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Degree of Suspicion of Peripheral Artery Disease (PAD) among the Employees of MSU-IIT

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ABSTRACT

This study focused on the degree of suspicion of peripheral artery disease (PAD) among the employees of Mindanao State University-Iligan Institute of Technology. As to the demographic profile of the respondents, majority were 50 years old and above, female; had heredo-familial disease with hypertension as the most common; had an unhealthy lifestyle with alcoholism as the most common; and had a normal body mass index. As to the degree of suspicion of peripheral artery disease, majority had a mild degree of suspicion for the development of PAD on both their left and right lower extremities, based on their left and right ankle brachial indices, respectively. As to the significant relationship between demographic profile and degree of suspicion of having PAD: considering the Left ABI, age, gender, and heredo-familial disease on diabetes mellitus (DM), hypertension(HPN), cardiac diseases are significant; lifestyle on alcoholism, irregular exercise, and high fat diet were also significant. Considering the Right ABI, gender and heredo-familial diseases on cardiac diseases were significant; lifestyle on smoking, alcoholism, irregular exercise, and high fat diet are also significant. As to the significant difference of Left ABI and Right ABI: considering the Left ABI, age, gender, and heredo-familial diseases on DM, HPN, and cardiac disease have significant difference; lifestyle on alcoholism, exercise, and diet also have significant difference. Considering the Right ABI, gender, heredo-

familial disease on cardiac disease, lifestyle on alcoholism, exercise, and diet have significant difference.

Keywords **-** peripheral artery disease, demographic profile

INTRODUCTION

Cardiovascular disease is the number one cause of death in the world (WHO, 2011). Peripheral artery disease is a type of cardiovascular disease; specifically it belongs to vascular system diseases, and it has ranked the second most common non-transmissible disease that cause deaths in the Philippines, compromising 29.7% of the total number of deaths among the top 10 leading causes of mortality (PHS 2000). Therefore, peripheral artery disease (PAD) is an important healthcare problem and early detection and intervention is vital to minimize the chances of further complication. Individuals eventually die mostly because of cardiac and cerebrovascular diseases (e.g., myocardial infarction and stroke, respectively), unaware that the possible reason for their mortality is peripheral arterial disease that wasn't earlier diagnosed and treated (Brunner, 2012). Indubitably, the prevention and early detection of Peripheral Artery Disease (PAD) among the faculty and staff of Mindanao State University-Iligan Institute of Technology (MSU-IIT), is of imperative importance. A healthy workforce means capacity for increased productivity, and less healthcare expenditures.

The ankle brachial index (ABI) constitutes a simple, non-invasive, cost-effective method for the early detection of peripheral artery disease (PAD) which complements the assessment of cardiovascular risk. This examination has been recommended for routine clinical use, with the aim of measuring the patency of the arterial circulation of the lower as well as the upper limbs (Fishbach, 2004). The more symptomatic and severe the PAD as objectively measured by the ankle-brachial index (ABI), the worse the overall prognosis of the patient (Criqui et al, 1992).

As an institution, Mindanao State University-Iligan Institute of Technology (MSU-IIT) houses faculty and staff of varying demographic profile. They are different from one and the other in terms of their diet, lifestyle (i.e., exercise frequency), and heredo-familial diseases, even Body Mass Index (i.e., obesity), factors that influence the occurrence of PAD (Smeltzer, 2010). For this reason, the researcher aims to conduct an investigation to determine the degree of suspicion of peripheral artery disease (PAD) among the employees of Mindanao

State University-Iligan Institute of Technology. In an attempt to help the Philippine government in its Millennium health goals, the researcher is hopeful that through the results of this study, individuals in the health arena will be better able to develop health promotion and/or disease prevention strategies which are appropriate to the respondents in question to minimize the incidence of PAD. Parenthetically, a healthy workforce is potentially an efficient and productive workforce in every institution. Thus, MSU-IIT needs to keep the health status of its employees in check to be able to perform its charter—to provide quality education in Mindanao.

FRAMEWORK

Jean Watson, in her Human Caring Theory (1979)**,** believes that the practice of caring is central to nursing: it is the unifying focus for practice. Nursing interventions related to human care are referred to as Carative factors, a guide Watson refers to as the "Core of Nursing." Watson's outlines the following 10 Caractive factors; 1) Forming a humanistic-altruistic system of values; 2) Instilling faith and hope; 3) Cultivating sensitivity to one's self and other; 4) Developing a helping-trust (human care) relationship; 5) Promoting and accepting the expression of positive and negative feelings; 6) Systematically using the scientific problem-solving method for decision making; 7) Promoting interpersonal teaching-learning; 8) Providing a supportive, protective, or corrective mental, physical, sociocultural, and spiritual environment; 9) Assisting with the gratification of human needs; 10) Allowing for existential-phenomenologic forces.

All ten (10) carative factors are present in their direct forms in both the assessment and intervention aspect of this research. More so, this research is anchored on Watson's assumptions of caring, which are: human caring in nursing is not just an emotion, concern, attitude, or benevolent desire; caring connotes a personal response; caring is an intersubjective human process and is the moral ideal of nursing; caring can be effectively demonstrated only interpersonally; effective caring promotes health and individual or family growth; caring promotes health more than does curing; caring responses accept a person not only s they are now, but also for what the person may become; a caring environment offers the development of potential while allowing the person to choose the best action for the self at a given point in time; caring occasions involve action and choice by nurse and client; if the caring occasion is transpersonal, the limits of openness

expand, as do human capacities; the most abstract characteristic of a caring person is that the person is somehow responsive to another person as a unique individual, perceives the other's feelings, and sets one person apart from another; human caring involves values, a will and a commitment to care, knowledge, caring action, and consequences; the ideal and value of caring is a starting point, a stance, and an attitude that has to become a will, an intention, a commitment, and a conscious judgment that manifests itself in concrete acts.

On the other hand, Callista Roy defines adaptation as "the process and outcome whereby the thinking and feeling person uses conscious awareness and choice to create human and environmental integration." Roy focuses on the individual as a biopsychosocial adaptive system that employs a feedback cycle of input (stimuli), throughput (control processes), and output (behaviors or adaptive responses). Both the individual and the environment are sources of stimuli that require modification to promote adaption, on-going purposive response. Adaptive responses contribute to health, which she defines as the process of being and becoming integrated; ineffective or maladaptive responses do not contribute to health (Kozier, 2004). Evidently, there are a lot of risk factors for PAD. Consequently, the respondents must learn to adapt and use measures to eliminate or lessen the impact of these risk factors.

Heredo-familial disease or condition like hypertension and diabetes mellitus also increase the risk of PAD. For instance, Franklin et al in 1999 showed systemic arterial hypertension increase the risk of PAD by 2.5% in men and 3.9% in women, while Gabriel et al (2006) showed the impact of systemic arterial hypertension on the development of atherothrombotic phenomena both in coronary arteries and in peripheral artery beds, as a high percentage of hypertensive patients presented PAD (85,94%) and coronary artery disease (84.62%). Additionally, Murabito et al, (2002), identified diabetes mellitus as an important risk factor for asymptomatic and symptomatic PAD as well as CAD. Additionally, they affirmed that the prevalence of diabetes mellitus increase in patients with reduce ABIs. In 2006, Gabriel et al produced concurring results, showing the prevalence of diabetes was great in individuals with PAD (68.65%) and in individuals with CAD (67.69%). The same research showed that diabetes mellitus also presented a direct association with the severity of PAD and CAD.

What is more, lifestyle factors like cigarette use, alcohol use, exercise, and diet plays a major role on one's risk for degenerative disorders, particularly cardiovascular diseases like peripheral artery disease (Black, 2005).

Smoking is the main risk factor PAD (Dirckx, 2001). Smoking or having a

history of smoking increases the risk for PAD up to four times (Kasper, 2005). In this research, in terms of cigarette use, the respondents are grouped according to a) smokers: those who smoke at the time of the interview, and b) non-smokers: those that had never smoked or those that had given up smoking at least two years prior to the interview.

On the other hand, alcohol is a gastrointestinal tract irritant which could cause a form of "malabsorption syndrome", decreasing the absorption of the vitamin b complex needed for the methylation of homocysteine, thus increasing the homocysteine level in the plasma, consequently increasing the risk for peripheral artery disease (Adams, 2007). In this research, in terms of alcohol use, the respondents are grouped according to a) alcoholics: those who consume alcohol at the time of interview, independently of the quantity consumed, and b)non-alcoholics: those who do not consume alcohol or those who had spent at least one year without drinking.

OBJECTIVES OF THE STUDY

This study aimed to answer the following questions: 1.) determine the demographic profile of the respondents in term of: age, gender, heredo-familial diseases, lifestyle and body mass index; 2.) identify the degree of suspicion of peripheral artery disease among the respondents using ankle-brachial index; 3.) establish significant relationship between the respondents' demographic profile and their degree of suspicion of having PAD using ankle-brachial index (ABI); and 4.) determine the significant difference in the degree of suspicion for PAD when the respondents are grouped according to their demographic profile.

METHODOLOGY

This study utilized descriptive-correlation-comparative research. Descriptive researches seek to describe the current status of an identified variable; correlational research attempts to determine the extent of a relationship between two or more groups on one or more variable (Boswell, 2011). This research design was used in this study to describe the demographic profile of the respondents, to correlate the respondents' demographic profile with their degree of suspicion of having peripheral artery disease (PAD) using ankle brachial index (ABI), and to compare the respondents' ankle brachial indices (ABI) when grouped according to demographic profile. The data were gathered from the employees (faculty and

staff) of Mindanao State University-Iligan Institute of Technology (MSU-IIT). MSU-IIT is an external unit and one of the ten campuses of Mindanao State University. The respondents of the study were the 901 faculty and staff (491 faculty, 37 lecturer, and 373 staff) of MSU-IIT's 10 colleges and schools.

The researcher used the questionnaire in collecting data to determine the correlation between the demographic profile of MSU-IIT faculty and staff and their of suspicion of their having Peripheral Artery Disease (PAD).

The questionnaire included two parts. Part I, adapted from the Southern California Health Specialist Peripheral Artery Disease Patient Questionnaire (2010), aimed to gather information on the respondent's personal and demographic data as to his/her name (optional), age, gender, heredo-familial diseases, lifestyle, and Body Mass Index (BMI)(i.e., weight in kg/height in meter squared.

Part II, which covered the Blood Pressure (BP) in mmHg of each extremity, from which the Ankle Brachial Index (ABI) is derived, is adapted from Fischbach's Ankle Brachial Index (ABI) Scale (2004). Ankle Brachial Index (ABI) was calculated by dividing the ankle pressure by the brachial pressure. The normal value of ABI is $\geq$1.0. On the other hand, an ABI < 1.0 is suspicious for disease. The lower the numeric value for this index, the more severe the disease may be. The degrees of suspicion for PAD are as follows: Mild (ABI 0.71-0.99), Moderate (ABI 0.41-0.70), or Severe (ABI 0.00-0.40) (Fischbach, 2004). Part II was filled up by the researcher.

The instrument was previously checked by the adviser and validated by a panel of experts (i.e., one [1] with a Ph.D in management) who did the content relevance and validity to the research problem in terms of reliability the research instrument has Cronbach's alpha of 0.706.

Firstly, the respondents signed an informed consent form. The test purpose, benefits, and procedures were explained. The respondent was instructed to refrain from smoking or consuming caffeine for at least 2 hours before the study. The respondent was assured that no radiation is employed, no contrast medium is injected, and no pain is involved, although some discomfort may be experienced from lying with extremity extended or when pneumatic cuffs are inflated. The respondent was then asked to lie on a table with extremity extended. The pneumatic cuffs were then placed at each extremity in interval at 2 inches above the antecubital space for the upper extremity and the area just above the ankle for the lower extremity. The formula is: Left ankle SBP/left brachial SBP and right ankle SBP/right brachial SBP. The cuff was then inflated to suprasystolic

values and then slowly deflated at 2-4mmHg/second until flow resumed. The pressure at which flow resumes was then recorded. After this, the test outcomes were interpreted. The respondent was then provided support, and counseled appropriately if an abnormality was detected (i.e., the need for possible further testing [arteriogram] and treatment [medical or surgical]).

Frequencies and percentages were used to present and analyze the first and second problem of the study. This was used to determine if there is a significant relationship between the degree of suspicion of having peripheral artery disease (PAD) using ankle-brachial index (ABI) and the respondents' demographic profile. In this research, this method was used to answer the third problem statement.

RESULTS AND DISCUSSION

Objective 1. To present the demographic profile of the respondents in terms of age, gender, heredo-familial disease, lifestyle, and body mass index.

Table 1. Percentage distribution of the respondents according to age

Age	Frequency Distribution	Percentage Distribution
20-29 yo	102	34.0
30-39 yo	72	24.0
40-49 yo	15	5.0
50 & above	111	37.0
TOTAL	300	100

Table 1 shows the percentage distribution of the respondents in terms of age. Majority of the respondents were 50-year-old and above and constitute 37% (111) of the total number of respondents. Meanwhile, 102 or 34% of the respondents belongs to the 20-29-year-old age bracket, 72 or 24% belonged to the 30-39-year-old age bracket, and 15 or 5% belonged to the 40-49 year old age bracket. This result is supported by the fact that 50 years old and above tend to have arterial disorders like atherosclerosis (narrowing of the vessel lumen caused by the accumulation of atheroma or fat in the tunica intima) and arteriosclerosis (narrowing of the vessel lumen caused by the degenerative disorders like diabetes mellitus, hypertension, and cardiac disease tend to manifest during old age (>50yo0, making it a significant predisposing factor to Peripheral Artery Disease (PAD) (Black, 2005).

Table 2. Percentage distribution of the respondents according to gender

Gender	Frequency Distribution	Percentage Distribution
Males	111	37.0
Females	189	63.0
Total	300	100

Table 2 shows the percentage distribution of the respondents according to gender. In terms of gender, majority or 63% (189) of the respondents were females. The group the higher degree of suspicion, the males, constitutes only 37% (111). Males have greater degree of suspicion for peripheral artery disease because they only have minute levels of estrogen, the female sex hormone that has a dual function of developing the female secondary sex characteristics (i.e. breast and hip development) and protection against cardiovascular disease by depositing cholesterol and lipids into adipose tissues instead of the vessel's lumen (Smeltzer,2010). However, by 50 Years old and above, the female's estrogen level decreases due to the age-related deterioration of the ovaries, making the female's risk for PAD equal to that of the male (Kasper, 2005).

Table 3. Percentage distribution of the respondents according to heredo-familial diseases

Heredo-Familial Diseases	Frequency Distribution			Percentage Distribution
Heredo-Familial Diseases	240			80.8
	Diabetes Mellitus	141 of 240	47.0	
	Hypertension	192 of 240	64.0	
	Cardiac Disease	87 or 240	29.0	
No Heredo-Familial Disease	60			20.0
Total	300			100

Table 3 shows the percentage distribution of the respondents according to heredo-familial diseases. In terms of heredo-familial diseases, 240 or 80% of the respondents have heredo-familial diseases, while only 60 or 20% have no heredo-familial diseases. Of those with heredo-familial diseases, 141 or 47% of respondents have *diabetes mellitus*, 192 or 64% have hypertension, and 87

or 29% have cardiac disease. All these disorders have a direct relationship with peripheral artery disease (PAD) (Black, 2005).

Table 4. Percentage distribution of the respondents according to lifestyle

Lifestyle	Frequency Distribution			Percentage Distribution
Unhealthy Lifestyle	236			
	Smoking	15 of 236	5.0	
	Alcohol use	75 of 236	25.0	
	Irregular Exercise	153 of 236	51.0	
	High Fat Diet	147 of 236	49.0	
Healthy Lifestyle	64			21.0
TOTAL	300			100

Table 4 shows the percentage distribution of the respondents according to lifestyle. In terms of lifestyle, 236 or 79% of the respondents have an unhealthy lifestyle that includes smoking, taking alcoholic beverages, does irregular exercise, and have high fat diet, while only 64 or 21% of the respondents have healthy lifestyle, meaning they don't smoke or take in alcoholic beverages, does regular exercise, and eat a low fat diet. 15 or 5% of the respondents were cigarette smokers, 75 or 25% were alcohol drinkers, 153 or 51% exercise irregularly, and 147 or 49% eat a high fat diet. The unhealthy lifestyle common among majority of the respondents could be attributed to the sedentary nature and stress typical of academic institutions. Smoking contains nicotine, a vasoconstrictor, and free radicals which are capable of direct endothelial tissue injury. Alcohol is a gastrointestinal tract irritant which could decrease the absorption of vitamin B complex and the removal of homocysteine—both conditions could predispose to peripheral artery disease (PAD). Parenthetically, exercising irregularly and eating a high fat diet could increase the cholesterol, triglycerides, low density lipoprotein, and very low density lipoprotein levels in the body, increasing the risk of atherosclerosis, and consequently—peripheral artery disease (PAD) (Smeltzer, 2010). These unhealthy lifestyle habits are not mutually exclusive of each other; to alucidate, the nicotine of cigarette cause vasoconstriction which delays the ataxia induced by the hypotension of alcohol (Kasper, 205); and people who are Smokers, alcoholics, or exercise irregularly usually eat a high-fat diet (Grodner, 2004)

Table 5. Percentage distribution of the respondents according to body mass index

Body Mass Index	Frequency Distribution	Percentage Distribution
Underweight (<18.5 kg/m2)	21	7.0
Normal (18.5-24.9 kg/m2)	147	49.0
Overweight (25-29.9 kg/m2)	81	27.0
Obese (30 and above kg/m2)	51	17.0
TOTAL	300	100

Table 5 shows the percentage distribution of the respondents according to body mass index. In terms of Body Mass Index (BMI), 21 or 7% of the respondents were underweight, 147 or 49% were normal, 81 or 27% were overweight and 51 or 17% were obese. People who were overweight (25-29.9 kg/m2) and obese (30 and above kg/m2) were at increased risk for peripheral artery disease (PAD) as these conditions increased cholesterol depose tissue has relatively less vasa vasorum (small arteries distributed to the outer and middle coats of the larger blood vessels), such that in obese individuals, there is delayed healing of vessel wall injuries, leading to PAD (Kasper, 2005). That most of the respondents have a normal BMI could be explained by the fact that Filipinos and most Asians are mesomorph, meaning they have an average metabolic rate (Kozier, 2004).

Objective 2. To identify the degree of suspicion of peripheral artery disease (PAD) among the respondents using ankle brachial index (ABI).

Table 6. Percentage distribution of the respondents according to left and right ankle brachial indices

Degree of suspicion of peripheral artery disease (PAD)	Left Ankle Brachial Index		Right Ankle Brachial Index	
	Frequency	Percentage	Frequency	Percentage
No degree of suspicion (ABI≥1.00)	138	46%	150	50%
Mild degree of suspicion (ABI 0.71-0.99)	153	51%	147	49%
Moderate degree of suspicion (ABI 0.41-0.70)	9	3%	3	1%

Severe degree of suspicion (ABI 0.00-0.40)	0	0%	0	0%
TOTAL	300	100%	300	100%

Table 6 shows the percentage distribution of the respondents according to left and right ankle brachial indices. In terms of degree of suspicion of having peripheral artery disease (PAD) using Left brachial Index (ABI), 153 or 51 % of the respondents have mild degree of suspicion, 138 or 46% of the respondents have no degree of suspicion, 9 or 3% of the respondents have moderate degree of suspicion, and 0 or 0% of the respondents have severe degree of suspicion. In terms of degree of suspicion of having peripheral artery disease (PAD) using Right Brachial Index (ABI), 147 or 49% of the respondents have mild degree of suspicion, 150 or 50% of the respondents have no degree of suspicion, 3 or 1% of the respondents have moderate degree of suspicion, and 0 or 0% of the respondents have sever degree of suspicion.

The left lower extremity has greater degree of suspicion for peripheral artery disease (PAD) because 8 out of 10 people in the world are right hand and right leg dominant (Kozier, 2004). Activity of the quadriceps, gastrocnemius and other muscles of the thighs and legs causes vasodilation, and consequently increased blood supply, to the lower extremities by stimulating the sympathetic component of the autonomic nervous system through the peroneal nerves and other lower extremity nerves. Consequently, the lesser-used extremity would have lesser muscle activity, which means lesser blood flow—and this places the non-dominant or the lesser-used extremity at a relatively higher degree of suspicion of peripheral artery disease (PAD) than the dominant or often-used extremity (Kasper, 2005).

Objective 3. To establish the significant relationship between the respondents' demographic profile and their degree of suspicion of having Peripheral Artery Disease using Ankle-Brachial Index (ABI)?

Table 7. The relationship between the respondents' degree of suspicion of having Peripheral Artery Disease (PAD) using Ankle-Brachial Index (ABI) and their demographic profile using Chi Square.

Variables Chi-Square		Degree of suspicion of having PAD using Left ABI			Degree of suspicion of having PAD using Right ABI		
		Tabular Value	Interpre-tation	Chi-Square	Tabular Value	Interpre-tation	
Age		31.55	7.82	SR*	7.34	7.82	NSR**
Gender		29.09	7.82	SR	13.90	7.82	SR
Heredo-Familial Disease	Diabetes Mellitus	10.38	7.82	SR	6.90	7.82	NSR
	Hyper-Tension	21.49	7.82	SR	3.42	7.82	NSR
	Cardiac Disease	46.98	7.82	SR	14.96	7.82	SR
Lifestyle	Smoking	1.13	7.82	NSR	20.23	7.82	SR
	Alcohol use	15.65	7.82	SR	8.37	7.82	SR
	Irregular Exercise	84.78	7.82	SR	174.73	7.82	SR
	High Fat Diet	15.65	7.82	SR	20.73	7.82	SR
Body Mass Index (BMI)		7.37	7.82	NSR	3.38	7.82	NSR

*SR: Significant Relationship **NSR: No Significant Relationship

Table 7 presents the chi squares of the variables, indicating that there is a significant relationship between the degree of suspicion of having PAD using both Left or Right ankle-brachial indices (ABI) and most of the demographic profile.

Age has a significant relationship with the degree of suspicion of having PAD using Left ABI, but not with Right ABI. This is so because people 50 years old and above tend to have arterial disorders like atherosclerosis (narrowing of the vessel lumen caused by the accumulation of atheroma or fat in the tunica intima) and arteriosclerosis (narrowing of the vessel lumen caused by the degenerative hardening of the tunica media and tunica adventitia)(Smeltzer, 2010). More so, degenerative disorders like diabetes mellitus, hypertension, and cardiac disease tend to manifest during old age (>50yo), making it a significant predisposing factor to having a higher degree of suspicion of having PAD (Black, 2005). The left lower extremity has greater degree of suspicion for peripheral artery disease (PAD) because 8 out of 10 people in the world are right hand and right leg dominant (Kozier, 2004). Activity of the quadriceps, gastrocnemius and other muscles of the thighs and legs causes vasodilation, and consequently increased

blood supply, to the lower extremities by stimulating the sympathetic component of the autonomic nervous system through the personeal nerves and other lower extremity nerves. Consequently, the lesser-used extremity would have lesser muscle activity, which means lesser blood flow—and this places the non-dominant or the lesser-used extremity at a relatively higher risk for PAD than the dominant oe often-used extremity (Kasper,2005).

Gender has a significant relationship to the degree of suspicion of having PAD using both left and right ABIs. This is so, because in terms of gender, degree of suspicion for peripheral artery disease (PAD) is greater for males than in females (Smeltzer, 2010). In the study of Gabriel et al (2006), 56.60% of patients presented with PAD; more men (57.80%) were involved compared to women (42.20%). This is so because the estrogen hormone, the sex hormone responsible for developing female secondary sex characteristics, protects female from cardiovascular disease by depositing cholesterol and other lipids in their adipose tissues (for breast and hip development) rather in than in the lumen of their blood vessels (Smeltzer, 2010). Also, in terms of alcoholism and cigarette smoking, males outnumber females (Kasper, 2005).

Heredo-familial disease like Diabetes Mellitus, Hypertension, and Cardiac disease like Myocardial Infraction and Cardiomegaly have a significant relationship between the degree of suspicion of having PAD using Left ABI, but not with Right ABI. Diabetes Mellitus, a group of disorders characterized by hyperglycemia, increases the viscosity of the blood, causing blood stasis and arterial occlusion, both precipitating factors for PAD (Huether, 2000).

Hypertension has a significant relationship with the degree of suspicion of having PAD using Left ABI, but not with Right ABI. Hypertension, the abnormally increased force of blood against the vessel wall, causes mechanical injury to the vessel wall's tunica intima and tunica media, precipitating PAD (Kasper, 2005).

In terms of lifestyle, smoking has a significant relationship with the degree of suspicion of having PAD using right ABI, but not with left ABI. Smoking is the main risk factor PAD (Dirckx, 2001). Smoking or having a history of smoking increases the degree of suspicion of PAD up to four times (Kasper, 2005). Lu et al (2004) demonstrated smoking as an important risk factor for Peripheral Artery Disease (PAD) and coronary artery disease (CAD). Another study in 2007 by Gabriel et al produced concurrent results, showing that the prevalence of smoking was greater both in individuals with PAD (68.75%) and in those with CAD (69.23%). Smoking causes tissue damage by the following

mechanisms: (a) direct endothelial cell toxicity by tobacco or cigarette agents due to free radicals, and by (b) idiosyncratic or immune response to tobacco or cigarette agents (autoimmune vasculitis) (Black, 2004). However, that there is a significant relationship with the degree of suspicion of having PAD using right ABI, but not with left ABI is unexpected.

Alcohol has a significant relationship with the degree of suspicion of having PAD using both right and left ABIs. Alcohol is gastrointestinal tract irritant which could cause a form of "malabsorption syndrome", decreasing the absorption of the vitamin b complex needed for the methylation of homocystine, thus increasing the homocystine level in the plasma, consequently increasing the risk for peripheral artery disease (Adams, 2007).

Irregular Exercise (exercising <3x/week and/or <30cumulative minutes/ exercise session) has a significant relationship with the degree of suspicion of having PAD using both right and left ABIs. Exercise causes an increase in the heart and muscle activity by at least 20%. To fuel these organs, cholesterol and other harmful fats in the blood is metabolized to provide 9kcal per gram of energy. Without exercise, there will be a plethora of cholesterol in the bloodstream—increasing the risk for PAD (Kasper, 2005). Eating high fat foods (eating >1 serving of high fat food/day) has a significant relationship with the degree of suspicion of having PAD using both right and left ABIs. An excessive intake of high fat food could increase cholesterol level more than 200mg/dl, triglyceride level more than 150mg/dl, low density lipoprotein more than 100mg/dl, and very low density lipoprotein more thana 40mg/dl—all of which could increase the risk of atheromatous clot (Fischbach, 2004).

On the other hand, body mass index (BMI) has no significant relationship with the degree of suspicion of having PAD using either right or left ABIs. This result is an unexpected result as people who are overweight and obese are at increased risk for peripheral artery disease (PAD) as these conditions are associated with increased cholesterol deposition in the lumen of blood vessels (i.e. atherosclerosis) (Black, 2005). Moreover, adipose tissue has relatively less vasa vasorum (small arteries distributed to the outer and middle coats of the larger blood vessels), such that in obese individuals, there is delayed healing of vessel wall injuries, leading to PAD (Kasper, 2005).

In summary, in terms of left ABI—age, gender, heredo-familial disease, lifestyle on alcohol use, irregular exercise, and high fat diet have a significant relationship with the degree of suspicion of having PAD using ABI, while BMI and smoking have no significant relationship with the degree of suspicion of

having PAD using ABI.

On the other hand, in terms of right ABI—gender, heredo-familial diseases, cardiac disease; lifestyle on smoking, alcohol use, and high fat diet have a significant relationship with the degree of suspicion of having PAD using ABI, while age, heredo-familial disease on hypertension, and BMI have no significant relationship with the degree of suspicion of having PAD using ABI.

Considering the totality of the results among the demographic profile on left ABI and right ABI, irregular exercise got the highest score. This could be attributed to the relatively sedentary environment of academic institutions. Meanwhile, Smoking got the lowest score in terms of left ABI. This could be attributed to the fact that there are very few smokers among the respondents (only 15 out of 300). However, hypertension got the lowest score in terms of right ABI. This could be attributed to the fact that peripheral artery disease (PAD), of which hypertension is a sign, least affects the dominant extremity, having more frequent movements and thus relatively better blood flow (Kasper, 2005).

Table 8. The difference between the degree of suspicion of having Peripheral Artery Disease (PAD) using Ankle-Brachial Index (ABI) when the respondents are grouped according to their demographic profile using T-test.

Variables T test		Degree of suspicion of having PAD using Left ABI			Degree of suspicion of having PAD using Right ABI		
		Tabular Value	Interpre-tation	T test	Tabular Value	Interpre-tation	
Age		4.09	1.98	SD*	0.78	1.98	NSD**
Gender		2.06	1.98	SD	4.34	1.98	SD
Heredo-Familial Diseases	Diabetes Mellitus	3.55	1.98	SD	1.21	1.98	NSD
	Hypertension	3.70	1.98	SD	1.78	1.98	NSD
	Cardiac Disease	4.12	1.98	SD	4.07	1.98	SD
Lifestyle	Smoking	0.21	1.98	NSD	1.92	1.98	NSD
	Alcohol use	4.32	1.98	SD	4.28	1.98	SD
	Irregular Exercise	4.44	1.98	SD	4.46	1.98	SD
	High Fat Diet	4.01	1.98	SD	4.20	1.98	SD
Body Mass Index (BMI)		0.99	1.98	NSD	1.19	1.98	NSD

*SD: Significant Difference **NSD: No Significant Difference

Table 8 presents the T test of the variables, indicating that there is a significant difference between the degrees of suspicion of having PAD using both left and right ankle-brachial indices (ABI) when they are grouped according to most of the demographic profile. This is so, because according to studies by Garcia (2006) and Mostaza (2003), the degree of suspicion for PAD (peripheral arterial disease) are similar to those associated to coronary artery disease and covers demographic profiles like advanced ages; male gender; heredo-familial disease like diabetes mellitus, hypertension, cardiac diseases; unhealthy lifestyle like smoking or cigarette use, alcohol use, decreased or irregular exercise, high fat diet; and obesity, as determine by body mass index (BMI).

When the degree of suspicion of having PAD using left ABI between those with those <50 years old (no degree of suspicion of having PAD) and ≥50 years old (mild to severe degree of suspicion of having PAD) is compared, the T test is 4.09, indicating there is significant difference. However, when the degree of suspicion of having PAD using right ABI between those <50 years old (no degree of suspicion of having PAD) and ≥50 years old (mild to severe degree of suspicion of having PAD) is compared, the T test is 0.78, indicating there is no significant difference. This is so because people 50 years old and above tend to have arterial disorders like atherosclerosis (narrowing of the vessel lumen caused by accumulation of atheroma or fat in the tunica intima) and arteriosclerosis (narrowing of the vessel lumen caused by the degenerative hardening of the tunica media and tunica adventitia)(Semltzer, 2010). More so, degenerative disorders like diabetes mellitus, hypertension, and cardiac diseases ten to manifest during old age (>50yo),making it a significant predisposing factor to PAD (Black, 2005).

When the degree of suspicion of having PAD using left ABI between females (no degree of suspicion of having PAD) and males(mild to severe degree of having PAD) is compared, the T test is 2.06, indicating there is significant difference. When the degree of suspicion of having PAD using right ABI between female (no degree of suspicion of having PAD) and males (mild to severe degree of suspicion of having PAD) is compared, the T test is 4.34, indicating there is significant difference. This is so, because in terms of gender, degree of suspicion for peripheral artery disease (PAD) is greater for males than in females (Smeltzer, 2010). In the study of Gabriel et al (2006), 56.60% of patients presented with PAD; more men (57.80%) were involved compared to women (42.20%). This is so because the estrogen hormone, the sex hormone responsible for developing female secondary sex characteristics, protects females from cardiovascular disease by depositing cholesterol and other lipids in their adipose tissues (for breast and

hip development) rather in than in the lumen of their blood vessels (Smeltzer, 2010). Also, in terms of alcoholism and cigarette smoking, males outnumber females (Kasper, 2005).

When the degree of suspicion of having PAD using left ABI between those with no heredo-familial Diabetes Mellitus (DM) and those with heredo-familial DM is compared, the T test is 3.55, indicating there is significant difference. This is so, because Diabetes Mellitus, a group of disorders characterized by hyperglycemia, increases the viscosity of the blood, causing blood stasis and arterial occlusion, both precipitating factors for PAD (Huether, 2000). Murabito et al, in 2002, identified diabetes mellitus as an important degree of suspicion for asymptomatic and symptomatic PAD as well as CAD. Additionally, it was affirmed that the prevalence of diabetes mellitus increases in patients with reduced ABIs. In 2006, Gabriel et al produced concurring results, showing the prevalence of diabetes was great in individuals with PAD (68.65%) and in individuals with CAD (67.69%). The same research showed that diabetes mellitus also presented a direct association with the severity of PAD and CAD. However, when the degree of suspicion of having PAD using right ABI between those with no heredo-familial DM and those with heredo-familial DM is compared, the T test is 1.21, indicating there is no significant difference.

When the degree of suspicion of having PAD using left ABI between those with no heredo-familial hypertension (HPN) and those with heredo-familial HPN is compared, the T test is 3.70, indicating there is significant difference. However, when the degree of suspicion of having PAD using right ABI between those with no heredo-familial HPN and those with heredo-familial HPN is compared, the T test is 1.78, indicating there is significant difference. This so because hypertension, the abnormally increased force of blood against the vessel wall, causes mechanical injury to the vessel wall's tunica intima and tunica media, precipitating PAD (Kasper, 2005). Franklin et al in 1999 showed systemic arterial hypertension increases the risk of PAD by 2.5% in men and 3.9% in women, while in 2006, Gabriel et al showed the impact of systemic arterial hypertension on the development of atherothrombotic phenomena both in coronary arteries and in peripheral artery beds, as a high percentage of hypertensive patients presented PAD (85.94%) and coronary artery disease (84.62%). In the same study, systemic arterial hypertension demonstrated a direct association with the severity of the peripheral artery disease as well as coronary artery disease.

When degree of suspicion of having PAD using left ABI between non-smoking and smokers is compared, the T test is 0.21, indicating there is no significant

difference. More so, when the degree of suspicion of having PAD using right ABI between non-smokers and smokers is compared, the T test is 1.92, indicating there is no significant difference. This could be because of the very small number of smokers among the respondents.

When the degree of suspicion of having PAD using left ABI between those who are non-alcoholics and those who are alcoholics is compared, T test is 4.32, indicating there is significant difference. When the degree of suspicion of having PAD using right ABI between those who are non-alcoholics and those who are alcoholics is compared, the T test is 4.28, indicating there is significant difference. This is so because Alcohol is gastrointestinal tract irritant which could cause a form of "malabsorption syndrome", decreasing the absorption of the vitamin b complex needed for the methylation of homocystine, ths increasing the homocystine level in the plasma, consequently increasing the risk for peripheral artery disease (Adams, 2007).

When the degree of suspicion of having PAD using left ABI between those who are regular exercisers and those who are irregular exercisers is compared, the T test is 4.44, indicating there is significant difference. When the degree of suspicion of having PAD using right ABI between those who are regular exercisers and those who are irregular exercisers is compared, the T test is 4.46, indicating there is significant difference. This is so because exercise causes an increase in heart and muscle activity by at least 20%. To fuel these organs, cholesterol and other harmful fats in the blood is metabolized to provide 9kcal per gram of energy. Without exercise, there will be a plethora of cholesterol in the bloodstream—increasing the risk for PAD (Kasper, 2005).

When the degree of suspicion of having PAD using left ABI between those who eat a non-high fat diet and those who eat a high fat diet is compared, the T test is 4.01, indicating there is significant difference. When the degree of suspicion of having PAD using right ABI between those who eat a non-high fat diet and those who eat a high fat diet is compared, the T test is 4.20, indicating there is significant difference. This is so because an excessive intake level more than 150mg/dl, low density lipoprotein more than 100mg/dl, and very low density lipoprotein more than 40mg/dl—all of which could increase the risk of atheromatous clot (Fischbach, 2004).

Lastly, when the degree of suspicion of having PAD using left ABI between those who have a normal BMI (<30) and those who have abnormal BMI (≥ 30) is compared, the T test is 0.99, indicating there is no significant difference. When the degree of suspicion of having PAD using right ABI between those who have

a normal BMI (<30) and those who have abnormal BMI (≥30) is compared, the T test is 1.19, indicating there is no significant difference. This result is an unexpected result as people who are overweight and obese are at increased risk for peripheral artery disease (PAD) as these condition are associated with increased cholesterol deposition in the lumen of blood vessels (i.e. atherosclerosis) (Black, 2005). More, Adipose tissue has relatively less vasa vasorum (small arteries distributed to the other and middle coats of the larger blood vessels), such that in obese individuals, there is delayed healing of vessel wall injuries, leading to PAD (Kasper, 2005).

Considering the left ABI of the respondents when grouped according to their demographic profile, smoking and BMI have no significant difference on the degree of suspicion of having PAD and the rest have significant difference. This could be attributed to the fact that there are very few smokers among the respondents (only 15 out of 300), and Filipinos, just like most Asians, are mesomorph, meaning they have an average metabolic rate, respectively (Kozier, 2004).

On the other hand, considering the right ABI of the respondents when grouped according to their demographic profile—age, heredo-familial disease on diabetes mellitus and hypertension, lifestyle on smoking, and BMI have no significant difference on the degree of suspicion of having PAD while the rest have significant difference. These results could be attributed to the fact that peripheral artery disease (PAD) least affects the dominant extremity, having more frequent movements and thus relatively better blood flow (Kasper, 2005)

In summary, lifestyle on irregular exercise had the highest result in terms of significant difference of the demographic profiles when grouped according to either left or right ABI. This could be attribute to the relatively sedentary environment typical of academic institutions like MSU-IIT. Meanwhile, when grouped according to left ABI, smoking is the demographic profile that had the least significant difference. This could be attributed to the fact that there were very few smokers among the respondents (only 15 out of 300). On the other hand, when grouped according to right ABI, age is the demographic profile that had the least significant difference. This result could be attributed to the fact that peripheral artery disease (PAD), of which age is a factor which could increase its degree of suspicion, least affects the dominant extremity, having more frequent movements and thus relatively better blood flow (Kasper, 2005), and 8 out of 10 people in the world are right extremity dominant (Kozier, 2004).

CONCLUSIONS

In light of the findings derived from this study, it was concluded that demographic profile does have strong and direct effect on degree of suspicion of having PAD. If one is old (≥50yo), have heredo-familial disease (i.e., smokes cigarettes, alcoholic, irregular exercise, high fat die), there was relatively higher degree of suspicion of having PAD than any other member of the general population. More so, there was a significant relationship between the respondents' demographic profile and their degree is suspicion of having PAD using ABI; and there was a significant difference in the degree of suspicion for PAD when the respondents are grouped according to their demographic profile. Moreover, the left lower extremity of the MSU-IIT employees had a relatively higher degree of suspicion of having PAD than the right lower extremity. This is expected as the left extremity is often the non-dominant extremity of most people, having lesser blood perfusion, making it more at risk for PAD.

RECOMMENDATIONS

1) Since demographic profile has a strong and direct effect on degree of suspicion of having PAD, employees of MSU-IIT, headed by the Administration (to be precise, the MSU President or MSU-II Chancellor) and the Human Resource Department should assist in altering modifiable risk factors to peripheral artery disease by fully implementing the Tobacco Regulation Act of 2003 (RA 9211), specifically section 5. Focus coulb be given to the section which bans smoking in public places like in colleges and universities, employing administrative and legal sanctions as necessary; decrease or cease alcohol intake, exercise regularly, eat a healthy diet, and submitting to regular health check-ups.
2) With the aid of the Administration and the Human Resource Department, and in coordination with the College of Nursing, the MSU-IIT clinic, in line with section 34 of RA 9211, should conduct seminars on the effects of smoking on health and in the productivity of the workforce, and schedule bi-annual check-up of the faculty and staff health status, including their ankle-brachial indices (ABI) to check for peripheral artery disease (PAD), preferably with Doppler ultrasound.
3) The MSU-IIT Administration should push for the development of a functional work-out gym for faculty and staff, including students, to

promote regularity in exercise regimens (i.e., at least 3 times a week, and at least 30 cumulative minutes per exercise session).

4) DOH should intensify peripheral artery disease-prevention strategies like anti-cigarette smoking campaigns and duly deciminate said strategies to university constituents.
5) Future researchers may study the relationship between the degree of suspicion of peripheral artery disease (PAD) using ankle brachial index (ABI) and the demographic profile among the faculty and staff and/or students in other schools in Iligan City and may use a more accurate non-invasive method of identifying peripheral artery disease like Doppler Ultrasound among future respondents.

Finally, researchers may correlate degree of suspicion of having PAD and levels of stress in the workplace.

LITERATURE CITED

Abul-Khoudoud O.
2006 Diagnosis and risk assessment of lower extremity peripheral arterial disease.JEndovaxcTher.13(Suppl 2):II-10-8. July, 2, 2012. From Google

Adams, Harold Jr.
2007 Principles of Cerebrovascular Disease. 1st edition. New York: McGraw-Hill Companies, Inc.

Brevetti G, Piscione F, Silverstro A, Galasso G, Di Donato A, Oliva G, et al.
2003 Increased inflammatory status and higher prevalence of three-vessel coronary artery disease in patients with concomitant coronary and peripheral atherosclerosis. ThrombHaemost.89(6):1058-63. July, 2012. From Google.

Black, Joyce et al.
2005 Medical-surgical Nursing: Clinical Management for Positive Outcomes. 7th Edition. New York: Elsevier, Inc.

Boswell Carol.
2011 Introduction to Nursing Research: Incorporating Evidence-Based practice. 2nd Edition. Ontario: Jones and Barttertt Publisheds.

Brener, Toby et al.
2007 Nursing Drug Handbook. 27th Edition. Chicago: Lippincott Williams and Wilkins.

Cordova AC, Jackson LS, berke-Schlessel DW, Sumpio BE.
2005 The cardiovascular protective effect of red wine. J Am CollSurg. 200(3):428-39. July 2, 2012. From Google

Diehm C, Schuster A, Allenberg JR, Darius H, Haberl R, Lange S, et al.
2004 High prevalence of peripheral arterial disease and comorbidity in 6880 premary care patients: cross-sectional study.Atherosclerosis.172(1):95-105.July 2, 2012 From Google.

Dirckx, John H et al.
2001 Stedma's Concise Medical Dictionary for the Health Profession. 4th Edition. Chicago: Lippincott Williams and Wilkins.

Fischbach, Frances T et al.
2004 A Manual of laboratory and Diagnotic Tests. 7th Edition. New York: Lippincott Williams and Wilkins.

Franklin SS, Khan SA, Wong ND, Larson MG, Levy D.
1999 Is pulse pressure useful in predicting risk for coronary heart disease? The Framingham Heart Study. 100:354-60. July 2, 2012. From Google.

Gabriel et al.
2006 Peripheral Arterial Occlusive Disease and ankle-brachial index in patients who had coronary angiography. Circulation.July 2, 2012. From Google.

Grodner, Michele.
2004 Fundations and Clinical Applications of Nutrition: A Nursing Approach.

3rd Edition. New York: Mosby.

Hasimu B, Li J, nakayama T, Yu J, Yang J, Li X, et al.
2006 Ankle brachial Index as a marker of atherosclerosis in Chinese patients with high cardiovascular risk.Hepretens Res. 29(1):23-8. July 2,2012. From Google.

Hilleman DE.
1998 Management of peripheral arterial disease. AmJHealthSyst Pharm.55(19 Suppl 1):S21-7.July 2, 2012. From Google.

Huether, Sue E et al.
2000 Understanding Pathophysiology. 2nd Edition. New York: Mosby

Igézias JCR, Oliveira JR. JL, Dallan LAO, Lourenção Jr. A, Stolf NAG.
2001 Preditores de mortalidadehospitalar no pacienteidosoportador de doença arterial coronária. Rev Bras CirCardiovasc. 16(2):9-10.July 2,2012. From Google.

Kasper, Dennis L et al.
2005 Harrison's Principles of Internal Medicine. 16th Edition. New York: McGraw-Hill Companies, Inc.

Kennerdy M, Solomon C, manolio TA, Criqui MH, NewmanAB, polka JF, et al.
2005 Risk factors for declining ankle-brachial index in men and women 65 year or older. The Cardiovascular Health Study. Arch Itern Med. 165(16):1896-902.July 2,2010.From Google.

Koji Y, Tomiyama H, Ichihashi H, Nagae T, Tanaka , Takazawa K, et al.
2004 Comparison of ankle-brachial pressure index and pulse wave velocity as markers of the presence of coronary artery disease in subjects with a high risk of atherosclerotic cardiovascular disease.Am J Cardiol. 94(7):868-72.July 2, 2012. From Google.

Kweon SS, Shin MH, Park KS, nam HS, Jeaong SK, Ryu SY, et al.
2005 Distribution of the ankle-brachial index and associatedcardiovascular risk factors in a population of middle-aged and elderly Koreans. J

Korean Med Sci. 20(3):373-8.July 2, 2012. From Google.

Kozier, Barbara et al.
2004 Fundamentals of Nursing: Concepts, Process, and practice. 7th Edition Chicago: Pearson Education Inc.

Lamina C, Meisinger C, Heid IM, Ratner B, Döring A, LöwelH, et al.
2005 Ankle-brachial index and peripheral arterial disease. Gesundheitswesen. 67(Suppl 1):S57-61.July 2,2012.From Google.

Lu JT, Creaher MA.
2012 The relationship of cigarette smoking to peripheral arterial disease. Rev Cardiovasc med. 5():189-93.July 2,2012.From Google

Meijer WT, Grobbee DE, Hunink MGM, Hofman A, Hoes AW.
2000 Determinants of peripheral arterial disease in the elderly. The Rotterdam study. Arch Intern Med. 160(6):293-8.July 2,2012. From Google

Meijer WT, Hoes AW, Rutgers D, Bots ML, Hofman A, Grobbee DE
1998 Peripheral arterial disease in the elderly.The Rotterdam Study. ArteriosculerThrombVascBiol.18(2):185-92.July 2,2012.From Google

Mortality: the Strong Heart Study.
2004 Circulation. 109(6):733-9.July 2,2012.From Google

Mostaza JM, Vicente I, Cairols M, Castillo J, González-Juanatey JR, Pomar JL, et al.
2003 Inddicetobillo-brazo y riesgovascular. Med Clin (Barc). 121(2):68-73. July 2,2012.From Google.

Msuiit.edu.ph.
2012

Murabito JM, Evans JC, Larson MG, Nieto K, Levy D, Wilson PWF.
2003 The ankle-brachial index in the elderly and risk of stroke, coronary disease and death. The Framingham Study.Arch Intern Med.

163(16):1939-42. July 2, 2012. From Google.

Murabito JM, Evans JC, Nieto K, Larson MG, Levy D, Wilson PWF.
2003 Prevalence and clinical correlates of peripheral arterial disease in the Framingham Offspring Study.Am Heart J. 143:961-5.July 2, 2012. From Google.

National Heart, Lung, and Blood Institute.
2011 Peripheral Artery Disease. National Institute of Health.com.Retrieved July 3, 2012 from http://www.nhlbi.nih.gov/health/health-topics/topics/pad/.

Norman PE, EikelboomJW, hankey GJ.
2004 Peripheral arterial disease: prognostic significance and prevention of atherothrombotic complication. Med J Aust. 181(3):150-4.July 2, 2012.From Google.

Papamichael CM, lekakis JP, Stamatelopoulos KS, Papaioannou TG, Alevizaki MK, Cimponeriu AT, et al.
2000 Anklebrachialindex as predictor of the extent of coronary atherosclerosis and cardiovascular events in patients with coronary artery disease.Am J Cardiol.86(6):615-8.July 2, 2012.From Google.

Sesso HD, Stampfer MJ, Rosner B, Hennekens CH, GazianoJM, Manson JE, et al.
2000 Systolic and diastolic blood pressure,pulse pressure, and mean arterial pressure as predictors of cardiovascular disease rick in men. Hypertension.36(5):801-7.July 2,2012.From Google.

Sukhija R, Aronow WS, Yalamanchili K, Peterson SJ, Frishman WH, Babu S.
2005 Association of ankle-brachial index with severity of angiographic coronary martery disease in patients with peripheral arterial disease and coronary artery disease. Cardiology. 103(3):158-60.July 2,2012.From Google.

Quiambao-Udan, Josie
2011 Theoretical Foundation of Nursing. 1st Edition. Manila: Educational Publishing House.

Smeltzer, Suzanne C et al.
2010 Brunner and Suddarth's Textbook of Medical-Surgical Nursing. 12th Edition. New York: Lippincott Williams and Wilkins.

University Web Ranking.
2011 Top 200 Universities in the Philippines. International Colleges and Universities.com. Retrieved July 3, 2012 from http://www/4icu.org/ph/

Wild SH, Byrne CD, Smith FB, Lee AJ, Fowkes FG.
2006 Low ankle-brachial pressureindex predicts increased risk of cardiovascular disease independent of the metabolic syndrome and