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The Use of Alternative and Conventional Medications for Treating Hypertension by Jamaicans in the Hartford, Connecticut Area

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The Use of Alternative and Conventional Medications for Treating Hypertension by
Jamaicans in the Hartford, Connecticut Area

Judith A. Bennett RN BSN

University of Connecticut, 2004

A Thesis

Submitted in Partial Fulfillment of the

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At the

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APPROVAL PAGE

Masters of Public Health Thesis

The Use of Alternative and Conventional Medications for Treating Hypertension by
Jamaicans in the Hartford, Connecticut Area

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Abstract

Background

Hypertension continues to be an international public health concern. This chronic disease is highly prevalent in Caribbean countries. Jamaican migrants to the Greater Hartford, Connecticut area share in this high prevalence. The purpose of this study was to investigate the concomitant use of herbal and conventional medicines for treating hypertension among these migrant Jamaicans.

Methods

Qualitative and quantitative mixed methods were used to carry out this study. Focus groups and in-depth interviews collected qualitative data and a survey questionnaire collected quantitative data allowing for representation and hypothesis testing. Analysis of qualitative data used a thematic approach while SPSS was used for univariate and bivariate analyses.

Results

Two focus group meetings initially led to selection of a sample for in-depth interviews with fifteen participants. Later, a questionnaire showed 92.9% of migrant Jamaicans continued to use herbal medicines for treating high blood pressure. The majority of respondents, 95.2% engaged in concomitant therapy, that is, use of both herbal and conventional medicines. Belief in the limited side effects of herbs was a primary reason given for continued use of herbal medicines. Strong correlations were seen for herbal and OTC use ($p < .001$), as well as herbal and prescription use ($p = .004$).

Conclusion

A high percentage of migrant Jamaicans in the Hartford area used herbal along with biomedicines to treat their hypertension suggesting that primary care providers need to know what their Jamaican hypertensive patients are taking beyond the medicines they prescribe.

Chapter I - Introduction

Researchers have found that native Jamaican Islanders extensively use traditional medicines (TM) alongside conventional medicines to treat both acute illnesses and chronic diseases (Picking et al., 2011; Landman & Hall 1983; Delgoda et al., 2010 and Gardener et al., 2000). Use of conventional medicines, which includes prescription and over-the-counter (OTC) along with TM for health maintenance, is referred to as concomitant therapy. This method of caring for health is used in many cultures and is therefore not unique to Jamaicans. The reasons for using TM in the treatment of chronic diseases include perceptions that biomedicines are ineffective, harmful, expensive and difficult to access. With strongly held beliefs in TM's efficacy, as well as its low cost and availability (Ekor, 2013; pp. 3-20), a large percentage of the world's population continues to incorporate it in primary health care.

This research examines the approaches to treatment of hypertension among the Jamaican population living in the Greater Hartford area of Connecticut. Hypertension, one of the many pervasive chronic health problems among the general population, was examined because of its permanence as a health condition requiring ongoing treatment. While this concomitant use of medicines is widespread in Jamaica (Picking et al., 2011), little is known about whether these practices continue among Jamaicans after they have migrated to the United States. The aim of this research was to investigate the practice and rationale of concomitant use of TM and conventional biomedicine among a Jamaican migrant population in the Hartford area.

The Global Perspective

According to World Health Organization (WHO), “Traditional medicine is the sum of knowledge, skills and practices based on beliefs, experiences and principles that are native to a culture,” (WHO, 2013; pp.15). This meaning is founded on the premise that skills and knowledge of herbal medicines, packaged with strong belief systems, were mastered and passed generationally among collective groups for thousands of years. These traditional ways of caring for health undoubtedly ensured these groups’ survival. Although modern herbal medicine varies somewhat from TM, taking the form of more processed preparations, the basis for its use remains in the claim that it provides wholistic health benefits. It may be reasonable to say then, that the growing interest in herbal medicine is a reinvestment by humans in an ancient philosophical belief.

New findings have emerged that demonstrate a variety of ways in which TM is making a global resurgence. The use of TM is on the rise globally with estimated annual sales greater than 60 billion \$US (Tilburt & Kaptchuk, 2008). Countries such as the US, China, Nigeria and India as well as WHO, have made important fiscal contributions to research of herbal extracts in recent years (Tilburt & Kaptchuk, 2008). Further, a review by Ekor (2013), of studies done in the US, Europe and Australia, have found the promotion of healthy living to be the most common motivating factor among users of TM. Combined, these factors may account for the renewed interest in herbal medicines, especially in developed nations, such as, Europe and North America (Ekor, 2013; pp. 2/20-3/20). The World Health Organization (WHO) estimates that over 80% of the world’s population, presently use herbal medicines for treating illnesses and diseases (Traditional Medicine, 2003).

The long-established history and benefits of TM has led the WHO to commit to

preserving these approaches to health maintenance and curing diseases (Chaudhary and Singh, 2011). As such, WHO initiatives to support opportunities and interest in traditional medicine across culture resulted in the formation of the Intellectual Property Rights Innovation and Public Health Commission in 2003 (CIPIH). The CIPIH is tasked to examine TM's contributions to healthcare, as well as to provide suggestions on measures to improve its development. The long-term goal of CIPIH is to champion human health through use of allopathic and non-allopathic therapy and ensure that approaches to traditional health, healing and illness prevention are safe and effective (WHO, 2018; Chaudhary and Singh, 2011). Therefore, it may be said that WHO has acknowledged TM as the first system of care for human health and healing. Its renewed global interest then is poised to supplement allopathic therapy treatments, ensuring the sustainability of TM in large codified healthcare systems and smaller more localized healing traditions. A brief description of *four* TM systems follows: Ayurveda, Chinese Traditional Medicine (TCM), African Traditional Medicine and that of American Indians.

Two of the longest-standing systems of TM are Indian Ayurveda and Chinese Traditional Medicine (CTM). These major systems of TM have persisted in their respective cultures, despite the rise of allopathic medicine. The term Ayurveda conjoins life and knowledge, *ayer* meaning life and *veda* meaning science. Ayurveda practice goes back over three millenniums, with written records dating over 2000 years. Among the primary concepts of Ayurveda is universal interconnectedness, whereby the body's constitution *prakriti* and life forces *dosha* are synchronous. The Great Trilogy refers to Ayurveda's three central written texts, the Caraka Samhita, Sushruta Samhita and Astanga Hridaya, all containing healing practices with reference to herbs, diet, exercise and lifestyle guides (NIH, 2013). Through this concept of oneness with the surroundings, the practice of Ayurveda seeks to attain healing of the whole person.

Ayurveda is considered a way of life by users and not only as means of treatment according to the *Charak Samhita*, a Sanskrit text on East Indian traditional medicine. Ayurveda's primary goal is to achieve mental, physical, spiritual and social wellbeing using a holistic approach, which rewards users with the benefit of good health (Chaudhary and Singh 2011). The difference between allopathic therapy and Ayurveda is the principle of healing versus curing. Allopathic therapy is seen as offering cures, a quick fix to relieve symptoms, while Ayurveda seeks holistic healing of mind, body, spirit and community interactions.

Chinese Traditional Medicine (CTM) utilizes similar means to achieve health and healing. Like Ayurveda, CTM has existed for over 3000 years with a philosophy based on the balance of body systems. This system of stability is referred to as *yin* and *yang*, which constitute the opposites of a functioning system (Gu and Pei, 2017). In CTM, a system in balance is free of disease so that *yin* and *yang* are equally operational. When the system succumbs to pathogens, it becomes unbalanced as it suffers illness. According to Taoism, the concept of *yin* and *yang* means a return to balance and is understood to be a way of life by its users (Gu and Pei, 2017), as in India's Ayurveda. To rebalance the system then, it becomes necessary for one to engage the use of herbs, exercise (tai chi), body stimulation (acupuncture) and diet. Thus, the benefits gained by users of CTM's are similar to those of Ayurveda, in that, they sustain the whole-being.

African Traditional Medicine (ATM), though largely unwritten, is another major TM system. ATM was the only source of healthcare for the majority of the population across the African continent prior to colonialism (Abdullahi, 2011). ATM engages herbs with animism and spiritualism in its approach to health and healing. Though ATM's application varies greatly across the African continent, a central theme is common, which is the return of balance and harmony to one's system. The process of achieving harmony in the body involves local healers

acting as intermediaries to re-establish equilibrium when there is a disruption or illness in the body (Hillenbrand, 2006; Abdullahi, 2011). With the introduction of allopathic medicines coupled with political upheavals, the ATM system has been affected in many locations. However, the strength of users' belief in ATM enabled its continuity in cultural practices across much of the continent. With the global rise in use of herbal medicine, post-colonial Africa has experienced a renewed interest in the use of ATM (Abdullahi, 2011). Governments in areas throughout the continent are now working to improve and promote the integration of TM as an officially recognized part of the healthcare system like those of China and India (Abdullahi, 2011).

Similar to ATM, there are other folk medicine systems that are maintained primarily through oral traditions, which have continuously served and benefitted users as much as their more coded counterparts. The Native American Indian TM system, well known in the western world, is one that has been studied and written about by many researchers. Like Ayurveda and TCM, Native American TM is engaged for healings, ceremonies and most daily practices (Koithan & Farrell, 2010). It is therefore not farfetched to say that American Indian TM is a way of life for its users. For all these TM systems, large or small, the primary goal is the wellness of the whole system as oppose to its parts. The holistic approach to heal body, spirit and mind has undoubtedly contributed to their continued existence and growing popularity as an alternative or supplement to allopathic medicine. TM long known advantages explain the efforts of WHO to preserve and integrate its use with that of allopathic medicines.

The Caribbean Perspective

The Caribbean encompasses an area of 1.06 million square miles and consists of many islands, peoples and languages. Located between North and South America, the islands of the Caribbean have an abundance of plant life, which has served as a rich source of medicinal plants for health and healing. Efforts have been made to catalogue the medicinal properties of indigenous plants by regional institutions and large projects such as the Traditional Medicines of the Island Project (TRAMIL 2015; Picking et al., 2011).

Peoples of the Caribbean today are descendants of a diverse mix of racial and ethnic groups, which resulted in the region's great diversity of health-related cultural practices. The Afro-Caribbean people constitute the largest percentage and are descendants of the West-African slave trade. In the mid-1800s, Asians, (both Indian and Chinese) came as indentured workers after the abolition of slavery. The Europeans came as post-Columbian settlers. Amerindians compose the smallest ethnic group in the Caribbean and are considered the Native Indians of the region with presence long established (Torres-Avilez et al., 2015). These diverse groups arrived in the Caribbean with their own cultural practices and intermingled with those of the Amerindians, together producing a unique set of knowledge, skills and experiences in the use of herbal medicines.

Beginning in the 1700s, Europeans introduced allopathic medicines to the Caribbean. The diverse Caribbean populations adopted allopathic medicines, which they incorporated with TM to treat illnesses and diseases (Torres-Avilez et al., 2015). Over time the concurrent use of herbal and allopathic therapy became the means by which all these populations take care of their health. Presently, the use of herbal medicines as the sole means of self-care continues only in extremely rural parts of Caribbean islands where it is fundamental to the survival of indigenous peoples.

Poor infrastructure continues to deny these populations access to more modern healthcare systems (Victor, 2003).

Like other cultures, Caribbean peoples are engaged in the use of TM and allopathic therapy to treat acute illnesses and chronic diseases. Research conducted in multiple Caribbean islands, including Jamaica, has found that a large percentage of people are engaged in the use of TM. Further, a high proportion of users regarded the effectiveness of herbal medicine above that of allopathic therapy (Clement et al., 2015; Torres-Avilez et al., 2015). Among the many reasons cited for use of complementary TM and allopathic treatment, affordability was the most commonly seen throughout the Caribbean. Given the high rates of rural unemployment, poor access to remote communities and inadequate healthcare infrastructures (ECLAC, 2015), such findings are not surprising. With all these barriers, it follows that the poorest and most rural communities continue to rely primarily on TM for health and healing as there is no other option.

Jamaicans in the Hartford area

The Greater Hartford area of Connecticut is home to approximately 18,000 Jamaicans, about two thirds of which have West Indian migrant status (West Indian Foundation Incorporated, 2015). Jamaicans have a long history of migration to the Hartford area. Beginning in the 1940s, through arrangements between the British and American governments, Jamaican men travelled to the United States as seasonal migrant tobacco and sugar cane farmers. After Jamaica's independence from the British in 1962 and the lifting of immigration restrictions, Jamaican farmers began applying for residency in the US (Migration Policy Institute, 2010). Once they gained permanent resident status, these farmers would sponsor their family members. For other Jamaicans, unlike the farmers, they gained entry through direct application to US

Immigration Services. In terms of immigration classification, most Jamaicans now, have chosen to be dual citizens (Mejia & Canny, 2007).

According to the 2010, United States Census, most Jamaicans in Connecticut were concentrated north of Hartford and worked in a variety of industries. The census data stated that, 78% of Jamaicans are employed, with 30% working in the services industry. Median household income is \$46,000, while 16-20% live below the poverty threshold and 75-78% are enrolled in some form of health insurance. Gender breakdown showed 57% to be female and 43% male. The data further showed 22% of Jamaicans are between 45-54 years old; 64.1% are college or high school graduates; and approximately 19% utilizes public transportation (US Census Bureau, 2010; 2011; & 2012).

Jamaicans have long-standing cultural beliefs in the use of herbal medicine for treating their illnesses, chronic diseases and general health maintenance (Harris, 2011). Uses are wide ranging from treatments for gastric distress, the common cold, arthritis and other chronic diseases, to revitalizing one's energy by means of herbal tonics (Picking, Younger Mitchell & Delgado, 2011). According to one study, older Jamaican adults were found to possess stronger beliefs and were more likely to use herbal medicines to treat chronic diseases. Younger Jamaicans who were more educated and employed, were less likely to use herbal medicines (Picking, Younger Mitchell & Delgado, 2011). Hypertension, a chronic disease, is among the conditions treated with herbal medicines by Jamaicans. It was found to affect a quarter of the population of Jamaican Islanders (Ragoobirsingh et al., 2002). Presently, there is no data available on the number of Jamaicans with hypertension in the Greater Hartford area.

Hypertension

Hypertension, also known as high blood pressure, is a chronic condition developed over time and often affects an individual in adult life. It manifests with symptoms of increased pressure resulting from high blood flow, which exerts more force against the walls of the arteries. Generally, a diagnosis of hypertension is made prior to age 50 years. The physician confirms this diagnosis across two to three examinations. Between examinations, other diagnostic procedures are usually done to rule out correctable causal factors that may be temporarily impacting individual's health. Therefore, consistency of the blood pressure above a given range helps to determine the presence of or worsening hypertension. The convention on normal blood pressure, when one is at rest is a systolic measure of 120 and a diastolic of 80, referred to as "ideal blood pressure". The blood pressure is affected by a number of factors including the presence of other diseases, diet, exercise and genetics. As people age, and vascular systems become impaired, these factors intermingle to affect the blood pressure resulting in an upward trend in resting blood pressure for a large percentage of the population (NIH, 2018).

There are three marked stages for blood pressure changes: the first, referred to as pre-hypertension, becomes evident when elevated systolic pressure reads between 121 and 129. The second, is seen when systolic readings trend between 130 and 139 while diastolic pressures range between 80 and 89. The third stage is reached when systolic readings are consistently at 140 or higher, with diastolic readings of 90 or higher (NIH, 2018). Upon reaching the third stage of hypertension, an individual is assigned a treatment regimen. In treating high blood pressure, a physician will decide on a plan best suited for individual patient. This arrangement generally includes prescription medicines, as well as, recommendations to incorporate lifestyle changes; particularly those having to do with diet and exercise, feats many adults find difficult to

accomplish.

Hypertension among Jamaicans

Hypertension and its global prevalence are public health concerns due to its increased risk for other cardiac and kidney diseases. Increasingly, studies have shown that there are wide disparities among populations with high incidence rates of chronic diseases, which leads to increased prevalence, morbidities and mortality (Bidulescu et al., 2015). Among native Jamaicans, hypertension affects 25% of the population between the ages of 15 and 74 years old. Low socioeconomic status was determined to be the primary cause with poorer outcomes for those with lower or no income (Bidulescu et al., 2015). In the Caribbean, approximately half of the population, 60 years and older, were found to be hypertensive.

Prevalence of hypertension in the overall Caribbean populations was higher than those of other groups such as South Asians, Caucasians and African Blacks who originate from Cameroon (Bidulescu et al., 2015). Age was a determinant among Jamaicans showing an overall increased risk. Jamaican females were three-times more likely to develop hypertension than their male counterparts (Ragoobirsingh et al., 2002). In adults with other chronic conditions, the risk of becoming hypertensive doubled. Those with family history of the disease, have a higher tendency to develop hypertension, indicating a genetic component (Ragoobirsingh et al., 2002). The global prevalence of high blood pressure and mounting evidence of its association with socioeconomic status has justified the need for widespread interventions. In 2011, WHO summoned a Global Conference on Social Determinants of Health requiring that a political commitment be made to implement measures to address social issues related to health inequalities (Bidulescu et al., 2015). With the burden of many chronic diseases falling

disproportionally on those with low socioeconomic status, there is an economic push for people to find alternative methods of treatment outside the allopathic healthcare system.

Jamaicans' access to herbal products

Jamaicans in Hartford utilize several sources to obtain the herbal products they need. For some, trips to Jamaica, as well as trips of family and friends, are integral to acquiring stocks of dried herbs. Local herbal stores also offer a wide variety of dried herbs, along with recommendations and information on methods of use. Caribbean ethnic stores, particularly Hispanic bodegas and East Indian grocery stores, stock imported dried herbs. Other sources are high-end local markets that stock herbal medicinal products for purchase. And lastly, online sales, which provide the most extensive variety of herbal medicinal products is another major source that likely will expand as the global trend in herbal use continues to rise.

Prescription medication

The terms “conventional medicines”, “biomedicines” and “allopathic medicines”, all describe modern medicinal therapy. These medicinal products are manufactured by worldwide pharmaceutical industries and are supported by empirical research. They are available in two categories: prescription and non-prescription. Practitioners for treatment of symptoms and diseases recommend both groups of medications. Non-prescriptions, however, are also available as over-the-counter medicines. Prescribed medicines on the other hand, carry increased potency, thus, a licensed physician is involved in the distribution as required by law. Jamaicans with hypertension are prescribed a variety of these biomedicines belonging to different classes,

including *Beta-blockers (BB)*, *Calcium channel blockers (CCB)*, *Angiotensin-converting enzyme inhibitors (ACE inhibitors)*, *Angiotensin II receptor blockers (ARBs)*, *Renin inhibitors*, and *Diuretics* (Mayo Foundation, 2018). Commonly prescribed conventional therapies are themselves combined to produce best results. For example, *metoprolol*, a *beta-blocker*, may be combined with a *diuretic*, *hydrochlorothiazide (HCTZ)*, for treatment of hypertension. In these instances, the diuretics serve as adjunct or secondary medications that work with primary ones to reduce high blood pressure.

The cost of individual allopathic medications for hypertension can range from \$600 to \$1000 annually (Davis, 2013). Even with insurance coverage, out-of-pocket costs may range from 10% - 50% of the total price. The cost to patients can vary significantly based on the different classes of drugs. Presently, monthly cost trends for common hypertension medication are as follows: *beta-blockers*, \$4-\$168, *calcium channel blockers (CCB)*, \$20 - \$200, *angiotensin-converting enzyme inhibitors (ACE inhibitors)*, \$10 - \$100 and *angiotensin II receptor blockers (ARBs)*, \$30-\$60. Among diuretics, *thiazides* ranged from \$8-\$312, *loop diuretics* were \$7-\$235; and *potassium sparing* \$14-\$21 (Costhelperhealth.com, 2018). A practitioner may recommend a combination of hypertension medications multiple times daily depending on the intensity of the patient's hypertensive condition.

The primary classes of medications used to treat hypertension have different physiological effects on the body. These medications work in complex ways to relax blood vessels resulting in lowered blood pressure. For example, a diuretic mechanism of action works to effectively remove excess fluid from the body to reduce the blood pressure. These medications and their functions to reduce high blood pressure, frequently trigger side effects for patients. The most common of these are dizziness, light-headedness, dry mouth, frequent urination, fatigue,

drowsiness, erectile dysfunction, coughs and headaches (NIH, Medline Plus, 2018). Patients are generally encouraged to report these symptoms to practitioners, who work with individuals to reduce or eliminate these side effects.

Over-the-counter medication (OTC)

According to the Federal Drug Administration (FDA), over-the-counter (OTC) medications are those, which do not require prescription for use (FDA, 2018). Referred to as ‘first aids’, they are safe and effective when used according to the guidelines. OTC medications are widely marketed and consume on a global scale. These non-prescription medicines are easy to purchase and are recognized as first line alternatives to herbal products to treat minor illnesses. Assumedly, cultures around the world use OTCs as first aids and Jamaicans are no exception. Therefore, once immersed into a Westernized lifestyle in the United States, it is likely that most migrant Jamaicans would replace herbal products with OTC as first line treatment for minor illnesses. With OTCs availability, ease of access, and low cost, Jamaicans, like most other cultural groups, use these medicines to self-medicate for multiple reasons among them pain relief, minor respiratory illnesses, digestive discomfort, cuts, bruises, sleep aid and seasonal allergy conditions. OTCs as a category of medications are not used in the treatment of hypertension.

Justifications for the use of over-the-counter medicines are primarily to save time and cost. The United States healthcare system saves approximately \$102 billion annually because of the use of OTC to self-medicate (Consumer Healthcare Products Association, 2018). A variety of retail outlets, provides OTC medication products for sale. OTC medications are divided into multiple categories including antibiotic creams, analgesics, anti-diarrheal, eye and eardrops,

laxatives and sleep aids. There are also those medications use to relieve symptoms of allergies, the common cold, influenza, congestions, coughs, among others. Like prescription medications OTCs are prone to causing side effects such as nausea, dizziness, gastrointestinal distress and allergic reactions, among other issues. However, OTC medications packaging, which are available for direct sales to the public, include instructions on how to manage these side effects.

Aims of this thesis

The research presented in this thesis aims to examine the extent of concomitant use of herbal and prescription medicines for hypertension by Jamaicans in the Greater Hartford area. The use of OTC also factors significantly as it adds to the complexity seen with intermingling use of multiple drugs for self-care, lending credence to the need for intervention. It is of great importance that public health and clinical practitioners become more aware of the use of TM and OTC among various groups and build that knowledge into community and clinical services. Such information may play a significant role in helping to guide patients' behavior as they navigate the use of multiple medicinal products.

Chapter II - Methods

A mixed method approach was utilized to collect data from multiple perspectives. The first step was to convene focus groups to get a general orientation to the use of alternative medicines in the Jamaican community. In-depth interviews focused on the individual use and rationale for alternative medicines. Inventory listing was utilized to compile the different medicine types. In addition, a questionnaire was used to quantify use of herbal medicines within the Jamaican community.

Inclusion criteria

The following five inclusion criteria were utilized to select samples for participation in the in-depth interview and the questionnaire. To complete the questionnaire people needed to be: born in Jamaica; an immigrant > 5 years; age > 40 years; diagnosed with hypertension and using prescribed medications. Participants who met the criteria were included. The questionnaire consisted of 25 questions with sections allotted to gather the following information: demographics, health status and use of conventional medications, herbal use, migration and travel patterns, PCP's interactions, and respondents' beliefs. The intent of the focus groups was to produce different sources of information for the project so focus group participants did not have to meet all of the criteria. However, four participants from the focus groups later completed questionnaire. There was no overlap of sampling between the interviews and the questionnaire.

Focus groups

A focus group consists of people with a variety of backgrounds, convened to engage in a

guided discussion about a particular topic of interest with the intent to collect new information on a topic or receive feedback on a set of ideas, products or interventions (PHAST, 2017). Two focus groups were held to enable discussions and exploration of healing approaches in the Hartford area Jamaican communities. Women waiting for services in beauty shops were informed of the research and asked to participate. Commitments were mostly given on spot with the exception of two individuals who decided later. Most attendees lived within close proximity of the shop. This selection of sampling was used exclusively for the focus group meetings.

The first meeting was held in March 2017 and was attended by five of the seven people who had initially committed. All were 40 - 50 years of age. Four participants were women. Three were healthcare workers and one a beautician. One male businessperson also participated. The second meeting was held in May 2017, with the group consisted of six individuals: two males both in their fifties and four females, ages 44 – 56 years. All attendees from the initial meeting attended. One male, a delivery driver, was the new attendee. All attendants use herbal medicines with one exception; all are employed and have insurance; however, these were not requirements for participation in the focus group meetings.

Each focus group discussion lasted seventy minutes. The first meeting's topic was, "Use of Herbal Medicines Among Jamaicans." The discussion focused on awareness of herbal use in the community and locating contacts that would yield the most materials for the research. The second group discussions focused on "Local Access to Herbal Products." The researcher facilitated the meetings, which were held on Thursdays, the most convenient day for everyone. The following theme ideas were posed: knowledge of herbal medicine used in communities; knowledge of contacts for primary source of information; knowledge of types of herbal products available locally; knowledge of the most frequent types of herbal use. Attendees provided their

input, which was generally based on personal experiences. Tangential topics were minimized, notes were taken during sessions and revisited to ascertain benefits captured. Both meetings produced positive outcomes.

In-depth interviews

In depth interview is a qualitative research method in which the researcher interviews a small number of people to gather information on a specific topic (PHAST, 2017). Fifteen in depth interviews were completed: seven males and eight females. Selection of interviewees was based on four of the independent variables; age, length of time in the United States, socioeconomic status, and number of visits to Jamaica within a five-year period. About 50% of the interviewees were recommended by key informant, 30% were encountered at the beautician shop and the remaining portion at social gatherings. Having obtained informed consent, interviews generally started with personal and work information then transitioned to other issues such as, hypertension diagnosis processes, use and effectiveness of medications, and time since migrating to the United States. Participants also shared perspectives on living in the United States, and use of herbal medicines for self-care. Questions were structured around themes for a wide exploration of ideas and included diagnosis of hypertension; use of prescription medicines; use of herbal medicines; beliefs held about herbal medicines including its natural qualities and effectiveness, and lastly, discussions with PCP on herbal use.

Inventory of medicine types

Inventory of medicine types is a technique employed to list items of different drugs for this project. In this process, listing was used to systematically construct the most commonly used

medicines from all three types, over-the-counter (OTC), herbal and prescription medicines. This information was gathered from community pharmacies, herbal shops, other local retail outlets for both over the counter and herbal products. Google was used to identify some of the uses.

Google was also used to do multiple searches for lists of frequently prescribed medicines for the treatment of high blood pressure. The search identified different classes of medications including, *diuretics, beta-blockers, calcium channel blockers, angiotensin converting enzyme inhibitors (ACE Inhibitors), and angiotensin II receptor blockers (ARB)*. *Diuretics* classes included *loop, thiazides* and *potassium sparing*.

Local herbal and ethnic stores were visited, and listings were taken of products available for sale. Conversations with the attendant herbalists at Lim's herbal store in one Jamaican community produced an organized list of herbal products that are generally stock for sale. In addition, Google was used to search for listings of Jamaican herbal medicinal plants, commonly used for hypertension and general care.

Questionnaire

A questionnaire was used to quantify peoples' use of the three classes of medications. The questionnaire was administered in different locations to a purposive sample of individuals in churches and beautician shops. Information gathered included demographics, diagnosis of hypertension, herbal and conventional medicine use, times and frequency of use, travel patterns and sources. One hundred and ten (110) Jamaicans were selected with target sample of 100 using purposive sampling to capture homogeneity. In order to meet this target sample one hundred and ten (110) questionnaires were distributed.

The first set of questions asked for data related to the independent variables and were

demographic in nature: age, education, gender, insurance, income and employment. The second set of questions asked for mixed data including diagnosis and knowledge of hypertension and PCP interactions. Respondents were asked about, the number of years migrated; residence of immediate family members; primary care physicians (PCP); whether the participant was diagnosed with hypertension by a doctor; discussions on hypertension; and annual visits made to PCP.

The third set of questions also collected a mix data: consumption of herbal teas and tonics within the last year before and after medications; whether respondents discussed use of herbal medicines with PCP; and if PCP provided advice regarding herbal use. Additional questions asked about the number of visits to Jamaica within the last 5 years; whether respondents returned from Jamaica with dried herbs; if they asked family/friends to bring dried herbs on their return trips; and whether respondents used over the counter medications (OTC).

For use of herbs, the dependent variables, respondents were provided tables with listings of each type of medicine:

- ***Prescription medicines*** - respondents were asked to indicate by yes/no; purpose of use was not required as respondents met the criterion of having hypertension diagnosis. For frequency of use, respondents were to indicate by 'fill in'; effect by yes/no and source by 'fill in.'
- ***Over-the-counter medicines (OTCs)*** - respondents were asked to indicate use by yes/no; purpose for use by 'fill in'; frequency of use by 'fill in'; effectiveness by yes/no; and source by 'fill in.'
- ***Herbal medicinal plants*** - respondents were asked to indicate use by yes/no; purpose for use by 'fill in'; frequency by 'fill in'; effectiveness by 'fill in'; and source by 'fill in.'

The two final questions asked respondents to indicate benefits of herbal and prescription medicines and to state reasons for not using herbal medicines, if applicable.

Statistical analysis

SPSS (25) was used to analyze the data. Descriptive statistics are used to show measures of frequent and central tendency as well as variation of the data. To explore the relationships between the different medicinal therapies, ANOVA was used to examine means; bivariate correlation (Pearson's r), was utilized to look at correlates; and Chi-Square to analyze the relations between categorical variables. A p value of $< .05$ was assumed statistical significance.

Chapter III - Results

Focus groups: The meetings provided information on key informants relating to sources of contacts for participation as well as sources of herbs. Themes were generated and provided the background for the in-depth interviews. Insights were gained on formulating particular questions for the survey especially those related to salary and age.

In-depth interviews: The interviews provided a glimpse into understanding why this population continues to use herbal medicines. Findings under the *five themes* from the interviews are presented below. Respondents' beliefs from the interviews are included in *Table 1*. Quotes from respondents are italicized.

Hypertension diagnosis

Different observations were made regarding timing of diagnoses. As expected norms were seen, whereby, participants who made annual visits to their PCPs were more likely to be diagnosed within a one-year time frame. Some participants did not make annual visits but showed up randomly to a doctor's office or a clinic setting when he/she is faced with a crisis. Plights may include onset of symptoms that were not formerly present such as headaches and dizziness among other issues. Since hypertension occurs in stages timely diagnosis is essential and enables the start of a medication regimen. The resulting benefit was better control of blood pressure for these respondents, provided other adherences are followed, as compared to those with later diagnoses. Clearly, two categories emerged from those diagnosed with hypertension, those who had PCPs and made annual visits and those without PCPs, who made

crisis visits to offices and community clinics.

Hypertension was better controlled in participants who had PCPs and made annual visits to see those PCPs. Respondents without PCPs as well as those with PCPs who did not make annual visits, obviously had more challenges in finding out their health status. For the respondents without PCPs, comorbidity and side effects from other medications were usually more difficult to handle. For instance, a headache could be a side effect of a medication or symptom of other conditions such as undiagnosed hypertension. For some respondents it was difficult to attribute the symptom of a headache to hypertension as opposed to side effects from medications or other possible conditions such as stress. Such lack of understanding led to individuals' delay in seeing a doctor. A *truck driver*, who initially had no PCP and was symptomatic for headache, related how he was diagnosed with high blood pressure.

Truck driver:

“It seems like I had the problem but I didn’t realize. I kept having these headaches for several weeks but was always thinking it was something else. Because at the time I had a lot going on and I was stressed out. I finally decided to go and see the doctor and that is when the doctor told me I have high blood pressure. I am glad I found out before anything worse happened. I know that living here in America I can get better care for my blood pressure, so I am not complaining.”

Prescription medication use

Of the six commonly prescribed classes of hypertensive medications, respondents most frequently used those from the class of *beta-blocker*, with *metoprolol* and *atenolol* the most often seen. *Calcium channel blockers* were also commonly used – among them *diltiazem*, and *amlodipine*. Other classes seen were *ACE inhibitors* and *Angiotensin II receptor blockers*, *lisinopril* and *losartan*, respectively. The class of *diuretics* included *furosemide*, *hydrochlorothiazide* and *chlorothiazide*. Some respondents described their experiences regarding

side effects, such as, dizziness, dry mouth and occasional coughs. Respondents talked of repeated visits to the bathroom due to the use of diuretics; however, they appeared accepting of this new reality after receiving a hypertension diagnosis. Others mentioned the uncomfortable feelings of dry mouth and their decisions to take bottled water on trips to run errands, while being acutely aware of the circle of events created.

Respondents also revealed how they discussed the problems of side effects with PCPs and the different responses they received. One respondent stated that her PCP said the problems would go away eventually. Others related how PCPs' answers only served the purpose of exchanging one problem for another. For example, in cases where they were having both dry mouth and making frequent bathroom visits, PCPs' recommendations were for respondents to drink more fluids to relieve their dry mouth. However, this also resulted in frequent bathroom visits. Two nurse's assistants related their experiences.

Nurse assistant 1:

"I take amlodipine once per day and metoprolol twice per day. The only thing that bothers me is sometimes I get a little dizzy. I told the doctor he said it will go away."

Nursing assistant 2:

"I use atenolol two times per day and chlorothiazide one time daily." I feel sometimes like I live in the bathroom. And I get very thirsty at times. I guess I have to live with it. It is my new life."

Use and sources of herbs

Some participants talked about use of herbal products such as *garlic* and *noni* to help manage high blood pressure. Use of *garlic* was frequent, especially for cooking, occasionally as teas but also respondents strongly believed its use helped to reduce high blood pressure. *Noni*, a native herb of Polynesia, which is also found Jamaica, is most often use for treating high blood

pressure among respondents. However, some users claimed that noni herb has effect on multiple chronic problems. There were some respondents who swore by the benefits gained in relief from arthritic pain. In the case of diabetes, respondents who used noni also claimed that they generally felt better and their *blood glucose* and *glycohemoglobin (HbA1c)* numbers improved with use. For treating hypertension, other herbs mentioned were *green and black teas*, *cerasse*, *turmeric* and *guaco* bush. These herbs were often consumed in the form of teas, daily or multiple times per week. Respondents in these interviews, generally believed these herbs worked to lower their high blood pressure. In regard to sources of dried herbs, some were purchased locally from community shops or brought back from Jamaica during visits. Two respondents, a construction laborer and a live-in household worker, who both lived in the US for more than 16 years, shared their stories.

Construction worker:

“I use herbal medicines sometimes for my blood pressure because I don’t know if the medicine is working. Sometimes everything is fine another time nothing seems to work. A friend told me about a bush, noni, that he used to help his blood pressure. So, I tried it and it worked. I used it for other things, like stomachache, and it helped. I grew up using all different kinds of herbs because I lived with my grandmother and not my parents. So basically, I have been using herbs all my life.”

Live-in household worker:

“I visit Jamaica two times per year and my grandmother always have what I need dried and ready for me to take back to America. I can also get herbs to buy at the Caribbean stores. More herbs are selling now than before. When I came to the United States fifteen years ago I could hardly find peppermint for tea. Now herbs are coming from different parts of the globe. I heard that more people are using herbs again. I know that would happen. We are going back to where we started – herbs”

PCP interactions – annual visits and herbal discussion

About 50% of respondents from the in-depth interview sample, made purposeful attempts to see practitioners for yearly follow-ups. Of the other half, some made visits, which were not annual, for other reasons while others made none. About 30% of all respondents had multiple visits per year for other illnesses, including those having problems with side effects from high blood pressure medications or the occurrence of acute conditions. Some related the difficulty in taking time off from work to make the visit. Others talked about setting up appointments and missing them. One respondent had not made a visit to the doctor for approximately three years prior to being diagnosed with hypertension. A common reason given for not seeing the doctor, was being “too busy.”

About 75%, of respondents, said they did not have discussions with their PCPs about the use of herbal medicines. Older respondents taking multiple medications appeared more open to having discussions with their PCPs about herbal use. Two older adults disclosed how they were prompted by families, who worked in healthcare offices, to disclose their use of herbs to their PCPs. In general, respondents’ thoughts were that practitioners would disagree with their choices to use herbal medicines. A female restaurant worker gave her views on the subject of herbal use.

Waitress:

“Herbal use is not something I would talk to my doctor about. I definitely know he would disapprove.”

Beliefs about herbal medicines: In-depth interview

There was the general belief that herbal teas were harmless, versatile, and may be used to treat any illness or disease. In addition, another common belief was that prescription medications, on its own, were not enough to treat high blood pressure. Therefore, they belief the use of herbal medicines was necessary, as they helped to provide adequate relief for

hypertension. Many respondents emphasized minimal side effects from use of herbal medicines. The importance of the absence of side effects, meant for example, that someone could have a cup of tea without worrying about side effects while at work or running errands. At the same time, some teas were seen as causing some unpleasant effects such as urinary frequency. However, respondents seemed resigned to these unwanted outcomes indicating that these side effects from teas were “natural.” A retired businessperson related how he felt about use of herbal medicines.

Businessperson:

“Herb is all natural; it is the best thing for you, not just you and I but everyone. We all should be using it. I myself find them very effective even working better than the medicines sometimes.”

Frequency of beliefs

Consistent with respondents’ beliefs from in-depth interviews, **Table 1**, shows reported benefits of herbal medicines revealed through the questionnaire. Respondents were asked to indicate by free text their thoughts on the benefits of herbal medicines. The responses were summarized into four groups and presented in **Table 1**.

Table 1		
Benefits of herbal medicines		
Herbal medicine benefits	Respondents' groups of thoughts	Number (%)
Benefits of herbal medicines	Herbal medicine has less side effects	54 (54.6)
	It is natural and better for your body	28 (28.3)
	Cost less than prescription medicines	9 (9.1)
	Less difficulty to obtain	6 (6.1)

Quantitative Results

Of the 99 Jamaican migrants who responded, 92.9% (92) reported use of herbal products, 95.9% OTCs and 96.9% were taking prescription medicines for hypertension. Overall, 95.2% were engaged in the use of complementary therapy. Herbal medicine uses among respondents were not limited to treating blood pressure. Herbs were also widely used for general care including treatments for acute illnesses.

Socio-demographic characteristics

Table 2 shows the general socio-demographic characteristics of respondents.

Table 2			
Demographics			
Characteristics of Respondents	Male 44 (44.4)	Female 55 (55.6)	Total 99 (100)
Age group (in years):			
40 – 50	12 (12.1)	21 (21.2)	33 (33.3)
51 – 60	19 (19.2)	22 (22.2)	41 (41.4)
61- 90	13 (13.1)	12 (12.1)	25 (25.3)
Education (in years):			
9 - 13	33 (33.3)	32 (32.3)	65 (65.7)
14 - 19	11(11.1)	23 (23.2)	34 (34.3)
Employ:			
Yes	35 (35.3)	48 (48.5)	83 (83.8)
No	9 (9.1)	7 (7.1)	16 (16.2)
Estimated household income:			
25000 – 50000	13 (13.1)	26 (26.3)	39 (39.4)
50000 – 75000	23 (23.2)	25 (25.3)	48 (48.5)
75000+	8 (8.1)	4 (4.0)	12 (12.1)
Health insurance:			
Private	36 (36.4)	44 (44.4)	80 (80.8)
Government -sponsored	8 (8.1)	11 (11.1)	19 (19.2)
Primary care physician:			
Yes	35 (35.4)	52 (52.5)	87 (87.9)
No	9 (9.1)	3 (3.0)	12 (12.1)
Years migrated:			
6 – 10	1 (1.0)	3 (3.0)	4 (4.0)
10 – 20	18 (18.2)	20 (20.2)	38 (38.4)
20 -30	10 (10.1)	20 (20.2)	30 (30.3)
30 +	15 (15.1)	12 (12.1)	27 (27.2)
Residence of family members:			
Jamaica	6 (6.1)	2 (2.0)	8 (8.1)
United States	4 (4.0)	5 (5.1)	9 (9.1)
Both places (Ja. & US)	34 (34.3)	48 (48.5)	82 (82.8)
Number of visits to Jamaica in last 5 years:			
0 -1	25 (25.3)	23 (23.2)	48 (48.5)
2 -4	19 (19.2)	26 (26.3)	45 (45.5)
5+	-	6 (6.1)	6 (6.1)

The socioeconomic status of respondents generally matches that of the 2010 US Census

description of the Jamaican community in the Greater Hartford area, with the exception being a greater mean salary among respondents. In addition, other responses, (e.g., the number of years since one has migrated, residence of family members and the number of visits to Jamaica made by respondents within the last five years) are also outlined in this table. Mean salary was \$56,500 with no significant difference between male and female incomes.

Since respondents were born and generally educated in Jamaica, a brief insight into the operations of the education system on the island may provide a clearer understanding of respondents' years of education. In Jamaica, post primary education splits into two different streams a parochial system that serves rural communities and a regular secondary system comparable to that of the US. Someone who completes the parochial stream, which runs from 7th to 9th grade may go on to complete another three years, after which they would be fully vested with a kindergarten thru twelfth grade education. However, for economic reasons, many forego that end, and they have less than a 10th grade level of education. However, less than 2% of respondents are in this category. A similar percentage had income below \$25,000 because of unemployment or menial ways of earning. Of the unemployed respondents, 13 were retired and three were actively seeking employment. Approximately 10% of respondents had not made a trip to Jamaica in the last five or more years.

The herbal pharmacopeia

Table 3, depicts 29 of the 75 medicinal plants provided in tables for the questionnaire.

Table 3

Commonly used herbs for general health

Common Names	Scientific Names	Parts Used	Methods of Use	Conditions
Aloe vera	Aloe Barbadenis	Leaves	Decoction	Digestive problems, body cleansing, constipation
Basil	Ocimum basilicum	Leaves	Tea, culinary	Eye health, anti-aging, stress, arthritis
Black sage	Salvia merifera	Leaves	Culinary	Indigestion, diarrhea, gastritis, heart burn
Black tea	Camellia senensis	Leaves	Tea,	Blood pressure, weight loss, cholesterol,
Boswellia	Boswellia serata	Resin	Tea	Anti-inflammatory, analgesic
Burdock Root	Articum	Root	Tea	Diabetes, diuretic, anti-inflammatory, blood purification, detox
Castor oil plant	Ricinus communis	Oil, Resin	Oil	Body care (hair), body cleansing, constipation
Catnip	Nepeta cataria	Leaves	Tea	Treat skin conditions, repellent, hair care, fever, cramps, diuretic
Cerasse (bitter melon)	Mormordica charantia	Leaves, Stems, Gourd	Tea Culinary	Diabetes, blood pressure, body cleansing, gastric pain, constipation, induce abortion
Chamomile	Matricaria Chamomilla	Leaves	Tea	Insomnia, immune system, colds, stomach ache
Chaney root	Smilax Balbisiana	Root, Bark	Concoction	Tonic, aphrodisiac, combat fatigue
Cinnamon	Cinnamomum Verum	Bark, Leaves, Oil	Tea Powder	Spice, aromatic, blood pressure, diabetes, diarrhea
Comfrey	Symphytum	Leaves	Tea	Bronchitis, respiratory problems, menstrual cramps, diarrhea, chronic cough
Echinacea	Echinacea purpura	Leaves, Stems	Tea	Boost immune system, pain laxative

Table 3				
Commonly used herbs for general health				
Common Names	Scientific Names	Parts Used	Methods of Use	Conditions
Eyebright	<i>Euphrasia officinalis</i>	Leaves and Stems	Tea	Hay fever, colds, sinus, coughs, eye inflammation, allergies
Fever grass (lemon grass)	<i>Cymbopogon citratus</i>	Leaves Stems Oil	Tea	Fever, cholesterol, heart rate, blood pressure, insomnia, nerves, diarrhea, acne
Flaxseed (linseed)	<i>Linum usitatissimum</i>	Seeds	Supplement (pills), oil	Circulatory benefits, skin care, blood pressure
Guinea hen weed	<i>Petiveria allicea</i>	Leaves, stems, root	Tea	Diabetes, digestive problems; arthritis, pain relief
Ginger	<i>Zingiber officinale</i>	Rhizome	Tea, Culinary, Spice, Powder	Nausea, blood pressure, anti-inflammatory, bloating, digestion
Jack-in-the-bush (bitter bush)	<i>Chromolaena odorata</i>	Leaves Stems	Tea	Colds, bronchitis, flu, asthma, sinusitis
Kola nut (bizzy)	<i>Kola acuminata</i>	Roots	Tea	Food poisoning, stimulate circulation
Marigold	<i>Callendula offinalis</i>	Leaves Flowers	Teas, Extracts, Oil, Culinary	Sinus, respiratory, eye health, rashes, dermatitis, fungal infection, colds, fever
Mint	<i>Mentha</i>	Leaves Stems	Tea, Culinary, Oil	Colds, indigestion, bloating, nausea, flatulence,
Pimento (allspice)	<i>Pimenta dioica</i>	Seeds, Leaves	Culinary	Stimulant, analgesic, antiseptic, flu, colds, diabetes
Rosemary	<i>Rosmarinus officinalis</i>	Leaves	Tea, Oil, Culinary	Head lice, stimulant, flatulence, gout
Semi-contract	<i>Camellia sinensis</i>	Leaves, Stems	Tea	Respiratory illnesses, cholesterol, immune system,

Table 3				
Commonly used herbs for general health				
Common Names	Scientific Names	Parts Used	Methods of Use	Conditions
Senna pods (cassia)	Cassia acutifolia delile	Leaves Pods	Tea	Constipation
Turmeric	Curcuma longa	Rhizomes	Tea, Culinary	Anti-inflammatory, immune system, circulatory system, blood thinning, anti-aging
Worm wood (mugwort)	Artemisia vulgaris	Leaves, Roots	Tea	Anti-fungal, indigestion, parasites, poor appetite, travel sickness, cramps, insomnia
Sources: (1) TRAMIL Project (2018); (2) MedicinalHerb4U.com; Google, 2018				

Table 3 is intended only to provide information on herb uses and nomenclatures, both local as known by respondents and as scientifically assigned. Also included are parts of the herb often used, common methods of use and the health condition for which they are generally used. These herbs are commonly used among respondents to treat chronic diseases, including hypertension, as well as, for acute illnesses and general care. Other chronic diseases, aside from hypertension, for which herbs may be utilized, are diabetes and arthritis. Acute illnesses may include respiratory and gastrointestinal conditions. General care for herb use includes cooking, to relief common ill feelings such as nausea, gastric discomfort, insomnia among other conditions. Herbs were most frequently consumed in the form of teas to provide intended benefits. There were those commonly used herbs such as *garlic*, *turmeric*, *ginger*, *cinnamon* and *cerasse (bitter melon)*, which were used for multiple conditions. See **Table 4** for a list of herbs used by respondents to treat hypertension.

For cooking purposes, *garlic* was indicated by 73.7% of respondents with 35.4% using it daily as compared with *thyme* with 74.7%, *cinnamon* 62.6%, *turmeric* 52.5%, and *pimento* (allspice) 51.5%. These culinary herbs were largely purchased at local stores. Among teas in general, *mint* was the most frequently indicated at 64.6% with daily use of 24.2% as compared with *black tea* at 60.6% with a daily use of 42.4%; and *lemon grass* (fever grass) at 51.5% being used on a weekly basis with 42.4% of respondents reportedly brought it on return trips from Jamaica.

Respondents, who used herbal medicines for acute respiratory illnesses indicated, *echinacea* 39.4%, as most often used to care for these conditions as compared to *jack-in-the-bush* at 34.3%, *comfrey* 34.3%, *marigold* 29.3%, and *guinea hen weed* 29.3%. For ‘general care as in colon cleansing, “wash out”, *senna pods* was most often indicated at 32.3% as compared to sleep aid like *chamomile* at 19.2%.

Herbal medicinal tonics, frequently used were *strong back* with *chaney root* (combination use) 22.3%, as compared with *ginseng* 20.2% and *medina* 18.2%. Other frequently used herbal plants were, *sorrel*- a hibiscus plant used to make a drink, bearing its name. This drink is most often consumed at Christmas time and was reportedly used by 75.8% of respondents with 50.5% indicating only annual use and 42.4% brought it as dried herb from Jamaica. *Cerasse* (bitter melon) was selected by 62.6%, with 40.4% weekly use, and 36.4% of all respondents brought it from Jamaica, as compared with *ginger* at 63.6% with weekly use of 38.4% and all respondents reported it as a local purchase. Of those making visits to Jamaica, 82% brought dried herbs on their return trips as compared to 38.4% of family and friends who were asked to do so.

Herbal preparations for hypertension

Table 4 intends to show the most commonly used herbs for the treatment of hypertension among respondents. As in **Table 3**, herbs are shown with common as well as scientific names and methods by which they are most often consumed by respondents. The *frequency* with which herbs were selected for use is also highlighted.

The number of herbal products used among respondents for treating high blood pressure ranged from 2 to 17. Daily use of herbs for treating hypertension, were reported by 30.3% of respondents as compared with 48.5% weekly use and 19.2% monthly. *Broom weed, cerasse, noni, lemon grass, guaco bush, lavender flower, leaf-of-life, moringa, periwinkle, soursop leaves* and *sorrel* were most frequently sourced from Jamaica as compared with *catnip, garlic, cinnamon, flaxseed, ginger, dandelion and turmeric* that were reported as local purchases.

Table 4			
Herbal medicines used to treat hypertension by <i>frequency</i> (n = 99)			
Common Names	Scientific Names	Frequency	Common Methods of Use
Broom weed	Gutierrezia sarothrae	18 (18.2)	Tea
Catnip	Nepeta cataria	28 (28.3)	Tea
Cerasse	(Mormordica charantia)	32 (32.3)	Tea
Garlic	Allium Sativum	30 (30.3)	Tea
Noni	Morinda Citrifolia L.	30 (30.3)	Concoction
Cinnamon	Cinnamomum verum	19 (19.2)	Tea Powder
Fever grass	Cimbopogon citratus	15 (15.2)	Tea

Table 4			
Herbal medicines used to treat hypertension by <i>frequency</i> (n = 99)			
Common Names	Scientific Names	Frequency	Common Methods of Use
(Lemon grass)			
Flaxseed	Linum usitatissimum	28 (28.3)	Supplement (pills), seeds, oil
Ginger	Zinger officinale	15 (15.2)	Tea
Guaco bush	Guaco Mikania	19 (19.2)	Tea
Dandelion	Taraxacum	17 (17.2)	Tea
Lavender Flower	Lavendula	18 (18.2)	Tea
Leaf-of-life	Kalanchoe pinnata	29 (29.3)	Tea
Moringa	Moringa oleifera	18 (18.2)	Tea Concoction
Periwinkle	Catharanthus roseus	24 (24.2)	Tea
Sorrel	Rumex acetosa	22 (22.2)	Tea
Sour-sop Leaves	Annona muricata	23 (23.2)	Tea
Turmeric	Curcuma longa	18 (18.2)	Tea
Sources: (1) TRAMIL Project, 2018; (2) MedicinalHerb4U.com; Google, 2018.			

A majority of respondents reported a positive effect resulting from use of herbal products for treating hypertension. As the worldwide trend in use of herbal products grows, community shops appear to be responding in kind. Recent visits to number of local retail outlets showed products for sale that were once considered exotic, such as: *sorrel*, *turmeric*, *cerasse*, *lemon*

grass, guaco bush, soursop leaves and noni, which are presently packaged and sold as teas.

Use of prescription medications

Primary hypertension medications are those that may be prescribed for treating high blood pressure without the assistance of diuretic adjuncts. Primary medications may be prescribed in combinations with others or with diuretics. Diuretics are regarded as adjuncts meant to work with primary medications to provide a more comprehensive relief for hypertension. A medication prescription generally includes, *dose* – quantity of the medication to be taken; *frequency* - how often the medication should be taken; *route* – means of taking the medication, for example orally; and *time* – how often the medication should be used. Among respondents, some were taking one tablet per day while others took multiple tablets from the different classes of medications including diuretics. **Table 5**, carries a listing of all prescription medications by class. Investigation into patterns of prescription showed, *amlodipine, a calcium channel blocker*, was the most frequently prescribed, 20.2% (20) of the time as compared to *metoprolol, a beta-blocker* 18.2% (18) and *diltiazem, a calcium channel blocker* 17.2% (17). All prescription medications described were used within the previous year.

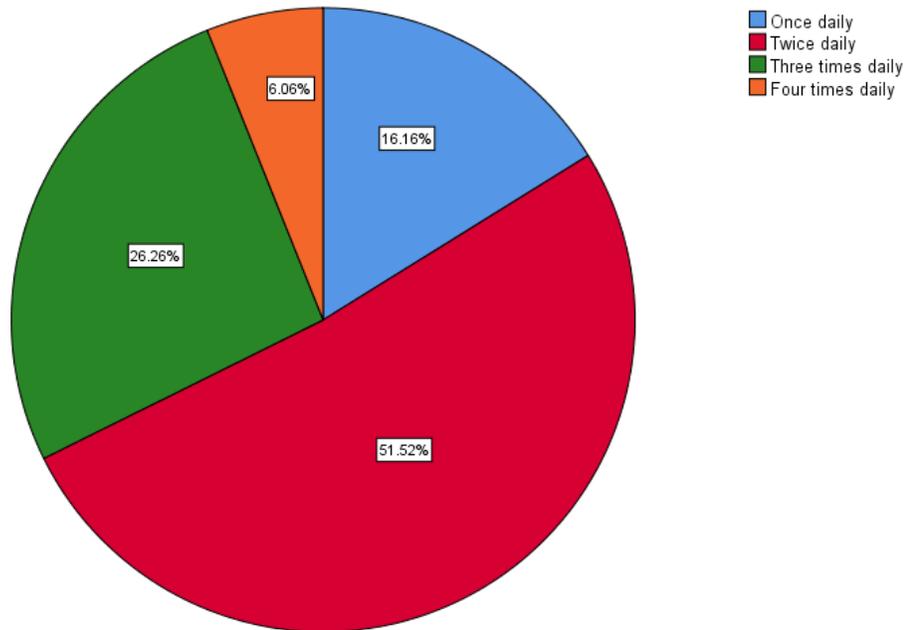
Table5		
Commonly prescribed medications for hypertension		
Medications	Class	Frequency by class
Metoprolol, Atenolol, Sotalol Propranolol, Nadolol, Timolol Carvedilol (Coreg), Labetalol Doxazosin, Prazosin, Terazosin	Beta and Alpha Blockers (BB & AB)	77 (77.8)
Captopril, Enalapril, Lisinopril Quinapril, Ramipril, Benazepril Fosinopril	Angiotensin Converting Enzyme Inhibitors (ACE Inhibitors)	52 (52.6)
Bumetanide, Furosemide, Torsemide, Hydrochlorothiazide Metolazone, Spironolactone, Chlorothiazide	Diuretics – loop, thiazide, thiazide-like and potassium sparing	50 (50.5)
Amlodipine, Nifedipine, Diltiazem, Verapamil, Felodipine, Nicardipine	Calcium Channel Blockers (CCB)	44 (44.3)
Candesartan, Irbesartan, Losartan, Olmesartan, Valsartan	Angiotensin II Receptor Antagonists (ARBs)	23 (23.3)
Clonidine, Guanabenz, Methyldopa, Guanfacine	Alpha 2 Adrenergic Receptor Antagonist	9 (9.1)

Daily medication use

To treat hypertension effectively, medications are prescribed for daily use according to a patient's needs. A practitioner may decide to distribute frequency of medication doses throughout the day or week, again depending on a patient's needs. For patients, who are already engaged in procedures affecting their body fluids (i.e., dialysis), sometimes hypertension medications are distributed over a one-week period. The underlying reason being, like diuretics, dialysis removes body fluids thus enabling a lowered blood pressure. In such cases, further blood

pressure reduction by use of hypertension medications would work to the disadvantage of the patient. Therefore, frequency of dose is dependent on how medications benefit patients and are subject to change for those reasons. However, no respondents in this sample were using dialysis therapy procedures. Primary hypertensive medication doses among respondents ranged from 1-4 times daily as depicted by *Figure. 1*. Three (3) respondents, who were initially prescribed medications had them replaced with other recommendations by their PCPs. Such options normally include lifestyle changes as they relate to diet, exercise and possibly stress reduction.

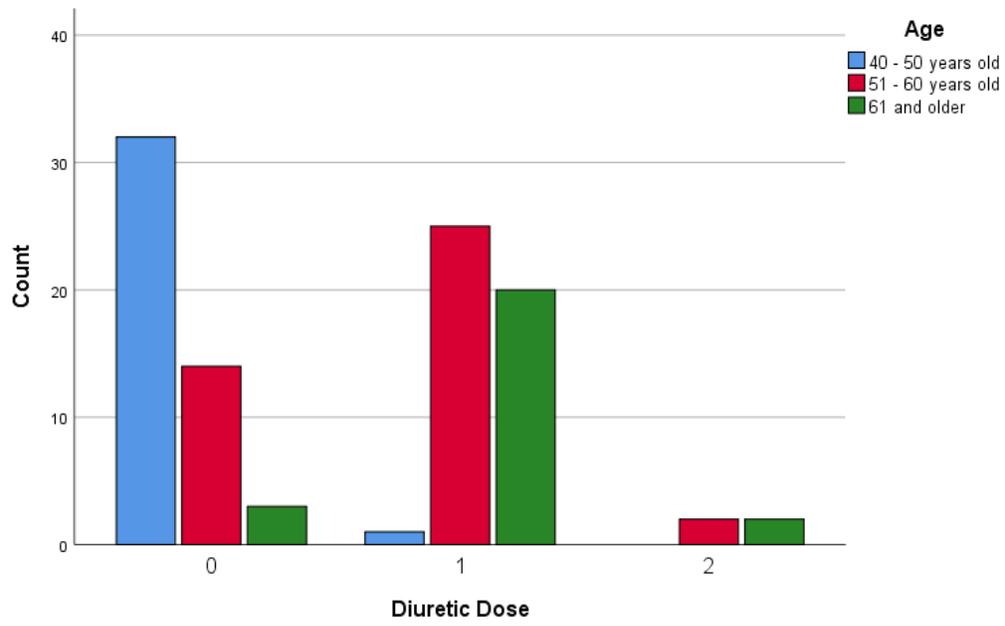
Figure 1
Daily use of prescription medications



Diuretics

Diuretics are used for a number of reasons including the treatment of cardiovascular, liver and kidney diseases. Diuretics are important due to their effectiveness in removing bodily fluids, which results in reduced blood pressure for people with hypertension. Diuretics tend to be added to primary hypertensive medications, as patients get older with less efficient vascular functions. Younger respondents then are less likely to be using diuretics. Among respondents, hydrochlorothiazide (HCTZ) was the most frequently used at 11.1% (11), as compared with chlorothiazide 10.1% (10); torsemide 10.1% (10); spironolactone 9.1% (9) and 8.1% (8). Dose frequencies for diuretics ranged between 1 – 2 times daily with 46.1% (46) of respondents using diuretics once daily, 4.0% (4) twice and 49.5% using no diuretics *Figure. 2*. This figure also shows the distribution of frequency dose by age. All respondents reported diuretic medications as effective.

Figure 2
Diuretic medications daily frequency by age group

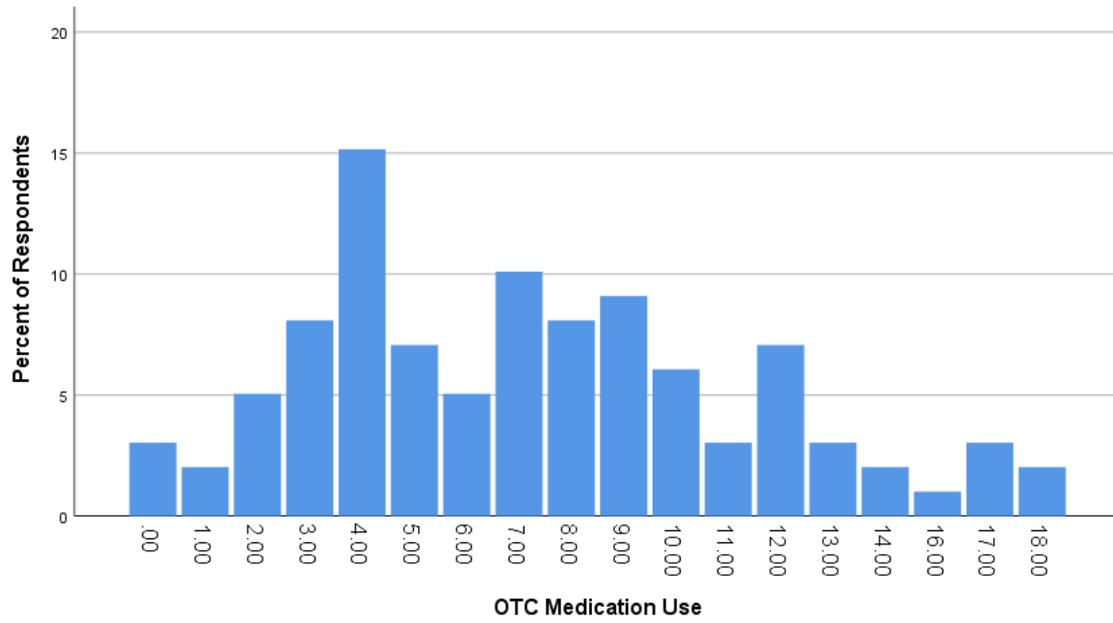


Concomitant use of OTC medications

OTC medicine uses were more sporadic in nature. Nevertheless, their use ranked high among respondents at 95.3%. Primary reasons for use of OTC by respondents were as supplements, pain relief and for treating minor illnesses. *Multi-vitamin* use as a supplement was reported by 43.4% (43), as compared to *Tylenol* 37.4% (37), *Theraflu* 32.3% (32), *Vicks* 31.3% (31), *Dettol*, 29.3% (29), and *Tums* 27.3%, (27). General use of over the counter medications ranged between 0 and 18 among respondents within the last year, **Figure. 3**. Frequency of use for OTC varied widely between daily to a few times per year with 29.3% (29) respondents using them daily as compared to 19.2% weekly, 27.3% monthly and 24% over the course of a year. Purchase of OTC most frequently happened at major retail outlets, 69.7% as compared to pharmacy at 30.3%.

The frequently used OTC medications among respondents are briefly described here: Theraflu is commonly used to combat the flu. Vicks, a decongestant, is used for the flu, colds and coughs. Dettol is a topical antiseptic commonly utilized for wound and skin care among other uses. Like herbal medicinal products, multiple over-the-counter medications serve dual purposes – for instance, aspirin, may be used as an adjunct therapy to benefit circulation. Therefore, aspirin may be prescribed by the doctor but purchased as an over-the-counter medication. This versatility saw aspirin cited as an adjunct medication by approximately one fifth of all respondents.

Figure 3
General use of OTC within the last year by respondents



Summary

Qualitative and quantitative data have shown consistent patterns of belief and use of herbal medicine to treat hypertension and take care of general health among respondents. Regimen of use for conventional medicinal products were highlighted, showing organized daily use of prescribed versus herbal and OTC medications. However, respondents showed high rates of use for particular herbal products such as, *garlic*, *noni* among others, for treating hypertension. The data also showed how respondents use herbs and OTC medicines to manage reoccurring symptoms of ill health over periods whether weekly or seasonally. In addition, we saw how access to herbs benefitted from trips to Jamaica and that a substantial number of herbal products were locally purchased. The relationships between variables will be next explored.

Chapter IV - Treatment Therapy Correlations

In this section, individual variable will be examined to find how they relate to the overall use of herbal and conventional medicines. The extent to which they interrelate to affect outcome will also be determined. First, the relationship between independent variables and complementary therapy are evaluated, followed by the investigation of individual treatment type. OTC medications, which is not used for treating high blood pressure, is examined for its complex relationships with other medication types as they are engaged for general use while caring for hypertension.

Complementary therapy uses of prescription, OTC and herbal medicines for treating hypertension and maintaining health was evident among respondents. Along with use of prescription medicines, 40.4% of male respondents were engaged in the use of OTC as compared with 55.6% of female. Similarly, use of herbal therapy was seen with 40.4% of males, as compared with 52.5% of females. There was a significant relationship between the use of OTC and herbal use, $r(97) = .48, p < .001$. The same positive correlation was true for the use of prescription and herbal medication, $r(97) = .29, p = .004$. No significant relationship was seen between use of OTC and prescription medicines.

In terms of age, the results showed that use of prescription medications was higher among older adults. One-way analysis of variance (ANOVA) was used to compare age with each therapy, OTC, herbal and prescription medicine use. The result was significant for age in all three respects: OTC, $F(32, 66) = 3.6, p < .001$; herbal, $F(32, 66) = 3.2, p < .001$ and prescription drugs, $F(32, 66) = 1.9, p = .012$. The results indicate that as age increases all categories of medication use rise. A mean use plot for prescription medications shows trends as it increases with age. See *Figure 4*.

Employment and the number of years living in the US were related to the use of complementary therapy. One-way ANOVA was performed to examine if there was a relationship between employment and complementary therapy use. The result was positive: OTC, $F(1, 97) = 14.7, p < .00$; herbal, $F(1, 97) = 22.3, p < .001$; and prescription medicine, $F(1, 97) = 5.8, p = .018$ respectively. These results indicated that, for respondents who are employed, concurrent use of all three-drug types was higher compared to those who were unemployed. Use of herbal medicines alone, was shown to be even more elevated when respondents were employed.

There was a positive relationship between number of years living in the US and use of OTC, $r(97) = .44, p < .001$; consumption of herbal products, $r(97) = .37, p < .001$; as well as prescription drugs, $r(97) = .33, p = .001$. These results mean that the more years spent in the US, the greater the tendency to use all three therapies as compared with those who had fewer years living in the US. Household income, education, having insurance, and visits to Jamaica, were not related to use of complementary therapy.

Figure 4

Mean use trend for prescription medications by age

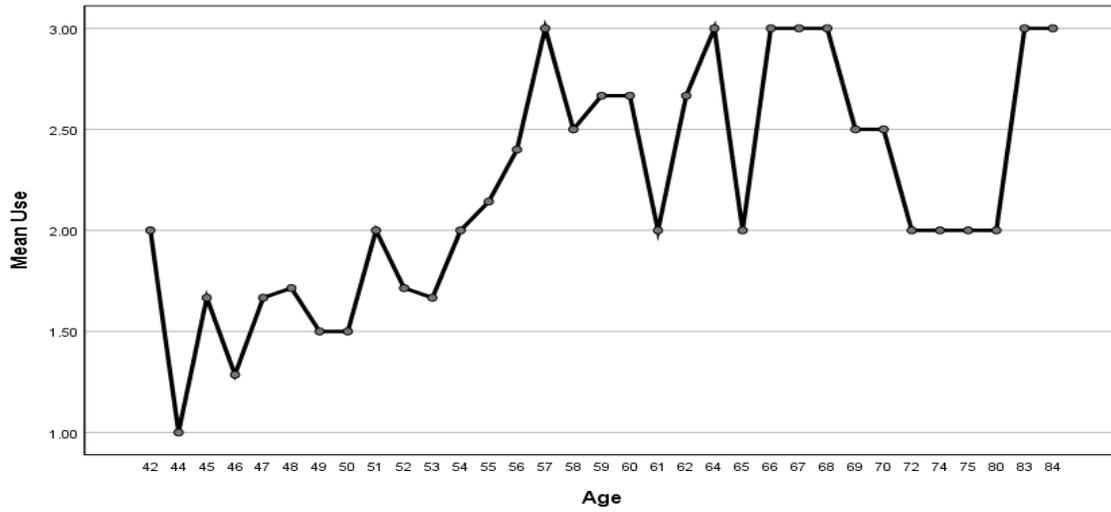


Figure 4

Variables associated with use of herbal medicine

The relationships between general herbal use, household income, having insurance, employment and herbal discussion with PCP, were examined. The results were significant. Higher household income showed lower use of herbal medicines as compared with those who earned less, $r(97) = -.23, p < .022$. Having insurance tended to show increased use of general herbs among respondents, $r(97) = .45, p < .001$. Unemployment largely decreased one's use of herbal medicines as compared with those who were employed, $r(97) = -.43, p < .001$. As for discussion with PCP, the more respondents were engaged in general herbal use the less likely it is that they would have discussions with their physicians, $r(97) = -.37, p < .001$.

Herbal hypertension medicines

Use of herbal medicines for hypertension were examined in relation to other variables. Mean use of herbal products for hypertension was $\bar{x} 7.5, SD = 3.98$. The relationship between herbal hypertension medicine and age was examined. The result was significant, $r(97) = -.35, p < .001$, indicating that, the younger the respondent, the less likely they were to use herbal blood pressure products. Significance was also seen for employment, $r(97) = -.28, p = .004$ indicating that use of herbs for treating hypertension decrease with unemployment. On the other hand, lower household income tended to show increase use of herbs, $r(97) = -.23, p = .021$. Having insurance, also showed increase tendency to use herbs for treating hypertension, $r(97) = .29, p = .003$. Results were also significant for use of herbs for hypertension and those having PCP discussions, as they were least likely to have discussions with PCPs, $r(97) = -.22, p = .031$. Respondents who spent fewer years living in the US, were less likely to use herbal hypertension

products $r(97) = -.46, p < .00$. Taking prescription medicines tended to show increase use of herbal hypertension products, $r(97) = .34, p < .001$; as well as, use of OTC, $r(97) = .33, p = .001$.

Prescription medications

The relationship between use of prescription medicines and employment, people who made annual visits to PCPs, those who visited Jamaica within the last *five* years and number of years living in the US. The results were significant. Respondents who were unemployed used less medication as compared to those who were employed, $r(97) = -.24, p = .018$. Those using fewer prescription medicines were least likely to make annual visits to their PCP, $r(97) = -.26, p = .010$. Fewer prescription users were also least likely to visit Jamaica within the last *five* years, $r(97) = .26, p = .009$. More time spent living in the US increase one's likelihood for use of prescription medicines, $r(97) = .33, p = .001$.

OTC medications

One-way analysis of variance (ANOVA) was performed to compare OTC medicines with age. The result was significant for difference between age groups $F(32,66) = 3.5, p < .001$. Older respondents tended to use more OTC medicines compared with younger ones. This indicates that as age increases frequency of OTC use also trends in the same direction. Significance was also found with having higher education, which tended to increase the use of OTC, $r(97) = .25, p = .013$. As for employment, respondents who are employed were more likely to use OTC, $r(97) = -.36, p < .001$. Having insurance, also increased one's chance of OTC

use, $r(97) = .38, p < .001$. Income was not related for use of OTC. For OTC use and PCP herbal discussions, respondents who used the least number of OTC medicines were least likely to talk to their doctors about herbal use, $r(97) = -.47, p < .001$. Those making annual PCP visits were more likely to have herbal discussions, $r(97) = .31, p = .002$. More time spent living in the US increase the likelihood of OTC use, $r(97) = .44, p < .001$. Respondents who worked fewer hours were more likely to use OTC, $r(97) = -.24, p = .016$.

PCP relationships

Chi-square was used to compare those who made annual visits and those who had herbal discussions with their PCP. Respondents who made annual visits were more likely to have discussions with their PCPs about use of herbal therapy, $\chi^2 = 10.55, df = 1, (n = 99), p = .001$. Younger respondents were less likely to have discussions with PCP about herbal use, $r(97) = -.36, p < .001$. Respondents who were less educated were less likely to discuss use of herbal medicinal products with their PCP, $r(97) = -.42, p < .001$.

Chapter V - Discussion

This study is first of its kind among migrant Jamaicans in the Hartford area with the aim of bringing awareness of TM and its concomitant use with conventional therapies to the attention of public health and medical practitioners serving Jamaicans and similar populations. The study examined how Jamaican migrants use herbal and conventional medicines for the treatment of hypertension and general health care. Medications from the six most commonly prescribed classes for hypertension treatment were used by study participants along with herbal products and OTC for therapy. Prescribed medicines provided the standard allopathic approach to lowering high blood pressure with generally good results. Use of herbal products for treating hypertension ranged from daily, as in the case of garlic for some respondents, to multiple times per month. For general care herbal use was more occasional and on an as needed basis.

Results of the study showed that within the last year, 92.9% of the study sample used herbal medicinal products. The number of herbal products used to treat hypertension ranged from 1-17 among respondents. For respondents using a high quantity of herbs, that number includes commonly used herbs such as *black tea*, *garlic*, *basil*, *rosemary*, *turmeric* and *ginger* frequently used by the general population. Approximately, 95% of respondents used at least one herbal product for general health. Only 7% of respondents reported no use of herbal products. Such high prevalence aligns with the findings of researchers from other Caribbean populations, such as Hispanics in the Hartford area. Caribbean researchers also pointed to the high rates of herbal use for different health problems among these populations (Clement et al.; Torres-Aviles, 2015; Delgado et al., 2010). Similarly, findings show consistency in beliefs across Caribbean populations for use of herbal products (Clement et al.; Torres-Aviles, 2015; Delgado et al., 2010; Picking et al., 2011).

Respondents engage in use of herbal medicines for numerous reasons. First, they view the practice as a part of cultural continuity, in which case, they derive comfort from maintaining contact with their culture of origin. Relatedly, the study shows that long held cultural beliefs play important roles. Such insight with respect to beliefs systems, ties into the global notion of wholistic benefits, held by herbal medicine users, and noted by previous researchers (Ekor, 2013; Clement et al., 2008; Picking et al., 2011).

Second, Jamaicans in greater Hartford area have found increasingly reliable sources of herbal products in the area. Because of rising demand for herbal products in the general population, small community outlets now stock a wide range of herbal products, many unavailable in previous years. At Lim's Herbal Store in Bloomfield for example, the variety of herbal products have increased over one hundred percent within the last decade. Other stores such as Whole Foods and the Vitamin Shoppe carry a wide range of processed herbal products. For many respondents, frequent travels to Jamaica were also important means of obtaining herbal products.

Third, the comparatively lower cost of herbal products may be another appeal for their use (Mukherjee 2015; Kennedy, Hart & Seely, 2007). Unprocessed herbal products sell at relatively lower costs when compared with biomedicines. The cost of prescription medications for treating hypertension is staggering, even after insurance benefits are applied. This study showed that cost of prescription medicines correlates positively with aging, which is consistent with results from other studies (Davis, 2013). For older adults in this group, substituting herbal preparations for costly prescription drugs when faced with economic challenges, is not farfetched as this is ingrained behavior. However, with the new popularity of herbal medicines and our increasing global population, prices may become unreasonable rendering its products less

affordable for succeeding generations.

Finally, the belief that use of herbal products will result in less side effects is an important reason for use of herbal products. Prescription drugs, though effective in lowering hypertension, produce unavoidable side effects that can be a turn-off for users. The problems of side effects experienced by respondents were frequently described during the in-depth interviews. As compared with conventional medicines, users of herbal products report fewer side effects, (Ekor, 2013; Clement et al., 2007; Picking et al., 2011). In this study, 54.6% of respondents stated that the lower side effects of herbs were beneficial to them.

Like other therapies, over-the-counter medications had a high percentage of use among respondents, especially older adults. OTC is well known for its comparative lower cost, ease of access and versatility in treating many common health problems (Consumer Health Products Association, 2018). OTCs are less potent and as a result, they usually cause milder side effects, than prescription medicines, when used as instructed. These benefits, may well be the reasons that OTCs use has high prevalence among older adults (Qato et al., 2008). In addition, researchers have also showed that senior adults used herbal, prescription and OTC medications simultaneously (Qato et al., 2008). In this study, stronger tendencies to use OTCs alongside other medicines were also seen among older respondents. In putting OTCs use among seniors in perspective, for the majority of this population, increased ailments with aging may well contribute to its greater use.

Older adults also tended to engage more in the use of herbal medicines for both treating high blood pressure and general care. These retired adults with fixed incomes see lower priced herbal products as alternative ways of caring for themselves. Gender accounted for only a slightly higher use of OTC with males showing less use, while both herbal and prescription

medicines were utilized by both groups. Higher household income among respondents was associated with lower use of prescription as well as herbal medicines. However, it was observed that higher income was associated with greater use of OTCs. The reasons for this phenomenon among people with high incomes were unclear, so that, any number of causes may be attributed to this greater use of OTCs.

Respondents who lived in the US for longer periods used all three therapies (herbal, prescription and OTC medicines) at a higher rate than more recent migrants did. The explanation may be that respondents living in the US for longer periods were older, which increased the likelihood to develop age-related chronic diseases and ailments. Hence, they were more likely to be on a prescribed regimen and have increased need for OTC use.

Among those who traveled to Jamaica within the last five years there was an increased proclivity to use TM. However, travels to Jamaica were not associated with use of OTC and prescription medicines.

Similar to other research, this study revealed that majority (67%) of respondents failed to disclose use of herbal medicines to their PCPs. This failure to communicate herbal use to PCPs is consistent with findings of prior studies (Martins, 2013; Delgoda et al., 2010; Picking et al 2011; TRAMIL 2015). This non-disclosure may also be explained, from the perspectives of respondents' beliefs. For example, herbal teas are the most common method of consumption of TMs. However, 82% respondents' in this study believe herbal teas to be harmless. This may well be the reason, at least for some respondents, that they do not reveal use of herbs to their doctors. Furthermore, it was revealed by other respondents, that their assumption was that doctors would not approve of herbal medicine use.

As allopathic medicine fails to deliver fully on health and healing, herbal medicine may

well become a more conventional approach to health problems, as an increasing number of people generally see them as a complement to prescribed medicines. With an aging population and lifestyles comparatively less active than cultures and countries of origin, chronic disease numbers will continue to rise. The increased availability of herbal products and the rising costs of allopathic medicines and treatments may become a consistent element of US medicine beyond those, who like Jamaicans, have a tradition of complementary therapies.

Limitations

Limitations in this study may have affected results. For one, any preference in sample selection may have introduced bias, especially the fact that the process had to be carried out at particular times of day or week as well as among certain groups to meet criteria. Subjectivity in selection then may have caused bias. Recall bias may have occurred on the part of respondents having to remember activities undertaken over any past time period. To counter the effect of bias, question formatting was thoughtfully done and care taken to evoke as free a response as possible during focus group discussions and in-depth interviews. The researcher's qualified novice position may have caused some unknowing sanctions rather than disavowing of responses when they were justly deserved.

Implications for intervention

These findings lead to the need for the health care system in general and primary care physicians specifically, to learn about the use of TM for specific communities, as well as, their individual patients. The extent of herbal and prescription use among migrant Jamaicans points to the need for health education. Any attention given should focus not only on the Jamaican

community but also on other migrant groups who may be engaged in similar practices. Education should aim to promote a discussion with PCPs. Patients should be alerted to the importance of disclosing all medications- prescription, herbal and OTC, to their PCPs. It must be made clear that related questions are already being asked, however, research findings continue to show high rates of non-disclosure. Therefore, more effort needs to be invested in addressing the situation. Such communication is vital and serves as a safety measure when medical practitioners make recommendations and write prescription orders. Simultaneously, PCPs must be trained in the nature and use of common herbal preparations used by the diverse ethnic groups for whom they provide care.

Suggested methods of health education may take the following format: (a) **Discussions:** initiating the conversation on a whole may first happen during the admission processes at any healthcare facility. At this point in time, healthcare staff generally has great opportunities to engage patients and families on the topic of medication use. This initial discussion will naturally continue with PCPs as they are face to face with their patients. (b) **Pamphlets:** this method of conveying information may be used both as individual take-aways and postings to notice boards at sites attended for medical care. It may also be placed in places of social venues such as churches and beautician shops, as well as community grocery stores and supermarkets. (c) **Leaflets:** this form of information may be distributed to similar locations mentioned for pamphlets. Education may include directing readers to have needed conversation with PCPs, reasons to avoid the combination of medicines and sources for contact as determined by public health.

The current trend of herbal medicine use, makes it clearer that the future of health care and treatment is one in which allopathic therapy will co-exist with herbal medicinal treatments.

However, much work is needed in understanding the benefits and actions of more herbal medicinal products. To that end, more studies are needed to investigate the health implications of alternative therapies beyond the borders of migrant communities.

With greater understanding in the actions and benefits of herbs, we may be better able to make decisions on how to incorporate this long existing alternative into our modern healthcare systems. In conclusion, the extent of the practice among Jamaicans and the growth of herbal use in the larger population, signal the need for policy to effectively guide a change of attitude toward the use of herbal products. Policy should be directed at increasing needed communication between patient and provider, as it relates to TM and multiple drug use, thus, creating a safer more supportive health care system.

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