intentional about who is selected into the program, looking at both ethnic and socioeconomic markers, to provide students with a diverse environment. Many of the program participants interviewed described their involvement with a diverse set of peers and how that impacted their overall experience in BCP. While program participants varied in terms of ethnic and socioeconomic backgrounds, the program participants that were interviewed focused more so on the visual diversity when discussing diversity of the program and its impact on their experience, hence the ethnic makeup of their cohort in the

program. Alicia, a Hispanic student who attended level two of the program, highlighted BCP's diversity and how it impacted her:

Being in the program opens your eyes to seeing people like you... I feel like diversity is very important because many times there are stigmas and you don't understand each other's cultures cause you're different and it's good to know how to accept all because as a physician you're going to take all types of people. I think it's important to understand now and be able to adapt and to get along with people in different cultures, different backgrounds, different mindsets, different beliefs, different practices, different values; but one similarity is you want to be a doctor and you all want to care for people. It's good being surrounded by such a diverse group, it opens you to that, and helps you learn how to behave around people, how to treat people and then how to appreciate what they have to offer. You also learn more about yourself through them. I like that we're in a diverse community, I think that's really important because there's all sorts of people and the bigger diversity, the wider your mind is, the greater for absorbing what there is here.

Alicia had an in-depth perception on the diversity of the program and how it positively affected her. She made the connection between the importance of learning and understanding other cultures, especially as someone who aspires to become a physician in the future and is aware that she will be potentially taking care of a diverse set of patients. She also described how although her peers were different, they shared a common bond which is the goal to take care of others. Additionally, her experience with a diverse cohort of peers allowed her to learn how to treat others and appreciate what they have to offer. She realized that exposing herself to diversity would allow her to expand her mind, something she strongly felt was important. Another student, Amie, a junior biology major originally from West Africa, discussed her fear of not being understood since she finds herself being "different" than those around her in other settings. However, in the program, she did feel that she was understood by her peers and even developed a friendship with an older student who was also from West Africa. Her fears were eased and she was able to do well in the program because she was surrounded by her diverse cohort and did not feel like she was "different."

Yolette, an African American biology major in her senior year, describes her experience with diversity in the program below:

In terms of diversity I would say that a majority of us were African Americans, but there were Hispanics, there was an Indian student, so I mean diversity in terms of our experiences that we brought to the table, our cultures that we brought to the table, our different routes that we're taking to get there. Everyone has their own story, everyone has their own reason as to why they're doing this. The medical school also was a diverse setting so it was [nice] to see many different faces and for everyone to be accepted, that was really positive for me.

Yolette highlighted the fact that a majority of students in the program were from underrepresented ethnic backgrounds, such as African American and Hispanic. This was a change from what most of the students were used to seeing in their science courses in their respective college, as many of them disclosed. However, while some of them may have shared similarities with respect to ethnic background, many like Yolette realized that they were all diverse in regard to their previous experiences, cultures, path to reaching their destination, and reasons for pursuing medicine as a profession. When asked if the diversity in the program had an impact on her, Yolette had the following response:

I think it did. I understand that one of the things in the mission statement [of the program] was that it was serving underrepresented students. I think being an underrepresented individual you kind of get covered in a mindset that you and the people that look like you [are] hardly expected to get this far, but when you're placed into a setting where you see your peers working along with other different types of peers I think that brings that mindset that you have to know that things are always open. I think it was a very good thing for us to be put along other different people also in a diverse setting.

Yolette disclosed an interesting perspective about how she feels as someone who is classified as belonging to an underrepresented group in the medical field. She discussed how it is easy to acquire the belief that someone who looks like her, referring to her ethnic identity, is not expected to get far. However, participating in BCP and working alongside others at the medical school with people of, both similar and different backgrounds allowed her to overcome these

limiting beliefs. This experience reinforced her potential to make it in the medical field and had a significant impact on her. Another student who shared a similar experience was Imani, also an African American biology major in her senior year. Imani describes her experience in BCP and the impact it had on her below:

It definitely impacted that [confidence] and so BCP definitely had a focus on diversity and an appreciation for diversity. So to know that not only are you appreciating diversity at the [name of Clinic], but someone appreciates the diversity that you belong to. I feel that that made me feel that someone appreciates who you are, someone appreciates what you bring to the table, someone appreciates that you helped diversify their program. That made me feel a sense of belonging.

Imani shared that being surrounded by diversity in the program had an impact on her confidence and sense of belonging. The program's appreciation of diversity matched and reinforced her own. Imani further adds:

It was a great program to participate in and for me the program really lives out that mission and lives out [their mission] to really get more underrepresented students and individuals in the medical field. Like I said I don't see it lived out as much but to see that that mission is being carried out and to see it really come into fruition was a great thing to see. I feel that that experience was really valuable, encouraging us to continue the work that we're doing at our undergraduate institution so that we can go on to medical school one day.

Imani had participated in other summer enrichment programs prior to her experience in the level three of BCP. Therefore, she was able to compare her experience in BCP with other programs that had similar missions of supporting underrepresented students. She shared that her experience at BCP was different because she experienced the commitment to diversity and witnessed the program's commitment to supporting underrepresented students with an interest in the medical field. She confirmed that the program was valuable and encouraged her to continue on the path to medical school. Thus, Imani affirmed the impact that the program's diversity and commitment to diversity had on the overall experience in the program as well as the viewpoint

on one's ability to pursue the health field in the future. The next section will discuss a second sub-theme of social interaction: peer support provided by participation in BCP.

Peer Support. The second sub-theme of social interaction was the peer support, the relationships formed between the students in the program, through participation in BCP. All seven of the students interviewed for this study discussed the peer relationships and support established during the program. Many identified peer relationships as a highlight of the program. Overall, students mentioned group work, the ability to study together, and the overall support provided by positive interactions as the reasons peer relationships were significant parts of the program.

Participants mentioned that the program taught and encouraged them to learn how to work better in a group setting. Their opportunity to volunteer in a clinical setting also reinforced the importance of working well in a group in the medical field. Yolette, a senior biology major, discussed the group work that took place in one of her courses and how that served as preparation for entering the health field:

Yeah, so within the level you chose groups to work [with]. For our genetics we had labs every week so you switched your group. That was something that was really helpful because we were not working with the same person all the time, but we did have a permanent group that we worked on our symposium project for. It encouraged feedback from everyone in our level, that this is what we're doing, you know, practicing presenting to get their feedback on how we're doing, so that was a lot of collaboration that went on... I think it's just another preparation in terms of in the field we're going to be working on. When I feel a patient has multiple things going on there's not just one doctor there's several, so you have to get in the mindset that you will be working as a team and there has to be not just communication, but effective communication to know that you're not in this by yourself, that it's a group effort, but you're working for one cause which is to get the patient better.

As Yolette described, she found it helpful to work with different groups and gain the input and feedback from various peers throughout the course of the program. She was also astute in realizing the connection between the intentional group work in BCP and how clinicians in the

medical field operate. Derrick, a junior cell biology and neuroscience major, further discussed this connection between group work and the medical field:

Of course because when you think about medicine it's all about group work. Now as the medical field is more changing towards more socialization and they're adding to [the] MCAT sociology and psychology because medicine now is getting more of, not the private office medicine but it's getting more residents working together or interns attending physicians and supply a good health care system, that's what it is with medicine now. I guess grouping and getting to know different ethnicities and how they think about something in the medical field, it opens your eyes on more ethical issues and maybe how this person would deal with this specific issue compared to this person. It opens your eyes on diversity which is a cool topic here in the United States.

Derrick discusses how the program allowed him to understand the growing importance of the social aspect of health care, including its inclusion on the new Medical College Admission Test (MCAT), which every student wishing to enter medical school needs to take. He highlighted how the program's emphasis on working with individuals of different backgrounds helped to expand his social perspective and prepare him for the contemporary practice of healthcare.

Another participant, Alicia, a junior biology major who participated in level two of the program, discussed how the difficult work was made easier to complete because everyone in the program shared a common goal with their interest in the health field as well as a similar work ethic. She stated that completing the group work was "very fair and it was understood, everyone did their part." Dante, a senior biology major who participated in level three of the program, discussed how working with others provided necessary input and support:

You always need input from other people, and this [group] was students who were also in my class [and] were all pre-med, so we've all taken the same kind of classes...we all had that medical background, so we really helped each other in some places. If you needed help with a certain element you were researching on, like if I knew something more about it I could explain to you. So we helped each other.

Dante described how students in the program helped each other through providing their input or serving as a resource if someone else was unsure of a particular topic or how to do something.

As he mentioned, it was helpful that students had common knowledge and interest in areas pertaining to the medical field, which facilitated working together and made it a smoother process. Another program participant, Mackenzie, highlighted how this community assisted each other by studying together as a group. She described how the group would keep each other going, saying to each other when it was 1 o'clock in the morning, "it's okay because you know we have an exam tomorrow and just keep going cause it's going to be worth it in the end." This support enabled the group to persist, providing the social support to not give up on the goal and to do their very best.

Finally, many of the participants mentioned how their peers created a positive, friendly environment within BCP, serving as academic and emotional supports while maintaining the rigorous learning environment intended to serve as an enrichment program. Alicia, a junior who participated in level two of the program, mentioned how the group looked out for each other and would offer car rides for those who commuted. She also described the program as both friendly and competitive:

I think it was both. I think it was very friendly like during lunch period it's very friendly and we'd all eat together at a big table. But competitive, not in a bad way, I wasn't trying to beat other people. There was never a time where you felt like 'oh I'm going to beat them' or [peers would ask] 'oh what's your score.' I understand be competitive, I understand everyone wants to do well and I think the competitive atmosphere just pushes you to do well, but it doesn't [mean] you have [to have] bad relationships. So that was nice.

Alicia appreciated that the environment was both friendly and competitive. It allowed her to established positive relationships with her peers, but also to keep persisting in the academic classes in the program because she and her peers wanted to do well. Another participant, Derrick, described how he had a positive relationship with his peers and how a "clique of soccer fans" developed in the program, where they would watch soccer games from the World Cup

while eating lunch in the cafeteria. Dante, another program participant, stated how the program was much more friendly than competitive. He described how he did not know anyone when he first started the program, but how by the second week everyone was friendly as they worked together in class and traveled to their clinical volunteer sites together. They developed such a good relationship that Dante still speaks to his peers today, maintaining the social networks developed beyond the program.

Overall, program participants highlighted the peer social networks established in BCP as an essential component of the program and of their learning. These networks provided participants with support, academically, socially, and emotionally, not only in the program but also beyond. From learning how to best work together in groups, pushing each other to do well by studying together, and creating both a friendly and competitive environment, capital was transmitted among these community that students have taken with them after completing the summer program.

Sense of belonging & feeling comfortable. The third sub-theme of social interaction within BCP was the participants' sense of belonging and feeling comfortable in the program. Each of the seven students interviewed described different aspects of the program that not only contributed to their overall sense of belonging and comfort within the program, but more importantly their sense of belonging in the medical field. Enabling students to feel comfortable and as if they belonged increased their confidence and empowered and motivated students to reach their goal of entering medical school.

One major contributor to program participants' overall sense of belonging was the fact that the program actually took place in a medical school. Imani, a senior biology major who has

participated in several other summer enrichment programs, commented extensively on the fact that BCP took place in an actual medical school:

The fact that the program takes place in the medical school helped tremendously. Not only did you get a feel of what classes are like, of what note taking in medical school was like, of what the professors in medical school was like, but you also got a feel of the culture of medical school. So aside from the academic side you [saw that] everybody has a locker, everyone has a quiet study space that they can study in medical school. Everyone has a universal lunch time of 12:00 to 1:00, there's different clubs or organizations that you can join in medical school to whatever your interest is, so there can be a club for students that are interested in internal medicine, there can be a group of students that are interested in OBGYN, so those groups go out to a special field and hospital and maybe do community health or rotation at Robert Wood Johnson Hospital that caters to their individual focus of something that they would want to carry out in residency. So you got to feel the culture of a medical school which I feel helps out a lot. You know, anyone can really sit down and know about academics and be taught information and spit that out back on an exam. But you got a feel of the culture, you got a feel of other ways that you'll be tested so that you can know what the complete package of a doctor should contain. So humanism, empathy, professionalism, punctuality, you got to learn all these different things through the program...I think the program helped out a lot in terms of showing you the 360 view of what a medical school student has to accomplish to do great in residency and after residency.

Imani's description of her experience in the program clearly demonstrates her sense of belonging due to the program's location taking place in an actual medical school and having access to individuals from the school. It was not just the fact that the program was located in the medical school, but what students gained from being exposed to that setting. Imani, along with the rest of the program participants, were able to witness the ins and outs of medical school, the "culture" as she describes it. Imani spoke of how the number of other underrepresented students in BCP impacted her sense of belonging. Imani describes her experience:

So you feel that encouragement, you feel that support, you definitely feel that sense of belonging and diversity is great, but it's also encouraging to see that underrepresented students in the medical field are here now training together, working together and there may not be many of us out there in the profession now, but there's a lot of us here in the summer program. I feel that all of us are going to make it and we're all going to do great and we're going to increase that percentage one day, give us six or seven years, I don't know. So it was reassuring to see that and it was encouraging to see that and I definitely felt I belonged to the group.

Imani was encouraged by the diversity in her cohort as well as the diversity in the medical school students she encountered during the program. She was adamant that she, along with her peers, would be successful in joining the medical profession and increase the number of underrepresented physicians in the field. Her cohort reassured her and it gave her a sense of belonging.

Another student who shared Imani's view on how the diversity impacted her sense of belonging was Amie, a first generation college student who participated in level two of the program. She described her experience with the program and feeling as if she belonged:

There were a lot of us with different backgrounds so I didn't feel like an outlier or an outsider, I felt [I fit] right in. I felt comfortable like I'm one of the team...I fit in well because the diversity within our class and the whole group overall were very different and it was wonderful to see that. So I fit right in... aside from the students that were in my class, because I think it was a very diverse group of students that we had, but seeing the diversity among the medical school students was like you know that I could fit here, seeing that there was other women there, seeing that there was other African Americans there, seeing how everyone was open...So knowing that the environment of the school was just very positive.

Amie witnessed not only a diverse group of peers experiencing the program along with her, but also witnessed a diverse group of medical school students. This allowed her to feel comfortable and not feel like an "outsider." In addition, Amie credits the teaching assistants for providing her with a sense of comfort, which led to an increased confidence level:

They tell us what to do on interview day or taking the MCAT. So they fostered that aspect well, I guess that's what I would say increased my confidence level because I am looking at them as someone who's been through it and survived through it, so I will be able to do the same thing because I feel like I really want that. I'm comfortable, I'm confident, so I'll be able to do as well as they did or better.

Once again, Amie looked up to the teaching assistants as individuals who had been through what she is currently experiencing. She saw them as people she could look up to and model, inspiring her to persist because she too can achieve her goals of entering medical school one day.

Mackenzie, a post-baccalaureate student who completed all three levels of the program, confirmed that going to medical school felt “more doable” after attending the program; the program provided her with a sense of belonging in medical school since she felt welcomed by the school. She stated:

I would say since the program took place at the medical school I was able to see medical school students and how they went about their day, be able to talk to them and see how they deal with the rigors of work and time management, can you have a life while you're in med school or not and I felt it just brought a lot of light into that aspect of it... I saw that people with different stories were able to do it well. There were people that I met that didn't get the MCAT score they wanted in the first try or took a year off to see if they really wanted to do it or work, and even throughout all of that they still got into med school. So I felt like it is something that's attainable and then if they can do it and be able to still succeed in medical school I feel like I would be too.

Mackenzie appreciated being in the medical school and more importantly having access to medical school students, who were more than willing to share their experiences with getting into medical school. She realized that everyone has a different journey and story, not everyone gets in right away. Knowing the struggles of other students who have been successful in getting into medical school has provided her with comfort and a renewed sense of being able to accomplish her goals.

Derrick and Dante, the only two male students interviewed during this study, also confirmed that the location of the program contributed to their overall sense of belonging, which resulted in an increased confidence level. Dante described his experience as the following:

It made me more comfortable, I don't know if you've ever been to Robert Wood Johnson, but sometimes like the whole building itself looks kind of, sometimes you don't know what to expect basically. Someone in my position knowing that this is what I want to do for the rest of my life, Robert Wood [looks] like it could be depressing sometimes [because of] the building itself. Being in there attenuated that, took that away, it was like 'this is way more fun than I thought'... It's like everything else in life as soon as you get to see it, it becomes less threatening. Just being there and knowing that this is what you got to do, I'm that kind of person, as long as I know what I need to do yeah the other part I can take care of that personally. I don't have to be scared of the rigors and the workload

of medical school. So being in BCP showed me, ‘okay so I know I’m going to spend at least six hours a day doing more,’ so it showed me the ropes basically.

As Dante recounted, the medical school felt daunting and unreachable to him just as someone looking in from the outside. However, being exposed to the medical school and made to feel as if he was part of the community demystified the process. Additionally, Dante shared with me that although he knew that he wasn’t a medical school student at the time he was in the program, the experience made him feel like he was and that he could do it.

Alicia, a junior who participated in level two of BCP, shared the same sentiment as her peers in stating that the program reduced her feelings of intimidation and increased her sense of comfort due to the location of the program. She describes her experience:

It helped boost my confidence especially because we were in the medical school itself. It’s nice, maybe we weren’t taking the classes that they [medical school student] were taking but just being in that environment and you’re seeing the students there and talking to our instructors, it’s nice to see that it’s actually possible and you’re in that environment, you feel that you’re not necessarily doing the same things but you feel it...I think it made it not as scary, it actually made it comfortable...it didn’t feel foreign anymore because we were going there every day for many weeks. You think it’s very intimidating before you go, but after being there every day and in the classrooms that they would be studying... it just made it comforting knowing that you could fit in there. It wasn’t as scary anymore because we actually got to experience how the environment was there. So I liked that they keep the program within the medical school and they don’t place you in another building somewhere else.

As mentioned by several program participants, attending BCP at the medical school demystified the school; it made students feel less scared and less intimidated. Alicia was comforted in knowing that she was participating in lectures and classes in the same space as medical school students. It further solidified her decision in pursuing entry into medical school as it gave her a sense of what to expect in the future. She stated that attending the program “felt like okay now I’m in here and I’m going to be in here for real later on,” providing her with the confidence that she would be back in a medical school in the future as a medical student.

Summary

In conclusion, this chapter presented and summarized the four principal means through which program participants acquired cultural and social capital by attending the Biomedical Careers Program, a program intended to effect underrepresented students' preparation for medical school. The findings, which arose from interviewing seven participants, highlight the transmission of cultural and social capital through the following four main themes: 1) informal mentorship and guidance, 2) social learning through clinical exposure, 3) academic study, and 4) social interaction. The next chapter presents an analysis of the participants' experiences while in BCP and how the program impacted their preparation for medical school. The upcoming chapter will draw conclusions from these findings about BCP and provide implications for institutions to improve practices that support underrepresented students' preparation for medical school. It will also provide recommendations for program revision and further research on BCP and similar programs.

CHAPTER V

DISCUSSION, IMPLICATIONS, AND CONCLUSION

The aim of this study was to learn more about the Biomedical Careers Program (BCP) at Rutgers Robert Wood Johnson Medical School; specifically, the study aimed to obtain information, in the form of student perspectives, to assess and evaluate the BCP's ability to effect the preparation of underrepresented students for medical school. The rationale for this study is the disjunction between the changing demographics in the U.S. population, the insufficient number of students from underrepresented populations attending medical school and the lack of underrepresented physicians in the field. In light of this disjunction, there is a need to research preparation programs designed to increase the number of underrepresented students entering medical school.

This chapter discusses the findings of this study in relation to the literature presented in Chapters One and Two of this dissertation, specifically using the research question as a framework. While there is one primary research question, the findings are divided and discussed in four sections based on the themes that arose from the qualitative data collected, each of which will be further analyzed in this chapter. In addition to providing analysis, I will offer implications for practice as well as limitations and opportunities for further study. Before engaging in a discussion of this study's findings, I offer a summary of the research journey of this study.

The Research Story

As someone interested in learning more about underrepresented students and their preparation for medical school, I embarked on a journey to study specifically the Biomedical Careers Program (BCP), a well-known six-week summer enrichment program at Rutgers University, specifically offered by Robert Wood Johnson Medical School. The literature

confirms that there is a need to increase the number of underrepresented students entering medical school, which would impact the number of underrepresented physicians in the field across the country (Butler, 2011; Lowe & Pechura, 2004). Thus, many initiatives, including summer enrichment programs, have been developed with the goal to improve the preparation of underrepresented students in college in order to increase the number of students being admitted into a medical school. However, while there is a demonstrated need to increase the number of underrepresented students in medical school, we are currently experiencing a time where federal funding has been cut significantly for pipeline programs, with many agencies, including the federal government, scrutinizing the efficiency and effectiveness of initiatives designed to increase access to underrepresented students within the different health programs. This has been confirmed by the BCP director, Cindy Ford, who informed me that BCP has faced funding challenges, with federal funding having been cut and requiring the medical school to incur the costs of continuing to run the program.

A review of current literature on this topic revealed a lack of qualitative evaluations; most studies have been quantitative and outcome driven, focused on the percentage of students graduating and moving on to health related professions (Cantor, Bergeisen, & Baker, 1998; Carline et. al., 1998; Strayhorn & Demby, 1999; Tekian & Hruska, 2010; Winkleby et. al., 2009). However, the studies that have been completed report a positive association with the number of underrepresented students entering a medical school who have participated in an enrichment pipeline program or evidence of programs having some impact in diversifying the health professions (Carline, Patterson, & Davis, 1998; Strayhorn & Demby, 1999; Winkleby et. al., 2009). This research study emerged in the context of a demonstrated research and social

need to investigate further an enrichment program focused on preparing underrepresented students with an interest in pursuing a health profession.

BCP, like most other pipeline programs, had never been formally studied. While anecdotal evidence existed that BCP is a successful program, there had not been a formal study of the program aside from an evaluation questionnaire that participants complete at the end of each program to provide feedback. Thus, BCP was a prime candidate for a systematic research study. In addition, this study took place at Rutgers University, specifically the Robert Wood Johnson Medical School (RWJMS). Rutgers University, which has over 65,000 students within the various campuses throughout New Jersey, was founded in 1766 and has since become “a leading national research university and the state’s preeminent, comprehensive public institution of higher education” (“Who We Are,” 2014). Additionally, Rutgers is known across the country for its diversity, with “more than 80% of students receiving financial aid” and “more than half of the incoming class self-identifying as non-Caucasian” (“Facts & Figures,” 2015), making it a prime location for this study.

A qualitative study method, employing open-ended, semi-structured interviews and review of program documents, was selected and implemented to address the lack of qualitative research on health professions pipeline programs. Additionally, I was most interested in hearing the student perspectives on the experience within the program in order to provide them with an opportunity to help shape recommendations for BCP as well as programs across the country. This study has attempted to bridge the gap in the literature by examining the BCP program in light of the research question: How does BCP (consisting of academic skill development, social engagement, and health care awareness) effect underrepresented students’ preparation for medical school? The findings, as presented in Chapter four, demonstrated that the BCP prepares

underrepresented students for medical professions via the transmission of cultural and social capital: 1) informal mentorship and guidance, 2) social learning through clinical exposure, 3) academic study, and 4) social interaction.

Informal mentorship and guidance. BCP documents mention that they offer mentorship opportunities; however, BCP does not have a formal mentorship program. Specifically, BCP participants are not assigned to a mentor while in the program. Instead, BCP offer opportunities where students are able to engage with others, including medical school students and health care professionals, in less formal ways, such as seminars and classroom settings. Despite the lack of a formal mentorship program, program participants were affected by the informal mentorship and guidance received in BCP, whether it was through a relationship established with course professors, teaching assistants, the program director, or health professionals such as physicians, nurses, and other professionals whom they met during shadowing and volunteer opportunities offered by the program. Informal mentorship and guidance was a consistent theme that arose from interviewing each of the program participants in this study, specifically serving as a source of information and source of support for participants.

The first sub-theme was that informal mentorship and guidance served as a source for information for program participants. For many of the participants, the course professors and the teaching assistants in the program, who were medical school students, informally served as mentors, answering questions specific to the program or about what to expect in the future as they persisted in their journey to get into medical school. One participant, Alicia, identified the teaching assistants as the most important of all the mentors in the program:

I think that the teaching assistants were the ones who were the biggest mentors especially to me because both of them were medical students but they're also the ones you keep in touch with and they're also the ones we spent a lot of time with even if it wasn't class time, like we have to study before our exam, but aside from that they were also just open

to like 'hey during lunch time if you guys want to talk we're here' and you could talk to them, or they would eat there with us, things like that.

Students identified course professors, teaching assistants, and program staff, such as the director, when identifying mentors. These individuals were available to students at the program site.

However, in addition to valuable interactions at the program site, students also identified their shadowing and volunteer locations as sites that provided them with opportunities for informal mentorship. Students were exposed to various individuals, serving as informal mentors, in the network they were provided with by their participation in BCP.

In addition to serving as a source of information, participants highlighted that the informal mentorship received served as a source of encouragement and support. They described their informal mentors as individuals who provided positive reinforcement, reassurance, a realistic and non-judgmental viewpoint, and the idea that making it to medical school is possible. Many of the participants have faced obstacles and challenges, almost giving up hope on their aspiration to pursue a health profession; however, they described the informal mentorship and guidance they received in the program as instrumental to their ability to persist. For example, Mackenzie, a student who had already completed her undergraduate degree and was a post-baccalaureate student at the time of the interview, described several challenges that she faced when we met. She described the impact of a relationship she developed with her professor, an informal mentor that had impacted her significantly during her experience in BCP and ultimately affected her ability to persist:

During that time my mom had just been unemployed and everything was a mess in my life so I didn't really, the goal of being able to go to medical school and everything was just becoming further and further away. Meeting her really helped me out because I could explain to her and she was a listening ear and she always supported me and always said that I could do it, and it just made it a lot easier to cope with everything that I had to do and it just got me up on my feet again.

Mackenzie exemplifies the various stories heard from the research participants; individuals who experienced several obstacles and challenges, including self-doubt and anxiety in their belief that they can achieve their goal of becoming a health care professional. Participation in the program provided students with a network of individuals who were able to serve as both a source of information and a source of support.

A review of the literature in Chapter Two revealed that mentorship, especially for underrepresented students, is a critical component within a pipeline program, as has been confirmed by several publications (Barlow & Villarejo, 2004; Carline et al., 1998; Kreuter, Griffith, Thompson, Brownson, McClure, Scharff, Clark, & Haire-Joshu, 2011; Lowe & Pechura, 2004). Kreuter et al. (2011) argue that successful strategies for those seeking to increase workforce diversity in the health professions include building a community of minority students and providing a diverse set of mentors. This study further confirms the importance of formal or informal mentorship as described by the findings. Mentorship does not necessarily have to take the shape of a formalized mentor-mentee relationship, where students are assigned to someone specifically. In some cases, a formalized relationship could limit the number of other significant interactions that could take place with valuable individuals. As the findings of this study demonstrate, students need to be exposed a variety of individuals, such as medical school students similar to them and health care professionals, that are able to provide them with diverse perspectives. There needs to be some assurance that members of this network, within the program are aware of the importance of sharing their insight with students as well as the importance of providing support for underrepresented students aspiring to become health care professionals. BCP may want to ensure, moving forward, that more attention and focus are

placed on whom they select for interacting with students in the program to ensure that students are receiving appropriate mentorship, even if it is informal.

Social learning through clinical exposure. BCP clearly promotes the fact that it provides program participants with opportunities to expose themselves to health care delivery via first-hand opportunities to shadow and/or volunteer in clinical settings. As mentioned in Chapter Two, for the BCP program developing an awareness of the delivery of medical care in underserved communities is critical and therefore program participants are exposed to various aspects of health care delivery at every level of the program. However, there was a clear gap in the literature review on research pertaining to the importance of exposure to health care delivery on underrepresented students' preparation for medical school. Philips et al. (1981) found that underrepresented students who participated in a summer program that focused on exposure to health care settings, where participants rotated through hospitals and teaching facilities, in addition to academic and interpersonal skills, were employed in health professions at a much greater proportion than a comparison group. While the focus of the research study did not look quantitatively at the number of students from BCP successfully gaining admission into a medical or other health professional program, the study did find that program participants highlighted clinical exposure received in the program as a significant component of the program.

The clinical exposure component of BCP affords students the opportunity to learn more about the medical field directly from practitioners in a clinical setting. While students are not allowed to have hands-on experiences since they do not have the education or experience to provide direct care, they reported that they truly valued the opportunity to observe significant interactions among health professionals, as well as interactions between professionals and their

patients. Imani, a senior biology major who participated in level three of the program, describes an example of shadowing experience:

Sitting in the lunchroom with them because we were there from like 9:00 to 2:00 or 9:00 to 3:00, so you got to view, you got to go through the whole day from the time that a doctor comes in in the morning time and sets their coffee and oatmeal down to the time that they do the ten patients in the morning, they have their lunch, what do they talk about at the lunch table, from the time that the second half of the day might be the residents might be shadowing them as well or they might be overseeing the residents, so you see what happens in a debriefing meeting when the residents come back in, so it made you just see what a doctor can do. Not only do you go from practicing, but then you can go to teaching as well if you choose to do that and being a mentor and a guide for residents to follow after you. I was able to see all of it and that was great.

Imani was excited by the opportunity to see all that took place in a daily routine of a physician, from having a morning coffee, to seeing several patients, having lunch, and overseeing a debriefing meeting with other health care professionals. Additionally, program participants were provided the opportunity to learn about and practice the day to day norms that exist at a health care facility, such as washing one's hands and providing patients with an introduction instead of going right to diagnosing an issue. Overall, the clinical experience provided by BCP allowed students to become comfortable in a medical setting, establish relationships with health care professionals, learn about health care norms, and ultimately envision themselves as a health care professional in the future. These are all forms of social and cultural capital.

The data from BCP participants gathered in this study will add to the literature on the importance of exposure to clinical settings and health care delivery for students interested in a health care profession, especially for underrepresented students who tend to lack their own networks to gain that exposure on their own. These findings support the recommendation that BCP staff should certainly continue to offer clinical experiences and exposure to the field, and possibly consider increasing the number of hours that students are able to shadow and/or

volunteer since many research participants mentioned that it is currently only available to students one day a week during the six week program.

Academic study. The Biomedical Careers Program is distinguished as an academic enrichment program, designed to provide academic preparation for underrepresented students interested in a health profession. The academic skill development component of the program consists of science courses, lab work, research, clinical experiences, MCAT preparation, and seminars. Students who apply to the program are informed of this component from the onset, so it is clear what they would be receiving academically if accepted into the program. From the program viewpoint, it is evident that the academic skill component is a significant component of the program, which is demonstrated by the program logic model included in Chapter Two as well as the promotional information available on the program via their website. As this research study sought to answer how the program prepares underrepresented students, academic study was the third theme that arose from the study's findings. Research study participants consistently discussed the aspect of academic preparation provided by the program as a key factor. The academic preparation was described as providing knowledge from two key areas: 1) the classroom and 2) supplemental workshops, both of which provided students with an awareness of what to anticipate in the future as they progress on their career path.

The first sub-theme of academic study that arose from research participants was that knowledge was received from the specific classes that they took while enrolled in the program. BCP offers courses such as Organic chemistry, Genetics, Immunology and Neuroscience, which students take based on the level of the program that they are accepted and enrolled into over the summer. These courses are real undergraduate courses, consisting of homework, exams, and a final grade, with the hope that this will prepare students for similar courses when they return to

their undergraduate institution after completion of the program. Program participants expressed more concern with their lack of study skills than in their ability to grasp the course concepts.

Alicia, who attended level two of BCP, exemplified this when she discussed her experience with me. She had disclosed to me that she thoroughly enjoyed her courses and credited how they were structured with assisting in her learning. She described her experience to me, which I included in Chapter Four and will reiterate here:

The [name of professor] is great and I liked the assessments he had and seeing how you study, how you learn and how we do like different study strategies, I felt those were very helpful and how to time manage. In fact the way he taught us to time manage which is something how I do now, my time I schedule is fit to that how he said, and you have daily planner and it's very organized. I have a Google calendar and I implemented that here, junior year after that, I implemented it for the summer because I wanted to organize because I not only was going to BCP I was also, I had to go home and I had chores to do, I had a job. So it just helped me structure my time.

Alicia explained how she gained other valuable skills while enrolled in her specific course with the particular professor, which ultimately led to her academic success. Additionally, she learned more about herself through self-assessments and by learning time management skills. Another student, Mackenzie, who attended all three levels of BCP, spoke to me about her level three academic experiences. She also exemplified how she was able to grasp the science coursework much differently through BCP:

I'm so used to seeing, while taking classes at [name of college] just basic science, you can't really relate it to medicine and you can get unmotivated by that cause you're [thinking] when is this really going to click, when is this going to work. I felt [that] the classes that I took that year [in BCP], they were able to bring it together, [you are] able to see how the diseases, using the basic sciences that you've learned, how those diseases work and how they impact others, and just brought it to a more holistic view of it.

Mackenzie reflected on her inability to grasp the connection between science and medicine via the science courses she had taken at her undergraduate college of enrollment. BCP provided her with the opportunity to engage in a different learning experience, one that allowed her to see the

connection between medicine and science because of how her professor taught the material of the course. She described her BCP experience as one that provided her with a more holistic view of science and medicine, thus impacting her academic success.

Overall, it appears that students were much more engaged in their BCP science courses, perhaps because it was a smaller number of students in the course allowing for professors to not just teach the material and have students regurgitate the information back to them. Instead, there was more interaction between students and their professor to facilitate their learning, as well as more application of tools and resources to assist with their overall understanding of the material. Again, this example of not simply learning “about” something, but rather learning “how to learn about something,” is a form of social capital.

The second sub-theme of academic study that arose was that knowledge was obtained from the supplemental workshops offered by BCP. Each week, the program provided participants with the opportunity to sit through a workshop on topics ranging from health issues to ethical dilemmas to different career paths in health. Participants found the workshops informative and enriching sources of much needed guidance. An example is offered by Mackenzie, a student who attended all three levels of BCP and was able to provide much insight into the program:

I had a lot of workshops which I found really helpful. The main one that I can remember is financial aid in medical school and how to be able to pay for it, which I found to be really helpful cause many people just want to go to med school, but I know that I need to start thinking about money cause I'm the one that's going to be paying for all of it. So I found those workshops to be helpful. They also did workshops involving different fields involving family medicine and different fields that are not just specialties which I found to be very informational.

Mackenzie, along with the other research participants, confirmed that BCP provides students with workshops that discuss how to pay for medical school as well as the different fields and

specialties within medicine. None of the program participants have family members who are in the medical field and can provide them with much needed insight or guidance in the process of getting into medical school; students are required to learn on their own through trial and error. However, BCP provides students with all of the information needed, in the form of both academic enrichment coursework and workshops, to ensure that students have the social and cultural capital to navigate the pathway to gain admission into a health professional program and avoid unnecessary mistakes that would hinder their chances of gaining admission or force them to take a much longer path to reach their end goal.

It is not surprising that BCP has an academic component as the literature research demonstrates that most programs aimed at assisting underrepresented students enter the health field provide an academic enrichment component. The reasoning for offering an academic component is as follows. Much attention has been placed on the fact that inequalities within the education system in the United States exist and have significant impact on the trajectory of students looking to go into math as well as science intensive fields (“Improving diversity in the health professions,” 2010). Additionally, the Sullivan Commission, which was established in 2003 to make policy recommendations to address the lack of diversity within the health field, specifically recommended students are provided with academic enrichment opportunities in the sciences both within and outside of the classroom (W.K. Kellogg Foundation, 2004). Hence, it is not surprising that BCP, a well-known and longstanding program, provides its participants with academic preparation.

Consequently, learning the details of students’ experiences in the academic component of BCP can provide essential information for program improvement. Gaining admission into a medical school is extremely competitive and while schools are looking at applicants holistically,

I know as a pre-health advisor myself that emphasis is placed on a student's academic performance in college as well as any post-baccalaureate work completed. Additionally, as confirmed by program participants, the academic coursework necessary to apply for admission is rigorous; therefore, it is imperative that BCP have and continue to have a focus on academic enrichment as a critical component of its program. It is also significant to see that BCP does not solely place attention on the academic coursework, comprised of science based courses, but also uses supplemental workshops to provide additional academic resources and knowledge. Whether it is hearing about a current research project underway at the medical school or how to pay for medical school once you get there, this information further enhances a student's academic background in preparation for a health career.

Social interaction. The last finding from this research study is the social interaction that took place from participating in the program, specifically the social networks that students were exposed to and developed by their participation in BCP. This area of the program is less conspicuous and evident in the promotional website of what students should anticipate from attending the program. However, it was a very important piece of what students obtained from participating in BCP and an aspect of the program that was similarly found in other programs as per the literature review completed. Once again, the Sullivan Commission has played a significant role in addressing the lack of diversity in the health professions and has called on colleges and universities to support socio-economically disadvantaged students with an interest in health by providing an array of services, including mentorship and career counseling (W.K. Kellogg Foundation, 2004). However, the definition of social engagement amongst the various programs, with similar goals as BCP, across the country varies.

For BCP, social engagement does not only refer to mentorship, career counseling, and guidance, which were apparent in the other findings already described. Instead, for program participants, many of whom are first generation college students as well as the first in their families to attempt to pursue a career in the health field, BCP provided them with more than just social engagement: a set of networks connecting them to the world of medicine. Data collected demonstrated a key finding of the program, which is to provide students with an environment that promotes social interaction. Three specific sub-themes within the umbrella of social interaction were highlighted: 1) diversity, 2) peer support, and 3) sense of belonging and comfort.

The first sub-theme of social interaction highlighted by BCP participants was its diversity. As mentioned in Chapter Four, the program takes its charge of focusing on the preparation of underrepresented students seriously. Hence, the admission committee for the program is intentional when selecting applicants for BCP. The effort that the committee makes to select its cohort is noteworthy as program participants highlighted the diversity of the program when discussing their overall experience with BCP. While BCP participants varied in terms of ethnic and socioeconomic backgrounds, students focused more on the perceptual diversity when discussing the program and its impact on their experience. Students highlighted how they enjoyed seeing students that looked like them. Many of the participants were African American or Hispanic and noted that this was a change from what they had been used to in their normal science courses at their respective undergraduate institutions. Alicia, a Hispanic student who attended level two of the program, shared what it was like to see students that looked like her. She not only appreciated seeing other students of underrepresented backgrounds pursuing the health professions, but also valued the opportunity to learn from other students:

Being in the program opens your eyes to seeing people like you...I feel like diversity is very important because many times there are stigmas and you don't understand each other's cultures cause you're different and it's good to know how to accept all because as a physician you're going to take all types of people. I think it's important to understand now and be able to adapt and to get along with people in different cultures, different backgrounds, different mindsets, different beliefs, different practices, different values; but one similarity is you want to be a doctor and you all want to care for people. It's good being surrounded by such a diverse group, it opens you to that, and helps you learn how to behave around people, how to treat people and then how to appreciate what they have to offer. You also learn more about yourself through them. I like that we're in a diverse community, I think that's really important because there's all sorts of people and the bigger diversity, the wider your mind is, the greater for absorbing what there is here.

Another example demonstrating students' appreciation for the diversity in the program was provided by Yolette, an African American biology major in her senior year. Yolette reflected not only on her peers' ethnicity when discussing the diversity, but also was astute to how each student had "their own story," as she called it. Each student brought a unique set of experiences and the program provided opportunities for the participants to share them and learn from each other as they prepare to enter a field where they will need to serve people of all backgrounds. This sub-theme highlights the importance of programs, including BCP, staying true to their mission and ensuring that they are assisting underrepresented students as is identified by the national associations including the AAMC. Diversity within BCP and the ability for students to attend the program with other students with whom they can identify positively impacted their overall experience as it affirmed the program's commitment to their mission.

The second sub-theme that research participants highlighted was the peer support, defined here as the relationships formed between the students in the program through participation in BCP. This was identified as a critical component of the program by all of the research participants. Students mentioned group work and the ability to study together as important forms of peer relationships and the overall support provided by these positive interactions as a significant effect of the program. Interestingly, students identified the

importance of learning how to work together as an important skill that transcends into the medical field. An example of this was provided by Derrick, a junior cell biology and neuroscience major:

Of course because when you think about medicine it's all about group work. Now as the medical field is more changing towards more socialization and they're adding to [the] MCAT sociology and psychology because medicine now is getting more of, not the private office medicine but it's getting more residents working together or interns attending physicians and supply a good health care system, that's what it is with medicine now. I guess grouping and getting to know different ethnicities and how they think about something in the medical field, it opens your eyes on more ethical issues and maybe how this person would deal with this specific issue compared to this person. It opens your eyes on diversity which is a cool topic here in the United States.

Derrick, along with many of his peers, reflected on how the program's emphasis on working with individuals of different backgrounds helped to expand his social perspective and prepare him for the contemporary practice of healthcare. Knowing how to work with others is becoming a more critical aspect of the medical field, as observed by the students during their clinical exposure in the program. Additionally, there is a growing need to understand the social aspect of health care, reflected by the new Medical College Admission Test (MCAT) released this year. Therefore, while not a focus of many former studies of pipeline programs for entrance into medical school, working together is an important concept that was identified in this study. In addition to learning how to work as a group, many of the participants credited their peers for creating a positive, friendly environment within BCP, serving as academic and emotional supports while maintaining the rigorous learning environment. They not only worked together in the classroom, but also studied together outside of their classes, motivating each other to keep going.

These peer relationships were described as an essential part of the program with consequences and effects that transcended the program, as many students have stayed in touch

outside of the program after its conclusion. While it is not a prominent aspect of what the program claims to do, the peer relationships that result from attending the program are evidently an important aspect that should be factored in when planning the program, perhaps ensuring that classroom activities promote peer collaboration for example. This study has used the theoretical concepts of social and cultural capital to give some larger meaning to discrete program activities and participant perceptions. BCP promotes particular learning activities, such as group work and study groups, as forms of peer support and collaborative learning. The findings of this study suggest that the meaning and effects of these activities transcend the program, and have consequences for participants in larger social life. This is precisely what Bourdieu and others have called social and cultural capital, and what BCP transmits to its participants.

The last sub-theme within social interaction was students' sense of belonging and comfort. A very interesting point is that while completing the literature review for this study, not one study addressed the need for students to become comfortable with the medical school environment, a key element of BCP confirmed by this study. Interviewing BCP participants confirmed that by feeling comfortable and as if they belonged led to an increased level of confidence as well as empowered and motivated students to continue in their path in pursuing medical school. Major contributors to program participants' overall sense of belonging included the diversity and peer support found in the program. However, one of the most significant factors was that the program actually took place in a medical school. A prime illustration was offered by Imani, a senior biology major who has participated in several other summer enrichment programs:

The fact that the program takes place in the medical school helped tremendously. Not only did you get a feel of what classes are like, of what note taking in medical school was like, of what the professors in medical school was like, but you also got a feel of the culture of medical school. So aside from the academic side you [saw that] everybody has

a locker, everyone has a quiet study space that they can study in medical school. Everyone has a universal lunch time of 12:00 to 1:00, there's different clubs or organizations that you can join in medical school to whatever your interest is, so there can be a club for students that are interested in internal medicine, there can be a group of students that are interested in OBGYN, so those groups go out to a special field and hospital and maybe do community health or rotation at Robert Wood Johnson Hospital that caters to their individual focus of something that they would want to carry out in residency...I think the program helped out a lot in terms of showing you the 360 view of what a medical school student has to accomplish to do great in residency and after residency.

Imani articulated what many of her peers also shared with me: having the program at a medical school made a difference. Students no longer felt like outsiders; although they understood that they were not yet medical school students, they had a sense of renewed inspiration by being in the same physical space as medical school students. This was the first time in a medical school for all of the participants. The awe and anxiety slipped away as they realized that if they worked hard they could be part of the medical school as students in the near future. Aside from the physical location, students had access to the social network afforded to them by having the program in the medical school, allowing them to speak to medical school students and administration. Additionally, they witnessed first-hand the ins and outs of medical school, the "culture" as Imani described it. This is another aspect of this study that can truly add to the literature on pipeline programs: the importance of the program location and resources associated with the program. As BCP participants shared, their sense of belonging and feelings of comfort had a significant effect on their overall performance in the program, and beyond as they left the program reinvigorated to continue with their goals. Bourdieu proposes that schools pass on "specific social identities that either enhance or hinder" the life chances of their students (Sadovnik, 2007, pg. 8). Research participants once again confirm that BCP is transmitting both cultural and social capital by enhancing the life chances of its participants, who are reinvigorated to continue with the goal of applying to medical school after completion of the program.

Finally, while BCP does not explicitly refer to these theoretical constructs, it is clear that the four findings demonstrate the transmission of social and cultural capital through BCP's programmatic efforts. The interest in medicine already exists in students who are admitted into the program, confirmed by the fact that students have to apply to be considered for the program and thus demonstrate their interest in the field. However, the program enriches the student and furthers their development holistically through the programmatic efforts targeting the academic and social growth of its participants, while providing them with an "insider" perspective with exposure to the field. These resources, in the form of knowledge, experience, and networks, transmit both cultural and social capital to students, exposing them to whole new side of the field that they had not had access to previous to this experience. The next section will discuss implications for practice that have arisen due to the insight into the program.

Implications for Practice

Having summarized my research study and its findings, this section will provide key recommendations for two distinct stakeholders: 1) the Biomedical Careers Program and 2) student affair professionals from other institutions. The first subsection below will focus on recommendations provided by the research participants on how to specifically improve the Biomedical Careers Program. The second subsection will focus on recommendations for student affairs professionals as well as any other professional in higher education that works with pipeline programs focused on increasing the number of underrepresented student entering the various health professions.

Recommendations for BCP. The seven research participants interviewed for this study were able to share their personal experiences undergoing BCP and how it contributed to their long term plan of applying to medical school, which assisted in answering the research question of how BCP affects underrepresented students' preparation for entrance into medical school.

However, research participants also provided recommendations, based on their completion of BCP, which would have ultimately improved their overall experience with the program. Those key recommendations cover the four themes identified from the research findings: 1) mentorship and guidance, 2) social learning through clinical exposure, 3) academic study, and 4) social interaction.

Mentorship and guidance. Research participants offered a key recommendation to improve the mentorship and guidance provided by the program. Several participants mentioned that they would have preferred that a mentor be assigned to them as opposed to the informal mentorship opportunities that emerged on their own to ensure that everyone had a mentor. One of the participants, Alicia, shared with me that although she was able to develop a great relationship with a professor which resulted in the continuation of the mentorship beyond the program, she knows for a fact that it was not the case for all program participants. Another program participant, Otito, wished that more professors had been involved with the program, especially to discuss their research projects during level III of BCP. Many hoped for an assigned mentor that would stay in touch with them after the program, continuing the support and network beyond BCP. Additionally, perhaps more training should be provided to the individuals involved in the program, including the teaching assistants and professors, to ensure that they are reaching all students, if a formal mentorship program is not created.

Social learning through clinical exposure. The research participants all agreed to one key recommendation for BCP: more clinical exposure. While participants had an opportunity to shadow once a week during the 6-week program, many felt that it was simply not enough. Imani disclosed that due to some complications early on, shadowing assignments had not been confirmed in time for students to start during their first week of the program. Therefore, she was

only able to start shadowing during her second week in the program, further lessening how much exposure she had. Another student, Amie, disclosed that she was only able to shadow two days during the entire program. In addition to more shadowing overall, one participant requested that there be time for debriefing during or after the completion of shadowing. Students had questions about what they observed, but not always the opportunity to discuss what they were learning. Another aspect of shadowing that the program needs to consider is how students get to their assignment; some students complained that they had difficulty getting to their shadowing site as they did not have cars and there was no reliable form of public transportation available from the program site. Hence, this key element of the program could be improved by helping participants secure a safe and reliable way of getting to their assignment.

Another suggestion for increasing the overall clinical exposure was the idea that a community service component should be incorporated into the program, allowing students to become more involved with the community that they plan to serve the future. Mackenzie shared, “I felt like that could have been a part of a way to get us into the community and being able to be part of something bigger just providing some community service even if it was just weekends, like go to a soup kitchen.” Considering that the program has a tight schedule during the week, which includes shadowing, seminars, classes, and time for study, it may look to take advantage of the weekend, as there are no official activities planned by the program on Saturdays or Sundays. Therefore, a suggestion would be to incorporate activities during one day on the weekend to allow for more shadowing or other activities, such as a community service project or trips to different medical schools and health care facilities in an attempt to increase the overall clinical exposure to its participants.

Academic study. Overall, participants reported that they enjoyed the academic component offered by BCP. There were only two minor suggestions offered by participants to improve the overall academic component. First was a recommendation to offer more real-life cases and examples to review in class. Students would like the opportunity to have more discussion with their peers and professors related to medical cases, hence incorporating more of the clinical aspect of what they see while shadowing into the classroom environment where they are learning the science behind it. Second, one participant shared that while the science courses offered by BCP were wonderful, the textbooks that went along with them were not helpful and usually not utilized by the instructors. Therefore a suggestion to offer other supplemental materials or to utilize textbooks more efficiently along with the coursework is recommended.

Social interaction. The last area of key recommendations for BCP falls within the domain of social interaction; students provided suggestions on how the program could improve participants' sense of belonging and feelings of comfort. First, participants would have liked to see more social interaction take place between the three levels of BCP. The only time the various levels came together was during the workshops offered by BCP; however, the majority of the program's itinerary had each level work on different tasks. One research participant, Yvette, shared, "I think us coming together more would be like even more helpful. I think as underrepresented students we need to constantly support each other, remind each other that there's more out there that we all can do it...level III could encourage level I and vice-versa."

Another recommendation was to increase the level of community building within the residence hall in which the participants reside during the program. A majority of program participants lived on campus during the program and therefore had the opportunity to study together and bond after their day within BCP was complete. There were residential assistants

(RAs) to supervise the students in the residence hall. However, no activities were planned in the residence hall to foster a sense of community amongst the program participants. Students hoped that the RAs involved with the program could have been better trained to assist with the community building amongst the program participants so that students could better support and work with one another, both in and outside of the program's official tasks. This could have also been an opportunity to incorporate activities related to the program, such as having medical school students come in and speak to them one-on-one or completing a community service project on a Friday night.

A final recommendation was to provide program participants with appropriate attire, such as medical scrubs or a white coat with the program's name on it, to assist students with feeling more comfortable. As was already shared, the program takes place at a medical school. One participant shared how he wished he had the opportunity to wear something official as it would have helped him psychologically feel that he was really part of something bigger, especially since the program took place in the medical school. Not only physically being at the medical school, but also having a physical representation that they belong there truly impacts their overall sense of belonging.

Recommendations for student affairs professionals. The next subsection will offer recommendations to institutions that offer pipeline programs with a similar mission to increase the number of underrepresented students entering the medical field, or other health related professions. Having studied the Biomedical Careers Program, a longstanding pipeline program known for assisting underrepresented undergraduate students, I utilize the past participants' experiences to share key recommendations for those thinking of starting a new program or for professionals who currently oversee a program to take into consideration within their own

program. Key recommendations are offered spanning the four themes identified from the research findings: 1) mentorship and guidance, 2) social learning through clinical exposure, 3) academic study, and 4) social interaction.

Informal mentorship & guidance. Mentorship, especially for underrepresented students, is a critical component within a pipeline program, as has been confirmed by several publications (Barlow & Villarejo, 2004; Carline et al., 1998; Kreuter, Griffith, Thompson, Brownson, McClure, Scharff, Clark, & Haire-Joshu, 2011; Lowe & Pechura, 2004). However, there was not much literature found on either how mentorship opportunities are designed or how students feel about mentorship overall. This study confirms the importance of mentorship from the student perspective. BCP participants highlighted the mentorship and guidance received by the program as a critical component of their experience. Therefore, a key recommendation is that a pipeline program must include a formal mentorship component. While BCP offers informal mentorship opportunities, students expressed a preference for there to be a formal mentorship relationship established where they would be assigned a mentor. This is a key implication derived from the findings of this study.

In addition to ensuring that there is an opportunity for mentorship, another key recommendation is that students should be exposed to more than one source of mentorship, such as having access to a medical school student, professor, and physician, who could each offer a different perspective. Participants appreciated individuals who could provide them with not only information on their trajectory, but who could also serve as a source of support and encouragement. Essentially, underrepresented students could benefit from individuals who are where they are (i.e. medical school students) or already in the field to encourage them to keep going and reassure them that they too can achieve their goal of entering the health field. Hence,

those serving as mentors would need to be aware of what students are looking for in preparation for taking on the responsibility of serving as a mentor and programs would need to ensure that that all participants have the opportunity to receive mentorship.

Social learning through clinical exposure. As the literature review confirmed, there is lack of research on the importance of clinical exposure on underrepresented undergraduate students. Philips et al. (1981), one of the few studies that discusses clinical exposure in a summer pipeline program, found that underrepresented students who participated in a summer program that focused on exposure to health care settings, where participants rotated through hospitals and teaching facilities in addition to receiving academic instruction and training in interpersonal skills, were employed in health professions at a much greater proportion than a comparison group. Consequently, this study contributes to the literature by demonstrating the importance of clinical exposure as reported by research participants. It is evident based on the experiences shared by participants that clinical exposure was critical to their overall experience in BCP, further confirmed by students requesting that the program increase the number of opportunities for the future. Hence, it is imperative that a pipeline program incorporate opportunities for significant amount of clinical exposure as well variety in the types of exposure, such as including shadowing, volunteering, and research opportunities. Clinical exposure is vital to underrepresented students, who often do not have access to opportunities on their own or have a network of professionals in the field to assist them with locating ways to immerse themselves in the health field. Additionally, it is through these clinical opportunities that students solidify their interest in pursuing a health career and confirm that they have what it takes to do it.

Academic study. Academic preparation is a key component of many pipeline programs similar to BCP as demonstrated by the literature review in Chapter Two. Numerous studies have

been completed over the years on the academic preparation offered by pipeline programs, typically in the form of quantitative studies. Carline et al. (1998) completed an extensive literature review on enrichment programs for undergraduate students projected to increase the representation of minorities in medicine and identified twenty such programs; out of the twenty programs identified, eighteen had an academic enrichment component, further illustrating the fact that academic enrichment is a substantial component of these types of programs. However, this qualitative study contributes to the available literature by looking at the academic component of a pipeline program through the lens of its participants. Evidence from this study demonstrates that academic preparation does not only take the form of offering science courses, but can also arrive from supplemental workshops and resources. Programs should consider offering relevant science courses that will enrich the students' academic preparation, while also offering supplemental instruction and workshops in the form of guest speakers. Additionally, other components of entrance into medical school should be considered when creating the curriculum of the program, such as including a component on preparation for entrance exams, how to apply to programs, and how to pay for graduate education. The topics can be daunting, sometimes more daunting than the science coursework itself and can therefore provide invaluable aid to students. Finally, providing clinical examples within the science coursework and teaching students how to study can assist with students performing better academically.

Social interaction. The last area of key recommendations emerges from the theme of social interaction, which included diversity, peer support, and participants' sense of belonging and comfort in BCP. This study demonstrates the importance of looking at the concept of social interaction (or engagement as referred to by many programs) beyond mentorship and career counseling. Programs must focus programs on creating a sense of community amongst its

participants, ensuring that students develop peer support as well as a sense of belonging during their enrollment in the program, which ultimately affects their self-esteem and level of confidence in continuing on this trajectory. This study also confirms the importance of programs, including BCP, staying true to their mission and ensuring that they are assisting underrepresented students. This includes certifying that the admission committees for enrichment and pipeline programs are looking not only at ethnicity, but other factors, such as socio-economic status, when reviewing and considering applicants for its program. Participants were impacted by seeing students who looked like them, which positively affected their overall experience with BCP. Hence, maintaining a diverse cohort of underrepresented students is critical to the overall student experience as reported by research participants.

Ultimately, the key recommendation offered to institutions and professionals in higher education who work with underrepresented undergraduate students is to understand the transmission of both cultural and social capital to this population. Programs aimed at increasing the number of underrepresented students entering the health professions need to focus on not only the academic preparation of students, which of course is very important, but also on offering resources that will increase students' social and cultural capital as demonstrated by the stories shared by our program participants. In addition, while the recommendations offered target those institutions, such as medical schools, that provide pipeline programs, the implications offered provide insight into the needs of underrepresented college students who aspire to become healthcare professions. Thus, pre-health advisors, within universities and colleges, can utilize the information provided in this study to create programming aimed at supporting and assisting underrepresented students who are preparing to apply to graduate programs in the health field.

Limitations and Opportunities for Further Study

The study has both limitations as well as opportunities for future research. As described in Chapter Three, the qualitative study has a small sample size, as only seven BCP participants were willing and able to be interviewed; hence the findings are not generalizable. Additionally, data collection methods utilized one in-depth interview with each participant and review of program documents, so an opportunity for more investigation is certainly a possibility. A majority of the several participants had only participated in level II of the program, with only one research participant having experience all three levels of the program.

Hence, this study's limitations demonstrate the need for further research to inform the practices aimed at supporting underrepresented students aspiring to enter medical school or another health professional program. As we are only privy to the experiences of seven former program participants, a larger pool of participants would contribute to the information collected and available for further analysis. The majority of participants in this study were female; out of the seven participants interviewed, five were female. Therefore, the voice largely heard in the stories collected and findings presented were from female participants. A future study could focus on collecting data from male participants and to obtain more of the male voice in determining how BCP, or another pipeline program, is perceived to affect one's preparation for a health profession.

In addition to a larger pool of participants, one could potentially utilize other forms of data collection, such as focus groups or observation while the program is in session, to further inform scholars of how best to assist underrepresented students. As the literature review confirmed, there is still a lack of qualitative studies on pipeline enrichment programs. While this study will certainly contribute to the literature, an opportunity to further investigate this

population and special programs aimed at impacting the number of underrepresented individuals in health care is still available. Most important is the need to continue to learn from the students we aim to assist: underrepresented students themselves. Hence, further research in the form of qualitative studies aimed at learning more from underrepresented students who have completed an enrichment program, especially looking at those who do continue and those who discontinue from pursuing a health professional program, would assist in improving practice.

Conclusion

Since the civil rights movement, there has been a long history of efforts to improve the number of underrepresented students in higher education, including those in the various health profession fields. In particular, given the changing demographics in the United States, there has been an increase in the number of initiatives to provide access, scholarships, and funding to underrepresented students in high school and college pipeline programs leading to health care careers. This qualitative study has aimed to contribute to the literature available on pipeline programs by investigating the Biomedical Careers Program offered by the Rutgers Robert Wood Johnson Medical School. As the literature review confirmed, most studies completed on pipeline programs have focused on quantitative data aimed at confirming whether programs are significantly impacting the number of underrepresented students who enter the health field. However, there was a need for qualitative analysis aimed at learning from the students who the programs target. Hence, this study arose with the objective to answer the following research question: How does BCP (consisting of academic skill development, social engagement, and health care awareness) effect underrepresented students' preparation for medical school?

As I embarked on the journey to answer this question, I learned from the amazing seven participants that I interviewed, each of who had tremendous personal stories of their upbringing, of their dream to enter medical school, and of their experiences while enrolled in BCP. This

study reflects how powerful the concept of storytelling can be. Additionally, it demonstrates how instrumental it is to learn directly from the experiences and personal journeys of participants. It is my hope that I have been able to contribute to the existing literature on pipeline programs by highlighting how BCP has effected underrepresented students' preparation for medical school. Most importantly, from the research findings, this study hopes to inform scholars and practitioners on how to assist underrepresented students by demonstrating valuable practices from BCP that are effective as confirmed by the students who participated in the program. Evidence demonstrated four main findings on how BCP prepares underrepresented students for medical professions via the transmission of cultural and social capital: 1) informal mentorship and guidance, 2) social learning through clinical exposure, 3) academic study, and 4) social interaction. This study also reveals implications for practice, not only for other institutions and professionals who work with pipeline programs, but also recommendations for improvement within BCP. Hence, this research study utilizes the voices of underrepresented students in helping to shape practices to better support and assist other underrepresented students in the future who aim to enter medical school or another health professional graduate program.

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Appendix A: 2014 Biomedical Careers Program (BCP) Admission Guidelines**(Ford, 2014)****Overview of BCP**

The Biomedical Careers Program was designed to provide educational enrichment for promising students who, due to educational background and/or financial circumstance, are not highly competitive for admission to professional school. Students with strong GPAs are less likely to need our help than others; therefore, these students are not our core group. Our core group demonstrates:

- an interest in the health professions, and
- an academic record that shows progress in achievement, while possibly needing some improvement, and
- a desire to attend the program.

GPA Requirements

Since it is important to give students a realistic picture of their educational options, a few general guidelines have been put in place. No applicant with a GPA of less than 2.0 will be admitted to any level of BCP. GPA requirements for Level I and II applicants are flexible, with the primary concern being the student's potential for success. Level I and II applicants with strong applications, personal statements and recommendation letters but a GPA of less than 3.0 may be admitted; however, if admitted, these students will be scheduled for counseling (see below). Level III applicants with GPAs of less than 3.0 will not be admitted but maybe contacted with suggestions on how they could improve their academic performance and/or information about alternative careers. The Admissions Committee members are encouraged to make suggestions that will be forwarded to the student and their counselor.

Counseling Component

An academic and career counseling component will be implemented for students with below average academic records. These students will be advised regarding how to improve their chances of admission to medical school and pathways to alternative careers.

Application Review

Applicants will be pre-screened for eligibility prior to being sent to a reviewer. New, non-AccessMed applicants will be reviewed by 2 committee members. In the event of a difference between the 2 ratings, the applicant will be reviewed by a third committee member or by the entire committee. Since Access Med students have been pre-screened by a committee at Rutgers (ODASIS) or Seton Hall, they will be reviewed by only 1 BCP Admissions Committee member. Former BCP participants will also be reviewed by only 1 committee member, since we have records of their past performance in the program. Grade reports for former students will be available to reviewers.

Level III Access Med Track

Students admitted to the Access Med Transition Year will attend the BCP Level III Access Med Track. This track will provide preparation for medical school Biochemistry, including a lab component consistent with the requirements for 3 lab credits at Rutgers.

Level III Regular Track

Students in the Level III Regular Track will study neuroscience or medical genetics and will participate in a clinical project. All Level III students will deliver a presentation based on their project at a symposium to be held at the conclusion of the program.

Appendix B: EOF Eligibility Guidelines

(Ford, 2014)

Undergraduate Eligibility:

1. Must demonstrate an educationally and economically disadvantaged background
2. Must be a New Jersey resident 12 consecutive months prior to receiving the award
3. Must apply and be accepted to a participating New Jersey college or university
4. Must meet the academic criteria as set by the institution of choice
5. Must file a Free Application for Federal Student Aid (FASAA)
6. Gross Income must fall within the criteria shown:

Academic Year 2013-2014		Academic Year 2014-2015	
Applicants with a Household Size of	Gross Income Not to Exceed	Applicants with a Household Size of	Gross Income Not to Exceed
1	\$22,340	1	\$22,980
2	\$30,260	2	\$31,020
3	\$38,180	3	\$39,060
4	\$46,100	4	\$47,100
5	\$54,020	5	\$55,140
6	\$61,940	6	\$63,180
7	\$69,860	7	\$71,220
8	\$77,780	8	\$79,260
**	For each additional member of the household add \$7,920	**	For each additional member of the household add \$8,040

http://www.nj.gov/highereducation/EOF/EOF_Eligibility.shtml

Appendix C: BCP Reviewer Rating Sheet

(Ford, 2014)

Date: _____

Applicant: _____

Reviewer: _____

High School Academic Record (if applicable)

College Academic Record

Most Recent

Most Recent

GPA: _____

Semester: _____

GPA: _____

Semester _____

SECTION I: Please score the application areas on the following scale:

1. Above Average	2. Average	3. Below Average
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Areas	Score	Comment
1. Academic performance in the sciences	_____	_____
2. Academic performance in non-sciences	_____	_____
3. Rigor of course work	_____	_____
4. Potential to benefit from BCP	_____	_____
5. Recommendation from teacher	_____	_____
6. Personal statement from applicant	_____	_____

Other relevant factors that should be considered (e.g., work during school year, family and other obligations, extracurricular activities, health of applicant, questions regarding ethnic self-identification or disadvantage status.) Please list and/or explain:

SECTION II: Please rate the applicant overall, using the following scale:
--

- High-priority accept** is to be used for highly competitive applicants

- Low-priority accept (wait-list)** is to be used for applicants who would be acceptable, but are not viewed to be among the strongest candidates. Typically, these applicants will have an area or area(s) of relative weakness; please specify any such area(s).

- Discuss** is to be used for applicants who the reviewer thinks should be discussed by the entire committee. Typically, this rating is prompted by a reservation or a concern about the applicant. Please specify the topic(s) on which the discussion should focus. If you think additional information might be helpful, please specify the information you would like to request.

- Reject** is to be used for applicants who appear unsuitable or ineligible under any circumstances. Please specify the basis for unsuitability and/or ineligibility.

Explanation/Comments:

Appendix D: Biomedical Careers Program: Participant Profile & Interview Protocol**Participant Profile**

1. Gender

- Male
- Female
- Other

2. Ethnicity

- White
- Hispanic, Latino, or of Spanish Origin
- Black or African American
- Asian/Pacific Islander (Korean, Indian, Chinese, etc.)
- Other: _____

3. Health Profession Interest

- Medicine
- Dentistry
- Podiatry
- Optometry
- Veterinary Medicine
- Other: _____

4. Current Year in College

- First Year (less than 30 credits)
- Sophomore (30-59 credits)
- Junior (60-89 credits)
- Senior (90 credits or more)
- Post-Baccalaureate (already earned a Bachelor's Degree)
- Other

5. Current cumulative GPA in college

- 3.5 or higher
- 3.0-3.49
- 2.5-2.99
- Under 2.5

6. Level of BCP that you participated in this year

- Level 1
- Level 2
- Level 3

Interview Protocol

I am interested in learning more about students who participate in the Biomedical Careers Program (BCP) at Rutgers Robert Wood Johnson Medical School. This population consists of any student who is looking to pursue a health-related career, such as medicine or dentistry. The first section of this interview will focus on general information related to your interest in a health-related career, which will then be followed by questions regarding your participation in the BCP program. Please remember there is no right or wrong answer; I am interested in your story.

Section A. Student's Pre-Program Interest in Medicine/Health-Related Career

1. Can you please start by sharing with me what originally sparked your interest in medicine (or another health-related career)?
2. What kinds of obstacles have you faced in pursuing your interest in a health related career, if any?
3. What sources of support have you relied on in pursuing your interest in a health related career, if any?
4. I want you to think back to a time before you had enrolled in the BCP program. How confident were you that you would pursue a health-related career?
Probes:
 - a. What influenced your initial confidence level?
 - b. What was the likelihood of you pursuing medicine?
 - c. Did you have any doubts about pursuing a health related career?

Section B. The Biomedical Careers Program

The next part of the interview focuses on the Biomedical Careers Program. I would like to talk about how BCP has impacted you.

1. First, what inspired you to apply to the Biomedical Careers program?
2. What personal expectations did you have before entering the program?
Probe:
 - a. How did your expectations change as a result of the program? (Give one specific example of how the program changed your expectations)
3. How did the program affect your confidence level in being able to handle the academic rigors of medical school (or another health related professional school)?
Probe:
 - a. Give one specific example of how your confidence level was impacted.
4. How did the program affect your feelings of comfort in a medical school environment?
Probe:
 - a. How about your sense of belonging in a medical school environment?
 - b. Describe one experience in detail that demonstrates how the program affected your comfort or sense of belonging.

5. Did you receive mentoring or guidance during the program?
Probes:
 - a. Describe what type of mentoring you received and how it affected your sense of confidence about applying to and succeeding in medical school.
 - b. Describe what type of guidance you received and how it affected your sense of confidence about applying to and succeeding in medical school.
 - c. Did the mentoring or guidance you received in the program affect your sense of belonging in a health-related career? (If so, how?)
6. Has your participation in BCP changed the likelihood that you will pursue a health-related career?
Probes:
 - a. How so? In what ways?
 - b. Has your confidence level changed as a result of your participation in BCP?
 - c. Do you see yourself differently as a result of your participation?
7. What aspect(s) of the program made it more likely that you would pursue a medical career?
8. Is there any aspect of the program that made it less likely that you would pursue a medical career? (If yes, please explain)

Appendix E: Study Participant Profiles

Alicia

Alicia, a third year undergraduate student at the time of the interview, self-identified as Puerto Rican and Filipina. Although she was born in the United States, she spent most of her youth in the Philippines. She traveled back and forth from California and the Philippines, until she finally settled permanently in New Jersey with her family at the age of 13. Therefore, she experienced the education system both in the Philippines and the United States. Her parents divorced and she ended up living with her father in New Jersey, although she visits her mother in California often. While she recalled wanting to become a physician as early as when she was in the first grade, Alicia confirmed that she truly became interested in the profession due to attending a high school focused on the health professions in her county. The first of her family to go to college in the United States, Alicia has received a lot of emotional support from her family, including in her pursuit of becoming a physician. In college, Alicia was a biology major with a cumulative GPA range of 3.0-3.4. She participated in level two of BCP in 2014 and had not previously participated in any other form of health enrichment program over the summer.

Amie

Amie was born and raised in West Africa. She moved to the United States with her immediate family at the age of 11, but was saddened by the fact that many of her family members were still far away in West Africa. Her interest in medicine stemmed from witnessing a lot of illness back in Africa, including observing family members experience serious injuries such as strokes. She expressed an interest in caring for others, especially her family, as part of her desire to pursue medicine. At the time of the interview, Amie was a biology major in her

third year of college, holding an impressive cumulative GPA range of 3.5-4.0. She participated in level two of BCP in 2014 and had never participated in any other type of enrichment program focused on medicine. She described several obstacles in pursuit of becoming a physician, such as experiencing discrimination when she first arrived to the United States and her own confusion on the steps to become a physician. However, she has persisted and intends to pursue medical school. Her hope was to become a physician and travel to Africa to volunteer her services or open a clinic in the future.

Dante

Dante was a biology major and psychology minor in his fourth year of college, with a cumulative GPA range of 3.0-3.4. He participated in level three of BCP in 2014, which was his first health-related enrichment program. He was born and raised in Nigeria, only moving to the United States during his junior year of high school. He lived with his parents, brothers, and sister in New Jersey. While language was not a barrier since Dante spoke English in Africa, he shared that he experienced a cultural transition during the move. However, as an athlete he was able to assimilate pretty quickly, garnering friendships through his involvement in football and track and field. Growing up, Dante was not interested in becoming a physician; instead, he pursued his artistic passions of drawing and painting. However, it was the personal experience of having his aunt, who helped raise him, suffer from and eventually die from breast cancer that exposed Dante to the world of medicine. It was a combination of his curiosity for the sciences and personal experience with illness that drew Dante to pursue becoming a physician. He credited his family for providing the support to persist and pursue applying to medical school despite the challenges faced along the way.

Derrick

Derrick always knew from a young age that he wanted to become a physician. Born and raised in Egypt, he observed his father, who was a physician in Egypt and worked hard to be able to practice in the United States when they moved in 2007. Derrick is one of the few BCP participants who had extensive experience with the field prior to BCP due to his father; he spent many years as a child observing his father passionately curing others. Derrick referred to his father as his hero and reflected on the sacrifices made during their transition to the United States. Derrick shared how his father struggled when they initially moved, unable to serve as a physician in the U.S. until he went through the proper licensing and certification. Therefore, Derrick's father was a dialysis technician to support the family financially until he was finally able to become certified as a pathologist, the same profession that he held in Egypt. Derrick lived with his father, mother, and one brother. He was a third year cell biology and neuroscience major with a cumulative GPA range of 3.5-4.0. He participated in level two of BCP in 2014, but had also previously attended one other health-related summer enrichment program prior to BCP. Despite obstacles faced, such as a language barrier, Derrick credited his family for supporting him in his pursuit to become a physician.

Imani

Imani, who self-identified as African American, was a fourth year biology major with a cumulative GPA range of 3.5-4.0. She was born and raised in New Jersey, specifically an urban city, with her father, mother, and two sisters. Although her parents divorced while in high school, she credited her family for providing her with support, especially her two sisters as they all push each other to accomplish to graduate from college. She participated in level three of

BCP in 2014 and had previously attended other health related summer enrichment programs. She aspired to become a physician due to a personal circumstance: her mother's recurrent battle with breast cancer. At the young age of 9, she witnessed firsthand the struggle of her mother treating her breast cancer, spending multiple nights in the hospital and dealing with several forms of treatment including radiation and chemotherapy. Imani never forgot the positive interactions that took place between her mother and the doctors, who empowered her in taking an active role in the determination of her treatment as well as empathized with her during difficult times. Additionally, Imani's mother has unfortunately dealt with a recurrent form of breast cancer, having been diagnosed for a third time during the time of this interview. While Imani did not have any other form of exposure to the field of medicine aside from her own visits to the pediatrician, it was through accompanying her mother to doctor and hospital visits that Imani appreciated how multifaceted medicine was and realized that it was the perfect career path for her.

Mackenzie

Mackenzie was born and raised in Ecuador, having moved to the United States at the age of 6. Her first experience with medicine was accompanying her mother, an assistant to a pathologist, to her job in Ecuador on the days that her mother was unable to find a babysitter. However, not having any other connections to medicine, she has had to work hard to immerse herself in the field of medicine in order to persist in pursuing her goal of becoming a physician. She shared that one of her biggest obstacles was the language barrier when she moved to the United States. However, she has looked to her family and peers to support her and motivate her during difficult times. Mackenzie, unlike many of the BCP participants, attended all three levels

of BCP in the span of three summers. She last completed level three in 2013 and did not complete any other health related enrichment program outside of BCP. Therefore, she had a unique perspective as a research participant as she was able to discuss and share input about all three levels of BCP. At the time of the interview, she had already graduated with a major in public health and minor in biology with a cumulative GPA range of 3.0-3.4. Due to graduating with a lower than desired GPA, Mackenzie was completing a post-baccalaureate program to assist with enhancing her academic transcript to demonstrate to medical schools that she is able to handle the rigorous coursework.

Yollette

Yollette was a fourth year biology major with a cumulative GPA range of 3.5-4.0 at the time of the interview. She completed level two of BCP in 2014 and had previously completed another health related summer enrichment program. Yollette was born and raised in an urban city in New Jersey, and self-identified as African American. She grew up with her father and mother, who divorced while in high school, as well as two sisters. Since a young age, Yollette has always enjoyed science from learning about the body to plants to animals; she needed constant stimulation, which science provided to her. However, it was by experiencing medicine via the various illnesses faced by different family members that sparked her own interest to become a physician. The one personal circumstance that stood out to Yollette the most was her mother's diagnosis and treatment of breast cancer. The doctors who treated Yollette's mother stood out to her because of their attention and due diligence. She reflected on the tight knit family unit that she grew up with and credited them with her ability to persist when times are difficult so that she can one day become a physician.

Appendix F: Informed Consent Form

Project Title: In Their Own Voices: A Qualitative Study of the Biomedical Careers Program and its Impact on Underrepresented Students in the Health Professions

You are invited to participate in a research study that is being conducted by Sofia Pinto, who is a graduate student in the Graduate School of Education at Rutgers University. The purpose of this study is to examine the Biomedical Careers Program and its impact on underrepresented students in the health professions. This research will examine how the Biomedical Careers Program, a college pipeline program, effects the preparation of underrepresented students for medical school, specifically in the areas of: a) academic skill development; b) social engagement; c) understanding health care delivery. The primary method includes interviewing college students about their experience with the Biomedical Careers Program.

Approximately nine to twelve subjects between the ages of 18 and 26 years old will participate in the study, and each individual's participation will last approximately one hour, with a possible follow up interview if any clarification is needed. The study procedures include one semi-structured interview with open-ended questions.

This research is confidential. Confidential means that the research records will include some information about you and this information will be stored in such a manner that some linkage between your identity and the response in the research exists. Some of the information collected about you includes gender, ethnicity, year of study, and health profession interest. Please note that we will keep this information confidential by limiting individual's access to the research data and keeping it in a secure location. I will keep this information confidential by using a pseudonym and keeping the data securely in a locked file cabinet and password protected computer. Additionally, the identity of the study participants will not be revealed.

The research team and the Institutional Review Board at Rutgers University are the only parties that will be allowed to see the data, except as may be required by law. If a report of this study is published, or the results are presented at a professional conference, only group results will be stated. All study data will be kept until the end of the research project, projected to be in 2015. However, the data may be kept for at least three years, until 2017.

There are no foreseeable risks to participation in this study. Additionally, for participating in this study, you will receive no compensation. Therefore, from participating in this study, you may receive no direct benefit except for sharing your own experience of the Biomedical Careers Program. Although the data gathered may not directly assist you, information gathered from this study will benefit college students and administrators in the future as this data will inform their decision making about this program as well as other programs to assist with preparing for medical school. I will share the final research project when it is completed.

Participation in this study is voluntary. You may choose not to participate, and you may withdraw at any time during the study procedures without any penalty to you. In addition, you may choose not to answer any questions with which you are not comfortable.

If you have any questions about the study or study procedures, you may contact myself, Sofia Pinto, at the Graduate School of Education, via phone (973) 353-5082 or via email sofia.pinto@gse.rutgers.edu, or you can contact my advisor Dr. James Giarelli via phone at (732) 932-7496, ext. 8209 or via email at james.giarelli@gse.rutgers.edu.

If you have any questions about your rights as a research subject, you may contact the IRB Administrator at Rutgers University at:

Rutgers University, the State University of New Jersey
Institutional Review Board for the Protection of Human Subjects
Office of Research and Sponsored Programs
3 Rutgers Plaza
New Brunswick, NJ 08901-8559
Tel: 848-932-0150
Email: humansubjects@orsp.rutgers.edu

You will be given a copy of this consent form for your records.

Sign below if you agree to participate in this research study:

Subject (Print) _____

Subject Signature _____ Date _____

Principal Investigator Signature _____ Date _____

AUDIO/VIDEOTAPE ADDENDUM TO CONSENT FORM

You have already agreed to participate in a research study entitled: In Their Own Voices: A Qualitative Study of the Biomedical Careers Program and its Impact on Underrepresented Students in the Health Professions conducted by Sofia Pinto. We are asking for your permission to allow us to audio record your interview as part of that research study. You do not have to agree to be recorded in order to participate in the main part of the study.

The recording(s) will be used so that the interviewer can listen carefully and keep accurate records in the form of transcriptions. The recording(s) will include the entire interview, including the subject's self-selected pseudonym.

The recording(s) are confidential and will be stored in a password protected computer. All recordings will be destroyed after transcription.

Your signature on this form grants the investigator named above permission to record you as described above during participation in the above-referenced study. The investigator will not use the recording(s) for any other reason than that/those stated in the consent form without your written permission.

Subject (Print) _____

Subject Signature _____ Date _____

Principal Investigator Signature _____ Date _____

Appendix G: Codebook

Code	Description
Background	Information provided by the student as it relates to their background/upbringing
Why Medicine	The reason student has decided to pursue a career in medicine
Obstacles	Obstacles student has faced in pursuit of health career
Supports	Supports student has received while in pursuit of health career
Why BCP	The reason the student decided to apply to the Biomedical Careers Program (BCP)
Clinical Exposure	Information pertaining to the student's exposure to the health field (i.e. shadowing, volunteering, research) while enrolled in BCP
Knowledge <ul style="list-style-type: none"> • Academic • Non-Academic 	Knowledge student obtained from attending BCP <ul style="list-style-type: none"> • Specific academic knowledge obtained from program (i.e. class) • Non-academic knowledge obtained from attending the program (i.e. financing your medical education workshop, other options for health professions)
Confidence	Information regarding student's perceived confidence level during and after attending BCP
Social Contact <ul style="list-style-type: none"> • Sense of Comfort/Belonging • Peer Support • Diversity 	Impact of social contact on students while in BCP <ul style="list-style-type: none"> • How student felt while enrolled in BCP/how comfortable felt in the medical school environment • The types of interactions taking place between peers in BCP • The diversity students were exposed to while in BCP
Mentoring/Guidance	Information related to the types of mentorship and guidance student received while enrolled in BCP
Recommendations	Suggestions as to how to improve the BCP experience provided by student participants