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Exploring Homeopathic Remedy Use Among South Asian Americans: Associations with Sociodemographic, Acculturative, and Health Measures

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Master of Public Health

B.S. Kinesiology

Purdue University

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Abstract

Exploring Homeopathic Remedy Use Among South Asian Americans: Associations with Sociodemographic, Acculturative, and Health Measures

By Avantika Rastogi

Background: Despite their significant demographic growth, SAAs remain underrepresented in health research. SAAs face increased risks of cardiovascular diseases (ASCVD) and mortality, attributed to their high-risk cardiometabolic profile characterized by conditions like type 2 diabetes mellitus and metabolic syndrome. Understanding SAA health behaviors and beliefs is crucial to developing our knowledge base and creating more culturally responsive practices, interventions, and policies. Homeopathic remedy use plays a significant role in SAA culture and by extension, health practices. Recent trends show the integration of homeopathic remedies into mainstream health interventions, emphasizing its importance in health research and practice.

Purpose: This study aims to investigate the prevalence of homeopathic remedy use among South Asian Americans (SAAs) in the Atlanta Metro Area and determine any associations with sociodemographic, acculturative, or health measures. Given the underrepresentation of SAAs in health research and their growing population, understanding these determinants is essential for improving culturally responsive healthcare.

Methods: The study was a secondary analysis of the CENSAA dataset, which was a cross-sectional, online survey. Respondent driven sampling was utilized to reach the SAA population in Metro Atlanta. Prevalence of homeopathic remedy use was assessed, along with associations between homeopathic remedy use and sociodemographic, acculturative, and health measures. Data analysis involved weighted chi-squared tests and weighted independent samples t-tests to assess associations and differences in population means.

Results: Within the sample of 363 SAAs, the median age was 33, 59% of the sample was male, 67% of participants were born in the US, and 42% of respondents reported using homeopathic remedies. When comparing homeopathic remedy users to non-users, many differences were noted. Within the sample of homeopathic remedy users, there was an increased prevalence of individuals who were born in the US, reported an educational attainment below a Bachelor's degree, used the separation acculturation strategy, had a family history of diabetes, and a diagnosis of cancer and cardiomyopathy. Results of weighted chi-squared tests and weighted independent samples t-tests indicated that homeopathic remedy use was significantly associated with decreased age and total acculturation composite score as well as being born in the US.

Conclusion: Findings revealed significant associations between homeopathic use, younger age, US nativity, and lower total acculturation scores. Comparisons with prior studies suggest differences in age demographics and nativity may contribute to variations in homeopathic remedy use patterns among SAA populations. This displays the significance of incorporating a nuanced understanding of homeopathic remedy use into SAA healthcare and education initiatives to address the prevalent utilization of such remedies among SAA immigrants and subsequent generations.

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Chapter 1. Introduction and Statement of Purpose

Introduction

South Asian Americans (SAA) are a rapidly growing, diverse ethnic group in the United States, who trace their ancestry to Bangladesh, Bhutan, India, Nepal, Pakistan, and Sri Lanka. There are approximately 5.7 million SAAs living in the United States, with Indian Americans comprising the largest segment of this group (Census, 2020). Within the state of Georgia, there are over 190,000 SAAs, with a majority (over 136,000) living in the Atlanta Metropolitan Area (Census, 2020). From 2000 to 2010, the SAA population in the US grew by over 55%, and from 2010 to 2020 growth in the SAA population was approximately 60%, making SAA one of the fastest growing ethnic groups within the United States (Census, 2020; Sandil & Srinivasan, 2018). Despite their growing presence, SAA populations remain underrepresented in medical research, largely due to the lack of disaggregated data on Asian American subgroups and the tendency to aggregate them within broader racial/ethnic categories, hindering the identification of health disparities within specific SAA subgroups (Sandil & Srinivasan, 2018; Gany et al., 2019; Mukherjea et al., 2018).

Current research on SAA populations show that SAAs experience a breadth of health disparities, including higher rates of atherosclerotic cardiovascular disease (ASCVD), and higher rates of ASCVD risk factors such as diabetes, hypertension, central obesity, and higher levels of abdominal visceral and liver fat when compared to White, Black, Hispanic, and Chinese American individuals (Sandil & Srinivasan, 2018; Kandula et al., 2019). Metabolic syndrome and insulin resistance are also prevalent among SAA populations, contributing to the increased ASCVD incidence (Flowers et al., 2010). Furthermore, sedentary lifestyles and diverse dietary patterns among SAAs, influenced by regional, religious, and generational factors, can contribute to disparate health outcomes (Daniel et al., 2013; Kandula, 2019). A recent push to better understand health behaviors and disparate health outcomes in SAA populations has shown that SAAs face a number of barriers when attempting to access care. These barriers can include health literacy, insurance status, lack of culturally appropriate care, discrimination, language barriers, among many others (Perera & Chang, 2018; Vakil et al., 2023).

Understanding SAA culture is one of many key factors in addressing SAA ASCVD disparities. There is an emerging research base on the efficacy of culturally tailored programming in SAAs. Longitudinal studies show significant improvements in various health markers among SAAs through culturally relevant lifestyle and dietary interventions (Vafaei et al., 2023). While pilot studies demonstrate strong evidence for the effectiveness of culturally tailored programs in preventing and managing heart disease and diabetes among SAAs, there's a need for more long-term investigations to understand their sustained impact (Farhat, 2023; Jayaprakash et al., 2016; Kandula et al., 2016; Weber et al., 2020).

Use of complementary alternative medicine (CAM) or homeopathy such as Ayurveda and naturopathy, and medical pluralism (the simultaneous use of allopathic medicine and CAM) are common health behaviors among SAA populations (Khosla et al., 2023; Sudarsan et al., 2022). Definitions of CAM vary depending on the source, however, according to the National Center for Complimentary and Integrative Health (NCCIH), there are 4 categories of non-allopathic health practices under the umbrella of CAM practices including “nutritional (e.g., special diets, dietary supplements, herbs, and probiotics), psychological (e.g., mindfulness), physical (e.g., massage, spinal manipulation), and combinations such as psychological and physical (e.g., yoga, tai chi, acupuncture, dance or art therapies) or psychological and nutritional (e.g., mindful eating)” (U.S. Department of Health and Human Services, 2021). Within the South Asian subcontinent, the practice of CAM, also considered homeopathic remedy use, is diverse. Many SAA families have their own traditions based off homeopathic practices that they incorporate into their daily lives (Khosla et al., 2023). For the purpose of this study, we will use the term homeopathic remedy use to refer to the range of practices under the CAM umbrella.

In recent decades, there has been a push to include an understanding of homeopathy in health education programming and professional development in order to be more culturally responsive when working with minority populations (Perez et al., 2013). For example, Cultural Competence in Health

Education and Health Promotion, a book intended to fulfill the current and future needs in cultural and linguistic competency for health education and promotion programs, emphasized the importance of maintaining a critical view of homeopathic remedy use based on the growing research base and evidence-based practice (Perez et al., 2013). Concurrently there has been an increase in the integration of homeopathic practices in health research and education; for example, ayurveda has been used in treatment for obesity and cancer (Arnold, 2022; Rioux & Howerter, 2019). Yoga, specifically, has been successfully utilized in interventions for obesity, hypertension, type 2 diabetes, cardiac rehabilitation, and more health outcomes (Manchanda & Madan, 2014; Guddeti et al., 2019) .There has also been an increased international dialogue about homeopathic remedies; The first India-US workshop on traditional medicine was held in 2018 as a collaboration between the Ministry of Ayurveda, Yoga and Naturopathy, Unani, Siddha, and Homeopathy (AYUSH), the US National Cancer Institute (NCI), the National Institutes of Health (NIH), the Office of Global Affairs, and the US Department of Health and Human Services (White et al., 2018). Even more recently, the WHO Traditional Medicine Global Summit took place in August of 2023 in Gujarat India.

Theoretical Framework

The Health Belief Model (HBM) along with concepts from Berry's Model of Acculturation can help researchers better understand the use of homeopathic remedies in SAA populations and how this may vary in subgroups of the SAA population. HBM provides a foundational lens through which researchers can examine individual perceptions of health risks and benefits, barriers, and cues to action related to homeopathic remedy use. The central tenet of the HBM posits that health behavior can be predicted by several constructs: risk susceptibility, risk severity, benefits to action, barriers to action, self-efficacy, and cues to action (Rosenstock, 1974; Janz & Becker, 1984).

In order to tailor this theoretical framework to apply to the SAA population, it is important to consider acculturation and the role of culture in health beliefs and behaviors. Acculturation describes a process of cultural and psychological change that occurs when two or more cultural groups and their members make contact (Berry, 2017). Originally, this process was described as a unilinear process, however, it is now clear that this is a multidimensional process that can be impacted by a multitude of factors including poverty, discrimination, loss of social networks (Lim, 2008). At the individual level, acculturation involves changes in people's behavior such as the way they dress, what they eat, the language they speak, their values, and potentially their health behavior; on a cultural level, acculturation can involve changes in social structures, institutions, and cultural norms (Lim et al., 2008).

As SAA populations experience acculturation, the way they perceive risks and benefits to adopting health behaviors may also change. SAAs who have adopted elements of the host (American/regional) culture and rejected their heritage culture have undergone *assimilation* into their host culture while SAAs who have adopted elements of their host culture and retained elements of their heritage culture have undergone *integration.* Retaining heritage culture and rejecting the host culture is considered *separation*, and *marginalization* occurs when individuals reject both their heritage and host cultures (Needham, 2018). A study on SAA in California indicates that the respondents who had no religious affiliation, high income levels, a long duration time spent in the US, and those who speak English very well were likely to have undergone assimilation or integration rather than separation (Needham et al., 2018). Another article utilizing data from the same study population noted that, consistent with previous research, participants who have undergone assimilation or integration, meaning they show some preference for the host culture, are likely to have a more favorable cardiometabolic risk profile (Al-Sofiani et al., 2020). These acculturation strategies can impact how SAAs perceive benefits and barriers to homeopathic remedy use and how they quantify risk susceptibility and severity.

Purpose Statement

SAAs, one of the most rapidly growing immigrant group within the United States, face significant health disparities and encounter various barriers to accessing healthcare services. Despite the rapid population growth, SAA's are underrepresented in health research, hindering the development and implementation of targeted interventions. This study focuses on the prevalence of homeopathic remedy use such as Ayurveda or Unani, among SAAs. The aim is to determine if there are associations between homeopathic remedy use and sociodemographic, acculturative, or health measures in a sample of SAAs in the Atlanta Metro Area. Understanding these sociodemographic determinants is crucial to improving culturally responsive health care for SAAs.

The increased integration of homeopathic practices in health education and international dialogues highlight the growing acknowledgement of their significance. However, research on homeopathic remedy use among SAAs is lacking. This study addresses this gap by attempting to determine if homeopathic remedy use (such as Ayurveda or Unani) is associated with sociodemographic variables such as age, country of birth, socioeconomic status, gender, nativity, acculturative indicators such as the culture respondents' friends belong to and number of years in the United States, and health outcomes such as Body Mass Index (BMI), family history of diabetes and diagnosis of various health conditions. Understanding how utilization of homeopathic remedies varies within the SAA population can provide insight into development and implementation of tailored, culturally responisve healthcare approaches.

Chapter 2. Literature Review

Introduction

This study aimed to investigate the association between homeopathic remedy use and various sociodemographic, acculturative, and health-related measures. This literature review will explore the existing landscape of SAA health research, the significance of understanding homeopathic remedy use in SAA populations, and provide a theoretical framework to guide this study.

Current Landscape of SAA Health Research

The SAA population has been growing rapidly in the recent years. Within the Atlanta Metropolitan Area, which for the purposes of this study, includes Cherokee, Cobb, Clayton, Dekalb, Fayette, Fulton, Gwinnett, Henry, and Rockdale Countries, there are over 136,000 SAAs (Census, 2020). Indians are the largest segment of the South Asian American community, followed by Pakistanis, Bangladeshis, Nepalis, Sri Lankans, and Bhutanese (Gany et al., 2019). It has been well established that SAA populations are underrepresented in medical research (Sandil & Srinivasan, 2018; Gany et al., 2019). Contributing to this issue is the lack of disaggregated data on SAA populations (Gany et al., 2019). Health disparities research has historically focused on aggregate racial/ethnic categories, this results in difficulties in elucidating disparities within Asian American subgroups as they are usually combined into an Asian/Pacific Islander (API) category (Mukherjea et al., 2018). Addressing this underrepresentation is crucial for understanding the unique health needs and disparities within the diverse SAA community, including factors influencing health choices such as the utilization of homeopathic remedies.

Research focusing on SAA populations across the country have noted that SAA populations are at a disproportionately high risk for atherosclerotic cardiovascular disease (ASCVD) and diabetes. When compared to non-Hispanic Whites and other Asian American subgroups, SAA populations have increased mortality rates from ASCVD (Volgman et al., 2018). There are several underlying risk factors for ASCVD, and SAA populations have increased prevalence of these risk factors. One of the most salient risk factors is the high prevalence of type 2 diabetes mellitus. Evidence has indicated that beta-cell function may be decreased in SAAs, resulting in this increased prevalence (23%) of diabetes mellitus in South Asians when compared to non-Hispanic white populations (6%), black populations (18%), Latino populations (17%), and Chinese American populations (13%) (Kanaya et al., 2013). A disproportionately high prevalence of metabolic syndrome and insulin resistance also likely contributes to the increased incidence of ASCVD in SAA populations (Flowers et al., 2010).Metabolic syndrome is a combination of related risk factors that is associated with diabetes mellitus, cardiovascular disease, and insulin resistance and is characterized by high abdominal adiposity, high blood-pressure, elevated triglyceride levels, low levels of high-density lipoprotein (HDL), and high fasting blood glucose levels (Volgman et al., 2018). In addressing this increased prevalence of cardiometabolic and cardiovascular risk factors, researchers have investigated specific health behaviors in SAA populations that may contribute to the increased disease burden. Physical activity and diet are both important health behaviors that have been established as risk factors for ASCVD (Volgman et al., 2018).

In order to address health disparities within the SAA population, it is crucial to understand their health behaviors and beliefs (Mukherjea et al., 2013). SAA populations are relatively more sedentary than their white counterparts, which is likely associated with a knowledge gap in the importance of consistent physical activity (Daniel et al., 2013; Volgman et al., 2018). SAA diet is also an important factor to consider. SAA's dietary patterns vary greatly based on the region of South Asia, religious identity, and immigrant generation. However, the typical South Asian diet is high in carbohydrates and saturated fats, which may be associated with the increased prevalence of cardiometabolic risk factors in SAA populations (Volgman et al., 2018). Additionally, some SAA individuals may have dietary restrictions or may fast as a part of a religious observance which could be linked with vitamin B-12 deficiency and glucose intolerance (Kandula et al., 2019).

In addition to behavioral factors, there are a host of environmental and cultural factors that can impact SAA health and health care utilization. Family plays an important role in SAA culture and decision making, this is true when considering health behaviors and beliefs as well. Research has demonstrated that adult children in SAA families can positively influence their parents' diet and physical activity practices by providing information and support throughout the behavior change process (Ram et al, 2022). On the other end of the spectrum, SAA populations can experience inequalities in healthcare access due to language barriers, low health literacy, unfamiliar healthcare system and practices, lack of cultural competence, and discrimination (Vakil et al., 2023).

A robust understanding of SAA culture is one of many factors necessary to properly address SAA health disparities. This is evident as the research base on the implementation of culturally tailored interventions for SAAs grows. One of the few long-term longitudinal studies on culturally tailored programming assesses the efficacy of a two-hour educational class providing culturally relevant lifestyle and dietary recommendations to South Asian patients; the authors found that there were significant improvements in diastolic blood pressure, triglycerides, low-density lipoprotein (LDL cholesterol, high-density lipoprotein (HDL) cholesterol, BMI, and hemoglobin A1C (HbA1c) (Vafaei et al., 2023). A systematic review of culturally tailored dietary interventions in South Asians based in India, Nepal, the US, Canada, and the UK demonstrated that culturally tailored dietary and physical activity interventions generated a clinically relevant decrease in HbA1c and significant weight loss (Farhat, 2023). However, the author noted that the short duration of these studies limited the exploration of the long-term impact of culturally tailored interventions. Several pilot studies have been conducted to assess `the efficacy of culturally tailored interventions for heart disease and diabetes prevention and management and all provide strong evidence that these interventions will have a significant impact on SAA health (Jayaprakash et al., 2016; Kandula et al., 2016; Weber et al., 2020).

Culture and Homeopathic Remedies in SAA Populations

Exploring cultural practices within South Asian and SAA populations can help researchers better understand SAA health beliefs and behaviors. As discussed previously, the use of homeopathic remedies due to religiosity or familial traditions are common health behaviors within SAA populations (Khosla et al., 2023). SAA populations may rely on these kinds of remedies due to familiarity, traditional beliefs, lack of health information, and lack of health insurance to access allopathic medicine (Khosla et al., 2023).

South Asians have been utilizing homeopathic remedies in the form of traditional medicine for centuries. India recognizes these forms of traditional medicine and teaches the practices in specialized schools: Ayurveda, Yoga, Naturopathy, Unani, Siddha, Sowa RIgpa, and Homeopathy, known as AYUSH (Khosla et al., 2023). Homeopathic remedy or AYUSH research has traditionally focused on health-seeking behavior and has shown that much of the population in India opts to use pluralistic medical approaches that include both allopathy and homeopathic remedy practices (Shankar, 2015). The use of homeopathic remedies is common for both chronic conditions as well as common diseases such as a cold, fever, aches, etc (Khosla, 2023). These practices commonly utilize natural products and herbs such as turmeric, neem, honey, tulsi (holy basil), cardamon, and fenugreek (Khosla et al., 2023). Additionally, homeopathic remedies remedies are utilized by South Asians of various socioeconomic status characteristics for various reasons; homeopathic remedies are quite cost effective, making them more accessible to populations with lower incomes (Khosla et al., 2023). Within the SAA population, the relationship between beliefs, traditions, and social influences is quite complex. Studies have examined the association between homeopathic remedy use and perceived severity of an illness, beliefs regarding side effects, availability of other options, familial influence, and acculturation (Khosla et al., 2023). A study on homeopathic remedy use in Indian Americans shows that homeopathic remedy use was associated with female gender, older age, increased barriers in accessing health care, and increased religiosity (Misra et al., 2010).

As referenced previously, Cultural Competence in Health Education and Health Promotion focuses on the importance of integrating an understanding of homeopathic remedy use in diverse populations to increase cultural competence within the field; the authors emphasized the importance of maintaining a critical view of homeopathic remedies through staying updated on the growing research and evidence base (Perez et al., 2013). In the recent years, researchers have been integrating homeopathic remedies into interventions for various health issues. Medical specialists have also been adopting homeopathic remedies into their repertoire; the overall acceptance of homeopathic remedy use was 52% across specialties, and the acceptance and use of homeopathic remedies was highest in the Family Medicine specialty and lowest in Surgery (Phutrakool & Pongpirul, 2022). The first workshop on Traditional Medicine between India and the United States was held in New Delhi in 2016 and the audience of this workshop included policymakers from both countries, scientists, academics, and practitioners from both countries who work in a range of disciplines (White et al., 2018). Research was presented by both US and Indian scientists on the efficacy of homeopathic remedies in cancer treatment and several recommendations for future research were developed including collaboration, standardization, and quality control of AYUSH remedies (White et al., 2018). In August, 2023, the WHO Traditional Medicine Global Summit took place following the establishment of the WHO Global Center for Traditional Medicine (GCTM) (WHO GTCM). Their work focuses on the use of artificial intelligence and systematic review to map traditional medicine use and create an evidence base for these practices, an emphasis on sustainability, equity, and innovation.

University of Arizona conducted a pilot study to gauge the outcomes of Ayurvedic medicine and Yoga therapy for obesity and found that these therapies not only may show promise for sustainable weight loss if lifestyle change is well integrated but it may also provide a low-cost alternative to traditional weight-loss interventions (Rioux et al., 2019). A study examining the effects of a short-term yoga course for young adults showed that the yoga intervention was associated with significant decreases in self-reported depression and anxiety symptoms (Woolery et al., 2004). Additionally, a review on yoga interventions in cancer patients provided evidence supporting the association between yoga and improved psychological state and reduction of physical symptoms (Danhauer et al., 2017). Lastly, a creative yoga intervention was shown to be a promising tool to enhance children with autisms' motor skills (Kaur & Bhat, 2019).

Theoretical Framework

The Health Belief Model (HBM) can provide a valuable perspective to enhance researchers' understanding of homeopathic remedy use in SAA populations. HBM has been utilized by health behavior researchers for decades to examine individual perceptions of health risk, benefits, barriers, self-efficacy, and cues to action and how these perceptions can drive health behavior. The HBM delineates 6 key constructs relating to individual beliefs: Perceived susceptibility refers to an individuals beliefs about the likelihood of experiencing a particular health condition or the severity of the consequences of not adopting a specific behavior, perceived severity refers to an individual's perception of the seriousness of a health condition or the potential consequences of not adopting a behavior, perceived benefits are the positive outcomes and individual anticipates as a result of adopting a behavior, perceived barriers include the individual's perceived obstacles, costs, or negative impacts of adopting a behavior, cues to action refer to internal or external triggers that may prompt and individual to take action regarding their health, and lastly, self-efficacy is an individual's confidence in their ability to adopt a specific health behavior (Skinner et al., 2015). Modifying factors such as knowledge and sociodemographic factors can affect an individual's health beliefs, and subsequently health behavior (Skinner et al., 2015).

Within the context of the HBM, there are many factors that could both drive and deter an individual from utilizing homeopathic remedies. Perceived severity or susceptibility to a specific disease may increase one's likelihood of adopting homeopathic remedies. Within SAA populations, genetic risk and cultural diet seem to be involved with perceived susceptibility and severity of cardiovascular disease (Kalra et al., 2004). Additionally, perceived barriers to homeopathic remedy use may be low considering the perceptions of low cost and easy access associated with many homeopathic remedies remedies (Rioux et al., 2019) which may be an especially powerful driver of behavior in SAA populations with low SES characteristics. A study conducted using data from the 2012 National Health Interview Survey demonstrated that there were many perceived benefits associated with homeopathic remedy use in a wide variety of populations. This data was not disaggregated into Asian subgroups, however, the perceived benefits for homeopathic remedy use in the Asian subgroup of this sample included: improved health, reduction in stress, relaxation, sense of control over health, better sleep, feeling better emotionally, and increased coping with health issues (Johnson et al., 2018). A study on undergraduate students at the University of Houston showed that some cues to action for homeopathic remedy use may be: hearing about it from various sources, and familial (parent and grandparent) use of homeopathic remedies (Mhatre et al., 2011).

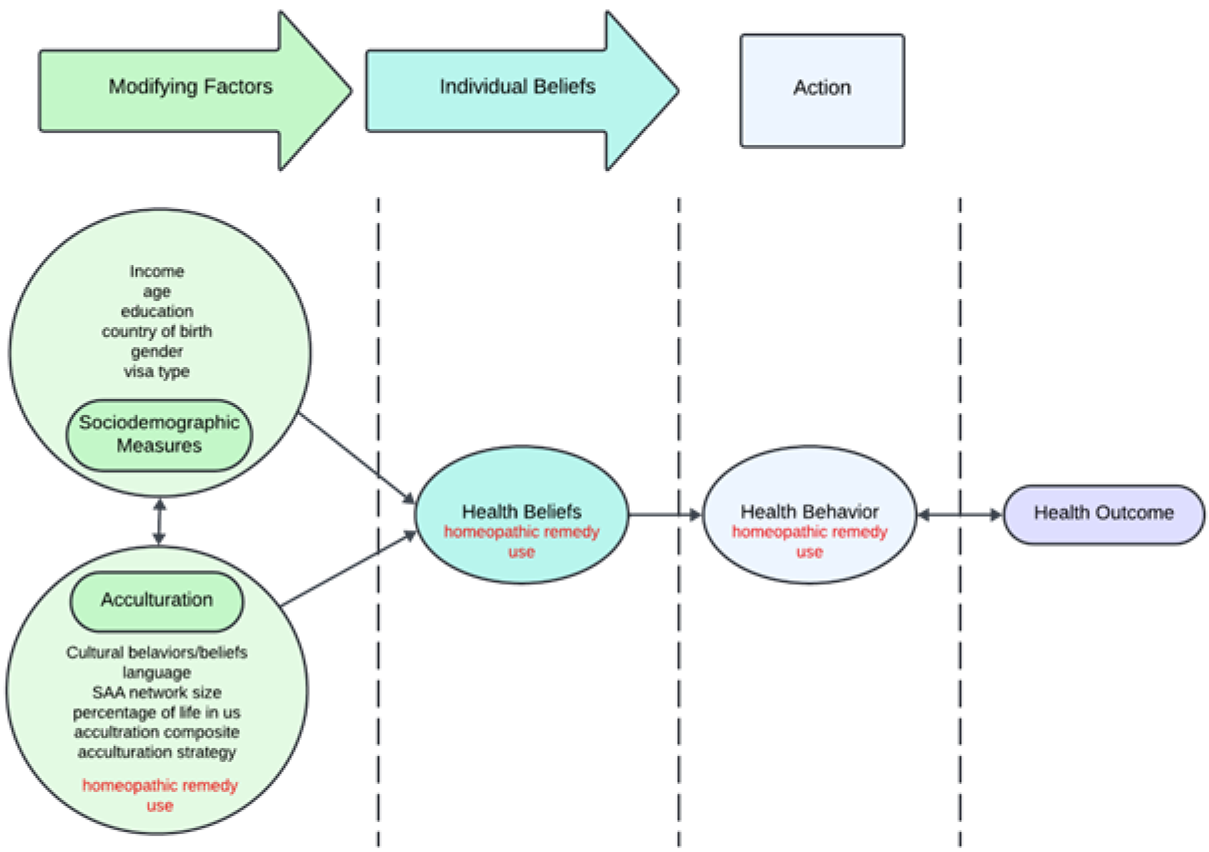
While the Health Belief Model (HBM) has traditionally offered valuable insights into health beliefs and behaviors, the incorporation of Berry's Acculturative Model, a framework rooted in cross-cultural psychology, expands our understanding even further. Acculturation refers to a multidimensional process that occurs when individual (in this case, SAA populations including migrants and second or third-generation individuals) come into contact with a host culture and either adopt or reject characteristics of both their traditional culture and mainstream or host culture (Berry, 2017). SAAs who have adopted elements of their host culture and retained elements of their traditional culture have experienced *integration* while SAAs who have adopted elements of the host culture and rejected their traditional culture have experienced *assimilation* into their host culture. Retaining traditional culture and rejecting the host culture is considered *separation*, and *marginalization* occurs when individuals reject both their traditional and host cultures (Needham et al., 2018). Because culture and cultural beliefs are closely related to health beliefs, behaviors, and outcomes, an understanding of acculturation strategies may help inform research on SAA health behavior.

The MASALA study examined acculturation strategies among SAA populations utilizing a latent class analysis and found that participants with no religious affiliation, those with higher levels of income, those who lived a greater percentage of their lives in the US, and those who spoke English well or very well were more likely to use the assimilation or integration strategies; measures of acculturation used were based on ethnic composition of friendship networks, frequency of shopping in South Asian markets, and attitudes regarding South Asian traditions (including traditional South Asian homeopathic remedy use) in SAA culture (Needham et al., 2018). Previous studies utilized self-reported English language proficiency and proportion of life in the United States (Lee et al., 2010). A more recent study on Asian Indians examining the association between proxy measures and direct acculturative measures such as media behavior, social customs, social contacts, and generational status, show that duration of residence or proportion of life in the US may be better proxies for acculturation than English language preference considering that there is a large proportion of SAAs are proficient English speakers (Bharmal et al., 2014). Validated acculturation scales have been developed for various ethnic groups, however, there are no scales developed and validated for use with SAA populations (Center for Substance Abuse Treatment, 2014). Validated scales have been developed by for Asian American populations and focus on various topic areas including language, media, ethnic-social relations, cultural behavior, cultural identity, and cultural knowledge (Park et al., 2021; Gim Chung et al., 2004; Choi & Reed, 2011).

Acculturation strategies have been studied in relation to cardiometabolic risk profile; this study results show an association between the *integration* and *assimilation* strategies and a healthier cardiometabolic risk profile (Al-Sofiani et al., 2020). In a study examining the association between acculturative strategies and mental health outcomes showed that SAA who undergo *separation* had more symptoms of depression than those undergo *Integration* or *assimilation* (Needham et al., 2018). These studies indicate a need to better understand acculturation strategies and how they inform health outcomes and behaviors. Further research in this area could inform the development and implementation of culturally responsive interventions for SAA populations.

Theoretical Model

Figure 1. Homeopathic Remedy Use and its Interaction with Acculturation, Sociodemographic Measures, and Health Outcomes: Informed by the Health Belief Model



The above model describes homeopathic remedy use in the context of the HBM. The model is split into 3 main areas based on constructs from the HBM including modifying factors, individual beliefs, and action. Modifying factors influence health perceptions and beliefs and, in the context of this study, include two of the major groups of independent variables: sociodemographic measures and acculturative measures. Individual beliefs are health beliefs around perceived threat, perceived benefits, perceived barriers, and perceived self-efficacy relating to homeopathic remedy use, in addition to more general health beliefs that may be related to various health outcomes or cultural factors. Health beliefs was intended to be more general to combat common critiques of the HBM such as the idea that the HBM does not account for individual attitudes beliefs or other determinants that influence one's acceptance of a health behavior (LaMorte, 2022). These modifying factors and individual beliefs both impact the health behavior: homeopathic remedy use. Finally, there is a two-way relationship between health behavior and health outcomes. Health outcomes refers to the final group of independent variables including BMI, health status, and diagnosis of health issues which include cancer, cardiomyopathy, congestive heart failure, heart disease, diabetes, heart attack, high cholesterol, and high blood pressure.

Conclusion

This literature review has explored the expanding landscape of SAA health research, emphasizing the urgent need for tailored investigations into the use of homeopathy in this diverse population. Despite the rapid growth of the SAA population, they are remarkably underrepresented in health research, which is exasperated by the lack of disaggregated data on Asian subgroups. Current health disparities research highlights SAA populations increased risk for ASCVD and increased mortality from ASCVD when compared to other racial/ethnic groups. This can potentially be explained by a high risk cardiometabolic profile including increased rates of type 2 diabetes mellitus, metabolic syndrome, and insulin resistance. Understanding SAA health behaviors and beliefs, which have previously been shown to include more sedentary lifestyles and diverse dietary patterns influenced by region, religion, and immigrant generation, is crucial. Language barriers and discrimination can further impact SAA health and healthcare utilization. Addressing these disparities requires a comprehensive understanding of the unique health beliefs and behaviors within the diverse SAA community.

The cultural practices within South Asian and South Asian American (SAA) populations offer valuable insights into their health beliefs and behaviors, particularly regarding the common use of homeopathic remedies. Influenced by religiosity and familial traditions, SAAs often turn to homeopathic remedies due to its familiarity, traditional beliefs, low barriers associated with utilization, and sometimes, the lack of health information or insurance for allopathic medicine. Traditional medicine, including Ayurveda, Yoga, Naturopathy, Unani, Siddha, Sowa Rigpa, and Homeopathy (AYUSH), has deep roots in South Asian culture. Recent trends have demonstrated an integration of homeopathic remedies into health education and interventions for various health issues such as cancer and obesity. Recent workshops and collaborations between the US, India, and the WHO demonstrate a global recognition of the importance of homeopathy and its integration into health research and practice.

The HBM is a valuable framework for understanding homeopathic remedy use in SAA populations. When augmented with Berry's Acculturative Model, these theories can provide researchers with an improved understanding of why SAA populations may or may not utilize homeopathic remedies. The rapid growth of the SAA population, underrepresentation of SAAs in health research, prevalence of SAA health disparities, high prevalence of homeopathic remedy use in SAA populations, and integration of homeopathy into mainstream Western health practice and research all indicate a need to better understand the utilization of homeopathy in SAA populations and how it relates to sociodemographic factors, acculturative measures, and health outcomes.

Chapter 3. Methods

Study Design

This study conducted a secondary analysis of the Community Engaged Needs Assessment of South Asians Living in Atlanta (CENSAA) dataset. CENSAA is a cross sectional online survey intending to better understand the cardiometabolic health of South Asians in the Atlanta Metro Area. The survey collected data aimed to establish representative estimates of cardiometabolic health. Additionally, researchers established a community advisory board to aid in survey design, piloting, and survey dissemination and reviewing and providing insights on the findings of the CENSAA study. In order to be eligible for the CENSAA study, participants had to be over the age of 18 and have a zip code in the Atlanta Metro Area, specifically within the following counties: Cherokee, Cobb, Clayton, Dekalb, Fayette, Fulton, Gwinnett, Henry, and Rockdale. Additionally, participants must self-report having at least two grandparents who were born in pre-partition India which includes current day India, Pakistan, and Bangladesh.

Sampling and Recruitment

Recruitment and data collection started February 8, 2022, and ended May 17, 2022. There was a $15 incentive for the first 1,000 participants. Researchers who have previously worked with SAA populations have noted that there has been significant difficulty in recruiting and sustaining participation of SAA populations in medical research (Mukherjea et al., 2018). Additionally, because Atlanta has no registry of SAA individuals, the respondent driven sampling (RDS) technique was utilized to best reach this population. RDS is a non-probability sampling and analysis method used to reach populations that are difficult to reach with traditional, probability-based sampling methods (Lee et al., 2020). RDS relies on the population's social networks and chain referrals (Lee et al., 2020). Initial respondents are considered "seeds" or wave 0. These respondents received a unique referral code that they could use to recruit people within their personal networks for the study. These new respondents, or wave 1, also received a code to use to recruit further. Seeds and waves 1 and 2 were not included in the analysis, resulting in a sample size of 363 out of a total of 1380. Seeds were recruited through outreach from community advisory board members, the Khabar magazine, and WhatsApp group messages.

Measures

Dependent Variable:

To assess homeopathic remedy use within this population, respondents were asked "To treat an illness, which of the following do you typically partake in?" Respondents placed a checkmark next to each of the following treatments: "homeopathic medicine/therapies (includes yoga, Ayurveda, Unani, homeopathy, Tibetan naturopathy, meditation)", "Allopathic/Western drugs/medicine", "neither traditional nor allopathic", "other", "decline", and "unknown". This was recoded into several binary variables relating to each method of treatment, the variable of focus was use of homeopathic medicine/therapies to treat an illness.

Independent Variables:

There were several independent variables used in this analysis including self-reported sociodemographic variables and self-reported anthropometric (height and weight used to calculate BMI) and health measures (diagnosis of cardiometabolic disease, and family history of diabetes).

Sociodemographic Variables: Several sociodemographic variables were used in this analysis, including age, sex, country of birth, type of visa the participant entered the country on, educational attainment, household income, and type of health insurance. Age was measured continuously, sex, country of birth, type of visa the participant entered the country on, educational attainment, household income, and type of health insurance were all measured categorically.

Acculturative Measures: Percentage of life spent in US, which was calculated for first generation participants, and number of Asian Indian friends who live in the Greater Atlanta Area, called South Asian network size, are two of the three continuous acculturative measures utilized in this analysis. For the third, several variables were aggregated into a multidimensional composite measure of acculturation that assesses both the reception of host culture and the maintenance of traditional culture. The following questions were used to create the composite measure of acculturation: How often do you fast? What foods do you normally eat at home? How often do you/your family shop at South Asian grocery stores/markets? Which country or culture most of your friends belong to? How often do you abstain from eating meat? How often do you abstain from drinking alcohol? What is the primary language spoken in your home? The former measures were all recorded categorically, and the following were measured continuously and subsequently recoded to a categorical variable: How many of your friends are Asian Indian and live in the Greater Atlanta Area? These questions had varying numbers of response options and therefore had to be scaled so they were weighted equally within the composite measure. Lastly, participants who were born in a different country were asked to report the year they immigrated to the US. This was used to calculate the percentage of life spent in the US, which was then scaled to the same weight as the previously mentioned categorical variables. The total acculturation composite score is out of 100, where a higher score indicates the use of the *assimilation* strategy and a lower score indicates the use of the *separation* strategy. If the total acculturation composite score was closer to the middle, it is likely the participant utilized the *integration* strategy. Total acculturation composite score was then recoded into a categorical variable called acculturation strategy.

Health Measures: There are several health measures used for this analysis. Respondents self-reported height and weight which was used to calculate BMI based on the WHO's BMI and Asian BMI categories (Misra & Dhurandhar, 2019). Respondents were also asked to rate their overall health as either "poor", "fair", "good", "very good", or "excellent". In separate survey questions, respondents were asked if their parents had been diagnosed with diabetes, if their siblings had been diagnosed with diabetes, and if their children had been diagnosed with diabetes. These variables were combined into family history of diabetes. Lastly, respondents were asked if they were diagnosed with any of the following diseases:

cancer, cardiomyopathy, congestive heart failure, heart disease, diabetes (excluding gestational diabetes), heart attack, cholesterol, and high blood pressure.

Data Analysis

All analyses were conducted through Statistical Analysis Systems (SAS) Studio on the SAS Viya Platform: SAS Studio version 3.8 on SAS version 9.4 (SAS Institute Inc, n.d.). Percentages and frequencies were calculated for all categorical variables of interest and median and interquartile range were calculated for continuous variables. In order to perform data analysis after using RDS technique, RDS weights were applied and used in all steps of the analysis. Chi squared tests were conducted using weighted frequencies to assess the association between homeopathic remedy use and sociodemographic variables, the acculturative composite measure, and health measures. The sociodemographic variables tested were sex, country of birth, visa type, education level, income, and insurance type. The health measures tested were BMI (based on WHO Asian cut offs), overall health status, family history of diabetes, and diagnosis of cancer, cardiomyopathy, congestive heart failure, diabetes, high cholesterol, and high blood pressure.

The following assumptions were tested for chi-squared test for independence: the level of measurement of all variables is nominal or ordinal, the levels of the variables are mutually exclusive, each subject contributes data to only one cell, the study groups are independent, and the expected cell value should be 5 or more in at least 80% of the cells, and no cell should have an expected of less than one (McHugh, 2013). All variables met these assumptions with the exception of diagnosis of heart disease and heart attack, which had expected cell counts lower than one. These two variables were excluded from analysis because Fishers-Exact tests require integers, weighted values are non-integer data points, and therefore a weighted Fishers-Exact test cannot be conducted to assess the association between homeopathic remedy use and diagnosis of heart disease or diagnosis of heart attack. Weighted independent samples t t-tests were conducted to assess differences in population means for age, percentage of life in US, total acculturation composite score, South Asian network size, and BMI depending on homeopathic remedy use. The following assumptions were tested before utilizing an independent samples t-test: data points are continuous, data follows the normal sampling distribution, the variances of the two groups are equal, the two samples are independent, and both samples are simple random samples (NCSS Statistical Software, n.d.). While an unweighted exploration of spread pointed to an abnormal distribution for several variables, the weighted sample size is 36,271, which is large enough to indicate that the sampling distribution of the mean is normal. All of these assumptions were met for the variables used in the analysis.

Chapter 4. Results

Sample Demographics

The survey elicited 2,463 responses, out of which 1,380 met the inclusion criteria. Of these participants, 504 were seeds, or wave 0. Data collected after wave 2 was used in the analysis and to calculate weighted descriptive statistics for the sample (n=36271) seen in Table 1; when utilizing RDS techniques, data from early waves tend to be representative of seed data (Lee et al., 2020). Data produced after wave 2 was stabilized, meaning, the characteristics of the sample after wave 2 became independent of the seeds'. The median age for participants was 33 with a lower quartile of 21 and an upper quartile of 37. The sample was 58.9% male and 42.4% female. In total, 33.1% of participants immigrated from another country and 66.9% of participants were born in the US. In total, 58.41% of participants did not report using homeopathic remedies, while 41.6% did.

Table 1. Participant Characteristics and Weighted Frequency Estimates from a Sample of South Asian Americans in Atlanta

		Sample n=363		***Weighted Estimate*** n=36,271		
		n	*%*	*%*	*Lower Bound*	*Upper Bound*
Sex[a]						
	Male	197	54.57	57.61	51.21	64
	Female	164	45.43	42.39	35.99	48.79
Country of Birth						
	United States	243	66.94	66.35	60.27	72.42
	India	108	29.79	31.11	25.12	37.1
	Other	12	3.31	2.54	0.97	4.11
Income[a]						
	<$20,000	13	3.94	4.08	1.47	6.69
	$20,001-$40,000	40	12.12	20.86	14.04	27.68
	$40,001-$60,000	55	16.67	15.78	11.39	20.17
	$60,001-$80,000	73	22.12	23.9	17.73	30.07
	$80,001-$100,000	47	14.24	11.66	7.85	15.47
	>$100,001	102	20.91	23.72	18.54	28.9
Homeopathic Remedy Use						
	Yes	155	42.94	41.58	35.14	48.02
	No	208	57.06	58.42	51.98	64.86
Median Age (Q1,Q3)[a,b]		30.00 (21.00,37.00)		33.00 (21.00, 37.00)		

[a] Sample size decreased due to missing data points

[b] Q1= lower quartile, Q3= upper quartile

Contingency tables were created for all categorical independent variables to compare frequencies based on homeopathic remedy usage as seen in Table 2. Among those who used homeopathic remedies 76.3% were born in the US, while, among non-users, 59.3% were born in the US. Education level also varied, 34.9% of homeopathic remedy users have a Bachelors degree or higher while 44.2% of non-users have a Bachelors degree or higher. Among homeopathic remedy users, 42.6% utilized the separation strategy while 32.6% of non-users utilized the separation strategy. Among those who did use homeopathic remedies, 44.7% had a family history of diabetes and 19.6% were categorized as underweight compared to 38.0% and 30.5% respectively. Diagnosis of cancer and cardiomyopathy both varied based on homeopathic remedy use; among those who do use homeopathic remedies, 12.2% are diagnosed with cancer and 11.9% are diagnosed with cardiomyopathy compared to 6.2% and 6.4% of non-users respectively. Sex, visa type, income, insurance status, overall health status, and diagnosis of congestive heart failure, heart disease, diabetes, heart attack, high cholesterol, and high blood pressure remained consistent across groups. Median age, lower and upper quartiles were relatively similar for those who do use homeopathic remedies (31 [21,36]) and those who do not (33 [22,38]). For those who used homeopathic remedies the median and interquartile range for percentage of life spent in the US is higher (50.00 [22.50,68.57]) than those who did not use homeopathic remedies (37.78 [18.42,59.02]). Median and interquartile range remained relatively similar for South Asian network size, total acculturation composite score, and BMI depending on homeopathic remedy use.

Table 2. Weighted Association Between Homeopathic Remedy use and Demographic Measures, Acculturative Measures, and Health Related Measures

		Homeopathic Remedy Use *n (%)*	***No Homeopathic Remedy Use*** *n (%)*	***Total*** *n (%)*	***Chi-Square Test Results***
Sex[a]					
	male	8161 (54.72)	12637 (59.64)	20792 (57.81)	P=0.458
	female	6752 (45.28)	8552 (40.36)	15304 (42.39)	$X^2(1) = 0.87$
Country of Birth					
	US	11510 (76.31)	12556 (59.26)	24066 (66.35)	**P=0.01**

	India	3369 (22.33)	7915 (37.56)	11284 (31.11)	$X^2(1)$ =11.70
	other	203.93 (1.35)	717.12 (3.38)	285.57 (2.54)	
Visa type[b]					
	Family	1863 (53.62)	4772 (56.81)	6636 (55.88)	P=0.891
	employment	1200 (34.53)	2463 (29.31)	3663 (30.84)	$X^2(1)$ =0.33
	other	411.75 (11.85)	1166 (13.88)	18 (13.28)	
Education					
	Highschool	1312 (8.70)	2360 (11.14)	3671 (10.12)	P=0.520
	some college	6167 (40.88)	6543 (30.88)	12709 (35.04)	$X^2(1)$ =5.13
	associates	2342 (15.53)	2919 (13.77)	5260 (14.50)	
	Bachelors	3771 (25.00)	6774 (31.97)	10545 (29.07)	
	grad/professional	1491 (9.89)	2594 (12.24)	4085 (11.27)	
Income[a]					
	<20,000	848.46 (6.10)	517.51(2.65)	1366 (4.08)	P= 0.603
	20,001-40,000	3128 (22.48)	3852 (19.71)	6980 (20.86)	$X^2(1)$ =5.36
	40,001-60,000	1625 (11.68)	3655 (18.70)	5280 (15.78)	
	60,001-80,000	3458 (24.85)	4538 (23.22)	7996 (23.90)	
	80,001-100,000	1689 (12.14)	2212 (11.32)	3901 (11.66)	
	>100,001	3169 (22.7)	4767 (24.40)	7936 (23.72)	
Insurance Status[a]					
	HMO/private	6684 (45.74)	9691 (51.11)	16375 (48.78)	P= 0.378
	Medicare	4787 (32.77)	4191 (22.11)	8978 (26.75)	$X^2(1)$ =4.95
	Medicaid	2283 (15.62)	3729 (19.67)	6011 (17.90)	
	Other	857.27 (5.87)	1349 (7.11)	2206 (6.57)	
Acculturation Strategy[a]					
	Assimilation	3171 (25.22)	5306 (35.31)	8477 (30.72)	P=0.251
	Integration	4044 (32.17)	4816 (32.05)	8859 (32.11)	$X^2(1)$ =4.11
	Seperation	5356 (42.61)	4903 (32.63)	10259 (37.17)	
Overall Health Status[a]					
	Poor	24.80 (0.16)	39.53 (0.19)	64.34 (0.18)	P=0.601
	Fair	205.50 (3.43)	1205 (5.82)	1722 (1.48)	$X^2(1)$ =3.34
	Good	4918 (32.60)	5219 (25.19)	10137 (28.31)	
	Very Good	7137 (47.32)	10127 (48.87)	1372 (3.36)	
	Excellent	2486 (16.49)	4130 (19.93)	6616 (18.48)	
Family History of Diabetes[a]					
	Yes	5787 (44.65)	6360 (38.01)	12147 (40.91)	P=0.375
	No	7172 (55.35)	10373 (61.99)	17545 (59.09)	$X^2(1)$ =0.37
Asian BMI					
	<18.5 Underweight	2953 (19.58)	6511 (30.73)	9463 (26.09)	P=0.238
	18.5-22.9 Normal Weight	5521 (36.61)	6994 (33.01)	12515 (34.50)	$X^2(1)$ =0.24
	23-24.9 Over Weight	2952 (19.57)	3843 (18.13)	6795 (18.73)	
	25+ Obese	3657 (24.24)	3841 (18.13)	7489 (20.67)	

Diagnosis of Health Issue					
Cancer	Yes	1834 (12.16)	1307 (6.17)	3141 (8.66)	P= 0.255
	No	13249 (87.84)	19881 (93.83)	33130 (91.34)	$X^2(1)$ =0.25
Cardio-myopathy	Yes	1792 (11.88)	1365 (6.44)	3157 (8.70)	P=0.303
	No	13291 (88.12)	19824 (93.56)	33114 (91.30)	$X^2(1)$ = 0.30
Congestive Heart Failure	Yes	527.09 (3.49)	316.25 (1.49)	843.34 (2.33)	P=0.490
	No	14556 (96.51)	20872 (98.51)	35428 (97.67)	$X^2(1)$ =0.49
Heart Disease[c]	Yes	0 (0)	322.58 (1.52)	322.58 (0.89)	
	No	155 (100)	20866 (98.48)	35948 (99.11)	
Diabetes	Yes	807.66 (5.45)	1484 (7.01)	2292 (6.32)	P=0.693
	No	14275 (94.65)	19704 (92.99)	33979 (93.68)	$X^2(1)$ =0.69
Heart Attack[c]	Yes	0 (0)	674.67 (3.18)	674.67 (1.86)	
	No	155 (100)	20514 (96.82)	35596 (98.14)	
High Cholesterol	Yes	446.80 (2.96)	541.99 (2.56)	998,79 (2.73)	P=0.799
	No	14636 (97.04)	20646 (97.44)	35282 (97.27)	$X^2(1)$ =0.80
High Blood Pressure	Yes	376.73 (2.50)	372.26 (1.76)	748.99 (2.07)	P=0.600
	No	14706 (97.50)	20816 (98.24)	353522 (97.93)	$X^2(1)$ =0.60

[a] Sample size decreased due to missing data points
[b] Sample size decreased due to exclusion of United States born participants
[c] Analysis not conducted due to actual frequency of 0 in contingency table

	Homeopathic Remedy Use	***No Homeopathic Remedy Use***	***Mean Difference***	***T Test Results***	
	Mean (Standard Deviation)	*Mean (Standard Deviation)*	*Mean (95% Confidence)*	*T Value*	*P Value*
Age	29.72 (84.01)	32.12 (96.06)	2.4 (0.37,4.43)	2.33	**0.0205**
Percentage of Life in US[a]	45.52 (267.3)	38.88 (264.5)	-6.63 (-18.63,5.37)	-1.1	0.2756
Total Acculturation Composite (/100)	57.74 (100.9)	60.23 (92.81)	2.49 (0.20,4.79)	2.14	**0.0335**
South Asian Network Size	8.49 (82.3)	8.43 (76.7)	-0.06 (-1.72,1.60)	-0.07	0.9406
BMI	23.20 (30.81)	23.10 (30.78)	-0.10 (-0.82,0.62)	-0.28	0.7791

[a] Sample size decreased due to exclusion of United States born participants

Key Findings

Sociodemographic Variables

Weighted chi-squared tests of independence were conducted to test for differences in homeopathy usage based on various sociodemographic variables as seen in table 2. Country of birth was significantly associated with homeopathic remedy use (p=0.010). Out of all homeopathic remedy users, 76.31% were born in the US compared to 59.26% born in the US out of all non-users. Sex, visa, income, and insurance were not significantly associated with homeopathic remedy use. Additionally, an independent samples t-test was conducted to assess mean differences in age between those who used homeopathic remedies and those who did not. There was a significant difference of 2.4 years in age between the two groups, with those who use homeopathic remedies being younger (M= 29.72) compared to those who do not (M=32.12), t=2.33, p=0.021.

Acculturative Measures

Chi-squared test for independence yielded insignificant results when assessing the association between acculturation strategy and homeopathic remedy use. Independent samples t-tests were utilized to assess the difference in population means for percentage of life spent in the US, total acculturation composite score, and South Asian network size. Results for percentage of life in US and South Asian network size were insignificant however, total acculturation composite yielded a significant mean difference of 2.49 when comparing those who use homeopathic remedies (M=57.74) to those who did not (M=60.23), t=2.14, p=0.034.

Health Measures

Chi-squared tests for independence were used to assess the association between overall health status, family history of diabetes, Asian BMI categories, and diagnosis of cancer, cardiomyopathy, congestive heart failure, diabetes, high cholesterol, and high blood pressure. The associations between heart disease and heart attack and homeopathic remedy use were not tested due to there being at least one expected cell count of zero. None of these tests yielded significant results despite the frequencies discussed previously. Population mean difference in BMI depending on homeopathic remedy use was also tested and yielded insignificant results.

Summary of Findings

Weighted analysis of post-wave 2 data resulted in significant associations between sociodemographic factors and homeopathic remedy use. Notably, country of birth emerged as determinant, 76.31% of homeopathic remedy users were born in the US compared to 59.26% born in the US out of all non-users (p=0.010). Furthermore, an independent samples t-test resulted in a significant age difference between users and non-users, with homeopathic remedy users being younger by 2.4 years on average. However, factors such as sex, visa status, income, and insurance did not exhibit significant associations with homeopathic remedy use. While acculturation measures showed no substantial differences between homeopathic remedy users and non-users, a modest yet significant difference in total acculturation composite scores was observed, with homeopathic remedy users scoring lower on the scale (more towards separation). In contrast, health measures did not establish significant associations with homeopathic remedy use.

Chapter 5. Discussion

Conclusions

This study aimed to determine the association between homeopathic remedy use and various sociodemographic variables, acculturative measures, and health outcomes within a weighted sample of SAAs in Atlanta. Results indicated that homeopathic remedy use was significantly associated with decreased age and total acculturation composite score as well as being born in the US. As previously mentioned, a national study on homeopathic remedy use in Asian Indian shows that homeopathic remedy use was associated with female gender and older age (Misra et al., 2010). However, the results of our analysis found that homeopathic remedy users were 2.4 years younger on average compared to non-users. This analysis did not yield a significant association between gender and homeopathic remedy use, unlike the Misra study. The upper quartile for age in the sample for this study was 37 years, when compared to the average age of 46 from the Misra study. This may explain some of the variations in results. A study by Felicilda-Reynaldo using data collected in 2012 assessed homeopathic remedy use for the treatment of specific illnesses among Asian American subgroups (Felicilda-Reynaldo et al., 2020). Results of this study found that nativity or country of birth was not significantly associated with homeopathic remedy use among Asian Indians, which is not consistent with our results that show that US nativity is significantly associated with homeopathic remedy use. However, the sample from the Felicilda-Reynaldo study was primarily foreign born (73.6%) while the data from this study was primarily US born (66.9%). These differences indicate a need to further investigate differences in health behavior between 1st and 2nd generation SAAs.

Previous studies that have assessed homeopathic remedy use and its association with acculturative factors have used mainly English proficiency and residency in the US as predictors rather than taking a more multifaceted approach to acculturation (Hsiao et al., 2006; Misra et al., 2010). No studies have used a variable similar to the total acculturation composite score in their analyses, making comparisons to previous literature difficult. This analysis yielded a significant difference in mean total acculturation composite score of 2.49. The total acculturation composite score was out of 100 possible points, so a difference of 2.49 is not very large. Further limitations of the total acculturation composite score will be discussed below.

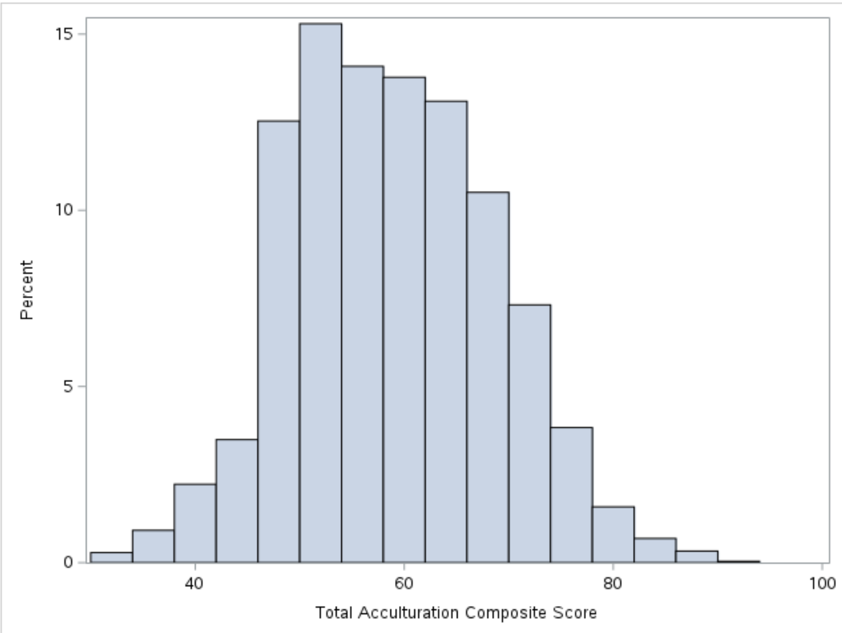
Many studies have examined the association between homeopathic remedy use and health status or specific health outcomes and have provided inconsistent results. A study based in England reports that going to a homeopathic remedy practitioner is associated with poorer health, while a study based in the US showed that homeopathic remedy use was associated with excellent health status (Ong et al., 2002; Nguyen et al., 2011). Additionally, many studies have acknowledged that those who have chronic diseases are more likely to use homeopathic remedies (Misra et al., 2010; Mbizo et al., 2018). However, none of these studies focused on South Asians or South Asian subgroups. This analysis yielded insignificant results when assessing associations between health outcomes and homeopathic remedy use, however, this may be due to the fact that this sample is relatively young and may not be experiencing chronic conditions at the same rate as older samples.

Strengths and Limitations

Though this study has its limitations, there are various strengths worth noting. This study is one of the few that assess the prevalence of homeopathic remedy use among SAA, and its association with sociodemographic variables, acculturative measures, and health outcomes. It is also the first study to assess the prevalence of homeopathic remedy use within SAA's in the Southeastern US. Additionally, the conceptualization of acculturation in this study accounts for the multifaceted nature of the acculturation process, while other studies focus more on English proficiency and residency/years in US.

Limitations of this study include common issues with the use of secondary data. Missing data can produce biased results. In addition, all of the survey measures were self-reported, which may create additional bias in the results. While this survey tool collected data on a variety of acculturation related measures, it was not completely consistent with previous studies that use a more multifaceted conceptualization of acculturation. For example, questions on religiosity and participant beliefs regarding specific South Asian traditions were not included in the survey; the use of these measures could potentially make the acculturation composites more robust. Additionally, homeopathic remedy use has not been consistently defined throughout the literature, making it difficult to directly compare results of this study with previous literature. Because acculturation is a continuously developing construct, it was difficult to decide how to best define the various acculturation strategies. The total acculturation composite score and the resulting acculturation strategy variable may not be the most robust measures. Cut-off points for the various acculturation strategies were defined based on the researcher's understanding of acculturation in South Asians, and not based on any empirical evidence. A histogram of total acculturation composite score was created when attempting to define cut off points (Figure 2); the distribution was unimodal meaning there was quite a high concentration of data points towards the center of the range (theoretically referring to the integration strategy), which made dichotomization difficult. Additionally, some researchers have critiqued the overreliance on acculturation or cultural factors as an explanation for immigrant health outcomes, noting that this may obscure the impact of structural factors on immigrant health (Viruell-Fuentes et al., 2011). Lastly, low sample sizes for certain health conditions also hindered analysis of the association between homeopathic remedy use and health outcomes.

Figure 2. Histogram of Total Acculturation Composite Score



Implications and Moving Forward

The results of this study have various implications relating to SAA health care, health education, disease prevention and management, programming and intervention development. Because homeopathic remedy use is widespread among SAA immigrants and subsequent generations who are born in the US, it is important to incorporate a critical understanding of homeopathic remedy use into aspects of health care for SAA. A critical understanding of homeopathic remedy use can contribute to the creation of more innovative and culturally responsive health education materials and practices for clinicians and public health practitioners alike. A Guide to Psychological Assessment with Asians (Dutt & Kit, 2014) utilizes data describing the prevalence of homeopathic remedy use in subgroups of the SAA population to inform a chapter titled *Cross-Cultural Considerations with Asian Indian American Clients: A Perspective on Psychological Assessment* which provides a cultural profile of the Asian Indian population. Understanding SAA culture is an area of competence for clinicians when counseling SAAs, including an understanding of homeopathic remedy use in SAA populations. These efforts should be recreated across various health-related fields to ensure cultural responsiveness to SAAs.

Culturally tailored health interventions could utilize homeopathic remedies in their programming which may potentially increase trust and buy-in from participants. Studies assessing homeopathic remedy use in Chinese Americans have been used to justify the use of traditional Chinese remedies in impactful interventions for cancer, tobacco cessation, and type 2 diabetes (Liu et al., 2017; Chang et al., 2013; Ho et al., 2021). Additionally, further research into country of birth or generational cohort and use of homeopathic remedies is warranted as it may help researchers better understand differences in acculturation and health behavior between first- and second-generation SAAs.

Based on the results of this analysis indicating a high prevalence of homeopathic remedy use among those who have chronic health conditions such as cancer and congestive heart failure, an understanding of SAA homeopathic remedies and their utilization for various conditions should be researched further. Due to the high utilization of homeopathic remedies in various immigrant or indigenous populations, researchers have conducted studies on the efficacy of traditional herbal remedies in the treatment of chronic heart failure and diabetes neuropathy (Wang et al., 2017; Tiwari et al, 2018). Studies on the efficacy of yoga have produced promising results (Manchanda & Mandan, 2014; Guddeti et al., 2019). Some research has been done on the efficacy of ayurvedic cancer treatments such as curcumin, ashwagandha, and triphala, but results are not conclusive (Arnold, 2022). Another study utilized ayurvedic practitioners to create personalized dietary plans for participants along with yoga with the goal of addressing psychophysiological imbalances impeding weight loss; authors reported that an ayurveda-yoga based lifestyle intervention is an acceptable, feasible, and low-cost approach to weight management (Rioux & Howerter, 2019). Further research into other common SAA homeopathic remedies and their efficacy in their intended use should be explored. Additionally, further research into acculturation as a concept and its relation to homeopathic remedy use in SAA populations is important and can provide additional context into the seemingly ubiquitous nature of homeopathic remedy use regardless of acculturation strategy.

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