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Descriptive Report

Cardiovascular Risk Among an Underserved Chinese American Community in Chicago: A Graduate Student Health Organization Prioritizing Community Health Needs

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Abstract

Introduction: The Midwestern University Asian Healthcare Association (AHA) is an interdisciplinary student healthcare organization. In collaboration with the Midwest Asian Health Association (MAHA) located in Chicago's Chinatown, AHA provides monthly community healthcare services led by AHA students at the MAHA facility. This project assessed the prevalence of hypertension and dyslipidemia among the Chinese American members of MAHA, as well as their risk for cardiovascular disease, to prioritize the community's health needs.
Methods: A retrospective review was conducted on MAHA members receiving community health services during 2014-2018. Blood pressure and fasting lipid panel data were analyzed to determine the prevalence of hypertension, dyslipidemia, and metabolic syndrome based on standard clinical guidelines. Data is presented as descriptive statistics.
Results: From January 2014 to December 2018, 1299 members of MAHA attended the monthly healthcare events, averaging 23 members per month. During the assessment period, 29% of members received more than one blood pressure reading. The prevalence of hypertension within this group was 15%, with nearly half having Stage 2 hypertension, making them candidates for antihypertensive drug therapy. Additionally, 89% of the members had a complete lipid panel for assessment. The results showed that 8% had very high total cholesterol levels, 25% had very low high-density lipoproteins levels, and 2% with very high low-density lipoproteins levels.
Conclusion: This assessment reveals notable cardiovascular risk among underserved Chinese Americans in Chicago's Chinatown. In response, AHA provides personalized education on cardiovascular risk reduction through diet and exercise. However, our findings also highlight challenges members face accessing advanced care and ongoing efforts to address these obstacles. Understanding health disparities in underserved populations offers valuable insights for student-led initiatives to prioritize services and address resource gaps.

Introduction

In 2021, the United States (US) Census Bureau estimated 24 million Asian Americans in the US,[1] the highest growing major racial and ethnic group since 2010.[2] Despite being projected to represent 46 million of the US population by 2060,[3] awareness of the unique health disparities within the various Asian ethnic groups remains largely unclear.[4] Health studies of Asian Americans often rely on undercounted census information[5] and overgeneralized aggregate data,[6,7] failing to recognize the

distinct ethnic, cultural, and linguistic profiles within this diverse race while perpetuating the false stereotypes of the healthy immigrant or model minority.[8] Misrepresentation or lack of awareness preserves misinformation, further marginalizing research and resources to understand better the health statistics and disparities among the Asian ethnic subgroups and providing the culturally sensitive healthcare services they deserve.

People of Chinese descent (excluding Taiwanese) make up the largest Asian group, with an estimated 5.2 million living in the US as of 2021.[1] Within the Chicago metropolitan region is the Armour Square neighborhood, which encompasses the Chinatown District and populates the largest foreign born Chinese-speaking community.[9] Since 2003, the Midwest Asian Health Association (MAHA)[10], a nonprofit community-based organization located in the Chinatown District of Armour Square, has been a beacon of affordable healthcare services for Chicago's medically underserved, low-income Chinatown immigrants. MAHA has aimed to deliver culturally sensitive and linguistically appropriate community focused care, attempting to overcome these barriers and cater to the healthcare needs of its community members. However, due to limited resources, MAHA faced challenges of retaining consistent healthcare volunteers that would often jeopardize the sustainability of their community services.

In October of 2010, an interdisciplinary student organization known as the Asian Healthcare Association (AHA)[11] was formed on the Midwestern University (MWU) Downers Grove Campus in Illinois, about 23 miles west of MAHA in the Chinatown District of Armour Square. AHA comprises of MWU pharmacy, osteopathic medicine, dental, optometry, and other health professional students. The AHA mission has been to encourage health awareness of preventable disease states among the local Asian American communities while promoting opportunities for student members to learn more about Asian health disparities. AHA student members represent diverse Asian ethnic groups, including Chinese, Korean, Vietnamese, Filipino, Singaporean, Burmese, and many others. Several student members are fluent in their native language and have first-hand experience of the cultural behaviors, values, and expectations associated with their customs.

In 2012, the two organizations came together, recognizing their shared interests and how each could support each other in achieving their goals. It was agreed that MAHA would provide access to the community, insights into the Chinese American population, and their unique health disparities. AHA student volunteers, utilizing their clinical education and cultural understanding, would promote healthier lifestyles that respect the cultural nuances of this underserved group. By the winter of 2012, AHA established its first monthly, student-led community healthcare services at the MAHA facility in Chicago's Chinatown. This location is well-known and trusted by the local Chinese Americans, making it easier for residents to access AHA's healthcare services. AHA plays a crucial role in sustaining these monthly community healthcare services by actively recruiting and organizing volunteers to ensure the services' consistency. More than a decade later, the AHA student-led community healthcare services continue to offer basic health education and preventative screening events for the underserved MAHA members nearly every month. However, the health statistics of this unique Chinese American community, which would reveal their most significant health disparities and influence the advancement and availability of healthcare resources, remains unclear.

Cardiovascular disease is the second leading cause of death in Asian Americans in the United States.[12] Compared to mainland Chinese, immigrants of China living in the US tend to have a higher prevalence of several major risk factors for cardiovascular disease, including hypertension, high serum cholesterol (dyslipidemia), diabetes, poor diet, obesity and smoking.[13] According to the National Center for Health Statistics, the prevalence of hypertension among non-Hispanic Asian adults in the US from 2015 to 2018 was 47.2%.[14] Additionally, the rates of high total cholesterol and low high-density lipoprotein (HDL) cholesterol were 11.6% and 15.8%, respectively.[15] However, these statistics combine all Asian American ethnicities, underlining the need for a more nuanced understanding of health trends within diverse Asian American communities. Disaggregating racial and ethnic health data is crucial for effectively directing limited resources to those who need them most.[16] Although primarily based on anecdotal evidence, AHA student volunteers have noticed a trend in hypertension and dyslipidemia

among MAHA members during their monthly community healthcare service visits. Therefore, the objective of our project was to assess the prevalence of hypertension and dyslipidemia among the Chinese American members of MAHA and evaluate their risk for cardiovascular disease. This assessment aims to prioritize the monthly AHA student-led community healthcare services and support the allocation of more comprehensive resources to address this potential health concern.

Methods

Monthly Healthcare Services

Since 2012, AHA student-led community healthcare services have been offered at the MAHA facility for the Chinatown community almost every month, except for a two-year hiatus from 2020 to 2022 due to coronavirus disease of 2019. MAHA promotes these monthly healthcare services within and around the Chinatown neighborhood, which takes place on the last Saturday of each month from 8:00 AM to 11:00 AM. AHA recruits student volunteers during quarterly student group meetings, using volunteer sign-ups and email reminders to encourage participation. Up to five student volunteers, preferably a mix of Mandarin and Cantonese-speaking students, are recruited each month with a required licensed faculty advisor present to facilitate. The community healthcare services provided by AHA student volunteers have evolved based on the needs of the MAHA community. In the previous years, AHA student volunteers have administered annual flu vaccines, assessed and educated on abnormal blood work consisting of a complete blood count with differential, basic metabolic panel, lipid panel, and hepatitis B immunity status. More recently, their services have expanded to include blood pressure, glucose, and osteoporosis screening, as well as linkage to care. Under guidance of a faculty advisor, who is not of Chinese descent, the AHA student volunteers serve as interpreters, effectively communicating important laboratory and screening results. They also educate patients about related preventable disease states in their native language. Given that MAHA is a nonprofit community organization with limited resources where access to certified medical interpreters is often not feasible, the program relies on these bilingual student volunteers to help bridge important linguistic barriers during encounters.

Assessing Cardiovascular Risk

Inclusion and Exclusion Criteria

MAHA members aged ≥18 years who participated in AHA/MAHA community health events between January 2014 and December 2018 and received blood pressure and blood work screenings were eligible for inclusion. Members younger than 18 years of age, those without both blood pressure and blood work data available, and those with incomplete or missing screening records during the study period were excluded.

Data Collection

Variables collected included demographic information (age and sex), systolic blood pressure (SBP), diastolic blood pressure (DBP), fasting lipid panel values (total cholesterol [TC], triglycerides [TG], high-density lipoprotein [HDL], and low-density lipoprotein [LDL]), and fasting glucose values when available.

Blood Pressure and Lipid Profile Assessment

Blood pressure and lipid profiles between January 2014 and December 2018 were retrospectively collected and assessed to determine the prevalence of hypertension and dyslipidemia among the Chinese American community of MAHA and by extension their risk for cardiovascular disease. For generalizability, MAHA members with at least two SBP and DBP readings on two separate occasions were averaged and assessed for inclusion. Each blood pressure reading was then categorized as normal, elevated, Stage 1 hypertension, or Stage 2 hypertension. Individuals with a SBP and DBP in two different categories were designated to the higher blood pressure category. The

aforementioned criteria are based on the 2017 American College of Cardiology and American Heart Association High Blood Pressure in Adults Guidelines.[17]

With regards to complete lipid profiles (TC, TG, HDL, and LDL), the most recent fasting lipid panel was included and categorized into optimal, near-optimal, borderline high, high, and very high groups according to the National Cholesterol Education Program Adult Treatment Panel III Guidelines (NCEP ATP III).[18]

Metabolic Syndrome Assessment

To further assess the risk of cardiovascular disease, metabolic risk factors were collected and assessed. As defined by NCEP ATP III,[18] three or more of the following factors were considered for metabolic syndrome: elevated fasting glucose (≥100 mg/dL), elevated blood pressure (≥130/85 mmHg), reduced HDL (men <40 mg/dL, women <50 mg/dL), and elevated TG (≥150 mg/dL). Waist circumferences of those included were not available.

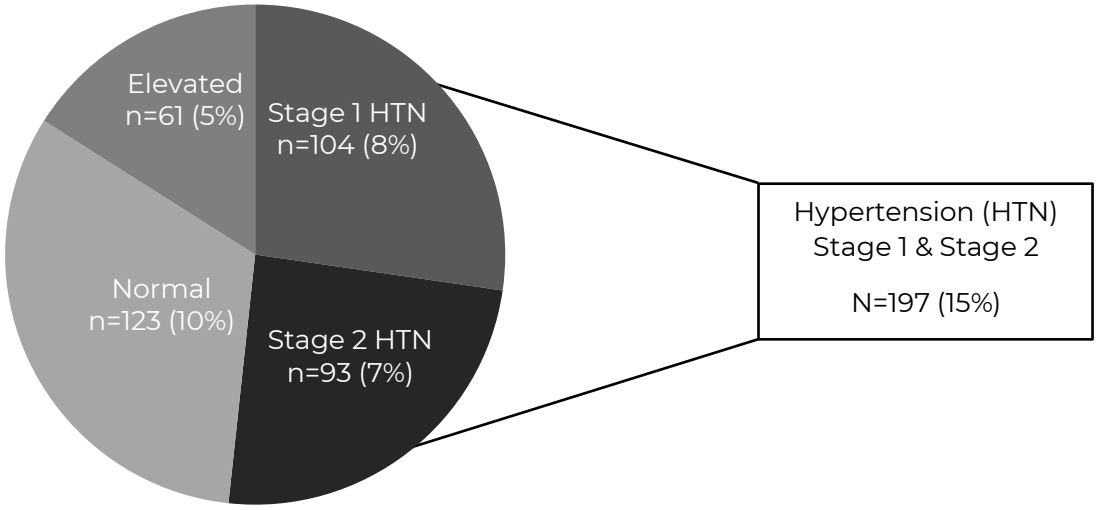
Data Analysis

Data were analyzed using descriptive statistics. Continuous variables were summarized using medians and ranges, while categorical variables were reported as frequencies and percentages. Statistical analyses were performed using Microsoft Excel (version 2024/16.89.1, Microsoft Corporation, Redmond, WA, USA).

Results

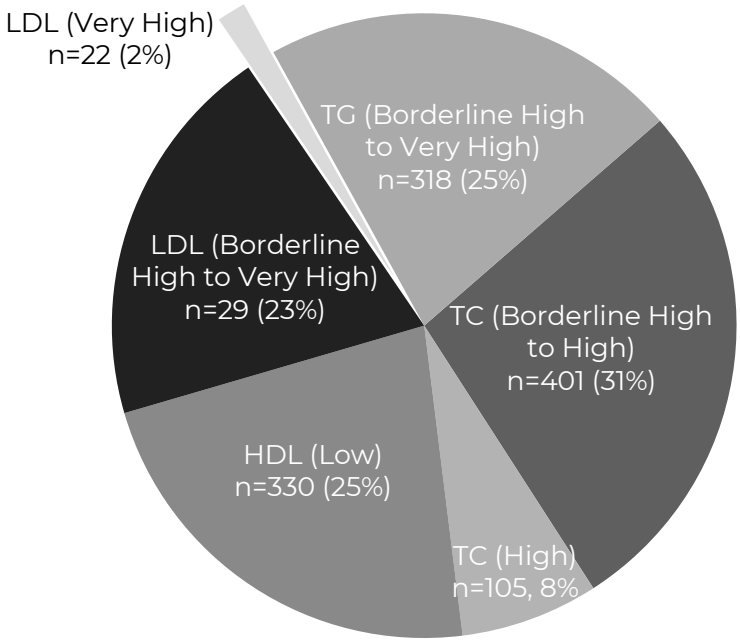
Approximately 1299 unique MAHA members attended the monthly AHA student-led community healthcare service events between 2014 and 2018, averaging about 23 members per month (range: 10 to 36). The median age was 49 (9 to 96) and 56% were female. Of the 1299 unique MAHA members seen, 97% received at least one blood pressure reading and 29% received more than one blood pressure reading for inclusion during the assessment period. The prevalence of hypertension among this group was 15%, with nearly half categorized as having Stage 2 hypertension and candi-

Figure 1. Prevalence of hypertension among Midwest Asian Health Association (MAHA) members



More than one blood pressure reading was included for 381 MAHA members. Percent prevalence based on N=1299.
Blood pressure category (adapted from Centers for Disease Control and Prevention[14]): Normal (systolic/diastolic): <120/<80 mmHg; Elevated: 120-129/<80 mmHg; Hypertension Stage 1: 130-139/80-89 mmHg; Hypertension stage 2: ≥140/≥90 mmHg

Figure 2. Prevalence of dyslipidemia among Midwest Asian Health Association (MAHA) members



Of the 1299 total MAHA participants, 1157 MAHA members had a complete lipid panel for assessment. Percent prevalence based on N=1299
Lipoprotein classification (adapted from Centers for Disease Control and Prevention[15]): LDL (borderline high to very high): ≥130 mg/dL; LDL (very high): ≥160 mg/dL; HDL (low): ≤40 mg/dL (male) or ≤50 mg/dL (female); TC (borderline high to high): ≥200 mg/dL; TC (high): ≥240 mg/dL; TG (borderline high to high): ≥150 mg/dL
LDL: low-density lipoprotein; HDL: high-density lipoprotein; TC: total cholesterol; TG: triglycerides

dates for antihypertensive drug therapy according to the 2017 High Blood Pressure in Adults Guidelines (Figure 1). Additionally, 89% of members had a complete lipid panel for assessment. Overall, 31% had a borderline high to high TC level, with 8% of this group living with high TC. Borderline high to very high LDL levels were observed in 23% of members, with 2% eligible for statin therapy based on having a very high LDL level alone. Furthermore, 25% had borderline high to very high TG levels, and 25% had a low HDL level (Figure 2). Metabolic syndrome was observed in 16% of MAHA members.

Discussion

The risk for cardiovascular disease among this group of Chinese Americans suggests that each month, 4 to 8 members of MAHA may present with potential cases of hypertension, dyslipidemia, and/or metabolic syndrome. In response to these findings and the notable health risks, AHA enhanced the student-led community healthcare services to address the specific needs of this population better. This has included: 1) setting up a counseling table to offer one-on-one education sessions in the members' native language, focusing on how to lower and manage high blood pressure and cholesterol levels through diet, exercise, and other lifestyle modifications; 2) providing educational handouts on blood pressure and cholesterol from the American College of Cardiology,[19] appropriately translated into Chinese; and 3) compiling a list of local primary care providers who speak Mandarin and/or Cantonese to expand access to care. Through these early interventions, AHA student volunteers discovered that some members of MAHA needed diagnostic and ongoing care that exceeded the services the student-led community healthcare events could offer. Unfortunately, MAHA lacks the resources to hire specialized staff to offer more advanced medical care, such as chronic disease management and prescription treatments. Although a few local Chinese speaking primary care

providers were identified, AHA's student-led monthly community healthcare services remain the only affordable option for many MAHA members to evaluate their health status (Dr. Hong Liu, MAHA Director, personal communication, March 2, 2025).

Community health centers like MAHA serve as a vital source of healthcare and act as a safety net for underserved Chinese American immigrants in Chicago.[20] Asian immigrants face significant interpersonal, institutional, and society barriers when trying to access high-quality advanced care in the US health care system.[21,22] The MAHA community well recognizes these challenges. Less than 15% of MAHA members have medical insurance, and an even smaller percentage have a primary care physician. Many MAHA members are locally employed in and around Chinatown, working long hours in blue-collar jobs as restaurant workers, hair stylists, or massage therapists, which limits their time to travel and seek routine medical care. While the median household income of Armour Square was reported to be $37,405 from 2017 to 2021[9], this figure does not accurately reflect the financial realities of many residents, as numerous individuals live below the federal poverty level. Common challenges faced by the Asian American immigrant community when trying to access advanced care include language barriers, discrimination, stigma, and limited health literacy. Many prefer to see healthcare providers from their ethnic backgrounds.[23] AHA student volunteers play a key role in embodying the principles of cultural humility within these community healthcare services. As fellow Asian Americans who speak the native language, AHA student volunteers can connect instinctively with the underserved Chinese American community at MAHA, effectively overcoming cultural and linguistic barriers. This connection fosters a more personalized approach to the healthcare services provided.[24]

There is a lack of detailed information regarding how underserved Asian American immigrants utilize the primary care system in the US. This gap complicates the efforts of community health centers that serve these populations, making it challenging to identify and expand services tailored to their unique healthcare needs. Our data provides some disaggregated information highlighting concerns about cardiovascular disease within the MAHA community and the known gaps and barriers these individuals face in accessing appropriate health services. However, our findings have limitations. First, paper charts are the primary record-keeping source, which only captures patient data relevant to the current healthcare services at MAHA. Comprehensive medical data that would aid in assessing conditions such as cardiovascular disease—like past medical history, family medical history, weight and height, smoking history, medical insurance, and medication history—are not routinely available. Additional variables that may have further characterized cardiovascular risk, including race/ethnicity subgroups, body mass index, waist circumference, comorbidities, and access to a primary care provider, were also not routinely collected because MAHA paper charts were designed primarily for point-of-care community screenings rather than comprehensive longitudinal medical documentation. Second, MAHA is limited to providing preventative healthcare services. Currently, it does not have a licensed primary care provider, such as a physician, nurse practitioner, or physician assistant, who can prescribe medications and offer continuity of care. The existing services are primarily supported by volunteers, mainly healthcare professional students from nearby medical, pharmacy, and dental schools, who are restricted in their scope of practice. While bilingual student volunteers play a critical role in facilitating communication, they are not certified medical interpreters, which may introduce variability in the accuracy and consistency of communication. Finally, since this project was limited to a retrospective chart review, we did not conduct post-intervention evaluations to monitor outcomes of the AHA student-led community healthcare services. Such assessments would have required active follow-up with the included subjects and their consent to gather post-intervention evaluation.

Conclusions

This project has revealed several significant findings: 1) the risk for cardiovascular disease within the MAHA community is notable, with some individuals requiring ongoing advanced care and

prescription treatments; 2) there are known barriers to healthcare access for this underserved immigrant Chinese American group, which complicates the situation for those needing comprehensive medical care; and 3) MAHA, along with the monthly AHA student-led community healthcare services, provides an affordable and often the only trusted source of healthcare for this community. Given these findings, AHA aims to: 1) continue data collection to include other observed healthcare risks, such as diabetes and osteoporosis, to provide more evidence of real-world health disparities, service gaps, and the need for resource allocation; 2) support MAHA in applying for federal grants or funding from state agencies and non-profit organizations; 3) seek partnership with various medical and pharmacy schools in the Chicago area to improve access to advanced ongoing healthcare for those in need; and 4) investigate patient assistance programs and voucher opportunities to enhance access to prescription medications.

The AHA student-led community healthcare services aim to increase access to quality healthcare for Chinese Americans in Chicago's Chinatown neighborhood. Despite healthcare students' lack of ability to diagnose disease or prescribe medications, AHA has found meaningful work in assessing the risk of cardiovascular disease, providing tailored interventions and taking disaggregated data to argue for more advanced resources. A trusting bond has been forged between AHA students and MAHA members through shared heritage and language. AHA students will continue to utilize this invaluable position to improve health outcomes of Asian Americans in the Greater Chicago Area for years to come. From this experience, we encourage other student-led groups to do the same.

Disclosures

The authors have no conflicts of interest to disclose.

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