San Francisco Health Initiative: Creating Agents of Change to Build Capacity for Free Clinic Research

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Abstract
San Francisco Health Initiative (SFHI) is an undergraduate student organization founded in 2017 that works to address community issues in health by increasing awareness of high school students to relevant topics; it is expected that their increased awareness of local issues in health, coupled with improved access to higher education in Science, Technology, Engineering, and Math (STEM), will expand the capacity of the free clinic workforce. SFHI has collaborated with local high schools in San Francisco to actualize this mission by conducting five workshops on the following topics: (1) environmental and racial health disparities, (2) racial disparities amongst people who suffer from chronic disease, (3) social pressure defined and assessed, (4) the basis of disease as a preventative health measure, and (5) effects of adiposity in the development of Type 2 diabetes mellitus (T2DM). SFHI aims to create an affirming and inclusive environment that spurs high schools to pursue a college degree in a STEM field and to consider a career serving in a free clinic.

Background
Lack of diversity of college graduates in STEM fields leads to an insufficient flow of underrepresented minority (URM) candidates (i.e., African American/Black, Hispanic or Latino/Latina, American Indian, Pacific Islander, and Alaska Natives) to hold STEM positions.[4] While some federal agencies like the National Institutes of Health (NIH) have launched efforts to better include URM in STEM fields, degree attainment remains low. For example, Black and Latinos represented only 4.3% and 7.2% respectively of doctorate degree awardees in the biomedical sciences in 2013, despite representing 13.9% and 17.2% of the United States population. Consequently, in spite of significant advances in the diagnosis and treatment of most chronic

diseases, there is evidence that ethnic minorities tend to receive lower quality of care than non-minorities and that patients of minority ethnicity experience greater morbidity and mortality from various chronic diseases than non-minorities.[5] It is for this reason, that our mission is to increase interest and awareness concerning relevant health issues to underserved communities while promoting exposure to STEM-related fields to combat health disparities.

An Approach for Change

The founders of the SFHI come from medically underserved communities, and most are the first in their families to attend a university and/or pursue careers in STEM. Founded in 2017 at San Francisco State University (SFSU), six female undergraduates sought to increase awareness of health disparities among local underserved high schools. Supported by a pilot grant, SFHI participants leveraged community engagement methods to work collaboratively with teachers and students at a high school to achieve two specific goals: (1) to contribute to health equity efforts by increasing awareness of health disparities that are relevant to the local communities in which the high school students live and (2) to provide tools for reducing health disparities by developing educational tools and strategies for prevention of health inequalities. These efforts aim to spur students to pursue a STEM degree and return to their communities and make a difference.

Learning from Experience

Given that each SFHI member comes from underserved communities, each has designed a specific workshop related to their training and/or life experience that addressed social, institutional, interpersonal, and personal determinants of health. The subsequent five workshops expose students from underserved populations to cutting-edge research on health disparities, strategies to resist peer pressure and conformity, and careers that can serve as potential avenues for disparity reduction in the underserved communities. The five workshops include: (1)*Identifying Environmental and Racial Disparities in Health,* (2) *The Fundamentals of Health Disparities in Chronic Diseases among Racial/Ethnic Minorities,* (3) *Defining and Assessing Social Pressure,* (4) *Understanding the Basis of Disease as a Preventative Health Measure,* and (5) *The Effects of Adiposity in the Development of Type 2 Diabetes Mellitus.*

Workshop One: Identifying Environmental and Racial Disparities in Health

Access to education and toxic exposure are environmental factors that are well-documented determinants for quality of life that directly contribute to health disparities. To increase awareness of environmental issues related to racial/ethnic identity, the first workshop presents data that correspond to environmental factors within different racial/ethnic groups. The workshop aims to mobilize students to critically analyze and identify the contributory effects of environmental factors on health disparities in different racial/ethnic communities, thus allowing them to innovate and be a part of the solution in alleviating the disease burden within their own racial/ethnic communities.

Workshop Two: The Fundamentals of Health Disparities in Chronic Diseases Among Racial/ Ethnic Minorities

The second workshop aims to inform students from communities affected by prominent health disparities of current research efforts to combat racial disparities in chronic diseases. Research from different scientific disciplines increase students' awareness of the fundamental importance of various STEM disciplines in overcoming health disparities. Lastly, the importance of various racial/ethnic group representation is incorporated by demonstrating the lack of diversity throughout STEM disciplines and the consequence this has had in establishing health equity.[1]

Workshop Three: Defining and Assessing Social Pressure

This workshop aims to increase students' ability to express themselves and to comprehend the value in self-expression. The workshop consists of two parts: (1) the origins of unhealthy habits by introducing a past smoker's experience of overcoming that lifestyle choice and (2) differentiating between spoken and unspoken pressure, providing the tools needed to combat both forms of social pressure. This experience will allow students to engage in peer support and promote social connection, which in turn induces self-autonomy and self-confidence.[10]

Workshop Four: Understanding the Basis of Disease as a Preventative Health Measure

The workshop aims to bring awareness and understanding of how biological factors (i.e., genetics within different ethnic groups) play a role in cancer pathogenesis. To disassemble the barrier between science and students, the workshop translates scientific concepts into a language that students can find more accessible and attainable. In doing so, students can more easily begin to understand the fundamentals of the biology, immunology, and pathophysiology underlying disease. Knowledge of scientific language is important in understanding science,[2] and scientific fluency can function as a preventative health measure by permitting the students to start thinking about the care their own body needs and, in doing so, internalizing the information presented to them as being saliently relevant to their communities and to themselves.

Workshop Five: The Effects of Adiposity in the Development of Type 2 Diabetes Mellitus

The fifth workshop brings awareness to the impact of nutritional health by exploring genetic factors that may attribute to the predisposition of T2DM in URM.[8] Implementation of educational and psychosocial interventions are beneficial for the management of diabetes and its consequences.[7] By teaching youth the importance of nutritional health, we can empower them to make healthy choices and to prevent them from developing chronic conditions like T2DM.

Future Directions

SFHI's mission is to promote peer-based learning among students from different schools by increasing exposure to STEM fields and awareness on the necessary tools to combat health inequalities. The long-term goals of our organization are to increase STEM degree attainment in college compared to that of previous cohorts of high school graduates from target schools and to promote their return to community health work, perhaps as free clinic researchers (**Figure 1**).

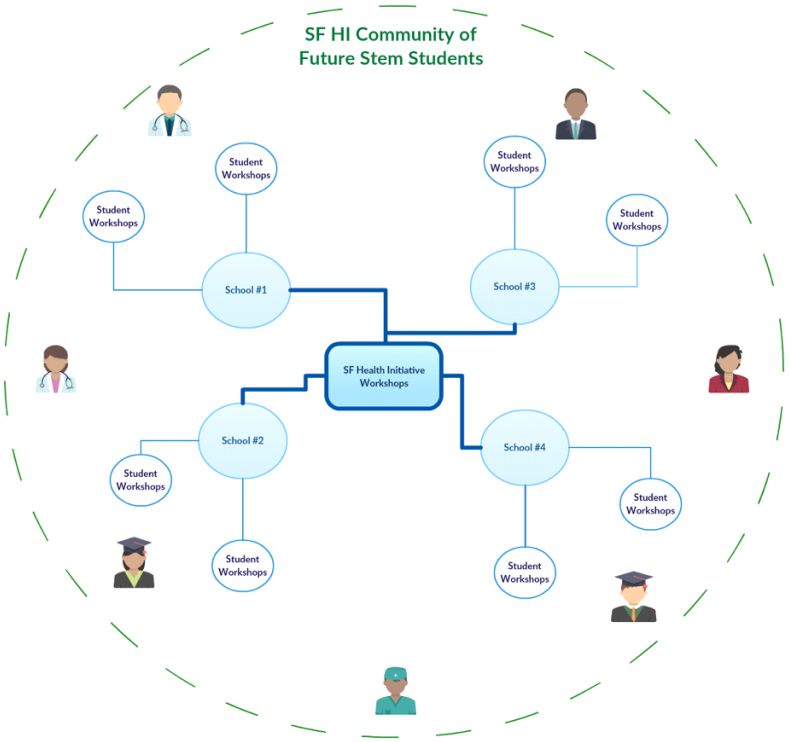

Figure 1. *This figure is a representation of the SFHI structural model, which illustrates the SFHI project's plan to build a community of STEM students within underserved communities by promoting higher education to students in the STEM field, while increasing awareness of health disparities. SFHI organizes their series of workshops to students from different high schools with the goal of encouraging participating students to present their own workshops within their own schools as well as among schools in the area. These STEM students would then form a community in which they can support, grow, and learn from one another, all the while promoting community-based outreach.*

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