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**Publication Date**

2017

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UNIVERSITY OF CALIFORNIA

Los Angeles

The Prevalence of High Blood Pressure in Armenians

A dissertation submitted in partial satisfaction of the

requirements for the degree Doctor of Philosophy

in Nursing

by

Salpy Akaragian

2017

ABSTRACT OF THE DISSERTATION


The Prevalence of High Blood Pressure in Armenians


by


Salpy Akaragian


Doctor of Philosophy in Nursing

University of California, Los Angeles, 2017

Professor Deborah Koniak-Griffin, Chair


Hypertension (HTN) is a significant and growing national and international public health problem that contributes to cardiovascular morbidity and mortality. In Armenia, limited data exist on the prevalence of the high blood pressure (HBP) or HTN and associated risk factors. Past research often employs self-report data on blood pressure (BP) or objective measures of BP that do not follow current Joint National Committee-8 (JNC-8) guidelines. Further, little is known about the relationship between adherence to antihypertensive medication(s), knowledge and awareness of HTN, and current BP. The rapid socio-demographic and infrastructural changes occurring in Armenia create an urgent need for further scientifically rigorous research on HBP.

The purpose of this descriptive, cross-sectional dissertation study, guided by the Health Lifestyle Theory, was to examine the prevalence of HBP and selected risk factors associated

with HBP in a convenience sample of Armenian men and women ages 21 and older, living in Armenia. The risk factors included: demographic, physiologic, health lifestyle behaviors, socioeconomic and inherited. The study also examined knowledge, awareness, and attitudes/perceptions related to HBP by awareness, treatment and control categories. The Morisky Medication Adherence Scale-8 was used to measure adherence.

Participants ($n = 200$) were predominantly middle-aged, married females, with a high school education or higher. Blood pressure was measured following JNC-8 guidelines at a single time point in a community setting.

Over half of the adults of the sample were found to be prehypertensive or hypertensive. For those diagnosed with HTN, adherence to prescribed antihypertensive medication(s) was low. The correlation between adherence and awareness scores was not significant. A significant association was found between HBP and waist-hip ratio, age, body mass index, total cholesterol, low high density lipoprotein cholesterol, and high low density lipoprotein cholesterol as reported in past research. Waist circumference was the strongest predictor of HBP, followed by personal history of HBP, high total cholesterol level, being male, and older age. Findings of this study have several implications for clinical practice. A similar larger study with a national representative sample needs to be conducted in Armenia to determine the prevalence and correlates of HBP.

The dissertation of Salpy Akaragian is approved.

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2017

**Dedication**

I wish to express my deepest appreciation and gratitude to the University of California, Los Angeles, for providing me with an exemplary education in Nursing.  My grandfather, a survivor of the 1915 Armenian Genocide, placed such a great value on education that, orphaned at the young age of seven, he taught himself to read and write not only in Armenian, but in several other languages.  My parents, the children of genocide survivors, did not have the financial means to study past the sixth grade, but had a love of education that they passed on to all four of their children.  They made sure we received excellent educations.

Today, all three of my siblings and I are university graduates--many with medical and juris doctorate degrees.  I am exceedingly grateful to my mentors, teachers, and life coaches in the United States and in Armenia for my education.  They have instilled in me the perseverance and resilience to reach my personal and professional goals.  My dream was to receive the highest possible level of education in Nursing, and I am exceptionally thrilled to have fulfilled my objectives and attained my vision.

In celebration, I dedicate this dissertation to the many generations of people who value education; to the many scholars, teachers, administrators, and donors who provide the opportunity to pursue an education; and to the successes and scholarly pursuits of current and future students, including my precious grandchildren Alina, Alex, Aiden, Anto, and Vivienne.

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# Abbreviations and Acronyms

| | |
|---|---|
| AA | Arab Americans |
| ACLDXA | Alere Cholestech LDX Analyzer |
| ADA | American Diabetes Association |
| AHA | American Heart Association |
| AHANC | American Heart Association Nutrition Committee |
| ABCs | American Born Caucasians |
| AUA | American University of Armenia |
| BMI | Body Mass Index |
| BP | Blood Pressure |
| CAD | Coronary Artery Disease |
| CHD | Cardiac Heart Disease |
| CHNDA | Center for Human Nutritional and Dietary Assessment |
| CHSRD | Center for Health Services Research Development |
| CHF | Congestive Heart Failure |
| CKD | Chronic Kidney Disease |
| CITI | Collaborative Institutional Training Initiative |
| cm | Centimeter |
| CV | Cardiovascular |
| CVD | Cardiovascular Disease |
| DASH | Dietary Approaches to Stop Hypertension |
| DBP | Diastolic Blood Pressure |
| DM | Diabetes Mellitus |
| EPC | Erebouni Primary Clinic |
| FM | Family Medicine |
| fSU | Former Soviet Union |
| GITM | Gentle + Inflation Technology Microlife |
| HBP | High Blood Pressure |
| HC | Hip Circumference |
| HCES | Household Consumption and Expenditures Survey |
| HDL-C | High Density Lipoprotein Cholesterol |
| HFMG | Henry Ford Medical Group |
| HHS | Household Health Survey |
| HLT | Health Lifestyle Theory |
| HPLP | Health Promotion Lifestyle Profile |
| HTN | Hypertension |
| IPAQ | International Physical Activity Questionnaire |
| IRB | Institutional of Review Board |
| JNC-8 | Joint National Committee-8 |
| KAP | Knowledge, Awareness and Practice |
| KAAP | Knowledge, Awareness and Attitudes/Perceptions |
| Kg | Kilogram |
| LDL-C | Low Density Lipoprotein Cholesterol |
| MoH | Ministry of Health |
| MMAS-8 | Morisky Medication Adherence Scale-8 |

| | |
|---|---|
| NHANES | National Health and Nutrition Examination Survey |
| NHIS | National Health Interview Survey |
| NHLBI | National Heart, Lung and Blood Institute |
| NIAAA | National Institute on Alcohol Abuse and Alcoholism |
| OE | Open Enrollment |
| OPM | Objective Physiologic Measurement |
| PA | Physical Activity |
| PCC | Primary Care Clinic |
| PHCP | Primary Health Care Provider |
| PHC | Public Health Clinic |
| PHCR | Primary Healthcare Reform Project |
| PI | Principal Investigator |
| RA | Research Assistant |
| SBP | Systolic Blood Pressure |
| SD | Standard Deviation |
| SEP | Socioeconomic Position |
| SPSS | Statistical Package of Social Sciences |
| Total-C | Total Cholesterol |
| TIA | Tribal Indian Adolescent |
| UCLA | University of California, Los Angeles |
| UK | United Kingdom |
| US | United States |
| USAID | United States Agency for International Development |
| USDA | United States Department of Agriculture |
| VO$_2$max | Maximum Volume of Oxygen |
| WC | Waist Circumference |
| WHO | World Health Organization |
| WHR | World Health Ranking |

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"Career Development for Unlicensed Assistive Personnel", Sigma Theta Tau Gamma Chapter, Los Angeles, California, May 2014.
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"Value of Volunteerism for Nursing and You", Nurse.com, Career Fair, Los Angeles Convention, Los Angeles, California, March 2015.
"Making the most of your Learning and Job Opportunities", Nurse.com, Los Angeles Convention, Career Days, Los Angeles, California, March 2015.
"Promotion of Wellness: Blood Pressure". Pre-Conference Nursing Sessions-Fourth International Medical Congress of Armenia, Yerevan, Armenia. July 1, 2015.
"Innovative Health Care Project: Cochlear Implants and Bone-Anchored Hearing Aid Surgeries in Armenia".
Fourth International Medical Congress of Armenia, Yerevan, Armenia. July 4, 2015.
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| 2014 | Women in Humanitarian Leadership Award-Knights of Vartan |
| 2014 | Ellis Island Medal of Honor |
| 2014 | UCLA Health, Heidi Crooks Visionary and Transformational Nursing Leadership Award |
| 2014 | Armenian American Nurses Association, Leadership Award |
| 2015 | Republic of Armenia, Minister of Diaspora, Boghos Doubar Pasha Medal |

## Chapter 1

## The Prevalence of High Blood Pressure in Armenians

Hypertension (HTN) is a significant public health concern in the United States (US) and across the globe. One billion people in the world are currently living with HTN and four million die every year from the disease (World Health Organization, 2004). In the US, 33% of adults 20 years of age and older have HTN. This represents approximately 72 million Americans, or one in three adults, with percentages of men and women being nearly equal (Go et al., 2013).

In 2015, the Joint National Committee (JNC-7) on Prevention, Detection, Evaluation and Treatment of High Blood Pressure defined normal blood pressure (BP) as systolic blood pressure (SBP) less than (<) 120 mmHg and diastolic blood pressure (DBP) less than (<) 80 mmHg. Stage 1 HTN is defined as SBP 140-159 mmHg or DBP 90-99 mmHg. Stage 2 is defined as SBP equal to or greater than (≥) 160 mmHg or a DBP equal to or greater than (≥) 100 mmHg. In 2016, JNC-8 guidelines were published and the JNC-7's definition of normal BP and stage 1 and 2 of HTN remained the same (Mahajan, 2014).

Throughout the literature, the terms HTN and high blood pressure (HBP) are used interchangeably. A diagnosis of HTN is determined for an individual only after several measurements of BP at different days over three months (American Heart Association, 2014). However, if BP is measured at only one point, the term HBP is used. Generally, if HBP is not treated and is sustained, it will lead to HTN and other diseases, such as diabetes, hypercholesteremia, cardiovascular disease (CVD) and/or chronic kidney disease (CKD), and stroke (Chobanian et al., 2003; Jennings & Cook, 2010). My study will collect BP measurements at a single time point and at one clinic, therefore, individuals with higher than normal BP readings will be referred to as having HBP.

**Prevalence of Hypertension in Race, Ethnicity, Gender, and Age**

In the US, HTN prevalence varies across race/ethnicity, gender, and age groups. The race/ethnicity of the person plays an important role in HTN. For example, HTN is significantly more common in blacks than in any other racial group (Ortega, Sedki, & Nayer, 2015). Furthermore, the number of cardiovascular and renal complications from HTN is greater in blacks than in whites (Ortega et al., 2015).

In the US, the prevalence of HTN increases with age. There is a 3% increase of BP among 18 to 24, year-olds and a 13% increase in BP among 34 to 44 year-olds (Wolz et al., 2000). Furthermore, there is a 50% increase of SBP and DBP among adults aged 60-69; this number increases to about 75% for persons aged 70 and older (Chobanian et al., 2003).

When combined with physiologic risk factors such as high blood cholesterol and high blood glucose levels, body mass index (BMI) and unhealthy lifestyle behaviors, HTN leads to CVD and stroke (Go et al., 2014). In the US, the data from 2007-2010 in an executive summary for American Heart Association (AHA) on heart disease and stroke statistics reported that one of every three deaths was related to CVD. When compared to the white population, the death rate from CVD was higher in blacks, both male and female (Go et al., 2014).

**Hypertension and Cardiovascular Disease in Armenians**

For over six decades, HTN has been a major public health concern and has been studied in many countries around the globe. While there is an abundance of published papers on the prevalence of HTN and risk factors in various countries, and across many nationalities, there are only five published studies about HBP or HTN in Armenians. Two papers reported findings on Armenians living outside of Armenia, and three papers reported on HBP or HTN in Armenians living in Armenia. Two of these three papers reporting BP prevalence among Armenians living

in Armenia are based on self-reported BP data (Footman, Roberts, Tumanov, & McKee, 2013; Roberts, Stickley, Balabanova, Haerpfer, & McKee, 2012).  One of three papers combined national survey data with actual measurements of BP; however, the measurement technique did not follow JNC-8 guidelines (Harhay, Harhay, & Nair, 2013).

Furthermore, in 2015, World Health Organization (WHO) reported an increase of mortality rate related to CVD among the Armenians living in Armenia.  In 2000, the mortality rate in males was 500.5 per 100,000 and 344.1 per 100,000 in females.  In 2012, the mortality rate from CVD in males increased to 606.9 per 100,000 and in females to 367.7 per 100,000 (WHO, 2015).

In a self-reported study conducted in 2010, 24.1% or about 1 in 4 Armenians reported a diagnosis of HTN, with equal percentages for men and women (Roberts et al., 2012).  The findings on HTN for the US are 33% or about 1:3 adults with no significant differences between men and women (Go et al., 2013).  Although the prevalence of HTN in Armenia is less than the US, Armenia's data are self-reported and the accuracy of the findings is questionable.  In an unpublished study of BP of Armenians ($n = 1846$) living in Armenia in 2002, investigators revealed that 59% of Armenians had HBP (Akaragian, Boyadjian, Bholat, & Dilbaryan, 2002).  The findings were based on measuring BP on each participant at one time only.  The BP electronic measuring devices were calibrated by using manufacturer's recommendations and measured by competent nurses in Armenia.  Competency on measuring BP was achieved by return demonstration by each nurse to an already established competent Registered Nurse from the US.

**Prevalence of and Risk Factors for Hypertension in Non-Armenians**

Multiple studies for non-Armenians on HBP or HTN were conducted in Arab countries and the former Soviet Union (fSU). Countries included were: Georgia, Jordan, Qatar, Kyrgyzstan, Ukraine and others (Bener, al Suwaidi, el-Menyar, & Gehani, 2004; Grim et al., 1999; Jaddou, Bateiha, & Ajlouni, 2000; Young, Parler, Bristol, & Klag, 2005). The prevalence of HBP or HTN varied from 13.4% to 81% in the populations reported in the papers and some of the papers described an association between HBP or HTN and its risk factors such as BMI, lipid panels and glucose levels. The wide range of prevalence of HTN is due to several factors, including differences in: 1) study design and sampling procedures (e.g, random selection vs convenience); 2) setting of studies (e.g., country; rural versus urban); 3) characteristics of samples (e.g., general population versus clinical patients with CVD); 4) procedures for measuring BP and defining HTN; (e.g, some studies defined HTN as >160 of SBP as compared to 140/90). Participants with HBP or HTN reported high Total-C, high triglycerides, high low density lipoprotein cholesterol (LDL-C) and low high density lipoprotein cholesterol (HDL-C) levels.

Gender and age are known physiologic factors in persons with HBP. Most studies had more than 50% female participants (Arevian, Adra, & Kubeissi, 2004; Dallo & Borrell, 2006; Jaddou, Bateiha, & Ajlouni, 2000; Mehler et al., 2001). Compared to the US born participants, prevalence of HBP or HTN in females is higher in Arab immigrants in the US (Dallo & Borrell, 2006). Furthermore, the prevalence of HBP or HTN in females is higher in Jordanians, and participants from Armenia, Ukraine and Azerbaijan (Footman et al., 2013; Harhay et al., 2013; Jaddou et al., 2000). However, males had a higher prevalence of HBP or HTN than females in Qatar, Georgia and Kyrgyzstan (Bener, al Suwaidi, el-Menyar, & Gehani, 2004; Grim et al.,

1999; Young, Parler, Bristol, & Klag, 2005).  Contrary to the above findings, compared to the US born participants, Arab American males and male immigrants from fSU had a higher prevalence of HBP or HTN than females (Fridman, Vandalovsky, & Bergmann, 2006; Tailakh et al., 2013; Tailakh et al., 2014).

In addition to gender and age, socioeconomic status was associated with HBP.  A majority of the studies indicated that lower socioeconomic status, less-educated participants and a family history of HBP contribute to prevalence of HTN (Albert, Glynn, Buring, & Ridker, 2006).

**Knowledge, Awareness and Attitudes/Perceptions**

Numerous studies about knowledge, awareness, attitudes and self-care practices related to HTN have been conducted in many countries (i.e. Armenia, China, Germany, Iran, Indian Ocean, Poland, and the US).  A significant relationship had been demonstrated in these studies between awareness and knowledge, awareness and attitudes, and awareness and self-care practices (Sabouhi, Babaee, & Zadeh, 2011).  Although participants had high awareness, knowledge, attitudes, and practices about HTN, their HBP was not under control (Sabouhi et al., 2011).  Furthermore, awareness and treatment of HTN decreases with advanced age (Zdrojewski et al., 2016).  Findings of a study conducted in China showed an association between awareness and treatment about HTN, and these variables were positively correlated with BMI, education level, family history and diagnosis of HTN (Wu et al., 2015).

In Armenia, the United States Agency for Development (USAID) and Primary Healthcare Reform (PHCR) project funded the Center for Health Services Research Development (CHSRD) of the American University of Armenia (AUA) to conduct a baseline data household health survey (HHS) (USAID/PHCR, 2008).  Some of the questions addressed

knowledge, awareness, and practices (KAP) about chronic illnesses including HTN.  The results indicated that KAP scores were the lowest in HTN, osteoporosis, and urinary tract infection compared to diabetes, tuberculosis, diabetes (USAID/PHCR, 2008).  Furthermore, women had significantly higher KAP scores than men (especially with regard to smoking).  KAP scores increased with educational level.  No association was found between KAP scores and participant's age, living standard, or average monthly income (USAID/PHCR, 2008).

As these results from worldwide studies and those conducted in Armenia attest, inconsistencies exist in several areas.  KAP scores in the China study showed a positive association with HTN treatment, while in Armenia they did not.  Awareness and treatment of HTN was negatively correlated with age in Poland, while in Armenia, no relation between KAP scores and age was apparent.  This lack of agreement and conclusive findings reveals a need for further research.

**Prevalence of HBP by Awareness, Treatment, and Control**

Studies were conducted in the US, China, Armenia, United Arab Emirates and other countries regarding awareness of HTN and its treatment and control (Egan, Zhao, & Axon, 2010; Jaddou et al., 2000; Roberts et al., 2012; Tailakh et al., 2013; USAID/PHCR; 2008; Wu et al, 2015).  In the US, it was reported that HTN awareness and treatment were higher in women than in men, and the proportion of patients controlled for HTN was higher in men versus women (Egan et al., 2010).  Furthermore, National Health and Nutrition Examination Survey (NHANES) data suggest that raising hypertension awareness and treatment was important for men, whereas controlling hypertension in patients who were treated was a higher priority for women (Egan et al., 2010).

A study conducted in China reported that, among the participants with HTN, the awareness, treatment, and control of HTN significantly increased from 2001 to 2010 (Wu et al., 2015). Moreover, respondents with higher education had increased awareness and treatment of HTN (We et al., 2015). The study conducted in Armenia (USAID/PHCR, 2008) reported the proportion controlled among treated hypertensive participants was 37%.

**Adherence to Hypertensive Medications**

Studies depicting levels of adherence to hypertensive medications in Armenia are very limited. A thorough review of the literature has revealed only one study reporting non-adherence to hypertensive medications in Armenian women living in Lebanon. In this study, 41% of the hypertensive participants were aware of having HTN; of this group, only 58.8% reported taking medications regularly (Arevian et al., 2004). In addition, HBP was noted in individuals with high BMI, high LDL-C, low HDL–C, and among those who consumed large amounts of salt, lacked physical activity and reported a family history of HTN (Arevian et al., 2004).

**Purpose of the Study and Aims**

Cardiovascular disease (CVD) is the leading cause of morbidity and mortality in Armenia (Rankings, 2012). Limited data exist on the prevalence of risk factors and other contributors to the development of CVD. Understanding the prevalence of various risk factors is a critical first step towards addressing the burden of disease among any population (Brouwer et al., 2015). Furthermore, the available literature specific to HBP or HTN among Armenians in Armenia lack rigorous research design and is outdated given the rapid socioeconomic, demographic, infrastructural, and culture changes occurring in Armenia since the collapse of the Soviet Union. All of these findings lead to the critical need to conduct a study in Armenia. The purpose of this

study is to examine the prevalence of HBP and risk factors associated with HBP in a select group of Armenian men and women ages 21 and older, living in Armenia.

**Specific Aim 1.** To identify the prevalence of HBP and selected factors, many of which are theoretically-based risk factors for HBP: demographic factors, physiologic, health lifestyle behaviors, and economic and inherited risk factors for 200 Armenian men and women 21 years of age and older, living in Armenia.

- Demographic factors include age, gender, and marital status.
- Physiologic factors include lipid panel results (specifically total cholesterol (Total-C), HDL-C, triglycerides and LDL-C glucose level, BMI, and waist and hip circumferences.
- Health lifestyle behavior factors include smoking, alcohol, nutrition, and physical activity.
- Economic status factors include education, income, and employment.
- Inherited risk factors include family history of HBP or HTN, or history of cardiac disease, high cholesterol and diabetes mellitus (DM).

**Specific Aim 2.** To examine the relationship between HBP and demographic, physiologic, health lifestyle behaviors, economic, and inherited risk factors.

**Specific Aim 3.** To describe knowledge, awareness, and attitudes/perceptions (KAAP) related to HTN.

**Specific Aim 4.** To report the prevalence of HBP by awareness, treatment, and control categories: 1) Aware of HBP; 2) Treated for HBP; 3) Controlled for HBP.

**Specific Aim 5.** To describe self-reported adherence in taking antihypertensive medication(s) using the Morisky Medication Adherence Scale (MMAS-8) among participants

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with HBP who have been prescribed antihypertensive medication(s).  To describe the psychosocial determinants of adherence (knowledge, awareness, etc.) and associations of adherence with physiological outcomes of BP control.

**Conceptual Framework**

Health Lifestyle Theory (HLT) is the middle range theory that will guide this research study.  In 2005, Cockerham, a medical sociologist from the University of Alabama, created the HLT.  Although the HLT has multiple concepts that are useful, the most relevant concept to use in this research study is the Practices Concept of HLT.  Practices or behaviors of the individual, may be perceived as either positive or negative, and comprise a person's overall pattern of health lifestyle (Cockerham, 2012).

The Practices Concept measures lifestyle behaviors that contribute to the individual's state of health.  Consuming salty foods, lack of exercise, smoking, excessive use of alcohol and infrequent physical checkups are unhealthy lifestyle behaviors (Cockerham, 2012).  These unhealthy behaviors are risk factors that predispose an individual to HBP, if not treated, can lead to HTN, CVD and stroke (Chobanian et al., 2003).  In addition, as the majority of Cockerham's studies were conducted in Russia, Armenia and other fSU countries, HLT is an appropriate and applicable theory to use for my research study.

**Research Design**

A cross-sectional descriptive study was conducted to examine BP measurements and risk factors among Armenians living in Armenia.  The study was conducted in Armenia because there is a paucity of rigorous studies conducted on Armenians living in this country.  Published papers were older and reported studies conducted prior to the rapid socioeconomic, demographic, infrastructural, and culture changes occurring in Armenia since the collapse of the Soviet Union.

Demographic and health assessment data collected included physiologic, health lifestyle behaviors, economic and inherited risk factors. Furthermore, data were collected on awareness, treatment and control of HBP and adherence to antihypertensive medication(s).

**Significance to Nursing Science and Practice**

This study reports BP findings and related risk factors in Armenians living in Armenia. Awareness, treatment and control of HBP and reported adherence levels to antihypertensive medication(s) were examined.

While there is a paucity of research that has assessed the prevalence of HTN and its associated risk factors in the Armenian population, it is essential that the scientific community have knowledge of the BP findings, related risk factors and how HTN can be prevented by establishing culturally-sensitive education programs. As there are only five papers reported on HTN in Armenians, and the majority of these papers based their findings on self-reported data, such as national household surveys, or lacked rigor in measuring BP. This research study advances the knowledge of prevalence and risk factors related to HBP among Armenians in Armenia while maintaining scientific rigor by following JNC-8 established guidelines. Findings provide a foundation for future larger studies in Armenia and have implications for health care.

It is well documented that HTN is highly associated with CVD such as cardiac diseases and stroke (Go et al., 2014; Rankings, 2012). Early detection of HTN is critical to reduce incidence of CVD and associated mortality (Bener el al., 2004). In Armenia, death rate due to CVD and stroke is high on the list for morbidity and mortality (Rankings, 2012); thus, plans are underway to open a Stroke Center in Yerevan, Armenia. Findings from this study will be useful to the stakeholders of the Stroke Center as it will describe how extensive the HBP problem is in Armenians.

This study determined the association of HBP with related risk factors as well as the predictors for HBP. Thus, when a person is found to have HBP and has related risk factors associated with HTN, healthcare providers will be alerted to perform additional assessments/tests such as waist circumference, blood lipid panel and blood glucose level. The findings of this study will also increase awareness for healthcare providers and the citizens of Armenia, and alert these healthcare professionals to check BP regularly.

Armenia's health care system is still largely based on the Soviet "Semaskho" health care system in which care is extremely fragmented and specialized (Richardson, 2013). Currently, there are no primary care practitioners that could screen, identify and treat risk factors such as HTN (Richardson, 2013). As primary care develops, practitioners will need to have some baseline data to effectively screen and treat their patients.

Costs of health care is on the rise. Global expenditure for health per person/year is US $948 (WHO, 2015). The highest spending per person/year on health is United States (US $8362) (WHO, 2015). In Armenia, with a poverty level of 32.4% (Statistical Service of the Republic of Armenia, 2013) the government allocates only 12 US dollars per person/year. Thus, when Armenians succumb to an illness, they often cannot afford the cost of hospitalization, physician fees, medications, or radiological and laboratory tests. Therefore, monitoring BP and preventing HTN is critical in developing countries such as Armenia.

This study was an initial research study using Joint National Committee's (JNC-8) established guidelines to measure BP accurately. Furthermore, all BP readings, regardless of level recorded (normotensive, prehypertensive or hypertensive) were assessed along with multiple related risk factors that are physiologic, health lifestyle behaviors, economic status and inherited. Finally, knowledge, awareness and attitudes/perceptions about HTN and adherence to

prescribed antihypertensive medication(s) were assessed using the Morisky Medication

Adherence Scale (MMAS-8).

**Chapter 2**

**Literature Review**

This research study is designed to report the prevalence of high blood pressure (HBP) among a select group of Armenians and risk factors associated with HBP in Armenian men and women ages 21 and older.  Globally, for over six decades, hypertension has been a major public health concern.  While there is an abundance of published papers on the prevalence of HTN and risk factors in various countries, and across many nationalities, there are only five published studies about HBP or HTN among Armenians.  Two papers reported findings on Armenians living outside of Armenia, and three papers reported on HBP or HTN in Armenians living in Armenia.  All three studies conducted in Armenia based findings on self-reported blood pressure (BP) data (Footman et al., 2013; Harhay et al., 2013; Roberts et al., 2012), and one of these three studies utilized BP measurement techniques but did not follow Joint National Committee's (JNC-8) guidelines (Harhay et al., 2013).

Due to the limited number of papers found about HBP or HTN in Armenians, the literature search was expanded to locate papers about HBP or HTN in countries surrounding Armenia, such as former (fSU) countries, Turkey, Eastern European and Arab countries as well as the United States (US).  In addition to geographical proximity to Armenia, the populations of these countries have lifestyles and risk factors similar to Armenians, such as obesity, diet and smoking (World Health Organization [WHO], 2009).  Populations included in these studies were from Qatar, Jordan, Turkey, Kyrgyzstan, and Georgia as well as Arabs and Russians living in the US (Bener et al., 2004; Dallo & Borrell, 2006; Fridman et al., 2006; Grim et al., 1999; Jaddou et al., 2000; Mehler et al., 2001; Tailakh et al., 2013; Tailakh et al., 2014; Young et al., 2005).

Use of the proper technique for measuring BP is an important factor in the diagnosis of HBP or HTN. Thus, the literature search was expanded to include two papers which present proper BP measurement based on the American Heart Association's (AHA) and/or JNC-8 guidelines. In summary, 13 papers are cited in the literature reviews that address HBP or HTN in Armenians and in populations similar to Armenians. The terminology used to describe BP findings in the cited literature (e.g., "prevalence" of HTN) is based upon the descriptive language provided by the author(s).

**Background of the Literature Search**

The literature search included databases such as PubMed, CINAHL, MeSH and HINARI. The following keywords were utilized: high blood pressure, hypertension and cardiovascular risk factors, combined with Armenia, Armenians, former Soviet Union countries, Arab and European countries. Furthermore, keywords such as awareness, treatment, control, knowledge and attitudes/perceptions, and Morisky Medication Adherence Scale-8 were used. The search included papers published in English, Armenian and Russian from 1970-2016.

The databases yielded 415,471 papers on HTN, 85,374 papers on the prevalence of HTN, 12,374 papers on the prevalence of HTN in Europe, 17 papers on the prevalence of HTN in the fSU. In total, 46 papers had words HBP or HTN with the combination of Armenia or Armenians, however, only five papers were in English and the content was about HBP or HTN in Armenians. Two out of the five papers reported HBP or HTN findings in Armenians living outside of Armenia (Arevian et al., 2004; Kumbasar et al., 2013) and three were on HTN or HBP in Armenia (Footman et al., 2013; Harhay et al., 2013; Roberts et al., 2012).

**Prevalence of HBP or HTN and Parameters**

Overall the prevalence of HBP or HTN in the 13 papers that present data about Armenians or populations similar to Armenians ranged from 13.4% to 81%. The prevalence of HBP or HTN in Armenians living in Armenia ranged from 21.7% to 29.3%, while for Armenians living outside of Armenia, the prevalence of HBP or HTN ranged from 31.9% to 65.8%. Among non-Armenians, the range of HBP or HTN was 13.4% to 81%. Prevalence of HTN in general was based on the criteria of BP ≥140/90 mmHg and/or use of antihypertensive medication(s) as reported in ten studies. Among these studies, one used a cut-off for HBP (BP ≥160/90 mmHg) (Fridman et al., 2006), while another utilized a cutoff for HBP (BP ≥130/85 mmHg) (Jaddou et al., 2000). There are many other factors contributing to the wide variation in percent of people reported to have HBP or HTN that have been previously described in Chapter 1. Most important among these factors are variations in study design and nature of the sample, procedures for data collection and operational definition of variables being examined,

Among the 13 studies included in the literature review, three did not report BP parameters for HTN (Footman et al., 2013; Fridman et al., 2006; Roberts et al., 2012). Further, from three studies among the 13 papers, BP data were collected from patient records (retroactive), and timelines for the data collection varied. The data from one study was collected over a 10-year period (1994-2004), while the second was over a 12-month period in 2004-2005. Data from a third study were collected from a three-day humanitarian project in 2005 (Bener et al., 2004; Fridman et al., 2006; Young et al., 2005). Thus, among the 13 studies, eight papers reported actual measurement of BP (Arevian et al., 2004; Grim et al., 1999; Harhay et al., 2013; Jaddou et al., 2000; Kumbasar et al., 2013; Mehler et al., 2001; Tailakh et al., 2013; Tailakh et al., 2014; Young et al., 2005).

A brief description of these 13 papers follows. Publications are categorized as: HBP or HTN in Armenians living in Armenia, HBP or HTN in Armenians living outside of Armenia and HBP or HTN in non-Armenians.

**HBP or HTN in Armenians living in Armenia**

Three papers reported data among participants living in nine fSU countries, of whom 36.44% were Armenians living in Armenia (Footman et al., 2013; Harhay et al., 2013; Roberts et al., 2012). All three papers reported data from a national survey collected from 2001-2013.

In a study by Roberts and colleagues (2012), changes in use of HTN treatment were assessed in Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyzstan, Moldova, Russia and Ukraine (Roberts et al., 2012). The descriptive study was conducted in 2010 and compared the findings of the authors' previous study conducted in 2001. The data were collected by using national household survey and face-to-face interview questions with 17,914 adults over 18 years of age. Among this group, 10% were Armenians living in Armenia. BP was not measured in this study.

For participants in the fSU countries listed above, the investigators collected demographic data and information about general health, physical fitness, economic status, psychological distress, alcohol and tobacco use (Cockerham, Hinote, & Abbott, 2006). Also, the participants were asked if they had ever been told by a doctor that their BP was too high and how frequently they took their BP medication. The paper did not define the parameters of HTN and self-reported data determined if the participant was hypertensive or not hypertensive. Adherence to HTN treatment was defined as regular or irregular. Participants with HTN who did not take prescribed antihypertensive medication(s) daily were considered to be on irregular treatment (Roberts et al., 2012).

Among the sample of 17,914 of all nationalities, 56% of the participants were women. The sample size of the Armenians living in Armenia was 1,800 (10% of 17,914) and 24.1% were diagnosed with HTN. Irregular treatment for HTN was much higher among Armenians (79%) than among persons from Kazakhstan (73%), Moldova (73%), Ukraine (70.2%), Azerbaijan (70%), Kyrgyzstan (69.3%), Belarus (67.4%), Russia (64.1%), and Georgia (55.7%) (Roberts et al., 2012). Significant associations were revealed between irregular treatment and gender (men), younger age, high fitness levels, and among participants who currently smoked and consumed alcohol. The study concluded that the irregular HTN treatment continues to be a major problem in the countries of the fSU (Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyzstan, Moldova and Ukraine) and require immediate attention (Roberts et al., 2012).

Another study was conducted in fSU countries, such as Albania, Armenia, Azerbaijan and Ukraine, using national Health Household Survey (HHS) data (Harhay et al., 2013). The purpose of the study was to report the relationship between socioeconomic position (SEP) and BP findings in these fSU countries. In addition to self-reported data about SEP, BP was measured by trained physicians and nurses for each country. However, these health care providers did not follow AHA and/or JNC-8 guidelines in measuring BP.

Among a sample size of 7,345, of whom 1207 (16.4%) were Armenian, findings specific to Armenians indicated that 84% were women, mean age was 31.3 years; 27.3% of men and 21.7% of women were hypertensive. HTN was defined as systolic blood pressure (SBP) $\geq$ 130 mmHg and diastolic blood pressure (DPB) $\geq$ 85 mmHg. Armenian men had a higher mortality rate (709/100,000) than women (368/100,000), and urban women who were highly educated and of high SEP had normal BP (SBP $\leq$ 120 mmHg and DPB $\leq$ 80 mmHg) compared to rural Armenian women (SBP $\geq$ 140 mmHg and DPB $\geq$ 90 mmHg (Harhay et al., 2013). The

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investigators recommended the implementation of a national campaign to educate the public about CVD risk factors (Harhay et al., 2013).

The focus of a descriptive study conducted in Russia, Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyzstan, Moldova and Ukraine was to examine the comorbidity of psychological distress and HTN in Russia and in eight fSU countries (Footman et al., 2013). National household survey data in 2001 and 2010 were analyzed to compare the levels of psychological distress in people with and without self-reported HTN across the two-time periods.

The sample size was 18,248 in 2001 and 18,000 in 2010. The sample size for Armenians from 2010 data was 1,800 (10%). More females responded to the survey than men. Using random sampling, a member from each household was selected for face-to-face interview by using a standardized questionnaire.

The results for the entire sample (2010) indicated that 29.3% of the respondents reported having HTN. Interestingly, the investigators did not define HTN. Significantly higher levels of psychological distress (9.9%) were experienced by hypertensive participants than non-hypertensive individuals (4.9%). After controlling for demographic and socio-economic characterizes, among participants of Armenia and Kyrgyzstan, women aged 50 and older, those less educated and having low income, and those with poor emotional support and limited access to health care and medications reported higher levels of psychological distress when living with HTN ($p < .05$) (Footman et al., 2013). The study reported a significant association between psychological distress and HTN in Russia and fSU countries ($p < .01$). Levels of psychological distress among those with HTN are depicted as follows: Armenia 15.9%, Moldova 13.8%, Georgia 12.1%, Kyrgyzstan 10.6%, Ukraine 10.0%, Belarus 7.1%, Azerbaijan 6.0% and Kazakhstan 4.1 (Footman et al., 2013).

**HBP or HTN in Armenians Living Outside of Armenia**

Two papers reported data on HTN in Armenians living outside of Armenia and in Lebanon and Turkey (Arevian et al., 2004; Kumbasar et al., 2013). The first paper was a descriptive study to explore risk factors for coronary artery disease (CAD) in Lebanese-Armenian women, and examined the association between HTN and other CAD risk factors (Arevian et al., 2004). The study collected data from a convenience sample of 83 Lebanese-Armenian women who attended a series of panel discussions about risk factors for CAD. The setting of the study was in a primary healthcare clinic and the investigators used structured interview and collected clinical/laboratory data. HTN was defined as SBP $\geq$ 140 mmHg and DPB $\geq$ 90 mmHg.

The investigators reported that 74% of the participants were 50 years of age or older, 85.5% of the women were housewives, 70% were non-smokers and 60.2% were physically active (walked regularly). Sixty-four percent of the participants had body mass index (BMI) levels > 27.3 kg/m², close to two-thirds (65.8%) were hypertensive, 71.6% were hypercholesterolemic, 53.1% had high levels of low density lipid (LDL-C), 61.7% had low levels of high density lipoprotein cholesterol (HDL-C), and 40.7% had high triglycerides. Hypertension was associated positively with older age, total cholesterol (Total-C), LDL-C and triglyceride levels, lack of physical activity and family history of HTN. Furthermore, 41% of the participants were aware of having HTN and slightly more than half (58.8%) reported taking medications regularly (Arevian et al., 2004).

The second study conducted in Turkey included Greeks, East Turkistanis, West Thracians and Armenians (Kumbasar et al., 2013). The sample size was 1106; 304 Armenians, 275 East Turkistanis, 274 West Thracians and 254 Greeks. Participants were recruited from

fraternity society groups living in Istanbul. Weight and height, waist circumference (WC) and

BP were measured. The BP was measured by using manual sphygmomanometer and taken twice

with three minute intervals. HBP was defined as SBP $\geq$ 130 mmHg and DPB $\geq$ 85 mmHg or on

antihypertensive medication(s). Furthermore, blood samples were collected to determine glucose

and lipid levels (Kumbasar et al., 2013).

The findings indicate that participants were 20 years or older. The prevalence of HTN

was 40% in East Turkistanis, 31.9% in Armenians, 24.5% in West Thracians and 18.5% in

Greeks. Furthermore, the prevalence of metabolic syndrome was significantly different ($p < .05$)

between ethnic groups: West Thracians, 24.9%, Armenians, 20.4%, Greeks, 19.3% and East

Turkistanis, 15.3% (Kumbasar et al., 2013).

**HBP or HTN in Non-Armenians**

Multiple studies for non-Armenians were conducted in the US, in the fSU and Arabic

countries. For example, studies reported the prevalence of HTN in Arabs and Russians living in

the US, and fSU populations living in Georgia, Kyrgyzstan, and Arabs living in Jordan and

Qatar.

In a study of Arab-Americans (AA) living in New York, the association between nativity

and self-reported diabetes and HTN was studied among a sample of non-Hispanic whites, Arabs

born in the Middle East and those born in the US (Dallo & Borrell, 2006). The sample size of

the study was 79,653; 79,228 were whites and 425 were Arabs (.53%). The data was analyzed

from adults assessed in the 2000-2003 National Health Interview Survey (NHIS). Overall, the

study showed the prevalence of HTN was 13.4% for AA and 24.5% for non-Hispanic Whites ($p$

$< .0001$) (Dallo & Borrell, 2006). In AA, the prevalence of HTN and diabetes increased as the

years in the US increased (Dallo & Borrell, 2006).  The prevalence of diabetes was 6.9% for

non-Hispanic Whites and 4.8% for AA.

In a cross-sectional study on AA living in Southern California, investigators assessed

their prevalence of HTN, their levels of awareness of being hypertensive, and treatment and

control in hypertensive patients (Tailakh et al., 2013).  In addition, lifestyle behaviors, such as

physical activity, nutrition and weight control were assessed.  The sample included 126 adult

AAs, 18 years of age and older.  Following Joint National Committee (JNC-7) BP measurement

guidelines, BP was measured three times at 60-second intervals after resting for five minutes.

Instruments measuring BP, and weight and height were calibrated following manufacturer's

recommendations.  Demographic data were collected (age, gender, marital status, years of

residence in the US, education level, employment, income and health insurance).  Furthermore,

personal health information was collected, such as alcohol and tobacco use and medical history

(Tailakh et al., 2013).

The results of the study indicated that the mean age of the participants was 41.7 years,

58.7% were men, 76.2% were married, 58% had university or postgraduate degrees, and 75.4%

had health insurance.  The mean BMI was 29.77 kg/m², 11.1% were smokers and diabetics, and

5.6% drank alcohol regularly.  Furthermore, 36.5% had HTN, and 39.7% were prehypertensive.

The prevalence of HTN was higher in men than in women (45.9% and 23.2%, respectively; $p$

=.029) and increased with age ($p = .01$).  Hypertensive participants had higher BMI (mean 31.55

kg/m²) compared with normotensive participants (mean, 28.37kg/ m²; $p = .01$).  More than half

(52.5%) of HTN participants did not adhere to prescribed BP medications, and only 9% of

women who took BP medication had their HTN under control (Tailakh et al., 2013).

Among a convenience sample of 207 Russian immigrants living in Denver, Colorado, participants were assessed for cardiovascular (CV) risk factors by survey; moreover, vital signs and blood samples (serum glucose, creatinine, Total-C, HDL-C, LDL-C, triglyceride level) were collected by a registered nurse (Mehler et al., 2001). BP was measured on each participant by using adjusted cuffs and done twice on both arms after resting for five minutes. The study results indicated that the Russians living in the US had a higher prevalence of HTN ($p < .03$) and hyperlipidemia ($p < .03$) compared to the US participants. The prevalence of diabetes in the Russian immigrant population was similar to the prevalence in the general US population (Mehler et al., 2001).

In a study comparing Russian immigrants and American-born Caucasians (ABCs) living in the US, differences in cardiac risk factors, and type of medication taken, during a hospitalization with chest pain or shortness of breath was assessed (Fridman et al., 2006). The setting was inpatient cardiac units; the sample size was 56 ABCs and 47 Russians. The mean age for the Russian participants were 20 years of age ($SD = 16$). Participants were assessed for cardiac risk factors, history of cardiac events, type of medicine prescribed and therapies. Furthermore, vital signs, height and weight, lipid panel and glucose levels were collected. The results of the study indicated that Russian immigrants had more cardiac risk factors, such as HTN than American counterparts (81% vs. 50%, $p = .002$), had more previous heart attacks (45% vs. 20%, $p = .012$) and higher SBP (138, $SD = 13$ vs. 129, $SD = 23$, $p = .019$) (Fridman et al., 2006).

A study conducted in the country of Georgia described the prevalence of cardiovascular risk factors in adults living in Tbilisi, Georgia (Grim et al., 1999). The sample size was 321 adults, with a mean age of 55 years. The data were collected by using a survey questionnaire;

BP was measured on all participants twice on the right arm instead of the left arm. HTN was

defined as in the Joint National Committee's (JNC-6) guidelines; SBP $\geq$ 140 mmHg and DBP $\geq$

90 mmHg or on antihypertensive medication. The prevalence of HTN was 56.3%; 58% (53/92)

in men and 56% (128/229) in women. In addition, 31% of the participants had a Total-C of $\geq$

220 mg/dL. A similar number had a low HDL-C $\leq$ 35 mg/dL. Smoking was present in the 60%

of men and none took aspirin to prevent premature CAD. There was no significant correlation of

BP with BMI, waist or hip circumference (Grim et al., 1999).

A study among Kyrgyzstan adults examined the prevalence of HTN and other illnesses.

The sample size consisted of 532 adults aged 20-100 years of age (Young et al., 2005). The data

was gathered from clinic visits over three days during humanitarian medical visits. The

participants were interviewed and BP was measured once. HBP was defined as SBP $\geq$ 140

mmHg and DPB $\geq$ 90 mmHg or on antihypertensive medication(s). The prevalence of HTN was

39%; a greater prevalence of HTN was found in men (46%) as compared with women (33%).

HTN increased with age; the slope of the increase in SBP with age surpassed the findings in

developed countries (Young et al., 2005).

A study conducted among Jordanians examined the magnitude of HTN, level of

awareness of HTN and its control, and a comparison of BP findings between urbanized and non-

urbanized Jordanians living in Jordan (Jaddou et al., 2000). The sample size was 545 adults who

were over 25 years of age. HBP was defined as SBP $\geq$ 160 mmHg and DPB $\geq$ 95 mmHg. A

structured interview questionnaire was utilized to collect information on history of HTN,

diabetes, hyperlipidemia and smoking. BP was measured on participants using manual

sphygmomanometers and repeated BP measurements were not reported. The prevalence of HTN

was 37% ($n = 543$) and 60% of the sample was women. HTN was positively associated with

older age, illiteracy, BMI, family history of HTN, and diabetes.  The rate of uncontrolled HTN was significantly higher for the 40-and-over age group, and was not associated with gender, level of education, obesity or a family history of HTN (Jaddou et al., 2000).

The final research study conducted in Qatar assessed the effect of HTN on patients hospitalized with congestive heart failure (CHF) and identified the risk factors for developing CHF (Bener et al., 2004).  The data were collected from 10 years of retrospective clinical records with the sample size of 20,856 patients.  Of these, about 40% were Qataris.  From the Qatari population, males constituted 60% of the sample and 46% of the hospitalized patients had CHF. HTN was defined as SBP $\geq$ 140 mmHg and SBP $\geq$ 90 mmHg and or use of antihypertensive medication(s).  The study findings revealed a higher mortality rate in Qataris than non-Qataris, and participants with HTN were most likely to have diabetes and hypercholesterolemia. Furthermore, significant differences between hypertensive and non-hypertensive cases were found with cardiac heart disease (CHD) by gender ($p < .001$).  The prevalence of HTN was 47% ($n = 3713$).  Hypertensive subjects were more likely to have diabetes ($p < .001$).  CHD subjects without HTN were more likely to be smokers than were the CHD patients with a history of HTN. Lastly, mortality rate of CHD patients with HTN was higher among Qataris than non-Qataris ($p < .038$) (Bener et al., 2004).

**Household Health Survey (HHS) in Armenia**

The United States Agency for International Development (USAID) and Primary Healthcare Reform Project (PHCR) Household Health Survey (HHS) was conducted in Armenia (USAID/PHCR, 2008).  The purpose of the survey was to assess knowledge, attitudes, and practices with regard to open enrollment and family medicine, perceived health status, and use of early diagnostics and preventive services among people living in Armenia.  Additional items on

the survey included an assessment of accessibility to care and perceived quality of care received as well as the level of exposure to health education activities conducted by the PHCR project (USAID/PHCR, 2008).

The researchers at the Center for Human Nutritional and Dietary Assessment (CHNDA) at American University of Armenia (AUA) developed the 113-item survey and collected data from October to December of 2006 with a sample of 2,310 households from 11 regions of Armenia, including Yerevan. The investigators used a multistage probability proportion to size cluster sampling technique to gather the survey data (USAID/PHCR, 2008). The instrument was administered with a hybrid design; interviewer-administered and self-administered. Interviews were conducted with men and women age 18 and older living in a household.

Overall, in addition to demographic and economic status of the participants, the findings of the survey were reported in the following five categories: health status, health behavior/lifestyle, use of primary health clinic (PHC) early diagnostic and prevention services, public awareness and open enrollment, family medicine and free PHC and community involvement.

**Demographic and economic status data.** The survey revealed that 51.5% of the respondents were from rural areas while the rest lived in urban areas. Almost all participants were of Armenian nationality (98.6%). Russians constituted 0.5% of the sample, followed by Yezidi (0.4%) and Assyrian (0.4%). The mean total number of people living in the surveyed household was 4.7 and ranged from 1 to 17. The mean number of adult males living in the household was 1.6, with a range from 0 to 5, while the mean number of children under 18 per household was 1.4, ranging from 0 to 9 (USAID/PHCR, 2008).

Approximately 9% of women had less than 10 years of school.  The majority of women had either completed 10 years of school (39.5%) or 10-13 years of professional technical education (34.6%).  Less than 17% of women completed Institute/University, and only 0.2% had postgraduate education.

The majority of the participants were not employed (84.9%); 35.3% of those unemployed were looking for work; 21.3% reported that they could not work due to disability, and 15.1% reported that they were retired.  When compared to different regions, participants from Yerevan and Shirak regions had the highest level of education (38.5% and 22.3%, respectively), while participants from Aragatsotn and Vayots Dzor had the lowest (8.2% and 10.0%, respectively).  The Yerevan region was ranked third highest (19.2%) for employment, followed by the Armavir region (19.5%) and the Shirak region (20.1%).  The mean age for Yerevan respondents was 44.6 years while the mean age of the Gegharkunik participants was 38 years (USAID/PHCR, 2008).

**Health status.** More than 60% of participants rated their health status as "fair" or "poor" and perceived their own health as declining while perceiving the health of the children in the household as improving.  Most participants (60.8% of males and 55.2% of females) perceived they had a chronic health condition.  HBP was the most frequent problem (28.7%), followed by vision problems (25.8%).  Nearly two-thirds of the female participants and half of male participants reported being limited in their vigorous physical activities due to non-specified health problems.  Mean satisfaction scores with one's own health and life was 56.8% for females and 57.5% for males (USAID/PHCR, 2008).

**Health behavior/lifestyle.** Over 60% of men and 1.7% of women reported they were current smokers.  The average daily number of cigarettes smoked by men was 22.8 and 12.3 by women.  Alcohol use in males was much higher, 40% of men and 4% of women reported having

one or more drinks per week.  The proportion of household where any member drank 5 or more portions of any kind of alcohol almost every day was 12.7%, with this proportion being 2.8% among female and 27.2% among male participants.  Nearly 7.1% of male and 4% of female participants stated they knew someone in their community who was drug-addicted.  Sixty percent of females and 56% of males believed that staying healthy is a matter of luck more than anything else.  Lastly, 40% of females and 44.7% of males agreed that it is generally better to practice self-treatment than visit a doctor (USAID/PHCR, 2008).

**Use of Public Health Clinic (PHC)/early diagnostic and prevention services.**
Approximately 26% of participants had not visited a PHC in the last two months, even when there was a need.  The main reasons for not using PHC services were lack of money/too expensive healthcare (49.7%), lack of trust in PHC providers/their qualification (16.7%), and lack of time (10.8%).  More than 22.7% of the sample reported that they never used PHC services.  Among screenings obtained, checking BP was rated higher (76.9% of participants) than screening for pap smear, breast exam, etc.  Only 12.8% of households had members who had made preventive visits to PHC facility during the last 12 months.  Lastly, for all assessed conditions (diabetes, HTN, chronic lung disease, eye problems), the prevalence of secondary prevention activities was lower than recommended (once a year screening; USAID/PHCR, 2008).

**Public awareness of open enrollment (OE), family medicine (FM) and free PHC.**
Only 9% of participants reported having heard about OE and 51.2% of them were enrolled.  The participants reported that enrollment experience was easy.  The concept of FM was familiar to 62.7% of all the participants.  Five percent of the total sample had received care from a family doctor during the past year and the quality of care was perceived as good or very good.  Eighty-

one percent of the participants had heard about free PHC services available to population. More than half who had heard about the free services had sought free care. The most common source of information on PHC services was national media, healthcare providers, local media and friends/neighbors (USAID/PHCR, 2008).

**Knowledge, awareness, and attitudes/perceptions.** In HHS survey conducted in Armenia, knowledge, attitudes and practices questions about different illnesses were included (USAID/PHCR, 2008). Two items were about HTN, for example, "At its early stages, high blood pressure (hypertension) does not cause any noticeable symptoms", "Physically active lifestyle cannot prevent hypertension?" The results indicated that knowledge, attitudes and practices (KAP) scores were the lowest for HTN, osteoporosis and urinary tract infection among Armenian population (USAID/PHCR, 2008). Furthermore, Women had significantly higher KAP scores than men (especially with regard to smoking). KAP levels increased with educational level. No association was found between KAP levels and participant's age, living standard, or average monthly income (USAID/PHCR, 2008). The authors suggested to provide health prevention education programs to less educated.

In the US, knowledge, awareness and attitudes were measured in a hypertensive population of Midwestern health care facility. The results indicated that 95% of hypertensive patients knew that lowering BP would improve health and 91% reported that a health care provider had told them about their diagnosis. Eighty-two percent identified the meaning of HTN as "high blood pressure." Twenty-four percent did not know the optimal level for SBP or DBP (Oliveria, Chen, McCarthy, Davis, & Hill, 2005).

**Community involvement.** Only 6.8% of participants reported attending a meeting or activity in the community about health improvement. Of the 336 participants who would not

attend, 50.3% stated that they were not interested in such a meeting. Furthermore, 20.8% of the 336 participants stated that they did not have time to attend a community activity and 10.7% thought that health was a private matter (USAID/PHCR, 2008).

The results of the HHS also indicated that there were significant variations across the regions, especially with Vayots Dzor region and Shirk region being the most disadvantaged in terms of health status and health behavior/attitudes. Urban/rural differences were also found, with the urban population having better awareness of reforms in PHC sector than the rural population. Significant positive correlations were observed between many awareness and health-related variables and participants' education and financial status (USAID/PHCR, 2008).

In summary, the survey results raised concerns that the country (Armenia) needed immediate attention by the stakeholders of healthcare. Some of the concerns were in the lack of utilization of primary healthcare services, minimum community involvement in health-related matters, high prevalence of certain chronic health conditions that can be effectively managed, high level of exposure to either active or passive smoking and high reliance on fate and self-treatment to fight against disease (USAID/PHCR, 2008).

**Summary**

Overall findings of the literature indicated that the terms HBP and HTN were used interchangeably. Yet, based on American Health Association (AHA) guidelines (2014), a diagnosis of HTN requires that individuals have their BP measured several times over a three-month period. A majority of the studies used the term HTN without following AHA or JNC-8 guidelines. Even when BP was measured twice, it was measured the same day versus repeated measures over a longer interval.

The prevalence of HBP or HTN varied from 13.4% to 81% in the reported studies.  Seven studies described an association between HBP or HTN and its risk factors such as BMI, lipid panel results and glucose levels (Arevian et al., 2004; Dallo & Borrell, 2006; Grim et al., 1999; Jaddou et al., 2000; Kumbasar et al., 2013; Mehler et al., 2001; Young et al., 2005).  In general, participants with HBP or HTN were reported to have high Total-C, high triglycerides, high LDL-C and low HDL-C levels.  As stated above, only one study reported waist circumference (WC) and/or percent of body fat, and found that Armenian women had higher abdominal obesity than men (Kumbasar et al., 2013).  This study advances the literature in this area by measuring WC and hip circumference, in addition to the other factors.  The purpose of this research study was to report the prevalence of HBP and associated risk factors among a select group of Armenian men and women ages 21 and older.  Currently, only three studies have assessed HBP or HTN in Armenia (Footman et al., 2013; Harhay et al., 2013; Roberts et al., 2012).  However, these studies either did not measure BP or collect BP information according to AHA or JNC guidelines.  This study followed JNC-8 established guidelines to accurately measure BP, and regardless of level recorded (normotensive, prehypertensive or hypertensive) assessed BP along with multiple related risk factors that are physiologic, health lifestyle behaviors, economic status and inherited.

**Chapter 3**

**Theoretical Framework**

Studies on high blood pressure (HBP) or hypertension (HTN) have frequently used theories related to lifestyle changes, health beliefs, and planned behavioral change as their guiding framework. Analysis of different theoretical frameworks used in previous research has led to the selection of the Health Lifestyle Theory (HLT) to guide my dissertation focused on reporting the prevalence of risk factors associated with cardiovascular disease (CVD) in Armenia, paying particular attention to HBP or HTN in Armenians living in Armenia.

In 2005, Cockerham formulated the HLT, a mid-range theory, which described the influence of lifestyle behaviors on health in positive and negative ways. HLT has been selected for the proposed dissertation because the core reason for conducting research on lifestyle behaviors was due to high mortality rate caused by CVD in Russia and former Soviet Union (fSU) countries (Cockerham, 2000, 2005, 2007; Cockerham, Hinote, Abbott, & Haerpfer, 2004; Cockerham, Hinote, Cockerham, & Abbott, 2006; Hinote, Cockerham, & Abbott, 2009).

The research was conducted in single and multi-country studies and compares health lifestyle behaviors with similar and different norms, beliefs, and values. These studies have been conducted in Armenia, Belarus, Georgia, Kazakhstan, Kyrgyzstan, Moldova, Russia and Ukraine. Scientists have systematically measured the concepts of the theory in groups with differing socioeconomic status, gender, age, and education in the Russia and fSU countries. However, to my knowledge, research testing the HLT has not been conducted to determine the association of HBP or HTN and HLT in the United States (US) or other countries. For the purpose of this study, while the entire theory will be presented in terms of relationships

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supported in the theory, greater detail will be provided for studies which highlight the major

variables of focus which include Structural Variables and Practices.

Each concept of the HLT is described and evidence to support most of the HLT's

concepts is provided. Furthermore, in the section, "Research support on HLT Structural

Variables and Practices," research findings that specifically address HLT's Structural Variables

and Practices concepts are presented.

**Health Lifestyle Theory (HLT)**

The HLT was constructed with seven concepts: (1) Structural Variables (renamed by

theorist in 2005 to represent variables in Box 1, as shown in Figure 1 below), (2) Socialization-

Experience, (3) Life Choices, (4) Life Chances, (5) Dispositions to Act (Habitus), (6) Practices

(Action), and (7) Health Lifestyles (Reproduction).
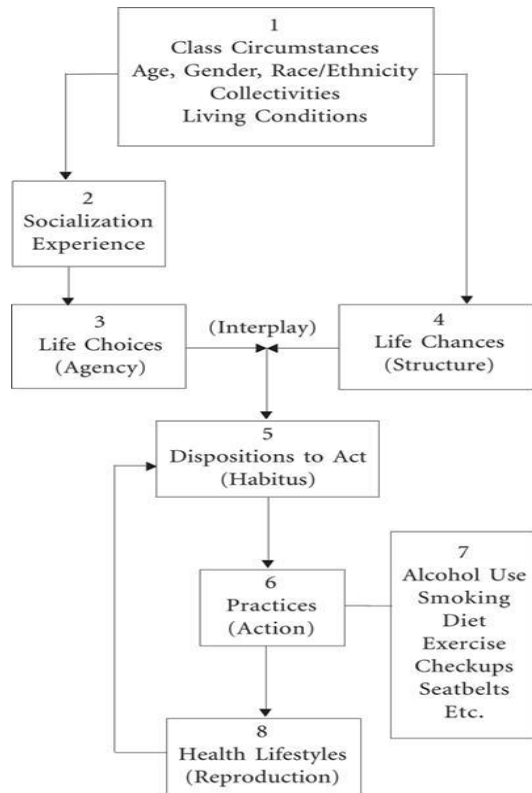


*Figure 1*. Health lifestyle theory (Cockerham, 2005, 2014).

Prior to Cockerham's development of the HLT, Max Weber, a German Socialist, introduced lifestyle theory in the early 20th century. Weber's classic work with lifestyle theory was first published in 1922, in a book entitled "Economy and Society". This theory was based on Karl Marx's philosophy, which stated that a person's social class position is determined exclusively by his or her degree of access to society's means of production (Cockerham, 2012). The four categories of Structural Variables that shape health lifestyles are: (1) Class Circumstances, (2) Age, Gender, Race/Ethnicity, (3) Collectivities, and (4) Living Conditions. See Figure 1, Box 1.

**Class circumstances.** Class circumstances is defined as the link between lifestyle and socioeconomic status; it is theorized to have the greatest influence and is the most powerful variable in shaping health lifestyles (Cockerham et al., 2006). Regardless of gender or age, the lifestyles of the upper and upper-middle classes are healthier than those of the lower class (Cockerham, 2005, 2010, 2012). For example, in the US, a low-income family of five may know that hamburgers may not be a healthy meal; however, due to lack of financial resources, they may not have options to select healthy meal for their families (Cockerham, 2005). Thus, unhealthy eating habits may not be a choice by the individual (Agency), but rather of Class Circumstances and Structural disadvantages.

Studies conducted in the US and Europe indicated that Class Circumstances are linked with education, so that the higher the social class, the more educated the participants. Education may induce individuals to exercise regularly, seek health checkups, and generally smoke less (Viera, Thorpe, & Garrett, 2006). However, investigators of other studies conducted in the Russian Federation, Singapore, and South Korea have found education not to be positively correlated with smoking cessation (Cockerham, 2000; Park & Kang, 2008).

**Age and gender.** Age affects health lifestyle because as people age, they are more likely to take better care of their health. Compared to studies conducted in Russia, in the US, older people choose their food more carefully, generally abstain from smoking and alcohol, and habitually take more frequent rest periods (Cockerham, 2010, 2012); (Selivanova & Cramm, 2014). However, the opposite is true of physical activity, which often declines with age (Cockerham, 2010, 2012). American women, when compared with American men, eat healthier, smoke less, more frequently seek preventive care, and more often wear seat belts (Center for Diseace Control and Prevention [CDC], 2007; Center for Disease Control and Prevention [CDC], 2010; Cockerham, 2010, 2012). Furthermore, younger men are less likely to seek health care services for routine checks or screening of blood pressure (BP) than older men (Grzywacz et al., 2012).

A study conducted among women in eight fSU countries (including Armenia) indicated that Russian females consumed alcohol more frequently than non-Russian females, with the exception of Moldovan women. Younger females throughout the fSU countries consumed alcohol more frequently than older women (Hinote et al., 2009). In a study conducted in Russia, males were significantly more likely than females to smoke, drink alcohol, exercise, and consume a higher level of fat daily (Cockerham, 2000).

**Race/ethnicity.** Research in this category is limited in Russia and fSU countries. The health status of ethnic groups is often influenced more by the Structure than by the individual (Agency). Evidence comparing physical activity between different countries show high physical activity was most prevalent in New Zealand, the Czech Republic, the USA, Canada and Australia than Brazil and Spain (Bauman et al., 2009). In studies comparing African-Americans

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(AA) and whites in the US, whites often drink alcohol, smoke, exercise, and practice weight control more often than AAs (Center for Disease Control and Prevention [CDC], 2015).

If a person from a certain ethnic group seeks health care, but the Structure does not accommodate the ethnic group's needs, the individual will not receive care. This paradox has been documented in Great Britain with ethnic groups such as Pakistani, Bangladeshi, Indian, and African-Asians. Therefore, research has concluded that the effects of race and ethnicity may reside more powerfully in Life Circumstances rather than on the individual's choice (Center for Disease Control and Prevention [CDC], 2015; Cockerham, 2010; Kaufman, 2014; Scambler, 2013).

**Collectivities.** Cockerham describes Collectivities as groups of people who are linked through particular relationships, such as kinship, religion, politics, and work. The group shares common norms, values, ideals, and social perspectives. Mead (1934) has contended that the values and norms of social Collectivities or groups enter into the thinking of the individual (Cockerham, 2010; Scherrer et al., 2012). Family and kinship groups influence individuals' health lifestyle; and children accept and learn from their caretakers as part of the norm and way of life. Religion as part of the Collectivities category likewise often promotes health. Individuals invested in religion will, in most cases, be less inclined to partake in unhealthy behaviors such as drinking or smoking (Assanangkornchai, Talek, & Edwards, 2016).

In the Islamic religion, alcohol use is forbidden; thus, alcohol consumption is very low (Assanangkornchai et al., 2016). Another example of Collectivities influencing individual lifestyle behavior is smoking: if people smoke within a group, most likely, non-smokers will pick up the habit (Cockerham, 2000; Scherrer et al., 2012). As these examples illustrate, behaviors

learned through the concept of Collectivities may have a positive or negative influence on the individual's health (Cockerham, 2010; Scherrer et al., 2012).

**Living conditions.** This category of Structural Variables concept also pertains to differences in the quality of housing and in access to basic utilities. People living in positive conditions with adequate water, heat, and food are healthier than when conditions lack the basic needs for healthy living. In the US, living in disadvantaged neighborhoods has been associated with less positive health status (Browning & Cagney, 2002; Cockerham, 2005). Furthermore, people living in unsafe neighborhoods refrain from vigorous outdoor exercise and may be predisposed to non-desirable health lifestyles (Grzywacz & Marks, 2001; Grzywacz et al., 2012; Molnar, Gortmaker, Bull, & Buka, 2004).

In summary, the four categories of Structural Variables concept are responsible for creating the opportunities that an individual will have in their lifetime. Due to the varying circumstances that different people are born into, the opportunities one person encounters will not be the same as another.

### Socialization and Experience

Experience is an essential basis for an individual's (Agency's) practical and evaluative dimension to evolve over time (Cockerham, 2005). Individual's socialization and experience molds them, with the four structural variables partially responsible for the choices of the individual (Cockerham, 2005). As stated earlier, even if the individual (Agency) seeks being healthy, their behaviors may well be influenced by Structure rather than their own control (Cockerham, 2005).

**Life Choices (Agency)**

Agency is the capacity of the individual to act independently and to make their own free choices in life (autonomy). The individual (Agency) chooses a behavior (or action), and notes that even though the individual has alternative options, they may not necessarily choose healthy lifestyle behaviors (Cockerham, 2005).

The individual (Agency) has the power to choose lifestyle, whereas, structure limits choices available to the individual (Cockerham, 2005). The individual (Agency) critically evaluates and chooses course of action and gives subjective meaning to choice. Health behavior is a matter of individual choice and lifestyle behaviors may be promoted through different opportunities, such as education (Cockerham, 2005).

**Life Chances (Structure)**

Originally, the term Life Chances was coined by German sociologist Max Weber (1949). Cockerham, also a medical sociologist, used the term Life Chances in the HLT. Life Chances refers to the opportunities each individual (Agency) has to improve quality of life. The available resources in a person's life dictate whether the individual uses the resources to improve life both socially and economically (Cockerham, 2005). The term also refers to advantages and disadvantages of class situations. For example, the higher a person's position in a class hierarchy, the better the individual's (Agency's) life chances (Cockerham, 2005).

**Choice and Chance Interplay**

The arrows in Figure 1 indicate the dialectical interplay between Life Choices (Box 3) and Life Chances (Box 4). Choices and Chances operate in tandem to determine a distinctive lifestyle for individuals, groups, and classes. Life Chances (Structure) either constrain or enable Choices (Agency). People choose their actions that either enable or constrain them. To

accomplish a set goal, people take into consideration the resources available and Structural

Variables.  Unrealistic goals and expectations are most likely not successful, whereas, realistic

goals are based upon what is structurally possible (Cockerham, 2005).

**Disposition to Act (Habitus)**

Disposition to Act (Habitus) is a cognitive map or set of perceptions in the mind that

routinely guides and evaluates an individual's (Agency's) choices and options (Cockerham,

2005).  Actions can be carried out without much thought and tasks are routine and intuitive

(Cockerham, 2005, 2010).

The term Habitus was used as early as ancient Greece, but its contemporary usage was

introduced by Mauss and later re-elaborated by Merleau-Ponty and Bourdieu (Cockerham,

2005).  In 1977, Bourdieu elaborated on the notion of Habitus by explaining its dependency on

history and human memory.  For instance, a certain behavior or belief is part of a society's

structure even though the original purpose of that behavior or belief can no longer be recalled.

The concept of Habitus is also present in the work of Weber, Deleuze, and Husserl (Cockerham,

2005).

Disposition to Act is related to Collectivities where the individual (Agency) is influenced

by group norms, and the structure defines the individual's decision (Cockerham, 2005).

However, even though group norms influence an individual's actions, Bourdieu contends that the

Life Choices concept is at the core of a person's actions.  Experiences also influence the

individual (Agency).

**Practices (Action)**

Practices through Action contribute to health lifestyle behavior.  HLT identifies the

following behaviors as common measurable Practices:  Alcohol Use, Smoking, Diet, Exercise,

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Checkups, and Seatbelts, etc.  Practices may be either positive or negative, but nonetheless comprise a person's overall pattern of health lifestyle (Cockerham, 2012).

**Alcohol use.** As demonstrated by multiple studies, the use of alcohol is directly associated with availability.  In many countries, alcohol is sold at gas stations, in convenience stores, and in drive-through shops.  A study conducted in France and Ireland indicates socioeconomic status does not affect the use of alcohol (Woodside et al., 2012).  In Russia, alcohol use is much higher in men than in women, a trend which is true for Armenia and the rest of the fSU countries except for Kyrgyzstan (Cockerham, 2010).

In Russia, drunkenness is not seen as a social problem as there is no social stigma attached.  Abuse of alcohol is the normative expectation and the outcome of experience (Cockerham et al., 2004).  To ban smoking, manipulation of Structural factors such as increasing taxes on alcohol, prohibiting alcohol use by youth and among individuals already intoxicate, establishing law enforcement check points, and using media counter-advertising will help to reduce the use of alcohol (Cohen, Scribner, & Farley, 2000).

**Smoking.** In 1990's, tobacco is the number one cause of death in the US by virtue of its association with cancer, heart, and lung disease (Cohen et al., 2000).  The use of tobacco has decreased in the US, while increasing in Asia, Europe, and the fSU countries (WHO, 2015).  Success in reducing tobacco use in the US has been attributed to prohibiting cigarette sales to minors, increasing prices, and banning smoking in public areas such as restaurants, hospitals, and worksites.  In addition, anti-smoking advertising in the media has been highly successful in decreasing the number of smokers (Cohen et al., 2000; Nonnemaker et al., 2014).

**Diet.** Health lifestyle behavior addresses food choices people make daily.  People may eat healthy or unhealthy based on their personal choices or due to Structural influences.  The

habit of eating healthy foods is based on multiple variables such as education, age, gender, and socioeconomics. Studies report that individuals with high socioeconomic class and education levels consume healthier foods as affluent individuals are able to afford the purchase of costly foods, such as fruits and vegetables (Cockerham et al., 2004; Park & Kang, 2008).

Obesity is currently a major health concern in the US, recently rising from 8% to 35% (US, 2015). Structural factors lie at the root of the problem. Several factors include the proliferation of high-fat and high-calorie foods in fast-food outlets and vending machines (Mayo Clinic, 2015). Furthermore, the media contributes to obesity through food advertising by encouraging both unrestrained consumption and a sedentary lifestyle: people spend an average of three hours per day watching television rather than exercising (WHO, 2015; American Heart Association, 2014; Cohen et al., 2000).

**Checkups.** The practice of seeking health checkups at clinics or medical offices is related to the socioeconomic level of the individual (Agency) as well as to the Structure. People who have to pay for their checkups and are concerned about their medical bills most likely will not seek regular checkups, a practice which will predispose them to chronic illnesses (Grzywacz et al., 2012). Studies also indicate that older persons pay more attention to their health status and are more prone to see a healthcare provider as compared with younger persons (Cockerham, 1981; Grzywacz et al., 2012).

Recently, several insurance providers, including Kaiser and Emory University, have begun to offer a monetary incentive to individuals who seek yearly checkups or who attend to routine screenings (Kaiser Health News, 2015). This is another example of how the Structure influences the Individual (Agency) to change lifestyle behaviors to promote health (Cockerham, 2005).

In the practice arena, HLT's Practices Concept is operationalized in many research instruments such as Health Promotion Lifestyle Profile (HPLP). Questions about smoking, alcohol use, diet, and physical exercise provide vital information to determine the risk factors associated with HBP.

**Health Lifestyle (Reproduction)**

Cockerham (2005) described Health Lifestyle (Reproduction) as the result of action or inaction of specific health practice, such as smoking, use of alcohol, and physical activity. The individual determines which actions (healthy or unhealthy) should be part of life and repeats (Habitus) the same behaviors throughout life (Abel & Frohlich, 2012; Cockerham, 2005) as shown in figure by the arrow showing movement from Box 8 back to Box 5.

**Research Support on HLT Structural Variables and Practices**

Cockerham and his colleagues tested HLT's Structural Variables and Practices concepts on populations in Armenia, Belarus, Georgia, Kazakhstan, Kyrgyzstan, Moldova, Russia and Ukraine. Four different research studies will be described: (a) Lifestyle behaviors in Russians with CVD (Cockerham, 2000, 2007), (b) health lifestyle Practices (drinking, smoking and diet) and self-rated health status and Practices variables in Belarus, Russia and Ukraine (Cockerham, Hinote, Cockerham, et al., 2006), (c) association of Practices variables and life expectancy of Kazakhs and Kyrgyzs (Cockerham et al., 2004), and (d) use of alcohol in females post-soviet union era in Russians, Armenians, Belarusians, Georgians, Kazakh's, Kyrgyzs, Moldavans and Ukrainians (Hinote et al., 2009). Cockerham and colleagues did not study the association of HBP or HTN with smoking, use of alcohol, diet and physical activity, and BP was not measured on the participants. However, Cockerham and colleagues studied lifestyle behaviors of populations with CVD that caused increased mortality and decreased life expectancy

(Cockerham, 2000, 2007; Cockerham et al., 2004; Cockerham, Hinote, Cockerham, et al., 2006; Hinote et al., 2009).

      **Russia.** In 1995, Cockerham examined health lifestyle in the Russian Federation as the decline in life expectancy was more severe in Russia than fSU countries (Cockerham, 2000; Hinote et al., 2009). The investigators assessed the association of gender with education and income (demographic data) on use of alcohol (Practices variable) (Cockerham, 2000). A random sample of 8,402 participants (mean age 44.7 years) participated in a survey on lifestyles related to alcohol use. The sample was 56.5% female and 43.5% male. The mean education level was at trade/factory training. The results indicated that males were significantly ($p < .01$) more likely than females to engage in all four of the negative health lifestyle practices by drinking alcohol more frequently, being a smoker, exercising, and consuming higher amount of fat daily (Cockerham, 2000).

      Also, age had significant effects on all four health lifestyle variables and perceived health status. Younger participants were more likely to drink frequently, smoke, exercise, eat fatty foods, and rate their health status as high. Furthermore, drinking by males started at ages 20-24 and peaked between 30 and 39. While the frequency of drinking declined significant after the age of 50, many Russian men died in their mid to late 50s (Cockerham, 2000).

      Less educated persons were significantly ($p < .01$) more likely to smoke, while higher educated participants were more likely to drink frequently, exercise and eat more fatty foods. Education was not significantly associated with self-rated health status, which is a distinct difference compared to the West, where education is often the strongest predictor for health status (Cockerham, 2000). Participants with higher income were more likely to drink frequently, exercise and have a higher fat intake. Furthermore, while unmarried persons were more likely to

exercise, frequency of drinking and fatty food consumption was higher in married than unmarried respondents (Cockerham, 2000).

The findings of the study conducted in Russia supports the interplay of Life Choices and Life Chances (Figure 1, Box 3 and 4). The healthy lifestyle of Russian males appears to be influenced less by Choice and more by Chance. The Socialization and Experiences (Figure 1, Box 2) of unhealthy lifestyle behaviors become routine practices in Russian men and the cycle continues by reproduction of unhealthy lifestyles (Cockerham, 2000).

In 2007, a similar study was conducted in Russia (Cockerham, 2007). The purpose of the study was to report association of gender with alcohol use and smoking (Cockerham, 2007). A random sample of 4,006 adults participated in a survey. The findings indicated that only education was significant ($p < .05$) in that men with less education were more likely to be smokers (Cockerham, 2007). Furthermore, younger men were more likely (OR = .963) to drink then older men. Men with less disposable income significantly ($p < .01$) drunk more than those with more disposable income ($p < .05$) (Cockerham, 2007). Females in lower status jobs were more likely ($p < .01$) to drink frequently than women in higher status occupations (Cockerham, 2007). Younger women were more likely ($p < .001$) to smoke than older women (Cockerham, 2007).

**Belarus, Russia, and Ukraine.** Cockerham and colleagues (2006) conducted a research study in Belarus, Russia and Ukraine to compare selected health lifestyle Practices (drinking, smoking and diet) and self-rated health status. The data from a random sample of 8,406 adults was analyzed after face-to-face interviews by experienced survey organizations in Belarus, Russia and Ukraine. The participants were 18 years and over (Cockerham, Hinote, Cockerham, et al., 2006).

The independent variables for the study were age, marital status, level of education, income and employment. The dependent variables were drinking, smoking and diet. The relationship between each independent variable and dependent variable was analyzed. The results indicated that frequent dinking was widespread among the men; they were also nearly 10 times more likely to drink alcohol frequently than females. Participants of Belarus were also more likely to drink more frequently than Russians. Conversely, younger adults, married person, and mangers/professionals were less likely to drink frequently when compared to older participants, the unmarried and unskilled workers (Cockerham, Hinote, Cockerham, et al., 2006).

Smoking was 12 times more common in males than in females and skilled workers were also more likely than unskilled workers to smoke. Furthermore, Belarusians and Ukrainians were less likely to smoke than Russians (Cockerham, Hinote, Cockerham, et al., 2006).

Participants with high income, skilled/professionals consumed meat daily more than low income and unskilled participants. Also, men had meat in their diets more than females. Compared to Russians, Belarusians were about 17% less likely to eat meat and those in the Ukraine were about 73 percent less likely. The findings suggest that daily meat consumption was not as widespread in Ukraine as in Russia. Belarusians consumed more meat than Ukrainians (Cockerham, Hinote, Cockerham, et al., 2006).

Furthermore, Cockerham and colleagues (Cockerham et al., 2006) investigated if political ideology made a difference in some health lifestyle Practices. The results indicated that fSU did not promote individuality or individual initiative in health matters as the central government imposed a collectivist (Figure 1, Box 1) oriented dominant ideology on the population (Cockerham, Snead, & Dewaal, 2002; Franco, Alvarez-Dardet, & Ruiz, 2004; Martyn, 2004).

**Kazakhstan and Kyrgyzstan.** Another study was conducted by Cockerham in two fSU countries: Kazakhstan and Kyrgyzstan. The purpose of the study was to investigate Practices variables; smoking, use of alcohol, physical activity and diet on life expectancy of Kazakhs and Kyrgyzs. The sample size was 4000; 2000 from each country. In addition, information about education, income, occupation, ethnicity and religious affiliation was collected (Cockerham et al., 2004).

The results for the Kazakhstan population indicated that males, younger adults, non-Russians, and non-Muslims drunk most often. Kazakh males were nearly 18 times (OR = 17.695) more likely to drink and smoke than females. Also, Kazakh males were nearly three times (OR = 2.888) more likely to have heavily physical activity at work and nearly 1.3 times (OR = 1.318) more likely to eat meat daily than Kazakh females.

In summary, Kazakh young males had negative health lifestyle practices with respect to drinking, smoking, physical activity at work and consumed more daily meat than females and older participants (Cockerham et al., 2004). Kazakh in lower-status occupations reported much greater physical activity at work, while those in higher-status occupations report the best overall diets with respect to daily meat, vegetable and fruit consumptions (Cockerham et al., 2004).

The results from Kyrgyzstan were very similar to Kazakhstan. Gender was the strongest predictor; males were significantly ($p < .01$) more likely than females to be frequent drinkers, smokers and physically active. Females, conversely, were more likely ($p < .01$) to consume vegetables daily. Age, was also an important predictor, as younger middle-age respondents drunk and smoke more. Neither education nor income were strong predictors for healthy lifestyle patterns in two counties (Cockerham et al., 2004).

**Descriptive studies conducted in eight fSU countries**.  A cross-sectional descriptive study was conducted in eight fSU counties with females to determine the use of alcohol post-Soviet Union era.  The sample size was 10,454; which included 3072 Russians, 1424 Ukrainians, 1234 Armenians, 978 Georgians, 930 Belarusians, 855 Moldovans/Romanians, 799 others, 705 Kyrgyzs, and 385 Kazakhs (Hinote et al., 2009).

The results indicated that the largest represented age group was 35-59 year olds who were married.  Most females reported having just enough money for food and clothes followed by the category of not even having enough money for nutritional needs.  Most women had secondary education or higher and had wide range of occupations.  Between 9% and 12% of females reported consumption of alcohol at least once per week or more frequently (Hinote et al., 2009).

Furthermore, Russian females consumed alcohol more frequently than non-Russians in these eight countries with the exception of Moldavans.  Younger females consumed alcohol more frequently than older women, and the married drank less than unmarried, divorced or widowed females (Hinote et al., 2009).

**Summary**

Although the HLT has multiple concepts, the most relevant concepts to use in this research study are Structural Variables and Practices.  Cockerham and colleagues studied lifestyle behaviors (Practices variables) in Russia and fSU countries.  The core reason for Cockerham and colleagues conducting research on lifestyle behaviors was due to high mortality rates caused by CVD in Russia and fSU countries.  Cockerham's HLT was the chosen theoretical framework for this research study because the purpose of the dissertation is to report prevalence of HBP among a select group of Armenians and risk factors associated with HBP in Armenian men and women ages 21 and older.  The HLT provides a framework for guiding the study in the

examination of Structural and Practices variables in relation to HBP. The study collected specific information about the Structural variables in the HLT, such as age, gender, socioeconomic status and Practices such as smoking, use of alcohol, physical activity and diet.

Cockerham's HLT provides evidence that simply wanting to be healthy is not always enough. Personal changes (Agency) can certainly lead to a healthier life; however, if a person cannot make those changes because of economic or other obstacles (Structure), healthy lifestyle may not be attainable. Change on an individual level is not enough to return to a healthy lifestyle; Structural change is required to reach this goal.

Cockerham summarized HLT by concluding that each individual (Agency) has Life Choices and Life Chances, and due to Life Circumstances, Age, Gender, Race/Ethnicity, Collectivities and Living Conditions; the person chooses healthy or unhealthy actions (smoking, use of alcohol, diet, physical activity). Thus, the person (Agency) determines to lead a healthy or unhealthy lifestyle.

## Chapter 4

## Methods

This chapter describes the methodology for a descriptive study that was conducted in Armenia.  The theoretical framework of this dissertation is Health Lifestyle Theory (HLT).  The sections of this chapter include: (a) overview of study; purpose and specific aims; (b) research design; (c) sample; (d) setting; (e) procedures; (f) instruments; (g) data analysis; (h) human subjects protection; and (i) summary.

### Purpose and Specific Aims

Cardiovascular disease (CVD) is the leading cause of morbidity and mortality in Armenia (WHR, 2012).  Limited data exists on the prevalence of risk factors and other contributors to the development of CVD in Armenia.  Understanding the prevalence of high blood pressure (HBP) and associated risk factors is a critical first step towards addressing the burden of disease among any population (Brouwer et al., 2015).  Furthermore, the available literature specific to HBP or hypertension (HTN) among Armenians in Armenia lacks rigorous research designs and are outdated given the rapid socioeconomic, demographic, infrastructure, and cultural changes that have occurred in Armenia since the collapse of the Soviet Union.  All of these concerns lead to the critical need to conduct an initial descriptive study in Armenia.  The purpose of this study is to report prevalence of HBP and its associated risk factors among a select group of Armenian men and women 21 years of age and older, living in Armenia

**Specific Aim 1.** To identify the prevalence of HBP and selected factors, many of which are theoretically-based risk factors for HBP, among 200 Armenian men and women 21 years of age and older, living in Armenia.

- Demographic factors include age, gender, and marital status.

- Physiologic factors include lipid panel results (specifically total cholesterol (Total-C), high density lipoprotein cholesterol (HDL-C), triglycerides and low density lipoprotein cholesterol (LDL-C), glucose level, body mass index (BMI), and waist and hip circumferences.

- Health lifestyle behavior factors include smoking, alcohol, nutrition, and physical activity.

- Economic status factors include education, income, and employment.

- Inherited risk factors include family history of HBP or HTN, or history of cardiac disease, high cholesterol and diabetes mellitus (DM).

**Specific Aim 2.** To examine the relationship between HBP and demographic, physiologic, health lifestyle behaviors, economic, and inherited risk factors.

**Specific Aim 3.** To describe knowledge, awareness, and attitudes/perceptions (KAAP) related to HTN.

**Specific Aim 4.** To report the prevalence of HBP by awareness, treatment and control categories: 1) Aware of HBP; 2) Treated for HBP; 3) Controlled for HBP.

**Specific Aim 5.** To describe self-reported adherence in taking antihypertensive medication(s) using the Morisky Medication Adherence Scale (MMAS-8) among participants with HBP who have been prescribed antihypertensive medication(s). To describe the psychosocial determinants of adherence (knowledge, awareness, etc.) and associations of adherence with physiological outcome of blood pressure (BP) control.

**Research Design**

A cross-sectional descriptive design was used to accomplish the aims of this study, which was an initial step to explore the findings of BP in Armenians, factors that are associated with

HBP and to describe adherence to antihypertensive medication(s) for participants with HBP or HTN. This study was conducted in Armenia because there is a lack of rigorously conducted research studies and outdated papers resulting from the rapid socioeconomic, demographic, infrastructural, and culture changes occurring in Armenia since the collapse of the Soviet Union. The descriptive research design was used because it enables the examination of the relationship among multiple variables where they naturally occur (Burns & Grove, 2009).

A Demographic and Health Assessment Questionnaire (DHAQ) was administered that assessed demographic, health lifestyle behaviors, economic status and inherited risk factors as portrayed in Appendix A. Furthermore, participants completed questionnaires assessing knowledge, awareness and attitudes/perceptions (see Appendix B) and MMAS-8 (see Appendix C). Physiological measures of blood pressure, cholesterol and glucose were obtained by the principal investigator.

**Sample**

This study assessed a convenience sample of 200 Armenian men and women, ages 21 and over, who lived in the Yerevan region of Armenia. The sample size for this study was based upon the number of correlates to be assessed in the stepwise multiple regression model. More specifically, the sample size of 200 was based on a *priori findings* determined by a literature review (Mehler et al., 2001; Tailakh et al., 2013) and unpublished findings indicating that close to 50% of the participants in the Yerevan region of Armenia may have HBP (Akaragian et al., 2002). Calculations using G Power version 3.1.2, revealed that a sample size of 200 would allow detection of a medium effect size (0.30) for understanding HBP with the multiple variables: demographic, physiologic, health lifestyle behaviors, and economic and inherited risk factors at alpha .05 and power 0.80.

**Inclusion/Exclusion Criteria**

Inclusion criteria consisted of: (a) self-identified as Armenian; (b) 21 years of age and older; (c) live in the Yerevan region of Armenia; (d) may or may not be on antihypertensive medication(s) and (e) speak Armenian (Eastern or Western). Verbal and written information was communicated in Eastern Armenian because all Armenians living in Armenia understand, read and speak Eastern Armenian. Exclusion criteria included: (a) identify with an ethnic group other than Armenian; (b) are unable or unwilling to give informed consent; (c) younger than 21 years of age as HBP is not generally a problem below 21 years of age; and (d) pregnant women as the HBP can result from pregnancy itself.

**Setting**

Recruitment and data collection activities were conducted in space provided by a government-funded public primary care clinic (PCC) located in the Yerevan region of Armenia. However, the sample was not limited to clients of the clinic. Participants in the study lived in the Yerevan region which is the capital city of Armenia with a population of about one million. The chosen PCC for the study in the Yerevan region was Erebouni Polyclinic (EPC). The term Polyclinic refers to an ambulatory clinic and was customarily used in the Soviet era. The clinic is a government-funded public clinic, serving over 200 adults per week, and providing care to a general population of adults and children. The clinic offers primary health care as well as specialized care such as Head and Neck, Rheumatology, Endocrinology, Obstetrics and Gynecology. Furthermore, EPC is conveniently adjacent to the Erebouni medical center for patients needing further diagnostic studies. The clinic has full-time primary health care physicians (PHCP), cardiologists, nurses and clinical laboratory on the premises and is open

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from Monday to Saturday, from 9am to 5pm. The hours for screening for this study were from 9am to 5pm, Monday through Saturday.

**Procedures**

Subsequent to securing the University of California, Los Angeles' (UCLA) Institutional of Review Board (IRB) and to the Erebouni Medical Center's (EMC) Ethics Committee approvals, the UCLA IRB did oversee, review and monitor all study procedures for the duration of the study. The Principal Investigator, Salpy Akaragian, received a Letter of Support from Dr. Harutyun Kushkyan, the medical director of EPC for the use of the clinic as the recruitment site for this dissertation study (see Appendix D).

Permission was granted by the medical director to post flyers (see Appendix E) in the EPC and public places adjacent to the polyclinic which invited residents of Yerevan region, aged 21 and over, to participate in this study. The UCLA IRB and EMC Ethics Committee approved the flyer, which was written in Eastern Armenian and was posted two weeks prior to the beginning of data collection. The flyer contained pertinent study information, such as the location of the clinic, and the start and end dates for the study. The flyer also contained contact information on who to call for an appointment and the amount of time required to participate in the study. Furthermore, it stated that the study offered free blood pressure reading, and free blood testing for cholesterol and glucose. The data were collected in one month and 200 participants were enrolled in the study.

Once the patient entered the front door of the clinic, the respondent was greeted by the clinic's administrative assistant and escorted to a private room in the EPC to meet the principal investigator (PI), who greeted the respondent and informed him/her that a study was being conducted to determine the prevalence of HBP and associated risk factors in the Armenian

population.  The PI reviewed the inclusion criteria with the respondent, and if eligible, asked whether the respondent was interested in the study.  The PI informed the potential respondent that participation in the study was voluntary and the individual was free to discontinue the study at any time without adverse effect in the care generally received at the EPC.  Additional information regarding protecting the rights of the participants were detailed in the human subject and protection section.  Name of the participant was not placed on any forms.  Each participant had an identifying number on the questionnaire packet.

If the potential participant was willing to participate in the study, the PI informed her/him that a trained research assistant (RA) would conduct a face-to-face interview to complete a questionnaire, which required approximately 20 minutes to complete.  Following the questionnaire administration, the second RA and/or the PI took the respondent's BP, weight, height, waist and hip circumference and a fingerstick blood test to determine lipid panel and glucose.  It required approximately 25 minutes per respondent to collect this data.

Furthermore, the PI informed the respondent that if found to have HBP and taking prescribed antihypertensive medication(s), the MMAS-8 would be administered to the respondent, which took an additional five minutes to complete.  The instrument reported participant's adherence to antihypertensive medication(s).  After all the data were collected, the PI reviewed the findings with the participant and, if any of the values were outside of normal range (see Appendix F), the PI suggested to the participant the need to return to the EPC for further follow up at their earliest convenience without charge.  The evaluation of the findings took 10 minutes per participant.

Total amount of time per participant to complete the questionnaire, perform blood test, PI to provide findings of physiologic data and recommend the future step was approximately 45-60 minutes.

Respondents who visited the clinic to participate in the study but did not have an appointment for the research study, were either given an appointment to return to the EPC or were seen immediately if the RAs and PI were not with other research study participants. The administrative assistant escorted the respondent to the PI and followed the above procedure.

**Instruments**

This research study used the following five instruments for data collection: (1) Demographic and Health Assessment Questionnaire (DHAQ) which included smoking and alcohol use questions, (2) UCLA Center for Human Nutrition Dietary Assessment (UCLA CHNDA), (3) International Physical Activity Questionnaire (IPAQ), (4) Objective Physiologic Measurement (OPM) for recording blood pressure, cholesterol (or lipid panel) and glucose, (5) Knowledge, Awareness and Attitudes/Perceptions (KAAP) Questionnaire and (6) MMAS-8.

**Original Household Health Survey for Armenians.** In 2006, the Center for Health Services and Research Development (CHSRD) at the American University of Armenia (AUA), developed the Household Health Survey (HHS) for Armenia. The CHSRD's prior extensive experience in conducting health surveys in Armenia, as well as in measuring the quality of life for different population groups led to the development of HHS (United States Agency for International Development (USAID/Primary Healthcare Reform Project [PHCR], 2008).

The HHS consists of 113 items and assesses the knowledge, attitudes and practices (KAP) of the Armenian population in regard to open enrollment and family medicine, perceived

health status, use of early diagnostics and preventive services, accessibility and perceived quality of care, as well as the level of exposure to health education campaigns conducted by CHSRD (USAID/PHCR, 2008).

The HHS was administered using a hybrid of interview-administered and self-administered components. The interview-administered portion of the survey collected data on the sociodemographic characteristics of the household members and their health-related practices. The self-administered portion of the questionnaire sought personal information on perceived health status, attitudes, and behaviors of the respondent, as well as quality of life and mental health items (USAID/PHCR, 2008).

The HSS collected data from thousands of participants living in eleven regions of Armenia (Yerevan is one of the regions) as discussed in the review of literature. The HSS has provided strong and detailed descriptive data on many topics such as access to health care, quality of care provided in the regions and health conditions of the participants in the same region that was assessed in this study. However, a thorough review of the literature and discussions with key officials in Armenia revealed no psychometric data found on the HHS. HSS was first conducted in Armenia in 2006 (USAID/PHCR, 2008), and selected items of this instrument were utilized in the current study. Nevertheless, strategies were incorporated to strengthen the health questions utilized in the HHS. This then became the Demographic and Health Assessment Questionnaire.

**Demographic and Health Assessment Questionnaire (DHAQ).** For this study, the first version of the DHAQ was created by selecting 18 questions from the 113 HHS questionnaire which had been previously administered in Armenia. The content areas of these questions included: seven items on socio-demographics, four items for health lifestyle behavior and seven

items on self or family health history.  The selected items follow the theoretical framework of Health Lifestyle Theory (HLT) (Cockerham, 2005) and risk factors that may contribute to HBP. The rest of the HSS items refer to access to health care, quality of care, mental health, and attitudes and behaviors.

*Strategies to enhance the DHAQ.* To further add rigor to the DHAQ, experts in the field of cigarette, alcohol use and nutrition were consulted.  The cigarette and alcohol use questions were recommended by Dr. Felicia Hodge, Professor from UCLA School of Nursing and worded similarly to measures reported in the literature (Hodge, & Nandy, 2011; National Institute on Alcohol Abuse and Alcoholism ([NIAAA]), 2003).

To assess nutritional status of the participants, Dr. Catherine Carpenter from the UCLA School of Nursing, an expert in nutrition and exercise, was consulted and the existing nutrition and exercise questions from the HHS were examined.  Dr. Carpenter recommended using the 24-hour UCLA CHNDA.  Also, Dr. Carpenter recommended using IPAQ instead of the three physical activity questions from HHS.

*Description of DHAQ sections*.  The 21-item DHAQ were questions about demographic background, health lifestyle behavior, and self-reported family history of HBP or HTN, cardiac disease, high blood cholesterol, and diabetes Mellites (DM) (see Appendix A).

*Demographic data*. Four questions of the DHAQ instrument focused on age, gender and marital status of the participating Armenians.  As reported in the literature, HBP increases with age (Arevian et al., 2004; Harhay et al., 2013; Jaddou et al., 2000; Mehler et al., 2001; Tailakh et al., 2013; Tailakh et al., 2014; Young et al., 2005), and females have higher prevalence of HBP than males (Dallo & Borrell, 2006; Footman et al., 2013; Go et al., 2013; Harhay et al., 2013; Jaddou et al., 2000; Vasan et al., 2002).

*Health lifestyle behaviors*. Health lifestyle behavior factors included cigarette smoking, alcohol use, unhealthy dietary intake or nutrition, and poor physical activity that may increase the risk of HBP.  Four questions of the DHAQ instrument focused on smoking and two questions were on alcohol use.  In addition, the seven-item IPAQ and the 24-hour recall survey were added to assess health lifestyle behaviors.

*Smoking*. Smoking raises the BP and places the individual at a higher risk for heart attack and stroke (National Heart, Lung and Blood Institute [NHLBI], 2012).  Cigarette smoking DHAQ items (Numbers 8, 9, 10 and 11) included "Have you ever smoked at least 100 or more cigarettes in your entire lifetime?" and "Do you now smoke cigarettes every day, or not at all?" If the answer is "Yes" to the second question, then the participant was asked "On average, how many cigarettes per day do you now smoke?" The answers to the first two questions were categorical and the follow-up data to the second question was continuous.  Smoking items were measured as a HBP risk factor.

*Alcohol use.*  Hinote and associates (2009) reported that young women consumed alcohol more than older women and Russian females consumed more alcohol than women in the surrounding countries.  DHAQ items #12 and 13 were on alcohol use and included "Now think about the past 12 months.  Over that time, did you have any kind of alcoholic drink?"

*Nutrition*. The third variable in health lifestyle behavior was nutritional status. Consumption of processed food, meals with high salt, low in potassium and/or with high fat content contribute to HBP (American Heart Association Nutrition Committee [AHANC], 2006). Furthermore, food high in saturated fats, such as egg yolks, hard cheeses, whole milk, cream, ice cream, butter and fatty meats contribute to risk factors for heart disease (AHANC, 2006).  In the

United States (US), the Dietary Approaches to Stop Hypertension (DASH) eating plan is recommended to help lower HBP (CDC, 2014).

To increase rigor to DHAQ, status of nutrition was assessed by the 24-hour UCLA CHNDA (see Appendix G) which were open-ended questions. Participants were asked to describe what drinks and foods were consumed in past 24 hours. The 24-hour UCLA CHNDA is described in a separate section below.

*Physical activity*. The last variable in the health lifestyle behavior category is physical activity. The Surgeon General-recommended level of physical activity can help to maintain or achieve a healthy weight and lower BP (CDC, 2014). The Surgeon General recommends two hours and 30 minutes per week of moderate-intensity exercise (i.e., brisk walking or bicycling every week) to prevent or lower HBP in adults (CDC, 2014). To assess the level of physical activity of the participant and to add rigor to physical activity assessment, the International Physical Activity Questionnaire (IPAQ) instrument was used, which is described in a separate section below (see Appendix H).

*Economic status*. Three items on DHAQ assessed education, income and employment status of the participant. These items included: "Indicate the highest level of education that you have completed", "Which of the following best describes your employment status?" and "Which of the following best describes your total family yearly income?" Persons with higher levels of education and income are more likely to have optimal BP than individuals from lower socioeconomic status and who have attained a lower education levels (Harhay et al., 2013).

*Inherited factors*. Genetic factors are likely to play a role in HBP, heart disease, DM, and other related conditions (AHA, 2014). HBP can run in a family, and the risk of HBP can increase with age and gender. Family history combined with unhealthy lifestyle behaviors, such

as smoking, lack of physical activity, eating unhealthy foods can increase the risk of having HBP (Go et al., 2013; Vasan et al., 2002). Question #s 14 to 21 of DHAQ assessed inherited factors category. Examples included: "Please indicate any chronic health problems that you have?", "Please indicate any chronic health problems that your siblings have?" Items # 19 and 21 address the mortality of family members from heart attack, stroke or diabetes, such as "Did anyone from your family die from heart attack?" Inherited factor items were categorical data and were identified risk factors for HBP. Inherited risk factors were scored as 0 = "Yes" and 1 = "No" for item # s 14-17.

There was one question (# 18) that assessed whether or not the participant was prescribed any medications for HBP, high cholesterol and DM. The reason for asking this question was to determine whether their HBP was being treated by medication. One other benefit of asking this question was to verify their diagnosis (hypertensive). This item was scored as 0 = "Yes" and 1 = "No".

**University of California of Los Angeles (UCLA) Center for Human Nutritional and Dietary Assessment (CHNDA).** Due to lack of rigor of nutrition questions in the HHS and redundancy of the nutrition question in the HHS as compared to the 24-item recall, it was recommended that only UCLA CHNDA be used to collect data on the nutritional status of participants. The instrument was recommended by nutrition researcher, Dr. Catherine Carpenter at UCLA School of Nursing.

The UCLA CHNDA developed a qualitative 24-Hour Recall instrument. The participant was asked to recall all of the foods and beverages consumed during the previous 24 hours for breakfast, morning snack, lunch, afternoon snack, evening meal and evening snack. It also

included the amount, methods of preparation (fresh, canned), condiments added, brand or label information per food or drink (Wrieden, Peace, Armstrong, & Barton, 2003).

As a retrospective method, the 24-hour recall relies on an accurate memory of intake, however, one limitation is that the tool's reliability is dependent on the respondents' ability to remember foods and beverages consumed and to accurately estimate portion size. The RA recorded the dietary information at a face-to-face interview. Having an assortment of bowls, cups, and glasses assisted the researcher in collecting the most accurate information possible. Another limitation of this method is that recording consumption for a single day is seldom representative of a person's usual intake due to day-to-day variation (Wrieden et al., 2003).

The UCLA CHNDA tool has been widely used with different populations, such as in the elderly Mexican Americans with diabetes living in Texas and tribal Indian adolescents (TIA). In the Mexican-Americans study, the UCLA CHNDA was used to determine if participants lost weight after an intensive diabetes education program (Elshaw, Young, Saunders, McGurn, & Lopez, 1994). The tool was also used with the TIA and the study concluded that folate insufficiency was widespread in TIA (Jani et al., 2015). In another study, the 24-hour recall tool was compared to Household Consumption and Expenditures Survey (HCES). The findings indicated that the HCES did not have adequate information on individual consumption amounts to estimate appropriate food fortification levels (Engle-Stone & Brown, 2015). As is pertinent to this study, values for total intake of calorie, protein, fat, Total-C, carbohydrate and sodium were analyzed.

**International Physical Activity Questionnaire (IPAQ).** The IPAQ is an instrument which was designed for use with adults aged 15-69 years of age (Craig et al., 2003). The IPAQ was developed in the late 1990's and was tested for validity and reliability across 12 countries

(not in Armenia) (Craig et al., 2003). The study conducted by Kurtze and associates reported the validity of IPAQ by using Spearman correlation measuring the maximum oxygen intake (VO2max) and ActiReg results ($P \leq .001$) (Kurtz, Rangul, and Hustvedt, 2008). ActiReg is an instrument that measures physical activity and energy expenditure. The IPAQ assesses physical activity (PA) of the participant for the past seven days and has five parts: (1) job-related PA; (2) transportation PA; (3) housework, house maintenance, and caring for family; (4) recreation, sport and leisure-time PA; and (5) time spent sitting.

IPAQ has a long and short version. The short version has seven questions and the long version has 31 questions. In 1997 and 1998, a study was conducted to determine if the short form was as valid and reliable as the long form of the IPAQ. The studies on the short form of IPAQ were conducted in 12 countries; Australia, Brazil, Canada, Finland, Guatemala, Netherlands, Japan, Portugal, South Africa, Sweden, United States (US) and United Kingdom (Craig et al., 2003). Overall, the short IPAQ questionnaires showed criterion validity as assessed by Spearman correlations with a median of 0.30 and test-retest reliability, Spearman correlations clustered around 0.8 (Craig et al., 2003).

The scoring of the IPAQ is in three categories of activity; low, moderate and high. Low level of PA relates to the report of no to some activity but not enough activity to meet the category level ranked as moderate or high. The score is considered moderate when either of the following three criteria are met: 3 or more days of vigorous activity of at least 20 minutes per day OR 5 or more days of moderate-intensity activity and/or walking or at least 30 minutes per day OR 5 or more days of any combination of walking, moderate-intensity or vigorous-intensity activities achieving a minimum of at least 500 MET-minutes/week (Craig et al., 2003).

High level of PA is considered when any of the following two criteria occur:  Vigorous-intensity activity on at least 3 days and accumulating at least 1500 MET-minutes/week OR 7 or more days of any combination of walking, moderate-or vigorous-intensity activities accumulating at least 3000 MET-minutes/week (Craig et al., 2003).

**Objective Physiologic Measurements (OPM).** The OPM form was used to record data on physiologic measurements.  These data included at least two BP readings, weight, height, waist and hip circumference findings, results of Total-C, HDL-C, LDL-C, triglycerides and glucose level.  Furthermore, next to the glucose result, the RA recorded if the participant was fasting or not (see Appendix I).  The OPM was used in duplicate format.  The original was for the PI and a copy was given to the participant to share with their physician if they so choose.

*Measurement of the BP (face and construct validity).* Measuring and recording BP readings is critical for a rigorous research study.  This research team followed the approved Joint National Committee (JNC-8) guidelines for measuring BP.  Normal BP is defined as systolic blood pressure (SBP) < 120 mmHg and diastolic blood pressure (DBP) < 80 mmHg, prehypertension as SBP between 120-139 mmHg or DBP between 80-89 mmHg and HTN is defined SBP $\geq$ 140 mmHg and/or DBP of $\geq$ 90 mmHg and/or the use of antihypertensive medication(s) (JNC-8).

As defined in JNC-8 guidelines, BP should be measured twice, with readings taken five minutes apart, with the participant sitting in a chair with feet flat on the floor, the BP cuff covering 2/3 of the upper left arm, and the arm resting on a table.  Gentle+ Inflation Technology Microlife (GITM) automated BP device was used to measure BP.

The RA wrapped the BP cuff around the left arm of the participant sitting, turned on GITM BP machine, and waited for the device to signal that the measurement of BP was

completed. The RA recorded systolic and diastolic numbers indicated on the GITM BP machine. BP was measured twice and each BP reading was recorded. If the first and second readings of BP were different (>5 numbers in SBP or DBP), BP was measured for the third time and recorded on the OPM (see Appendix I). The mean SBP and DBP was calculated based on the average of either the first two readings or the three readings of BP when a third measure was taken.

GITM automated BP device was used to avoid inter-rater reliability errors. Four GITM BP machines were purchased in the US and transported to Armenia by the PI. The automated BP devices were calibrated following the recommendations of the manufacturer prior to using in the research study.

*Measuring weight and height.* The participant's weight and height were obtained by the trained RA. The participant was asked to remove footwear and step on the standing scale. The RA weighed the fully- dressed (included shoes and coat) participant and recorded the weight in kilograms (Kg) on the OPM form (see Appendix I).

The same RA asked the participant to stand straight and face the RA, and measured the height of the participant by using stadiometer in centimeter (cm). The height of the participant was recorded by the RA on the OPM form. The PI calculated BMI from weight and height measurements and recorded on the OPM. BMI measures body fat which may or may not be predictor for HBP. Using a computer calculator, the PI calculated the BMI by entering the weight in kg divided by the square of height in meters (weight/height² [kg/m²]). To ensure the reliability of weight measurements, the standing scale was calibrated by the clinic's biomedical engineer before participants were weighed and height was measured.

***Waist and hip circumference.*** Waist and hip circumference were measured. According to National Heart, Lung, and Blood Institute (NHLBI) a high waist and hip circumference with a BMI in a range between 25 and 34.9 kg/m² (NHLBI, 2015) is associated with an increased risk for HTN, CVD, dyslipidemia and DM.

To measure waist circumference, the RA used a cloth tape and placed it directly on the participant's skin. The participant was instructed to stand in a relaxed position with the feet shoulder-width apart. The RA started at the top of the participant's hip bone and brought the tape measure all the way around, level with the belly button. Also, the RA instructed the participant not to hold their breath while measuring. The RA recorded the waist circumference number in cm on the OPM form. To measure the hip circumference, the RA instructed the participant to stand straight and face the RA. The RA placed the tape measure around the widest part of the hip areas and measured the circumference of hips (over the buttocks). The RA recorded the hip circumference in cm on the OPM form (see Appendix I).

***Measuring lipid panel and glucose level.*** Upon completion of the above procedures, the participant's blood sample was analyzed for Total-C, HDL-C, LDL-C, triglycerides and glucose level. High Total-C, high LDL-C, high triglycerides and low HDL-C are all risk factors for HBP, cardiac disease or stroke (AHA, 2014). To analyze the data, the findings were categorized as desirable or borderline-high for Total-C, low or high for HDL-C, optimal, borderline-high, or high-very high for LDL-C, normal or borderline-high for triglycerides and normal prediabetes, or diabetes for glucose.

*Total blood (or serum) cholesterol.* As defined by NHLBI, desirable Total-C is < 200 mg/dL, borderline high is > 200-239 mg/dL and high is ≥ 240 (NHLBI, 2012, 2015). People

with high Total-C have approximately twice the risk of heart disease as people with optimal

levels (CDC, 2014).

*HDL-C (good) cholesterol*. Low HDL-C is < 40 mg/dL and high HDL-C is ≥ 40 mg/dL

(NHLBI, 2015).  Low HD-C and/or high LDL-C increase the risk for heart disease.  Usually,

individuals with high blood triglycerides will also have lower HDL-C cholesterol.  Furthermore,

genetic factors, DM, smoking, being overweight and being sedentary can all result in lower

HDL-C (AHA, 2014).

*LDL-C (bad) cholesterol*. The optimal and near optimal LDL-C is < 129 mg/dL,

borderline-high is > 130-159 mg/dL and high-very high LDL-C is ≥ 160 mg/dL (NHLBI, 2015).

A low LDL-C cholesterol level is considered good for a healthy heart.  A diet high in saturated

and trans fats raises LDL-C (AHA, 2014).

*Triglycerides.* Triglycerides are the most common type of fat in the body.  Normal

triglyceride levels vary by age and gender.  Normal triglyceride level is < 150 mg/dL and

borderline-high is ≥ 150 mg/dL.  A high triglyceride level combined with low HDL-C or high

LDL-C is associated with atherosclerosis, the buildup of fatty deposits in artery walls that

increases the risk for HBP, heart attack and stroke (AHA, 2014).

*Glucose*. The fasting normal range for glucose level is 70-99 mg/dL, prediabetes is from

100-125 mg/dL and glucose level of ≥ 126 mg/dL is considered diabetes (NHLBI, 2015).

Individuals with high glucose levels are at a higher risk for HBP and cardiac disease at a younger

age as well as risk for developing DM (Filipovsky et al., 1996; NHLBI, 2011).

*The Alere Cholestech LDX Analyzer (ACLDXA)*. The ACLDXA is a machine specifically

designed to analyze the lipid panel and glucose level.  ACLDXA is used by many physician

offices, hospitals and wellness programs in the US.  The ACLDXA provides accurate blood test

results in five minutes.  Due to rapid results of the blood tests, the health care providers can quickly identify CVD, diabetes and other health risks within minutes.  ACLDXA requires a very small blood sample (40µL) to analyze the HDL-C, LDL-C, Total-C, triglyceride and glucose.  ACLDXA is certified by the cholesterol Reference Method Laboratory Network for measuring Total-C, HDL-C and LDL-C.

To obtain the blood sample, the RA cleaned the side of the index or middle finger with sterile alcohol swap and waited five seconds for the alcohol to dry.  Afterwards, the RA donned clean gloves, chose a spot on the side of the index or middle finger of either hand, removed the protective disk of the sterile lancet, and with a quick motion, performed a fingerstick and within 10 seconds collected the sample with a capillary tube.  Using the capillary tube, the RA dispensed the whole blood sample into the Cholestech cassette which contained the reagents, inserted the cassette in ACLDXA machine, and pressed the "run' button.  In five to eight minutes, the machine emitted an audible alarm which alerted the RA that the blood was analyzed.  The RA recorded the Total-C, HDL-C, LDL-C, triglyceride and glucose results on the OPM (see Appendix I).

A cassette is a reagent and is used to analyze lipid panel and glucose.  One cassette was used for each participant.  The cost of a cassette was $14 and the researcher provided one ACLDX machine and 230 cassettes.  The ACLDXA device uses specific cassettes and each pack had 10 cassettes with an expiration date.  The PI ensured the cassettes were not expired and recorded in the calibration book.  Used lancets were disposed of in the red contamination box.  The RA placed a Band-Aid on the puncture site, removed and disposed gloves in the waste basket.  At the end of the study, the container was sealed and disposed by following EPC policy for disposing red contamination container.

**Knowledge, Awareness and Attitudes/Perceptions (KAAP) Questionnaire.** The

KAAP instrument measures knowledge, awareness and attitudes/perceptions related to HTN.

The KAAP questions were designed by using the existing literature, practicing physicians, and

experts in HTN (Oliveria et al., 2005).  Using different instruments, knowledge, awareness,

attitudes and/or practices were evaluated in other studies (Ke at al., 2015; Neuhauser, Adler,

Rosario, Diederichs, & Ellert, 2015; Oliveria et al., 2005; Pilav, Doder, & Branković, 2014;

Sabouhi et al., 2011; Wu et al., 2015; Zdrojewski et al., 2016).  This study's KAAP instrument

consists of eight questions for knowledge, six questions for awareness and ten questions for

attitudes/perceptions.  There were no psychometrics found on the instrument (see Appendix B).

*Knowledge questions.* A total of eight questions addressed the participant's knowledge

about HTN.  Item #5 has "a" and "b" parts.  Each question has multiple options for the

respondent to choose, with a total possible score of 9 points.  The data were entered in three

categories; low, medium and high knowledge in HTN.  These items included: "What does the

term hypertension mean?", "How dangerous is hypertension to your health?", "Would lowering

high blood pressure improve a person's health?"  The Cronbach alpha for knowledge questions

was .45.

*Awareness questions.* This section had six items.  Each question had multiple options for

the participant to choose and total possible score was 6 points.  These items included: "Have you

ever been told by a doctor or health care provider that you have hypertension", "Has a doctor or

health care provider ever told you that the bottom number is important to keep under control?"

The Cronbach alpha for awareness questions was .92.

*Attitudes/perceptions questions.* A total of 10 questions constituted this section of the

instrument.  Question #1 had part "a" and "b".  Each question had multiple answers for the

participant to choose and total possible score was 11 points. These items included: "Can changing lifestyle help to lower your blood pressure?", "Do you think that high blood pressure is an avoidable part of aging?" The questions were not all attitude questions. Reliability was tested using internal consistency Cronbach alpha (.081) and no consistency was shown in the items within this study sample, perhaps because of the diversity and nature of the items, with some appearing to assess knowledge.

**Morisky Medication Adherence Scale-8 (MMAS-8).** The MMAS-8 measures adherence to taking prescribed antihypertensive medication(s). This instrument consists of eight self-reported items and is a self-reported instrument (Morisky, Ang, Krousel-Wood, & Ward, 2008). The original validated instrument consisted of four item scale (Morisky, Green, & Levine, 1986), and since then, four additional items were added to address the circumstances surrounding medication adherence behavior (Morisky & DiMatteo, 2011).

The MMAS-8 measures medication adherence decisions, memory and habits associated with adherence and will provided an insight into non-adherence to antihypertensive medication(s) in Armenians living in Armenia. Furthermore, it identified barriers and behaviors associated with adherence to chronic medications. The MMAS-8 measures factors such as forgetfulness, satisfaction and medication complexity (Morisky et al., 2008).

Predictive validity of MMAS-8 was established in 2008. Morisky and associates conducted a randomized experimental pretest and posttest study designed to examine the psychometric properties of the instrument. A total of 1,367 participants were enrolled into a 12-month study. The participants' sociodemographic characteristics included a mean age of 52.5 years; almost two thirds (59.2%) were female, and over half (50.8%) graduated from high school. About one quarter (26%) were married, and 54.1% had income < $5,000. For this study,

the internal consistency of MMAS-8 revealed a Cronbach's alpha reliability of .83. The MMAS was significantly associated with BP control ($p < .05$). Furthermore, the MMAS-8 proved to be reliable specifically for low-income participants and functioned as a simple and practical screening instrument for ambulatory patients (Morisky et al., 2008). The first seven items of the MMAS-8 are dichotomous response categories with "Yes" or "No", and the last item is a five point Likert response (see Appendix C).

The scale has been used in many countries around the globe except in Armenia. For over two decades, the MMAS-4 or MMAS-8 has been used in the US, Canada, and European countries, and recently in China (Lee et al., 2013) and Brazil (de Oliveira-Filho, Morisky, Neves, Costa, & de Lyra, 2014).

The MMAS-8 was administered in Brazilian-Portuguese population with HBP and reliability was tested using internal consistency (Cronbach's alpha) and test-retest reliability. Validity was confirmed using known groups validity (de Oliveira-Filho et al., 2014). Three levels of adherence were considered based on the following scores: 0 to < 6 (low); 6 to < 8 (medium); 8 (high). Moderate internal consistency was found (Cronbach's alpha = .68), and test-retest readability was satisfactory (Spearman's $r = .93$; $p < .001$) (de Oliveira-Filho et al., 2014).

A significant relationship was found between MMAS-8 levels of adherence and BP control (chi-square, 8.28; $p = .016$). In total, 46% of the participants revealed a low adherence score to taking antihypertensive medication(s), 33.6% had medium adherence score and 20.4% had high scores in adherence to antihypertensive medication(s). The self-reported sensitivity, specificity, and positive and negative predictive values of the measure were: 86.1%; 31.2%, 57.4%, and 66.3%, respectively (de Oliveira-Filho et al., 2014). The sensitivity detects fine

differences between the three groups: low, medium and high adherence to antihypertensive medication(s).  The specificity refers to what adherence meant to different populations, while predictive values predicts (forecasts) the behavior.

The MMAS-8 has eight questions.  The responses to questions from #s 1 - 7 are "Yes" or "No".  Question # 8 has five choices.  Total score of "8" indicates high adherence to taking antihypertensive medication(s), score between 6 to < 8 is considered medium adherence to taking antihypertensive medication(s), and a score below < 6 indicates low adherence to taking antihypertensive medication(s).

Due to the limited information on BP medication adherence in Armenia, the specific Aim of this research was to measure adherence of antihypertensive medication(s) for participants with HBP who are on antihypertensive medication(s).  The MMAS-8 was the chosen instrument to collect the data, and to my knowledge, this study was the first in Armenia use this scale.

*MMAS-8 piloted in Armenian language in Los Angeles*.  To assess the use of the scale in Armenia, the PI oversaw the translation of the MMAS-8 into Eastern Armenian by two Armenian physicians; one living in the US and the other in Armenia (see Appendix C).  The application for the UCLA IRB pilot was submitted with the translated scale by the PI to receive approval to conduct the pilot study (*n* = 10) in Armenians living in Los Angeles.  The purpose of the pilot study was to determine the clarity of the translated MMAS-8 by Armenians.  All 10 participants stated that each translated item was clear and understandable (see Appendix C).  The MMAS-8 was translated into Armenian through the process of forward and backward translation by two professionals that spoke both languages fluently.  A blinded backward translation was completed by a second professional bilingual translator.

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After receiving the approval from UCLA IRB, the scale was administered to 10

Armenians living in Los Angeles by the PI.  A UCLA IRB approved information sheet about the

research study was developed and provided to each participant prior to administering the

MMAS-8 (see Appendix C).  A convenience sample was selected by those who were willing to

participate to pilot test the instrument.  Inclusion criteria for the participants were (1) last name

ended with "yan" or "ian"; (2) the participant stated that they were Armenian; (3) 21 years of age

or older; and (4) spoke and read Eastern Armenian.  After receiving the approval to participate in

the study, the PI provided a space where conversation could not be heard and administered

Armenian version of MMAS-8.  Each question was read by the PI and the participant was asked

if each question was understandable or not.  The participant was asked to raise his/her hand if a

question was not clear or understandable.

Each participant took 10-20 minutes to respond to the MMAS-8 and 80% of the

participants were females.  The results of the pilot study showed that the translated MMAS-8 did

not lose its meaning and 100% of the participants understood all eight questions.  No changes

were made to the translated MMAS-8.

***Administration of MMAS-8 for participants with HBP.*** The PI approached each

participant who had marked "Yes" to taking antihypertensive medication(s) (see Appendices A)

and invited the participant to complete the MMAS-8.  Using a face-to-face interview approach in

PCC office, the RA read each question in Armenian to the participant, waited for response, and

recorded on the paper copy of the scale.  The identifying number that was created as the

participant was enrolled into the study was placed on all assessments collected.  The

administration of the MMAS-8 took approximately 10-20 minutes.

**Evaluation by the PI**

Prior to the participant leaving the PCC, the PI reviewed the data (DHAQ, UCLA CHNDA, IPAQ, OPM, KAAP and MMAS-8) and explained the findings to the participant. If the physiologic findings were outside of the recommended range, or if any risk factors were documented, or if the participant had further questions, they were asked to see the clinic physician. The recommended ranges for HBP, low HDL-C, high LDL-C, high triglycerides and glucose were available to the PI (see Appendix F).

**The Training of Research Assistants (RAs)**

The PI trained two retired nurses (living in Armenia) and one pre-medical student from the US to assist with the data collection. The RA from the US completed the Collaborative Institutional Training Initiative (CITI) course. The RAs in Armenia were trained in ethics and confidentiality to meet the IRB's international requirements. Furthermore, RAs from Armenia were trained to conduct a face-to face interviews and how to complete DHAQ, CHNDA, IPAQ, KAAP and MMAS-8 instruments. The RA from the US was trained to obtain measurement of BP, weight, height, waist and hip circumference; obtained blood sample for lipid panels and glucose level.

The RA was trained using training manuals provided by the manufacture of GITM BP machine and ACLDXA device. Lippincott procedure manual was used to train the RA on the steps for using the scale, the stadiometer, and for measuring waist and hip circumferences.

All RAs were validated on their knowledge and skill by the PI using criterion-based competency verification form and established 95% inter-rater reliability prior to performing the procedure independently. The inter-rater reliability was done by return demonstration of the RA

to the PI of all the steps in sequence for measuring BP, weighing the participant, obtaining height, measuring waist and hip circumference and performing fingerstick and blood test.

To complete DHAQ, CHNDA, IPAQ, KAAP and MMAS-8 forms, the PI demonstrated performance of a face-to-face interview by asking each question to the RA and recorded the response. Next, the RA performed a return demonstrate of the steps in the face-to face interview with the PI, recorded responses to each item. It is only after establishing 95% inter-rater reliability that the RA was able to interview independently.

**Data Management**

The DHAQ, CHNDA, IPAQ, OPM, KAAP, and MMAS-8 questionnaire were assembled as a packet for each participant. A code book that included the variables of the study was created prior to data collection and saved on a secured computer for the purpose of entering data. Statistical Package for Social Sciences (SPSS) Version 22 was used to analyze the data.

The PI entered all of the data onto the SPSS file, and verified the data by re-checking the computer data twice with the original hard copies to ensure there was no missing data or data entry errors. The dataset was assessed for any outliers and for completion. Prior to deleting the outliers, the PI considered whether those data contained valuable information that was not necessarily related to the intended study, but had important information related to HBP.

A calibration book was kept to include quality control information on GITM automated BP device, ACLDXA blood analyzer machine, standing scale and stadiometer. All equipment was calibrated following the manufacturers' recommendation for quality control. Expiration date for each packet of cassettes for ACLDXA device and box of lancets was recorded.

**Data Analysis**

To meet the aims of the study, the analysis included descriptive statistics of demographic and other factors by gender. This analysis consisted of *t* test for continuous data and chi square test for categorical data to assess association between HBP and variables such as gender. Non-parametric Spearman correlations, Mann-Whitney tests and stepwise multiple regression analyses were performed. To address the unequal gender sample size, Mann-Whitney test was performed. SPSS Version 22 was used to analyze the data and described the sample by reporting measures of mean with standard deviation, frequencies and percentages. Normality test was performed on all continuous data.

**Specific Aim 1.** To identify the prevalence of HBP and selected factors, many of which are theoretically-based risk factors for HBP, among 200 Armenian men and women 21 years of age and older, living in Armenia.

- Demographic factors include age, gender, and marital status.

- Physiologic factors include lipid panel results (specifically Total-C, HDL-C, triglycerides and LDL-C), glucose level, BMI, and waist and hip circumferences.

- Health lifestyle behavior factors include smoking, alcohol, nutrition, and physical activity.

- Economic status factors include education, income, and employment.

- Inherited risk factors include family history of HBP or HTN, or history of cardiac disease, high cholesterol and diabetes mellitus (DM).

The data from all of the above factors are either continuous or categorical as shown in Table 1.

Table 1

*Variables and Type of Data*

| Variable | Type of data |
| --- | --- |
| A. Demographic | |
|    1. Age | Continuous |
|    2. Gender | Categorical |
|    3. Marital status | Categorical |
| B. Physiologic | |
|    1. SBP | Continuous |
|    2. DBP | Continuous |
|    3. Total cholesterol- Total-C | Continuous |
|    4. HDL-C | Continuous |
|    5. LDL-C | Continuous |
|    6. Triglycerides | Continuous |
|    7. Glucose | Continuous |
|    8. BMI | Continuous |
|    9. Waist Circumference | Continuous |
|    10. Hip Circumference | Continuous |
| C. Health Lifestyle Behavior | |
|    1. Smoking | Categorical |
|    2. Current Smoker | Categorical |
|    3. Number of Cigarettes/day | Continuous |
|    4. Age started smoking | Continuous |
|    5. Alcohol Use | Categorical |
|    6. Nutrition | Continuous |
|    7. Physical Activity | Categorical |
| D. Economic Status | |
|    1. Education | Categorical |
|    2. Income | Categorical |
|    3. Employment | Categorical |
| E. Self and Family Health History | |
|    1. Diabetes | Categorical |
|    2. HBP | Categorical |
|    3. High Cholesterol | Categorical |
|    4. Heart Disease | Categorical |
|    5. Kidney Problems | Categorical |
|    6. No Chronic Health Problems | Categorical |
|    7. Mortality of Siblings from Heart Attack | Categorical |
|    8. Mortality of Parent from Heart Attack | Categorical |
|    9. Mortality of Grandparent from Heart Attack | Categorical |
|    10. Mortality of Siblings from Stroke | Categorical |
|    11. Mortality of Parent from Stroke | Categorical |
|    12. Mortality of Grandparent from Stroke | Categorical |
|    13. Mortality of Siblings from Diabetes | Categorical |
|    14. Mortality of Parent from Diabetes | Categorical |
|    15. Mortality of Grandparent from Diabetes | Categorical |

**Demographic data.** The demographic data of age, gender and marital status were analyzed using descriptive analysis of frequencies and percentages for categorical data. Means with Standard Deviation (SD) for continuous data (Age) were reported. Furthermore, chi square and *t* tests were performed for the demographic and other variables based on gender.

**Physiologic data.**

*BP measurements data.* Each participant had either two or three BP readings. The means with SD for the systolic blood pressure (SBP) and diastolic blood pressure (DBP) were reported. Frequencies, percentages and means with SD were presented in three categories (normal BP, prehypertensive and HBP).

*Lipid panel, glucose, BMI, weight and hip circumference.* The findings for these variables were reported in frequencies, percentages and means with SD. For example, how many of the participants had low and high findings for HDL-C.

**Health lifestyle behavior data.** The data from health lifestyle behavior factors were reported in tables of frequency and percentages. These included: smoking, use of alcohol and intensity of physical activity. The 24-hour UCLA CHNDA was analyzed by entering all the responses in an excel sheet of total amount of calories, protein, fat, Total-C, carbohydrates and sodium consumed during the previous 24 hours. As is pertinent to this study, values for total fat, cholesterol, carbohydrates, protein, sodium and caloric intake were analyzed by frequencies, percentages and means with SD.

IPAQ data were categorized into three levels of physical activity. The levels are low, moderate and high. Frequencies and percentages were reported for these three categories.

**Economic status data.** The economic status factors which included employment, education and income were reported in frequencies, percentages and means with SD.

**Inherited factors.** Knowledge of having chronic disease of the participant and family, use of medications by the participant and mortality of the family members from heart attack and stroke were reported in frequencies and percentages.

**Specific Aim 2.** To examine the relationship between HBP and demographic, physiologic, health lifestyle behaviors, economic, and inherited risk factors. To determine the factors associated with HBP, bivariate analysis was performed using Spearman correlations. To look at bivariate relationships, HBP was examined with each variable. Variables of interest include age, gender, BMI, waist and hip circumferences, employment, family history of chronic disease, etc. T test for continuous data and chi square test for categorical data were performed to determine significant covariates of HBP.

**Specific Aim 3.** To describe knowledge, awareness, and attitudes/perceptions related to HTN. Descriptive analysis was used to report the results of aim #3. The instrument has three domains; knowledge, awareness and attitudes/perceptions. Each participant had a total score for each domain. Frequencies and percentages were reported for each domain.

**Specific Aim 4.** To report the prevalence of HBP by awareness, treatment, and control categories: 1) Aware of HBP; 2) Treated for HBP; 3) Controlled for HBP. Frequencies, means, SDs, and *F* tests for one-way analysis for variance were performed to report the results of aim #4. Total scores for knowledge and awareness were reported in means, SDs and with *F* tests for one-way analysis for variance with three BP levels; normal, prehypertensive and hypertensive. Participants who responded "Yes" to the awareness question, "Have you been told by a doctor or health care provider that you have hypertension?" were included in the "Aware of HBP" category. Subsequent analysis examined participants who responded "Yes" to the self-reported prescribed antihypertensive medication(s) (treated for HBP category). Then their BP was

recorded and categorized as normal or hypertensive. This information was interpreted to mean that the BP was controlled.

Additional analysis were performed on all the variables. A series of stepwise multiple regression was used to determine what variables predicted or contributed to HBP. Covariates with a significant $p$ value or those non-significant but theoretically important were included in the final stepwise multiple regression model to determine which variables were the most predictors to contributing HBP.

**Specific Aim 5.** To describe self-reported adherence in taking antihypertensive medication(s) using the Morisky Medication Adherence Scale (MMAS-8) among participants who have been prescribed antihypertensive medication(s). To describe the psychosocial determinants of adherence (knowledge, awareness, etc.) and associations of adherence with the physiological outcome of BP control.

Descriptive statistical analyses were performed on the scores from MMAS-8. Frequencies and percentages were reported for low, medium and high adherence for individuals and prescribed antihypertensive medication(s). ANOVA was performed for continuous data to determine number of people who have been prescribed antihypertensive medication(s) and fell into low, medium or high adherence categories. Furthermore, nonparametric Spearman correlations between adherence and mean SBP and mean DBP were performed with knowledge and awareness scores.

**Human Subject Protection**

Permission was obtained from the IRB of UCLA and from the Ethics Committee of the EMC. A verbal informed consent was obtained from each participant and the following instructions were given to each participant prior to obtaining their consent.

The PI introduced self to a potential participant, and explained the purpose of the study and the exact procedure, such as the participant will complete a DAHQ, the UCLA CHNDA, an IPAQ, and a KAAP Questionnaire. Furthermore, if the participant was prescribed to take an antihypertensive medication(s), the MMAS-8 was completed. In addition, OPM form was completed based upon findings about BP, lipids and glucose. The fingerstick blood test used sterile technique to obtain the samples for analysis of lipids and glucose.

The benefits and risk factors were explained to participant. The benefits were a free health assessment and the participant would know about their BP, BMI, and lipid panel and glucose level. The risks were minimal to the participant. The participant may feel discomfort, potential bruising or infection at the site of the fingerstick. It is reported that in less than 10% of cases may have a small amount of bleeding under the skin which may produce a bruise and the risk of local infection is less than 1 in 1,000 fingerstick (Summit Health, 1999).

The respondent was informed that participation in the study was voluntary and they were free to discontinue participation at any time without any adverse effect. Each respondent received 1000 drams ($2.5) as an incentive to participate in the study. Also, the respondent was informed that the study would take about 45-60 minutes. The role of PI and the participant and the rights of the participant were explained. It was critical for the participant to know that the collected data did not have any identifiable information that can be linked back to the participant. Furthermore, the PI provided contact information both in Los Angeles and Yerevan should the participant need to contact her for any questions, or make comments or concerns about the research. The participant was also told that upon completion of the study, he/she received a copy of the OPM data form to take to their physician. Participants with HBP were recommended to see their primary physician for further evaluation of their BP.

To ensure anonymity of all study participants, each participant was assigned an individual participant code which was known only to the PI and the UCLA School of Nursing doctoral dissertation chair, Dr. Deborah Koniak-Griffin. These codes were non-traceable back to the participant. All electronic and paper data were maintained in a password-protected security computer and locked in file cabinets to ensure privacy and confidentiality. At the conclusion of the study, all information were stripped of personal or private identifies and/or the key to the code destroyed. The data were maintained indefinitely under the supervision of the PI.

**Limitations**

One of the limitations of this study is the use of cross-sectional design in which all measurements were obtained at a single time point in one setting, and there was no follow-up visits conducted. It is basically describing BP findings and then looking for association between BP and one risk factor at a time.

The researcher used the word HBP instead of HTN because the data were collected at a single time point. As indicated in the literature, HTN terminology was used only when BP is measured at different intervals of the study. The relationship between BP and its risk factors were only an association and cannot determine cause and effect; however, the researcher determined which variables were the predictors for HBP and which ones were weighted higher for HBP.

Convenience sampling is another limitation of this study. Because participants interested in their health status were more likely to visit health care clinics for BP readings and other tests performed as part of data collection, the possibility of self-selection bias exists. This study was conducted in one region of Armenia. The results cannot be generalizable to the rest of the population in the Yerevan region and/or Armenia.

**Summary**

This research study was the first in Armenia to collect BP measurements following JNC-8 guidelines and applied rigorous research methodology. Even though the findings are not generalizable, data provides a stepping stone for future studies. A larger scale study of the same or similar type needs to be conducted to determine the prevalence of HBP or HTN in Armenians in Armenia. It is only after a larger study that the results may potentially lead to various interventions to prevent HBP or HTN. Interventions may focus on public awareness, education, and monitoring of HBP by making the subject culturally-sensitive to Armenians living in Armenia, for example, leading to a reduction of sodium intake, decreasing alcohol use, and better control of weight and smoking (Chobanian et al., 2003).

The findings of this study increase awareness of the need for healthcare providers and the citizens of Armenia to check BP regularly. Furthermore, the study determined the association of HBP with related risk factors. Thus, when a person is found to be hypertensive and has related risk factors associated with HTN, healthcare providers are alerted to perform additional assessments/tests such as blood lipid panels and measure waist circumference. Currently, there are no primary care practitioners that could screen, identify and treat risk factors for HTN (Richardson, 2015). As primary care develops, practitioners will need to have some baseline data to effectively screen and treat their patients.

## Chapter 5

## Results

This chapter describes the results for a descriptive study that was conducted in Armenia. The sections of this chapter include: (1) introduction; (2) specific Aims; (3) sample characteristics; (4) findings related to the Aims of study; and (5) summary. The purpose of this study was to report prevalence of high blood pressure (HBP) among a select group of Armenian men and women and to identify risk factors associated with HBP in adult Armenian men and women. Furthermore, this study examined knowledge, awareness and attitudes/perceptions regarding HBP, the prevalence of HBP by awareness, treatment and control as well as adherence to prescribed antihypertensive medication(s).

Data were collected from 200 Armenian adult participants living in Armenia between September and October 2016. The sample was composed of Armenian men ($n = 34$, 17%) and women ($n = 166$, 83%) who were 21 years of age and older. The results of the study are reported in frequencies, percentages, means with standard deviations (SD), Spearman correlations, Mann-Whitney tests, chi square tests for significance, and stepwise multiple regression. The use of non-parametric statistics addresses the imbalance in size of the subsamples of men and women.

**Specific Aim 1**. To identify the prevalence of HBP and selected factors, many of which are theoretically-based risk factors for HBP, among 200 Armenian men and women 21 years of age and older, living in Armenia.

- Demographic factors include age, gender, and marital status.
- Physiologic factors include lipid panel results (specifically total cholesterol (Total-C), high density lipoprotein (HDL-C), triglycerides and low density lipoprotein (LDL-C), glucose level, body mass index (BMI), and waist and hip circumferences.

- Health lifestyle behavior factors include smoking, alcohol, nutrition, and physical activity.

- Economic status factors include education, income, and employment.

- Inherited risk factors include family history of HBP or hypertension (HTN), or history of cardiac disease, high cholesterol and diabetes mellitus (DM).

**Specific Aim 2.** To examine the relationship between HBP and demographic, physiologic, health lifestyle behaviors, economic and inherited risk factors.

**Specific Aim 3.** To describe knowledge, awareness, and attitudes/perceptions (KAAP) related to HTN.

**Specific Aim 4.** To report the prevalence of HBP by awareness, treatment and control categories: (1) Aware of HBP; (2) Treated for HBP; (3) Controlled for HBP.

**Specific Aim 5.** To describe self-reported adherence in taking antihypertensive medication(s) using the Morisky Medication Adherence Scale (MMAS-8) among participants with HBP who have been prescribed antihypertensive medication(s). To describe the psychosocial determinants of adherence (knowledge, awareness, etc.) and associations of adherence with physiological outcome of blood pressure (BP) control.

**Sample Characteristics**

The principal investigator (PI) approached 208 participants, 200 were enrolled and provided data for testing the aims. The participant rate was 96%. The reasons for refusing to participate in the study included: "Don't have time now to participate," "I don't want to know my blood pressure," "Too much time to answer questions" and "I just want to know my blood pressure and cholesterol results".

Further characteristics of the sample are described under specific Aim 1.

**Findings Related to the Aims of the Study**

  **Specific Aim 1.** To identify the prevalence of HBP and selected factors, many of which

are theoretically-based risk factors for HBP: demographic factors, physiologic, health lifestyle

behaviors, economic, and inherited risk factors, among Armenian men and women 21 years of

age and older, living in Armenia.

  Table 2 displays the frequency counts for the demographic variables in the study. Ages

for the 200 respondents ranged from 21 to 78 years old ($M = 48.62$, $SD = 14.64$). The mean age

in years for males was 47.94 and females were 48.76.

Table 2

*Frequency Counts for Demographic Variables*

| Age in decades [a] | n | % |
|---|---|---|
| 21-30 | 30 | 15.0 |
| 31-40 | 37 | 18.5 |
| 41-50 | 29 | 14.5 |
| 51-60 | 58 | 29.0 |
| 61-70 | 41 | 20.5 |
| 71-78 | 5 | 2.5 |

*Note.* This table presents findings for Aim 1 based on $N = 200$.
[a] Total Sample-Age in years: $M = 48.62$, $SD = 14.64$; Males - Age in years: $n = 34$, $M = 47.94$, $SD = 14.52$; Females - Age in years: $n = 166$, $M = 48.76$, $SD = 14.71$.

  Table 3 provides the results of the bivariate chi-square tests for the demographic

variables based on gender. Whether participants were married varied significantly ($p = .005$) by

gender; men were more likely to be married (85.3%) than women (60.2%). In addition, income

varied significantly ($p = .002$) by gender, as men were more likely to be earning more than

women. No significant gender differences were found for education ($p = .46$) or employment ($p$

$= .38$) (see Table 3).

Table 3

*Demographic Characteristics of Sample*

| | Male | | Female | | Total | |
|---|---|---|---|---|---|---|
| Variable and category | *n* | % | *n* | % | *n* | % |
| Married [a] | | | | | | |
| No | 5 | 14.7 | 66 | 39.8 | 71 | 35.5 |
| Yes | 29 | 85.3 | 100 | 60.2 | 129 | 64.5 |
| Education [b] | | | | | | |
| Less than 10 | 1 | 2.9 | 6 | 3.6 | 7 | 3.5 |
| 10 years | 12 | 35.3 | 48 | 28.9 | 60 | 30.0 |
| Professional | 9 | 26.5 | 70 | 42.2 | 79 | 39.5 |
| Institute | 9 | 26.5 | 28 | 16.9 | 37 | 18.5 |
| Post graduate | 3 | 8.8 | 14 | 8.4 | 17 | 8.5 |
| Employed [c] | | | | | | |
| No | 11 | 32.4 | 67 | 40.4 | 78 | 39.0 |
| Yes | 23 | 67.6 | 99 | 59.6 | 122 | 61.0 |
| Income [d] | | | | | | |
| 600,000 D* | 13 | 38.2 | 75 | 45.2 | 88 | 44.0 |
| 999,000- 2.8 million D* | 4 | 11.8 | 47 | 28.3 | 51 | 25.5 |
| 2.9 million to 5.8 million D* | 14 | 41.2 | 43 | 25.9 | 57 | 28.5 |
| 5.9 million D* and above | 3 | 8.8 | 1 | 0.6 | 4 | 2.0 |

Note. This table presents findings for Aim 1 based on $N = 200$. D*= Dram 480 Dram equivalent to $1.00.
[a] $\chi^2 (1) = 7.74$, $p = .005$. Cramer's $V = .20$. [b] $\chi^2 (4) = 3.59$, $p = .46$. Cramer's $V = .13$. [c] $\chi^2 (1) = 0.76$, $p = .38$. Cramer's $V = .06$. [d] $\chi^2 (3) = 15.19$, $p = .002$. Cramer's $V = .28$.

Table 4 provides the results of the bivariate chi-square tests for eight health risk factor variables based on gender. Forty-four percent (*n* = 87) of the participants had normal blood pressure (systolic blood pressure (SBP) < 120 mmHg and diastolic blood pressure (DBP) < 80 mmHg), 23.5% (*n* = 47) were prehypertensive (SBP 120 - 139 mmHg or DBP 80 – 89 mm Hg) and 33.0% (*n* = 66) were hypertensive (SBP ≥ 140 mmHg and/or DBP of ≥ 90 mmHg based on examination and/or reported use of antihypertensive medication(s). Fewer men had normal blood pressure levels (14.7%) than did women (49.4%; *p* = .001).

Significantly fewer men had acceptable waist sizes (26.5%) than did women (65.1%; *p* = .001). Men had significantly more central adiposity than women based upon waist circumference (WC). Sixty percent of the sample (men and women) had normal or underweight

BMI scores.  There were no significant differences in BMI between men and women.  Also, significantly less men were obese or extremely obese (5.9%) than women (21.1%; $p = .02$). Overall, men had greater risk factors than women as evidenced by higher mean BP levels and WC.  Despite the greater WC in males, men were found to be less obese or extreme obese than women.

Finally, significantly more men had lower HDL-C levels ($M = 36.91$, SD $\pm 13.32$; 64.7%) than women ($M = 46.77$, SD $\pm 13.08$; 30.7%; $p = .001$).  No significant gender differences were noted for Total-C ($p = .80$), LDL-C ($p = .35$), triglycerides ($p = .63$), or glucose ($p = .38$) (see Table 4).

Table 4

*Health and Risk Factor Variables Based on Gender*

| Variable and category | Male n | Male % | Male CI | Female n | Female % | Female CI | Total n | Total % | Total CI |
|---|---|---|---|---|---|---|---|---|---|
| **Blood pressure level** [a] | | | | | | | | | |
| Normal | 5 | 14.7 | (2.8,26.61) | 82 | 49.4 | (41.79,57) | 87 | 43.5 | (36.63,50.37) |
| Prehypertensive | 11 | 32.4 | (16.63,48.08) | 36 | 21.7 | (15.42,27.96) | 47 | 23.5 | (17.62,29.38) |
| Hypertensive | 18 | 52.9 | (36.16,69.72) | 48 | 28.9 | (22.02,35.81) | 66 | 33 | (26.48,39.52) |
| **Waist category** [b] | | | | | | | | | |
| Acceptable | 9 | 26.5 | (11.64,41.3) | 108 | 65.1 | (57.81,72.31) | 117 | 58.5 | (51.67,65.33) |
| Unacceptable | 25 | 73.5 | (58.7,88.36) | 58 | 34.9 | (27.69,42.19) | 83 | 41.5 | (34.67,48.33) |
| **BMI category** [c] | | | | | | | | | |
| Underweight | 0 | 0 | -- | 3 | 1.8 | (-0.22,3.83) | 3 | 1.5 | (-0.18,3.18) |
| Normal | 18 | 52.9 | (36.16,69.72) | 99 | 59.6 | (52.17,67.1) | 117 | 58.5 | (51.67,65.33) |
| Overweight | 14 | 41.2 | (24.63,57.72) | 29 | 17.5 | (11.69,23.25) | 43 | 21.5 | (15.81,27.19) |
| Obesity | 2 | 5.9 | (-2.03,13.79) | 24 | 14.5 | (9.11,19.81) | 26 | 13 | (8.34,17.66) |
| Extreme obesity | 0 | 0 | -- | 11 | 6.6 | (2.84,10.41) | 11 | 5.5 | (2.34,8.66) |
| **Total cholesterol** [d] | | | | | | | | | |
| Desirable | 17 | 50 | (33.19,66.81) | 79 | 47.6 | (39.99,55.19) | 96 | 48 | (41.08,54.92) |
| Borderline-high | 17 | 50 | (33.19,66.81) | 87 | 52.4 | (44.81,60.01) | 104 | 52 | (45.08,58.92) |
| **High density lipoprotein** [e] | | | | | | | | | |
| Low | 22 | 64.7 | (48.64,80.77) | 51 | 30.7 | (23.7,37.74) | 73 | 36.5 | (29.83,43.17) |
| High | 12 | 35.3 | (19.23,51.36) | 115 | 69.3 | (62.26,76.3) | 127 | 63.5 | (56.83,70.17) |
| **Low density lipoprotein** [f] | | | | | | | | | |
| Optimal | 19 | 55.9 | (39.19,72.57) | 107 | 64.5 | (57.18,71.74) | 126 | 63 | (56.31,69.69) |
| Borderline-high | 10 | 29.4 | (14.1,44.73) | 37 | 22.3 | (15.96,28.62) | 47 | 23.5 | (17.62,29.38) |
| High-very high | 5 | 14.7 | (2.8,26.61) | 22 | 13.3 | (8.09,18.41) | 27 | 13.5 | (8.76,18.24) |
| **Triglycerides** [g] | | | | | | | | | |
| Normal | 13 | 38.2 | (21.9,54.57) | 71 | 42.8 | (35.24,50.3) | 84 | 42 | (35.16,48.84) |
| Borderline-high | 21 | 61.8 | (45.43,78.1) | 95 | 57.2 | (49.7,64.76) | 116 | 58 | (51.16,64.84) |
| **Glucose** [h] | | | | | | | | | |
| Normal | 17 | 50 | (33.19,66.81) | 74 | 44.6 | (37.02,52.14) | 91 | 45.5 | (38.6,52.4) |
| Prediabetes | 10 | 29.4 | (14.1,44.73) | 60 | 36.1 | (28.84,43.45) | 70 | 35 | (28.39,41.61) |
| Diabetes | 7 | 20.6 | (7,34.18) | 32 | 19.3 | (13.28,25.28) | 39 | 19.5 | (14.01,24.99) |

*Note*. This table presents findings for Aim 1 based on $N = 200$. JNC-8 standards are applied: Normal: SBP < 120 mmHg and DBP < 80 mmHg. Prehypertensive: SBP 120 - 139 mmHg or DBP 80 – 89 mmHg. Hypertensive: SBP $\geq$ 140 mmHg and/or DBP of $\geq$ 90 mmHg and/or the use of antihypertensive medication(s). World Health Organization (WHO 2008): BMI: Underweight > 18.5 kg/m², Normal $\geq$ 18.5-24.9 kg/m², Overweight $\geq$ 25.0- 29.9 kg/m², Obese $\geq$30.0 kg/m². Waist Circumference: Female Acceptable < 88 cm, Unacceptable > 88 cm. Male Acceptable < 102 cm, Unacceptable > 102 cm. Waist-Hip Ratio: female $\geq$ .85 cm, male $\geq$ .9 cm. National Heart, Lung and Blood Institute (NHLBI 2015): Total-C Desirable < 200 mg/dL, Borderline > 200-239 mg/dL, High $\geq$ 240 mg/dL HDL-C: low < 40 mg/dL, high $\geq$ 40 mg/dL. LDL-C: optimal/near optimal < 129 mg/dL, borderline-high >130-159 mg/dL, high-very high $\geq$ 160 mg/dL. Triglycerides: Normal < 150 mg/dL, borderline – high $\geq$ 150 ml/dL. Glucose-Fasting: Normal 70-99 mg/dL, Prediabetes 100-125 mg/dL, Diabetes $\geq$ 126.
[a] $\chi^2 (2) = 14.11$, $p = .001$. Cramer's $V = .27$. [b] $\chi^2 (1) = 17.31$, $p = .001$. Cramer's $V = .29$. [c] $\chi^2 (4) = 12.06$, $p = .02$. Cramer's $V = .25$. [d] $\chi^2 (1) = 0.06$, $p = .80$. Cramer's $V = .02$. [e] $\chi^2 (1) = 14.06$, $p = .001$. Cramer's $V = .27$. [f] $\chi^2 (1) = 0.89$, $p = .35$. Cramer's $V = .07$. [g] $\chi^2 (1) = 0.24$, $p = .63$. Cramer's $V = .04$. [h] $\chi^2 (2) = 0.57$, $p = .75$. Cramer's $V = .05$.

Table 5 displays the means and SDs found for 11 physiological variables for the total sample. The mean systolic blood pressure was 123.26 with *SD* = 22.39, while mean diastolic blood pressure was 75.63 with *SD* = 11.35. Waist-Hip ratio was *M* = 0.85 and *SD* = 0.09 (see Table 5).

Table 5

*Descriptive Statistics for Physiological Variables*

| Variable | *M* | *SD* | Low | High |
|---|---|---|---|---|
| Mean Systolic Blood Pressure | 123.26 | 22.39 | 80.50 | 212.00 |
| Mean Diastolic Blood Pressure | 75.63 | 11.35 | 50.00 | 111.00 |
| Body Mass Index | 29.58 | 8.14 | 17.21 | 80.00 |
| Waist Circumference | 94.58 | 14.99 | 61.00 | 140.00 |
| Hip Circumference | 111.09 | 14.70 | 50.00 | 156.00 |
| Waist-Hip Ratio | 0.85 | 0.09 | 0.72 | 1.42 |
| Total Cholesterol | 204.64 | 46.18 | 111.00 | 339.00 |
| High Density Lipoprotein | 45.10 | 13.60 | 15.00 | 92.00 |
| Low Density Lipoprotein | 121.58 | 39.50 | 12.00 | 250.00 |
| Triglycerides | 192.99 | 103.92 | 48.00 | 650.00 |
| Glucose | 113.46 | 42.08 | 66.00 | 384.00 |

*Note*. This table presents findings for Aim 1 based on *N* = 200. WHO 2008: BMI: Underweight > 18.5 kg/m², Normal ≥ 18.5-24.9 kg/m², Overweight ≥ 25.0- 29.9 kg/m², Obese ≥30.0 kg/m² Waist Circumference: Female Acceptable < 88 cm, Unacceptable > 88 cm. Male Acceptable < 102 cm, Unacceptable > 102 cm. Waist-Hip Ratio: female ≥ .85 cm, male ≥ .9 cm. NHLBI 2015: Total-C: Desirable < 200 mg/dL, Borderline > 200-239 mg/dL, High ≥ 240 mg/dL. HDL-C: low < 40 mg/dL, high ≥ 40 mg/dL. LDL-C: optimal/near optimal < 129 mg/dL, borderline-high >130-159 mg/dL, high-very high ≥ 160 mg/dL: Triglycerides: Normal < 150 mg/dL, borderline – high ≥ 150 ml/dL. Glucose-Fasting: Normal 70-99 mg/dL, Prediabetes 100-125 mg/dL, Diabetes ≥ 126.

Table 6 displays the results of the Mann-Whitney u test for between group comparisons of men and women for 11 risk factors. Five of 11 comparisons were significant at the *p* = .001 level. Specifically, men had significantly higher mean systolic blood pressure (*M* = 136.20) compared to women (*M* = 120.61), higher diastolic blood pressure (*M* = 82.40) than women (*M* = 74.24), greater waist circumference (*M* = 105.09) than women (*M* = 92.42), lower HDL-C (*M* = 36.91) than women (*M* = 46.77), and a greater waist-hip ratio (*M* = 0.95) than women (*M* = 0.83). No significant differences were found for BMI (*p* = .56), hip circumference (*p* = .53), Total-C (*p* = .88), LDL-C (*p* = .46), triglycerides (*p* = .57), or glucose (*p* = .94) (see Table 6).

Table 6

*Comparison of Selected Variables Based on Gender: Mann-Whitney Tests*

| Category and gender | n | M | SD | $r_s$ | z | p |
|---|---|---|---|---|---|---|
| Mean Systolic Blood Pressure | | | | .27 | 3.86 | .001 |
| Male | 34 | 136.20 | 20.78 | | | |
| Female | 166 | 120.61 | 21.83 | | | |
| Mean Diastolic Blood Pressure | | | | .28 | 3.91 | .001 |
| Male | 34 | 82.40 | 11.50 | | | |
| Female | 166 | 74.24 | 10.84 | | | |
| Body Mass Index | | | | .04 | 0.58 | .56 |
| Male | 34 | 29.12 | 4.87 | | | |
| Female | 166 | 29.68 | 8.66 | | | |
| Waist Circumference | | | | .32 | 4.48 | .001 |
| Male | 34 | 105.09 | 13.54 | | | |
| Female | 166 | 92.42 | 14.38 | | | |
| Hip Circumference | | | | .05 | 0.63 | .53 |
| Male | 34 | 111.44 | 12.48 | | | |
| Female | 166 | 111.01 | 15.15 | | | |
| Total Cholesterol | | | | .01 | 0.15 | .88 |
| Male | 34 | 206.24 | 48.45 | | | |
| Female | 166 | 204.31 | 45.85 | | | |
| High Density Lipoprotein | | | | .30 | 4.25 | .001 |
| Male | 34 | 36.91 | 13.32 | | | |
| Female | 166 | 46.77 | 13.08 | | | |
| Low Density Lipoprotein | | | | .05 | 0.73 | .46 |
| Male | 34 | 126.47 | 40.02 | | | |
| Female | 166 | 120.57 | 39.44 | | | |
| Triglycerides | | | | .04 | 0.57 | .57 |
| Male | 34 | 197.09 | 92.39 | | | |
| Female | 166 | 192.15 | 106.37 | | | |
| Glucose | | | | .01 | 0.07 | .94 |
| Male | 34 | 120.15 | 58.86 | | | |
| Female | 166 | 112.09 | 37.84 | | | |
| Waist-Hip Ratio | | | | .50 | 7.04 | .001 |
| Male | 34 | 0.95 | 0.09 | | | |
| Female | 166 | 0.83 | 0.08 | | | |

*Note*. This table presents findings for Aim 1 based on *N* = 200.

Table 7 provides findings on the number and percent of participants reporting each of the health lifestyle behavior variables.  Most respondents were non-smokers (*n* = 165, 82.5%). Among the 35 participants who reported smoking at least 100 cigarettes during their lifetime, most of the 30 current smokers reported smoking daily (*n* = 25, 71.4%), consuming a pack or

less (68.6%). Five of the 35 (14%) smokers were not currently smokers. Initiation of smoking

began between ages 15-20 (71.4%). One hundred forty-two participants (71.0 %) reported

drinking alcohol at least one time in the past year. Overall, self-reported weekly or more

frequent consumption for the total sample was as follows: liquor (7.7%), wine (5.6%), and beer

(4.9%). Among those who reporting alcohol consumption during the past 12 months, the percent

of participants consuming different types of drinks were as follows: wine (78%), liquor (67.6%),

and beer (45.8%). Over three-quarters of the participants never smoked and over half of the

respondents consumed some type of alcohol in the past 12 months.

Over half (*n*= 105, 53.8%) scored "High" physical activity (PA) rating on the

International Physical Activity Questionnaire (IPAQ). High level of PA is considered when any

of the following two criteria are met: Vigorous-intensity activity on at least 3 days and

accumulating at least 1500 MET-minutes/week OR 7 or more days of any combination of

walking, moderate-or vigorous-intensity activities accumulating at least 3000 MET-

minutes/week (Craig et al., 2003) (see Table 7).

Table 7

*Frequency Counts for Health Lifestyle Behavior Variables*

| Variable and category | *n* | % |
|---|---|---|
| Smoked during lifetime | | |
| Yes | 35 | 17.5 |
| No | 165 | 82.5 |
| Current smoking [a] | | |
| Every day | 25 | 71.4 |
| Some days | 5 | 17.2 |
| Previously smoked | 5 | 17.2 |
| Number of cigarettes [a] | | |
| Not now | 5 | 14.3 |
| One pack or less | 24 | 68.6 |
| More than one pack | 6 | 17.1 |
| Age smoking [a] | | |
| 14 years old | 2 | 5.7 |

(table continues)

Table 7 (*continued*)

| Variable and category | *n* | % |
|---|---|---|
| 15-20 | 25 | 71.4 |
| 21-30 | 5 | 14.3 |
| 31 years and older | 3 | 8.6 |
| Alcohol use in past 12 months | | |
| Yes | 142 | 71.0 |
| No | 58 | 29.0 |
| Beer consumption in past 12 months [b] | | |
| Every day | 1 | 0.7 |
| 3-4 times week | 1 | 0.7 |
| Twice week | 1 | 0.7 |
| Once week | 4 | 2.8 |
| 2-3 times month | 6 | 4.2 |
| Once a month | 13 | 9.2 |
| 3-11 times past year | 39 | 27.5 |
| Did not drink beer | 77 | 54.2 |
| Wine consumption in past 12 months [b] | | |
| Every day | 1 | 0.7 |
| 3-4 times week | 1 | 0.7 |
| Once week | 6 | 4.2 |
| 2-3 times month | 9 | 6.3 |
| Once a month | 16 | 11.3 |
| 3-11 times past year | 77 | 54.2 |
| Did not drink wine | 32 | 22.5 |
| Liquor consumption in past 12 months [b] | | |
| Every day | 1 | 0.7 |
| 3-4 times week | 3 | 2.1 |
| Twice week | 2 | 1.4 |
| Once week | 5 | 3.5 |
| 2-3 times month | 9 | 6.3 |
| Once a month | 10 | 7.0 |
| 3-11 times past year | 66 | 46.5 |
| Did not drink liquor | 46 | 32.4 |
| IPAQ score [c] | | |
| Low | 16 | 8.2 |
| Moderate | 74 | 37.9 |
| High | 105 | 53.8 |

*Note*. This table presents findings for Aim 1 based on $N = 200$.
[a] $n = 35$.  [b] $n = 142$.  [c] $n = 195$ (only participants under age 70).

Table 8 displays the nutrition data for the sample.  The mean number of calories

consumed per day was $M = 1,719.60$ ($SD = 78.75$).  Also, the mean numbers for protein, fat,

cholesterol, carbohydrates and sodium were $M = 63.17$ ($SD = 33.07$), $M = 59.12$ ($SD = 30.48$), $M = 101.44$ ($SD = 106.43$), $M = 294.14$ ($SD = 195.50$), $M = 937.39$ ($SD = 633.98$) respectively.

Table 8

*Means and Standard Deviations for Self-Reported Daily Nutritional Consumption*

| Variable | M | SD | Low | High |
|---|---|---|---|---|
| Calories | 1,719.60 | 780.75 | 133 | 4,414 |
| Protein | 63.17 | 33.07 | 3 | 183 |
| Fat | 59.12 | 30.48 | 3 | 205 |
| Cholesterol | 101.44 | 106.43 | 0 | 495 |
| Carbohydrates | 294.14 | 195.50 | 24 | 1,137 |
| Sodium | 937.39 | 633.98 | 13 | 3,389 |

*Note*. This table presents findings for Aim 1 based on $N = 200$.

Table 9 the number and percent of participants reporting current health problems are displayed in Table 9.  The most frequently occurring self-reported health problem was high blood pressure ($n = 74$, 37.0%), while the least frequently occurring problem was kidney problems ($n = 14$, 7.0%).  Five participants reported no chronic health problems (2.5%) (see Table 9).

Table 9

*Frequency Counts for Current Self-Reported Chronic Health Problem(s)*

| Variable | n | % |
|---|---|---|
| High blood pressure | 74 | 37.0 |
| Heart disease | 51 | 25.5 |
| High cholesterol | 31 | 15.5 |
| Diabetes | 19 | 9.5 |
| Kidney problems | 14 | 7.0 |
| No chronic health problems | 5 | 2.5 |

*Note*. This table presents findings for Aim 1 based on $N = 200$.  Not everyone had a problem.  Some respondents reported more than one problem.

Table 10 displays the frequency counts for self and family health history variables reported by participants.  Those with a personal or family history of the five health problems

were as follows: over 75% reported HBP, nearly 60% reported heart disease, 42% reported

diabetes, 32% reported high Total-C and 22% reported kidney problems (see Table 10).

Table 10

*Frequency Counts for Self and Family Health History Variables*

| Variable and category | *n* | % |
|---|---|---|
| Self / family history of diabetes | | |
| No one | 117 | 58.5 |
| Grandparents | 20 | 10.0 |
| Sibling | 10 | 5.0 |
| Parent | 34 | 17.0 |
| Self | 19 | 9.5 |
| Self / family history of high blood pressure | | |
| No one | 49 | 24.5 |
| Grandparents | 14 | 7.0 |
| Sibling | 6 | 3.0 |
| Parent | 57 | 28.5 |
| Self | 74 | 37.0 |
| Self / family history of high cholesterol | | |
| No one | 137 | 68.5 |
| Grandparents | 1 | 0.5 |
| Sibling | 8 | 4.0 |
| Parent | 23 | 11.5 |
| Self | 31 | 15.5 |
| Self / family history of heart disease | | |
| No one | 81 | 40.5 |
| Grandparents | 12 | 6.0 |
| Sibling | 11 | 5.5 |
| Parent | 45 | 22.5 |
| Self | 51 | 25.5 |
| Self / family history of kidney problems | | |
| No one | 157 | 78.5 |
| Grandparents | 3 | 1.5 |
| Sibling | 8 | 4.0 |
| Parent | 18 | 9.0 |
| Self | 14 | 7.0 |

*Note.* This table presents findings for Aim 1 based on $N = 200$.  Not everyone had a problem.  Some respondents reported more than one problem.

**Specific Aim 2.**  To examine the relationship between HBP and demographic,

physiologic, health lifestyle behaviors, economic, and inherited risk factors.  According to

recommended guidelines for interpreting strength of linear corrections (Cohen, 1988), a weak

correlation typically has an absolute value of $r = .10$ ($r^2 =$ one percent of the variance explained), a moderate correlation typically has an absolute value of $r = .30$ ($r^2 =$ nine percent of the variance explained) and a strong correlation typically has an absolute value of $r = .50$ ($r^2 = 25$ percent of the variance explained). Therefore, for the sake of parsimony, the results reported in this chapter will primarily highlight those correlations that were of at least moderate strength to minimize the potential of numerous Type I errors stemming from interpreting and drawing conclusions based on potentially spurious correlations.

Table 11 provides the nonparametric Spearman correlations for 46 risk factor variables with blood pressure level. Blood pressure level ($1 = normal$, $2 = prehypertensive$, and $3 = hypertensive$) had a statistically significant positive correlation with 28 of 46 variables ($p < .05$ level); 15 of these variables were at least moderate strength using the Cohen (1988) criteria. Specifically, total blood pressure level had significant moderate to large correlations with age ($r_s = .54$, $p < .001$), mean systolic blood pressure ($r_s = .91$, $p < .001$), mean diastolic blood pressure ($r_s = .73$, $p < .001$), body mass index ($r_s = .44$, $p < .001$), waist circumference ($r_s = .59$, $p < .001$), hip circumference ($r_s = .48$, $p < .001$), total cholesterol ($r_s = .35$, $p < .001$), low density lipoprotein ($r_s = .30$, $p < .001$), triglycerides ($r_s = .33$, $p < .001$), waist-hip ratio ($r_s = .42$, $p < .001$), self-high blood pressure diagnosis ($r_s = .55$, $p < .001$), self-heart disease diagnosis ($r_s = .41$, $p < .001$), family history of high blood pressure ($r_s = .45$, $p < .001$), family history of heart disease ($r_s = .33$, $p < .001$), and the total awareness score ($r_s = .32$, $p < .001$). Interestingly, significant relationships were not found between blood pressure and physical activity level, and intake of sodium or most other nutrients (see Table 11).

Table 11

*Nonparametric Spearman Correlations for Risk Factor Variables with Blood Pressure (BP)*

*Level*

| Variable | Blood pressure level [a] | $r_s{}^2$ expressed as percentage |
|---|---|---|
| Demographic factors | | |
|   Age | .54**** | 29.2 |
|   Gender | -.26**** | 6.8 |
|   Married | .19** | 3.6 |
| Physiologic factors | | |
|   Mean SBP | .91**** | 82.8 |
|   Mean DBP | .73**** | 53.3 |
|   Body Mass Index | .44**** | 19.4 |
|   Waist circumference | .59**** | 34.8 |
|   Hip circumference | .48**** | 23.0 |
|   Total cholesterol | .35**** | 12.3 |
|   High density lipoprotein | -.19** | 3.6 |
|   Low density lipoprotein | .30**** | 9.0 |
|   Triglycerides | .33**** | 10.9 |
|   Glucose | .14* | 2.0 |
|   Waist-hip ratio | .42**** | 17.6 |
| Health lifestyle behaviors factors | | |
|   Smoking | -.15* | 2.3 |
|   Currently smoke | -.15* | 2.3 |
|   Number of cigarettes | .04 | 0.0 |
|   Age smoking | -.24 | 5.8 |
|   Alcohol use frequency | .03 | 0.0 |
|   Beer | .19* | 3.6 |
|   Wine | .27**** | 7.3 |
|   Liquor | -.11 | 1.2 |
|   Calories | .12 | 1.4 |
|   Protein | .19** | 3.6 |
|   Fat | .07 | 0.5 |
|   Cholesterol | -.03 | 0.0 |
|   Carbohydrates | .07 | 0.5 |
|   Sodium | -.12 | 1.4 |
|   IPAQ score | -.06 | 0.4 |
| Economic status factors | | |
|   Education | -.17* | 2.9 |
|   Employed | -.05 | 0.3 |
|   Income | .07 | 0.5 |
| Self and family history | | |
|   Diabetes | .20*** | 4.0 |

(table continues)

Table 11 (*continued*)

| Variable | Blood pressure level [a] | $r_s^2$ expressed as percentage |
|---|---|---|
| High blood pressure diagnosis | .55**** | 30.3 |
| High cholesterol diagnosis | .21*** | 4.4 |
| Heart disease diagnosis | .41**** | 16.8 |
| Kidney problems diagnosis | .15* | 2.3 |
| No chronic health problems | .09 | 0.8 |
| Family history of diabetes | .13 | 1.7 |
| Family history of high BP | .45**** | 20.3 |
| Family history of high cholesterol | .13 | 1.7 |
| Family history of heart disease | .33**** | 10.9 |
| Family history of kidney problems | .10 | 1.0 |
| Total knowledge score | .14 | 2.0 |
| Total awareness score | .32**** | 10.2 |

*Note*. This table presents findings for Aim 2 based on $N = 200$.

[a] Blood pressure level: 1 = *normal* to 3 = *hypertensive*.

* $p < .05$.  ** $p < .01$.  *** $p < .005$.  **** $p < .001$.

**Specific Aim 3.** To describe knowledge, attitudes and awareness related to HTN.  Table 12 displays the frequency counts for the 8 items evaluating knowledge of blood pressure.  One of the knowledge questions had part "a" and "b", making a total possible score of 9.  Total knowledge scores ranged from 3 (0.5%) to 9 (53.0%; $M = 8.24$, $SD = 1.06$), with eight of nine questions answered corrected by at least 89.0% of the respondents.  Awareness scores on the 6 items ranged from 0 (42.5%) to 6 (21.0%; $M = 2.40$, $SD = 2.46$); most participants were unaware of hypertension based upon information from their medical doctor (73.0%), and were not informed about their overall blood pressure (59.0%), systolic blood pressure (50.0%), diastolic blood pressure (52.5%).  Furthermore, the participants were not informed about the importance of systolic blood pressure (59.5%) or diastolic blood pressure (66.0%) (see Table 12).

Table 12

*Total and Individual Items Scores for Knowledge Questionnaire and Awareness of Blood*

*Pressure Questionnaire*

| Variable and category | *n* | % |
|---|---|---|
| Total knowledge score [a] | | |
| 3 | 1 | 0.5 |
| 4 | 1 | 0.5 |
| 5 | 4 | 2.0 |
| 6 | 8 | 4.0 |
| 7 | 21 | 10.5 |
| 8 | 59 | 29.5 |
| 9 | 106 | 53.0 |
| Knowledge hypertension meaning | | |
| Incorrect | 10 | 5.0 |
| Correct | 190 | 95.0 |
| Knowledge hypertension danger | | |
| Incorrect | 45 | 22.5 |
| Correct | 155 | 77.5 |
| Knowledge HBP lowering | | |
| Incorrect | 22 | 11.0 |
| Correct | 178 | 89.0 |
| Knowledge BP two number | | |
| Incorrect | 9 | 4.5 |
| Correct | 191 | 95.5 |
| Knowledge normal BP top | | |
| Incorrect | 9 | 4.5 |
| Correct | 191 | 95.5 |
| Knowledge BP normal bottom | | |
| Incorrect | 11 | 5.5 |
| Correct | 189 | 94.5 |
| Knowledge BP measures important | | |
| Incorrect | 18 | 9.0 |
| Correct | 182 | 91.0 |
| Knowledge people lower BP | | |
| Incorrect | 17 | 8.5 |
| Correct | 183 | 91.5 |
| Knowledge lowering BP helps health | | |
| Incorrect | 11 | 5.5 |
| Correct | 189 | 95.5 |
| Awareness Scale Score [b] | | |
| 0 | 85 | 42.5 |
| 1 | 9 | 4.5 |
| 2 | 19 | 9.5 |

(table continues)

Table 12 (*continued*)

| Variable and category | *n* | % |
|---|---|---|
| 3 | 17 | 8.5 |
| 4 | 10 | 5.0 |
| 5 | 18 | 9.0 |
| 6 | 42 | 21.0 |
| Awareness HTN Told By MD | | |
| Unaware | 146 | 73.0 |
| Aware | 54 | 27.0 |
| Awareness MD Told Reading | | |
| Unaware | 118 | 59.0 |
| Aware | 82 | 41.0 |
| Awareness MD Told SBP | | |
| Unaware | 100 | 50.0 |
| Aware | 100 | 50.0 |
| Awareness MD Told DBP | | |
| Unaware | 105 | 52.5 |
| Aware | 95 | 47.5 |
| Awareness MD Told Systolic Important | | |
| Unaware | 119 | 59.5 |
| Aware | 81 | 40.5 |
| Awareness MD Told Diastolic Important | | |
| Unaware | 132 | 66.0 |
| Aware | 68 | 34.0 |

*Note*. This table presents findings for Aim 3 based on $N = 200$.

[a] Total Knowledge Score: $M = 8.24$, $SD = 1.06$.  [b] Total Awareness Score: $M = 2.40$, $SD = 2.46$.

**Specific Aim 4.** To report prevalence of HBP by awareness, treatment and control

categories: (1) Aware of HBP, (2) Treated for HBP, and (3) Controlled for HBP.  Table 13

displays the results of one-way of analysis variance tests for total knowledge and total awareness

scores based on blood pressure level categorization (normal, prehypertensive and hypertensive).

Results showed significant differences in the blood pressure levels for awareness ($F [12,197] =$

$25.50$, $p = .001$), but not in the blood pressure levels for total knowledge ($F [12,197] = 1.55$, $p =$

$.22$).  Scheffe post hoc tests found the awareness score to be significantly higher for the

hypertensive respondents than either of the other groups at the $p < .001$ level (see Table 13).

Table 13

*Comparison of Total Knowledge and Awareness Scores Based on Blood Pressure Level and*

*Normality: F Tests for One-way Analysis of Variance*

| Score and blood pressure level | $n$ | $M$ | $SD$ | $\eta$ | $F$ | $p$ |
|---|---|---|---|---|---|---|
| Total Knowledge | | | | .12 | 1.55 | .22 |
|   Normal | 87 | 8.17 | 1.08 | | | |
|   Prehypertensive | 47 | 8.11 | 0.91 | | | |
|   Hypertensive | 66 | 8.42 | 1.12 | | | |
| Total Awareness [a] | | | | .45 | 25.50 | .001 |
|   Normal | 87 | 1.84 | 2.14 | | | |
|   Prehypertensive | 47 | 1.26 | 1.91 | | | |
|   Hypertensive | 66 | 3.95 | 2.48 | | | |

*Note*. This table presents findings for Aim 4 based on $N = 200$.

[a] Scheffe post hoc tests: hypertensive > normal ($p = .001$); hypertensive > prehypertensive ($p = .001$).

Table 14 provides the results of the bivariate chi-square tests for blood pressure level

(normal, prehypertensive and hypertensive) and blood pressure normality based on blood

pressure medication. Significant differences were found in the blood pressure level

categorization ($p = .001$) and normality ($p = .001$), depending on whether the participant was

taking blood pressure medication(s). Most participants with HTN ($n = 53$, 80.3%) reported

taking prescribed medication(s), whereas no prehypertensive participants were taking prescribed

medication(s) and nine participants (10.3%) who were taking prescribed BP medication(s) had

normal BP (see Table 14).

Table 14

*Blood Pressure Level and Medication Use (N = 62)*

| | Use medication | | Do not use medication | |
|---|---|---|---|---|
| Blood pressure level [a] | $n$ | % | $n$ | % |
| Normal | 9 | 10.3 | 78 | 89.7 |
| Prehypertensive | 0 | 0.0 | 47 | 100.0 |
| Hypertensive | 53 | 80.3 | 13 | 19.7 |

*Note*. This table presents findings for Aim 4 based on $N = 62$. JNC-8: Normal: SBP < 120 mmHg and DBP < 80 mmHg. Prehypertensive: SBP 120 - 139 mmHg or DBP 80-89 mmHg. Hypertensive: SBP $\geq$ 140 mmHg and/or DBP of $\geq$ 90 mmHg and/or the use of antihypertensive medication(s).

[a] $\chi^2$ (2, $n = 200$) =113.47, $p = .001$. Cramer's $V = .75$.

Table 15 provides results on hypertensive participants' awareness of having HBP. The findings are based on the question "Have you ever been told by a doctor or health care provider that you have hypertension?" Sixty-six participants responded "Yes." Thirty-six percent *(n = 24)* were normotensive BP on assessment and 64% *(n = 42)* were hypertensive. Among the 62 participants who reported being prescribed BP medication(s), the large majority (85%) had HBP on assessment and only nine of the participants had their BP under control because of antihypertensive medication(s).

Table 15

*Prevalence of High Blood Pressure by Awareness, Treatment and Controlled Frequency*

|  | Awareness of HTN[a] (N = 66) | | Prescribed BP Medication(s) (N = 62) | |
|---|---|---|---|---|
|  | N | % | n | % |
| BP < 140/90 (Controlled) | 24 | 36.0 | 9 | 15 |
| BP ≥ 140/90 (Hypertensive) | 42 | 64.0 | 53 | 85 |

*Note*. This table presents findings for Aim 4.
[a] Awareness = Based on "MD Told." Normal and prehypertensive BP < 140/90 mmHg. Hypertensive BP ≥ 140/90 mmHg.

Table 16 displays the results of the stepwise multiple regression model that predicted blood pressure level based on 37 risk factors and demographic variables. Stepwise multiple regression was used instead of standard multiple regression to create a parsimonious model that removed all non-significant and redundant variables (Hesse-Biber & Leavy, 2011). The final five-variable model was statistically significant ($p = .001$) and accounted for 52.4% of the variance in blood pressure levels. Specifically, blood pressure levels were higher with: (a) greater waist circumference ($\beta = .25$, $p = .001$); (b) personal history of high blood pressure ($\beta = .36$, $p = .001$); (c) higher Total-C ($\beta = .15$, $p = .006$); (d) being male ($\beta = -.16$, $p = .003$); and (e) older age ($\beta = .16$, $p = .02$) (see Table 16).

Table 16

*Prediction of Blood Pressure Level Based on Selected Variables: Stepwise Multiple Regression*

| Variable | B | SE | β | p |
|---|---|---|---|---|
| Intercept | -0.45 | 0.37 | | .22 |
| Waist Circumference | 0.01 | 0.00 | .25 | .001 |
| High Blood Pressure q14 | 0.64 | 0.11 | .36 | .001 |
| Total Cholesterol | 0.00 | 0.00 | .15 | .006 |
| Gender [a] | -0.38 | 0.13 | -.16 | .003 |
| Age | 0.01 | 0.00 | .16 | .02 |

*Note*. This table is an additional analysis based on $N = 200$. Final Model: $F (5, 194) = 42.71$, $p = .001$. $R^2 = .524$. Candidate variables = 37.
[a] Coding: 0 = *Male* 1 = *Female*

**Specific Aim 5a.** To describe self-reported adherence in taking antihypertensive

medication(s) using the Morisky Medication Adherence Scale (MMAS-8) among participants

with HBP who have been prescribed antihypertensive medication(s) ($n = 62$). Table 17 displays

the total adherence scores and frequency counts for the individual items in the MMAS-8. Most

participants had low adherence scores ($n = 44$, 71.0%) and responded "Yes" ($n = 34$, 54.8%) to

the question "Do you sometimes forget to take your [health concern] medication? and/or

responded "Yes" ($n = 36$, 58.1%) to the item "People sometimes miss taking their medications

for reasons other than forgetting. Thinking over the past two weeks, were there any days when

you did not take your [health concern] medications?" Respondents were not likely to stop taking

medication completely ($n = 23$, 37.1%) or leave home forgetting ($n = 27$, 43.5%). Most

participants reported taking their medication yesterday ($n = 36$, 58.1%) and stopping medication

if feeling better ($n = 40$, 64.5%). They responded "Yes" to the question "Taking medication

every day is a real inconvenience for some people. Do you feel hassled about sticking to your

[health concern] treatment plan?" ($n = 48$, 77.4%). Over half of the participants reported

remembering to take their medication "all the time" ($n = 24$, 38.7%) or "usually" ($n = 19$,

30.6%) (see Table 17).

Table 17

*Frequency Counts for Morisky Medication Adherence Scale-8 Variables*

| Variable and category | *n* | % |
|---|---|---|
| Total adherence score | | |
|   Low adherence | 44 | 71.0 |
|   Moderate adherence | 17 | 27.4 |
|   High adherence | 1 | 1.6 |
| Forget | | |
|   Yes | 34 | 54.8 |
|   No | 28 | 45.2 |
| Forget 2 weeks | | |
|   Yes | 36 | 58.1 |
|   No | 26 | 41.9 |
| Stopped taking medication | | |
|   Yes | 23 | 37.1 |
|   No | 39 | 62.9 |
| Leave home forget | | |
|   Yes | 27 | 43.5 |
|   No | 35 | 56.5 |
| Took medication yesterday | | |
|   Yes | 36 | 58.1 |
|   No | 26 | 41.9 |
| Feels well stops medication | | |
|   Yes | 40 | 64.5 |
|   No | 22 | 35.5 |
| Feel hassled taking medication | | |
|   Yes | 48 | 77.4 |
|   No | 14 | 22.6 |
| Frequency of remembering taking medication | | |
|   All the time | 24 | 38.7 |
|   Usually | 19 | 30.6 |
|   Sometimes | 16 | 25.8 |
|   Once in a while | 3 | 4.8 |

*Note*. This table presents findings for Aim 5a based on *N* = 62.

**Specific Aim 5b.** To describe the psychosocial determinants of adherence (knowledge, awareness, etc. - this part of aim is presented in Table 17) and associations of adherence with physiological outcomes of BP control.  Table 18 provides the nonparametric Spearman correlations between the scores for the MMAS-8 measure and mean systolic, diastolic blood pressures, total knowledge scores, and total awareness scores.  While there was a trend for higher

adherence with lower mean systolic blood pressure ($r_s^2 = -.23$), the results were not statistically significant ($p = .08$). There was a trend for higher adherence with higher awareness scores ($r_s = .18$), but again the results did not approach statistical significance ($p = .16$) (see Table 18).

Table 18

*Nonparametric Spearman Correlations between Adherence Scores and Mean Systolic, Diastolic Blood Pressure, Knowledge and Awareness Scores*

| Variable | Morisky adherence | $r_s^2$ expressed as percentage |
|---|---|---|
| Mean SBP | -.23 | 5.3 |
| Mean DBP | -.12 | 1.4 |
| Total Knowledge Score | .03 | 0.0 |
| Total Awareness Score | .18 | 3.2 |

*Note*. This table presents findings for Aim 5b based on $N = 62$. * $p < .05$.

**Summary**

In summary, the sample was composed predominantly of middle-age females, married with at least a high school education. Over 50% of the respondents ($n = 113$, 56.5%) were found to be prehypertensive ($n = 47$, 23.5%) or hypertensive ($n = 66$, 33%). Over three-quarters of the participants never smoked and over half of the respondents consumed alcohol in the past 12 months.

The nonparametric Spearman correlations indicated that BP level had significant moderate to large correlations with age, mean SBP, mean DBP, BMI, WC, hip circumference, Total-C, LDL-C, triglycerides, waist-hip ratio, and with self and family reported history of HBP and heart disease. The results of the stepwise multiple regression model indicated that BP levels were higher with greater waist circumference, a personal history of HBP, high Total-C, being male and older age. Furthermore, a fraction of hypertensive respondents had their HBP controlled and more than half of the respondents scored low for adhering to taking prescribed antihypertensive medication(s).

In the final chapter, these findings are interpreted and compared to previous research, and conclusions and implications are drawn.  A series of recommendations are suggested based upon these results.

## Chapter 6

## Discussion

This chapter discusses the specific aims and key findings of this study and compares the results to past research.  Following this discussion, the study's strengths and limitations, implications for future clinical practice and research, recommendations, and a summary are presented.

Findings of this study address the critical need to expand knowledge about the prevalence of high blood pressure (HBP) and the relationship between HBP and its associated risk factors among a select group of Armenian adults, living in Armenia.

### Specific Aims

**Specific Aim 1.**  To identify the prevalence of HBP and selected factors, many of which are theoretically-based risk factors for HBP, among 200 Armenian men and women 21 years of age and older, living in Armenia.

- Demographic factors include age, gender, and marital status.

- Physiologic factors include lipid panel results (specifically, total cholesterol (Total-C), high density lipoprotein (HDL-C), triglycerides, low density lipoprotein (LDL-C), glucose level, body mass index (BMI), and waist and hip circumferences.

- Health lifestyle behavior factors include smoking, alcohol, nutrition, and physical activity.

- Economic status factors include education, income, and employment.

- Inherited risk factors include family history of HBP or hypertension (HTN), or history of cardiac disease, high cholesterol, and diabetes mellitus (DM).

**Specific Aim 2.**  To examine the relationship between HBP and demographic, physiologic, health lifestyle behavior, economic, and inherited risk factors.

**Specific Aim 3.**  To describe knowledge, awareness, and attitudes/perceptions related to HTN.

**Specific Aim 4.**  To report the prevalence of HBP by awareness, treatment, and control categories:  1) Aware of HBP; 2) Treated for HBP; 3) Controlled for HBP.

**Specific Aim 5.**  To describe self-reported adherence in taking antihypertensive medication(s) using the Morisky Medication Adherence Scale (MMAS-8) among participants with HBP who have been prescribed antihypertensive medication(s).  To describe the psychosocial determinants of adherence (knowledge, awareness, etc.) and associations of adherence with the physiological outcome of BP control.

**Comparison of Results with Literature**

In comparing the findings of the three previous studies conducted in Armenia (Footman et al., 2013; Harhay et al., 2013; Roberts et al., 2012) and the findings of this study showed some similarities and many differences.

The proportion of female to male participants in all three previously-reported studies and this dissertation study were the same; over half of the participants were women.  Also, similar to this study, Roberts and associates (2012) reported low adherence rates to prescribed medication(s) using a different measure of this outcome.  Adherence to medication(s) was not examined in the other two studies (Footman et al., 2013; Harhay et al., 2013).

Further, methodological differences existed across past research conducted in Armenia and the dissertation study (Footman et al., 2013; Harhay et al., 2013; Roberts et al., 2012), including  differences in recruitment methods and sample size,  use of multiple dissimilar measures for data collection,  and examination of differing risk factors related to HBP.  The

sample size of this study was considerably smaller than that of past studies conducted in

Armenia. Two hundred participants were in the nonrandom sample of this study compared to

over 7,345 participants in the national survey (Footman et al., 2013; Harhay et al., 2013; Roberts

et al., 2012). This study used face-to-face interviews and collected objective physiological data,

whereas, only one study measured BP after face-to-face interviews (Harhay et al., 2013) and did

not use American Heart Association (AHA) or Joint National Committee (JNC) guidelines.

Compared to previous research (Footman et al., 2013; Harhay et al., 2013; Roberts et al.,

2012) this study used several instruments that were not reported in previous studies in Armenia,

such as, University of California, Los Angeles, (UCLA) Center for Human Nutrition Dietary

Assessment (CHNDA), International Physical Activity Questionnaire (IPAQ), Knowledge,

Awareness and Attitudes/Perceptions Questionnaire (KAAP), and MMAS-8.

The findings of demographic and risk factor variables of previous studies and this study

are described in the sections below.

**Prevalence of HTN and Prehypertension.** Findings of this study revealed that over

50% of the sample were either hypertensive or prehypertensive. This finding is similar to the

United States (US) population and to a study conducted in Turkey and on Armenians in Los

Angeles, California (CDC, 2016; Erem, Hacihasanoglu, Kocak, Deger, & Topbas 2009;

Naccashian, 2017). Studies conducted in Armenia (Footman et al., 2013; Harhay et al., 2013;

Roberts et al., 2012) and in Turkey with Armenians (Kumbasar et al., 2013) reported lower HBP

prevalence rates. In contrast, an unpublished study conducted on Armenians in Armenia

(Akaragian et al., 2002), a study on Arab-Americans living in the US (Tailakh et al., 2013), and a

study conducted on Armenians living in Lebanon (Arevian et al., 2004) found much higher

prevalence rates of HBP. The latter finding may be related to differences in the samples: the

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Lebanese-Armenian sample (Arevian et al., 2004) was composed of adults with coronary artery disease (CAD). However, this study's HBP prevalence rate (33%) was similar to the US results, which reported about one out of three participants with HBP or HTN (CDC, 2016; Go et al., 2014).

Comparison of the prehypertension prevalence rate among Armenians in this sample with similar populations cannot be made because research reports on this condition among Armenians were not found in the literature review. However, when a comparison was made with the prevalence rate described for a US population (29%) (CDC, 2016) and Arab-Americans (39.7%) (Tailakh et al., 2013), the rates were lower in this dissertation study sample (24%). It is critical to identify prehypertensive individuals because prehypertension increases the likelihood of cardiovascular events by 80% compared with their normotensive counterparts (Qureshi, Suri, Kirmani, Divani, & Mohammad, 2005; Zhang et al., 2006). Furthermore, prehypertensive individuals require health-promoting lifestyle modifications to prevent Cardiovascular Disease (CVD) (Chobanian et al., 2003).

**Prevalence of age and gender.** The demographic characteristics (i.e., age and gender composition) of this study's sample differ from past studies on Armenians (Arevian et al., 2004; Footman et al., 2013; Harhay et al., 2013; Kumbasar et al., 2013; Roberts et al., 2012). This study's participants were younger than those in the studies conducted on Armenians living in Lebanon (Arevian et al., 2004) and on Armenians living in Turkey (Kumbasar et al., 2013) and older than those in other studies (Footman et al., 2013; Harhay et al., 2013; Roberts et al., 2012; Tailakh et al., 2013). The age variations in research samples may contribute to differences in the prevalence rates of HBP. For example, in Arevian and colleagues' (2004) sample of older participants, the prevalence of HTN was 65.8%. In contrast, the prevalence rate of HTN among

the younger participants in the study conducted by Kumbasar and colleagues (2013) and other studies (Footman et al., 2013; Harhay et al., 2013; Roberts et al., 2012) was lower (range 24.1%, 29.3%, and 31%, respectively). All of these findings are consistent with the physiological fact that BP increases with age (AHA, 2017; Arevian et al., 2004; Chobanian et al., 2003; Harhay et al., 2013; Jaddou et al., 2000; Mehler et al., 2001; NHLBI, 2015; Tailakh et al., 2013; Wolz et al., 2000; Young et al., 2005).

There were more women than men in this sample. This gender difference is also reported in other studies on Armenians and non-Armenians (Dallo & Borrell, 2006; Footman et al., 2013; Harhay et al., 2013; Jaddou et al., 2000; Mehler et al., 2001; Young et al., 2005). In contrast, some studies conducted on Arabs reported more men participated than women (Bener et al., 2004; Tailakh et al., 2013). One of the differences reported for gender differences in composition of samples reported in prior studies is that women are typically more interested in health issues (CDC, 2007, 2015; Cockerham, 2010, 2012; Egan, Zhao, & Axon, 2010). Other explanations provided in past research for lower rates of participation among women are influences of social prohibitions against female participating in research (Bener et al., 2004). Furthermore, in Armenia the proportion of men to women is not equal. Sixty percent of the population is female, as men often seek jobs outside of Armenia to support the family (Gregoryan, 2015) the latter likely explains the unequal gender participation in this study.

Gender differences were also found in the prevalence of HTN among study participants. Men had significantly higher mean SBP ($M =136.20$) compared to women ($M =120.61$). This finding is consistent with the results of previous studies involving samples of non-Armenians (AHA, 2017; Bener et al., 2004; Friedman et al., 2006; Mehler et al., 2001; NHLBI, 2016; Tailakh et al., 2013; Young et al., 2005). However, other studies reported that more females

were found to be hypertensive than males (Dallo & Borrell, 2006; Footman et al., 2013; Go et al., 2013; Harhay et al., 2013; Jaddou et al., 2000; Vasan et al., 2002).  One of the reasons that men may have had higher mean SBP in this dissertation than women is that they had higher waist circumference (WC) measurements.  WC was found to be the strongest predictor for HBP, as reported in Chapter 5.

**Relationship between HTN and WC, BMI, LDL-C, HDL-C, triglycerides, and glucose.** Objective measures were obtained for all of the physiological variables, i.e., WC, BMI, LDL-C, HDL-C, triglycerides, and glucose.  Results of the stepwise multiple regression analyses indicated that HTN was predicted by several physiological variables.

The relationship between HBP and WC is consistent with findings of previous studies conducted on Armenians (Kumbasar et al., 2013; Naccashian, 2017).  The relationship between HBP and WC has also been found in research conducted in China (Dong et al., 2016).  This finding represents an important relationship because the proximity of fat deposits to the heart is one of the risk factors of heart attack.  Furthermore, visceral fat is metabolized by the liver and converted to cholesterol, which is one of the risk factors for HBP (Ladeiras-Lopes et al., 2016).

The significant positive relationship found between HBP and BMI has been reported in many previous research studies (Arevian et al., 2004; Daderian-Huckabay, 2003; Jaddou et al., 2000; Ortegaa et al., 2015; Roka, Michimi, & Macy, 2015; Tailakh et al., 2013) except for the findings reported for adults living in Kyrgyzstan (Young et al., 2005).  In considering BMI findings of the dissertation study, it is important to note that gender was not likely to be a contributing factor to the relationship between HBP and BMI because there were no significant differences between the mean BMIs of Armenian men and women.  However, many studies have found a significant relationship between HBP and BMI and gender (CDC, 2016; JNC-7; Jaddou

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et al., 2000; NHLBI, 2015; NHLBI, 2016; Younger et al., 2005).  The reason for gender differences in the relationship between HBP and BMI across studies is unclear and warrants further investigation.

As anticipated, HBP was positively related to LDL-C and negatively related to HDL-C. These findings are consistent with previous studies conducted on Armenians in the US and in other countries (Arevian et al., 2004; Dong et al., 2016; Jaddou et al., 2000; NHLBI, 2002; NHLBI, 2012; Tailakh et al., 2013; Töth, Potter, & Ming, 2014; Young et al., 2005).

In the dissertation sample, significant gender differences were observed for HDL-C levels: Men had significantly lower HDL-C ($M = 36.91$) than women ($M = 46.77$).  These findings are consistent with the reported data of studies conducted on Armenians living in Turkey (Kumbasar et al., 2013), in the US (AHA, 2016), and in Korea (Kim et al., 2011). Further research is needed to gain an understanding about why Armenian males have lower HDL-C in comparison to females.

Overall, the lipid findings of the dissertation support physiological explanations about the nature of the relationship between HBP and levels of LDL-C and HDL-C (NHLBI, 2012; NHLBI, 2016) as reported in previous research.  These two indicators are part of the US golden standard as predictors for HTN (NHLBI, 2012).

A statistically significant but a weak correlation was found between HBP and glucose. More than fifty percent of the participants were classified as prediabetic or diabetic.  This finding is consistent with results reported for research conducted in the US and Turkey (Erem et al., 2009; Huffman et al., 2012).  A study conducted on Armenians in Lebanon and Los Angeles, California reported low glucose levels (Arevian et al., 2004; Naccashian, 2017).  Furthermore, this dissertation found more females than males had prediabetes, or diabetic glucose levels.  This

finding is similar to other results from studies conducted on Native American Indians (Scavini et al., 2003; Zhang et al., 2006). Contrary to this finding, other studies reported more males than females had prediabetic, or diabetic glucose levels (CDC, 2016; Naccashian, 2017; Nordström, Hadrévi, Olsson, Franks, & Nordström, 2016). One of the reasons more women than men had prediabetic or diabetic glucose levels may be due to gender differences in weight categorization.

**Health lifestyle behaviors.** In respect to relating the prevalence of HBP to health lifestyle behaviors (i.e. smoking, physical activity, alcohol use, and nutrition), the only significant correlation was between HBP and smoking and this relationship was weak. Two studies on Armenians (Arevian et al., 2004; Roberts et al., 2012) reported data on smoking and physical activity (PA). Similar to this study, the majority of the Armenian participants were non-smokers (Arevian et al., 2004). Compared to previous studies (Roberts et al., 2012; USAID/PHCR, 2008), smoking was found more common in men than women. Contrary to previous research (Arevian et al., 2004), in this study, the relationship between HBP and PA was non-significant. The use of different instruments to collect data on PA, as well as variations in sample characteristics, may contribute to outcomes differing with previous study (Arevian et al., 2004).

**Alcohol use.** The relationship between HBP and alcohol use was found to be non-significant in this study. This finding was consistent with some previous research (Grim et al., 1999; Puddey & Beilin, 2006) and contrary to findings in the Sichuan Tibetan population (Huang et al., 2016). Another finding in this study was that Armenian men consumed alcohol more frequently than women, which is similar to the findings of a previous study conducted in Armenia (USAID/PHCR, 2008). However, contrary to the findings of this study, the results of research studies in Muslim populations (Dallo & Borrell, 2006; Tailakh et al., 2013) showed

lower alcohol consumption than in this study.  The inconsistency between this study and findings of the previous study may be due to religious differences: Islam prohibits consumption of alcohol (Dallo & Borrell, 2006; Tailakh et al., 2013).  Also, HBP is associated with excessive alcohol use (over two drinks per day) (AHA, 2016; Medicinenet.com, 2002; NHLBI, 2015; WebMD, 2014) the majority of the participants in this study consumed alcohol from once a month to 2-3 times per month.  Neither men nor women thus abused alcohol, as measured by established standards of alcohol use (NIAAA, 2007).

**Nutrition.** To the principal investigator's (PI) knowledge, only one paper on Armenians reported nutrition findings (Arevian et al., 2004), collecting information on the type of oil used in cooking.  Also, UCLA's CHNDA instrument was not used in studies related to HBP or HTN in Armenia; therefore, comparing the findings of this study with other papers was not possible. Participants did not have high levels of fat and/or cholesterol in their diets according to their 24-hour recall.  This may have contributed to the lack of a significant correlation between the HBP and nutrition variables.  Compared to the US data, the average daily caloric, cholesterol and sodium intake for adult Armenians were lower than for the US general population (NHNES; 2000) and higher for carbohydrates, protein and fat (Information Please, 2005; Authority Nutrition, 2017).

There may be several explanations for these nutrient intake differences.  One of the reasons may be due to the heightened "fast food" practice of the US when compared to Armenia. The food consumption of Armenians is typically "closer to the food chain" than in the US. There are a very limited number of vending machines in Armenian public places and due to cost, eating at restaurants is perceived as a luxury.

**Economic status factors: Education, income and employment.** The only economic status variable found to be related to HBP was education. The higher the education level, the lower the blood pressure. This study's findings were consistent with previous research conducted on Armenians (Harhay et al., 2013; USAID/PHCR, 2008). A majority of the participants had more than a high school education. Even though this study did not find a relationship between HBP and income, a previous study conducted in Armenia reported that wealthier women were more likely to have optimal BP (Harhay et al., 2013). Further research is needed to gain a global perspective on the relationship between wealth, education and nutrition that affects HBP.

**Inherited risk factors.** Inherited risk factors of a family history of chronic illness such as HBP and heart disease were found to be significantly correlated with HBP. These findings were supported by many studies conducted globally (Albert et al., 2006; Arevian et al., 2004; CDC; 2015; Erem et al., 2009; Goldstein, Shapiro, & Weiss, 2008; Jaddou et al., 2000; Ranasinghe, Cooray, Jayawardena, & Katulan, 2015). It is a well-accepted premise that if parents or other close blood relatives have HBP, there is an increased chance that the person will develop HBP in his or her lifetime (AHA, 2017; CDC, 2015; Goldstein et al., 2008; NHLBI, 2015; Ranasinghe et al., 2006; Tailakh et al., 2013).

**Knowledge, awareness, and attitudes/perceptions (KAAP) related to HTN.** Objective measures of HBP were not found to be correlated with a knowledge questionnaire scores about HBP; however, they were correlated with an awareness (MD told) of whether or not they actually had HBP.

Scores for the knowledge questionnaire reflect a high level of knowledge about HTN among the large majority of participants and very little score variation in the sample. The

majority of the participants correctly identified the meaning of HTN as "high blood pressure," whereas a study conducted in the US at the Henry Ford Medical Group (HFMG) on hypertensive patients, using the same measure, reported a lower score (Oliveria et al., 2005). The findings for the question "Can lowering blood pressure even a little bit improve health?" were similar for both studies. However, slightly more HFMG participants correctly answered the question "Can people do things to lower their blood pressure?" than participants in this study.

Although the sample of this study was recruited from the general public, the findings indicated that Armenians had higher HTN knowledge scores than the hypertensive respondents in the HFMG study (Oliveria et al., 2005). Furthermore, this study found no significant correlations between knowledge about HBP and adherence to antihypertensive medication(s). This result suggests that knowledge does not influence behavior (Bastable, 2014; Lira et al., 2006).

Awareness was significantly correlated with the actual measurement of BP and the respondents' awareness of having an HTN diagnosis. These findings were supported by a study conducted on hypertensive patients in the US (Oliveria et al., 2005). Using a similar awareness questionnaires, the results also were supported by other studies conducted in China (Zhang et al., 2009) and in the US (Ong, Cheung, Man, Lau, & Lam, 2007). The findings of this study support the conclusion that the Armenian respondents were aware of their health condition. Furthermore, the awareness of an HTN diagnosis is the first step in taking actions to remediate the problem (Alzaman, Wartak, Friderici, & Rothberg, 2013; Lira et al., 2006).

**HBP compared with awareness, treatment, and control.** The large majority of participants with HBP in the study sample were aware of their HTN diagnosis based upon information provided by their health care provider. This finding is similar to studies conducted

in the US (Oliveria et al., 2005); however, not with findings from Pakistan and in South Asians living in the United Arab Emirates (Bilal et al., 2015; Shah et al., 2015). Among the participants who reported being prescribed antihypertensive medication(s), over 50% were found to be hypertensive. This finding is consistent with results of studies done on Lebanese-Armenians, in the US, Turkey and in the United Arab Emirates (Arevian et al., 2004; Egan et al., 2010; Erem et al., 2009; Shah et al., 2015). Less than one-sixth (15%) of the participants in the study sample who reported taking prescribed antihypertensive medication(s) had controlled BP. Other studies conducted in Armenia, in the US, and the United Arab Emirates had similar findings (Egan et al., 2010; Shah et al., 2015; USAID/PHCR, 2008). However, the study conducted on Arab-Americans in the US and Turkey reported a much higher control of BP for the participants taking prescribed antihypertensive medication(s) (Erem et al., 2009; Tailakh et al., 2016). Low control of BP among hypertensive participants may be related to MMAS-8 findings that are described below.

**MMAS-8.** The MMAS-8 has been widely used in the US, China, Iran, and other parts of the globe. To the PI's knowledge, this is the only research evaluating medication adherence using the MMAS-8 in Armenia.

Close to 30% of the participants were on prescribed antihypertensive medications, and about three quarters scored low adherence on the MMAS-8. This study's findings for low adherence were much lower than studies conducted in the US (de Oliveria-Filho et al., 2014; Krousel-Wood, 2009; Morisky et al., 2008; Tailakh et al., 2016).

Using a difference adherence scale with Armenians, another study similarly found low adherence on Armenians (Roberts et al., 2012). There may be several possible explanations for the low adherence to antihypertensive medication(s) among participants. One of the possible

reasons is that HBP is a silent killer phenomenon in which people do not have overt signs and symptoms to cause discomfort and to alert them to take proper action. The second reason may be that the participants are unaware of the consequences of not taking antihypertensive medications(s) regularly and stop taking medications(s) without their provider's knowledge. The third reason is medications are expensive in Armenia and individuals with HTN are reluctant to take prescribed antihypertensive medication(s) when they feel well. They may save the tablets for future occurrences. The fourth possible reason may be that there is no follow up visit by the participants with providers. The latter two interpretations are evidenced by a study conducted in Armenia (UASID/PHCR, 2008) reporting that only half of the respondents had a preventive health visit within the preceding 12 months, and they did not adhere to their medication regimens due to a lack of funds to purchase prescribed medications or to visit the doctor.

**Theory**

Health Lifestyle Theory (HLT) (Cockerham, 2005) provided the framework for this study. To my knowledge, research testing of the HLT has not been conducted in the US or other countries to determine the model's association with HBP or HTN; however, Cockerham and associates conducted multiple research studies on lifestyle behaviors related to CVD and high mortality rates from CVD in Russia and former Soviet Union (fSU) countries (Cockerham, 2000; Cockerham et al., 2002; Cockerham et al., 2004; Cockerham et al., 2006).

Some of the variables in the HLT, i.e., age, gender, socioeconomic status were examined in this study. Findings supported the relationship between HBP and age, gender that have been found by other researchers (Arevian et al, 2004; Chobanian et al., 2003; Erem et al., 2009; Harhay et al., 2013; Jaddou et al., 2000; Mehler et al., 2001; NHLBI, 2015; Tailakh et al., 2013; Wolz et al., 2000; Young et al. 2005).

The Practices component of HLT was also examined in this research. This component refers to the lifestyle behaviors of individuals that comprise a person's overall pattern of health lifestyle, including use of alcohol, smoking, diet and PA (Cockerham, 2012). Surprisingly, this study found the use of alcohol, smoking, diet, and physical exercise, were not significantly related to HBP. In contrast, some studies have found significant links between HBP and alcohol use, smoking, diet and/or physical activity (Arevian et al., 2004; Erem et al., 2009; Huang et al, 2016; Mayo Clinic, 2015; Roberts et al., 2012). Possible reason for the difference in findings of this study and previous research may be due to the sample composed predominantly of women, who did not use alcohol excessively and were non-smokers.

Another component of the Practices variable examined in this study is diet. Food intake was assessed based upon self-report of food intake during the preceding 24-hour period. Differences between diets of people living in the US and Armenians were previously discussed. The findings of this study did not support the hypothesized relationship between physical PA and HBP. Though the data indicated that participants engaged in high levels of PA, which is a health-promoting lifestyle behavior, there was no evidence that the PA influenced BP level. One of the reasons for this finding may be the long-standing lack of personal motorized transportation in Armenia. The majority of Armenians walk to work, grocery stores, etc. It is not unusual for Armenians to walk 3-5 miles per day as evidenced in this study's findings. Thus, Armenians' high physical activity is a Life Chance and not a Life Choice, with little variation among people.

Furthermore, low adherence to prescribed antihypertensive medication(s) is a Life Chance and not a Life Choice. Participants knew the importance of taking the prescribed medication(s); however, due to the cost of the antihypertensive medication(s), some participants

choose not to take the medication every day and to keep it for days when they do not feel well. The latter is supported by the findings of MMAS-8 scores.

**Strengths and Limitations**

To the PI's knowledge, this study was the first to collect data on 46 risk-factor variables for HBP and to administer the UCLA CHNDA, IPAQ, and the MMAS-8 in Armenia. This study investigated an important health problem in an under-reached group and contributed to scientific knowledge about HBP on Armenians living in Armenia.

One of the strengths of this study was the collection of objective data on several physiologic measures that are significant in terms of risk for HBP. The results from the lipid panel and glucose test were provided within five minutes of blood sampling, using point-of-care equipment. HBP findings were based on objective measurements obtained by following established Joint National Committee (JNC-8) guidelines and did not rely on self-reported blood pressure numbers.

This study achieved the sample composition as intended. All of the respondents were Armenians and had a high school education or higher.

A significant advantage of conducting this study was that the PI is Armenian, speaks the language fluently, and was able to instill trust and cultural understanding with the population. The PI's familiarity with the Armenian language and culture facilitated the receptivity of the participants in responding to the lengthy data collection; participants related to the PI intellectually and culturally. These are additional advantages for conducting international research.

The cross-sectional design employed in this study was an appropriate approach for examining the research questions; however, the use of a small convenience sample is a limitation

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as it is not representative of the population of Armenia or the selected region. Furthermore, the sample may have been composed of participants who self-selected because they considered themselves at risk for health problems related to HBP and/or desired information about the lipids. If this were the case, physiological outcomes may have been influenced by selection bias. Given these concerns about nonrandom sampling of a small group from one geographic area of Armenia, generalizations can not be made about the findings of this study.

The data were collected at a single time point at one location and reported HBP, and do not imply a diagnosis of HTN. An HTN diagnosis requires that BP measurements be obtained from several visits over six months (JNC-8).

Except for the physiologic measures, the rest of the data were collected by self-reporting, which relies on the memory of the participants. The 24-hour recall of dietary intake using the UCLA CHNDA, was dependent on accuracy of memory for foods consumed in the previous 24 hours. Not all the foods consumed by Armenians were found in the United States Department of Agriculture (USDA) or other reliable resources (USDA, 2002). In these cases, the PI identified the ingredients of a food and calculated the nutritional value of that specific food. For example, the dish called "harisa" was not included in the USDA or at other nutrition sites. The PI calculated the amount of meat, butter, and cracked wheat used to prepare "harisa" and assigned values to each ingredient. This method was thus not evidence-based, but provided the closest possible estimate.

The finding of low internal consistency for the Attitudes/perceptions questionnaires was another limitation of this study. This instrument has not been widely used in previous research and is reported in findings for only one study (Oliveria et al., 2005).

**Implications for Future Clinical Practice and Research**

This study contributes to the information reservoir of health care providers by increasing awareness of the need for patient education, the monitoring of BP for at-risk patients, and assessing whether hypertensive patients take their prescribed antihypertensive medication(s) consistently. The findings point to the need for further educate health care providers about the predictors of HBP so that individuals at risk may be identified and appropriately managed. For example, people with high waist circumference should be monitored and informed about the importance of routine checkups. Without routine checkups, a prehypertensive person may become hypertensive and develop co-morbidities such as kidney failure, coronary artery disease (CAD), etc. Furthermore, men at any age and older adults must have BP evaluated every time a clinic visit is made.

A potential area for future research is determining the best mode by which Armenians can learn about their overall health and how to prevent the development of chronic diseases such as HBP. Over the past twenty years, the Ministry of Health (MoH), with the help of many organizations, such as World Bank, has provided education about HBP in Armenia. Nevertheless, HBP continues to be a health problem in Armenia. Perhaps the current education approaches are not sufficient and Armenians may benefit from an array of approaches, such as one-to-one teaching tailored to their individual's needs. Another topic of research is exploring the means of alerting citizens to check their BP regularly. The use of mobile devices to transmit BP readings to clinics should be explored, especially among those with or at risk for HBP. The findings of this study may suggest revisions of the current CVD assessment forms by listing the most frequent risk factors contributing to HBP in Armenians, such as WC.

In the twenty-five years since their independence from the Soviet Union, Armenians have made great strides in health care and in public welfare. To continue this positive trend, Armenia needs to invest additional funds and resources in health care, particularly to increase awareness of HBP and in its prevention and control. HBP is an international health burden that, in both financial and human terms, impacts all nations and will benefit from further research. This study's findings support investing the limited resources in Armenia into health education for HTN prevention and control.

**Recommendations**

A larger scale study of the same or of a similar type needs to be conducted at different locations in Yerevan and in the rest of the ten regions in Armenia to determine the prevalence of HBP in Armenians. A larger epidemiological study with a representative national sample may provide the data needed to develop various interventions to prevent HTN. Culturally sensitive interventions for Armenians should focus on public awareness, education, and monitoring of HBP. Free health screening fairs must be planned in all regions to increase awareness of the prevention of HBP, diabetes, and hyperlipidemia.

To increase the public's awareness of the importance of prevention of HBP, placing automated BP machines in grocery stores, pharmacies, parks, and other public places should be considered. Also, BP should routinely be measured by health care providers during home visits. In Armenia, as a public health measure, nurses and physician make periodic house visits.

Attempts also should also be made to include more males in research samples by conducting recruitment activities at construction sites, taxi stations, or places where Armenian men outnumber women. Asking women to invite their partners to participate in the research may

also be effective.  Furthermore, research is needed to determine the reasons for low HDL-C findings and higher WC measurements in Armenian men than women.

The KAAP instrument needs refinement prior to its use in future studies due to its very low reliability.  The entire questionnaire has been reported in only one study (Oliveria et al., 2005).  It is nevertheless essential for future studies to collect data on knowledge, awareness, and attitudes and to have the use of reliable measures in order to design effective HTN prevention and control programs.  Furthermore, future studies should incorporate measures of risk perception and/or vulnerability to enhance understanding about BP and adherence to medication regimes.

Research on adherence to prescribed antihypertensive medication(s) is also critical, particularly in light of the low levels found in this study.  Recommended approaches to increased adherence include the use of seven-day pill dispenser boxes and setting phone alarms to remind the individuals to take their medication(s) at particular times.  Furthermore, education pamphlets must emphasize the importance of taking prescribed medication(s) as ordered, rather than stopping when they feel better or self-adjusting medication dosage.  The cost of medication(s) is also a contributing factor to non-adherence.  Cost-benefit analyses should be incorporated into future studies of HBP among Armenians so that investments in prevention and treatment (e.g., education, recreational areas, health care services, medications) may be more accurately weighed against adverse outcomes.

Qualitative research needs to be conducted to further explain the reasons for non-adherence, such as cost, availability, or lack of understanding about medication half-life, and other unknown factors that may explain the phenomenon, such as intentional or unintentional behaviors for non-adherence.  Examining adherence using the Morisky scale in clinical practice

and research with Armenians may help to distinguish intentional and non-intentional behaviors in relation to use of antihypertensive drugs.  In addition, more culturally sensitive instruments are needed to fully explore health lifestyle behaviors (nutrition and smoking).  A successful instrument should include foods commonly consumed in Armenia and identify nutrient values, such as calories, carbohydrates, protein, fat, Total-C and sodium.  In examining smoking behaviors, use of a "hookah" (water pipe) and e-cigarettes should be included as they are gaining popularity in Armenia.

The Ministry of Education in Armenia needs to be encouraged to strengthen existing nursing and medical education by focusing on the importance of assessing, monitoring, and evaluating the BP of all citizens, especially targeting those at risk for developing HBP, such as adults over 40 years of age and those with a high Total-C levels, larger waist circumferences, or personal and/or family histories of HBP.  Finally, recommendations should be made to the family medicine division of the MoH of Armenia to provide free or affordable antihypertensive medication(s) to citizens at risk, and to offer free health fairs to screen the public and make appropriate referrals.

**Summary**

The study aimed to describe the prevalence of HBP and its relationship with risk factors (e.g. lipid and glucose levels, waist circumference, self/family history) among residents of Armenia.  Several other variables were examined in relation to HBP included knowledge, awareness, and attitudes/perceptions about HBP, and adherence to medications(s).  The convenience sample was composed predominantly of middle-aged, married females, with a high school education or higher.  Over half of the adults of the sample were found to be prehypertensive or hypertensive.  In terms of gender, fewer men had normal blood pressure

levels than women.  For those diagnosed with HTN, adherence to prescribed antihypertensive medication(s) was low.  The findings of this study about the associations between HBP and waist-hip ratio, age, BMI, Total-C, low HDL-C, and high LDL-C were consistent with past research.  Waist circumference was the strongest predictor of HBP, followed by personal history of HBP, high Total-C level, being male, and older age.

Findings of this research may be valuable to organizations such as the Ministry of Health, Yerevan State Medical University, pharmaceutical companies, policy makers, and the Public Health Department of the American University of Armenia.

## Appendix A

## Demographic and Health Assessment Questionnaire

ID Number: _____     Date: _____

**1)** Your age in years at the last birthday: _____

**2)** Your nationality?
      a.  □ Armenian
      b.  □ Russian
      c.  □ Yesdi
      d.  □ Other (describe)_____

**3)** Your gender:    a. □ Male        b. □ Female

**4)** Marital Status:
      a.  □ Never married
      b.  □ Married
      c.  □ Separated
      d.  □ Divorced
      e.  □ Widowed

**5)** Indicate the highest level of education that you have completed:
      a.  □ School (less than 10 years)
      b.  □ School (10 years)
      c.  □ Professional technical education (11-13 years)
      d.  □ Institute/University degree
      e.  □ Postgraduate education

**6)** Which of the following best describes your employment status (Read answers a-i)
      a.  □ Unemployed, looking for work
      b.  □ Unemployed, not looking for work
      c.  □ Unable to work, disability
      d.  □ Unable to work, child care issues
      e.  □ Student
      f.  □ Homemaker
      g.  □ Retired
      h.  □ Self-employed
      i.  □ Farmer
      j.  □ Other_____

**7)** Which of the following best describes your total family yearly income (Read answers a-f)
- a. □ Less than 600,000 Dram/year ($1,200/year)
- b. □ 600,000-999,000 Dram/year
- c. □ 1 million – 2.9 million Dram/year
- d. □ 3.0 million – 5.9 million Dram/year
- e. □ 6.0 million – 8.9 million Dram/year
- f. □ Over 9.0 million Dram/year

## Smoking /Cigarette Use

**8)** Now, I am going to ask about various health behaviors. Altogether, have you smoked at least 100 or more cigarettes in your entire lifetime?

    a. □ Yes     b. □ No     c. □ Refused   d. □ Don't know

**9)** Do you now smoke cigarettes every day, some days, or not at all

    a. □ Every day    b. □ Some days   c. □ Not at all   d. □ Refused   e. □ Don't know

**10)** On average, how many cigarettes do you now smoke a day? _____ Number of cigarettes (a pack=20 cigarettes)

    a. □ Refused     b. □ Don't know

**11)** How old were you when you first started to smoke cigarettes fairly regular? ____Years old

    a. □ Never smoked regularly   b. □ Refused   c. □ Don't know

## Alcohol Use

**12)** Now think about the past 12 months. Over that time, did you have any kind of alcoholic drink?

    a. □ Yes    b. □ No   c. □ Refused   d. □ Don't know

**13)** During the last 12 months, how often did you usually have any kind of drink containing alcohol? By drink we mean half an ounce of absolute alcohol (e.g. a 12 ounce can or glass of beer or cooler; a 5 ounce glass of wine, or a drink containing 1 shot of liquor). *Choose only one per type of drink:*

| **Beer** | **Glass of wine** | **Shot of liquor** |
|---|---|---|
| a. □ Every day | a. □ Every day | a. □ Every day |
| b. □ 5-6 times a week | b. □ 5-6 times a week | b. □ 5-6 times a week |
| c. □ 3-4 times a week | c. □ 3-4 times a week | c. □ 3-4 times a week |
| d. □ Twice a week | d. □ Twice a week | d. □ Twice a week |
| e. □ Once a week | e. □ Once a week | e. □ Once a week |
| f. □ 2-3 times a month | f. □ 2-3 times a month | f. □ 2-3 times a month |
| g. □ Once a month | g. □ Once a month | g. □ Once a month |
| h. □ 3-11 times in past year | h. □ 3-11 times in past year | h. □ 3-11 times in past year |

**Nutrition (see 24-hour UCLA CHNDA) -**

    **Displayed on page 141**

**Physical Activity (see International Physical Activity Questionnaire) –**

    **Displayed on page 142 and 143**

**Self and Family Health History**

14) Please indicate any chronic health problems(s) that you have: (Check all that apply)

| | | | |
|---|---|---|---|
| a. | Diabetes | □ a. Yes | □ b. No |
| b. | High blood pressure | □ a. Yes | □ b. No |
| c. | High Cholesterol | □ a. Yes | □ b. No |
| d. | Heart disease | □ a. Yes | □ b. No |
| e. | Kidney problems | □ a. Yes | □ b. No |
| f. | No chronic health problems | □ a. Yes | □ b. No |
| g. | Other problems_____ | | |

15) Please indicate any chronic health problems(s) that your siblings have/had: (Check all that apply)

| | | | |
|---|---|---|---|
| a. | Diabetes | □ a. Yes | □ b. No |
| b. | High blood pressure | □ a. Yes | □ b. No |
| c. | High Cholesterol | □ a. Yes | □ b. No |
| d. | Heart disease | □ a. Yes | □ b. No |
| e. | Kidney problems | □ a. Yes | □ b. No |
| f. | No chronic health problems | □ a. Yes | □ b. No |
| g. | Other problems_____ | | |

16) Please indicate any chronic health problems(s) that your parents have/had: (Check all that apply)

| | | | |
|---|---|---|---|
| a. | Diabetes | □ a. Yes | □ b. No |
| b. | High blood pressure | □ a. Yes | □ b. No |
| c. | High Cholesterol | □ a. Yes | □ b. No |
| d. | Heart disease | □ a. Yes | □ b. No |
| e. | Kidney problems | □ a. Yes | □ b. No |
| f. | No chronic health problems | □ a. Yes | □ b. No |
| g. | Other problems_____ | | |

17) Please indicate any chronic health problems(s) that your grandparents have/had: (Check all that apply)

| | | | |
|---|---|---|---|
| a. | Diabetes | □ a. Yes | □ b. No |

| | | | | | | |
|---|---|---|---|---|---|---|
| b. High blood pressure | | | | □ a. Yes | □ b. No | |
| c. High Cholesterol | | | | □ a. Yes | □ b. No | |
| d. Heart disease | | | | □ a. Yes | □ b. No | |
| e. Kidney problems | | | | □ a. Yes | □ b. No | |
| f. No chronic health problems | | | | □ a. Yes | □ b. No | |
| g. Other problems_____ | | | | | | |

18) Have you been prescribed to take any of the following medications: □ a. Yes □ b. No

    If YES, please check all that applies

       a. Blood pressure medication (s)                        □ a. Yes □ b. No

       b. Diabetes medication (s)                             □ a. Yes □ b. No

       c. Cholesterol medication (s)                         □ a. Yes □ b. No

19) Did anyone from your family die from heart attack?     □ a. Yes □ b. No
    If YES, the relationship (Please check all that apply)

| | | | Age | Age | Age | Age | Age |
|---|---|---|---|---|---|---|---|
| □ Sibling | □M | □F | □ 21-30 | □ 31-40 | □ 41-50 | □ 51-60 | □ > 60 |
| □ Sibling | □M | □F | □ 21-30 | □ 31-40 | □ 41-50 | □ 51-60 | □ > 60 |
| □ Sibling | □M | □F | □ 21-30 | □ 31-40 | □ 41-50 | □ 51-60 | □ > 60 |
| □ Sibling | □M | □F | □ 21-30 | □ 31-40 | □ 41-50 | □ 51-60 | □ > 60 |
| □ Parent | □M | □F | □ 21-30 | □ 31-40 | □ 41-50 | □ 51-60 | □ > 60 |
| □ Parent | □M | □F | □ 21-30 | □ 31-40 | □ 41-50 | □ 51-60 | □ > 60 |
| □ Grandparent | □M | □F | □ 21-30 | □ 31-40 | □ 41-50 | □ 51-60 | □ > 60 |
| □ Grandparent | □M | □F | □ 21-30 | □ 31-40 | □ 41-50 | □ 51-60 | □ > 60 |

20) Did anyone from your family die from stroke?     □ a. Yes     □ b. No
    If YES, the relationship (Please check all that apply)

| | | | Age | Age | Age | Age | Age |
|---|---|---|---|---|---|---|---|
| □ Sibling | □M | □F | □ 21-30 | □ 31-40 | □ 41-50 | □ 51-60 | □ > 60 |
| □ Sibling | □M | □F | □ 21-30 | □ 31-40 | □ 41-50 | □ 51-60 | □ > 60 |
| □ Sibling | □M | □F | □ 21-30 | □ 31-40 | □ 41-50 | □ 51-60 | □ > 60 |
| □ Sibling | □M | □F | □ 21-30 | □ 31-40 | □ 41-50 | □ 51-60 | □ > 60 |
| □ Parent | □M | □F | □ 21-30 | □ 31-40 | □ 41-50 | □ 51-60 | □ > 60 |
| □ Parent | □M | □F | □ 21-30 | □ 31-40 | □ 41-50 | □ 51-60 | □ > 60 |
| □ Grandparent | □M | □F | □ 21-30 | □ 31-40 | □ 41-50 | □ 51-60 | □ > 60 |
| □ Grandparent | □M | □F | □ 21-30 | □ 31-40 | □ 41-50 | □ 51-60 | □ > 60 |

**21)** Did anyone from your family die from diabetes?　□ a. Yes　□ b. No

If YES, the relationship (Please check all that apply)

|  |  |  | Age | Age | Age | Age | Age |
|---|---|---|---|---|---|---|---|
| □ Sibling | □M | □F | □ 21-30 | □ 31-40 | □ 41-50 | □ 51-60 | □ > 60 |
| □ Sibling | □M | □F | □ 21-30 | □ 31-40 | □ 41-50 | □ 51-60 | □ > 60 |
| □ Sibling | □M | □F | □ 21-30 | □ 31-40 | □ 41-50 | □ 51-60 | □ > 60 |
| □ Sibling | □M | □F | □ 21-30 | □ 31-40 | □ 41-50 | □ 51-60 | □ > 60 |
| □ Parent | □M | □F | □ 21-30 | □ 31-40 | □ 41-50 | □ 51-60 | □ > 60 |
| □ Parent | □M | □F | □ 21-30 | □ 31-40 | □ 41-50 | □ 51-60 | □ > 60 |
| □ Grandparent | □M | □F | □ 21-30 | □ 31-40 | □ 41-50 | □ 51-60 | □ > 60 |
| □ Grandparent | □M | □F | □ 21-30 | □ 31-40 | □ 41-50 | □ 51-60 | □ > 60 |

## Appendix B

## Hypertension Knowledge

1) What does the term hypertension mean? (Please circle)
   a.  High blood pressure
   b.  High level stress/tension
   c.  Nervous condition
   d.  High blood sugar
   e.  Overactivity
   f.  Don't know

2) How dangerous is hypertension to your health?
   a.  Extremely
   b.  Somewhat
   c.  Not at all
   d.  Don't know

3) Would lowering high blood pressure improve a person's health?
   a.  Yes
   b.  No
   c.  Somewhat
   d.  Don't know

4) What do the two numbers reported for blood pressure mean?
   a.  Correctly replied "systolic" for top number
   b.  Correctly replied "diastolic" for bottom number
   c.  Correctly replied for both top and bottom number

5) What should normal blood pressure levels be?
   *Top number*
   a.  <140
   b.   140
   c.  >140
   d.   Don't know

*Bottom number*

   a.   <90

   b.    90

   c.   >90

   d.    Don't know

6) Which measure(s) is (are) more important?

   a.   Top (systolic)

   b.   Bottom (diastolic)

   c.   Both (top and bottom)

   d.   Don't know

7) Can people do things to lower their blood pressure?

   a.   Yes

   b.   No

   c.   Don't know

8) Can lowering blood pressure even a little bit improves health?

   a.   Yes

   b.   No

   c.   Don't know

## Hypertension Awareness

   1) Have you ever been told by a doctor or health care provider that you have hypertension?

   a.   Yes

   b.   No

   2) Did your doctor or health care provider tell you what your personal blood pressure reading should be?

   a.   Yes

   b.   No

   c.   Don't know

   3) If told, what should your top number (systolic) be?

   a.   <140

   b.   140

c.    &gt;140

d.    Don't know

4) If told, what should your bottom number (diastolic) be?

    a.    &lt;90

    b.    90

    c.    &gt;90

    d.    Don't know

5) Has a doctor or health care provider ever told you that the top number is important to keep under control?

    a.    Yes, doctor

    b.    Yes, other health care provider

    c.    No

    d.    Don't know

6) Has a doctor or health care provider ever told you that the bottom number is important to keep under control?

    a.    Yes, doctor

    b.    Yes, other health care provider

    c.    No

    d.    Don't know

## Attitudes and Perceptions Related to Hypertension

1) What was your blood pressure level at your most recent visit?

*Systolic*

    a.    &lt;140

    b.    140

    c.    &gt;140

    d.    Was told but don't recall value

    e.    Don't know if told

    f.    Wasn't told

*Diastolic*

    a.    &lt;90

    b.    90

    c.    &gt;90

d.       Was told but don't recall value

e.       Don't know if told

f.       Wasn't told

2) What did you think this blood pressure level was?

a.       High

b.       Borderline high

c.       Normal (under control)

d.       Low

e.       Don't know

If ever told by a doctor or health care provider that you have high blood pressure:

3) How serious of a personal health concern has high blood pressure been?

a.       Very serious concern

b.       Somewhat serious concern

c.       Not at all serious concern

4) How important do you think taking medicine is to keeping blood pressure under control?

a.       Very important

b.       Somewhat important

c.       Not at all important

5) Do you think that high blood pressure (hypertension) is a life-long disease?

a.       Yes

b.       No

c.       Don't know

6) Do you think that high blood pressure (hypertension) is something you can cure?

a.       Yes

b.       No

c.       Don't know

7) Can changing lifestyle help to lower your blood pressure?

a.       Yes

b.       No

c. Don't know

8) Do you think that high blood pressure is an avoidable part of aging?
   a. Yes
   b. No
   c. Don't know

9) What is the single most important factor in controlling your high blood pressure?
   a. Taking medications
   b. Exercising
   c. Less stress
   d. Quitting smoking
   e. Change diet (salt)
   f. Reducing alcohol
   g. Losing weight
   h. Other
   i. Don't know

10) Do you think your blood pressure has improved over the last 12 months?
    a. Yes
    b. No
    c. Don't know

**Appendix C**

**Morisky Medication Adherence Scale-8**

ID Number: _____     Date: _____

1.  Do you sometimes forget to take your high blood pressure pills?        No   Yes

2.  Over the past 2 weeks, were there any days when you did not take your high blood pressure
    medicine?                                                             No   Yes

3.  Have you ever cut back or stopped taking your medication without telling your doctor because
    you felt worse when you took it?                                      No   Yes

4.  When you travel or leave home, do you sometimes forget to bring along your medications?

    No   Yes

5.  Did you take your high blood pressure medicine yesterday?             No   Yes

6.  When you feel like your blood pressure is under control, do you sometimes stop taking your
    medicine?                                                             No   Yes

7.  Taking medication everyday is a real inconvenience for some people. Do you ever feel hassled
    about sticking to your blood pressure treatment plan?                 No   Yes

8.  How often do you have difficulty remembering to take all your blood pressure medication?
    Please circle you answer below
            a. Never/rarely…………………………a
            b. Once in while……………………….. b
            c. Sometimes…………………………... c
            d. Usually……………………………… d
            e. All the time …………………………. e

**Support Letter from Erebouni Polyclinic Director**



**ՆԱԻՐԻ ԲԺՇԿԱԿԱՆ ԿԵՆՏՐՈՆ**
**NAIRI MEDICAL CENTER**

May 6, 2016

Dear Salpy,

It is with great pleasure to give you the permission to conduct your research study at Erebouni Polyclinic. I have known about your study when you first started your PhD studies and I look forward to see you collect the data in Armenia.

We will ensure all the requirements from UCLA Institutional of Review Board and Armenia's ethics committee are followed. We understand the information that you will collect is confidential and your research assistants will be trained by you.

Again, we look forward to see you in Armenia.

Please let me know if you have any questions.

Sincerely,

HarutunKouskyan, MD, PhD.
Director, Erebouni Medical Center & polyclinic
Director, Nairi Medial Center

**Appendix E**

**Flyer for Recruitment**

## Research Volunteers Needed

For a Doctorate Study about High Blood Pressure and its Risk Factors

### University of California, Los Angeles and Erebouni Medical Center

You may be eligible to participate if you:
- Are 21 years and older
- Armenian
- Not pregnant

**How long will it take?**

**45 minutes-1 hour**

**What will you be asked to do:**
- Answer questions relate to blood pressure
- Fingerstick blood test for cholesterol & glucose

**Benefits of participation are:**
- You will know your blood pressure measurement, your cholesterol and glucose levels

**Risks of participation are:**
- No greater than those encountered in daily life

If you are interested in participating or would like more information regarding this study please contact the researcher,

Salpy Akaragian 93-413263

# Appendix F

## Ranges for Measurements

Normal Blood Pressure:  SBP < 120 mmHg and DBP < 80 mmHg*

Prehypertension:         SBP 120 - 139 mmHg or DBP 80 - 89mmHg*

High Blood Pressure:     SBP ≥ 140 mmHg and/or DBP of ≥ 90 mmHg and/or the use

of antihypertensive medication *

BMI and Weight Status:

- Underweight       Below 18.5 kg/m²

- Normal            18.5-24.9 kg/m²

- Overweight        25.0 – 29.9 kg/m²

- Obese             30.0 kg/m² and Above

Total Cholesterol (Total-C):

- Desirable         < 200 mg/dL

- Borderline        > 200-239 mg/dL

- High              ≥ 240

LDL-C:

- Optimal/near optimal  < 129 mg/dL

- Borderline- High      > 130-159 mg/dL

- High-Very High        ≥ 160 mg/dL

HDL-C:

- Low               < 40 mg/dL

- High              ≥ 40 mg/dL

Triglyceride Level:

- Normal            < 150 mg/dL

- Borderline-High          ≥ 150 mg/dL

Glucose level (fasting):

- Normal          70-99 mg/dL

- Prediabetes          100-125 mg/dL

- Diabetes          ≥ 126 mg/dL

Waist Circumference:

- Acceptable          Female < 88 cm, Males < 102 cm

- Unacceptable          Female ≥ 88 cm, Males ≥ 102 cm


Waist and Hip Ratio:          ≥ .85 cm Female

          ≥.9 cm Male


* JNC-8

** WHO (2008): BMI, WC, Waist and Hip Ratio,

*** NHLBI (2015): Total-C, HDL-C, LDL-C, triglycerides and glucose

# Appendix G

## 24-Hour Recall Instrument-UCLA Center for Human Nutrition and Dietary Assessment

| Foods eaten, beverages consumed | Preparation/brand/label information | Amount |
|---|---|---|
| | **Breakfast** | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | **Morning snack** | |
| | | |
| | | |
| | | |
| | **Lunch** | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | **Afternoon snack** | |
| | | |
| | | |
| | | |
| | **Evening meal** | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | **Evening snack** | |
| | | |
| | | |
| | | |

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# INTERNATIONAL PHYSICAL ACTIVITY QUESTIONNAIRE

We are interested in finding out about the kinds of physical activities that people do as part of their everyday lives. The questions will ask you about the time you spent being physically active in the <u>last 7 days</u>. Please answer each question even if you do not consider yourself to be an active person. Please think about the activities you do at work, as part of your house and yard work, to get from place to place, and in your spare time for recreation, exercise or sport.

Think about all the **vigorous** activities that you did in the **last 7 days**. **Vigorous** physical activities refer to activities that take hard physical effort and make you breathe much harder than normal. Think *only* about those physical activities that you did for at least 10 minutes at a time.

1.  During the **last 7 days**, on how many days did you do **vigorous** physical activities like heavy lifting, digging, aerobics, or fast bicycling?

    _____ **days per week**

    ☐  No vigorous physical activities  ➡ *Skip to question 3*

2.  How much time did you usually spend doing **vigorous** physical activities on one of those days?

    _____ **hours per day**

    _____ **minutes per day**

    ☐  Don't know/Not sure

Think about all the **moderate** activities that you did in the **last 7 days**. **Moderate** activities refer to activities that take moderate physical effort and make you breathe somewhat harder than normal. Think only about those physical activities that you did for at least 10 minutes at a time.

3.  During the **last 7 days**, on how many days did you do **moderate** physical activities like carrying light loads, bicycling at a regular pace, or doubles tennis? Do not include walking.

    _____ **days per week**

    ☐  No moderate physical activities  ➡ *Skip to question 5*

SHORT LAST 7 DAYS SELF-ADMINISTERED version of the IPAQ. Revised August 2002.

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4. How much time did you usually spend doing **moderate** physical activities on one of those days?

_____ **hours per day**

_____ **minutes per day**

[ ] Don't know/Not sure

Think about the time you spent **walking** in the **last 7 days**. This includes at work and at home, walking to travel from place to place, and any other walking that you have done solely for recreation, sport, exercise, or leisure.

5. During the **last 7 days**, on how many days did you **walk** for at least 10 minutes at a time?

_____ **days per week**

[ ] No walking ➡ *Skip to question 7*

6. How much time did you usually spend **walking** on one of those days?

_____ **hours per day**

_____ **minutes per day**

[ ] Don't know/Not sure

The last question is about the time you spent **sitting** on weekdays during the **last 7 days**. Include time spent at work, at home, while doing course work and during leisure time. This may include time spent sitting at a desk, visiting friends, reading, or sitting or lying down to watch television.

7. During the **last 7 days**, how much time did you spend **sitting** on a **week day**?

_____ **hours per day**

_____ **minutes per day**

[ ] Don't know/Not sure

**This is the end of the questionnaire, thank you for participating.**

**Objective Physiologic Measurements**

**A Copy is Provided to the Participant**

ID Number:   _____          Date: _____

**Physiologic Measurements**:  If #1 and #2 readings of BP are different; 3$^{rd}$ reading is required.

  1)  Systolic BP_____                    Diastolic BP_____

  2)  Systolic BP_____                    Diastolic BP_____

  3)  Systolic BP_____                    Diastolic BP_____

Height _____cm     Weight_____ Kg

Waist Circumference _____cm    Hip Circumference _____cm     BMI _____

Total C_____ HDL-C_____ LDL-C_____ Triglyceride_____

Glucose_____ Fasting_____    Non-Fasting_____

**Thank you!**

# Appendix J

## Documents and Instruments Translated to Armenian

## Հարցաշար


Նույնականացման քարտի համարը՝  _____


Ամսաթիվ՝ _____

# Ժողովրդագրական և Առողջության Գնահատման հարցաշար

*(Դրեք "✓" պատասխանը նշելու համար)*

1. Ձեր տարիքը_____

2. Ձեր ազգությունը
   - ա. □ Հայ
   - բ. □ Ռուս
   - գ. □ Եզդի
   - դ. □ այլ (նկարագրեք) _____

3. Ձեր սեռը:     ա. □ Արական          բ. □ Իգական

4. Ամուսնական կարգավիճակը:
   - ա. □ Երբեք ամուսնացած չեմ եղել
   - բ. □ Ամուսնացած
   - գ. □ Բաժանված
   - դ. □ Ամուսնալուծված
   - ե. □ Այրի

5. Նշեք ամենաբարձր կրթության աստիճանը, որն ավարտել եք`
   - ա. □ Դպրոց (ավելի քիչ քան 10 տարի)
   - բ. □ Դպրոց (10 տարի)
   - գ. □ Միջին մասնագիտական կրթություն (11-13 տարի)
   - դ. □ Համալսարանական կրթական աստիճան
   - ե. □ Հետբուհական կրթություն

6. Հետևյալներից որոնք են լավագույնս նկարագրում Ձեր աշխատանքային պաշտոնը (Կարդացեք պատասխաններ ա-իg ժ)
   - ա. □ Գործազուրկ, փնտրում եմ աշխատանք
   - բ. □ Գործազուրկ, չեմ փնտրում աշխատանք
   - գ. □ Անաշխատունակ, հաշմանդամ
   - դ. □ Չեմ կարող աշխատել երեխային խնամելու պատճառով
   - ե. □ Ուսանող
   - զ. □ Տնային տնտես/ուհի
   - է. □ Թոշակառու
   - ը. □ Սեփական գործ
   - թ. □ Գյուղատնտես
   - ժ. □ Այլ_____

7. Հետևյալներից որո՞նք են ամենալավը բնութագրում Ձեր տարեկան ընդհանուր Ընտանեկան եկամուտը (Կարդացեք պատասխաններ ա-ից զ)

   ա. □ Ավելի քիչ քան 600,000 Դրամ/տարի ($1,200/տարի)

   բ. □ 600,000-999,000 դրամ/տար

   գ. □ 1 միլիոնից – 2.9 միլոն դրամ/տարի

   դ. □ 3.0 միլիոնից – 5.9 միլոն դրամ/տարի

   ե. □ 6.0 միլիոնից – 8.9 միլոն դրամ/տարի

   զ. □ Ավելի քան 9.0 միլոն դրամ/տարի

## ԾԽԵԼԸ/ԾԽԱԽՈՏԻ ՕԳՏԱԳՈՐԾՈՒՄԸ

8. Այժմ խնդրում ենք պատասխանել առողջ ապրելակերպին առնչվող մի քանի հարց: Ընդհանուր առմամբ, Ձեր ողջ կյանքում ծխել եք 100 կամ ավելի ծխախոտ?

   ա. □ առ

   բ. □ ոչ

   գ. □ չեմ կարող պատասխանել

   դ. □ չգիտեմ

9. Այժմ ծխում եք ամեն օր, երբեմն, երբեք

   ա. □ ամեն օր

   բ. □ երբեմն

   գ. □ երբեք

   դ. □ չեմ կարող պատասխանել

   ե. □ չգիտեմ

10. Միջին հաշվով քանի ծխախոտ եք ծխում այժմ մեկ օրվա ընթացքում ծխախոտների

  քանակը_____

  (1տուփր=20 ծխախոտ)

   ա. □ չեմ կարող պատասխանել

   բ. □ չգիտեմ

11. Քանի տարեկան էիք դուք, երբ առաջին անգամ սկսեցիք ծխել կանոնավորաբար.

  _____տարեկան

   ա. □ երբեք կանոնավորաբար չեմ ծխել

   բ. □ չեմ կարող պատասխանել

   գ. □ չգիտեմ

ԱԼԿՈՀՈԼԻ ՕԳՏԱԳՈՐԾՈՒՄԸ

12. Այժմ խնդրում եմ ասացեք վերջին 12 ամիսների ընթացքում իմել եք որևէ ոգելից
    խմիչք

        ա. □ այո

         բ. □ ոչ

        գ. □ չեմ կարող պատասխանել

        դ. □ չգիտեմ


13. Վերջին 12 ամիսների ընթացքում որքան հաճախ եք դուք իմել ալկոհոլ
    պարունակող որևէ ըմպելիք: Ալկոհոլային ըմպելիք ասելով մենք նկատի ունենք
    բացարձակ ալկոհոլի կես ունցիա (օրինակ12-ունցիանոց տարա կամ բաժակ
    գարեջուր կամ վացուցիչ Ըմպելիք; 5-ունցիանոց գավաթ գինի կամ մեկ փոքր
    բաժակ լիկյոր պարունակող ըմպելիք) յուրաքանչյուր խմիչքի համար ընտրեք
    միայն 1 տարբերակ

Գարեջուր

        ա. □ ամեն օր

        բ. □ շաբաթը 5-6 անգամ

        գ. □ շաբաթը 3-4 անգամ

        դ. □ շաբաթը 2անգամ

        ե. □ շաբաթը 1անգամ

         q. □ ամիսը 2-3 անգամ

         է. □ ամիսը 1 անգամը.

        ը. □ վերջին տարվա ընթացքում 3-11 անգամ

Գավաթ գինի

        ա. □ ամեն օր

        բ. □ շաբաթը 5-6 անգամ

        գ. □ շաբաթը 3-4 անգամ

        դ. □ շաբաթը 2անգամ

        ե. □ շաբաթը 1անգամ

        q. □ ամիսը 2-3 անգամ

        է. □ ամիսը 1 անգամը.

        ը. □ վերջին տարվա ընթացքում 3-11 անգամ

Փոքր բաժակ լիկյոր

        ա. □ ամեն օր

        բ. □ շաբաթը 5-6 անգամ

q. □ շաբաթը 3-4 անգամ

դ. □ շաբաթը 2անգամ

ե. □ շաբաթը 1անգամ

զ. □ ամիսը 2-3 անգամ

է. □ ամիսը 1 անգամը.

ը. □ վերջին տարվա ընթացքում 3-11 անգամ

Ֆիզիկական ակտիվությունը (տես Ֆիզիկական ակտիվության միջազգային հարցաշարը)

Սննդի ընդունում (տես 24-ժամյա  UCLA CHADA)

## Ձեր և Ձեր ընտանիքի անդամները հիվանդությունների պատմությունը

14. Խնդրում ենք, նշել ցանկացած խրոնիկական հիանդություն (ներ), որ ունեք՝
    (Լրացրեք|Բոլորը համապատասխանողները)

|  |  |  |
|---|---|---|
| ա. Շաքարային դիաբետ | □ա. Այո | □բ. Ոչ |
| բ. Արյան բարձր ճնշում | □ա. Այո | □բ. Ոչ |
| գ. Բարձր խոլեստերին | □ա. Այո | □բ. Ոչ |
| դ. Սրտային հիվանդություններ | □ա. Այո | □բ. Ոչ |
| ե. Երիկամային խնդիրներ | □ա. Այո | □բ. Ոչ |
| զ. Ոչ խրոնիկական առողջական խնդիրներ | □ա. Այո | □բ. Ոչ |
| է. Այլ խնդիրներ_____ | | |

15. Խնդրում ենք նշել ցանկացած խրոնիկական հիանդություն (ներ), որ Ձեր քույրը
կամ երբայրը ունի/ունեցել է՝ (Լրացրեք բոլորը համապատասխանողները)

|  |  |  |
|---|---|---|
| ա. Շաքարային դիաբետ | □ա. Այո | □բ. Ոչ |
| բ. Արյան բարձր ճնշում | □ա. Այո | □բ. Ոչ |
| գ. Բարձր խոլեստերին | □ա. Այո | □բ. Ոչ |
| դ. Սրտային հիվանդություններ | □ա. Այո | □բ. Ոչ |
| ե. Երիկամային խնդիրներ | □ա. Այո | □բ. Ոչ |
| զ. Ոչ խրոնիկական առողջական խնդիրներ | □ա. Այո | □բ. Ոչ |
| է. Այլ խնդիրներ_____ | | |

16. Խնդրում ենք նշել ցանկացած խրոնիկական հիանդություն (ներ), որ Ձեր
    Ծնողները Ունեն/ունեցել են՝ (Լրացրեք բոլորը համապատասխանողները)

|  |  |  |
|---|---|---|
| ա. Շաքարային դիաբետ | □ա. Այո | □բ. Ոչ |
| բ. Արյան բարձր ճնշում | □ա. Այո | □բ. Ոչ |
| գ. Բարձր խոլեստերին | □ա. Այո | □բ. Ոչ |
| դ. Սրտային հիվանդություններ | □ա. Այո | □բ. Ոչ |

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ե. Երիկամային խնդիրներ                              □ա. Այո        □բ. Ոչ

q. Ոչ խրոնիկական առողջական խնդիրներ                 □ա. Այո        □բ. Ոչ

է. Այլ խնդիրներ_____


17. Խնդրում ենք նշել ցանկացած խրոնիկական հիանդություն (ներ), որ Ձեր պապը
կամ տատը ունի/ունեցել է` (Լրացրեք բոլորը համապատասխանողները)

ա. Շաքարային դիաբետ                                 □ա. Այո        □բ. Ոչ

բ. Արյան բարձր ճնշում                                □ա. Այո        □բ. Ոչ

q. Բարձր խոլեստերին                                  □ա. Այո        □բ. Ոչ

դ. Սրտային հիվանդություններ                          □ա. Այո        □բ. Ոչ

ե. Երիկամի խնդիրներ                                  □ա. Այո        □բ. Ոչ

q. Ոչ խրոնիկական առողջական խնդիրներ                 □ա. Այո        □բ. Ոչ

է. Այլ խնդիրներ_____


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18. Ձեզ նշանակվել է արդյոք հետևյալ դեղամիջոցներից որևէ մեկը ընդունելու համար`

□ա. Այո □բ. Ոչ

Եթե ԱՅՈ, խնդրում ենք նշել նրանք, որոնք ընդունել եք

a. Արյան ճնշման դեմ դեղորայք    □ա. Այո □բ. Ոչ

բ. Դիաբետի դեմ դեղորայք    □ա. Այո □բ. Ոչ

դ. Խոլեստերինի դեմ դեղորայք    □ա. Այո □բ. Ոչ


19. Ձեր ընտանիքի անդամներից որևէ մեկը մահացել է սրտի կաթվածից
a. Այո □բ. Ոչ

Եթե ԱՅՈ, նշեք ազգակցական կապը (Խնդրում ենք լրացնել բոլոր Համապատասխանողները)

| | | | Տարիքը | Տարիքը | Տարիքը | Տարիքը |
|---|---|---|---|---|---|---|
| □ Քույր/եղբայր | □Ա | □Ի | □ 21-30 | □31-40 | □ 41-50 | □ 51-60 □> 60 |
| □ Քույր/եղբայր | □Ա | □Ի | □ 21-30 | □31-40 | □ 41-50 | □ 51-60 □> 60 |
| □ Քույր/եղբայր | □Ա | □Ի | □ 21-30 | □31-40 | □ 41-50 | □ 51-60 □> 60 |
| □ Քույր/եղբայր | □Ա | □Ի | □ 21-30 | □31-40 | □ 41-50 | □ 51-60 □> 60 |
| □ Ծնող | □Ա | □Ի | □ 21-30 | □31-40 | □ 41-50 | □ 51-60 □> 60 |
| □ Ծնող | □Ա | □Ի | □ 21-30 | □31-40 | □ 41-50 | □ 51-60 □> 60 |
| □ Տատ/պապ | □Ա | □Ի | □ 21-30 | □31-40 | □ 41-50 | □ 51-60 □> 60 |
| □ Տատ/պապ | □Ա | □Ի | □ 21-30 | □31-40 | □ 41-50 | □ 51-60 □> 60 |


20. Ձեր ընտանիքի անդամներից որևէ մեկը մահացել է Կաթվածից
□ա. Այո   □բ. Ոչ

Եթե ԱՅՈ, նշեք ազգակցական կապը (Խնդրում ենք լրացնել բոլոր Համապատասխանողները)

| | | | Տարիքը | Տարիքը | Տարիքը | Տարիքը |
|---|---|---|---|---|---|---|
| □ Քույր/եղբայր | □Ա | □Ի | □ 21-30 | □31-40 | □ 41-50 | □ 51-60 □> 60 |
| □ Քույր/եղբայր | □Ա | □Ի | □ 21-30 | □31-40 | □ 41-50 | □ 51-60 □> 60 |
| □ Քույր/եղբայր | □Ա | □Ի | □ 21-30 | □31-40 | □ 41-50 | □ 51-60 □> 60 |
| □ Քույր/եղբայր | □Ա | □Ի | □ 21-30 | □31-40 | □ 41-50 | □ 51-60 □> 60 |
| □ Ծնող | □Ա | □Ի | □ 21-30 | □31-40 | □ 41-50 | □ 51-60 □> 60 |
| □ Ծնող | □Ա | □Ի | □ 21-30 | □31-40 | □ 41-50 | □ 51-60 □> 60 |

| □ Տատ/պապ | □Ա | □Ի | □ 21-30 | □31-40 | □ 41-50 | □ 51-60 □> 60 |
|-----------|-----|-----|---------|--------|---------|----------------|
| □ Տատ/պապ | □Ա | □Ի | □ 21-30 | □31-40 | □ 41-50 | □ 51-60 □> 60 |

21. Ձեր ընտանիքի անդամներից որևէ մեկը մահացել է շաքարային դիաբետից

□ա. Այո □բ. Ոչ

Եթե ԱՅՈ, նշեք ազգակցական կապը (Խնդրում ենք լրացնել բոլոր համապատասխանողները)

| | | | Տարիքը | Տարիքը | Տարիքը | Տարիքը |
|-----------|-----|-----|---------|--------|---------|----------------|
| □ Քույր/եղբայր | □Ա | □Ի | □ 21-30 | □31-40 | □ 41-50 | □ 51-60 □> 60 |
| □ Քույր/եղբայր | □Ա | □Ի | □ 21-30 | □31-40 | □ 41-50 | □ 51-60 □> 60 |
| □ Քույր/եղբայր | □Ա | □Ի | □ 21-30 | □31-40 | □ 41-50 | □ 51-60 □> 60 |
| □ Քույր/եղբայր | □Ա | □Ի | □ 21-30 | □31-40 | □ 41-50 | □ 51-60 □> 60 |
| □ Ծնող | □Ա | □Ի | □ 21-30 | □31-40 | □ 41-50 | □ 51-60 □> 60 |
| □ Ծնող | □Ա | □Ի | □ 21-30 | □31-40 | □ 41-50 | □ 51-60 □> 60 |
| □ Տատ/պապ | □Ա | □Ի | □ 21-30 | □31-40 | □ 41-50 | □ 51-60 □> 60 |
| □ Տատ/պապ | □Ա | □Ի | □ 21-30 | □31-40 | □ 41-50 | □ 51-60 □> 60 |

# Հիպերտոնիայի Մասին Գիտելիք

*(Դրեք "✓" պատասխանը նշելու համար)*

1.  Ի՞նչ է նշանակում հիպերտենսիա եզրույթը: / Խնդրում ենք վերցնել շրջանակի մեջ

    ա. □ Արյան բարձր ճնշում
    բ. □ Սթրեսի/լարվածության բարձր մակարդակ
    գ. □ Ներվային վիճակ
    դ. □ Արյան բարձր շաքար
    ե. □ Գերակտիվություն
    զ. □ Չգիտեմ

2.  Որքանո՞վ է հիպերտենսիան վտանգավոր Ձեր առողջության համար:

    ա. □ Չափազանց վտանգավոր է
    բ. □ Ինչ-որ չափով
    գ. □ Ընդհանրապես վտանգավոր չէ
    դ. □ Չգիտեմ

3.  Արյան բարձր ճնշումը իջեցնելը կբարելավի՞ մարդու առողջությունը:

    ա. □ Այո
    բ. □ Ոչ
    գ. □ Ինչ-որ չափով
    դ. □ Չգիտեմ

4.  Ի՞նչ են նշանակում 2 թվերը, որոնք արձանագրվում են ճնշումը չափելիս:

    ա. □ Վերնի ցուցիչը "սիստոլիկ"-ն է
    բ. □ Ներքևի ցուցիչը "դիաստոլիկ"-ն է
    գ. □ Վերնի և ներքևի ցուցիչների համար

5.  Որքա՞ն պետք է լինի նորմալ արյան ճնշման մակարդակը:

    *Վերնի ցուցիչը*
    ա. □ < 140
    բ. □ 140
    գ. □ >140
    դ. □ Չգիտեմ

*Ներքնի ցուցիչը*

ա.□ < 90
բ. □   90
գ. □ >90
դ. □ Չգիտեմ

6. Որ չափումներն են ավելի կարևոր
ա. □ Վերնի /սիստոլիկ/
բ. □ Ներքնի /դիասստոլիկ/
գ. □ Երկուսն էլ /սիստոլիկ, դիասստոլիկ/
դ. □ Չգիտեմ

7. Կարող են մարդիկ որոշ միջոցներով իջեցնել արյան ճնշումը:
ա. □ Այո
բ. □ Ոչ
գ. □ Չգիտեմ

8. Կարող է ցածր արյան ճնշումը նույնիսկ մի փոքր բարելավել առողջությունը
ա. □ Այո
բ. □ Ոչ
գ. □ Չգիտեմ

<u>Հիպերտենսիայի Մասին Իրազեկում</u>
1.  Ձեզ երբևէ բժիշկը ասել է, որ դուք ունեք հիպերտենսիա:
ա. □ Այո
բ.  □ Ոչ

2.  Ձեզ երբևէ բժիշկը ասել է որքան պետք է Ձեր ճնշումը լինի:
ա. □ Այո
բ. □ Ոչ
գ. □ Չգիտեմ

3.  Եթե ասել է, որքան պետք է լինի վերնի ցուցիչը / սիստոլիկը/

ա.  □ < 140
բ.  □   140
գ. □ >140
դ. □ Չգիտեմ

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4. Եթե այսել է, որքան պետք է լինի ներքևի ցուցիչը / դիաստոլիկը/
   ա. □ < 90
   բ. □ 90
   գ. □ >90
   դ. □ Չգիտեմ

5. Ձեզ երբևէ բժիշկը ասել է, որ վերևի ցուցիչը պետք է պահել հսկողության տակ:

   ա. □Այո, բժիշկը
   բ. □ Այո, առողջապահության հարցերով մասնագետը
   գ. □ Ոչ
   դ. □ Չգիտեմ

6. Ձեզ երբևէ բժիշկը ասել է, որ ներքևի ցուցիչը պետք է պահել հսկողության տակ:
   ա. □ Այո, բժիշկը
   բ. □ Այո, առողջապահության հարցերով մասնագետը
   գ. □ Ոչ
   դ. □ Չգիտեմ

## Հիպերտենսիայի հետ կապված վերաբերմունքը և ընկալումները

1. Որքան էր Ձեր արյան ճնշումը ամենավերջին այցելության ժամանակ:
   Սիստոլիկ
   ա. □< 140
   բ. □ 140
   գ. □ >140
   դ. □ Ասել են, բայց չեմ հիշում թիվը
   ե. □ Չգիտեմ արդյոք ասել են
   զ. □ Չեն ասել

   Դիաստոլիկ
   ա. □< 90
   բ. □ 90
   գ. □ >90
   դ. □ Ասել են, բայց չեմ հիշում թիվը
   ե. □ Չգիտեմ արդյոք ասել են
   զ. □ Չեն ասել

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2. Ինչ եք կարծում այդ ցուցանիշի մասին
     ա. □ Բարձր է
     բ. □ Բարձրի սահմանագծին է
     գ. □ Նորմալ է /հսկողության տակ
     դ. □ Ցածր է
     ե. □ Չգիտեմ

Եթե երբևէ բժիշկը ասել է, որ դուք ունեք արյան բարձր ճնշում,

3. Որքանով է լուրջ առողջության համար արյան բարձր ճնշում
     ա. □ Շատ լուրջ
     բ. □ Ինչ-որ չափով լուրջ
     գ. □ Ընդհանրապես լուրջ չէ

4. Որքանով է կարևոր դեղամիջոցի օգտագործումը արյան ճնշումը
   հսկողության տակ պահելու համար:
     ա. □ Շատ կարևոր է
     բ. □ Ինչ-որ չափով կարևոր է
     գ. □ Ընդհանրապես կարևոր չէ

5. Ինչ եք կարծում արյան բարձր ճնշումը/ հիպերտենսիան/ ամբողջ կյանքում
   ուղեկցող հիվանդություն է:
     ա. □ Այո
     բ. □ Ոչ
     գ. □ Չգիտեմ

6. Ինչ եք կարծում արյան բարձր ճնշումը/ հիպերտենսիան/ բուժվող
   հիվանդություն է:
     ա. □ Այո
     բ. □ Ոչ
     գ. □ Չգիտեմ

7. Կենսակերպի փոփոխությունը կարող է իջեցնել արյան ճնշումը
     ա. □ Այո
     բ. □ Ոչ
     գ. □ Չգիտեմ

8.  Կարծում եք արյան բարձր ճնշումից կարելի է խուսափել տարիքի հետ:
    ա. □ Այո
    բ. □ Ոչ
    գ. □ Չգիտեմ

9.  Որն է այն եզակի ամենա կարևոր ֆակտորը արյան բարձր ճնշումը հսկողության տակ պահելու համար:
    ա. □ Դեղերի ընդունումը
    բ. □ Վարժությունների կատարումը
    գ. □ Քիչ սթրեսը
    դ. □ Ծխելը թողնելը
    ե. □ Դիետա պահելը
    զ. □ Ալկոհոլի չափաբաժնի նվազեցումը
    է. □ Քաշի նվազեցումը
    ը. □ Այլ
    թ. □ Չգիտեմ

10. Ինչ եք կարծում Ձեր արյան ճնշումը բարելավվե±լ է վերջին 12 ամիսների ընթացքում:
    ա. □ Այո
    բ. □ Ոչ
    գ. □ Չգիտեմ

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Նույնականացման քարտի համարը՝ _____ Ամսաթիվ՝ _____

*(Դրեք "✓" պատասխանը նշելու համար)*

## Մորիսկու դեղերի ընդունման վերահսկման ցուցնակ (չափացույց)

1. Դուք երբեմն մոռանում եք ընդունել բարձր ճնշման ձեր դեղահաբերը?
   □ա. Այո    □բ. Ոչ

2. Վերջին երկու շաբաթվա ընթացքում եղել են օրեր, երբ դուք մոռացել եք ընդունել բարձր ճնշման ձեր դեղահաբերը?
   □ա. Այո    □բ. Ոչ

3. Երբևիցե, առանց բժշկին ասելու, նորից փոքրացրել եք դեղաչափը կամ լիովին դադարեցրել այն, որովհետև դեղն ընդունելուց հետո ավելի վատ էիք զգում?
   □ա. Այո    □բ. Ոչ

4. Երբ ճամփորդում կամ տնից բացակայում եք, երբեմն մոռանում եք ձեր հետ տանել ձեր դեղերը?
   □ա. Այո    □բ. Ոչ

5. Երեկ ընդունել եք բարձր ճնշման ձեր դեղը?
   □ա. Այո    □բ. Ոչ

6. Երբ զգում եք որ ձեր ճնշումը կարգավորված է, երբեմնդադարեցնում եք դեղերն ընդունելը?
   □ա. Այո    □բ. Ոչ

7. Ամեն օր դեղ ընդունելն ինկապես հոգնեցուցիչ է որոշ մարդկանց համար: Երբևիցե զգացել եք, որ բարձր ճնշման բուժման ծրագրին հետևելը հոգնեցրել/զգվեցրել է ձեզ?
   □ա. Այո    □բ. Ոչ

8. Որքան հաճախ եք մոռանում ընդունել բարձր ճնշման ձեր բոլոր դեղերը?
   ա. երբեք, հազվադեպ
   բ. ժամանակ առ ժամանակ
   գ. երբեմն
   դ. սովորաբար
   ե. ամբողջ ժամանակ, միշտ

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# Պահանջվում են Կամավորներ

## Արյան բարձր ճնշման և դրա հետ կապված ռիսկային գործոնների վերաբերյալ դոկտորական հետազոտության համար

### Դուք կարող եք մասնակցել, եթե

. 21 տարեկան եք կամ ավել
. Հայ եք
. Հղի չեք

### Ինչ կխնդրեն Ձեզ անել՝

. Պատասխանել արյան ճնշման մասին հարցերի

. Խոլեստերինի և գլյուկոզայի թեստի համար մատից արյուն տալ

**Որքան ժամանակ խլի:**

45ր-ից - 1 ժամ

### Մասնակցությունից ինչ կշահեք
. Դուք կիմանաք Ձեր արյան ճնշման չափը, խոլեստերինի և գլյուկոզայի մակարդակը

### Մասնակցության ռիսկերը՝
. Ոչ ավելի մեծ քան հանդիպում են ամենօրյա կյանքում

Եթե հետաքրքրված եք մասնակցությամբ կամ ավել ինֆորմացիա կցանկանաք ստանալ այս հետազոտման վերաբերյալ, խնդրում ենք կապվել հետազոտողի հետ Սալլի Ակարագյան հեռ. 93-41-32-63

## Չափերի Համակարգի Շարք

Նորմալ արյան ճնշում:  SBP < 120 մմսնդիկի սյուն և DBP < 80 մմսնդիկի սյուն

Բարձր արյան ճնշում:   SBP ≥ 140 մմսնդիկի սյուն և/կամ DBP of ≥ 90 մմսնդիկի

սյուն և/կամ հիպոտենզիվ դեղորայքի օգտագործում*

Մարմնի քաշի ինդեքս (BMI):

- Քաշի նվազում          ներքեւ18.5 կգ/մ²
- Նորմալ               18.5-24.9 կգ/մ²
- Քաշի ավելցում        25.0 – 29.9 կգ/մ²
- Ճառբակալում         30.0 կգ/մ² և Բարձր

Ընդհանուր խոլոստերին (Total-C):

- Ցանկալի            < 200 մգ/դլ
- Սահմանագիծ         > 200-239 մգ/դլ
- Բարձր              ≥ 240 մգ/դլ

Ցածր խտությամբ լիպոպրոտեին խոլեստերինը (LDL-C):

- Աբդիմալ/մոդաբդիմալ    < 129 մգ/դլ
- Սահմանագիծ - Բարձր    > 130-159 մգ/դլ
- Բարձր - շատ Բարձր     ≥ 160 մգ/դլ

Բարձր խտությամբ լիպոպրոտեին խոլեստերինը (HDL-C):

- Ցածր               < 40 մգ/դլ
- Բարձր              ≥ 40 մգ/դլ

Տրիգլիցերիդ (Triglyceride Level):

- Նորմալ             < 150 մգ/դլ
- Սահմանագիծ - Բարձր    ≥ 150 մգ/դլ

Գլյուկոզայի մակարդակ (Glucose level fasting) ։

- Նորմալ                   70-99 մգ/դլ

- Նախա Շաքարախտ           100-125 մգ/դլ

- Շաքարախտ                 ≥ 126 մգ/դլ

Գոտկատեղի շրջագիծ (WC):

- ընդունելի                Իգ < 88 սմ, Առու < 102 սմ

- անընդունելի              Իգ ≥ 88 սմ, Առու ≥ 102 սմ

Գոտկատեղի և Ազդրերի համեմատություն:

$$≥ .85 սմ Իգ$$

$$≥ .9 սմ Առու$$

* Ճունտ Ազգային հանցնակումպ-8(ՃԱՀ-8)

** WHO (2008): Մարմնի քաշի ինդեքս (BMI), Գոտկատեղի շրջագիծ (WC,)
Գոտկատեղի և ազդրերի համեմատություն (Waist-Hip Ratio)
*** Ազգային Սիրտ, Թոք, եւ Արիան Ինստուդուտ (ԱՆՀԼԲա) (2014): Ընդհանուր
խոլեստերինը (Total-C), բարձր խտությամբ լիպոպրոտեին խոլեստերինը (HDL-C),
ցածր խտությամբ լիպոպրոտեին խոլեստերինը (LDL-C), Տրիգլիցերիդ (triglycerides)
and Գլյուկոզա (glucose)

**24 ժամյա գրանցման գործիք – Մարդու Սննդառության և Դիետայի Գնահատման**
**UCLA –ի Կենտրոն**
**Սննդի ընդունման օրական գրանցուներ**

Արձանագրություն _____         Ամսաթիվ\_\_\_\_\_

| Ընդունած ուտելիքը և խմիչքները | Պատրաստման եղանակը/ ապրանքանիշը/պիտակի ինֆորմացիան | Քանակը |
|---|---|---|
|  | Նախաճաշ |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  | Առավոտյան թեթև ուտեստ |  |
|  |  |  |
|  |  |  |
|  | Լանչ |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  | Ցերեկային թեթև ուտեստ |  |
|  |  |  |
|  |  |  |
|  | Երեկոյան ճաշ |  |
|  |  |  |
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|  | Երեկոյան թեթև ուտեստ |  |
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# Ֆիզիկական Ակտիվության Միջազգային Հարցում

Մենք ցանկացում ենք բացահայտել թե իրենց առօրյա կյանքում մարդիկ ինչպիսի ֆիզիկական ակտիվություն են դրսևորում:

Ձեզ կուղղվեն հարցեր վերջին 7 օրվա Ձեր ֆիզիկական ակտիվության ժամաքանակի մասին: Խնդրում ենք, պատասխանեք յուրաքանչյուր հարցին, նույնիսկ եթե Դուք Ձեզ չեք համարում ֆիզիկապես ակտիվ մարդ: Խնդրում ենք, մտաբերեք այն ֆիզիկական գործողությունների մասին, որոնք կատարում եք աշխատանքի վայրում, տանը կամ բակում, մի վայրից մյուսը հասնելու համար և Ձեր ազատ ժամանակ հանգստանալիս, վարժություն անելիս կամ սպորտով զբաղվելիս:

1. Վերջին 7 օրերից, քանի օրն եք ունեցել ֆիզիկական ծանրաբեռնվածություն, օրինակ ծանր բեռ բարձրացնել, փորել, աերոբիկա, կամ արագ հեծանիվ քշել`

   Շաբաթվա _____ օրը

   □ Ոչ մի ծանրաբեռնվածություն --→  Անցեք հարց 3-ին

2. Այդ 7 օրերի ընթացքում սովորաբար ինչքան ժամանակ էիք ծախսում ծանր աշխատանք կատարելու վրա:

   _____ ժամ օրական
   _____ րոպե օրական

   □ Չգիտեմ/ Համոզված չեմ

Մտաբերեք բոլոր չափավոր ակտիվ գործողությունները, որոնք արել եք վերջին յոթ օրերի ընթացքում: Չափավոր ակտիվ համարվում են այն գործողությունները, որոնք ստիպում են, որ Դուք շնչեք նորմայից մի փոքի ավելի ծանր: Մտածեք միայն այն գործողությունների մասին, որոնք արել եք առնվազն 10 րոպե անդադար:

3. Վերջին 7 օրերից քանի օր եք ունեցել չափավոր ֆիզիկական ծանրաբեռնվածություն, օրինակ կրել թեթև բեռ, վարել հեծանիվ չափավոր արագությամբ, կամ սեղանի թենիս խաղացել

   _____օր շաբաթվա մեջ
   □ Ոչ մի չափավոր ֆիզիկական ծանրաբեռնվածություն → Անցեք հարց 5-ին

4. Այդ 7 օրերի ընթացքում սովորաբար ինչքան ժամանակ էիք ծախսում չափավոր ծանր աշխատանք կատարելու վրա:
   _____ ժամ օրական

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_____րոպե օրական

□ Չգիտեմ/ Համոզված չեմ

Մտաբերեք թե վերջին 7 օրերի ընթացքում որքան եք ծախսել քայլելու վրա: Այն ներառում է աշխատանքի վայրում, տանը, քայլել հասնելու համար մի վայրից մյուսը, և այլ քայլելու աշխատանք, որը արել եք սպորտի, վարժությունների, հանգստի ժամանակ:

5.  Վերջին 7 օրերի ընթացքում քանի օրն եք քայլել առնվազն 10 րոպե անդադար

_____օր շաբաթվա մեջ
□ Չեմ քայլել➔ Անցեք հարց 7-ին

6.  Օրական որքա±ն ժամանակ եք ծախսել քայլելու վրա

_____ ժամ օրական
_____րոպե օրական
□ Չգիտեմ/ Համոզված չեմ

Վերջին հարցը այն ժամանակահատվածի մասին է, որը ծախսել եք նստելու վրա վերջին 7 աշխատանքային օրերի ընթացքում:  Ներառեք այն ժամանակը, որն անցկացրել եք աշխատավայրում, տանը, կուրսային աշխատանք կատարելիս կամ ազատ ժամանակ: Կարող եք ներառել այն ժամանակը, որը ծախսել եք աշխատասեղանի մոտ, ընկերներին այցելելիս, ընթերցելիս կամ նստած/պառկած հեռուստացույց դիտելիս:

7.  Վերջին 7 աշխատանքային օրերի ընթացքում ինչքան ժամանակ եք անցկացրել նստած

_____ ժամ օրական
_____րոպե օրական
□ Չգիտեմ/ Համոզված չեմ


Հարցումն ավարտված է, շնորհակալություն մասնակցության համար:

## Օբյեկտիվ Ֆիզիոլոգիական Չափում
### Մեկ Օրինակ Տրամադրվում է Մասնակցին

Նույնականացման քարտի համար_____Ամսաթիվ_____

**Ֆիզիոլոգիական չափումներ `** Եթե բարոմետրիկ ճնշման #1 և #2 ցուցանիշները տարբերվում են, պահանջվում է 3-րդ-ը:


Սիստոլիկ բարոմետրային ճնշում____Դիաստոլիկ բարոմետրային ճնշում _____

Սիստոլիկ բարոմետրային ճնշում ____Դիաստոլիկ բարոմետրային ճնշում ____

Սիստոլիկ բարոմետրային ճնշում _____Դիաստոլիկ բարոմետրային ճնշում ____


Հասակը _____սմ          Քաշը _____կգ

Գոտկատեղի շրջագիծ ___սմ    Կոնքի շրջագիծ____սմ    Մարմնի քաշի ցուցիչ_____


Ընդհանուր խոլեստերինը_____ HDL /բարձր խտությամբ լիպոպրոտեին/ _____
LDL/ցածր խտությամբ լիպոպրոտեին/ _____   Տրիգլիցերիդ_____


Գլյուկոզա_____ Քաղցած_____ Կուշտ_____



### Շնորհակալություն



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# References

Abel, T., & Frohlich, K. L. (2012). Capitals and capabilities: Linking structure and agency to reduce health inequalities. *Social Science & Medicine*, *74*, 236-244. doi:10.1016/j.socscimed.2011.10.028

Akaragian, S., Boyadjian, R., Bholat, M., & Dilbaryan, R. (2002). Use of health fairs for community health assessment in Armenia. Unpublished raw data.

Albert, M. A., Glynn, R. J., Buring, J., & Ridker, P. M. (2006). Impact of traditional and novel risk factors on the relationship between socioeconomic status and incident cardiovascular events. *Circulation, 114*, 2619-2626. doi:10.1161/circulationaha.106.660043

Alere Cholestech LDX Analyzer. (2016). Lipid profile, cholesterol and glucose testing. Retrieved from http://www.alere.com/en/home/product-details/cholestech-ldx-system.html

Alzaman, N., Wartak, S. A., Friderici, J., Rothberg, M. B. (2013). Effect of patients' awareness of CVD risk factors on health-related behaviors. *Southern Medical Journal, 106*(11), 606-609. doi:10.1097/SMJ.0000000000000013

American Heart Association. (2014a). Understanding blood pressure readings. Retrieved from http://heart.org/HEARTORG/Conditins/Cholesterol/High Blood Pressure/AboutHighbBloodPressure/Understanding-Blood-Pressure-Readings_UCM_301764_Article.jsp#VO_Iro-cGcw

American Heart Association. (2014b). What your cholesterol levels mean. Retrieved from http://heart.org/HEARTORG/Conditins/Cholesterol/AboutChlesterol/What-Your-Cholesterol-Levels-Mean_UCM_305562_Article.jsp#VO_V4oc-cGcw

American Heart Association. (2016a). Alcohol. Retrieved from http://www.heart.org/HEARTORG/HealthyLiving/HealthyEating/Nutrition/Alcohol-and-Heart-Health_UCM_305173_Article.jsp#.WPldTogrJPY

American Heart Association. (2016b). Women and cholesterol. Retrieved from http://www.heart.org/.../Cholesterol/UnderstandYourRiskforHighCholesterol/Women-and-C.

American Heart Association. (2017). The American Heart Association helps you understand your risk of high blood pressure. Retrieved from http://heart.org/.../HighBloodPressure/.../Know-Your-Risk-Factors-for-High-Blood-Pr...

American Heart Association Nutrition Committee. (2006). Diet and lifestyle recommendations revision 2006: A scientific statement from the American Heart Association nutrition Committee. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/16785338

Arevian, M., Adra, M., & Kubeissi, L. (2004). Risk factors for coronary artery disease (CAD) in Lebanese-Armenian women. *Health Care Women International, 25,* 933-949. doi:10.1080/07399330490508631

Assanangkornchai, S., Talek, M., & Edwards, J. G. (2016). Influence of Islam and the globalized alcohol industry on drinking in Muslim countries. *Addiction*, *111,* 1715-1716. doi:10.1111/add.13284

Authority Nutrition. (2017). Protein intake. Retrieved from https://authoritynutrition.com/how-much-protein-per-day/

Bastable, S. B. (2014). *Nurse as educator*. Burlington, MA: Jones & Bartlett Learning.

Bauman, A., Bull, F., Chey, T., Craig, C. L., Ainsworth, B. E., Sallis, J. F., Bowles, H. R., Hagstomr, M., Sjostrom, M., Pratt, M., & the IPS Group (2009). The international prevalence study on physical activity: results from 20 countries. *International Journal of Behavioral Nutrition and Physical Activity, 6*(21), 1-26. doi:10:1186/1479-5868-6-21

Bener, A., Al-Suwaidi, J., Al-Jaber, K., Al-Marri, S., Elbagi, I. E. (2004). Epidemiology of hypertension and its associated risk factors in the Qatari population. *Journal of Human Hypertension 18*, 529-530. doi:10.1038/sj.jhh.1001691

Bilal, M., Haseeb, A., Lashkerwala, S. S., Zahid, I., Siddiq, K., Saad, M., Dar, M. I., Arshad, M. H., Shahnawaz, W., Ahmed, B., Yaqub, A. (2015). Knowledge, awareness and self-care practices of hypertension among cardiac hypertensive patients. *Global Journal of Health Science, 8*(2), 9-19. doi:10.5539/gjhs.v8n2p9

Brouwer, E. D., Watkins, D., Olson, Z., Goett, J., Nugent, R., & Levin, C. (2015). Provider costs for prevention and treatment of cardiovascular and related conditions in low- and middle-income countries: A systematic review. *BioMed Central Public Health, 15,* 1183-1199. doi:10.1186/s12889-015-2538-z

Browning, C. R., & Cagney, K. A. (2002). Neighborhood structural disadvantage, collective efficacy, and self-rated physical health in an urban setting. *Journal of Health and Social Behavior*, *43*, 383-399.

Burns, N., & Grove, S. K. (2009). *The practice of nursing research: Appraisal, synthesis and generation of evidence* (6th ed.). St Louis, MO: Saunders Elsevier.

Centers for Disease Control and Prevention. (2014). Preventing high blood pressure: Healthy living habits. Retrieved from http://www.cdc.gov/bloodpressure/healthy_living.htm

Centers for Disease Control and Prevention. (2015a). Age adjusted rates of diagnosed diabetes per 100 civilian, non-institutionalized population, by sex, United States, 1980-2014. Retrieved from https://www.cdc.gov/diabetes/statistics/prev/national/figbysex.htm

Centers for Disease Control and Prevention. (2015b). Family history. Retrieved from https://www.cdc.gov/bloodpressure/family_history.htm

Centers for Disease Control and Prevention. (2015c). National Center for Injury Prevention and Control. Retrieved from http://www.cdc.gov/injury

Centers for Disease Control and Prevention. (2015d). Preventing chronic disease. Retrieved from http://www.cdc.gov/PCD/issues/2015/14_0353.htm

Centers for Disease Control and Prevention. (2016). High blood pressure facts. Retrieved from https://www.cdc.gov/bloodpressure/facts.htm

Chobanian, A. V., Bakris, G. L., Black, H. R., Cushman, W. C., Green, L. A., Izzo, J. L., Jr., . . . Roccella, E. J. (2003). The seventh report of the Joint National Committee on prevention, detection, evaluation, and treatment of high blood pressure: The JNC 7 report. *JAMA, 289*, 2560-2572. doi:10.1001/jama.289.19.2560

Cockerham, W. C. (1981). Medical sociology. *International Review of Modern Sociology, 11,* 231-250.

Cockerham, W. C. (2000). Health lifestyles in Russia. *Social Science & Medicine, 51,* 1313-1324. doi:10.1016/S0277-9536(00)00094-0

Cockerham, W. C. (2005). Health lifestyle theory and the convergence of agency and structure. *Journal of Health and Social Behavior, 46*, 51-67. doi:10.1177/002214650504600105

Cockerham, W. C. (2007). Health lifestyles and the absence of the Russian middle class. *Sociology of Health & Illness, 29*, 457-473. doi:10.1111/j.1467-9566.2007.00492.x

Cockerham, W. C. (2010). *The New Blackwell companion to medical sociology*. Hoboken, NJ: Wiley-Blackwell.

Cockerham, W. C. (2012). *Medical sociology*. Boston, MA: Prentice Hall.

Cockerham, W. C. (2014). The sociology of health in the United States: Recent theoretical contributions. *Cien Saude Colet, 19*, 1031-1039. doi:10.1590/1413-81232014194.14872013

Cockerham, W. C., Hinote, B. P., & Abbott, P. (2006). Psychological distress, gender, and health lifestyles in Belarus, Kazakhstan, Russia, and Ukraine. *Social Science of Medicine, 63*, 2381-2394. doi:10.1016/j.socscimed.2006.06.001

Cockerham, W. C., Hinote, B. P., Abbott, P., & Haerpfer, C. (2004). Health lifestyles in Central Asia: The case of Kazakhstan and Kyrgyzstan. *Social Science of Medicine, 59*, 1409-1421. doi:10.1016/j.socscimed.2004.01.023

Cockerham, W. C., Hinote, B. P., Cockerham, G. B., & Abbott, P. (2006). Health lifestyles and political ideology in Belarus, Russia, and Ukraine. *Social Science of Medicine, 62*, 1799-1809. doi:10.1016/j.socscimed.2005.08.024

Cockerham, W. C., Snead, M. C., & Dewaal, D. F. (2002). Health lifestyles in Russia and the socialist heritage. *Journal of Health & Social Behavior, 43*, 42-55. doi:10.2307/3090244

Cohen, D. A., Scribner, R. A., & Farley, T. A. (2000). A structural model of health behavior: A pragmatic approach to explain and influence health behaviors at the population level. *Preventive Medicine, 30*, 146-154. doi:10.1006/pmed.1999.0609

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Erlbaum.

Craig, C. L., Marshall, A. L., Sjostrom, M., Bauman, A. E., Booth, M. L., Ainsworth, B. E., . . . Oja, P. (2003). International physical activity questionnaire: 12-country reliability and validity. *Medicine & Science in Sports & Exercise, 35*, 1381-1395. doi:10.1249/01.mss.0000078924.61453.fb

Daderian-Huckabay, L. M. (2003). A study of the health status of the Armenian immigrant population in United States. Retrieved from http://www.aub.edu.lb/hson/Documents /Home_nes/lectures/LoucineDaderian-Huckabay.pdf

Dallo, F. J., & Borrell, L. N. (2006). Self-reported diabetes and hypertension among Arab Americans in the United States. *Ethnicity & Disease, 16*, 699-705. doi:10.1093/aje/163.suppl_11.s185-b

de Oliveira-Filho, A. D., Morisky, D. E., Neves, S. J., Costa, F. A., & de Lyra, D. P., Jr. (2014). The 8-item Morisky Medication Adherence Scale: Validation of a Brazilian-Portuguese version in hypertensive adults. *Research in Social & Administrative Pharmacy, 10*, 554-561. doi:10.1016/j.sapharm.2013.10.006

Dong, F., Wang, D., Pan, L., Yu, Y., Wang, K., Li, L., . . . Shan, G. (2016). Disparities in hypertension prevalence, awareness, treatment and control between Bouyei and Han: Results from a bi-ethnic health survey in developing regions from South China. *International Journal of Environmental Research & Public Health, 13*, 233. doi:10.3390/ijerph13020233.

Egan, B. M., Zhao, Y., & Axon, R. N. (2010). US trends in prevalence: Awareness, treatment, and control of hypertension, 1988-2008. *Journal of the American Medical Association, 303,* 243-250. doi:10.1001/jama.2010.650

Elshaw, E. B., Young, E. A., Saunders, M. J., McGurn, W. C., & Lopez, L. C. (1994). Utilizing a 24-hour dietary recall and culturally specific diabetes education in Mexican Americans with diabetes. *Diabetes Educator, 20*, 228-235. doi:10.1177/014572179402000309

Emery University. (2016). Incentives. Retrieved from http://www.hr.emory.edu/eu/benefits/incentives/checkup.html

Engle-Stone, R., & Brown, K. H. (2015). Comparison of a household consumption and expenditures survey with nationally representative food frequency questionnaire and 24-hour dietary recall data for assessing consumption of fortifiable foods by women and

young children in Cameroon. *Food and Nutrition Bulletin, 36*, 211-230. doi:10.1177/0379572115587272

Erem, C., Hacihasanoglu, A., Kocak, M., Deger, O., & Topbas, M. (2009). Prevalence of prehypertension and hypertension and associated risk factors among Turkish adults: Trabzon hypertension study. *Journal of Public Health, 31*, 47-58. doi:10.1093/pubmed/fdn078

Filipovsky, J., Ducimetiere, P., Eschwege, E., Richard, J. L., Rosselin, G., & Claude, J. R. (1996). The relationship of blood pressure with glucose, insulin, heart rate, free fatty acids and plasma cortisol levels according to degree of obesity in middle-aged men. *Journal of Hypertension, 14*, 229-235. doi:10.1097/00004872-199602000-00012

Footman, K., Roberts, B., Tumanov, S., & McKee, M. (2013). The comorbidity of hypertension and psychological distress: A study of nine countries in the former Soviet Union. *Journal of Public Health,35*, 548-557. doi:10.1093/pubmed/fdt019

Franco, A., Alvarez-Dardet, C., & Ruiz, M. T. (2004). Effect of democracy on health: Ecological study. *BMJ, 329*(7480), 1421-1423. doi:10.1136/bmj.329.7480.1421

Fridman, V., Vandalovsky, E., & Bergmann, S. R. (2006). Cardiac risk factors, medicine usage, and hospital course in immigrants from the former Soviet Union. *Journal of Health Care for the Poor and Underserved*, *17,* 290-301. doi:10.1353/hpu.2006.0060

Go, A. S., Mozaffarian, D., Roger, V. L., Benjamin, E. J., Berry, J. D., Blaha, M. J., . . . Turner, M. B. (2014). Executive summary: Heart disease and stroke statistics—2014 update: A report from the American Heart Association. *Circulation, 129*, 399-410. doi:10.1161/01.cir.0000442015.53336.12

Go, A. S., Mozaffarian, D., Roger, V. L., Benjamin, E. J., Berry, J. D., Borden, W. B., . . . Turner, M. B. (2013). Heart disease and stroke statistics—2013 update: A report from the American Heart Association. *Circulation, 127*, e6-e245. doi:10.1161/CIR.0b013e31828124ad

Goldstein, I. B., Shapiro, D., Weiss, R. E. (2008). How family history and risk factors for hypertension relate to ambulatory blood pressure in healthy adults. *Journal of Hypertension, 26*, 276-283. doi:10.1097/HJH.0b013e3282f15c27

Grigoryan, M. (2015). Armenia: Seeking work in Russia by hook or by crook. Retrieved from http://www.eurasianet.org/node/72801

Grim, C. E., Grim, C. M., Petersen, J. R., Li, J., Tavill, F., Kipshidze, N. N., . . . Kipshidze, N. (1999). Prevalence of cardiovascular risk factors in the Republic of Georgia. *Journal of Human Hypertension 13*(4), 243-247. doi:10.1038/sj.jhh.1000795

Grzywacz, J. G., & Marks, N. F. (2001). Social inequalities and exercise during adulthood: Toward an ecological perspective. *Journal of Health & Social Behavior, 42*, 202-220. doi:10.2307/3090178

Grzywacz, J. G., Stoller, E. P., Brewer-Lowry, A. N., Bell, R. A., Quandt, S. A., & Arcury, T. A. (2012). Gender and health lifestyle: An in-depth exploration of self-care activities in later life. *Health Education & Behavior, 39*, 332-340. doi:10.1177/1090198111405195

Harhay, M. O., Harhay, J. S., & Nair, M. M. (2013). Education, household wealth and blood pressure in Albania, Armenia, Azerbaijan and Ukraine: Findings from the Demographic Health Surveys, 2005-2009. *European Journal of Internal Medicine, 24*, 117-126. doi:10.1016/j.ejim.2012.11.004

Hesse-Biber, S. N., & Leavy, P. (2011). *The practice of qualitative research.* Thousand Oaks, CA: Sage.

Hinote, B. P., Cockerham, W. C., & Abbott, P. (2009). The specter of post-communism: Women and alcohol in eight post-Soviet states. *Social Science of Medicine, 68*, 1254-1262. doi:10.1016/j.socscimed.2009.01.019

Hodge, F., & Nandy, K. (2011). Factors associated with American Indian cigarette smoking in rural settings. *International Journal of Environmental Research and Public Health, 8*, 944-954. doi:10.3390/ijerph8040944

Huang, X., Zhou, Z., Liu, J., Song, W., Chen, Y., Liu, Y., . . . Zhao, S. (2016). Prevalence, awareness, treatment, and control of hypertension among China's Sichuan Tibetan population: A cross-sectional study. *Clinical & Experimental Hypertension, 38*, 457-463. doi:10.3109/10641963.2016.1163369.

Huffman, M. D., Capewell, S., Ning, H., Shay, C. M., Ford, E. S., & Lloyd-Jones, D. M. (2012). Cardiovascular health behavior and health factor changes (1988-2008) and projections to 2020: Results from the National Health and Nutrition Examination Surveys. *Circulation*, *125*, 2595-2602. doi:10.1161/CIRCULATIONAHA.111.070722

Information Please. (2005). Fat intake in the US. Retrieved from https://www.infoplease.com/science-health/health/recommended-daily-fat-intake

Jaddou, H. Y., Bateiha, A. M., & Ajlouni, K. M. (2000). Prevalence, awareness and management of hypertension in a recently urbanised community, eastern Jordan. *Journal of Human Hypertension, 14*(8), 497-501. doi:10.1038/sj.jhh.1001063

Jani, R., Salian, N., Udipi, S., Ghugre, P., Lohia, N., Haas, J., & Boy, E. (2015). Folate status and intake of tribal Indian adolescents aged 10 to 17 years. *Food and Nutrition Bulletin, 36,* 14-23. doi:10.1177/156482651503600102

Jennings, H., & Cook, T. S. (2010). Hypertension: Clinical practice updates. Retrieved from https://www.accp.com/docs/bookstore/psap/p7b01sample01.pdf

Ke, L., Ho, J., Feng, J., Mpofu, E., Dibley, M. J., Li, Y., Feng, X., Van, F., Lau, W., Brock, K. E. Prevalence, awareness, treatment and control of hypertension in Macau: Results from a cross-sectional epidemiological study in Macau, China. *American Journal of Hypertension, 28*, 159-165. doi:10.1093/ajh/hpu121

Kim, H. J., Park, H. A., Cho, Y. G., Kang, J. H., Kim, K. W., Kang, J. H., . . . Park, J. K. (2011). Gender difference in the level of HDL cholesterol in Korean adults. *Korean Journal of Family Medicine*, *32*(3), 173-181. doi:10.4082/kjfm.2011.32.3.173

Kim, S., Popkin, B. M., Siega-Riz, A. M., Haines, P. S., & Arab, L. (2004). A cross-national comparison of lifestyle between China and the United States, using a comprehensive cross-national measurement tool of the healthfulness of lifestyles: The Lifestyle Index. *Preventive Medicine, 38*, 160-171. doi:10.1016/j.ypmed.2003.09.028

Krousel-Wood, M. A., Islam, T., Webber, L. S., Re, R. S., Morisky, D. E., & Muntner, P. (2009). New medication adherence scale versus pharmacy fill rates in seniors with hypertenation. *American Journal of Managed Care, 15*, 59-66. Retrieved from http://www.ajmc.com/

Kumbasar, B., Yenigun, M., Ataoglu, H. E., Sar, F., Serez, K., Turker, T., . . . Kazancioglu, R. (2013). The prevalence of metabolic syndrome in different ethnic groups in Turkey. *Journal of International Medical Research, 41*, 188-199. doi:10.1177/0300060512474137

Kurtze, N., Rangul, V., & Hustvedt B. (2008). Reliability and validity of the international physical activity questionnaire in the Nord-Trøndelag Health Study (HUNT) population of men. *Medical Research Methodolgy, 8,* 1-9. doi:10.1186/1471-2288-8-63

Ladeiras-Lopes, R., Sampaio, F., Bettencourt, N., Fontes-Carvalho, R., Ferreira, N., Leite-Moreira, A., & Gama, V. (in press). The ratio between visceral and subcutaneous abdominal fat assessed by computed tomography is an independent predictor of mortality and cardiac events. *Cardiology (English Edition).* doi:10.1016/j.rec.2016.09.010

Lee, G. K., Wang, H. H., Liu, K. Q., Cheung, Y., Morisky, D. E., & Wong, M. C. (2013). Determinants of medication adherence to antihypertensive medications among a Chinese population using Morisky Medication Adherence Scale. *PLoS One, 8*(4), e62775. doi:10.1371/journal.pone.0062775

Lira, M. T., Kunstmann, S., Caballero, E., Guarda, E., Villarroel, L., & Molina. J. C. (2006). Cardiovascular prevention and attitude of people towards behavior changes: state of the art—Cardiovascular prediction and attitude of change in relation to risk factors: a critical analysis of the current state. *Medical Journal of Chile*, *134*, 223-230. doi:S0034-98872006000200014

Mahajan, R. (2014). Joint National Committee 8 report: How it differs from JNC 7. *International Journal of Applied Basic Medical Research, 4*(2), 61-62. doi:10.4103/2229-516X.136773

Martyn, C. (2004). Politics as a determinant of health. *BMJ, 329*(7480), 1423-1424. doi:10.1136/bmj.329.7480.1423

Mayo Clinic. (2015a). Does drinking alcohol affect your blood pressure? Retrieved from http:www.mayoclinic.org/diseses-conditions/high-blood-pressure/expert-answers/blood-pressuer/faq-200058254

Mayo Clinic. (2015b). The FDA recommended sodium intake. Retrieved from
http://healthyeating.sfgate.com/fda-recommended-sodium-intake-1873.html

Medicinenet.com. (2002). How do alcohol, coffee, and smoking influence blood pressure?
Retrieved from http://www.medicinenet.com/script/main/art.asp?articlekey=20340

Mehler, P. S., Scott, J. Y., Pines, I., Gifford, N., Biggerstaff, S., & Hiatt, W. R. (2001). Russian
immigrant cardiovascular risk assessment. *Journal of Health Care for the Poor and
Underserved, 12,* 224-235. doi:10.1353/hpu.2010.0822

Molnar, B. E., Gortmaker, S. L., Bull, F. C., & Buka, S. L. (2004). Unsafe to play?
Neighborhood disorder and lack of safety predict reduced physical activity among urban
children and adolescents. *American Journal of Health Promotion, 18*, 378-386.
doi:10.4278/0890-1171-18.5.378

Morisky, D. E., Ang, A., Krousel-Wood, M., & Ward, H. J. (2008). Predictive validity of a
medication adherence measure for hypertension control. *Journal of Clinical
Hypertension, 10*, 348-354. doi:10.1111/j.1751-7176.2008.07572.x

Morisky, D. E., & DiMatteo, M. R. (2011). Improving the measurement of self-reported
medication nonadherence: Final response. *Journal of Clinical Epidemiology, 64*, 258-
263. doi:10.1016/j.jclinepi.2010.09.002

Morisky, D. E., Green, L. W., & Levine, D. M. (1986). Concurrent and predictive validity of a
self-reported measure of medication adherence. *Medical Care, 24*, 67-74.
doi:10.1097/00005650-198601000-00007

Naccasian, Z. (2017). Prevalence and predictors of diabetes mellitus and hypertension in
Armenian Americans in Los Angeles [Unpublished raw data].

National Heart, Lung and Blood Institute. (2011). What is diabetic heart disease?
http://www.nhlbi.nih.gov/health/health-topics/topics/dhd

National Heart, Lung and Blood Institute. (2012a). Coronary heart disease risk factors. Retrieved
from http://www.nhlbi.nih.gov/health/health-topics/topics/hd/atrisk

National Heart, Lung and Blood Institute. (2012c). What is cholesterol?
https://www.nhlbi.nih.gov/health/health-topics/topics/hbc

National Heart, Lung and Blood Institute. (2013). Seventh report of the Joint National
Committee on prevention, detection, evaluation, and treatment of high blood pressure
(JNC-7). Retrieved from http://www.nhlbi.nih.gov/guidelines/hypertension

National Heart, Lung and Blood Institute. (2015a). According to waist circumference.
http://www.nhlbi.nih.gov/health-pro/guidelines/current/obesity-guidelines/e_textbook/tx

National Heart, Lung and Blood Institute. (2015b). Description of high blood pressure. Retrieved
from http://www.nhlbi.nih.gov/health/health/topics/hbp/

National Heart, Lung and Blood Institute. (2015c). Risk factors for high blood pressure. Retrieved from http://www.nhlbi.nih.gov/health/health-topics/topics/hbp/atrisk.htm

National Heart, Lung and Blood Institute. (2016a). Assessing your weight and health risk, body mass index, waist circumference. Retrieved from https://www.nhlbi.nih.gov/health/educational/lose_wt/risk.htm

National Heart, Lung and Blood Institute. (2016b). Body Mass Index. https://www.nhlbi.nih.gov/health/educational/lose_wt/risk.htm-bmi findings

National Institute on Alcohol Abuse and Alcoholism. (2003). Recommended alcohol questions. Retrieved from https://niaaa.nih.gov/research/guidelines-and-resources/recommended-alcohol-questions

National Institute on Alcohol Abuse and Alcoholism. (2007). *Clinician's guide.* Retrieved from http://www.niaaa.nih.gov/publications/clinical-guides-and-manuals

Neuhauser, H. K., Adler, C., Rosario, A. S., Diederichs, C., & Ellert, U. (2015). Hypertension prevalence, awareness, treatment and control in Germany 1998 and 2008-11. *Journal of Human Hypertension, 29*(4), 247-253. doi:10.1038/jhh.2014.82

Nonnemaker, J. M., Allen, J. A., Davis, K. C., Kamyab, K., Duke, J. C., & Farrelly, M. C. (2014). The influence of antismoking television advertisements on cessation by race/ethnicity, socioeconomic status, and mental health status. *PLoS One, 9*(7), e102943. doi:10.1371/journal.pone.0102943

Nordström, A., Hadrévi, J., Olsson, T., Franks, P. W., & Nordström, P. (2016). Higher prevalence of Type 2 diabetes in men than in women is associated with differences in visceral fat. *Journal of Clinical Endocrinology & Metabolism, 101,* 3740-3746. doi:10.1210/ic.2016-1915

Oliveria, S. A., Chen, R. S., McCarthy, B. D., Davis, C. C., Hill, M. N. (2005). Hypertension knowledge, awareness, and attitudes in a hypertensive population. *Journal of General Internal Medicine, 20,* 219-225. doi:10.1111/j.1525-1497.2005.30353.x

Ong, K. L., Cheung, B. M., Man, Y. B., Lau, C. P., Lam, K. S. (2007). Prevalence, awareness, treatment, and control of hypertension among United States adults 1999-2004. *Hypertension, 49*, 69-75. doi:10.1161/01.HYP.0000252676.46043.18

Ortega, L. M., Sedki, E., & Nayer, A. (2015). Hypertension in the African American population: A succinct look at its epidemiology, pathogenesis, and therapy. *Nefrologia, 35*, 139-145. doi:10.1016/j.nefro.2015.05.014

Park, C., & Kang, C. (2008). Does education induce healthy lifestyle? *Journal of Health Economics, 27*, 1516-1531. doi:10.1016/j.jhealeco.2008.07.005

Pilav, A., Doder, V., Branković, S. (2014). Awareness, treatment, and control of hypertension among adult population in the Federation of Bosnia and Herzegovina over the past decade. *Journal of Public Health Research, 18*, 323. doi:10.4081/jphr.2014.323

Puddey, I. B., Beilin, L. J. (2006). Alcohol is bad for blood pressure. *Clinical and Experimental Pharmacology and Physiology, 33*, 847-852. doi:10.1111/j.1440-1681.2006.04452.x

Qureshi, A. I., Suri, M. F., Kirmani, J. F., Divani, A. A., & Mohammad, Y. (2005). Is prehypertension a risk factor for cardiovascular diseases? *Stroke*, *36*, 1859-1863. doi:10.1161/01.STR.0000177495.45580.f1

Ranasinghe, P., Cooray, D. N., Jayawardena, R., & Katulanda, P. (2015). The influence of family history of hypertension on disease prevalence and associated metabolic risk factors among Sri Lankan adults. *BioMed Central Public Health, 15*, 576. doi**:**10.1186/s12889-015-1927-7

Richardson, E. (2013). Armenia: Health system review. *Health Systems in Transition, 15*(4), 1-99. Retrieved from http://www.wpro.who.int/asia_pacific_observatory/hits/en/

Roberts, B., Stickley, A., Balabanova, D., Haerpfer, C., & McKee, M. (2012). The persistence of irregular treatment of hypertension in the former Soviet Union. *Journal of Epidemiological Community Health, 66*, 1079-1082. doi:10.1136/jech-2011-200645

Roka, R., Michimi, A., & Macy, G. (2015). Associations between hypertension and body mass index and waist circumference in U.S. adults: A comparative analysis by gender. *High Blood Pressure & Cardiovascular Prevention, 22*, 265-273. doi:10.1007/s40292-015-0106-3

Sabouhi, F., Babaee, S., Naji, H., & Zadeh, A. H. (2011). Knowledge, awareness, attitudes and practice about hypertension in hypertensive patients referring to public health care centers in Khoor & Biabanak. *Iranian Journal of Nursing and Midwifery Research, 16*, 34-40. Retrieved from http://ijnmr.mui.ac.ir/index.php/ijnmr

Scambler, G. (2013). Resistance in unjust times: Archer, structured agency and the sociology of health inequalities. *Sociology, 47*, 142-156. doi:10.1177/0038038512455878

Scavini, M., Stidley, C. A., Shah, V. O., Narva, A. S., Tentori, F., Kessler, D. S., . . . Zager, P. G. (2003). Prevalence of diabetes is higher among female than male Zuni Indians. *Diabetes Care, 26,* 55-60. doi:10.2337/diacare.26.1.55

Scherrer, J. F., Xian, H., Pan, H., Pergadia, M. L., Madden, P. A., Grant, J. D., . . . Bucholz, K. K. (2012). Parent, sibling and peer influences on smoking initiation, regular smoking and nicotine dependence. Results from a genetically informative design. *Addict Behaviors, 37*, 240-247. doi:10.1016/j.addbeh.2011.10.005

Shah, S. M., Loney, T., Sheek-Hussein, M., El Sadig, M., Al Dhaheri, S., El Barazi, I., . . . Ali, R. (2015). Hypertension prevalence, awareness, treatment, and control, in male South

Asian immigrants in the United Arab Emirates: A cross-sectional study. *BMC Cardiovascular Disorders*, *15*, 30. doi:10.1186/s12872-015-002

Statistical Service of the Republic of Armenia. (2013). Main statistical data. Retrieved from http://www.armstat.am/en/

Summit Health. (1999). Health screenings: Fingerstick or venous blood draw? Retrieved from http://www.summithealth.com

Tailakh, A., Evangelista, L. S., Mentes, J. C., Pike, N. A., Phillips, L. R., & Morisky, D. E. (2014). Hypertension prevalence, awareness, and control in Arab countries: A systematic review. *Nursing & Health Sciences, 16*, 126-130. doi:10.1111/nhs.12060

Tailakh, A., Evangelista, L. S., Morisky, D. E., Mentes, J. C., Pike, N. A., & Phillips, L. R. (2016). Acculturation, medication adherence, lifestyle behaviors, and blood pressure control among Arab Americans. *Journal of Transcultural Nursing, 16*, 126-130. doi:10.1177/104365961452646

Tailakh, A., Mentes, J. C., Morisky, D. E., Pike, N. A., Phillips, L. R., & Evangelista, L. S. (2013). Prevalence, awareness, treatment, and control of hypertension among Arab Americans. *Journal of Cardiovascular Nursing, 28*, 330-337. doi:10.1097/JCN.0b013e31825638ae

Tóth, P. P., Potter, D., & Ming, E. E. (2012). Prevalence of lipid abnormalities in the United States: The National Health and Nutrition Examination Survey 2003-2006. *Journal of Clinical Lipodology, 6,* 325-330. doi:10.1016/j.jacl.2012.05.002

U.S. Agency for International Development/Primary Healthcare Reform Project. (2008). *Household health survey.* Yerevan, Armenia: American University of Armenia.

U.S. Department of Agriculture, Agricultural Research Service. (2002). *Nutritive value of foods.* Washington, DC: Author.

Vasan, R. S., Beiser, A., Seshadri, S., Larson, M. G., Kannel, W. B., D'Agostino, R. B., & Levy, D. (2002). Residual lifetime risk for developing hypertension in middle-aged women and men: The Framingham Heart Study. *JAMA, 287*, 1003-1010. Retrieved from http://jamanetwork.com/journals/jama

Viera, A. J., Thorpe, J. M., & Garrett, J. M. (2006). Effects of sex, age, and visits on receipt of preventive healthcare services: A secondary analysis of national data. *BioMed Central Public Health 6*, 15. doi:10.1186/1472-6963-6-15

WebMD. (2014). High blood pressure and alcohol. Retrieved from http:www.webmd.com /hypertension-high-blood-pressure/features/hypertension-and-alcohol#3

Wolz, M., Cutler, J., Roccella, E. J., Rohde, F., Thom, T., & Burt, V. (2000). Statement from the National High Blood Pressure Education Program: Prevalence of hypertension. *American Journal of Hypertension, 13*, 103-104. doi:10.1016/S0895-7061(99)00241-1

Woodside, J. V., Yarnell, J. W., Patterson, C. C., Arveiler, D., Amouyel, P., Ferrieres, J., . . . Ducimetiere, P. (2012). Do lifestyle behaviours explain socioeconomic differences in all-cause mortality, and fatal and non-fatal cardiovascular events? Evidence from middle aged men in France and Northern Ireland in the PRIME Study. *Preventive Medicine, 54*, 247-253. doi:10.1016/j.ypmed.2012.01.017

World Health Organization. (2008). Waist circumference and waist-hip ratio: Report of a WHO Experts Consultation. Geneva. Retrieved from http://apps.who.int/iris/bitstream/10665/44583/1/9789241501491_eng.pdf

World Health Organization. (2009). *Global health risks: Mortality and burden of disease attributable to selected major risks*. Geneva, Switzerland: Author.

World Health Organization. (2015a). Mortality by country Armenia. Retrieved from http://who.int/gho/data/node.imr.WHS2_13

World Health Organization. (2015b). Prevalence of tobacco smoking. Retrieved from http://www.who.int/gho/tobacco/use/en/

World Health Organization. (2015c). Spending on health: A global overview. Retrieved from http://www.who.int/mediacentre/factsheets/fs319/en/

World Health Rankings. (2012). Mortality health topics: Age-Standardize death rate by country Armenia. Retrieved from http://www.who.int/topics/mortality/en/

Wrieden, W., Peace, H., Armstrong, J., & Barton, K. (2003, September). *A short review of dietary assessment methods used in national and Scottish Research Studies*. Paper presented at the Working Group on Monitoring Scottish Dietary Targets Workshop, Edinburgh.

Wu, L., He, Y., Jiang, B., Sun, D., Wang, J., Liu, M., . . . Wang, Y. (2015). Trends in prevalence, awareness, treatment and control of hypertension during 2001-2010 in an urban elderly population of China. *PLoS One, 10*(8), e0132814. doi:10.1371/journal.pone.0132814

Young, J. H., Parler, P., Bristol, B., & Klag, M. J. (2005). The coming epidemic: hypertension in rural Kyrgyzstan, Central Asia. *Journal of Human Hypertension, 19*, 145-148. doi:10.1038/sj.jhh.1001791

Zdrojewski, T., Wizner, B., Więcek, A., Ślusarczyk, P., Chudek, .J, Mossakowska, M., . . . Grodzicki, T. (2016). Prevalence, awareness, and control of hypertension in elderly and very elderly in Poland: Results of a cross-sectional representative survey. *Journal of Hypertension, 34*, 532-538. doi:10.1097/HJH.0000000000000823.

Zhang, X., Zhu, M., Dib, H. H., Hu, J., Tang, S., Zhong, T., & Ming, X. (2009). Knowledge, awareness, behavior (KAB) and control of hypertension among urban elderly in western China. *International Journal of Cardiology, 137*, 9-15. doi:10.1016/j.ijcard.2008.06.003

Zhang, Y., Lee, E. T., Devereux, R. B., Yeh, J., Best, L. G., Fabsitz, R. R., & Howard, B. V. (2006). Prehypertension, diabetes, and cardiovascular disease risk in a population-based sample: The strong heart study. *Hypertension*, *47*, 410-422. doi:10.1161/01.HYP.0000205119.19804.08