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Impacts of Observing Live Open Heart Surgery on Young Adults' Health Behaviors

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This is to certify that the doctoral dissertation by

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2017

Abstract

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Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

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Abstract

Having a heart healthy lifestyle at a younger age is beneficial in reducing the risk of coronary heart disease (CHD) in adulthood and various health education programs for CHD prevention exist to persuade young adults to adopt a heart healthy lifestyle. Little is known, however, about the influence of watching live open heart surgery on young adults' adoption of a heart healthy lifestyle. To address that gap in knowledge, this study was conducted at a health facility in Virginia where students came to observe live open heart surgery. The purpose of the study was to understand whether watching live open heart surgery can influence young adults' attitudes and behaviors towards adopting a heart healthy lifestyle. The theory of health belief model and the theory of reasoned action were used in guiding this research. A quantitative design involving observation and administration of surveys was used. A survey with questions about participants' lifestyle practices was administered prior to observation of open heart surgery and 3 or more months afterwards. A total number of 179 young adults at baseline were considered eligible for the study. Ages of the research participants were between 18 and 35 years old. The t test and ANOVA results showed no significant differences between baseline and follow up data with regards to changes in behaviors of young adult students towards adopting a heart healthy lifestyle. The study concluded that observing live heart surgery did not significantly change behaviors of the students in adopting a heart healthy lifestyle. In order to achieve the desired changes in attitudes and behavior of students, looking into other evidence based options and pursuing those that can influence and motivate young adult students to adopt a heart healthy lifestyle can be a positive social change.

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Dedication

I dedicate my dissertation to all of the members of my beloved family.

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I would like to express my gratitude to Dr. Joseph Robare for his guidance, support and encouragement as the chair of my doctoral study and to extend my warmest gratitude to the member of my dissertation committee, Dr. Lee Caplan, who continuously supported me throughout my dissertation. Their guidance helped me in all the time that I was developing my dissertation. Without their guidance and professional support this dissertation would not have been possible.

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Finally, I would like to thank the study participants and have to admit that, it would have been literally impossible that this dissertation could have been completed without their participation.

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Chapter 1: Introduction to the Study

Introduction

The most common known modifiable risk factors for cardiovascular disease are lifestyle factors such as tobacco use, unhealthy diet, and physical inactivity (Lichtenstein, A., Appel, L., Brands, M., Carnethon, M., Daniels, S., Franch, H., …, &Wylie-Rosett, J., 2006)). Targeting these common modifiable cardiovascular disease risk factors through health education interventions resulted in improvements in cardiovascular disease outcomes (American Heart Association, 2013). Different health education interventions are existing targeting young adults to raise their awareness of cardiovascular risk factors and to motivate them to adopt a heart healthy lifestyle. A program to bring students to watch live open heart surgery through a dome-shaped glass roof in an observation dome in one of the health facilities in Virginia is a kind of health education for young adult students. The purpose of the program is to allow students the opportunity to watch live open heart surgery in order to educate them about cardiovascular risk factors while observing an open-heart surgery. Examples of the observed surgeries under this program include coronary artery bypass grafting (CABG) surgery which improves blood flow to the heart, heart valve surgery for repairing or replacing heart valves to improve blood flow between the heart chambers, and maze surgery, a procedure which is used to treat atrial fibrillation, a type of irregular heartbeat. This program provided a unique opportunity for this study because no study is available to identify the influence of watching live heart surgery as an educational intervention in adopting a heart healthy lifestyle among young adults.

In this study, I analyzed data collected from research participants at this health facility. I conducted this study in order to examine the influence of watching live heart surgery on adoption of a heart healthy lifestyle of young adult students age 18-35 years old. A heart healthy lifestyle in this study were as having regular exercises, eating a healthy diet, and giving up smoking cigarette. I compared data collected at baseline (i.e., prior to students' viewing live heart surgery) and to that collected 3monthsor more afterwards.

This introductory chapter provides an overview of what is known about the influence of such educational interventions in changing individuals' behaviors and attitudes towards adopting a heart healthy lifestyle. In presenting literature on cardiovascular diseases risk factors and the influence of health education, I will also justify the need for this additional research. I will then present my research questions and briefly describe my study methodology and explain my use of conceptual frameworks. I will then discuss the significance of my study in terms of its implications for positive social change and potential benefits to the young adult participants.

Background

Several researchers have established a relationship between a healthy lifestyle and coronary heart disease (CHD) prevention. For example, Chiuve, McCullough, Sacks, and Rimm (2006) found that adherence to healthy lifestyle practices can prevent events of CHD among men in the United States. They stated that even among those using antihypertensive and anti-hypercholesterolemia medications, adherence to a healthy lifestyle can prevent CHD. Some researchers have focused on the relationship between

modification of cardiovascular risk factors in early life by adopting a healthy lifestyle and CHD prevention later in life. Berenson (2002), a member of the Bogalusa Heart Study Research Group, reported that identifying an individual's early life risk factors is important in predicting cardiovascular risk factors in adulthood. The author emphasized that altering one's lifestyle plays a major role in the management of cardiovascular risk factors. Berenson (2002) stressed that those healthy lifestyles that influence cardiovascular risk factors should be adopted in early childhood because they are critical in reducing risk factors later in adulthood. Therefore, in this research we are focusing on young adults' health education to find out the influence of observing live heart surgery as early health education intervention in adopting a heart healthy lifestyle.

In another study, Liu et al. (2012) found a strong association between the maintenance of healthy lifestyle from young adulthood and having a low-risk profile for cardiovascular diseases in middle age. The authors concluded that adopting a heart healthy lifestyle at an early age and maintaining it can result in lower cardiovascular risk in middle age. McGill, Jr., et al. (2008) stated that if major known cardiovascular risk factors are controlled during young ages, they can reach their goal of eliminating90% of CHD cases. More youths would enter adulthood with a very low risk of CHD although achieving this goal will take time. The authors of these studies suggest an association between adopting and maintaining a heart healthy lifestyle in childhood or earlier in life and lower risks of CHD later in life.

Researchers have identified physical activity, a balanced diet, and avoidance of tobacco products as main cardiovascularprotective factors. In other words, physical

activity, a balanced diet, and avoidance of tobacco products can reduce the risks of cardiovascular diseases. For example, Lichtenstein et al. (2006) explained the recommendations of the American Heart Association (AHA) on diet and lifestyle for cardiovascular risk reduction. The authors found out that not using tobacco, being physically active, and balancing calorie intake with physical activity to maintain optimum body weight are key factors for reducing cardiovascular risk factors. Baker, Olsen, and Sorensen (2007) studied the association between body mass index (BMI) and CHD later in life. The authors found that children with higher BMI will have an increased risk of CHD in later life and argued that this association is more robust in boys than in girls and that the risk increases with age in both sexes. These studies demonstrate clearly that being physically active, having a balanced diet, and not using tobacco are the main risk factors for CHD.

Several studies, established the influence of the three main risk factors (i.e., physical inactivity, diet, and smoking) on other risk factors for CHD (e.g., hypertension, diabetes, and hyperlipidemia).Mozaffarian, Wilson, and Kannel (2008) observed that lifestyle risk factors for cardiovascular such as smoking, diet, and physical inactivity strongly influence blood pressure, cholesterol, and glucose insulin homeostasis. They also noted that these factors interfere with endothelial functions and cause other pleiotropic effects. The authors stated that the age adjusted prevalence of risk factors such as obesity, hypertension, hyperlipidemia and diabetes are much lower among populations with a traditional lifestyle compared to populations in industrialized countries.

Mozaffarian et al. (2008) argued that altering one's lifestyle, even modestly, in favor of a heart healthy lifestyle, can have a powerful effect on cardiovascular risk. For example, smoking cessation can reduce total mortality by one third, and a decrease in smoking can reduce cardiovascular events. Similarly, the authors observed that physical activity can lead to a 30% to 50% reduction in the risks of cardiovascular events. In their study of U.S. adults aged 35 and younger between 1980- 2002, Ford and Capewell (2007) found that high CHD mortality rates were due to risk factors such as obesity, hypertension, diabetes, and metabolic syndromes. These studies stress that controlling the main risk factors for CHD (smoking cigarettes, lack of physical activity, and unhealthy diet) can have a significant influence on CHD prevention.

The authors of these studies have concluded that having a heart healthy lifestyle at a younger age is beneficial in reducing the risk of CHD later in life. I believe that it is very important to find ways to motivate individuals to adopt a heart healthy lifestyle as early in life as possible. In this study, I sought insight on whether observing live heart surgery can influence young adults' attitudes and behaviors towards adopting a heart healthy lifestyle. Implications for positive social change include encouraging more young adults to adopt a heart healthy lifestyle, which may lower their risk factors for CHD.

Problem Statement

Researchers have found that the main lifestyle related risk factors for CHD are physical inactivity, tobacco use, and an unhealthy diet (Lichtenstein et al., 2006). They also found that changing lifestyle with respect to these known modifiable risk factors at a young age is beneficial in preventing CHD later in life (Liu et al., 2012). Several studies

described those intervention techniques for changing lifestyle practices among young adults can be influential. For example, Rippe, Angelopoulos, and Zukley (2007) stated that lifestyle intervention, in combination with medical and surgical intervention, can be useful in improving existing cardiovascular diseases.

The importance of health education in order to provide young adults information and knowledge with regards to cardiovascular risk factors is crucial. Because Vanhecke, Miller, Franklin, Weber, and McCullough (2006) observed that adolescents lack knowledge about cardiovascular risk factors and do not perceive themselves at risk of cardiovascular diseases. Similarly, Lynch, Liu, Kiefe, and Greenland (2006) also found that knowledge of cardiovascular risk factors is very low among young adults and, thus, does not influence risk factor changes. So, health education becomes an important tool to provide knowledge and understanding of cardiovascular risks factors among young adults. Also, the findings of these studies indicate the importance of the use of theories and models in understanding components of health education.

Some authors have found that integration of health education programs with broader health promotion programs is more effective than health education alone. McGill, Jr., McMahan, and Gidding (2008) argued that use of school-based health promotion programs in isolation cannot achieve educators' goal of instilling healthy behavior in youth. They emphasized that school-based programs must be part of broader community and environmental change programs. Their finding was based on data from 1980-2000 from school- and community-based interventions focused on CHD prevention.

Although various potential ways to persuade youth to change behavior exist, interventions to provide knowledge to young adults through various channels are considered to be effective (McGill, Jr., McMahan, and Gidding, 2008).However, according to my review of the literature, researchers have not sufficiently examined the influence of watching live heart surgery as a motivational and educational tool to change lifestyle among young adults. Therefore, knowing about the influence of watching live heart surgery in adopting a heart healthy lifestyle among young adults can be an important step in identifying additional effective way of providing knowledge for changing attitudes and behaviors among young adults.

Purpose of the Study

The purpose of this study was to explore whether observing live open heart surgery can influence behaviors and attitudes of young adults toward adopting a heart healthy lifestyle. To do so, I compared questionnaire responses of research participants prior to observing live heart surgery 3 months afterwards. The findings of this study is expected to provide evidence that can such programs be useful motivational tool for young adults to change their attitudes and behaviors in adopting a heart healthy lifestyle.

Research Questions and Hypotheses

My research questions and corresponding hypotheses are, as follows:

RQ1. Does observing live open heart surgery motivate young adult students to change their attitudes towards adopting a heart healthier lifestyle?

$H_0$1: Observing live heart surgery does not motivate students to change their attitudes towards adopting a heart healthy lifestyle.

H_a1: Observing live heart surgery motivates young adult students to change their attitudes towards adopting a heart healthy lifestyle.

RQ2. Can observing live open heart surgery be used as an educational intervention for young adult students to change their lifestyle and adopt a heart healthy lifestyle?

$H_0 2$: Observing live open heart surgery cannot be used as a motivational tool for young adult students to change their lifestyle and adopt a heart healthy lifestyle.

$H_a 2$: Observing live open heart surgery can be used as a motivational tool for young adult students to change their lifestyle and adopt a heart healthy lifestyle.

Variables of interest in relation to lifestyle are smoking, exercise, and diet. Watching live heart surgery is an independent (or, explanatory) variable, whereas lifestyle behaviors of interest such as smoking, exercise, and diet were dependent (or, response variables) Measurement for all three variables would be a combination of nominal (Yes, No), ordinal (scales for confidence), and ratio scales.

Theoretical and/or Conceptual Framework for the Study

My selected theoretical framework consisted of the theory of reasoned action (The National Cancer Institute, NCI, 2005) and the health belief model(Frost, Mel, and Zuckerman, 2008).According to the theory of reasoned action, individuals will take actions to adopt a healthy behavior if they intention is to change behavior in adopting a healthy lifestyle. Therefore, I believe that the theory of reasoned action is a good fit for my study, because I sought to explore the relationship between behavior and beliefs, attitudes, and intentions.

According to Frost, Mel, and Zuckerman (2008), a key tenet of the health belief model is that individuals will take actions to avoid risks to their health if they know and believe that the health threat is serious. Therefore, I believe that the health belief model is a good fit for my study because it addresses behaviors that are risks to health and can evoke health concerns among young adults.

Nature of the Study

I used a follow-up observational study which was a prospective pretest-posttest quantitative research design. I used questionnaires as data collection tools. I developed a consent form based on the health facility's regulations in this research. The health facility's Institutional Review Board (IRB) granted approval for this research study and for the research data collection tools. (Baseline and follow-up questionnaires are included in Appendices1 and 2

I collected the baseline questionnaire data on lifestyle prior to observing live open heart surgery. Then I gathered the follow-up questionnaire data on lifestyle 3 months or more after participants observed live heart surgery. The health facility administrator sent follow-up questionnaires to all participants who completed the baseline questionnaire by postal mail. The researcher also sent questionnaires by email to the participants. Inova Health System granted permission for me to use collected data for my dissertation.

Definitions

The main variables of interest in this research were watching live heart surgery, smoking, diet, and physical activity. Watching live heart surgery is an independent (or, explanatory) variable, whereas lifestyle behaviors of interest such as smoking, exercise,

and diet were dependent (or, response variables) that I compared between males and females. I tried to determine whether there is an association between watching live heart surgery and smoking, diet, and exercise among the research participants after being exposed to watching live heart surgery. Dependent lifestyle variables such as smoking, exercise, and diet were measured at baseline prior to watching live heart surgery and 3or more months after watching live heart surgery.

Assumptions

The risk reduction for CHD for the research participants may occur due to lifestyle changes. The potential that this research will contribute to the areas of CHD prevention among young adults may result in changes in lifestyle behaviors of young adults in the communities.

Scope and Delimitations

To some extent, I tried to minimize non response bias in my study by contacting the participant persistently in different ways during the follow-up. The non-probability sampling method is less likely to produce a representative sample compared to a probability sampling method. All young adult students in the communities came from different schools in the area.

Limitations

Non response bias was the main potential limitation of this study. To some extent, I minimized it by contacting the participants in three different ways: phone, email, and snail mail in order to get a response to the follow-up questionnaires. The first attempt to contact the study participant was according to the participant's preference, and sending a

follow up mail questionnaire was for the reason if there was no response. Loss to follow up was another limitation of this study. Some respondents were not available by any of the three means of contacts.

Significance

The primary outcome of interest is whether there are any significant changes in the attitudes towards a heart healthy lifestyle of the research participants and any changes in their lifestyle to a heart healthy lifestyle after observing the open heart surgery. The findings from this research can provide evidence-based value for the importance of watching live heart surgery as educational programming for changing lifestyle among young adults.

Summary

Watching live open heart surgery has the potential to motivate young adult students to change their attitudes regarding adopting a heart healthier lifestyle in order to minimize the risks of CHD in later life. Therefore this research was designed to evaluate whether observing live open heart surgery motivates young adult students to change their attitudes towards adopting a heart healthier lifestyle and behavior changes. The study used an observational study design with a baseline questionnaire before the study participants were exposed to live heart surgery as pretest and a follow up questionnaire at three months or more after the exposure as posttest.

The primary outcome of the research was whether there is any effect of watching live heart surgery on the attitudes of the participants towards adopting a heart healthy

lifestyle. The secondary outcome of this research was whether there were any changes in lifestyle as a result of watching live heart surgery.

Chapter 2: Literature Review

Introduction

Cardiovascular disease is the leading cause of death in the industrialized world, including the United States (Center for Disease Control and Prevention, CDC). The most commonly mentioned risk factors for cardiovascular disease are tobacco use, unhealthy diet, and physical inactivity (Lichtenstein et al., 2006). For example, the Centers for Disease Control and Prevention (CDC) expressed that tobacco use, a diet high in saturated fat and sodium, physical inactivity, and excessive alcohol use are risk factors for cardiovascular diseases. Similarly, the National Heart, Lung, and Blood Institute (NHLBI) found that being overweight or obese, engaging in smoking, being physically inactive, and having an unhealthy diet are risk factors for cardiovascular diseases.

Most of the risks factors for cardiovascular diseases are modifiable by lifestyle changes. Known modifiable risk factors for cardiovascular diseases and stroke include diabetes, hypertension, hyperlipidemia, obesity, smoking, and physical inactivity (American Heart Association, 2013). Evidences from the American heart Association (AHA) show the possibility to control cardiovascular risk factors by bringing changes in lifestyle. Lifestyle changes at early age are more beneficial in preventing cardiovascular diseases than those in later life (Liu et al., 2012). AHA recommended that heart attack prevention should begin by age 20 and that modifiable and controllable risk factors be kept low; the sooner risk reduction begins, the healthier the heart will remain. Using reports from school- and community-based interventions for CHD prevention between 1980-2000, McGill, Jr., McMahan, and Gidding (2008) argued that in order to achieve

the goal of healthy behavior among youth, school-based programs should be a supplement to broader community and environment change programs.

Although evidence exist demonstrating that lifestyle changes at early age are beneficial in reducing risk of cardiovascular diseases (Rippe, Angelopoulos, and Zukley, 2007), certain obstacles are present that impede lifestyle changes among young adults. Vanhecke et al.(2006) in their study found that adolescents lack knowledge about cardiovascular risk factors and do not perceive themselves at risk for cardiovascular diseases. Lynch, Liu, Kiefe, and Greenland (2006) also found that knowledge of cardiovascular risk factors was very low among young adults and that this limited knowledge did not seem to influence risk factor changes among young adults.

Evidences from literature review show that different health education interventions exist aiming to educate young adults about risk factors for cardiovascular diseases and ways to reduce or prevent these risk factors by various interventions. According to my review of the literature, no study showed the influence of observing live heart surgery on changing behavior in adopting a heart healthy lifestyle among young adults. Therefore, I thought that further research was needed to determine whether observing live heart surgery can influence attitudinal and lifestyle changes among young adults. The purpose of this study was to explore whether observing live open heart surgery can be used as a motivational tool for young adult students to change their attitudes and adopt a heart healthy lifestyle in order to reduce their risk factors for cardiovascular diseases. In this chapter, I provide a detailed review of the literature and

the strategy through which I searched the literature. Additionally, I provide detailed explanations about the theoretical framework that I used.

Literature Search Strategy

I developed the literature search strategy used in this study according to the research questions and the theoretical framework selected for my investigation. Sources for the literature search included library at the health facility, Walden University Library Database, Center for Disease Control Database, American Heart Association Database, American Public Health Association Journals, and PhD course textbooks.

The health facility library website was a conveniently available search engine and lists of databases for the literature search because it has a list of journals that are available to their employees. At the health facility website through databases, I searched public health journals as well as PubMed. I used the medical subject headings database for searching topics in relation to my research study. I used the following search terms and Boolean connectors: *lifestyle* OR *behavior changes* AND *CHD risk factors* OR *cardiovascular risks*. By adding search builder in the medical subject's headings database, the major topic becomes the key term for the search. For my major topic search, "lifestyle" became a key search term.

I also used Google Scholar as the search engine for finding relevant original literature because some of the relevant literature was not available through the Health Facility's Library website. I also used textbooks, course materials, and editorials from scientific journals to provide insight about my study methodology and theoretical frameworks.

Theoretical Foundation

Use of theoretical framework is necessary to guide my study. Sinclair (2007) stated that a theoretical framework is a map which provides guidance to a researcher from start to finish. The author also argued that it is crucial for researchers to consider theories relevant to their research questions and develop helpful theoretical frameworks for using throughout their research work. The National Cancer Institute (NCI; 2005) defines theory as a systematic way for individuals to understand events. Theory, according to NCI, is a set of concepts, definitions, and propositions that show the events and the relationship between variables related to the events.

Use of theory in a study helps to answer questions of "why", "what", and "how" of a health problem. According to the NCI (2005), the focus of HBM is mostly on health motivation and addresses issues such as perceived susceptibility, severity, and benefits of a health problem. It also focuses on individual's cue to action and confidence to perform the action. The NCI stated that TRA focus is on behavioral intention and behavioral intention is the main determinant of behavior. Therefore both theories look into the relationship between behavior and factors like beliefs, attitudes, and intentions.

Similarly, Frost, Zuckerman, and Zuckerman (2008) argued that an important construct of HBM as a theoretical framework in research is that individual people will take action if he/she believes that there is a serious health threat and that the benefit of taking action outweighs the perceived barriers. As explained by Frost, Zuckerman, and Zuckerman (2008), HBM explains that people will take actions to avoid risks to their health if they know and believe that the health threat is serious; in this research the health

threat is CHD and the risks are smoking, physical inactivity, and unhealthy diet. Therefore the HBM is a good fit for this research for addressing behaviors that are risks to health and can evoke health concerns among young adults. The use of TRA in this research is useful for exploring the relationship between behavior and beliefs, attitudes, and intentions, because people will take actions to adopt a healthy behavior if they intend to do so. Thus both theories are suitable for use in my study as I am looking into the relationship between behavior and factors influencing the behavior.

Literature Review Related to Key Variables and/or Concepts

Many studies have established the relationships between CHD and smoking, physical inactivity, and unhealthy diet. For example, in a prospective cohort study Merry, Boer, Schouten, Feskens, Verschuren, and Gorgels (2011) studied the relationship between smoking, alcohol consumption, physical inactivity and risk of unstable angina pectoris (UAP) and acute myocardial infarction (AMI).Both conditions, AMI and UAP, are related to CHD. The authors found that smoking, alcohol consumption, and physical activity had strong associations with UAP and AMI, with smoking increasing risk for UAP and AMI and alcohol consumption and physical activity decreasing risk for both diseases. AMI had stronger associations with these factors than UAP. The strength of association for smoking and alcohol were significant with AMI but not with UAP. No difference observed in the effects of lifestyle factors on both of the diseases among subjects with or without family history of the diseases, except for smoking. The authors mentioned exposure misclassification due to self-reported lifestyle as a limitation of the study but mentioned that the accuracy of self-reported data has been proven in several

studies. The authors emphasized the importance of lifestyle factors such as smoking, physical activity, and alcohol consumption and stated that changing behavior in terms of modifying these risk factors can be crucial in primary prevention of CHD.

Some studies found obesity and high waist circumference to be independent risk factors for CHD. In a prospective, population-based study, Arsenault, Rana, Lemieux, Despres, Kastelein, Boekholdt, et al. (2010) investigated the association between CHD risk and physical inactivity and BMI. The authors found that both physical inactivity and abdominal obesity were independently associated with increased risk of CHD. The authors also found that inactive people had increased waist circumferences in any BMI category, and that those with low waist circumference developed increased risk for CHD when they remained physically inactive. Also, higher waist circumference was associated with higher risk for CHD irrespective of physical activity. They concluded that people with high waist circumference who are physically inactive are more at risk for CHD therefore the authors emphasized that physical activity should be encouraged and promoted at population level, and should carefully manage risks associated with abdominal obesity.

Variables of interest in my research are related to lifestyle and include smoking cigarettes, unhealthy diet, and physical inactivity. The evidence from literature demonstrated these variables to be the most common risk factors for CHD. Many studies demonstrated that changes in lifestyle targeting these common risk factors through interventions like health education resulted in improvements in CHD outcomes. For example, in a real life setting observational study Schwandt, Bertsch, and Haas (2011)

studied associations between continuation of improved CHD risk factors and lifestyle changes over one year. After one year of sustained health education about heart healthy lifestyle, including nutrition, physical activity, and decrease in exposure to tobacco smoke, most of the risk factors for CHD improved among parents and their children.

In another study, a descriptive cross sectional study, Mooney& Franks (2011) assessed the effect of community health screening, combined with health education, on the knowledge of a convenience sample of 56 subjects about the risk factors of CHD. They also assessed changes in the health promoting behaviors of the research participants. They found that community-based health screening and education interventions promoted knowledge of risk factors for CHD among the participants and encouraged health promotion behavior. The authors concluded that knowledge of risk factors of CHD can empower participants to engage in health promoting behaviors. The researchers particularly stressed their finding that pharmacist- and student- led health education interventions and screening increased knowledge of CHD risk factors and promoted healthy behavior of the research participants. The authors compared the prescreening questionnaires with post screening questionnaires and found changes in the knowledge of CHD risk factors among the participants. Some of the research participants reported changes in eating habits and increase in exercise. However, the authors listed a number of study limitations, including a lack of generalizability as the sample might not have been representative of the general population, recall bias, and not assessing healthy behaviors such as smoking cessation, weight, and alcohol.

Although many studies of lifestyle changes focusing on CHD risk factors were observational, some studies used clinical trials to evaluate the impact of interventions in reducing CHD. In a pilot study, Chen, Chen, Huang, Lee, Liu, and Jou (2009) evaluated the influence of a weight reduction lifestyle program using diet and exercise on cardiovascular risk factors among women. The study included 29 participants for three months. Physical exams with blood tests were done at the start and at the end of the three month follow-up period. The study found significant body weight reductions as well as reductions in several other risk factors for cardiovascular diseases. The authors concluded that a well-suited weight reduction lifestyle program can have influence on body weight reduction and can decrease cardiovascular disease risk factors. The authors listed small sample size, lack of control group, and short duration of follow- up as limitations of the study.

In a cluster randomized clinical trial, Ruffin, Nease, Sen, Pace, Wang, Acheson, et al. (2011) compared the impact of tailored messages with standard messages on lifestyle behaviors. They delivered tailored messages for CHD and other common diseases based on the individual's familial risk factor history for six common diseases. The authors measured fruit and vegetable consumption, physical activity, smoking cessation, aspirin use, blood pressure, blood glucose and cholesterol at baseline and after six months of follow-up. The authors did not find any significant differences between the two health education interventions in terms of smoking cessation, aspirin use, blood pressure, and blood glucose changes. However tailored messages designed for individual risk factors slightly increased self- reported fruit and vegetable consumption as well as

physical activity. The authors suggested that the reasons for not finding significant differences for most of the variables of interest were a failure to recruit a more diverse study population and that most of the study population was already at the level of recommended lifestyle at baseline.

I found several clinical trials aimed at looking into the influence of educational programs in preventing CHD among school children. In a prospective, community-based, randomized clinical trial, Fornari, Giuliano, Azevedo, Pastana, Vieira, and Caramelli (2013) found that a multidisciplinary educational program for the prevention of CHD aimed at school-age children can reduce Framingham Cardiovascular Risk of their parents. The intervention group of children received written healthy lifestyle educational material for their parents and a weekly educational program dealing with CHD prevention, whereas the control group received the same material for the parent material only. The authors mentioned a few limitations of the study, including the single school setting in a middle income area, inadequate sample size, short duration of the study, and contamination bias.

Also, in a three-group stratified randomized controlled trial called PREMIER that lasted six months, Maruthur, Wang, and Appel (2009)studied the effects of two multi-component lifestyle interventions, which included diet and physical activity, on preventing the risks of CHD. Participants' randomization included three intervention groups: an "advice only" group who received only printed educational material and brief advice on lifestyle modifications, an "established" group that received established lifestyle recommendations for blood pressure control, and an "established plus DASH"

group. DASH stands for Dietary Approaches to Stop Hypertension. The authors investigated the differences between the interventions in groups of population with defined baseline variables. The authors found that the risk of CHD was decreased12-14% more in the intervention groups than in the control group, and that the difference was statistically significant. The study used a large diverse group of participants. The authors mentioned the Hawthorne effect, which is a type of bias in which participants behave differently because they are involved in research, as the study limitation. The authors recommended that counseling lifestyle changes should be part of routine medical care, because CHD remains the leading cause of death in the United States.

Some reviews of evidence in relation to established guidelines for CHD prevention exist that evaluates the guidelines. For example, Berglund, and Fagrell (2012) reviewed the scientific basis for current CHD prevention guidelines and stated that scientific evidence support recommendations to increase consumption of fruits and vegetables, whole grain, and oily fish. They stated however that scientific evidence does not support recommendations about increases in consumption of low fat dairy and lean meat, as well as reductions in consumption of saturated fat due to the lack of well-designed studies. They argued that, for example, the Seven Countries Study used an ecological design which used population means instead of individual means resulting in statistical significance of association between fat intake and risk for CHD.

Many studies recommended that lifestyle interventions designed to change attitudes and behaviors towards a heart healthy lifestyle should begin at an early age. For example, Stanner (2009) stated that introduction of lifestyle changes for CHD risk factor

reduction later life cannot be as beneficial as when introduced in early life. The author mentioned that smoking cessation, regular physical activity, having a healthy diet, controlling weight, and moderate alcohol consumption are the main effective measures to prevent CHD as they reduce the major modifiable risk factors for CHD. Therefore, encouraging children and young adults to adopt a healthy lifestyle early in life is the most pragmatic approach to the prevention of CHD.

In another study, Reis, Loria, Launer, Sidney, Jacobs, et al. (2013) studied the association between cognitive function in middle age life and overall cardiovascular health based on the definition by the AHA. The study design was a prospective follow-up study embedded in another follow-up study called the Coronary Artery Risk Development in Young Adults (CARDIA) study. A community-based sample was drawn from the research participants and followed for 25 years. The researchers used standardized protocols for data collection. The authors found that good cardiovascular health during young adulthood and maintaining it to middle age can result in better health in middle life in terms of psychomotor speed, executive function, and verbal memory. The authors mentioned that a limitation of the study was that measurement of cognitive functions at a cross section of time in middle age cannot determine association between aging related cognitive issues and cardiovascular health during young adulthood. They also mentioned that selection bias might have been present in the study as the sample population might have been more likely to have the desired lifestyle than the rest of the population who did not participate. The authors also mentioned the possibility of residual confounding by socioeconomic status, but adjusting for midlife educational status might

have removed the possibility of confounding. The authors stated the strengths of their study as being population based sampling methods, large sample size, and availability of a wide range of data to permit adjustment for several variables. All of these studies emphasized that correctable risk factors for CHD are smoking, physical activity, and diet.

Marbach-Ad, Sokolove, Seifert, et al. (2007) conducted a study for the purpose of measuring students' knowledge of CHD risk factors before and immediately after watching live heart surgery in the observation dome at of the health facility. The authors found that by observing live heart surgery in the dome, the students had increased knowledge and awareness of heart diseases risk factors and risk reduction strategies. This study did not look into the influence of watching live heart surgery in changing attitudes and behaviors towards adopting a heart healthy lifestyle.

Critique of Methods

The sample size calculation was based on the Walden University Sample Size Calculation Tables which yielded a required sample size of 199 participants. This sample size calculation was based on selecting the power of the study (1-B) at 80% and the alpha level at 0.05. This sample size can provide a statistically significant result for the study. It is evident from the literature review that observational studies were used to find out the influence of interventions such as health education on attitude and lifestyle changes. The research method designed for this study was observational as this study looks into the influence of watching live heart surgery as an educational intervention on the changes in attitude of the research participants towards adopting a heart healthy lifestyle.

Summary and Conclusions

CHD is the leading cause of death in the US as stated by the AHA. Some of the risk factors are modifiable including diabetes, hypertension, hyperlipidemia, obesity, smoking, and physical inactivity, and most of them can be reduced through public health interventions such as health education (AHA). Review of several studies found that health education can be an important mean to change attitudes and behavior about heart healthy lifestyle with respect to nutrition, physical activity, and exposure to tobacco smoke. A few studies acknowledged that knowledge of cardiovascular risk factors is very low among young adults. Therefore, based on these evidence need for health education interventions should be considered in order to change attitudes and behavior towards adopting a heart healthy lifestyle. Many types of health education interventions targeting young adults to raise their awareness of cardiovascular risk factors and to motivate them to adopt a heart healthy lifestyle are currently in practice. One such health education program is available which exposes students and young adults from schools and communities in northern Virginia to observe live heart surgery. Thus far no study is available to explore the influence of this kind of health education intervention on the attitudes and behaviors of students towards adopting a heart healthy lifestyle. Therefore I designed this study to find out the influence of watching live heart surgery in adopting a heart healthy lifestyle among young adults.

Chapter 3: Research Method

Introduction

The main reasons to bring young adult students observe live heart surgery are to show them a real life example of heart disease and provide them information about cardiovascular risk factors while observing an open-heart surgery at the health facilities in Virginia. The students observe patients with heart disease attributed to risk factors such as smoking, physical inactivity, and unhealthy diets. Young adult students come to the health facility through a well-developed program with the area schools in order to expand the health curriculum beyond the classroom. Students come from different schools and colleges located in the vicinity of the health facility in Northern Virginia. Groups of 20-30 students typically attend each session. Students arrive prior to the surgical procedure. They observe the entire surgical procedure through a dome-shaped glass roof on the top of the operation theatre under the supervision of a trained nurse.

Understanding the influence of observing live open heart surgery on the attitudes and behaviors of students in adopting heart healthy lifestyle can be important in reducing cardiovascular risk factors (McGill, Jr., McMahan, and Gidding, 2008). If observing live heart surgery can influence young adult students to change behavior, it can influence communities in which the students reside. The influence of the knowledge provided to young adult students to understand cardiovascular risk factors can disseminate in the community resulting to a positive social change. Therefore to understand whether observing live heart surgery can influence attitudes and behaviors of young adult students to adopt a heart healthy lifestyle is very important.

I will explain the research design and my rationale for using it and my research methodology, including the population under study, sampling methods, sample size justification, data collection methods, and instruments. I also discuss ethical considerations related to my study and involvement with research participants.

Research Design and Rationale

This study involved use of a quantitative pretest-posttest research design. In order to compare baseline data with data gathered at follow-up at 3or more months, the pretest-posttest design is suitable. As Creswell (2009) argued, in comparative studies the goal is to quantify the relationships between explanatory variables and response variables in a population. In this study use of pretest-posttest design allows me to study associations between explanatory variables and response variables in the young adult student population coming to observe live heart surgery. According to Creswell (2009), in comparative studies there are two sample groups of research participants, an intervention group and a control group. In this research design, both groups at baseline and follow up are from the same population of young adult students with no comparison group. However, I will perform a comparison between whites and nonwhites at baseline and at follow up in regards to their attitude and behavior towards heart healthy lifestyle.

Methodology

The aim of my study is to assess the influence of watching live heart surgery on the attitudes and lifestyle behavior of young adult students. Therefore I developed the research questions and hypothesis based on the aim of my study and the program aim and

objectives which are to demonstrate the risks of having an unhealthy lifestyle to young adult students. My research questions and corresponding hypotheses were the following:

Research Question 1: Does observing live open heart surgery motivate young adult students to change their attitudes towards adopting a heart healthier lifestyle?

Ho for RQ1: Observing live heart surgery does not motivate students to change their attitudes towards adopting a heart healthy lifestyle.

Ha for RQ1: Observing live heart surgery motivates students to change their attitudes towards adopting a heart healthy lifestyle.

Research Question 2: Can observing live open heart surgery be used as a motivational tool for young adult students to change their lifestyle and adopt a heart healthy lifestyle?

Ho for RQ2. Observing live open heart surgery cannot be used as a motivational tool for young adult students to change their lifestyle and adopt a heart healthy lifestyle.

Ha for RQ2: Observing live open heart surgery can be used as a motivational tool for young adult students to change their lifestyle and adopt a heart healthy lifestyle.

My study used a pretest and posttest quantitative research design in which young adult students received pretest questionnaires for baseline data before watching live heart surgery, and follow-up posttest questionnaires at 3 or more months following observation of open heart surgery. Study participants were students from schools in the area of Northern Virginia. All participatingyoung adult students were potential candidate for inclusion in the study.

Study Population

The target population for this study was the young adult students who came to observe live heart surgery at the health care facility. The decision to select only those young adult students was that they have more autonomy in providing informed consent for participating in the study. Study participants were male and female students of various races and ethnicities from the schools in the area of Northern Virginia. I divided the participants into two groups of whites and nonwhites for comparison.

Sampling and Sampling Procedures

The sampling method for this study was non-probability convenience sampling, as all young adult students age 18-35 that came to observe live heart surgery were potential candidate for the study.

Since the sample size calculated to be 199 participants, therefore recruitment continued to reach that number. A number of students excluded from the participation immediately due to provision of incomplete addresses for follow-up.. This was another reason why baseline data collection took longer than 3 months.

Estimated attendance of students eligible for the study was about 20% of the total students attending the live heart surgery. Therefore, out of about 100 students attending the program, approximately 20 students per week were eligible for this study. At this rate, it I estimated that I could enroll 199 participants in three months.

The sample size calculation based on the Walden University Sample Size Calculation Tables yielded a required sample size of 199 participants. The power of the study (1-B) was set at 80% and the alpha level was set at 0.05.Subjects were assigned a

study PIN or code number (starting with the number 001 and continuing sequentially). The top part of the questionnaire, where personal details of research participants were entered, had the code number (not the name) of the subject linking the subject to that questionnaire part The top part of the questionnaire was detached from the questions part and maintained separately in a locked and secured area (office and shared drive), accessible only to study personnel.

The questions developed and used in the questionnaires for gathering data for this research were based on the questions used for similar studies as well as questions specific to this research. To test the questions they were distributed as questionnaires to different people in order to know whether the readers can understand what is expected from them in answering each question. The health facility IRB team approved questionnaires developed for baseline and for follow up data collection.

Variables of interest in relation to lifestyle are smoking, exercise, and diet. Measurement for all three variables would be a combination of nominal (Yes, No), ordinal (scales for confidence), and ratio scales. Comparison of the main three variables of lifestyle would demonstrate to see which of them are going to be more prone to change. Comparison of the changes between whites and nonwhites in relation to lifestyle variables and attitude variables will show the differences in changes between the two groups at baseline and at follow up. The first 7 questions are related to lifestyle variables, whereas the last 6 questions are related to attitude variables.

1. Did you smoke? Yes_____ No_____

2. If Yes how many cigarettes per day? _____

3. If No, did you quit in the last three months? Yes_____ No_____

4. Did you do regular exercises? Yes_____ No_____

5. Did you start doing regular exercise in the last three months? Yes__ No__

6. How many times per week do you do exercises? 1__2__3__4__5__6__7__

7. Did you increase the intensity and rigorousness of your exercise in the last three months? Yes_____ No_____

8. Did you consider the following in your diet:
    a. Eat 5 or more servings of fruits and vegetables daily? Yes___ No___
    b. Consistently choose foods with whole grains? Yes____ No____
    c. Choose foods high in fiber? Yes_____ No_____
    d. Drink no more than 2 alcoholic drinks per day? Yes____ No____

9. Did you think about the importance of having a healthy diet in the last three months? Yes_____ No_____

10. Are you planning or motivated to do the following:
    a. Lose or maintain body weight? Yes_____ No_____
    b. Avoid smoking or tobacco use? Yes_____ No_____
    c. Live an overall healthy lifestyle? Yes_____ No_____

11. How confident you are in your plan?

    Very confident_____Somewhat confident_____ Not confident_____

12. Did you think/plan about adopting overall healthy lifestyle in the last three months: Yes_____ No_____

13. Do you think your visit to watch live heart surgery at Inova Heart and Vascular Institute three months ago has influence your lifestyle?

    Yes_____ No_____

Procedures for Recruitment

The potential research participants were coming to the health facility under a well-organized program to watch live heart surgery. Contacting the potential research participants was easier as was getting the informed consent and the baseline data. Young adult students age 18-35 were approached and asked if they are willing to participate.

Participation and Data Collection

The data collection for the research started after getting the approval of the Inova Institutional Review Board. Recruitments took place on the day the students came to watch the surgery as part of the ongoing program. Before the students observed the surgery, the program coordinator made an announcement about this study. Then I, as the researcher, briefly explained the research and its purposes and the process for becoming a research participant. After providing detailed information about the study, the students were approached for informed consent, if they were interested in participating in the study. The informed consent form was a standard form developed by the health facility research center and approved by the IRB related to the health facility. The program coordinator also signed all of the consent forms as witness for the informed consent. For those that signed the informed consent, I administered the study-related

questionnaire(baseline data collection questionnaire is attached as appendix). This process continued until the recruitment of the required number of research participants.

Instrumentation and Operationalization of Constructs

According to Frankfort-Nachmias and Nachmias (2008), variations in measurement procedures that include instruments, researchers, and the participants can result in measurement error. If researchers do not take these errors into consideration, this in turn results in systematic error or random error affecting the validity and reliability of the results. The authors also explained the differences in validity in terms of sampling validity and face validity. According to the authors, sampling validity means that the research participants are composed of a fully representative sample of the real population, whereas face validity is about the instruments' ability to capture the whole picture of the variables of the study. Moreover, the authors described construct validity as the validity in relation to the theoretical framework used in research where the instrument should logically and empirically have components of the framework. In this study the participants are fully representative of young school children, and the questionnaire is designed to capture all the variables of interest in this research.

Frankfort-Nachmias and Nachmias (2008) also explained that in order to enhance validity the researcher should be able to rule out factors, other than the variable under study. These factors are in the causal pathway between independent and dependent variables. These factors should answer the question whether changes in the independent variable were truly associated with the changes in the dependent variable. In this research I planned to look into other factors that can influence the variables of interest by asking

questions specific to watching live heart surgery and its influence on the participants' lifestyle. The authors also mentioned that researchers should explain extrinsic and intrinsic factors together with the control measures in order to minimize threats to the validity of the research findings.

Threats to validity inherent in this pretest-posttest design could be related to history, maturation, regression to the mean due to nonrandom sampling, and instrumentation threat. Instrumentation threat occurs when the change from pretest to posttest is not due to the intervention but it might be due to change in the test used to obtain results. Several ways are available to deal with such threats to validity. The most common one is having a control group which is not possible in this research. Alternative way to deal with threats to validity of this research design could be a comparison between two subgroups of the research participants in terms of Whites and Nonwhites. I will do a comparison of the effects of the intervention between Whites and Nonwhites when doing analysis of the results of this research in order to minimize threats to validity.

Data Analysis Plan

To analyze the survey questionnaires, I used SPSS software version 21. I entered baseline and follow-up questionnaire data in SPSS. After approval for the proposal was received, data analysis begun. Statistical analysis included t tests in order to find out relationships between dependent and independent variables at baseline and at follow up as well as comparing between the two groups of white and nonwhite.

Descriptive analysis explains number of the research participants by gender and by age group at baseline and at follow up. I used t tests for explaining the relationship

between the dependent and independent variables, and for comparing means. For comparing the mean differences between the two groups of whites and nonwhite, I used independent sample t tests. I also used ANOVA test for doing regular exercise in order to compare between white and nonwhite groups at baseline and at follow-up was conducted.

Ethical Procedures

The young adult students provided informed consent while they were at the health facility to watch live heart surgery. The young adult students received a brief summary of the research and IRB approved consent forms with details about the participants' rights, including their right to withdraw at any time during the study.

All study-related data stored in the health facility in a locked and secured area accessible only to the study personnel. All electronic files stored on the secured departmental shared drive accessible only by study personnel. Information about study subjects kept confidential and managed according to the requirements of the Health Insurance Portability and Accountability Act of 1996 (HIPAA). In brief in maintaining privacy and confidentiality of all enrolled study participants, all necessary actions were taken and implemented.

Although there is a potential for an unanticipated adverse event of a breach of confidentiality, the process to keep the individual identifiable information separate will diminish this threat. If any potential breach of confidentiality occurs, it will be immediately reported to the health facility IRB and handled accordingly.

Summary

The purpose of this study is to explore whether observing live open heart surgery can influence lifestyle behaviors of young adults and whether we can use it as a motivational tool to change behavior of young adults to adopt a heart healthy lifestyle. I used a quantitative pretest- posttest observational study design with a baseline questionnaire during the first visit and a follow-up questionnaire 3 months or more after the dome visit. The study participants' recruitment occurred when the students came to watch a heart surgery.

The study included all eligible young adult students who came to observe live heart surgery at the health facility and provided consent for the study. Therefore, the target population for this study was the young adult students from the communities in northern Virginia who came to observe live heart surgery in the health facility. My study will provide information whether observing live heart surgery can be considered as a potentially effective health education method in changing attitude and behavior of young adults towards adopting a heart healthy lifestyle.

Chapter 4: Results

Introduction

The purpose of my study is to determine whether observing live heart surgery can be influential in young adult students' adoption of a heart healthy lifestyle. The findings of my investigation may give some indication as to the effectiveness of health education programs in which young adult students observe live heart surgery. The results of my study may guide program planners' decisions about whether these programs they should continue and should disseminate such programs in other areas.

With these aims, I developed the research questions and hypotheses. The focus of the research question was whether observing live open heart surgery motivates young adult students to change their attitudes and behavior towards adopting a heart healthier lifestyle. The answer to the research question will indicate whether such a program of observing live open heart surgery should be continued and disseminated as a useful educational and health promotion program for young adult students age 18-35.

The null hypothesis for the research question was that observing live heart surgery does not motivate young adult students to change their attitudes towards adopting a heart healthy lifestyle, whereas the alternative hypothesis was that live heart surgery motivates young adult students to change their attitudes towards adopting a heart healthy lifestyle. The research participants answered questions regarding three lifestyle variables (smoking cigarettes, doing regular exercise, and having a healthy diet) before and 3 months or more after observing live heart surgery.

Data Collection

At baseline, the sample size estimation was to be 199, but 179 research participants who completed the questionnaires and provided full answers with full contact details considered eligible for the study. Those who agreed to participate but did not complete the questionnaires or did not provide contact details for follow up were considered ineligible for enrollment. Among those who were eligible for enrollment 137 were females and 42 were males. Those who eligible for enrollment in the study were the individuals who provided complete answers to the baseline questionnaires and gave their full address and contact details.

Baseline data collection occurred in the first visit prior to observing live heart surgery between January 2014 and April 2014, and the follow-up data collection occurred 3 or more months following observation of live heart surgery. Follow-up data collection occurred from the same group of research participants between April and August 2014.

The potential research participants came to the health facility under a well-organized program to watch live heart surgery therefore contacting the potential research participants was very easy and convenient. Similarly, baseline data collection was very easy because those who were considered eligible were present on the site for answering baseline questionnaires. Contrary to very easy baseline data collection process, follow-up data collection after 3 or more months was difficult due to loss to follow up and no responses. Although all of the research participants who were considered eligible for the study provided their contact information at baseline, approximately 33% of the participants responded to the follow up questionnaires.

ResultsTable 1 provides information on the distribution of the age variable at baseline.

N	Valid	179
	Missing	0
Mean		19.93
Median		18.00
Skewness		2.160
Std. Error of Skewness		.182
Minimum		18
Maximum		35

Almost 69% of the research participants were 18 years old. The age distribution of the study participants at baseline is shown in Table 2.

Results Table 2 Frequency Distribution of Age of Study Participants at Baseline

Age	Frequency	Percent	Valid Percent	Cumulative Percent
18	123	68.7	68.7	68.7
19	6	3.4	3.4	72.1
20	3	1.7	1.7	73.7
21	10	5.6	5.6	79.3
22	7	3.9	3.9	83.2
23	4	2.2	2.2	85.5
24	3	1.7	1.7	87.2
25	4	2.2	2.2	89.4
26	7	3.9	3.9	93.3
27	1	0.6	0.6	93.9
28	1	0.6	0.6	94.4
29	2	1.1	1.1	95.5
30	3	1.7	1.7	97.2
31	1	0.6	0.6	97.8
32	1	0.6	0.6	98.3
34	2	1.1	1.1	99.4
35	1	0.6	0.6	100
Total	179	100	100	

Only 70 (39%) of the 179 study participants returned the follow-up questionnaires. Of this number, 56 were females, and 14 were males. Similar to the baseline sample, about two thirds of the participants in the follow-up were 18 years old. The age distribution of the study participants at follow-up is shown in Table 3.

Results Table 3 Age Distribution of Study Participants at Follow-up.

Age	Frequency	Percent	Valid Percent	Cumulative Percent
18	46	65.7	65.7	65.7
19	1	1.4	1.4	67.1
20	1	1.4	1.4	68.6
21	2	2.9	2.9	71.4
22	2	2.9	2.9	74.3
24	1	1.4	1.4	75.7
25	2	2.9	2.9	78.6
26	5	7.1	7.1	85.7
27	1	1.4	1.4	87.1
28	1	1.4	1.4	88.6
29	2	2.9	2.9	91.4
30	3	4.3	4.3	95.7
31	1	1.4	1.4	97.1
32	1	1.4	1.4	98.6
34	1	1.4	1.4	100
Total	70	100	100	

Approximately 60% of participants were White. Table 4 shows the ethnicity distribution of the research participants at follow-up.

Results Table 4 Follow-up Research Participants by Ethnic Group

Ethnicity	Frequency	Percent	Valid Percent	Cumulative Percent
White	42	60.0	67.7	67.7
Asian	6	8.6	9.7	77.4
Black or African American	4	5.7	6.5	83.9
American Indian or Alaska Native	1	1.4	1.6	85.5
Others	8	11.4	12.9	98.4
Don't know/Not Sure	1	1.4	1.6	100.0
Total	62	88.6	100.0	
Missing	8	11.4		
Total	70	100.0		

Among the 70 follow-up research participants I compared the three main variables of interest: smoking cigarettes, exercise, and diet between baseline and follow-up. Only one participant was a smoker at baseline, compared to three smokers at follow-up. Almost 81% exercised regularly at baseline, compared to76.5% at follow-up. Almost 51% ate five or more servings of fruits and vegetables daily, 64% consistently chose foods with whole grains, and almost 57% chose foods high in fiber at baseline, compared to 55.9% , 67.6%, and 63.2%, respectively at follow-up. Over two-thirds indicated that a healthy diet was very important to them, and 28.6% indicated that a healthy diet was somewhat important to them at baseline, compared to 65.7% and 34.3%, respectively at follow-up. Over 94% indicated that they were planning on losing or maintaining body weight at baseline compared to 91% at follow-up, while all 70 participants indicated that

they planned on living an overall healthy lifestyle at baseline, compared to 69at follow up. At baseline just over two-thirds of the study participants (67%) indicated that they were very confident in their plans to live an overall healthy lifestyle, and 30% were somewhat confident at baseline, compared to 67.2% were 31.3%, respectively at follow-up.

The questionnaire asked all 70 follow-up participants whether visiting the health facility to watch live heart surgery three months earlier influenced their lifestyle, and 62.9% answered in the affirmative.

A paired t-test on the 70 follow-up research participants comparing smoking cigarettes at baseline and at follow-up found that the means at baseline and at follow-up were exactly the same (M=.000, SD=.29925, significance=1.000). Also no significant difference found in doing regular exercises at baseline and at follow-up, in eating five or more servings of fruits and vegetables daily, in consistently choosing foods with whole grains high in fiber, nor in choosing food high in fiber. These are all shown in Table (5) below.

Paired Samples Test for the Three Main Variables: Smoking, Exercise, and Diet

Results Table (5) Paired Samples T-Test for smoking, exercise, and diet

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Do you Smoke? - Did you smoke cigarettes in the last 3 months?	.00000	.29925	.03629	-.07243	.07243	.00	67	1.000
Do you do regular exercises? - Did you regularly exercise in the last 3 months?			-.04412	.50175	.06085	-.16557 .07733	-.725	67 .471
Do you eat 5 or more servings of fruits and vegetables daily? - Do you eat 5 or more servings of fruits and vegetables daily?		.03077	.61159	.07586	-.12077	.18231	.406	64 .686
Do you consistently choose foods with whole grains? - Do you consistently choose foods with whole grains?		.01538	.54464	.06755	-.11957	.15034	.228	64 .821
Do you choose foods high in fiber? - Do you choose foods high in fiber?		.01538	.48387	.06002	-.10451	.13528	.256	64 .799

Moreover, there was neither significant difference in planning or motivated to live an overall healthy lifestyle between baseline and follow-up, nor in planning on losing or maintaining body weight. Table 6 shows Paired sample t- tests with significance levels for questions and answers with regards to planning on losing or maintaining body weight, planning to avoid smoking or tobacco use, and planning on living an overall healthy lifestyle at baseline and at the follow up with significance levels:

Results Table (6) Paired Samples Test for Planning on Losing or Maintaining Body Weight, Planning to Avoid Smoking or Tobacco Use, and Planning on Living an Overall Healthy Lifestyle at Baseline and at the Follow- up

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Are you planning on losing or maintaining body weight? - Are you planning or motivated to lose or maintain body weight?	-.02985	.24434	.02985	-.08945	.02975	-1.000	66	.321
Are you planning to avoid smoking or tobacco use? - Are you planning or motivated to avoid smoking or tobacco use?	-.09091	.33865	.04169	-.17416	-.00766	-2.181	65	.033
Are you planning on living an overall healthy lifestyle? - Are you planning or motivated to live an overall healthy lifestyle?	-.01471	.12127	.01471	-.04406	.01465	-1.000	67	.321

Independent Sample t-tests were done to see if there were any significant differences between Whites and non- Whites at baseline and at follow-up. No significant differences were observed for any of the three variables of interest at baseline and follow-up between the Whites and non-Whites except for the variable, Regular Exercise at follow up (Table 7). The difference between Whites and non-Whites in doing Regular Exercise at follow- up is statistically significant ($p= 0.030$). Table 7 shows Independent sample t-tests at baseline and follow-up comparing Whites and Non Whites with respect to the diet questions.

Results Table (7) Independent Sample Test for Smoking, Exercise, and Diet at Baseline and Follow up for comparison between White and Nonwhite groups

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Do you Smoke?	Equal variances assumed	2.62	0.11	0.787	66	0.434	0.05311	0.06745	-0.08156	0.18779
	Equal variances not assumed			0.663	29.853	0.515	0.05311	0.08052	-0.11137	0.2176
Did you smoke cigarettes in the last 3 months?	Equal variances assumed	0.189	0.665	-0.217	64	0.829	-0.01154	0.05327	-0.11795	0.09488
	Equal variances not assumed			-0.222	57.938	0.825	-0.01154	0.05193	-0.1155	0.09242

Table Continues

Results Table (7) Independent Sample Test for Smoking, Exercise, and Diet at Baseline and Follow up for comparison between White and Nonwhite groups

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Do you do regular exercises?	Equal variances assumed	3.824	0.055	-1.175	66	0.244	-0.12637	0.10754	-0.34109	0.08834
	Equal variances not assumed			-1.153	49.854	0.255	-0.12637	0.10963	-0.34658	0.09383
Did you regularly exercise in the last 3 months?	Equal variances assumed	17.013	0	-2.221	64	0.03	-0.23462	0.10564	-0.44565	-0.0236
	Equal variances not assumed			-2.079	42.034	0.044	-0.23462	0.11286	-0.46236	-0.0069

Table Continues

Results Table (7) Independent Sample Test for Smoking, Exercise, and Diet at Baseline and Follow up for comparison between White and Nonwhite groups

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Do you eat 5 or more servings of fruits and vegetables daily?	Equal variances assumed	0.006	0.937	0.039	63	0.969	0.00508	0.13014	-0.25499	0.26515
	Equal variances not assumed			0.039	47.972	0.969	0.00508	0.13042	-0.25716	0.26732
Do you consistently choose foods with whole grains?	Equal variances assumed	2.596	0.112	0.763	63	0.449	0.09146	0.11994	-0.14821	0.33114
	Equal variances not assumed			0.779	51.56	0.439	0.09146	0.11736	-0.14409	0.32702

Table Continues

Results Table (7) Independent Sample Test for Smoking, Exercise, and Diet at Baseline and Follow up for comparison between White and Nonwhite groups

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Do you choose foods high in fiber?	Equal variances assumed	5.943	0.018	1.173	63	0.245	0.14736	0.12564	-0.10372	0.39844
	Equal variances not assumed			1.198	51.44	0.237	0.14736	0.12304	-0.09961	0.39433
Do you eat 5 or more servings of fruits and vegetables daily?	Equal variances assumed	3.68	0.06	1.426	64	0.159	0.17885	0.1254	-0.07168	0.42937
	Equal variances not assumed			1.439	55.15	0.156	0.17885	0.12429	-0.07022	0.42791

Table Continues

Results Table (7) Independent Sample Test for Smoking, Exercise, and Diet at Baseline and Follow up for comparison between White and Nonwhite groups

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Do you consistently choose foods with whole grains?	Equal variances assumed	1.999	0.162	0.68	64	0.499	0.08077	0.11873	-0.15641	0.31795
	Equal variances not assumed			0.69	56.055	0.493	0.08077	0.11706	-0.15373	0.31526
Do you choose foods high in fiber?	Equal variances assumed	11.573	0.001	1.626	64	0.109	0.19423	0.11945	-0.04441	0.43287
	Equal variances not assumed			1.68	59.093	0.098	0.19423	0.11561	-0.0371	.42557

Results Table (8) shows that 89% of Whites did regular exercise compared to 63% of non-Whites at follow-up.

White or Nonwhite * Do you do regular exercises? Cross tabulation

Ethnicity	Do you do regular exercises?			Total
	Yes	No	Missing	
White	37	4	1	42
Nonwhite	19	7	0	26
Total	56	11	1	68

Table 8: Comparison of Answers for Exercise at Baseline between White and Nonwhite

Comparison of exercise at follow-up between Whites and non-Whites demonstrated that similar to the baseline, more Whites than non-Whites exercised. However, doing regular exercise decreased in both groups from baseline to follow-up, with the decrease being more prominent in non-Whites.

Results Table (9) Comparison of exercise at follow-up between white and nonwhite groups

White or Nonwhite * Regular exercise in the last 3 months?

	Did you regularly exercise in the last 3 months?		Total
	Yes	No	
White	34	6	40
Nonwhite	16	10	26
Total	50	16	66

One way ANOVA tests were conducted to confirm the significance levels seen in independent sample t tests. As is shown in Table (10), there was a statistically significant

difference between Whites and non-Whites in doing regular exercise at follow-up (p= 0.03).

Results Table (10) ANOVA test for Doing Regular Exercise Comparing Whites and non-white at Baseline and at Follow-Up

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
Do you do regular exercises?	Between Groups	.256	1	.256	1.381	.244
	Within Groups	12.258	66	.186		
	Total	12.515	67			
Did you regularly exercise in the last 3 months?	Between Groups	.867	1	.867	4.933	.030
	Within Groups	11.254	64	.176		
	Total	12.121	65			

Summary

A total number of 179 research participants provided complete answers to the baseline questionnaires, while only 70 of them completed the follow up questionnaires. Age and gender percentages were almost the same at baseline and follow-up.

Comparing baseline data with the follow-up data using Paired Sample t- tests as well as using Independent Sample t- tests for comparing Whites and Nonwhites at baseline and follow- up made the basis for analysis. The variables of interest were smoking cigarettes, doing regular exercises, and having a healthy diet.

Paired sample t tests found no significant differences between baseline and follow up for all three main variables of interest: smoking, exercise, and diet. Comparison between Whites and non-whites, demonstrated no significant differences in all three variables, smoking, exercise, and diet, at baseline. However, at follow up, although there were no significant differences between Whites and non-whites with respect to smoking and diet, there was a significant difference with respect to exercise (P=0.03), with the whites were less likely than the non-whites to stop exercising. But in both groups, white and nonwhite, doing regular exercises decreased at follow-up compared to the baseline.

Chapter 5: Discussion, Conclusions, and Recommendations

Introduction

In conducting this investigation, I sought to determine whether observing live heart surgery can be influential in adopting a heart healthy lifestyle among young adult students. My study involved administration of a questionnaire prior to students' observation of live heart surgery and 3or more months afterwards. The research participants answered questions at baseline and follow up through a questionnaire focusing on three main lifestyle variables: smoking cigarettes, doing regular exercise, and having a healthy diet.

In data analysis, I made comparison between baseline and follow up answers provided by the study participants. Using paired sample t tests to compare baseline data with the follow up data I found no significant differences for all three of these main lifestyle variables. I also conducted independent sample t test comparing between White and Nonwhite groups at baseline and follow up. The independent sample t tests showed no significant differences in the three lifestyle variables between White and Nonwhite groups at baseline or follow-up except for exercise. Exercise comparison showed a significant difference ($p=0.003$) at follow up between white and nonwhite groups with white group less likely to stop exercise compared to nonwhite group. However, both white and nonwhite groups showed a decrease in exercise at follow up compared to the baseline data with more decrease in nonwhite group. Although the comparison between the two groups of whites and nonwhite at follow up showed significant differences in stopping exercise, overall the results showed no significant differences in changing behavior of the study participants in all 3 main variables of interest.

Interpretation of the Findings

Watching live heart surgery did not significantly influence participants' attitudes and behaviors with respect to the three main variables: exercise, diet, and smoking cigarette. Although comparing baseline data between white and nonwhite groups showed a significant difference with whites less likely to stop exercise, exercise decreased in both groups. Mozaffarian et al. in 2008 showed the importance of physical activity in reducing cardiovascular risk factors. The authors found that a modest change towards a heart healthy lifestyle can have a powerful effect on individuals' cardiovascular risk. They found that physical activity reduced the risks of cardiovascular events by 30-50%. Although my research participants decreased exercise at follow up compared to baseline, the decrease among white group was significantly less likely. Therefore white group may benefit from not stopping exercise significantly. Similarly, in a prospective population-based study, Arsenault et al. (2010) found the independent association between both physical inactivity and abdominal obesity with increased risk of cardiovascular diseases. Based on their findings, they emphasized that physical activity should be encouraged and promoted at the population level. Although watching live heart surgery did not significantly promote physical activity among young adult students in my study, at least white group did not decrease their exercise significantly at follow up compared to their nonwhite counterpart.

In Chapter 2, I noted that McCullough (2006) had found that adolescents do not know about cardiovascular risk factors and therefore do not perceive themselves at risk for cardiovascular disease. The author emphasized the importance of understanding

cardiovascular risk factors among youth in adopting heart healthy lifestyle. Moreover, according to Lynch, Liu, Kiefe, and Greenland (2006) researchers have extensively examined the influence of very low knowledge of cardiovascular risk factors on behavior changes among young adults. Similarly, in community-- based clinical trials of educational programs aimed at preventing cardiovascular diseases among school children, Fornariet al. (2013) found that a multidisciplinary educational program targeted to school-age children can reduce the Framingham Cardiovascular Risk of their parents. The Framingham Cardiovascular Risk is a gender-specific scoring method that calculates the 10-year cardiovascular risk of an individual (Fornariet al., 2013).

Many other researchers have found that targeting common CHD risk factors through health education interventions results in improved CHD outcomes. Schwandt, Bertsch, and Haas (2011) studied associations between continuation of improved CHD risk factors and lifestyle changes over 1 year in a real life setting. In this study, health education about a heart healthy lifestyle, with information about nutrition, physical activity, and decreasing exposure to tobacco smoke, were given to participants. Most of the CHD risk factors improved for parents and their children after program participation.

Another example is a descriptive cross sectional study that Mooney and Franks (2011) conducted. In this study, the authors assessed the effect of community health screening delivered together with health education. The focus of health education was knowledge of CHD risk factors. The authors assessed changes in health promoting behavior of the 56 sample of conveniently selected participants. The authors found that community-based health screening combined with health education interventions

increased participants' knowledge of CHD risk factors and encouraged more health promotion behavior. The authors concluded that knowledge of CHD risk factors motivated research participants to become engaged in health promoting behaviors.

Based on Chapter 2my review of the literature, I hypothesized that observing live heart surgery together with being provided knowledge would influence young adult students to adopt a heart healthy lifestyle. In a study, Marbach-Ad et al. (2007) evaluated the influence of health education and observing live heart surgery on the knowledge of students who attended the program. The authors evaluated questionnaires administered before watching live heart surgery and immediately after watching live heart surgery and found that students had increased knowledge and awareness of heart diseases risk factors and risk reduction strategies. So, the question was that does the knowledge gained by observing live heart surgery influence behavior of the young adult students to adopt a heart healthy lifestyle. Therefore, in my study, I investigated the influence of the knowledge gained by watching live heart surgery on adopting a heart healthy lifestyle. I found that increased knowledge did not result in any changes towards adopting a heart healthy lifestyle among my study participants. Therefore, the results of my investigation do not support my hypothesis that knowledge of cardiovascular risk factors can influence behavior towards adopting a heart healthy lifestyle in young adults.

According to HBM (NCI; 2005) which was part of my theoretical framework, individuals will take actions to avoid risks to their health if they know and believe that the health threats are serious. The findings of my research found no significant changes in adopting heart healthy lifestyle among young adult students after observing live heart

surgery. In my study, the students knew about the cardiovascular risk factors by observing live heart surgery but whether they perceived that the health threats were serious or not is a question. Therefore, based on the results of this study we cannot establish a definitive link between observing live heart surgery and perceived threats to cardiovascular health that should have resulted in changes of attitudes and behavior towards adopting a heart healthy lifestyle. Additionally, we cannot find a reliable relationship between perceived health competency and motivation to change lifestyle.

Another selected framework for this research was The Theory of Reasoned Action which states that people will take actions to adopt a healthy behavior if they intend to do so (NCI, 2005). In other words, the Theory of Reasoned Action assumes that behavioral intention is the main determinant of behavior. The findings of my research indicated that there were no significant changes in planning to adopt a heart healthy lifestyle after the intervention, except for smoking *(p=0.03).* A significant difference in intention to plan to avoid smoking cigarette between the baseline and the follow up answers of the research participants existed.

Limitations of the Study

My study has a couple of limitations. First, a control group selected from the same schools where the students who attended the live heart surgery came from could have made the findings comparable to a non-exposed to intervention group. Through the control group the influences other than watching live heart surgery on attitude and behavior changes in adopting a heart healthy lifestyle among the exposed students could have been canceled. Secondly, the number of research participants who responded to the

follow-up questionnaires was only about 39% which could perhaps lead to non-response bias. The low response rate was despite our efforts to make contact with the baseline study participants in three different ways, phone, email, and snail mail. Thirdly, the focus of the research was limited to behavior changes after three months follow up, making the scope limited to behavior change. Adding tools to measure the perceptions of the research participants in terms of how they perceive and believe cardiovascular risks could have provided insight in looking into the components of Health Belief Model and its application in this research context and process. Finally, as mentioned by Merry, Boer, Schouten, Feskens, Verschuren, and Gorgels (2011) that the accuracy of self-reported data has been proven in several studies, still as the authors emphasized, exposure misclassification due to self-reported lifestyle can occur as a limitation of this type of study.

The sampling method was purposive sampling, which is a non-probability sampling method. This kind of sampling method is less likely to produce a representative sample compared to a probability sampling method. Although this sampling method is not random probability sampling, the findings can be generalizable to all young adult students in the communities because the students came from different schools in the area.

Recommendations

Although the program to bring students to watch live heart surgery is well designed and well run in terms of the content, process, and logistics; its influence to motivate young adult students to adopt a heart healthy lifestyle is not proven. The program planners need to find interventions that are evidence based and have the

potential to strengthen the effectiveness of the program in achieving the desired goal of influencing students to adopt a heart healthy lifestyle. The program could be aided further by adding more evidence based information that focuses on what a heart healthy lifestyle is and how to achieve it. Such evidence based approaches to the program would provide students with the information needed to achieve the objective of adopting a heart healthy lifestyle when they really perceive the threat of cardiovascular risk factors by watching live heart surgery.

Implications

The expected positive social change from the intervention studied was to see significant changes in attitudes and behaviors of young adult students towards adopting a heart healthy lifestyle after observing live heart surgery. The results of the study indicated that there were no significant changes in the behavior of the research participants in relation to known cardiovascular risk factors such as smoking, exercise, and diet at baseline and follow- up. The only significant difference observed in comparing Whites and Nonwhites with respect to doing regular exercise at follow- up, but doing regular exercise decreased in both groups at follow- up compared to the baseline. Therefore, considering the findings of this research, looking into other evidence based options and pursuing those interventions that can influence and motivate young adult students to adopt a heart healthy lifestyle can be a positive social change.

Conclusion

The most common risk factors for cardiovascular disease are lifestyle factors such as tobacco use, unhealthy diet, and physical inactivity. Adopting a heart healthy lifestyle

by not smoking tobacco, doing regular exercises, and having a healthy diet is proven to prevent cardiovascular diseases later in life. Therefore the program to bring students to observe live open heart surgery is based on the notion that it has the potential to motivate young adult students to change their attitudes and behavior regarding adopting a heart healthier lifestyle in order to minimize cardiovascular diseases in later life.

The study I conducted found that watching live heart surgery did not significantly influence behaviors of the young adult students towards adopting a heart healthy lifestyle. Moreover, the study found a reduction in doing exercise both in Whites and among Nonwhites at follow- up compared to the baseline, but the decrease in exercises was significantly less in Whites compared to Nonwhites.

Despite certain limitations my research had, such as not having a control group and having a lower response rate at follow up, it provided the evidence that the current program to bring students to observe live heart surgery at the health facility does not benefit young adult students in adopting a heart healthy lifestyle. Considering the findings of this research, the program planners need to find evidence based interventions that should have the potential to strengthen the effectiveness of the program in achieving its goal. As far as cardiovascular diseases remain the leading cause of mortality and morbidity in the industrialized countries including the United States, efforts to reduce its risk factors should also remain one of the main priorities of public health programs.

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Walden University Dissertation Course material: Tables to Calculate: Tables_to_Calculate_Necessary_Sample_Size.pdf

AppendixA: Baseline Lifestyle Questionnaire

Name_____ Age_____ Gender____ Code:
Address_____
_____
_____
Email_____
Telephone_____
Preferred way of communication: Postal_____ Phone_____ Email_____

Please tick mark or write a number for your answers as appropriate:

Code:

14. Do you smoke? Yes_____ No_____

15. If Yes how many cigarettes per day? _____

16. How important it is for you to quit smoking?
    Very important ____ Somewhat important _____ Not important_____

17. Do you do regular exercises? Yes_____ No_____

18. If Yes how many times per week? 1___ 2___3____4___5____6___7____

19. How important is regular exercise for you?

    Very important _____Somewhat important_____ Not important_____

20. Do you consider the following in your diet:
    a. Eat 5 or more servings of fruits and vegetables daily? Yes___ No___
    b. Consistently choose foods with whole grains? Yes____ No____
    c. Choose foods high in fiber? Yes_____ No_____
    d. Drink no more than 2 alcoholic drinks per day? Yes____ No____

21. How important is a healthy diet for you?
    Very important _____Somewhat important_____ Not important_____

22. Are you planning or are motivated to do the followings:
    a. Lose or maintain body weight? Yes_____ No_____
    b. Avoid smoking or tobacco use? Yes_____ No_____
    c. Live an overall healthy lifestyle? Yes_____ No_____

23. How confident you are in your plan?
    Very confident_____ Somewhat confident_____ Not confident_____

Appendix B: Follow-up Questionnaire

Follow up Questionnaire: Date: / /2014

Please tick mark or write a number for your answers as appropriate

Are you Hispanic or Latino? ○a. Yes ○b. No ◉c. Don't Know/Not Sure

What is your race or ethnic group? (Click all that apply) ☐White

☐American Indian or Alaksa Native ☐Native Hawaiian or Other Pacific Islander

☐Asian ☐Other (please specify)

☐Black or African American ☐Don't know/Not sure

Code:

Over the past 3 or more months:

1. Did you smoke cigarettes in the last three months? ☐Yes ☐No

If NO go to Q5

2. If Yes, how many cigarettes did you smoke per day?
3. If No, did you quit in the last three months? ☐Yes ☐No

4. How important is it for you to quit smoking?

☐Very important ☐Somewhat important ☐Not important

☐Yes ☐No

5. Did you do regular exercises in the last three months?

☐Yes ☐No

6. Did you start doing regular exercise in the last three months?
7. How many days per week do you do exercises?
8. Did you increase the intensity and rigorousness of your exercise in the last three months? ☐Yes ☐No

9. How important is doing regular exercise to you?

☐Very important ☐Somewhat important ☐Not important

10. Do you consider the following in your diet:

a. Eat 5 or more servings of fruits and vegetables daily? ☐Yes ☐No

b. Consistently choose foods with whole grains? ☐Yes ☐No

c. Choose foods high in fiber? ☐Yes ☐No

d. Drink no more than 2 alcoholic drinks per ☐Yes ☐No

day?

11. Have you thought about the importance of having a healthy diet in the last three months?

How important is a healthy diet for you?

☐Very important ☐Somewhat important ☐Not improtant

12. Are you planning or motivated to do the following:

a. Lose or maintain body weight? ☐Yes ☐No

b. Avoid smoking or tobacco use? ☐Yes ☐No

c. Live an overall healthy lifestyle? ☐Yes ☐No

13. How confident you are in your plan with regards to question number 12?

☐Very cofident ☐Somewhat confident ☐Not confident

14. Did you think/plan about adopting overall healthy lifestyle in the last three months? ☐Yes ☐No

15. Do you think your visit to watch live heart surgery at Inova Heart and Vascular Institute three months ago has influence your lifestyle? ☐Yes ☐No ☐Not su