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Understanding the Role Street Medicine Programs Play in the Career Trajectories of Student Volunteers Who Choose to Work with Underserved Populations

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UNDERSTANDING THE ROLE STREET MEDICINE PROGRAMS PLAY IN THE
CAREER TRAJECTORIES OF STUDENT VOLUNTEERS WHO CHOOSE TO
WORK WITH UNDERSERVED POPULATIONS

by

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UNIVERSITY OF GEORGIA

A Thesis Submitted to the Graduate Faculty
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of the
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APPROVAL

UNDERSTANDING THE ROLE STREET MEDICINE PROGRAMS PLAY IN THE
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Abstract

INTRODUCTION: Street medicine programs utilize a nontraditional healthcare model to provide care to populations experiencing homelessness. Through street medicine programs, clinicians take to the streets to offer services to individuals who are living unsheltered. Many street medicine programs offer health professional students the opportunity to volunteer and provide care to this vulnerable population.

AIM: This exploratory study aimed to answer the following question: what influence does volunteering with a street medicine program have on the career trajectories of student volunteers who ultimately choose to work with medically underserved populations (MUPs)?

METHODS: This study used an exploratory mixed methods approach to answering the research question. The core ideas that emerged from the qualitative data collected from street medicine student volunteers were used to inform the development of a web-based survey administered to a broader, national sample of street medicine student volunteers. The survey included closed- and opened- ended questions, as well as demographic questions. The Health Professionals' Attitude Towards the Homeless Inventory (HPATHI; Buck et al., 2005) questionnaire was embedded into the survey to measure students' attitudes towards the population experiencing homelessness before and after volunteering with a street medicine program.

RESULTS: The results suggested that 15 (65.22%) of the 23 participants who completed the web-based survey reported that volunteering with a street medicine program influenced their decision to ultimately work with MUPs. Of the 19 participants who provided qualitative feedback, 7 (36.84%) mentioned that their decision to work with MUPs was influenced by their increased exposure and awareness to the barriers and needs of MUPs while volunteering with a street medicine program. Additionally, 6 (31.58%) participants mentioned that their previous decision to work with MUPs was reinforced while volunteering with a street medicine program.

CONCLUSION: Volunteering with a street medicine program appears to help motivate students to work with MUPs. Incorporating opportunities to volunteer with a street medicine program into current health professional school curriculum has the potential to impact a greater network of students, as well as influence decisions regarding the students' careers.

Author's Statement

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SYDNEY MARIE SMITH-GRAHAM

List of Tables

Table 1: Participant Demographic Characteristics

Table 2: Health Professional School and Street Medicine Program Location Characteristics

Table 3: Individual HPATHI Item Mean Scores and Changes

Table 4: Participants' Training and Practice Characteristics

Table 5: Participants' Interest in Working with Medically Underserved Populations

Table 6: Experiences Prior to Volunteering with a Street Medicine Program

Table 7: Experiences While Volunteering with a Street Medicine Program

Table 8: Experiences After Volunteering with a Street Medicine Program

TABLE OF CONTENTS

Approval.....	ii
Acknowledgements.....	iii
Abstract.....	iv
Author’s Statement.....	v
List of Tables.....	vi
I. Introduction.....	2
A. Background.....	2
B. Purpose of Study.....	3
II. Review of the Literature.....	4-17
A. Increase Access to Healthcare for the Population Experiencing Homelessness.....	4-10
1. Defining Homelessness.....	4-5
2. Population Experiencing Homelessness.....	5-6
3. Populations Experiencing Homelessness and Health.....	6-7
4. Healthcare Delivery Models for Populations Experiencing Homelessness.....	8-9
5. Street Medicine Program Volunteer Criteria.....	9-10
B. Shortage of Healthcare Providers for Underserved Populations.....	10-12
1. Status of Primary Care Physician Shortage.....	10-11
2. Changes in Policy.....	11-12
C. Increase Health Professional Students’ Exposure to Underserved Populations.....	12-17
1. School Curriculum.....	12-16
2. The Choice of Primary Care of Specialty Training.....	16-17
III. Methods.....	18-24
A. Overview of Phase I & Phase II.....	18
B. Phase I.....	18-22
C. Phase II.....	22-24
IV. Results.....	25-35
A. Sample.....	25
B. Location of Training and Volunteering with a Street Medicine Program.....	26
C. Health Professionals’ Attitudes Towards Homeless Inventory.....	26-28
D. Training and Practice Interest.....	29
E. Interest in Working with Medically Underserved Populations.....	30-31
F. Experiences Prior to Volunteering with a Street Medicine Program.....	31-32
G. Experiences While Volunteering with a Street Medicine Program.....	32-34
H. Experiences After Volunteering with a Street Medicine Program.....	34-35
V. Discussion.....	36-38
VI. Limitations.....	39
Implications for Future Research.....	39-40
VII. Conclusion.....	40
VIII. References.....	41-48
IX. Appendices.....	49-57
A. Phase I: Semi-Structured Interview Protocol.....	49-50
B. Phase I & Phase II: Demographic & HPATHI Questionnaire.....	51-53
C. Phase II: Web-Based Survey.....	54-57

I. Introduction:

Background. As of January 2015, roughly 565,000 individuals were estimated to experience homelessness on any given night in the United States (“Snapshots of Homelessness,” n.d.). Annually, the estimate of the total number of individuals experiencing homelessness ranges from 2.5 to 3.5 million (Maness & Khan, 2014). Notably, individuals experiencing homelessness suffer from significantly worse health outcomes when compared to housed individuals as a result of often unmet healthcare needs (Lebrun-Harris et al., 2013).

The standard delivery of healthcare model fails to meet the needs of individuals experiencing homelessness due to their lack of health insurance or other viable payment methods, inability to gain reliable transportation, or feelings of distrust with a healthcare practitioner. In efforts to remove the barriers keeping individuals experiencing homelessness from accessing healthcare, the street medicine model was developed (O’Connell, 2004). This nontraditional delivery of healthcare model focuses on providing healthcare to unsheltered individuals by meeting them in the environment where they live. Additionally, healthcare practitioners focus on building rapport and trust so that participants may continually access healthcare (“Operation Safety Net: Street Medicine Manual,” n.d.). A street medicine program is composed of an allied health professional team, which includes licensed healthcare practitioners, as well as health professional students.

Street medicine programs often use students attending health professional school as volunteers. Street medicine programs allow students to learn more about the specific living conditions and healthcare needs of the population experiencing homelessness. While the criteria students must meet in order to volunteer varies amongst street medicine programs, many programs require student volunteers to have clinical experience and be seeking a degree that

leads to licensure with prescriptive rights. In addition to increasing students' exposure to medically underserved populations, the street medicine model provides students with education and training outside of what is learned in their healthcare related programs.

Purpose of Study. This exploratory study aims to answer the following question: what influence does volunteering with a street medicine program have on the career trajectories of student volunteers who ultimately choose to work with medically underserved populations (MUPs)?

II. Review of the Literature:

Increase Access to Health for the Populations Experiencing Homelessness

Defining Homelessness. In a given year, 1% of the population in the United States experiences homelessness (Maness & Khan, 2014). While there are varying stages of homelessness, the broad characterization of homelessness is severe poverty and housing instability (“Frequently Asked Questions About Health Care for the Homeless,” 2011). One defining element of homelessness is the length or time period an individual experiences homelessness. Only 15% of individuals experiencing homelessness are considered chronically homeless, which is defined as an individual who has been experiencing homelessness continuously or experienced four episodes of homelessness in the past three years (“Defining Chronic Homelessness: A Technical Guide for HUD Programs,” 2007). Thus, the majority of individuals experiencing homelessness fall into the category of experiencing homelessness in a temporary circumstance, lasting anywhere between a few days to several weeks (“How Many People Experience Homelessness,” 2009). As a result, it is difficult to know the exact number of individuals experiencing homelessness in the United States, which often leads to a misrepresentation of the population experiencing homelessness (“How Many People Experience Homelessness,” 2009).

In addition to the hurdles created due to the temporal aspect of homelessness, difficulties arise when attempting to define homelessness because there is no standard definition of homelessness; therefore, many studies have contradicting ideas. For example, defining homelessness as only “unsheltered” fails to recognize those individuals sleeping in their cars (Nickasch and Marnocha, 2009). Somerville’s (1992) research aimed to analyze the meaning of homelessness in accordance to the meaning of home. The study illustrates the struggle society

makes in accepting the commonsense definition of homelessness, having a physical shelter, instead of the ideologically constructed definition, having an emotional connection to the place in which an individual is inhabiting (Somerville, 1992).

In the United States, the federal program Serving Children, Youth, and Families attempted to mitigate ambiguity by creating two standard definitions of homelessness; the education definition and the Housing and Urban Development definition. In accordance with the Housing and Urban Development definition, homeless status is established through two questions regarding an individual's physical shelter both of which require an affirmative answer: 1) Are you living in an unsheltered location? 2) Are you living in an emergency shelter or transitional housing? (McKinney-Vento Homeless Education Assistance Improvements Act of 2001). Additionally, various situations, such as staying with others when fleeing domestic violence in the individual's current housing situation, are exceptions that are defined as homelessness. In other terms, using the commonsense definition, homelessness can be defined as rooflessness, houselessness, or house sharing in certain situations (Wright & Tompkins, 2006).

Populations Experiencing Homelessness. In the United States, there has been a remarkable shift in the demographics of the population experiencing homelessness. The shift constituted a change from a predominately single white male population to a now largely ethnically diverse population (McQuiston, Gorroochurn, Hsu & Caton, 2014). While homelessness can affect men, women, and children of all races and ethnicities, specific populations have higher prevalence rates of homelessness when compared to others. Individuals with mental health concerns or those that misuse substances, as well as those with criminal records, experience homelessness at a higher rate than the general population (McQuiston et al.,

2014). Many experience homelessness on a reoccurring basis due to their inability to secure continual housing (Hwang & Burns, 2014).

Veterans, particularly females, are at a higher risk for experiencing homelessness than those who have not served in the military (Metraux, Clegg, Daigh, Culhane & Kane, 2013). Amongst veteran populations, those with mental health concerns, such as PTSD, have been shown to have a higher rate of experiencing homelessness (Metraux et al., 2013).

Populations Experiencing Homelessness and Health. Individuals experiencing homelessness must spend a substantial amount of energy to overcome the barriers to access essential resources for survival, such as water, food, and shelter, so in accordance with Maslow's Hierarchy of needs (1943), homeless individuals are left with very little energy to overcome all of the barriers to access healthcare (Nickasch & Marnocha, 2009). Therefore, the struggle to survive further exacerbates the individual's experiencing homelessness inability to access healthcare on a continual basis. As a result, individuals experiencing homelessness have poorer health outcomes, which prolongs their homeless status (Maness & Khan, 2014). This is best explained using the morbidity cycle, which illustrates the perpetuation of homelessness as a result of poor health (Maness & Khan, 2014).

The health status of individuals experiencing homelessness is significantly worse when compared to the general population (Lebrun-Harris et al., 2013). Specifically, the life expectancy of individuals experiencing homelessness is between 42 and 52 years old, compared to the life expectancy of housed individuals, which is 78 years old (Hwang, Orav, O'Connell, Lebow & Brennan, 1997). The dramatic reduction in health status is seen in both adult and children populations. Adults experiencing homelessness are three to six times more likely to become ill and have a hospitalization rate four times the average housed adult (Maness & Khan, 2014). The

most common acute illnesses amongst adults experiencing homelessness are upper respiratory infections, trauma, parasites, and skin ailments (Martins, 2008). Children experiencing homelessness are severely impacted by the unsheltered environment. That is, they experience illnesses, such as asthma and lead poisoning four times more often than children who are housing (Maness & Khan, 2014).

While the health status of individuals experiencing homelessness is poorer than the housed population, it is important to consider how individuals feels about their health status. In terms of health, the population experiencing homelessness has a concern for their physical illness, mental health, addiction, and stress (Daiski, 2007). However, they are unable to utilize healthcare to absolve these concerns due to the many barriers. Maness & Khan (2014) examined the extrinsic factors that impact the feelings individuals experiencing homeless have regarding their health. The results showed that the population feels that their health is affected by many barriers including: lack of resources to access basic necessities, lack of financial resources to seek care, lack of transportation or communication, and lack of compassion from healthcare providers (Maness & Khan, 2014).

Many of the individuals experiencing homelessness described the healthcare system as dehumanizing (Daiski, 2007). Martins (2008) studied the intricacy of how individuals experiencing homelessness felt once they were able to interact with the healthcare system. The study revealed that the individuals experiencing homelessness believed that while living without essential resources compromised their health, due to the barriers they encountered, including feeling labeled, being treated with disrespect, and feeling invisible to healthcare providers, they put off healthcare until crisis (Martins, 2008).

Healthcare Delivery Models for Populations Experiencing Homelessness. While the United States has made many improvements to the standard delivery of healthcare model to address the growth of chronic illness and aging populations, it has failed to provide any innovative ways to eliminate many barriers populations experiencing homelessness face when attempting to access healthcare (Shortell, Gillies & Wu, 2010). The standard delivery of healthcare model requires that patients have the resources to access reliable transportation, follow treatment plans that are often unmet with the limited resources available, and establish continuity in accessing healthcare (O'Connell, 2004).

In addition to causing poorer health outcomes for populations experiencing homeless, the aforementioned barriers for accessing health care through the standard delivery of healthcare model put a strain on the healthcare system (Daiski, 2007). Many individuals experiencing homelessness use the emergency department to access any type of healthcare, which is more expensive for the hospital (Daiski, 2007). Additionally, individuals experiencing homelessness are sicker when they arrive at the emergency department which requires more intensive treatments (Daiski, 2007). Consequently, the mortality rates amongst individuals experiencing homelessness are greater than housed individuals (Daiski, 2007).

In an attempt to mitigate the burdens populations experiencing homelessness must endure to access healthcare, patient-centered medical homes have become limited, but viable options. Patient-centered medical homes are centered around providing comprehensive and coordinated care by primary care teams in an environment accessible to the patient ("Defining the Medical Home, n.d.). Patient-centered medical homes success lies in the primary outreach component used to identify patients in need of care in an environment outside of a traditional hospital or clinic. Additionally, the model provides patients with resources outside of healthcare, such as

affordable housing and employment opportunities. Once identified, patients are scheduled for clinic visits to establish rapport with the multidisciplinary medical team and address symptomatic issues. Following the initial visit, patients' health outcomes are based on continual clinic visits to address more complex issues, establish short term goals, and effectively use the clinical coordinators and case managers to change trajectory of overall wellbeing (Maness & Khan, 2014). Patient-centered medical homes provide a more inclusive delivery model; however, access to transportation is still a factor impeding successful health outcomes and there are a limited number of patient-centered medical homes throughout the United States (Shortell, Gillies & Wu, 2010).

Street medicine was born as a nontraditional method to deliver healthcare to populations experiencing homelessness, specifically those considered 'unsheltered'. Street medicine alleviates the barriers created by the standard delivery of healthcare model and patient-centered medical homes by addressing the discontinuity and ineffectiveness of both models with regards to populations experiencing homelessness. The basis of street medicine lies in creating a harmonious relationship between the patient and healthcare provider. The healthcare provider meets the patient directly in the environment in which the individual is living. The healthcare provider is able to provide the individual access to healthcare in addition to building rapport which can result in generating a continuum of care for the individual (Withers, 2011).

Street Medicine Program Volunteer Criteria. The mission of street medicine is to ensure access to quality medical care that meets the needs of populations experiencing homelessness. Therefore, street medicine provides populations experiencing homelessness access to healthcare, as well as interventions that promote healthier lifestyles, such as psychiatric and substance misuse treatment ("Operation Safety Net: Street Medicine Manual," n.d.). In addition to

providing populations experiencing homelessness access to healthcare, the street medicine model serves as an avenue to provide health professional students the opportunity to gain exposure serving vulnerable populations while learning how to practice street medicine. While this model can differ depending on the street medicine program, many programs in the United States are modeled from Operation Safety Net in Pittsburgh, Pennsylvania, started by Dr. Jim Withers.

In order to become a student volunteer, many of the street medicine programs require health professional students to be seeking a career in which they will receive prescriptive rights, this includes allopathic and osteopathic medical students, physician assistant students, and nurse practitioner students. Criteria for specific roles on the street medicine team are dependent on education experience. For example, medical students who are in their first or second year can be responsible for building rapport with patients through initial contact and primary screening. Medical students in their third or fourth year are able to provide medical care under the supervision of a licensed healthcare provider (Lo, 2011).

Shortage of Healthcare Providers for Underserved Populations

Status of Primary Care Physician Shortage. Following the 1990s, the number of medical students choosing to become primary care physicians, this includes family medicine, internal medicine, gynecology or obstetrics, geriatrics, and pediatrics, leveled off while medical students choosing subspecialty training increased proportionally (Bazargan et al., 2006). In 2011, the Association of American Medical Colleges estimated a 27% decrease in medical graduates choosing primary care (Xierali, Fair, Johnson, Maeshiro & Jeney, 2016).

The limited contact and experience with underserved populations could impact medical students' decisions to work with underserved populations; thus intensifying the shortage of providers serving underserved populations. Puertas, Arósquipa & Gutiérrez (2013), estimated the

national shortage of primary care physicians close to 30,000. As a direct consequence, the Health Resources and Services Administration (HRSA) determined 57 million individuals live in 5,864 designated primary care shortage areas in the United States.

As of 2010, 37% of physicians are primary care physicians. This small percentage of physicians provide the majority of physician office visits, specifically 56% of office visits (Bodenheimer & Pham, 2010). In other words, a small percentage of primary care physicians provide the majority of office visits in all areas. Therefore, the prediction George et al. (2015) established, regarding the continual worsening of the physician shortage and maldistribution of healthcare providers, will have a disparate impact on medically underserved communities (Bazargan et al., 2006).

Changes in Policy. The United States spends an exorbitant amount of its Gross Domestic Product (GDP) on healthcare, specifically 17.1% in 2013 (Squires & Anderson, 2015). However, when compared to other developed countries, the United States suffers from the greatest population health disparities, including life expectancy and morbidity (Squires & Anderson, 2015). In 2011, the United States had the highest infant mortality rate of 6.1 deaths per 1,000 live births, compared to the median of the other 13 high-income countries, 3.5 deaths per 1,000 live births (Squires & Anderson, 2015). Furthermore, populations that experience social and economic barriers in the United States, such as populations experiencing homelessness, suffer from significantly worse health outcomes (Vanderbilt, Baugh, Hogue, Brennan & Ali, 2016).

In 2010, the Patient Protection and Affordable Care Act was passed to address the lack of widespread health insurance coverage, increasing healthcare costs, and the shortage of primary care providers (Bodenheimer & Pham., 2010). Effectively, the passage of the ACA gave 32-46 million individuals access to healthcare, ensured that people with preexisting conditions would

not be denied insurance coverage, and covered preventative and wellness services (Odell, Kippenbrock, Buron & Narcisse, 2013). Additionally, the merit-based incentive pay system, a value-based program that measures providers quality of care, cost of care, compliance, and clinical practice improvement, was enforced to provide physicians financial incentives for the quality of care they provided and the health outcomes of their patient panels (George et al., 2015).

The United States healthcare system continues to evolve to satisfy the call for more association between public health and medicine (Kaprielian et al., 2013). As a result, health professional schools are altering guidelines and curriculum to reflect support for the policy changes. First, medical schools are recruiting students from underserved or under represented communities because they will be more likely to return and serve that population (Larkins et al., 2014). Second, medical schools are creating education and training opportunities in medically underserved areas or amongst medically underserved populations. Lastly, medical schools are implementing loan forgiveness programs to help alleviate the decree in primary care providers (George et al., 2015).

Increase Health Professional Students' Exposure to Medically Underserved Populations

School Curriculum. In addition to serving as a steward of the body, students enrolled in medical school have an obligation to practice and serve medically underserved populations as physicians on a regular basis (American Medical Association Council on Ethical and Judicial Affairs, 1993). While many medical students fulfill this obligation by practicing in community health centers or other public settings serving medically underserved populations, most practice in a private setting, only serving medically underserved populations with Medicaid or specific uncompensated care cases (Huang, 2011).

As the standard delivery of healthcare model is altered to remove barriers many populations, including populations experiencing homelessness, encounter when attempting to access healthcare, medical school curriculum must evolve to train medical students to have the confidence to care for these populations. In 2008, the Liaison Committee on Medical Education revised medical school accreditation criteria to reflect this change (Buckner, Ndjakani, Banks & Blumenthal, 2010). The revision includes: 1) medical schools must create and encourage students to participate in service-learning opportunities, 2) medical schools must integrate interprofessional education and communication, and 3) medical schools must provide education regarding public health and prevention practices (Buckner et al., 2010); (VanderWielen et al., 2015).

In response to these changes, medical schools are moving towards making curriculum "streamlined". That is, medical schools are integrating social medicine practices into curriculum to give students exposure, education, and practice to interact and serve medically underserved populations (Vanderbilt et al., 2016). This strengthens students' knowledge and ability to gain training experiences, which enhances students' efficacy and engages more students to choose to serve medically underserved populations (Huang, 2011). Tavernier, Connor, Gates & Wan examined the effects integration of curriculum, specifically increased exposure to medically underserved populations, had on medical students' decision to serve medically underserved populations after the completion of residency. Results showed that medical students who were exposed to medically underserved populations during medical school through educational or training opportunities were more likely to serve medically underserved populations after the completion of school (2003).

Examples of the changes in curriculum include rotations aimed to increase contact with medically underserved populations, courses to enhance knowledge of serving medically underserved populations, service-learning opportunities, longitudinal tracks for students who are interested in serving medically underserved populations prior to entering medical school, and extracurricular opportunities. First, medical students are able to perform rotations in facilities that will increase their contact with medically underserved populations, including community health centers and clinics in prisons or low-income schools (The Robert Graham Center: Policy Studies in Family Medicine and Primary Care, 2009). Second, courses are offered that will enhance students' knowledge of serving medically underserved populations. For example, social medicine courses educate students regarding the health disparities in communities and the associated population health (The Robert Graham Center: Policy Studies in Family Medicine and Primary Care, 2009), as well as courses emphasizing interprofessional communication and cultural competency (Vanderbilt et al., 2016).

Third, service-learning opportunities are available that merge instruction learned in the typical classroom with a community outreach setting. The experience allows students to go into the community and put their practice to use. Thus, students feel more prepared to serve the community and are able to make a well-informed commitment to serving the community (Buckner et al., 2010). One example comes from a medical school that partnered with community organizations to give students the opportunity to complete a community needs assessment, determine the health issues needing to be addressed, and create interventions to promote better health in the community (Buckner et al., 2010).

Fourth, longitudinal tracks are offered to students who identify an interest in serving medically underserved populations prior to beginning medical school. The longitudinal track

provides students hands-on experience for four years, learning curriculum through integrated blocks focused on specific themes, as opposed to sequenced blocks. In addition, the longitudinal track offers students the opportunity for experiential training (“Longitudinal Track Programs,” n.d.). An example of a longitudinal track program is a program implemented by a medical school to give students with a prior indicated interest in serving medically underserved populations positive exposure with communities to increase the likelihood that they will practice in a medically underserved area (Roy, Hurley, Plumb, Castellan & McManus, 2015). Initially, the student must indicate their commitment to working with urban underserved populations before beginning their first year of medical school. They are then admitted to the program and must complete specific courses, such as primary care monthly evening seminars, community health internships, or placement at sites focused on primary care training, to gain and promote training that empowers them to serve urban underserved populations (Roy et al., 2015). Lastly, extracurricular opportunities, such as study abroad experiences or mission trips, allow students to utilize their medical education and training to serve populations in foreign locations (Bruno, Imperato, Szarek, 2013).

The success of these various opportunities was exemplified through a study performed by Cox et al. (2008). The research showed that after changes in medical school curriculum, specifically those focused on caring for medically underserved populations, a significant number of students felt the curriculum changes improved their self-efficacy and clinical skills to successfully serve medically underserved populations (Cox et al., 2008). In addition to the medical school curriculum modifications, other health professional schools are altering their curriculum to reflect the integration of education and training to better prepare students to provide healthcare to medically underserved populations. For example, nursing schools are

revising curriculum to reflect training similar to the care Florence Nightingale provided to marginalized populations (Daiski, 2007).

The Choice of Primary Care or Specialty Training. The success of a street medicine program lies in an interdisciplinary team composed of both primary care and specialty trained physicians, as well as other allied healthcare providers. Due to the maldistribution of primary care providers, it is important to explore the factors that influence health professional students to seek primary care or specialty training.

Lynch, Newton, Grayson & Whitley (1998) explored the influence medical school culture has on medical students' decision to ultimately choose primary care or specialty training. The researchers measured students' interest in primary care from the students' first year of medical school, and again during the students' fourth year of medical school using a survey tool. The study results revealed those students' beliefs regarding the prestige of primary care decreased, but the realistic perceptions about the rigor of primary care increased as they continued through their medical program (Lynch et al., 1998).

In addition to medical school culture, intrinsic and extrinsic factors impact the decision to choose primary care or specialty training. Demographics play a large role in a student deciding primary care over subspecialty training. Puertas et al. (2013) determined that gender, relationship status, and previous experience in non-urban or rural environments are all factors that affect a student's decision to choose primary care or specialty training. When observing extrinsic factors, researchers determined students who chose primary care had positive social values towards medically underserved populations, an understanding and preference for the continuity of care model, and an appreciation for the varying spectrum of patients and diseases (Puertas et al., 2013). In comparison, students who chose specialty training were specifically interested in

intellectual content of the respective specialty, research opportunities, and prestige (Barzargan et al., 2006).

III. Methods:

Overview of Phase I & Phase II. The purpose of this study is to gain a better understanding of the influence volunteering for a street medicine program has on the career trajectories of student volunteers who ultimately choose to work with medically underserved populations. This study consisted of two phases; Phase I) an exploratory interview study conducted within one street medicine program to better understand the experiences of students who volunteer for street medicine programs, and Phase II) an exploratory survey study conducted with a national sample to examine what role do street medicine programs play in the career trajectories of student volunteers who ultimately choose to work with medically underserved populations.

Phase I was completed prior to this study and used a semi-structure interview to collect qualitative data to inform this study's, phase II, web-based survey. Specifically, the core and sub-domains that resulted from phase I were used as the choices for the close-ended questions in phase II. Phase I used a semi-structured interview to collect qualitative data to inform phase II's web-based survey. Both phase I and phase II used convenience sampling to collect data.

Phase I.

Consenting Process. Georgia State University's Institutional Review Board for human subject protection approved this research study. The informed consent form was presented to participants prior to engaging in the in-depth interview. The consent form was presented to each participant to be read and then signed by the participant and the researcher. All participants consented to be in the study and audio-recorded.

Ethical Consideration. Careful consideration was given when developing the study protocol to ensure the participant faced minimal risks that were no greater than those incurred in a normal day of life. The participant received no benefits for partaking in the in-depth interview.

The participant was informed that their input could be used to inform phase II of this research study.

Research Questions. The goal of phase I of this research was to explore the experiences of health professional students who volunteer with an urban street medicine team through mixed method interviews. That is, participating in an in-depth interview and completing a questionnaire focused on their demographics and attitudes towards the population experiencing homelessness. This research intended to answer the following questions: 1) How do student volunteers experience a street medicine program? 2) What do student volunteers learn about themselves, individuals who are experiencing homelessness, and street medicine through volunteering in a street medicine program? 3) What perceived influence does volunteering for a street medicine program have on the career trajectories of student volunteers?

Sample. Participants were notified of the research through an organization that coordinates health professional student volunteers for the street medicine program in the Metro-Atlanta area. The participants were told of research being conducted to better understand the experiences of the students who volunteer for the street medicine program. If interested, the participants scheduled a time to complete an in-depth interview, as well as a brief questionnaire focused on the participant's demographics and attitude towards the population experiencing homelessness. Participants included in the convenience sample met the inclusion criteria: a past or current health professional student volunteer in a street medicine program. Phase I participants were recruited from only one street medicine program.

Procedures. A semi-structured interview, *Appendix A*, was used to collect the data in phase I. This allowed participants and interviewers to elaborate on desired points without losing overall focus. The in-depth interviews ranged from 20 to 40 minutes. Questions from the in-

depth interviews were broad, open-ended questions, developed to give the participant the opportunity to identify what experiences were important to them while volunteering with a street medicine program. The data was collected through the in-depth interviews that were audio-recorded and transcribed verbatim.

After completing and analyzing the first collection of data, the researchers identified common emerging themes and altered interview questions to further investigate these topics. Additionally, the participants completed a demographic survey and Health Professionals' Attitudes Towards the Homeless Inventory (HPATHI). The HPATHI questionnaire was completed to measure the students' interests in the populations experiencing homelessness, as well as to measure the students' beliefs in their abilities to provide healthcare to populations experiencing homelessness (Buck et al., 2005). The demographic survey and HPATHI questionnaire took participants from 15-20 minutes to complete.

Demographic Survey. The demographic survey, *Appendix B*, was used to document the background of the population that participated in the research study. This includes questions regarding gender, race and ethnicity, age, parents' level of education, geographical setting of formative years, and income contribution to the household as a late adolescent. There has been a positive correlation between a health professionals' career choice, specifically medical students' career choice, and demographic characteristics (Newton, Grayson & Whitley, 1998). Student demographic questions were procured from the Association of American Medical Colleges Graduation Questionnaire 1995 and 1999.

Health Professionals' Attitude Towards the Homeless Inventory (HPATHI) Questionnaire. The Health Professionals' Attitude Towards the Homeless Inventory, *Appendix B*, is a validated 19-item questionnaire that uses a 5-point Likert scale and was originally

designed for medical students, but later modified to include healthcare professionals (Buck et al., 2005). With permission from the HPATHI author, the research team modified the questionnaire to utilize the post and retrospective pretest method for measuring change. Previous studies have found that retrospective pretest items are more representative of individuals' judgment than the traditional pretest-posttest model (Goedhart & Hoogstraten, 1992).

The post and retrospective pretest method allowed the research team to explore the possibility that direct experiences with individuals experiencing homelessness may change health professionals' attitudes more than medical training alone. Therefore, health professional schools may alter curriculum to give students more opportunities to work directly with medically underserved populations, so they may be more inclined to serve medically underserved populations after training is completed.

The usage of the HPATHI was to measure student volunteers' level of interest in populations experiencing homelessness and confidence providing healthcare to populations experiencing homelessness before and after volunteering with a street medicine team. The instrument's questions represent personal advocacy- the volunteer's personal commitment to work and represent individuals experiencing homelessness, social advocacy- the volunteer's beliefs regarding societies commitment to care for populations experiencing homelessness, and cynicism- any negative attitude or feelings of uncertainty in treating individuals experiencing homelessness the volunteer may have (Buck et al., 2005).

Process for Data Analysis. For phase I, a Consensual Qualitative Research (CQR) approach was utilized during data analysis for primary and secondary data collections of the in-depth interviews (Hill et al., 2005). The in-depth interviews were audio-recorded and transcribed verbatim. Each member of the research team was given a set of manuscripts to view

independently to determine a list of emerging themes. The research team then met to discuss the meaning of the data and a reached consensus on a finalized list of domains, *Appendix B*. The domains refer to broader topics that cluster the data into major themes being explored. During the meeting, the domain list was created so that the scope of each was not too broad or too narrow and reflected what was articulated by the participant regarding their experience volunteering with a street medicine program. Subdomains were used to organize other meaningful data to allow for higher explanation of core themes.

Analysis of Demographic and HPATHI Questionnaire. The demographic and HPATHI information gathered from phase I was analyzed using less formal methods. First, the demographic information was analyzed based on response frequencies. For example, how many people responded ‘yes’ to contributing their income to their household prior to being 18 years of age. Second, the HPATHI survey was analyzed by dichotomizing the scores to either ‘disagree’ or ‘agree’. The statements that the participant positively scored, four or five on the Likert scale, were categorized with ‘agree’. The statements that the participant negatively scored, one or two on the Likert scale, were categorized with ‘disagree’.

Phase II.

Consenting Process. Georgia State University’s Institutional Review Board for human subject protection approved this research. The informed consent form was presented to participants prior to engaging in the web-based survey. The consent form was presented to each participant via an email containing the link. After reading the consent form, participants either consented to participate in the research study or did not. If consent was given, the participants were directed to the web-based survey. If not, the participant was guided to Georgia State University’s website.

Ethical Consideration. Careful consideration was given when developing the study protocol to ensure the participant faced minimal risks that were no greater than those incurred in a normal day of life. The participant received no benefits for partaking in the web-based survey.

Research Questions. The goal of phase II of this research was to explore what role volunteering with a street medicine program has on the career trajectories of student volunteers who choose to work with medically underserved populations through a survey with open and closed- ended questions. This research intended to answer the following questions: What perceived influence does volunteering for a street medicine program have on the career trajectories of student volunteers who choose to work with medically underserved populations?

Sample. Street medicine programs across the United States were notified of the research through an email from the research team. Once street medicine programs were notified of the research, emails were forwarded to each participant containing a link to the informed consent form of the study. The participants were told of the research being conducted: to explore what role volunteering with a street medicine program had on the career trajectories of student volunteers who ultimately chose to work with medically underserved populations. If interested, the participants gave consent and completed the web-based survey, including the demographic survey and HPATHI questionnaire used in phase I of the study. Participants included in the convenience sample met the inclusion criteria: past or current health professional student volunteers in a street medicine program. Phase II participants were recruited from multiple street medicine programs across the United States.

Procedures. The data collected from the interviews with semi-structured questions during phase I was used to inform the development of the web-based survey, *Appendix C*, created for phase II. Completion of the web-based survey ranged from 30-40 minutes. The majority of the

questions included in the web-based survey were closed-ended questions with choices that emerged from the themes of phase I. Some questions included an open-ended option; ‘Other’, so that participants could add personal ideas that were not included. The demographic survey and HPATHI questionnaire, *Appendix B*, were included in the web-based survey to measure the participants’ level of interest and confidence in their ability to deliver healthcare services to the homelessness population (Buck et al., 2005).

Process for Data Analysis. For phase II, the web-based surveys were analyzed using two methods. The closed-ended questions’ results were reported using frequency. The open-ended questions were grouped into core domains. The results were reported using frequency.

Analysis of Demographic and HPATHI Questionnaire. For phase II, the demographic questionnaire was analyzed using the frequencies of the various responses. The age categories were grouped into ten-year categories, so the information was more accessible. The HPATHI questionnaire was analyzed by using the median scores for before and after volunteering with a street medicine program. Additionally, the mean change in score from before and after volunteering with a street medicine program was calculated. A paired sample t-test was used to analyze the data in order to compare the before and after means to determine if the change was statistically significant. The significant differences in scores were either positive or negative, reflecting students’ changes in attitude from before and after.

IV. Results:

Sample. Thirty-one participants started the web-based survey; however, only twenty-three participants completed the web-based survey in its entirety over the course of a ten-week period. The drop of participants was most prominent between the final survey question and the first demographic question. The final sample, Table 1, was primarily female and identified as white. The average age of participants was 30.5 years old, with most participants classified in the 21 to 29 years range. The majority of the participants reported their parents' highest level of education being at or above a Bachelor's Degree and spent the majority of their formative years in a suburban area. While the majority of participants earned an income prior to turning 18 years old, they did not contribute said income to their household.

Table 1. Participant Demographics

<i>Characteristics:</i>	<i>Total N= 23</i>
<i>Gender</i>	
<i>Female</i>	16 (69.57%)
<i>Male</i>	6 (26.09%)
<i>Transgender</i>	1 (4.35%)
<i>Age</i>	
21-29	16 (69.57%)
30-39	4 (17.39%)
40-49	0 (0.0%)
50-59	2 (8.69%)
60-69	1 (4.35%)
<i>Race/ Ethnicity</i>	
<i>Hispanic/ Latino</i>	3 (13.04%)
<i>Multiracial</i>	1 (4.35%)
<i>White</i>	19 (82.61%)
<i>Mother's Highest Level of Education</i>	
<i>No High School</i>	1 (4.35%)
<i>High School</i>	4 (17.39%)
<i>Associate Degree</i>	3 (13.04%)
<i>Bachelor's Degree</i>	4 (17.39%)
<i>Graduate Degree</i>	11 (47.83%)
<i>Father's Highest Level of Education</i>	
<i>No High School</i>	1 (4.35%)
<i>High School</i>	1 (4.35%)
<i>Bachelor's Degree</i>	7 (30.43%)
<i>Graduate Degree</i>	14 (60.87%)
<i>What Type of Area did you Grow-Up In?</i>	
<i>Rural</i>	5 (21.74%)
<i>Suburban</i>	14 (60.87%)
<i>Urban</i>	4 (17.39%)
<i>Did you Earn an Income Prior to Turning 18 Years Old?</i>	
<i>Yes</i>	14 (60.87%)
<i>No</i>	9 (39.13%)
<i>Were you Expected to Contribute the Income you Earned to your Household?</i>	Total N=14
<i>Yes</i>	
<i>No</i>	14 (100%)

Location of Training and Volunteering with a Street Medicine Program. The web-based survey was disseminated to street medicine programs nationally. To get a better understanding of the participants reached, the participants were asked to identify the location of the medical profession school they attended and the location of the street medicine program where they volunteered, seen in Table 2. Of the 31 participants that completed this question, 11 (35.5%) participants identified the location of the medical profession school they attended as the Northeast. Additionally, five (16.13%) participants did not attend medical profession school. The remainder of participants, 15 (48.39%), were normally distributed across the other regions in the United States including, South, Midwest, and West. The location of the street medicine programs followed a similar arrangement with the exception of 10 (32.25%) participants that volunteered with a street medicine program in the West.

Table 2. Location Characteristics

<i>Characteristic:</i>	<i>Total N= 31</i>
<i>Location of Medical Profession School:</i>	
<i>Northeast</i>	11 (35.5%)
<i>South</i>	5 (16.13%)
<i>Midwest</i>	6 (19.35%)
<i>West</i>	4 (12.90%)
<i>None</i>	5 (16.13%)
<i>Location of Street Medicine Program:</i>	
<i>Northeast</i>	10 (32.25%)
<i>South</i>	5 (16.13%)
<i>Midwest</i>	5 (16.13%)
<i>West</i>	10 (32.25%)
<i>None</i>	1 (3.23%)

HPATHI. In addition to completing the demographic information, the 23 participants completed the HPATHI survey, *Appendix B*. The median scores for the retrospective and prospective HPATHI surveys and the mean score difference are shown in Table 3. The means

scores for before and after were 63.37 and 66.57, respectively, (mean score difference= 3.2, paired t- 2.135, p-value= 0.047), indicating that there was a significant positive change in attitude during or after participants volunteered with a street medicine program. For twelve HPATHI items, the difference between the before and after volunteering with a street medicine scores were statistically significant. Significant differences for positive changes, the score value increased, reflect students' scores that became more positive towards the population experiencing homelessness from before volunteering with a street medicine team to after volunteering with a street medicine team. Significant differences for negative changes, the score value decreased, reflect students' scores that became more negative towards the population experiencing homelessness from before volunteering with a street medicine team to after volunteering with a street medicine team.

Significant differences for positive changes included, "Homelessness is a major problem in our society.", "Homeless people choose to be homeless.", "Homeless people are lazy.", "Health care dollars should be directed toward serving the poor and homeless.", "Doctors should address the physical and social problems of homeless.", "Doctors have a duty to care for the homeless.", "I am comfortable being a primary care provider for a homeless person with major mental illness.", "I am comfortable being a part of a team when providing care to the homeless.", "I entered medicine because I want to help those in need.", "I am interested in working with the underserved.", and "I enjoy addressing psychosocial issues with patients." Significant differences for negative changes included, "Homeless people have the right to basic health care."

Table 3. Individual HPATHI Item Scores

Question	Mean Before Score	Mean After Score	Mean Change in Score	p-value
1. Homeless people are victims of circumstance.	3.96	3.96	0	1.0
2. Homeless people have the right to basic health care.	4.65	4.61	-0.04	0.0018*
3. Homelessness is a major problem in our society.	4.35	4.70	0.35	0.002*
4. Homeless people choose to be homeless.	1.96	1.57	-0.39	0.0012*
5. Homeless people are lazy.	1.91	1.43	-0.48	0.00083*
6. Health care dollars should be directed toward serving the poor and homeless.	4.04	4.39	0.35	0.0024*
7. Doctors should address the physical and social problems of homeless.	4.17	4.48	0.31	0.005*
8. Doctors have a duty to care for the homeless.	3.9	4.39	0.49	0.00018*
9. Caring for the homeless is pointless since they do not follow-up.	1.61	1.57	-0.04	0.58
10. Providing medical care for the homeless is futile.	1.52	1.52	0	1.0
11. I am comfortable being a primary care provider for a homeless person with major mental illness.	2.74	3.61	0.87	< 0.00001*
12. I feel comfortable being part of a team when providing care to the homeless.	3.91	4.74	0.83	4.2E-05*
13. I entered medicine because I want to help those in need.	4.48	4.78	0.3	0.0052*
14. I am interested in working with the underserved.	4.39	4.57	0.18	0.043*
15. I enjoy addressing psychosocial issues with patients.	3.91	4.17	0.26	0.011*
16. I resent the amount of time it takes to see homeless patients.	1.52	1.39	-0.13	0.19
17. I enjoy learning about the lives of my homeless patients.	4	4.13	0.13	0.19
18. I believe social justice is an important part of health care.	4.35	4.52	0.17	0.103
19. I believe caring for the homeless is not financially viable for my career.	2	2.04	0.04	0.66

Training and Practice Interests. In order to explore the professional characteristics of individuals who volunteer with a street medicine program, participants were asked if they currently held or were seeking a medical profession degree, and if they had a practice specialty. Practice specialty referred interest in a specific branch of medicine. Of the 31 participants that completed the training and practice section (Table 4), 15 (48.39%) participants did not currently have a medical profession degree. Of the remaining participants, seven (22.58%) were allopathic physicians, six (16.13%) were registered nurses, two (6.45%) were EMTs, and one (3.23%) had public benefits training.

When asked what medical profession degree they were seeking, an overwhelming majority answered allopathic physician. Finally, participants were asked about their practice specialty. The majority of participants responded that they were undecided. Additionally, four (12.90%) participants responded that their specialty was family medicine, three participants responded to psychiatry, and participants evenly chose the remaining branches.

Table 4. Training and Practice Characteristics

<i>Characteristic:</i>	<i>Total N= 31</i>
<i>Current Medical Professional Degree:</i>	
<i>Physician Assistant</i>	1 (3.23%)
<i>Physician- Allopathic</i>	7 (22.58%)
<i>Registered Nurse</i>	6 (16.13%)
<i>None</i>	15 (48.39%)
<i>Other:</i>	
<i>EMT</i>	
<i>Public Benefits</i>	2 (6.45%)
<i>Medical Professional Degree Seeking:</i>	1 (3.23%)
<i>Physician Assistant</i>	
<i>Physician- Allopathic</i>	2 (6.90%)
<i>Registered Nurse</i>	20 (64.52%)
<i>None</i>	2 (6.90%)
<i>What is your practice specialty?</i>	7 (24.14%)
<i>Family Practice</i>	
<i>Women's Health</i>	4 (12.90%)
<i>Psychiatry</i>	2 (6.45%)
<i>Gerontology</i>	3 (3.23%)
<i>Emergency Medicine (ER)</i>	1 (3.23%)
<i>Neurology</i>	2 (6.45%)
<i>Other:</i>	1 (3.23%)
<i>Undecided</i>	
<i>Critical Care</i>	4 (12.90%)
<i>Endocrine</i>	2 (6.45%)
<i>Harm Reduction</i>	1 (3.23%)
<i>Otolaryngology</i>	1 (3.23%)
<i>None</i>	1 (3.23%)
	9 (29.03%)

Interested in Working with Medically Underserved Populations. Because the street medicine teams predominately serve populations experiencing homelessness, the web-based survey asked participants about their interest in working with medically underserved populations and if the participants were currently working with medically underserved populations (Table 5). Of the 31 participants that completed this section, 27 (87.10%) participants reported that they were interested in working with medically underserved populations. Specifically, 17 (62.96%) participants reported that they intended on working with populations experiencing homelessness. Of the remaining participants, eight (29.63%) participants reported they intended on working with a specific demographic of medically underserved populations, such as Latino populations or female populations, one (3.70%) participant reported the intention to work with an international population, and the final participant remained undecided.

The majority of the participants (77.42%) were currently working with a medically underserved population. Specifically, 11 (45.83%) participants currently worked with populations experiencing homelessness, an equal amount of participants worked with populations of specific demographics and populations comprised of multiple medically underserved individuals, two participants worked with uninsured populations, and one participant worked with an international populations. Finally, the majority of participants (69.57%) chose interest in health equity and access as the reason they worked with medically underserved populations.

Table 5. Interest in Working with Medically Underserved Populations

<i>Characteristic:</i>	<i>Total N= 31</i>
<i>Do you intend to work with a medically underserved population?</i>	
<i>Yes</i>	27 (87.10%)
<i>No</i>	4 (12.90%)
<i>What medically underserved population do you intend to work with?</i>	Total N= 27
<i>Population experiencing homelessness</i>	17 (62.96%)
<i>Population based on specific demographic</i>	8 (29.63%)
<i>International population</i>	1 (3.70%)
<i>Undecided</i>	1 (3.70%)
<i>Are you currently working with a medically underserved population?</i>	
<i>Yes</i>	24 (77.42%)
<i>No</i>	7 (22.58%)
<i>What medically underserved population are you currently working with?</i>	Total N= 24
<i>Population experiencing homelessness</i>	11 (45.83%)
<i>Population based on specific demographic</i>	5 (20.83%)
<i>International population</i>	1 (4.17%)
<i>Population without insurance</i>	2 (8.33%)
<i>Population consisting of a variety of underserved individuals</i>	5 (20.83%)
<i>Why did you choose to work with a medically underserved population?</i>	
<i>Interested in Health Equity/ Access</i>	17 (69.57%)
<i>Interested in Working with a Particular Population</i>	5 (21.74%)
<i>Other:</i>	
<i>Social Justice</i>	1 (4.35%)
<i>Fun</i>	1 (4.35%)

Prior to Volunteering with a Street Medicine Program. Of the 29 participants that completed the “prior to volunteering with a street medicine program” portion of the web-based survey, 21 (72.41%) participants had previous experience working with medically underserved populations (Table 6). The open-ended responses were categorized into core ideas. The majority of participants who had previous experiences working with medically underserved populations volunteered with homeless shelters, outreach programs, or other street medicine or mobile clinic programs. Participants mentioned equally the follow core ideas: volunteering with a study abroad program serving medically underserved populations and participating in academic opportunities serving medically underserved populations. Finally, one (4.76%) participant had previous

experience working with a medically underserved population through a previous healthcare occupation.

The majority of the 29 (62.07%) participants identified wanting to help medically underserved populations as the main reason they chose to volunteer with a street medicine program. Furthermore, six (20.69%) participants chose to volunteer with a street medicine program in order to learn and enhance their skills working with medically underserved populations. Lastly, 3 (13.79%) participants mentioned the nontraditional clinical experience as the reason they chose to volunteer with a street medicine program.

Table 6. Experiences Prior to Volunteering with a Street Medicine Program

<i>Prior to Volunteering with a Street Medicine Program:</i>	<i>Total N= 29</i>
<i>Do you have a past experience working with medically underserved populations?</i>	
<i>Yes</i>	21 (72.41%)
<i>No</i>	8 (27.59%)
<i>What was the past experience?</i>	Total N=21
<i>Volunteer through similar program, outreach, shelters</i>	16 (76.19%)
<i>Volunteer with abroad program</i>	2 (9.52%)
<i>Academic opportunities working with similar population</i>	2 (9.52%)
<i>Previous healthcare experience</i>	1 (4.76%)
<i>What is the main reason you chose to volunteer with a street medicine program?</i>	
<i>The nontraditional clinical experience.</i>	3 (13.79%)
<i>I wanted to help underserved populations.</i>	17 (62.07%)
<i>I wanted to learn and enhance my skills working with underserved populations.</i>	6 (20.69%)
<i>Other:</i>	
<i>Requirement for medical professional school</i>	1 (4.35%)
<i>I wanted to expand and continue my prior involvement with Street Medicine.</i>	1 (4.35%)
<i>All of the above.</i>	1 (4.35%)

While Volunteering with a Street Medicine Program. To get a better understanding of student volunteers' experiences while volunteering with a street medicine program, participants were asked to respond to survey questions regarding important things they learned through volunteering with a street medicine program and how they are using the skills they learned in a street medicine program in their current role (Table 7). Participants were given answer choices

that were informed from phase I of the study. Additionally, participants were given the option to provide their own answer in an open-ended style format. The majority of participants chose providing medical care with minimal resources and developing relationships with patients as two of the three most important things they learned through volunteering with a street medicine team. Additionally, 12 (50.0%) participants noted the heightened awareness for the living conditions of individuals experiencing homelessness.

Of the three important things, participants were asked to choose the most important thing they learned from volunteering with a street medicine team. An equal number of participants chose developing relationships with patients and awareness for medically underserved communities. In addition, five (20.83%) participants chose patient advocacy, three (12.5%) participants chose harm reduction, three (12.5%) participants chose providing care with minimal resources, and one (4.17%) participant chose interprofessional communication as the most important things.

Lastly, participants reported the skills learned from volunteering with a street medicine program in their current role. Of the 24 participants that completed this section, 11 (45.83%) participants reported that they engaged more frequently in patient advocacy, four (16.67%) participants reported that they are able to provide care with less resources, three (12.5%) participants reported that they were able to employ the harm reduction model to reduce negative consequences associated with drug use, two (8.43%) participants mentioned that they are using all of the skills given as answer responses, and one (4.17%) participant included a personal response, they were able to relate more with patients that were alienated from the traditional healthcare system.

Table 7. Experiences While Volunteering with a Street Medicine Program

<i>Experience While Volunteering with a Street Medicine Program:</i>	<i>Total N= 24</i>
<i>What are three important things you learned through volunteering with a street medicine program?</i>	
<i>Providing medical care with minimal resources</i>	18 (75.00%)
<i>Developing relationships with patients</i>	15 (62.50%)
<i>Heightened awareness of living conditions for those experiencing homelessness</i>	12 (50.00%)
<i>Awareness for underserved communities</i>	11 (45.83%)
<i>Patient advocacy</i>	9 (37.50%)
<i>Harm reduction</i>	5 (20.83%)
<i>Interprofessional communication</i>	4 (16.67%)
<i>Patient-centered care</i>	3 (12.50%)
<i>Other:</i>	
<i>Utilizing local resources</i>	1 (4.17%)
<i>Of the three important things you learned through volunteering with a street medicine program, what is the most important?</i>	
<i>Harm reduction</i>	3 (12.5%)
<i>Developing relationships with patients</i>	6 (25%)
<i>Patient advocacy</i>	5 (20.83%)
<i>Awareness for underserved communities</i>	6 (25%)
<i>Providing medical care with minimal resources</i>	3 (12.5%)
<i>Interprofessional communication</i>	1 (4.17%)
<i>How are you using the skills you learned volunteering in a street medicine program in your current role?</i>	
<i>I engage more frequently in advocacy for underserved populations.</i>	11 (45.83%)
<i>I am better able to provide care with minimal resources.</i>	4 (16.67%)
<i>I am better able to utilize the harm reduction model to reduce the negative consequences associated with drug use.</i>	3 (12.50%)
<i>I am more comfortable communication with the various health professionals involved in providing a patient care.</i>	3 (12.50%)
<i>Other:</i>	
<i>All of the above, including I am more comfortable providing psychiatric care.</i>	2 (8.34%)
<i>I am better able to relate with patients who are often alienated from the healthcare system.</i>	1 (4.17%)

After Volunteering with a Street Medicine Program. Lastly, the participants were asked about the influence volunteering with a street medicine program had on their decision to work with medically underserved populations (Table 8). Of the 23 participants that completed this section, 15 (65.22%) participants reported that volunteering with a street medicine program influenced their decision to work with medically underserved populations. Contrasting, one participant (4.35%) reported the inverse, that is, working with medically underserved populations influenced their decision to volunteer with a street medicine program. The remaining

participants, seven (30.43%), reported that volunteering with a street medicine program had no influence on their decision to work with medically underserved populations.

Of the 23 participants that answered the previous question, 19 provided further qualitative details regarding the influence volunteering with a street medicine program had on their decision to work with medically underserved populations. Of the four core ideas that emerged from the data, seven (36.84%) participants mentioned that volunteering with a street medicine program influenced their decision to work with medically underserved populations by exposing and increasing their awareness to the barriers and needs of medically underserved populations, specifically populations experiencing homelessness. Six (31.58%) participants mentioned that their work with a street medicine program reinforced their desire to work with medically underserved populations. Two (10.53%) of participants mentioned that a street medicine program provided a positive experience and gave them the opportunity to build positive relationships, which in turn, influenced their decision to work with medically underserved populations. Lastly, four (21.05%) participants mentioned that the influence to work with medically underserved populations occurred prior to volunteering with a street medicine program.

Table 8. Experiences After Volunteering with a Street Medicine Program

<i>After volunteering with a street medicine program:</i>	<i>Total N= 23</i>
<i>Do you think volunteering with a street medicine program influenced your decision to work with medically underserved populations?</i>	
<i>Yes</i>	15 (65.22%)
<i>No</i>	7 (30.43%)
<i>Other:</i>	
<i>I think working with medically underserved populations influenced my decision to volunteer with a street medicine program.</i>	1 (4.35%)
<i>Why do you think volunteering with a street medicine program influenced your decision to work with medically underserved populations?</i>	Total N=19
<i>Reinforced previous desire to work with a medically underserved population</i>	6 (31.58%)
<i>Exposed and increased awareness to the barriers and needs of a medically underserved population</i>	7 (36.84%)
<i>Positive experience and positive relationships</i>	2 (10.53%)
<i>The influence occurred before volunteering with a street medicine program.</i>	4 (21.05%)

V. Discussion:

This study attempted to identify the influence volunteering with a street medicine program has on the career trajectories of student volunteers who ultimately choose to work with MUPs.

Demographics. The participants' demographic information does not align with the demographic information of all practicing medical doctors or the demographic information of all practicing primary care physicians. While the majority of participants who completed the web-based survey were white and female, the majority of practicing medical doctors are white and male ("Diversity in Medical Education: Facts & Figures," 2012). This likely reflects the usage of convenience sampling while recruiting participants to complete the web-based survey.

HPATHI. The HPATHI questionnaire regarding the attitudes and beliefs about the population experiencing homelessness provides evidence of multiple areas of divergence between students' attitudes before and after volunteering in a street medicine program. Overall, student volunteers were more positive in their attitudes and interests in working with populations experiencing homelessness after volunteering with a street medicine program. Most notably, student volunteers' HPATHI scores regarding their ability to provide healthcare to populations experiencing homelessness differentiated greatly from before and after volunteering with a street medicine program. This finding likely reflects students' lesser degree of exposure and clinical experience with populations experiencing homelessness prior to volunteering with a street medicine program. Additionally, the findings suggest that after volunteering with a street medicine program students' confidence in caring for populations experiencing homelessness increased.

Prior to Volunteering with a Street Medicine Program. The majority of the student volunteers who participated in the web-based survey mentioned that they had previous experience working with MUPs in a program similar to a street medicine program. Additionally, participants determined that they chose to volunteer with a street medicine team as a way to help MUPs. This finding suggests that because most health professional schools do not include opportunities to volunteer with a street medicine program in their curriculum, students choose to volunteer with a street medicine program based on their past experiences. Therefore, health professional schools are limiting the network of health professional students who choose to volunteer with a street medicine program by not integrating it into their curriculum. Previous literature revealed that integrating opportunities where students are able to gain exposure, practice, and education regarding MUPs into curriculum, such as volunteering with a street medicine program, would reach a larger network of students. As a result, students are more likely to choose to serve MUPs (Vanderbilt et al., 2016).

Experience While Volunteering with a Street Medicine Program. First, the majority of participants noted that an important thing learned while volunteering with a street medicine program was how to provide medical care with minimal resources. This suggests that volunteering with a street medicine program in a nonclinical environment gives students the opportunity to learn new skills regarding resource utilization when treating patients.

Second, the majority of participants noted that the most important thing learned while volunteering with a street medicine program was how to develop relationships with the patients. Previous literature suggests that the success of a street medicine program lies within the healthcare providers' ability to build a trustful relationship with the patients, which may differ from patient-provider communication and interactions in a clinical setting (Withers, 2011). The

study's findings suggest that volunteering with a street medicine program gives students the opportunity to learn new skills regarding patient-provider communication and interactions.

Lastly, participants reported that they now engage more frequently in advocacy for MUPs in their current role. This could be an indication that, in addition to providing students with new skills and training to work with MUPs, exposure to MUPs while volunteering with a street medicine program heightens students' awareness for their personal role in supporting MUPs. The aforementioned findings point to the impact volunteering with a street medicine program has on the career trajectories of students who choose to work with MUPs, specifically giving students the opportunity to provide healthcare through a nontraditional healthcare delivery model.

After Volunteering with a Street Medicine Program. The overwhelming majority of the participants who completed the web-based survey reported that volunteering with a street medicine program influenced their decision to work with MUPs. Many participants mentioned that volunteering with a street medicine program increased their exposure to the living conditions, barriers encountered when receiving healthcare, and the healthcare needs of MUPs which, in turn, influenced their decision to serve MUPs. Other participants did not identify the exposure to MUPs through volunteering with a street medicine program as the initial point-of-contact with this population. However, these participants did identify volunteering with a street medicine program as an experience that reaffirmed their decision to work with MUPs.

Our findings could be an indication of the positive impact contact with MUPs through volunteering with a street medicine program has on students' decisions to work with MUPs. Additionally, our findings support previous literature completed regarding the positive effect exposure to MUPs and medical training experiences in underserved areas has on students' practice site choices (Tavernier et al., 2003).

VI. Limitations:

There are several limitations to this study that need to be considered. In both phase I and phase II, participants chose to be included in the sample being observed in order to explore what role volunteering with a street medicine program had on the career trajectories of students who choose to work with medically underserved populations. That is, participants volunteered to participate in the study; therefore, the convenience sample was not stratified. As a result, questions included in the survey may not represent how every student experiences volunteering with a street medicine program.

Additionally, participants were asked to determine how much they agreed with statements featured in the HPATHI survey based on remembering how they felt before volunteering in a street medicine program. This introduces recall bias into the final results of the HPATHI survey because students were tasked with accurately recalling experiences and feelings from the past.

VII. Implications for Future Research:

This study will contribute information regarding the influence volunteering with a street medicine program has on the career trajectories of student volunteers who ultimately choose to work with medically underserved populations. One major implication of this study is that the findings could be used to support the inclusion of opportunities to volunteer with a street medicine program into health professional school curriculum in order to motivate students to work with MUPs, similar to the success integration of service-learning opportunities has provided medical students who participate in the program and choose to serve the respective community (Buckner et al., 2014). Future research by individual health professional schools is

needed to determine, on a case-by-case basis, the extent they desire to partner with a street medicine program.

VIII. Conclusion:

Volunteering with street medicine programs appears to help motivate students to work with MUPs. Incorporating opportunities to volunteer with a street medicine program into current health professional school curriculum has the potential to impact a greater network of students, as well as influence decision regarding the students' careers.

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X. Appendices:*A. Phase I: Semi-Structured Interview Protocol*

Good afternoon. My name is _____ and I am doing a research project for Georgia State University's School of Public Health on the experiences of students who volunteer with a street medicine team. As part of the project, we are talking with people like yourself. I want to let you know that your participation in this interview is completely voluntary and if you want to stop at any time please don't hesitate to let me know. If you don't feel comfortable answering a question or don't want to continue with our conversation, let me know. Also, the interview will be completely confidential and anything you say will not be linked to you personally. As it was mentioned in the consent form, I would like to tape-record our interview so I do not miss or forget anything that we talk about. I know you already consented but I wanted to confirm it is okay for me to tape record our interview. I am excited to speak with you. I have a list of topics I would like to discuss but I want this to be more like a conversation so please feel free to bring up any topics you feel are related.

Do you have any questions? Let's get started.

To start, I have a question about your career goals.

1. What did you want to be when you grew up?
 - If medical profession mentioned: What prompted that desire?
 - If medical profession not mentioned: What changed as you transitioned into a medical career?

Next, I'd like to ask a few questions about your interest in medicine.

2. Why did you choose to go into medicine?
 - What patient population did you intend to work with?
 - What patient population are you currently working with?
 - What patient population do you intend to work with in the future?

Now I'd like to discuss your involvement with street medicine team.

3. Tell me how you became interested in volunteering with a street medicine team.
 - How did you hear about it?
 - Why did you choose to get involved?
 - What was your reaction when you were selected?
 - Did you do anything to prepare?
4. What did you expect the experience of volunteering with a street medicine team to be like before participating in the training?
 - What did you know about street medicine?
 - What did you know about what the team does?
 - What was your experience?
 - What did you know about working with people who experience homelessness?
 - What was your experience?
 - What did you know about providing clinical care to people living on the streets?

- What was your experience?
5. What did you expect the experience to be like after learning more about street medicine during the training?
 - What were your thoughts prior your first time providing clinical care to a patient on the street?
 - Tell me about your first time providing clinical care to a patient living on the street.
 - If “a” is answered: What were your thoughts prior to your first time providing clinical care to a patient in a clinical setting?
 - What were your thoughts prior to your first time providing clinical care to a patient in a clinical setting?
 6. Tell me about your experience volunteering with a street medicine team.
 - Can you tell me about the best thing that happened?
 - Can you tell me about the worst thing that happened?
 - Tell me how you felt when you were out with the street medicine team.
 7. How did you talk about your experience volunteering with the street medicine team with your friends and family?
 8. How have you thought about your experience volunteering with the street medicine team since volunteering?
 9. What is next for you professionally?
 10. What do you think you will take away from your experience volunteering with the street medicine team?

This is the last question before we conclude.

11. Of everything we discussed today, what would be the 1-2 things you think would be important for students who are considering volunteering with a street medicine team to know?
 - What do you wish you had been told?
12. Do you have anything else you would like to share?

Thank you for your time.

B. Phase I & Phase II: Demographic & HPATHI Questionnaire

Participant ID #: _____

1

Demographic Questionnaire:

1. Race/Ethnicity:

- African American/Black
 - Asian/ Pacific Islanders
 - Hispanic/ Latino
 - Multiracial
 - Native American/ American Indian
 - White
 - Not Listed (please specify below)
- _____

2. Gender:

- Female
- Male
- Transgender
- Prefer not to respond

3. Age:

4. What was your motive for entering medical school?

- Personal Wish
 - Family Wish
 - Social Status
 - Good Income
 - Helping Others
 - Not Listed (please specify below)
- _____

5. Mother's Highest Level of Education:

- No High School
- High School
- Associate Degree
- Bachelor's Degree
- Graduate Degree

Participant ID #: _____

2

6. Father's Highest Level of Education:

- No High School
- High School
- Associate Degree
- Bachelor's Degree
- Graduate Degree

7. Did you earn an income prior to turning 18 years old?

- Yes
- No

If so, were you expected to contribute income to household?

- Yes
- No

Participant ID #: _____

3

Health Professionals' Attitudes Toward the Homeless Inventory (HPATHI):
Please circle the number that best indicates how much you agree with each statement BEFORE volunteering in the street medicine program and AFTER volunteering in the street medicine program.

1= Strongly Disagree 2= Disagree 3= Neither Agree nor Disagree 4= Agree 5= Strongly Agree

	BEFORE volunteering in the street medicine program					AFTER volunteering in the street medicine program				
1. Homeless people are victims of circumstance.	1 Strongly Disagree	2 Disagree	3 Neither Agree nor Disagree	4 Agree	5 Strongly Agree	1 Strongly Disagree	2 Disagree	3 Neither Agree nor Disagree	4 Agree	5 Strongly Agree
2. Homeless people have the right to basic health care.	1 Strongly Disagree	2 Disagree	3 Neither Agree nor Disagree	4 Agree	5 Strongly Agree	1 Strongly Disagree	2 Disagree	3 Neither Agree nor Disagree	4 Agree	5 Strongly Agree
3. Homelessness is a major problem in our society.	1 Strongly Disagree	2 Disagree	3 Neither Agree nor Disagree	4 Agree	5 Strongly Agree	1 Strongly Disagree	2 Disagree	3 Neither Agree nor Disagree	4 Agree	5 Strongly Agree
4. Homeless people choose to be homeless.	1 Strongly Disagree	2 Disagree	3 Neither Agree nor Disagree	4 Agree	5 Strongly Agree	1 Strongly Disagree	2 Disagree	3 Neither Agree nor Disagree	4 Agree	5 Strongly Agree

	BEFORE volunteering in the street medicine program					AFTER volunteering in the street medicine program				
5. Homeless people are lazy.	1 Strongly Disagree	2 Disagree	3 Neither Agree nor Disagree	4 Agree	5 Strongly Agree	1 Strongly Disagree	2 Disagree	3 Neither Agree nor Disagree	4 Agree	5 Strongly Agree
6. Health care dollars should be directed toward serving the poor and homeless.	1 Strongly Disagree	2 Disagree	3 Neither Agree nor Disagree	4 Agree	5 Strongly Agree	1 Strongly Disagree	2 Disagree	3 Neither Agree nor Disagree	4 Agree	5 Strongly Agree
7. Doctors should address the physical and social problems of homeless.	1 Strongly Disagree	2 Disagree	3 Neither Agree nor Disagree	4 Agree	5 Strongly Agree	1 Strongly Disagree	2 Disagree	3 Neither Agree nor Disagree	4 Agree	5 Strongly Agree
8. Doctors have a duty to care for the homeless.	1 Strongly Disagree	2 Disagree	3 Neither Agree nor Disagree	4 Agree	5 Strongly Agree	1 Strongly Disagree	2 Disagree	3 Neither Agree nor Disagree	4 Agree	5 Strongly Agree
9. Caring for the homeless is pointless since they do not follow-up.	1 Strongly Disagree	2 Disagree	3 Neither Agree nor Disagree	4 Agree	5 Strongly Agree	1 Strongly Disagree	2 Disagree	3 Neither Agree nor Disagree	4 Agree	5 Strongly Agree
10. Providing medical care for the homeless is futile.	1 Strongly Disagree	2 Disagree	3 Neither Agree nor Disagree	4 Agree	5 Strongly Agree	1 Strongly Disagree	2 Disagree	3 Neither Agree nor Disagree	4 Agree	5 Strongly Agree

Participant ID #: _____

5

	BEFORE volunteering in the street medicine program					AFTER volunteering in the street medicine program				
11. I am comfortable being a primary care provider for a homeless person with major mental illness.	1 Strongly Disagree	2 Disagree	3 Neither Agree nor Disagree	4 Agree	5 Strongly Agree	1 Strongly Disagree	2 Disagree	3 Neither Agree nor Disagree	4 Agree	5 Strongly Agree
12. I feel comfortable being part of a team when providing care to the homeless.	1 Strongly Disagree	2 Disagree	3 Neither Agree nor Disagree	4 Agree	5 Strongly Agree	1 Strongly Disagree	2 Disagree	3 Neither Agree nor Disagree	4 Agree	5 Strongly Agree
13. I entered medicine because I want to help those in need.	1 Strongly Disagree	2 Disagree	3 Neither Agree nor Disagree	4 Agree	5 Strongly Agree	1 Strongly Disagree	2 Disagree	3 Neither Agree nor Disagree	4 Agree	5 Strongly Agree
14. I am interested in working with the underserved.	1 Strongly Disagree	2 Disagree	3 Neither Agree nor Disagree	4 Agree	5 Strongly Agree	1 Strongly Disagree	2 Disagree	3 Neither Agree nor Disagree	4 Agree	5 Strongly Agree
15. I enjoy addressing psychosocial issues with patients.	1 Strongly Disagree	2 Disagree	3 Neither Agree nor Disagree	4 Agree	5 Strongly Agree	1 Strongly Disagree	2 Disagree	3 Neither Agree nor Disagree	4 Agree	5 Strongly Agree
16. I resent the amount of time it takes to see homeless patients.	1 Strongly Disagree	2 Disagree	3 Neither Agree nor Disagree	4 Agree	5 Strongly Agree	1 Strongly Disagree	2 Disagree	3 Neither Agree nor Disagree	4 Agree	5 Strongly Agree

Participant ID #: _____

6

	BEFORE volunteering in the street medicine program					AFTER volunteering in the street medicine program				
17. I enjoy learning about the lives of my homeless patients.	1 Strongly Disagree	2 Disagree	3 Neither Agree nor Disagree	4 Agree	5 Strongly Agree	1 Strongly Disagree	2 Disagree	3 Neither Agree nor Disagree	4 Agree	5 Strongly Agree
18. I believe social justice is an important part of health care.	1 Strongly Disagree	2 Disagree	3 Neither Agree nor Disagree	4 Agree	5 Strongly Agree	1 Strongly Disagree	2 Disagree	3 Neither Agree nor Disagree	4 Agree	5 Strongly Agree
19. I believe caring for the homeless is not financially viable for my career.	1 Strongly Disagree	2 Disagree	3 Neither Agree nor Disagree	4 Agree	5 Strongly Agree	1 Strongly Disagree	2 Disagree	3 Neither Agree nor Disagree	4 Agree	5 Strongly Agree

C. Phase II: Web-Based Survey

Training, Practice, and Employment Characteristics:

1. What medical professional degree do you have?
 - Dentist
 - Nurse Anesthetists
 - Nurse Midwife
 - Nurse Practitioner
 - Occupational Therapist
 - Pharmacist
 - Physical Therapist
 - Physician Assistant
 - Physician- Allopathic
 - Physician- Osteopathic
 - Registered Nurse
 - Other:
 - None

2. What medical professional degree are you currently seeking?
 - Dentist
 - Nurse Anesthetists
 - Nurse Midwife
 - Nurse Practitioner
 - Occupational Therapist
 - Pharmacist
 - Physical Therapist
 - Physician Assistant
 - Physician- Allopathic
 - Physician- Osteopathic
 - Registered Nurse
 - Other:
 - None

3. What is your practice specialty?
 - Family Practice
 - Adult Health
 - Pediatrics
 - Women's Health
 - Psychiatry
 - Gerontology
 - Neonatology
 - Cardiology
 - Emergency Medicine (ER)
 - Neurology
 - Orthopaedics
 - Pulmonology
 - Other:

4. What is the location of the medical profession school you attend/ attended?

5. What is the location of the street medicine program where you volunteered?

6. Do you intend to work with a medically underserved population?

For the purpose of this survey a Medically Underserved Population (MUP) is defined as a population that has too few primary care providers, high infant mortality, high poverty, and/or high older adult population. MUPs may include groups or persons within an area of residence who face economic, cultural, or linguistic barriers to health care.

(Retrieved from HRSA- Health Resources and Services Administration in the U.S. Department of Health and Human Services)

Yes

No

1. What population do you intend to work with?

2. What medically underserved population do you intend to work with?

7. Are you currently working with a medically underserved population?

Yes

No

1. What population are you currently working with?

2. What medically underserved population are you currently working with?

8. Why did you choose to work with a medically underserved population?

Interested in Health Equity/ Access

Interested in Working with a Particular Condition

Interested in Working with a Particular Population

Other:

Prior to Volunteering with a Street Medicine Program:

1. Do you have a past experience working with medically underserved populations?

Yes

No

1. What was the past experience?

2. What is the main reason you chose to volunteer with a street medicine program? (Please select 1.)

The nontraditional clinical experience.

I wanted to help underserved populations.

The similarities to prior experiences.

I wanted to have a leadership role within the program.

I wanted to learn and enhance my skills working with underserved populations.

Other:

Experience Volunteering with a Street Medicine Program:

1. What are three important things you learned through volunteering with a street medicine program?

Harm Reduction

Patient-Centered Care

Providing Medical Care with Minimal Resources

Developing Relationships with Patients

Interprofessional Communication

Patient Advocacy

Awareness for Underserved Communities

Heightened Awareness of Living Conditions for Those Experiencing Homelessness

Other:

2. Of the three important things you learned through volunteering with a street medicine program, what is the most important and why?

3. How are you using the skills you learned volunteering in a street medicine program in your current role?

I am better able to utilize the harm reduction model to reduce the negative consequences associated with drug use.

I am more comfortable communicating with the various health professionals involved in providing a patient care.

I am better able to provide care with minimal resources.

I engage more frequently in advocacy for underserved populations.

I am more comfortable providing psychiatric care.

Other:

After Volunteering with a Street Medicine Program:

1. Do you think volunteering with a street medicine program influenced your decision to work with medically underserved populations?

Yes

No

Other:

2. Why do you think volunteering with a street medicine program influenced your decision to work with medically underserved populations?

Demographic Survey:

1. Gender:

- Female
- Male
- Transgender
- Prefer not to respond.

2. Age:

3. Race/Ethnicity:

- African American/ Black
- Asian/ Pacific Islander
- Hispanic/ Latino
- Multiracial
- Native American/ American Indian
- White
- Not listed (Please specify below.)
- Prefer not to respond.

4. Mother's Highest Level of Education:

- No High School
- High School
- Associate Degree
- Bachelor's Degree
- Graduate Degree
- Prefer not to respond.

5. Father's Highest Level of Education:

- No High School
- High School
- Associate Degree
- Bachelor's Degree
- Graduate Degree
- Prefer not to respond.

6. What type of area did you grow-up in?

- Rural
- Suburban
- Urban
- Other:

7. Did you earn an income prior to turning 18 years old?

- Yes
- No

1. Were you expected to contribute the income you earned to your household?

- Yes
- No

HPATHI Survey: *Please refer to Appendix B.*