

ปัจจัยทำนายพฤติกรรมการป้องกันโรคหลอดเลือดหัวใจของวัยผู้ใหญ่  
ในจังหวัดอาเจะ ประเทศอินโดนีเซีย



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จุฬาลงกรณ์มหาวิทยาลัย

CHULALONGKORN UNIVERSITY

บทคัดย่อและแฟ้มข้อมูลฉบับเต็มของวิทยานิพนธ์ตั้งแต่ปีการศึกษา 2554 ที่ให้บริการในคลังปัญญาจุฬาฯ (CUIR)  
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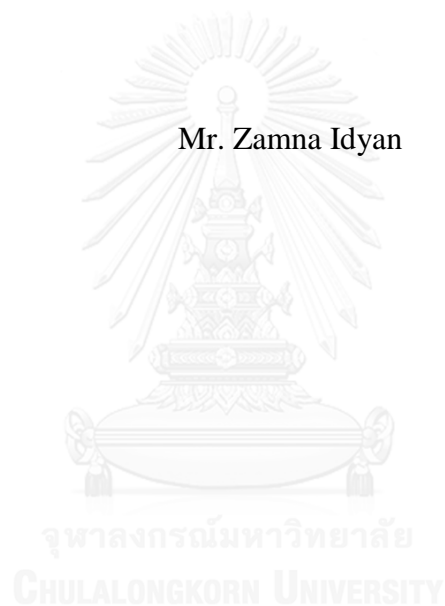
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ลิขสิทธิ์ของจุฬาลงกรณ์มหาวิทยาลัย

FACTORS PREDICTING PREVENTIVE BEHAVIORS FOR CORONARY  
ARTERY DISEASE AMONG ADULT PATIENTS  
IN ACEH PROVINCE, INDONESIA

Mr. Zamna Idyan



A Thesis Submitted in Partial Fulfillment of the Requirements  
for the Degree of Master of Nursing Science Program in Nursing Science  
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ชมน่า อิดยาน : ปัจจัยทำนายพฤติกรรมการป้องกันโรคหลอดเลือดหัวใจของวัยผู้ใหญ่ในจังหวัดอาเจะ ประเทศอินโดนีเซีย (FACTORS PREDICTING PREVENTIVE BEHAVIORS FOR CORONARY ARTERY DISEASE AMONG ADULT PATIENTS IN ACEH PROVINCE, INDONESIA) อ.ที่ปรึกษาวิทยานิพนธ์หลัก: รศ. ดร.รัตนศิริ ทาโต, 139 หน้า.

การศึกษานี้มีวัตถุประสงค์เพื่อ 1) ศึกษาพฤติกรรมการป้องกันการเกิดโรคหลอดเลือดหัวใจในประชากรผู้ใหญ่ในจังหวัดอาเจะ ประเทศอินโดนีเซีย 2) เพื่อทดสอบความสัมพันธ์ระหว่าง อายุ เพศ ความสนใจในศาสนา ความสำคัญของศาสนา การรับรู้ความอ่อนแอในจิตใจ การรับรู้ความรุนแรง การรับรู้ประโยชน์ การรับรู้อุปสรรค สมรรถนะแห่งตนและพฤติกรรมการป้องกันการเกิดโรคหลอดเลือดหัวใจ 3) เพื่อศึกษาปัจจัยทำนายพฤติกรรมการป้องกันการเกิดโรคหลอดเลือดหัวใจในประชากรผู้ใหญ่ในจังหวัดอาเจะ ประเทศอินโดนีเซีย ได้แก่ อายุ เพศ ความสนใจในศาสนา ความสำคัญของศาสนา การรับรู้ความอ่อนแอในจิตใจ ความสำคัญของศาสนา การรับรู้ความอ่อนแอในจิตใจ การรับรู้ความรุนแรง การรับรู้ประโยชน์ การรับรู้อุปสรรค และสมรรถนะแห่งตน

การศึกษานี้เป็นการศึกษาความสัมพันธ์เชิงทำนาย โดยเก็บข้อมูลในโรงพยาบาลระดับตติยภูมิ 2 แห่งและโรงพยาบาลระดับชุมชน 1 แห่ง ใน 3 ตำบลของจังหวัดอาเจะ ประเทศอินโดนีเซีย กลุ่มตัวอย่างที่ศึกษาเป็นประชากรวัยผู้ใหญ่ อายุ 20-59 ปี จำนวน 178 คน การคัดเลือกกลุ่มตัวอย่างโดยวิธี เลือกกลุ่มตัวอย่างตามสะดวก เครื่องมือที่ใช้ในการวิจัย ได้แก่ แบบสอบถามพฤติกรรมการป้องกันการเกิดโรคหลอดเลือดหัวใจ แบบสอบถามความสนใจในศาสนา แบบวัดจิตวิญญาณแห่งจริง ความเชื่อด้านสุขภาพเกี่ยวกับโรคหัวใจและหลอดเลือด แบบสอบถามสมรรถนะแห่งตนต่อพฤติกรรมสุขภาพ วิเคราะห์ข้อมูลโดยใช้สถิติบรรยาย สถิติสหสัมพันธ์ เพียร์สัน สถิติสัมประสิทธิ์อันดับ และการวิเคราะห์ถดถอยพหุคูณแบบขั้นตอน

#### ผลการศึกษา

1. พฤติกรรมการป้องกันโรคหลอดเลือดหัวใจในประชากรผู้ใหญ่ในจังหวัดอาเจะประเทศอินโดนีเซีย มีค่าเฉลี่ย ( $= 8.80$ ,  $SD = 2.516$ )

2. อายุ เพศ ความสนใจในศาสนา ความสำคัญของศาสนา การรับรู้ความอ่อนแอในจิตใจ การรับรู้ความรุนแรง การรับรู้ประโยชน์ และสมรรถนะแห่งตนมีความสัมพันธ์ทางบวก กับพฤติกรรมการป้องกันการเกิดโรคหลอดเลือดหัวใจอย่างมีนัยยะสำคัญทางสถิติ ( $r = .278$ ,  $\eta = .252$ ,  $r = .838$ ,  $r = .602$ ,  $r = .519$ ,  $r = .244$ ,  $r = .405$ , และ  $r = .285$ ) การรับรู้อุปสรรคมีความสัมพันธ์ทางลบต่อพฤติกรรมการป้องกันการเกิดโรคหลอดเลือดหัวใจอย่างมีนัยยะสำคัญทางสถิติ ( $r = -.297$ )

3. ปัจจัยทำนายพฤติกรรมการป้องกันการเกิดโรคหลอดเลือดหัวใจในประชากรผู้ใหญ่ ในจังหวัดอาเจะ ได้แก่ ความสนใจในศาสนา เพศ การรับรู้ประโยชน์ ความสำคัญของศาสนา และสมรรถนะแห่งตน สามารถร่วมกันทำนายพฤติกรรมการป้องกันการเกิดโรคหลอดเลือดหัวใจในประชากรผู้ใหญ่ในจังหวัดอาเจะ ได้ร้อยละ 79.7 ( $R^2 \text{ change} = .797$ ,  $F = 5.768$ ,  $p < .05$ )

สาขาวิชา พยาบาลศาสตร์

ปีการศึกษา 2558

ลายมือชื่อนิติกร .....

ลายมือชื่อ อ.ที่ปรึกษาหลัก .....

## 5777164036 : MAJOR NURSING SCIENCE

KEYWORDS: ADULTS / CORONARY ARTERY DISEASE PREVENTIVE BEHAVIORS / INDONESIA / PREDICTORS

ZAMNA IDYAN: FACTORS PREDICTING PREVENTIVE BEHAVIORS FOR CORONARY ARTERY DISEASE AMONG ADULT PATIENTS IN ACEH PROVINCE, INDONESIA. ADVISOR: ASSOC. PROF. RATSIRI THATO, Ph.D., 139 pp.

The objectives of this study were: 1) to investigate Coronary Artery Disease (CAD) preventive behaviors among adults in Aceh province, Indonesia; 2) to examine the correlation between age, gender, religious attendance, religious salience, perceived susceptibility, perceived severity, perceived benefits, perceived barriers, self-efficacy and CAD preventive behaviors; 3) to identify predictors of CAD preventive behaviors among adults in Aceh province from gender, age, religious attendance, religious salience, perceived susceptibility, perceived severity, perceived benefits, perceived barrier, and self-efficacy.

This descriptive predictive study was conducted at two secondary hospitals and one community hospital from three districts in Aceh Province, Indonesia. A total of 178 adults aged 20 to 59 years were recruited with convenience sampling. CAD preventive behaviors questionnaire, religious attendance questionnaire, The Intrinsic Spirituality Scale, the Health Beliefs related to cardiovascular scale, the Self Efficacy Questionnaire on Health Behavior were used to collect the data. Descriptive statistics, Pearson's  $r$  correlation, Eta coefficient and Stepwise multiple regression were used to analyze the data. The results revealed that:

1. CAD preventive behaviors in Aceh was at average level ( $\bar{x} = 8.80$ ,  $SD = 2.516$ ).
2. Age, gender, religious attendance, religious salience, perceived susceptibility, perceived severity, perceived benefits, and self-efficacy were positively and significantly correlated with CAD preventive behaviors ( $r = .278$ ,  $\eta = .252$ ,  $r = .838$ ,  $r = .602$ ,  $r = .519$ ,  $r = .244$ ,  $r = .405$ , and  $r = .285$ , respectively). Perceived barriers was negatively and significantly correlated with CAD preventive behaviors ( $r = -.297$ ).
3. The significant predictors of CAD preventive behaviors were religious attendance, gender, perceived benefits, religious salience and self-efficacy. They accounted for 79.7% of the variance ( $R^2$  change = .797,  $F = 5.768$ ,  $p = < .05$ ).

Field of Study: Nursing Science

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Student's Signature .....

Advisor's Signature .....

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# CHAPTER I

## INTRODUCTION

### **Background and Significance of the Study**

Coronary Artery Disease (CAD) remains the leading cause of cardiovascular mortality worldwide. It is estimated that 7.4 million people died from CAD in 2012 (World Health Organization, 2015). In United State of America, CAD strikes someone about once every 43 seconds and 375.000 people died a year due to CAD (WHO, 2015). In Asia, both the mortality and the prevalence of CAD risk factors continue to rise considerably. In South Asian countries, the mortality of CAD is much higher than in Western Countries. CAD is a major cause of mortality in Asian countries including Indonesia (Hata & Kiyohara, 2013).

According to statistic from National Survey 2013, totally 2,697,000 prevalence of CAD in Indonesia, where 1,146,009 cases for male and 1,416,557 cases for female. In addition, 37% of total deaths in Indonesia causes by CAD from total 1,551,000 deaths in 2013. Approximately 2.3 % of CAD incidences found in Aceh province which is the fourth highest province nationally. There are 5 districts with the highest CAD incidences, East Aceh accounted for 1.8% of total cases, followed by Aceh Singkil 1.5%, Sabang 1.3%, Lhokseumawe 1.2% and Langsa 1.1% (Badan Penelitian, 2013).

CAD is often undetected as it develops from young age over the course of several years by cholesterol deposits (plaques) build up called atherosclerosis, narrowing the coronary arteries. The plagues will block the blood supply to the heart muscle. This can eventually weaken the heart muscle, causing heart failure or an arrhythmia. Unfortunately, most people do not feel any symptoms until it produces a heart attack. Most of CAD is asymptomatic and 80% is preventable (WHO, 2015). Therefore, it is very important for people to know how to prevent from CAD. It is recommended that people should perform CAD preventive behaviors in order to prevent from CAD. American Heart Association (AHA) suggests several ideal health behaviors indicating that one should perform CAD preventive behaviors including no smoking, maintaining Body Mass Index (BMI)  $<25 \text{ kg/m}^2$ , doing physical activity at

goal level, and eating recommended diet. In addition, AHA determines 7 goals to maintain cardiovascular health status including smoking, BMI, physical activity, healthy diet score, total cholesterol, blood pressure and fasting plasma glucose (Lloyd-Jones et al., 2010).

CAD preventive behavior is defined as continuously presence of 4 favorable health behaviors including abstinence from smoking within the last year, ideal BMI, physical activity at goal, healthy dietary pattern that promotes cardiovascular health, and the simultaneous presence of 4 favorable health factors which are abstinence from smoking within last year, untreated total cholesterol <200 mg/dl, untreated blood pressure <120/<80 mmHg, and absence of diabetes mellitus, and the absence of clinical cardiovascular disease (Lloyd-Jones et al., 2010).

WHO (2015) revealed that smoking is one of CAD risk factors among Indonesian. Smoking is a common phenomenon among men and become as a culturally habit. At home, at least one of Acehnese's family members and in their social life most of friends are smoker. Male smokes during social gatherings and during the traditional events such as wedding ceremonies, religious festivals, grieving ceremonies, religious lectures, etc. This phenomenon aggravated by the fact that there is no smoking regulation policy arranged by the government. Consequently, people smoke everywhere such as at coffee shops, at restaurants, in public transportations, and at any public facilities. A study discovered that the prevalence of CAD is significantly higher among smoker in Indonesia particularly among older group (Sumartono, Sirait, Holy, & Thabrany, 2011). Data from WHO illustrates that 56.7% of Indonesian adults are smoker (WHO, 2015). In Aceh province, 30% of Aceh populations are active smokers. The higher proportion is among adult (36.3%) (Badan Penelitian, 2013).

Being overweight is acknowledged as one of risk factors which contribute to the incidence of CAD. Higher BMI is associated with clinical inflammation, increased systemic oxidative stress independently from blood glucose that will lead to atherosclerosis. AHA (2010) suggests the normal BMI for adult is within this range 18.5 to 24.9 kg/m<sup>2</sup>. Data revealed that the proportion of male adult with a BMI above 25 kg/m<sup>2</sup> is 19.7%, and the proportion of female adult with a BMI above 25 kg/m<sup>2</sup> is 32.9%. In Aceh province, 23 % of female with a BMI above 25 kg/m<sup>2</sup> and 9.5% of

male with a BMI above 25 kg/m<sup>2</sup> (Badan Penelitian, 2013) Changing food consumption patterns, decreasing exercise, directly contribute to the problem (Roemling & Qaim, 2012).

Physical inactivity leads to higher morbidity from non-communicable disease such as CAD. It is recommended that adults must practice no less than 150 minutes exercise with moderate intensity weekly such as brisk walking or more than 75 minutes vigorous intensity weekly such as aerobic to achieve ideal cardiovascular health (Lloyd-Jones et al., 2010). According to National Survey, Indonesian population is generally classified as physically inactive (26.1%). Several barriers regarding physical activity have been found including time constraint, facility constraint, low motivation, and knowledge about physical activity. In Aceh province, data showed that 37.2% of Acehnese are classified as having sedentary lifestyle in which people exercise less than 150 minutes weekly (Badan Penelitian, 2013).

Another serious health behavior related to CAD is dietary. Unhealthy diet leads to several health consequences including CAD (Lloyd-Jones et al., 2010). Although dietary guideline has been set by policy maker, the problem regarding diet in Indonesia is still occur. Prior study found that some message related to dietary was not well implemented in some provinces in Indonesia. This is due to the transformation of modern lifestyle such as urbanization, changing food consumption from traditional to fast food, ect. Statistic shows that 53.1% Indonesian food is sweet and 40.7% is fatty (Usfar & Fahmida, 2011). In Aceh province, food is a blend of various cultures such as Indian, Arab, and Malay which is mostly tasty, fatty and oily. Approximately 36.6% of Acehnese use coconut oil for cooking and consume it 20.2 grams per person daily. They also use palm oil 18.9 grams per person daily for frying. They consume sodium more than 2,000 mg per person daily. They also consume sugar more than 50 grams (150 kcal) per person daily (Kartono, Hermina, & Faatih, 2014).

Several factors influence preventive behaviors including knowledge, attitude, and belief (Rosenstock, Strecher, & Becker, 1988). According to the Health Belief Model (HBM), one is unlikely to change behavior unless there is a good reason to do so. Thus, for a recommended behavior to be adopted one must feel personally susceptible to a severe and serious illness and one must believe that the benefits of

following the recommended action outweigh the costs or other barriers to performance. For all practical purposes, the original model identified two primary determinants of behavior: perceived risk (which is viewed as some function of perceived susceptibility and perceived severity) and behavioral beliefs, that is, beliefs about the consequences, the costs, and the benefits of performing the behavior in question (Rosenstock, 1974).

Aceh Province is a special province in Indonesia. Since 1999, it is the only Province in Indonesia which applied the *Sharia* law (Islamic-based law) regulation. Aceh's provincial legislature enacted a series of qanuns (local laws) governing the implementation of Sharia. Five qanuns enacted between 2002 and 2004 contained criminal penalties for violations of Sharia: qanun 11/2002 on "belief, ritual, and promoting Islam," which contains the Islamic attire requirement; qanun 12/2003 prohibiting the consumption and sale of alcohol; qanun 13/2003 prohibiting gambling; Qanun 14 /2003 prohibiting "seclusion"; and qanun 7/2004 on the payment of Islamic alms. With the exception of gambling, none of the offenses are prohibited outside of Aceh. The culture of Aceh is basically Islamic. Religious practice in Aceh takes place in the *meunasah* and the mosques. As Muslims, Acehnese are suggested to attend the meunasah or the mosque for prayers 5 times a day. In addition they also suggested to attend the Islamic lectures that held at the mosque or special lecture places namely Islamic Boarding School. These cultural aspects influence Acehnese in daily habits including health behaviors (Taylor, 2015).

From the empirical data, it can be seen that CAD risk behavior among Acehnese is a major health problem which in turn will increase CAD prevalence in Aceh province. Accordingly, it is very important to study CAD preventive behaviors among Acehnese adults. Even though these CAD risk behaviors among Acehnese are hard to change, it is a proactive role of nurses to prevent CAD by modifying its influencing factors. From literature review, none of the theory-based study in Indonesia has examined factors predicting CAD preventive behaviors among Acehnese adults. Therefore, this study will examine the predictors of CAD preventive behaviors so that culturally appropriate intervention can be developed. Finally, the prevalence of CAD among Acehnese will decline.

### **Objectives of the Study**

1. To investigate Coronary Artery Disease (CAD) preventive behaviors among adult patients in Aceh province, Indonesia.
2. To examine the association between gender, age, religious attendance, religious salience, perceived susceptibility, perceived severity, perceived benefits, perceived barriers, self-efficacy and CAD preventive behaviors of adult patients.
3. To identify predictors of CAD preventive behaviors among adult patients in Aceh province from gender, age, religious attendance, religious salience, perceived susceptibility, perceived severity, perceived benefits, perceived barrier, and self-efficacy.

### **Research Questions**

This study addresses the following research questions:

1. What is the CAD preventive behaviors level among adult patients in Aceh province, Indonesia?
2. What are the bivariate relationship between gender, age, religious attendance, religious salience, perceived susceptibility, perceived severity, perceived benefits, perceived barriers, self-efficacy and CAD preventive behaviors of adult patients in Aceh?
3. What are the predictors of CAD preventive behaviors among adult patients in Aceh province?

### **Reasons and Hypotheses**

This study uses the Health Beliefs Model (HBM) as a conceptual framework. Becker (1974) suggests several determinants in order for people to engage in preventive behavior including perceived susceptibility, perceived severity, perceived benefits, perceived barrier, cues to action, and self-efficacy. HBM also includes the modifying factors such as age, sex, ethnicity, socio-economics and knowledge. HBM is one of the most widely employed theories in the design and evaluation of health behavior interventions (Orji, Vassileva, & Mandryk, 2012). HBM addresses the

individual's perception of threat posed by a health problem (susceptibility, severity), the benefits of avoiding the threat and factors influencing the decision to act (barriers, cues to action and self-efficacy).

The independent variables of this study derived from the constructs of HBM theory. Four variables (age, gender, religious attendance, religious salience) derived from the modifying factors domain. Two variables (perceived susceptibility and perceived severity) were adopted from the individual perception domain. Simultaneously, Two variables (perceived benefits and perceived barrier) were derived from the likelihood of action domain. Lastly, the self-efficacy construct was taken as the last independent variable. From the intensive literature reviews, it was found that there are significant relationship between the selected independent variables and the dependent variable. The relationship of each variable will be discussed on the following paragraphs.

*Age* is likely to influence health related behavior. Prevalence of illness increases with expanding of the life span, thus the older tend to seek for health service than the younger. People over 51 years of age were more likely participating in specific screening health checks than people at younger age (Deeks, Lombard, Michelmore, & Teede, 2009). Middle-aged adults generally had poorer health behavior levels compared to older individuals (Zanjani, Schaie, & Willis, 2006). The prevalence of risky medical check-up behavior is increased for old-old adults compared to young-old adults (Cardi et al., 2009).

*Gender* is likely to influence health related behaviors. Frequently, women become the family health caregivers, encouraging male partners and family members to attend for health check. Previous study found that women were more likely to visit their medical practitioner compared to men (Redondo-Sendino, Guallar-Castillón, Banegas, & Rodríguez-Artalejo, 2006). The study also revealed that the percentage of women who visited medical practitioner is greater compared to men. Female had a stronger predictor between pretreatment motivation and perceived risks of smoking compared to male (McKee, O'Malley, Salovey, Krishnan-Sarin, & Mazure, 2005).

*Religious attendance* is refers to reception of religious service offered by a particular denomination. Religious attendance may influence preventive service use in several ways. For example, involvement in religious organization provides individuals



chances for social contact such as religious groups or educational groups. These contacts can result in larger social networks. In turn, more social resources often lead to better health outcomes. Attending the religious service may also have more direct influences on preventive health care utilization. For example, some religious services offer activities or information about health-related topics that may lead (directly or indirectly) to a greater use of health care services (Benjamins & Buck, 2008).

Muslims are suggested to attend the mosque for praying and for religious teaching. The teaching may be held before or after praying activity. In some cases, the teaching may be taught separately from praying times. The subject of the teachings are not only addressing about religiosity, but also about health-related behaviors. However, in fact many Muslims do not follow the teachings of Islam related to good health behaviors. This happened due to increase of negative stressor that will lead to decreased religious commitment and neglecting good health behaviors (Koenig & Shohaib, 2014). Another reason is because of less salience among the Muslims. The more salience is a person the more important a religion for him/her, and the more he/she applying the belief to daily habits (Koenig & Shohaib, 2014).

Certain aspects such as diet, and personal hygiene are addressed specifically in Islamic Law (Koenig & Shohaib, 2014). A study found that Muslims who did not attend prayers compared to those who prayer on time were 2.87 times at risk of health problems (Sotodehasl, Ghorbani, Mahdavi-Nejad, Haji-Aghajani, & Mehdizadeh, 2014). Study in Kuwait found that religious commitment and religious activities affected systolic and diastolic blood pressure (Al-Kandari, 2003). Another study found that religious attendance was significantly associated with the use of preventive health care (Benjamins, Trinitapoli, & Ellison, 2006)

*Religious salience* is a subjective indicator of importance of religion and the degree to which one is involved to the belief. The influence of religion on health behaviors may work directly through religious salience (Benjamins & Buck, 2008). For example, believe in a higher power may encourage positive health behaviors due to feelings of responsibility. More specific for Muslim, religious individuals may be more motivated to maintain their health in order to be physically able to lead a life consistently with their beliefs. The more salience is a person the more he/she applying the belief to daily habits (Koenig & Shohaib, 2014). There are twenty eight verses in

the Qur'an which is relevant to preventive behaviors focusing on nutrition, alcohol abstention, and importance of healthy lifestyle (Aboul-Enein, 2014). Those verses have a great impact on Muslims whose salience are high. Research in Saudi Arabia among college students discovered that students who were more salience were 15% less likely to smoke (Almutairi, 2015).

*Perceived susceptibility* refers to someone's beliefs about likelihood of getting a disease or condition. Perceived susceptibility explains that people will be more motivated to behave in healthy ways if they believe they are vulnerable to a particular negative health outcome (Rosenstock, 1974). When the perception of susceptibility is combined with severity, it results in perceived threat. If the perception of threat is to a serious disease for which there is a real risk, behavior often changes. Perceived susceptibility of CHD can predict CHD preventive behaviors among women and it accounted for 50.7% of the variance (Ali, 2002). Perceived susceptibility to ischemic heart attack associated with cardiac health related behavior among patient with chest pain (Katz et al., 2009). Perceived susceptibility to heart disease was independently associated with exercising after acute coronary syndrome (Reges et al., 2014).

*Perceived severity* is the feeling about seriousness of an illness or leaving it untreated include evaluations of both medical and clinical consequences (for example, death, disability, and pain). If one perceived that an illness is severe, he/she is more likely to adopt preventive behavior (Rosenstock, 1974). Ali (2002) found that perceived seriousness of CHD predict CHD behaviors among women and it explained about 76% of the variance. Another study found that perceived severity was associated with exercise practice among CHD (Mirotznik, Feldman & Stein, 1995). Perceived threat to health was related to exercise habits among coronary heart disease patients (Troein, Råstam, & Selander, 1997). Perceived severity predicted the willingness to engage in preventive health behaviors among cardiac patients (Nau et al., 2005).

*Perceived benefits* refer to an individual's subjective opinion of the value of usefulness of enacting a health behavior to offset the perceived threat. People tend to adopt healthier behaviors when they believe the new behavior will decrease their chances of developing a disease. If one perceived that the benefit of taking action outweighs the costs of the barriers to performance, he/she is more likely to adopt

preventive behavior (Rosenstock, 1974). Perceived benefits was associated with exercise practice among CHD (Mirotznik, Feldman & Stein, 1995). Perceived benefits of exercise predicted participation in cardiac prevention and rehabilitation programs among cardiac patients (Reges et al., 2014).

*Perceived barriers* is the negative aspects of health action such as expensive if take the action, be unpleasant, negative side effects, time-consuming. Of all the HBM constructs, perceived barriers are the most significant in determining behavior change (Janz & Becker, 1984). Perceived barriers predicted nutrition and physical activity behaviors of cardiovascular disease among Tehran University students (Rahmati-Najarkolaei, Tavafian, Gholami Fesharaki, & Jafari, 2015). Fewer barriers was associated to healthy dietary intake among cardiac patient (Sharp & Salyer, 2012). Men's heart-healthy behaviors were predicted by beliefs of barriers (Mahalik & Burns, 2011).

*Self-Efficacy* is an individual's belief about his/her ability to perform the behavior required successfully. People generally do not try to do something new unless they think they can do it. If someone believes that a new behavior is useful, and think that she/he is capable of doing it, the chances are that she/he will try the new behavior is greater (Bandura, 1977). Previous study showed that self-efficacy were important determinants of exercise behavior regulation among CHD patients (Slovenic D'Angelo, Pelletier, Reid, & Huta, 2014). Self-efficacy was the strongest predictor of behavior to modify cardiovascular risk factors (Chiou et al., 2009). Self-efficacy was associated with cardiac exercise among patient with coronary heart disease (Lau-Walker, 2007). Self-efficacy improved the commitment to take healthy diet among cardiac patients (Sharp & Salyer, 2012).

From the reasons above, the hypotheses of this study are:

1. Age, gender (female), religious attendance, religious salience, perceived susceptibility, perceived severity, perceived benefits and self-efficacy are positively correlated with CAD preventive behaviors of Acehnese adults.
2. Perceived barriers is negatively correlated with CAD preventive behaviors of Acehnese adults.
3. Age, gender, religious attendance, religious salience, perceived susceptibility, perceived severity, perceived benefits, perceived barriers and self-efficacy will

be the significant predictors of CAD preventive behaviors among Acehese adults.

### **Boundaries of the Study**

This study was conducted In Aceh province Indonesia. Muslims (male and female) aged 20 to 59 years who come for health care services from primary and secondary hospitals in Aceh province will be selected as the subjects. The dependent variable will be CAD preventive behaviors. The independent variables will be age, gender, religious attendance, religious salience, perceived susceptibility, perceived severity, perceived benefits, perceived barriers and self-efficacy.

### **Operational Definition**

Coronary Artery Disease (CAD) preventive behaviors is defined as behaviors or activities that undertaken by Muslim adult patients in Aceh for the purpose of preventing themselves from CAD including:

1. No smoking within the last year: adults who never or quit smoking for 12 months before.
2. Ideal BMI : 18.5 to 24.9 kg/m<sup>2</sup>
3. Physical activity > 21 minutes per day: adults must perform at least 150 minutes a week (> 21 minutes per day) of at least moderate-intensity physical activity, such as brisk walking, or 75 minutes per week of vigorous-intensity aerobic physical activity, or a combination of moderate and vigorous aerobic activities.
4. Healthy diet scores: Fruits and vegetables more than 4.5 cups per day (1 cup of fruit equals to 1 large orange or banana or 1 small apple), Fish more than 2 serving per week preferably oily fish (a serving of fish is 3.5 ounces), Fiber-rich whole grains: more than 1.1 g of fiber per day, Sodium : less than 1500 mg per day, and Sugar : less than 450 kcal per week.
5. Normal cholesterol: the individual should maintain total cholesterol less than 200 mg/dl.
6. Blood pressure: maintaining systole less than 120 mmHg and diastole less than 80 mmHg.

7. Absence of diabetes mellitus: maintaining fasting plasma glucose less than 100 mg/dl.

CAD preventive behaviors is measured by 4 favorable health behaviors and 4 health factors of ideal cardiovascular health developed by AHA (2010). The smoking elements from health behavior and from health factor are combined becoming one element.

**Age** is the period of living of Muslim adults in Aceh range from 20 to 59 years old. It will be measured by demographic characteristic questionnaire which was developed by researcher.

**Gender** refers to a state of being male or female of Muslim adults in Aceh. It will be measured by demographic characteristic questionnaire which was developed by researcher.

**Religious attendance** is refer to how often Muslim adults in Aceh attend to the Mosque for praying or attending to the Islamic teaching which is taught separately from praying activities. It was measured by the modified religious attendance questionnaire (Hill, Burdette, Ellison, & Musick, 2006).

**Religious salience** refers to the belief of the importance of Islam and the degree to which Muslim adults in Aceh involved in Islamic practice. It was measured by the Intrinsic Spirituality Scale (ISS) for Muslims (Hodge, Zidan, & Husain, 2015).

**Perceived susceptibility** refers to the perception of Muslim adults in Aceh about the possibility or risk of developing CAD. It was measured by the Health Beliefs related to Cardiovascular Disease (HBCVD) scale (Tovar, Rayens, Clark, & Nguyen, 2010).

**Perceived severity** is defined as the perception of Muslim adults in Aceh about the negative impact for the body of getting CAD. It will be measured by the HBCVD (Tovar et al., 2010).

**Perceived benefits** refers to the perception of Muslim adults in Aceh about the positive outcomes or advantages of practicing CAD preventive behaviors. It will be measured by the HBCVD scale (Tovar et al., 2010).

**Perceived barriers** is defined as the perception of Muslim adults in Aceh concerning the obstacles or the difficulties associated with CAD preventive behaviors.

It will be measured by the health beliefs related to cardiovascular disease scale (Tovar et al., 2010).

**Self-efficacy** is defined as the appraisal of Muslim adults' ability to quit smoking, choose healthy food, take the proper amount of exercise, control the weight, and taking the medication as prescribed. Self-efficacy will be measured using Self-efficacy Questionnaire on Health Behavior for vascular patients (Sol, van der Graaf, van der Bijl, Goessens, & Visseren, 2006).

### **Expected Benefits**

Through this study, both local and national health care stakeholders can apply the evidence regarding the current description of CAD preventive behaviors among adults in Aceh province so that the proper health policy strategies in term of CAD prevention can be established. In addition, by findings the factors that influence CAD preventive behaviors, an appropriate cultural intervention regarding CAD preventive behaviors can be developed by nurses in Aceh Indonesia. Furthermore, the findings may contribute to professional development of adult nursing in Indonesia.

## **CHAPTER II**

### **LITERATURE REVIEW**

This study aimed to 1) To investigate Coronary Artery Disease (CAD) preventive behaviors among adults in Aceh province Indonesia, 2) To examine the association between gender, age, religious attendance, religious salience, perceived susceptibility, perceived severity, perceived benefits, perceived barriers, self-efficacy and CAD preventive behaviors of adults, 3) To identify predictors of CAD preventive behaviors among adults in Aceh province, Indonesia.

Related literature is reviewed as follow:

1. Coronary Artery Disease
  1. 1. Risk Factors
  1. 2. Classification
    - 1.2.1. Coronary Atherosclerosis
    - 1.2.2. Angina Pectoris
    - 1.2.3. Myocardial Infarction
  1. 3. Invasive Coronary Artery Procedure
2. CAD Preventive Behavior
  2. 1. Definition
  2. 2. Recommended CAD Preventive Behaviors
    2. 2. 1. Smoking
    2. 2. 2. Obesity
    2. 2. 3. Physical Activity
    2. 2. 4. Diet
    2. 2. 5. Cholesterol
    2. 2. 6. Hypertension
    2. 2. 7. Diabetes
  2. 3. CAD Preventive Behaviors in Indonesia
  2. 4. CAD Preventive Behavior Measurements
3. Determinant of Preventive Behaviors
4. The Health Belief Model Theory
5. Related Literature
6. Conceptual Framework

## **1. Coronary Artery Disease**

Coronary Artery Disease (CAD) remains the leading cause of cardiovascular mortality worldwide. It is estimated that 7.4 million people died from CAD in 2012 (World Health Organization, 2015). In United State of America, CAD strikes someone about once every 43 seconds and 375.000 people died a year due to CAD (Roger et al., 2012). The biggest contributor to cardiovascular-related morbidity is CAD (Moser & Riegel, 2008). In Asia, both the mortality and the prevalence of CAD risk factors continue to rise considerably. In South Asian countries, the mortality of CAD is much higher than in Western countries. CAD is a major cause of mortality in Asian countries including Indonesia (Hata & Kiyohara, 2013).

In Indonesia, totally 2,697,000 prevalence of CAD in Indonesia, where 1,146,009 cases for male and 1,416,557 cases for female. In addition, 37% of total deaths in Indonesia causes by CAD from total 1,551,000 deaths in 2013. Approximately 2.3 % of CAD incidences found in Aceh province which is the fourth highest province nationally. There are 5 districts with the highest CAD incidences, East Aceh accounted for 1.8% of total cases, followed by Aceh Singkil 1.5%, Sabang 1.3%, Lhokseumawe 1.2% and Langsa 1.1% (Badan Penelitian, 2013).

CAD is the most prevalent type of cardiovascular disease in adults (Brunner, Smeltzer, Bare, Hinkle, & Cheever, 2010). For this reasons, it is important for nurses to become familiar with various manifestations of CAD condition and methods for assessing, preventing, and treating this disorders.

### **1. 1. Risk Factors**

CAD risk factors are divided into two groups the modifiable risk factors and non-modifiable risk factors. Modifiable risk factors include hyperlipidemia, smoking, hypertension, diabetes mellitus, obesity and physical activity. Non-modifiable risk factors include family history of coronary heart disease, increasing age, gender and heredity. A risk factor may operate independently or in tandem with other risk factors. Those at risk are advised to seek regular medical examinations and to engage in “heart-healthy” behavior. Four modifiable risk factors (cholesterol abnormalities,



smoking, hypertension, and diabetes mellitus) have been cited as major risk factors for CAD and its complications (Blumenthal, Foody, Wong, 2011).

### **1.1.1. Hypertension**

Hypertension often occurs together with other cardiovascular risk factors, particularly obesity, elevated levels of cholesterol and triglycerides, and diabetes mellitus. This suggests that there may be a common cause for these conditions, but it may simply be that an environmental factor, such as overeating, may lead to some or all of these problems (Blumenthal, Foody, Wong, 2011). In hypertension patients, high blood pressure, the force exerted on your arteries is too high. It's so high that it creates microscopic tears in the artery walls that then turn into scar tissue. This scar tissue provides a lodging place for particles of fat, cholesterol and other substances, which are collectively called plaque. As the plaque builds up, the arteries slowly narrow and harden, causing conditions such as peripheral artery disease (PAD) and coronary artery disease (CAD). As age increases, your arteries will naturally harden and become less elastic over time. This happens even in people without HBP. However, uncontrolled high blood pressure speeds up the hardening process (Willerson & Holmes, 2015).

### **1.1.2. Cigarette Smoking**

Cigarette smoking is a major contributor to coronary heart disease, stroke, and peripheral vascular disease even though smokers tend to be thinner and to have lower blood pressure than nonsmokers. Cigarette smoking cause myocardial ischemia by adversely affecting the balance of demand for myocardial oxygen and nutrients with myocardial blood supply. The increase in demand for oxygen in myocardium is a consequence of nicotine stimulation of the sympathetic of nervous system and the heart. Cigarette smoking acutely increases levels of plasma norepinephrine and epinephrine and enhanced 24-hour urinary excretion of these catecholamine. Regular smoking increases the heart rate up to 20 beats per minutes. Nicotine also increases heart rate, blood pressure and myocardial contractility (Willerson & Holmes, 2015).

### **1.1.3. Obesity**

Any level of overweight appears to increase heart disease risk. Obesity can predispose the development of other risk factors, and the greater the degree of overweight, the greater the likelihood of developing other antecedents of atherosclerosis (such as high blood pressure and diabetes) that will increase the probability that heart disease will develop. Those who are obese (more than 30 percent over their ideal body weight) are the most likely to develop heart disease, even if they have no other risk factors (Blumenthal, Foody, Wong, 2011).

### **1.1.4. Diabetes Mellitus**

Individuals with diabetes mellitus, especially those whose diabetes occurs in adult life, have an increased incidence of coronary heart disease and stroke. Those who have slightly elevated blood sugar levels but do not have detectable diabetes also have an increased risk of developing these problems. The risk of ischemic heart disease is twofold to fourfold higher in people with type II diabetes compared with those without diabetes. The risk of myocardial infarction in patients with diabetes with no history of prior coronary events is similar to the risk of myocardial infarction in patients without diabetes but with prevalent CAD (Blumenthal, Foody, & Wong, 2011).

### **1.1.5. Age**

The risk of cardiovascular events increases as we get older. In many epidemiologic surveys, age remains one of the strongest predictors of disease. More than half of those who have heart attacks are 65 or older, and about four out of five who die of such attacks are over age 65 (Willerson & Holmes, 2015). The risk of cardiovascular events increases as we get older. With age, the function of the heart is influenced mainly by the decrease in elasticity and the ability to respond to changes in pressure (compliance) of the arterial system. The resultant increase in the resistance to the pumping action of the heart thereby increases the work needed to drive the blood to the various organs of the body (Blumenthal, Foody, Wong, 2011).

### **1.1.6. Gender**

Men are more likely than women to develop coronary heart disease, stroke, and other cardiovascular diseases that are manifestations of atherosclerosis. Whether this is because male hormones androgens increase risk or because female hormones estrogens protect against atherosclerosis is not completely understood. It is likely that both play a role, but that the protective role of estrogens is the predominant factor. This seems to be supported by the fact that heart disease risk for women rises dramatically after menopause, when their bodies stop producing estrogen (Blumenthal, Foody, Wong, 2011).

### **1.1.7. Heredity**

In some instances, such as familial hypercholesterolemia (very high levels of cholesterol in the blood), the pattern of inheritance is well understood and the specific biochemical defects are well characterized. For most cardiovascular risk factors, however, the specific way in which inheritance plays a role is not at all clear. As in almost all situations in medicine, both heredity and environment play a role and it is often difficult to know where one stops and the other begins. Prior generations did not have the level of medical care we now enjoy, nor the general awareness about health; the details of the illness that one's grandparents or even parents had may not be precise. anyone who has a family history of heart disease that occurred at an early age (below 55) should be especially careful to reduce the impact of any risk that can be controlled. Even if one can successfully control known risk factors, there are, unfortunately, a number of inherited characteristics that we have not yet identified and so cannot favorably affect. Individuals with a history of atherosclerotic cardiovascular disease in the family simply have to be more vigilant if they wish to avoid heart attacks and strokes (Smeltzer, Bare, Hinkle, and Cheever, 2008).

## **1. 2. Classification**

From literature reviews, generally CAD are classified into three main classification including atherosclerosis, angina pectoris and myocardial infarction. The detail explanation regarding its classification will be discussed below.

### 1. 2. 1. Coronary Atherosclerosis

Atherosclerosis is an abnormal accumulation of lipid, or fatty, substances and fibrous tissue in the lining of arterial blood vessel walls. These substance create blockage and narrow the coronary vessels in a way that reduces blood flow to the myocardium (Brunner et al., 2010). Another literature defines atherosclerosis as accumulation of lipid in the arterial wall, create blockages or narrow the vessels, in a way that reduces blood flow to the myocardium (Smeltzer, Bare, Hinkle, and Cheever, 2008).

#### Pathophysiology

Atherosclerosis is thought to begin a fatty streak of lipids that are deposited in the intima of the arterial wall. These lesions commonly begin early in life, perhaps even in childhood. Not all fatty streaks later develop into more advanced lesions. Genetics and environmental factors are involved in the progression of these lesions. The continued development of atherosclerosis involves an inflammatory response, which begin with injury to the vascular endothelium. The injury maybe initiated by smoking, hypertension and other factors. The presence of inflammation has multiple effects on the arterial wall, including the attraction of inflammatory cells (including macrophages). The macrophages infiltrate the injured vascular endothelium and ingest the lipids, which turn them into what are called foam cells. Activated macrophages also release biochemical substances that can further damage the endothelium, attracting platelet and initiating clotting (Willerson & Holmes, 2015).

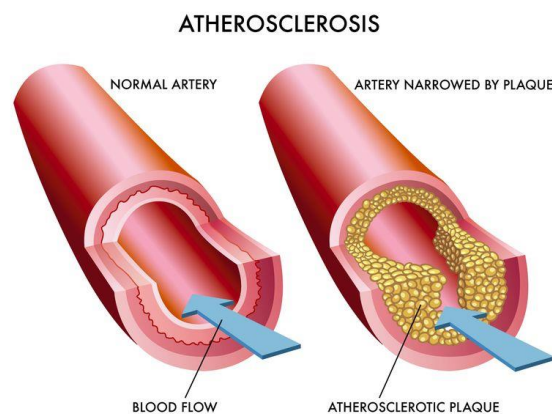


Figure 1 Atherosclerosis (Willerson & Holmes, 2015)

Smooth muscle cells within the vessel wall subsequently proliferate and form a fibrous cap over a core filled with lipid. These deposits, called atheromas or plaques, protrude into the lumen of the vessel, narrowing it and obstructing blood flow. Plaque may be stable or unstable, depending on the degree of inflammation and consequent thicknesses of the fibrous cap. If the fibrous cap of the plaque is thick and the lipid pool remains relatively stable, it can resist the stress from blood flow and vessel movement. If the cap is thin and inflammation is ongoing, the lipid core may grow, causing it to rupture and hemorrhage into the plaque. A ruptured plaque is a focus for thrombus formation. The thrombus may then obstruct blood flow (Smeltzer, Bare, Hinkle, and Cheever, 2008).

Normally, the endothelium of coronary artery allows for unrestricted blood flow to the myocardium. Any kind of trauma or irritant can disrupt this protective endothelium. Endothelial injuries causes the release of thromboxane, which minimizes the extent of injury through local vasoconstriction and by stimulating platelet aggregation. The intima releases prostacyclin in response to the effects of thromboxane. Prostacyclin works to restore equilibrium through local vasodilatation and by opposing platelet aggregation. With repeated injury, the deteriorated intima cannot produce enough prostacyclin, and platelet aggregation forces predominate. Platelet and accumulating monocyte release powerful growth factors into the arterial wall. These factors stimulate the proliferation and migration of medial smooth muscle cells into the intima. This structural change causes an increased permeability of the vessel wall to cholesterol. The accumulation of cholesterol produces a fatty streak that protrudes into the lumen of the artery. Smooth muscle cells and fibrous tissue form a fibrous cap over the fatty streak. The fatty streak continues to grow, invading both the intima and media (Phipps, Sands, Marek, 1999).

### **1. 2. 2. Angina Pectoris**

Angina pectoris is a clinical syndrome usually characterized by episodes of paroxysm of pain or pressure in the anterior chest. The cause is insufficient coronary blood flow, resulting in a decreased oxygen supply when there is increased myocardial demand for oxygen in response to physical exertion or emotional stress. Angina usually causes uncomfortable pressure, fullness, squeezing or pain in the

center of the chest, discomfort in your neck, jaw, shoulder, back or arm (Willerson & Holmes, 2015).

Stable angina Also known as *effort angina*, this refers to the classic type of angina related to myocardial ischemia. A typical presentation of stable angina is that of chest discomfort and associated symptoms precipitated by some activity (running, walking, etc.) with minimal or non-existent symptoms at rest or after administration of sublingual nitroglycerin. Symptoms typically abate several minutes after activity and recur when activity resumes. In this way, stable angina may be thought of as being similar to intermittent claudication symptoms. Other recognized precipitants of stable angina include cold weather, heavy meals, and emotional stress (Phipps, Sands, Marek, 1999).

Unstable angina may occur unpredictably at rest, which may be a serious indicator of an impending heart attack. What differentiates stable angina from unstable angina (other than symptoms) is the pathophysiology of the atherosclerosis. The pathophysiology of unstable angina is the reduction of coronary flow due to transient platelet aggregation on apparently normal endothelium, coronary artery spasms, or coronary thrombosis. The process starts with atherosclerosis, progresses through inflammation to yield an active unstable plaque, which undergoes thrombosis and results in acutemyocardial ischemia, which, if not reversed, results in cell necrosis (infarction). Studies show that 64% of all unstable anginas occur between 10 PM and 8 AM when patients are at rest (Phipps, Sands, Marek, 1999).

### **Pathophysiology**

Angina pectoris usually caused by atherosclerosis disease. Almost invariably, angina is associated with a significant obstruction of a major coronary artery. Normally, the myocardium extracts a large amount of oxygen from the coronary circulation to meet its continuous demands. When there is an increase in demand, flow through the coronary arteries needs to be increased. When there is a blockage in a coronary artery, flow cannot be increased, and ischemia results. Ischemia of the heart muscle may produce pain or other symptoms, varying in severity from mild indigestion to a choking or heavy sensation in the upper chest. **Stable Angina** is predictable and consistent pain that occurs on exertion and is relieved by rest.

**Unstable Angina** (also called pre-infraction angina or crescendo angina) symptoms occur more frequently and last longer than stable angina. The threshold for pain is lower, and pain may occur at rest (Willerson & Holmes, 2015).

### **Clinical Manifestation**

Ischemia of the heart may produce pain or other symptoms. The pain is often felt deep in the chest behind the sternum (retrosternal area). Typically, the pain or discomfort is localized and may radiate to the neck, jaw, shoulders, and inner aspects of the upper arms, usually the left arm. The patient often feels tightness or a heavy, choking, or strangling sensation that has a viselike, insistent quality. A feeling of weakness or numbness in the arms, wrists, and hands, as well as shortness of breath, pallor, diaphoresis, dizziness or lightheadness, nausea and vomiting, may accompany the pain. Anxiety may occur with angina. An important characteristic of angina is that it subsides with rest or nitroglycerin (Willerson & Holmes, 2015).

### **1. 2. 3. Myocardial Infarction (MI)**

In a myocardial infarction, certain area of the myocardium is permanently destroyed. Significant myocardial damage may result low cardiac output, and the heart cannot support the body's needs for blood, which is called heart failure. A decrease in blood supply from coronary artery may even cause the heart to abruptly stop beating (sudden cardiac death) (Willerson & Holmes, 2015).

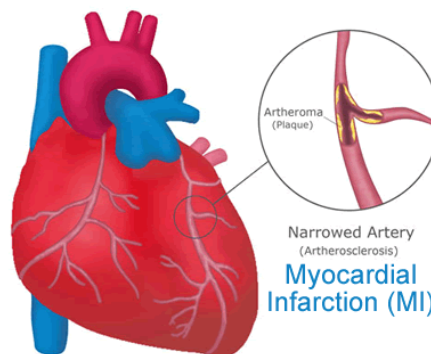


Figure 2 Coronary Artery Disease (Willerson & Holmes, 2015).

### **Pathophysiology**

Myocardial infarction is usually caused by reduced blood flow in a coronary artery due to rupture of an atherosclerotic plaque and subsequent occlusion of the artery by a thrombus. In unstable angina, the plaque ruptures but the artery is not completely occluded. Because unstable angina and acute MI are considered to be the same process but different points along the continuum, the term acute coronary syndrome (ACS) may be used for the diagnosis. Other causes of MI include vasospasm (sudden constriction or narrowing) of a coronary artery, decreased oxygen supply (from acute blood loss, anemia, or low blood pressure), and increased demand for oxygen (from a rapid heart rate). The area of infarction develops over minutes to hours. As the cells are deprived of oxygen, ischemia develops, cellular injury occurs, and the lack of oxygen results in infarction, or the death of cells (Willerson & Holmes, 2015).

Coronary occlusion creates a rapid series of physiological events. The first of these events is immediate myocardial ischemia distal to the occlusion. Ischemia alters the integrity and the permeability of the myocardial cell membrane to vital electrolytes. This instability depress myocardial contractility and predisposes the patient to sudden death from dysrhythmias. The body activates fibrinolysis to lyse the clot and restore blood flow. However, if clot lysis does not immediately restore blood flow, ischemia will continue in the area of myocardium distal to the obstruction. Ongoing myocardial ischemia for 20 minutes or longer can result in death of the tissue. This condition is termed acute myocardial infarction (Phipps, Sands, Marek, 1999).

### **1.3. Pharmacologic Therapy**

There are several common medications for coronary artery disease including Antiplatelet agents, nitrates, beta blockers, calcium channel blockers, angiotensin-converting enzyme inhibitors, anti-coagulants, thrombolytics and oxygen administration (Phipps, Sands, Marek, 1999). Another literature suggests the same medication, but in addition beta-adrenergic blocking agents is suggested (Smeltzer, Bare, Hinkle, and Cheever, 2008).



#### **1. 4. Invasive Coronary Artery Procedure**

Invasive interventional procedures to treat CAD and angina include Percutaneous Transluminal Coronary Angioplasty (PTCA), intracoronary stent implantation and Coronary Artery Bypass Graft (CABG) (Smeltzer, Bare, Hinkle, and Cheever, 2008).

##### **Percutaneous Transluminal Coronary Angioplasty (PTCA)**

In PTCA, a balloon-tipped catheter is used to open blocked coronary vessels and resolve ischemia. It is used in patients with angina and as an intervention for acute MI. The purpose of PTCA is to improve blood flow within a coronary artery by compressing and “cracking” the atheroma. The procedure is attempted when the cardiologist believes that PTCA can improve blood flow to the myocardium (Smeltzer, Bare, Hinkle, and Cheever, 2008).

##### **Coronary Artery Stent**

After PTCA, a coronary artery stent is placed to overcome clotting and scar tissue formation. A stent is a metal mesh that provides structural support to a vessel at risk of closure. The stent is positioned over the angioplasty balloon. When the balloon is inflated, the mesh expands and presses against the vessel wall, holding the artery open. The balloon is withdrawn, but the stent is left permanently within the artery (Smeltzer, Bare, Hinkle, and Cheever, 2008).

##### **Coronary Artery Bypass Graft (CABG)**

The traditional CABG procedure is performed with the patient under general anesthesia. The surgeon makes a median sternotomy incision and connects the patient to the Cardiopulmonary bypass (CPB) machine. Next, a blood vessel from another part of the patient’s body (saphenous vein, left internal mammary artery) is grafted distal to the coronary artery lesion, bypassing the obstruction (Smeltzer, Bare, Hinkle, and Cheever, 2008).

In summary, coronary artery disease is an impedance or blockage of one or more arteries that supply blood to the heart, usually due to atherosclerosis (hardening of the arteries). A major cause of illness and death begins when cholesterol or lipid substances (plaques) are deposited within a coronary artery. The plaques in the coronary arteries can lead to the formation of clots that can obstruct the flow of blood to the heart muscle, producing symptoms including chest pain (angina pectoris), heart attack (myocardial infarction), and sudden death. The risk factors of CAD are varies depends on how a literature classify it. Generally, there are seven risk factors that well-known including hypertension, cigarette smoking, obesity, diabetes mellitus (modifiable risk factors), age, gender and genetic factor (non-modifiable factors).

There are three classifications of CAD including atherosclerosis, angina pectoris (stable angina and unstable angina), and myocardial infarction (MI). Numerous medications are administered when an individual suffer from CAD including antiplatelet agents, nitrates, beta blockers, calcium channel blockers, angiotensin-converting enzyme inhibitors, thrombolytics, beta-adrenergic blocking and oxygen. Invasive procedures are performed sometimes if needed such as Percutaneous Transluminal Coronary Angioplasty (PTCA), coronary artery stent, and Coronary Artery Bypass Graft (CABG).

## **2. Coronary Artery Disease (CAD) Preventive Behavior**

Behavior is central to the development prevention, treatment and management of the preventable manifestations of Coronary artery disease (CAD). In this study, coronary artery disease preventive behaviors are discussed based on the American Heart Association guideline for cardiovascular ideal behaviors.

### **2. 1. Definition**

American Heart Association (2010) defined CAD preventive behavior as continuously presence of 4 favorable health behaviors including abstinence from smoking within the last year, ideal BMI, physical activity at goal, healthy dietary pattern that promotes cardiovascular health, and the simultaneous presence of 4

favorable health factors which are abstinence from smoking within last year, untreated total cholesterol <200 mg/dl, untreated blood pressure <120/<80 mmHg, and absence of diabetes mellitus, and the absence of clinical cardiovascular disease.

CAD preventive behavior is a coordinated set of actions, at public and individual level, aimed at eradicating, eliminating, or minimizing the impact of cardiovascular disease and their related disability (Perk et al., 2012).

CAD preventive behavior refers to activities undertaken to prevent the onset of CAD and to identify and treat asymptomatic person who already have developed risk factors or preclinical CAD but in whom the condition is not yet clinically apparent (Moser & Riegel, 2008).

From three definitions above it can be concluded that CAD preventive behavior is any activities and behaviors which are performed by individuals in term of anticipating themselves from both the risk and further complication of coronary artery disease.

In this study, CAD preventive behavior is defined according to AHA definition as a continuously presence of 4 favorable health behaviors including abstinence from smoking within the last year, ideal BMI, physical activity at goal, healthy dietary pattern that promotes cardiovascular health, and the simultaneous presence of 4 favorable health factors which are abstinence from smoking within last year, untreated total cholesterol <200 mg/dl, untreated blood pressure <120/<80 mmHg, and absence of diabetes mellitus, and the absence of clinical cardiovascular disease.

## **2. 2. Recommended CAD Preventive Behaviors**

Health behaviors have significant and substantial association with CAD risk. The relationships of health behaviors to CAD risk are similarly robust among men (AHA, 2010). In order to impede CAD, AHA (2010) recommends four ideal health behaviors (smoking, weight maintenance, physical activity, diet) and four health factors that must be achieved (abstinence from smoking within last year, desirable cholesterol, blood pressure and fasting blood glucose value). These health behaviors and health factors must be fulfilled concurrently.

### **2. 2. 1. Smoking**

Adults who never or quit smoking for 12 months before, and never tried or never smoked for children 12 to 19 years old are categorized as ideal health behaviors (Lloyd-Jones et al., 2010). The smoking of tobacco products increases the risk of cardiovascular disease including CAD, stroke and peripheral artery disease. How smoking cause CAD will be discussed in the mechanism below (Centers for Disease Control Prevention, 2010).

Cigarette smoking cause myocardial ischemia by adversely affecting the balance of demand for myocardial oxygen and nutrients with myocardial blood supply. The increase in demand for oxygen in myocardium is a consequence of nicotine stimulation of the sympathetic of nervous system and the heart. Cigarette smoking acutely increases levels of plasma norepinephrine and epinephrine and enhanced 24-hour urinary excretion of these catecholamine. Regular smoking increases the heart rate up to 20 beats per minutes. Nicotine also increases heart rate, blood pressure and myocardial contractility.

In healthy person, cigarette smoking increases coronary blood flow in response to increases in myocardial work. In smokers, the response in coronary blood flow to increased myocardial demand is impaired. Cigarette smoking play a direct role by constricting coronary arteries through nicotine-mediated action on  $\alpha$ -adrenergic receptors and by induction of endothelial dysfunction by nicotine and oxidizing chemicals. In addition, oxidant chemicals contribute to platelet activation and thrombogenesis.

Exposure to carbon monoxide (CO) may also contribute to the adverse haemodynamic effect of cigarette smoking. CO increases the need of coronary blood flow, especially during physical exertion. Cigarette smoking produces inadequate vasodilatory flow reserve in the face of need for increased coronary blood flow mediated by carbon dioxide, could contribute to myocardial ischemia with exercise in smokers. Cigarette smoking also has effects on inflammation, insulin sensitivity, and lipid abnormalities that most likely contribute to smoking-induced CAD.

### **2. 2. 2. Obesity**

Obesity is defined as the presence of excessive body fat, or most accurately excess weight for height. AHA suggests the normal body weight for adults as BMI of 18.5 to 24.9 kg/m<sup>2</sup>, while for children aged 2 to 19 as BMI of less than 85 percentile. It is thought that a major issues confronting CAD at present and for the future is the high and increasing prevalence of overweight and obesity (Lloyd-Jones et al., 2010).

The relationship between obesity and CAD appears to develop at a relatively young age. It is associated with accelerated coronary artery atherosclerosis. The development of atherosclerosis in obesity stems from a constellation of inter-related pro-atherogenic mechanism. Higher BMI is associated with clinical inflammation, increased systemic oxidative stress independently from blood glucose. Endothelial dysfunction has been also demonstrated in obese patients (Marinou, Tousoulis, Antonopoulos, Stefanadi, & Stefanadis, 2010).

### **2. 2. 3. Physical Activity**

Physical activity is defined as any bodily movement produced by skeletal muscles that result in energy expenditure beyond resting expenditure. Regular physical activity reduces the risk of many adverse health outcomes including cardiovascular health. The exercise has certain intensity, frequency and duration. For adults, most health benefits occur with at least 150 minutes a week of at least moderate-intensity physical activity, such as brisk walking, or 75 minutes per week of vigorous-intensity aerobic physical activity, or an equivalent combination of moderate and vigorous aerobic activities (Lloyd-Jones et al., 2010).

Exercise training leads to increases vascular responsiveness mediated primarily by increased formation of endothelium-dependent nitric oxide. Exercise induces improvements in endothelial function, a principle mechanism for the improved myocardial perfusion. Exercise also improves coronary plaques stability and reduces long term cardiovascular mortality. Exercise results in improved endothelial function, increase arterial vessel diameter and may delay the progression of atherosclerosis and promote collateral vessel formation. Increased physical activity is less likely to be overweight as more calories are burned. Exercise improves all

components of metabolic syndrome, particularly the characteristic pattern of dyslipidemia, abdominal obesity, and insulin resistance (Willerson & Holmes, 2015).

#### **2. 2. 4. Diet**

AHA selected 5 aspects of diet to define a healthy dietary score. It is a practical approach that provides individuals with a set of potential concrete action. Individuals are considered at healthy diet if minimum 4 components are fulfilled. The dietary recommendations are listed as follow:

- Fruits and vegetables : more than 4.5 cups per day (1 cup of fruit equals to 1 large orange or banana or 1 small apple, 1 cup of vegetable equals to 1 medium potato or large sweet potato or 1 cup of cooked greens or 2 medium carrots).
- Fish : more than 2 serving per week preferably oily fish (a serving of fish is 3.5 ounces, approximately the same size as a deck of cards).
- Fiber-rich whole grains: more than 1.1 g of fiber per day
- Sodium : less than 1500 mg per day
- Sugar : less than 450 kcal per week (Lloyd-Jones et al., 2010).

There are several other factors are important for healthy dietary pattern including avoidance of fat and saturated fat and avoidance of processed meat, intake of nuts, legumes and seeds (Lloyd-Jones et al., 2010)..

#### **2. 2. 5. Cholesterol**

Cholesterol is a lipid soluble compound and is a component of cells in the body. It enables absorption and transport of fatty acids. There are two main type of cholesterol lipoprotein: low-density lipoprotein (LDL) and high-density lipoprotein (HDL). LDL is a harmful type of cholesterol that blocked the arteries, cause CAD. HDL cholesterol helps to protect against CAD keeping the arteries clear of blockage. High cholesterol levels can lead to clogged arteries a process known as atherosclerosis. LDL damages that will lead to fatty deposit in the arterial walls, as the deposit grow larger, plaque is formed. Dietary modification is relevant to anyone who has raised blood cholesterol level (Walker, 2013). To avoid from CAD, it is suggested that an individual should maintain total cholesterol less than 200 mg/dl.

### **2. 2. 6. Hypertension**

Atherosclerosis is exacerbated by arterial hypertension. Hypertension is frequently associated to metabolic disorders, such as insulin resistance with hyperinsuliaemia and dyslipidemia, which are additional risk factors of atherosclerosis. Deposition of lipids and the formation of the atherosclerotic plaque may be favoured by the increase of transmural pressure in arterial vessels, with an increase in mechanical stress and endothelial permeability. It has been recently confirmed that coronary blood flow is increased in hypertensive patients with left ventricular hypertrophy compared with hypertensive without hypertrophy and normotensives. The lumen area was similar in hypertensive with hypertrophy of the left ventricle and normotensives, and significantly greater than hypertensive without hypertrophy. Vessel area was significantly greater in hypertensive with hypertrophy than in those without. Vessel area increased significantly with plaque area in the three groups. The increase in lumen area would contribute to maintain a constant flow velocity in large epicardial arteries and as a consequence a normal endothelial function with a normal shear stress. This would result in a reduced release of endothelium-derived relaxing factor which is known to be a potent vasodilator, inhibits proliferation of vascular smooth muscle cells, endothelial movement and extracellular matrix production (Escobar, 2002).

### **2. 2. 7. Diabetes**

Diabetes mellitus is a major risk factor for atherosclerosis, clinically manifested as diabetic macrovascular complication. The risk of ischemic heart disease is twofold to Fourfold higher in people with type II diabetes compared with those without diabetes. The risk of myocardial infarction in patients with diabetes with no history of prior coronary events is similar to the risk of myocardial infarction in patients without diabetes but with prevalent CAD (Blumenthal, Foody, & Wong, 2011).

Type II diabetes increases endothelial dysfunction, driven largely by dysregulated nitric oxide biology, indirect and direct vascular effects of advanced glycation end products, direct adverse effects of increased circulating non-esterified free fatty acids, and increased systemic inflammation and aberrant leukocyte-

endothelial interaction among others. Compounding the direct vascular effects of diabetes are a number of perturbations in the proteo-fibrinolytic system and platelet yielding a constitutive prothrombotic. These abnormalities include increased circulating tissue factor, further contributing to increased thrombotic potential as well as acceleration of atherosclerosis. Finally, diabetic dyslipidemia is a constellation of metabolically interconnected lipid and lipoprotein abnormalities, including increased plasma triglycerides, decreased HDL, and modest increased in LDL. Decreased HDL impairs reverse cholesterol transport (the movement of cholesterol from peripheral tissues to the liver) and reduces the anti-inflammatory and antioxidant effects of HDL in the circulation. Elevated LDL and increased remnant lipoproteins directly promotes atherosclerosis (Blumenthal, Foody, & Wong, 2011).

### **2. 3. Preventive Behavior Problem in Indonesia Related to Target Population**

There has been a rapid increase in coronary artery disease (CAD) in most asean countries in association with rapid economic development, including Indonesia. Hypertension, smoking and diabetes mellitus are the main risk factors. Indonesia fails to provide its population with sufficient CAD care. Because both monitoring and effective treatment of CAD are currently lacking, Indonesia may experience a higher burden due to substantial morbidity, mortality, and increasing healthcare costs in the decade ahead. The identification of factors that distinguish those with met needs for CAD care from the rest of the population may suggest how the current levels of unmet needs can be reduced, thus staving off the tremendous anticipated burden (Maharani & Tampubolon, 2014).

At the individual level, higher levels of per capita expenditure, possession of health insurance and residence in a rural area are important determinants in explaining discrepancies in met needs for CAD care. Individuals who are better off have a higher likelihood of receiving CAD care services even if they live in rural areas or have no health insurance. This underlines the fact that poverty increases the risk of having unmet healthcare needs. Higher income is associated with more frequent and more intensive use of health services in Indonesia, the poor use inpatient service in hospitals 60% less than the relatively wealthy. People with higher incomes tend to



seek care from modern health care providers rather than traditional practitioners (Maharani & Tampubolon, 2014).

Prior study projected that CAD mortality rates will double from 1990 to 2020, with approximately 82% of the increase attributable to the developing countries including Indonesia. Rapid socioeconomic growth in developing countries increases exposure to risk factors for CAD, such as diabetes, hypercholesterolemia, dietary, hypertension and smoking (Okraïneç, Banerjee, & Eisenberg, 2004). This prophecy is relevant to the data from Indonesian national survey. Series of national surveys in Indonesia indicate increasing of CAD prevalence (Badan Penelitian, 2013).

Majority of Indonesian population are Muslim. Muslim belief and practice regarding health are based on the Qur'an and the Hadith. Quranic verses encourage healthy life-style, consume good and healthy food, and performing physical activity (Aboul-Enein, 2014). These religious and cultural traditions influenced the attitudes and practices of Muslims toward health behaviors, food consumption, and physical activity.

Smoking has been the most significant risk factor for CAD in Indonesia (Badan Penelitian, 2013). This phenomenon happened due to Indonesia does not have strict regulations regarding smoking, and unlike many countries in the region, has not ratified the WHO's framework convention on tobacco control (WHO, 2015). One of the reasons was the government officials perceived of lack of local evidences on the health consequences of smoking as the majority of cigarettes consumed by Indonesian are kreteks. While some policy makers argue that the kreteks (the Indonesian native cloved cigarettes) have no health consequence since the associations between kreteks and CAD have not been proven (Sumartono et al., 2011). Consequently, Smoking is almost ubiquitous, which also results in increasing numbers of passive smokers. People smoke freely everywhere and anytime even inside their houses. Cigarette advertising and tobacco sponsorship in sport and performing arts are prolific. Smoking cessation programs are also quite rare. Clinical consultations to quit smoking are still very rarely done, either in clinics or health centers. Statistic shows that 56.7% of Indonesian adults are smoker (WHO, 2015).

Obesity is considered as primarily problems of developed countries with increasing income, urbanization, and changing lifestyle. In Indonesia, overweight and

obesity are becoming problems in both urban and rural area (Roemling & Qaim, 2012). Obesity is higher among women due to women seems to have higher propensity to store fat. Furthermore, after pregnancy women often have the problem of not losing the excess weight that they gained. But there are also cultural factors related to the type of work and leisure activities acceptable for women in some societies especially in countries with high Muslim population such as Indonesia. Women are sometimes less free to do sports and other physical exercises, which may raise the likelihood of accumulating excess weight. National survey discovered that the prevalence of adult obesity among male is 19.7% , prevalence of adult obesity among female is 32.9% (Badan Penelitian, 2013).

Physical activity is defined as any bodily movement produced by skeletal muscle that results in energy expenditure beyond resting expenditure. Exercise is a subset of physical activity that is planned, structured, repetitive, and purposeful in the sense that improvement or maintenance of physical fitness is the objective (Lloyd-Jones et al., 2010). Physical inactivity leads to higher morbidity and mortality from non-communicable disease such as CAD. Physical activity both prevents and helps treat many established atherosclerosis risk factors, including elevated blood pressure, insulin resistance and glucose intolerance, elevated triglyceride concentrations, low HDL concentration and obesity. Approximately 26.1 % of Indonesian population classified as sedentary life style spreading to 22 provinces. Time constraint, facility constraint, low motivation, and knowledge about physical activity are reasons of Indonesian for not doing physical activity (Badan Penelitian, 2013).

Indonesia is a multi-ethnic society with the population consisting of approximately 50 ethnic groups (Badan Penelitian, 2013). There is an ethnic diversity with widely diverse of food consumption among those 50 ethnic groups. The Indonesian dietary guidelines for the general population had been published in 1995 consisted message : consume food to provide sufficient energy, obtain not more than a quarter of energy from fat or oil, use only iodized salt, consume iron-rich food, eat breakfast, drink adequate quantities of fluid that are free from contaminant, avoid drinking alcohol, and eat a wide variety of food (Usfar & Fahmida, 2011). Unfortunately, not all message are implemented due to the transformation of modern lifestyle. Food consumption pattern changes from traditional food to fast food. Data

showed that Most of Indonesian foods are sweet (53.1 %) and fatty (40.7 %) (Badan Penelitian, 2013).

From the description above, it is obviously can be seen that the CAD prevalence increases considerably in Indonesia as well as the risk factors by reason of urbanization, rapid socioeconomic growth, and alteration of lifestyle. It is predicted that the incidence of CAD will be double in the next five years in Indonesia. Poor CAD preventive behaviors such as cigarette smoking, unhealthy diet, and sedentary lifestyle aggravate the problem. Related policies from the government are also still lacking. It is the nurses' duty together with the other health care workers and the policy maker to overcome this problem by modifying those poor health behaviors with cultural approach.

#### **2. 4. CAD Preventive Behavior Measurement**

Based on literature review there are several instruments could be used to measure CAD preventive behavior such as the AHA measurement of ideal cardiovascular health, the Lifestyle Index (Kim, Popkin, Siega-Riz, Haines, & Arab, 2004), and the 30-item Beliefs and Behaviour Questionnaire (George, Mackinnon, Kong, & Stewart, 2006).

##### **1. American Heart Association measurement of ideal cardiovascular health**

To achieve improvement in cardiovascular health, AHA sets the same 8 elements of CAD preventive behaviors definition as the primary means for measuring the behavior. For this purpose, definition of 4 recommended behaviors (abstinence from smoking within the last year, ideal BMI, physical activity at goal, healthy dietary) and 3 health factors (untreated total cholesterol <200 mg/dl, untreated blood pressure <120/<80 mmHg, and absence of diabetes mellitus) are expanded to encompass the entire spectrum of cardiovascular health. The smoking element from the health factors was dropped since it the same to the smoking element from the recommended behaviors.

Elements	Poor Health	Intermediate Health	Ideal Health
<b>Current smoking</b>	Yes	Former <12 month	Never or quit >12 month
<b>Body mass index</b>	>30 kg/m <sup>2</sup>	25-29.9 kg/m <sup>2</sup>	<25 kg/m <sup>2</sup>
<b>Physical activity</b>	None	1-149 minutes weekly moderate intensity or 1-74 minutes weekly vigorous intensity or 1-149 minutes weekly moderate + vigorous intensity.	>150 minutes/week moderate intensity or >75 minutes weekly vigorous intensity or >150 minutes moderate + vigorous.
<b>Healthy diet score</b>	0-1 components	2-3 components	4-5 components
<b>Total cholesterol</b>	>240 mm/dl	200-239 mg/dl or treated to goal	<200 mg/dl
<b>Blood pressure</b>	Systole > 140 mmHg or diastole >90 mmHg	Systole 120-139 or diastole 80-89 mmHg or treated to goal.	Systole <120 or diastole <80 mmHg
<b>Fasting plasma glucose</b>	>126 mg/dl	100-125 mg/dl or treated to goal	<100 mg/dl

Element of behaviors and factors are divided into three levels (poor = 0, intermediate = 1, ideal = 2 points range from 0 to 14 points for all seven element). The score is categorized into three groups: inadequate (0 – 4 points), average (5 – 9 points), and optimum (10 – 14 points). Many previous studies used the AHA CAD preventive behaviors measurements, however none of the studies reported the reliability of the measurements.

A study in China used the AHA measurement of ideal cardiovascular health in their study to evaluate how well the elements predict mortality from all cause of

cardiovascular disease in adult Chinese found that 4 elements (smoking status, physical activity, blood pressure and fasting blood glucose) were significantly associated with all-cause mortality of cardiovascular disease (Liu et al., 2014). Another study in Beijing also used AHA measurement to investigate the relationship between cardiovascular health score and the risk of cardiovascular disease (Miao et al., 2015). AHA Cardiovascular health score was strongly and inversely associated with risk of CAD (Lachman et al., 2015). Another study measured CAD preventive behaviors using AHA measurement in their study and reported that the AHA cardiovascular health metric is a strong predictor of mortality from all cause and diseases of the circulatory system (Ford, Greenlund, & Hong, 2012). AHA measurement also employed to study the ideal cardiovascular health in Northern China (Wu et al., 2012). AHA measurement was used to estimate the prevalence of ideal cardiovascular health and its relationship with incidence of CVD in community (Folsom et al., 2011).

## 2. Lifestyle Index (LI)

The LI measures 4 aspects of health behaviors including diet, physical activity, smoking and alcohol use (Kim et al., 2004). For diet, the Diet Quality Index-International (DQI-I) to measure diet quality is used. Variety of diet is evaluated in two aspects, overall variety and variety within protein source to assess whether intake comes from diverse sources both across and within food groups. A maximum score of dietary protein variety is defined as consumption of at least three different sources of protein (from among meat, poultry, fish, dairy, beans and eggs) per day. The adequacy category evaluates the intake of fruits, vegetables, grains, protein, iron, calcium, vitamin C, and dietary fiber. Percentage of energy intake of total fat, saturated fat, and empty calorie foods and the level of cholesterol and sodium intake are evaluated. Lastly, DQI-I examines the balance of diet in term of proportionality in the energy sources and fatty acid composition. The total DQI-I score ranges from 0 (poorest) to 100 (best possible).

Physical activity index includes any bodily movement produced by skeletal muscles that result in energy expenditure, covering daily activities at work and structured exercise training. Over 30 minutes of moderate-intensity physical activity

on each day of the week is recommended to obtain benefits from physical activity. The Physical Activity Index (PAI) categorizes activity level into five groups: very active, active, moderate, light and sedentary, and assigns a gradient of score from 10 (very active) to 0 (sedentary).

The Smoking Index (SMI) is based on both the status and amount of smoking. Categories of smoking status include nonsmokers, former smokers, and current smokers. Nonsmokers who have never smoked are given the highest score of 10. Current smokers are categorized into 4 groups based on the number of cigarettes smoked per day, and the descending gradient of scores (from 5 to 0) is given as the smoking amount increases. Smokers are given a score of 5 at best, because smoking with any intensity significantly elevates the risk of chronic disease. Since the health benefits of smoking cessation are noticeable the higher score of 7 points is given to former smokers.

The Alcohol Consumption Index (ACI) is used to measure the pattern of alcohol consumption. Four or more drinks for women and five or more drinks for men per occasion are considered binge drinking and are given the lowest score of 0. If an individual is not a binge drinker, the number of drinks per week is categorized further. Both abstinence and moderate consumption categories are given the highest score of 10.

A weighted sum of four components results in the overall LI score ranging from 0 to 100, with a higher score representing a healthier lifestyle. The four components are weighted according to the degree that they affect long-term health-based on a comprehensive review of literature.

### 3. Beliefs and Behavior Questionnaire (BBQ)

The 30-items BBQ was developed by George, Mackinnon, Kong & Stewart (2006). It measures beliefs, experience and adherence behavior on five-point Likert-type scales. The beliefs section has two factor solutions that are confidence and concern with internal consistency of 0.45 and 0.82, respectively. The two domains identified the experience section, satisfaction, and disappointment have internal consistencies of 0.52 and 0.85, respectively. The behavior section, separately entitled the Tool for

Adherence Behavior Screening (TABS) has a two factors solution that are adherence and non-adherence, with internal consistencies of 0.59 and 0.80, respectively.

In summary, literature review reported various instruments have been used to measure preventive behaviors such as the Lifestyle Index (LI), the Beliefs and Behavior Questionnaire (BBQ) and the AHA measurement. The LI and the BBQ are only measure the health behaviors aspect of CAD preventive behaviors. Whereas The AHA measurement measure both health behavior and health factors of CAD preventive behaviors. For the reason that it measures the CAD preventive behaviors comprehensively, the AHA measurement was employed used in this study to quantify the level of CAD preventive behaviors among adult patients in this study. Another reason that from previous studies showed that AHA measurement was measure CAD preventive behaviors more accurately (Liu et al., 2014; Miao et al., 2015; Lachman et al; Ford, Greenlund, & Hong, 2012; Wu et al., 2012; Folsom et al., 2011).

### **3. Determinants of CAD Preventive Behaviors**

Individuals commonly realize that they should perform preventive health behavior for the sake of better and long life such as not smoking, have a balanced diet low in fat and rich in vegetables and fruits, exercising, avoid heavy drinking, medical screening, ect. However even knowing that those healthy behaviors can avoid serious future health problems, some people do not undertake it. As such, people do not provide the same response as health behavior developed to treat diseases that have already been diagnosed through symptoms, exams or medical opinion. Furthermore, it is essential to apprehend the factors behind why people adopt preventive health behaviors as mentioned above.

The HBM theory recommends several factors that influencing people to engage in preventive behaviors. Summarily, the HBM suggests that preventive health behaviors are influenced by six factors including perceived susceptibility, perceived severity, perceived benefits, perceived barriers, cues to action, and self-efficacy. In addition, HBM also includes the modifying factors such as age, sex, ethnicity, socio-economics and knowledge (Becker, 1974).

### **3.1 Modifying Factors**

Age, gender, religious attendance and religious salience were selected as the modifying factors in this study. Age and gender were selected for the reason that there was evidence from previous study in Indonesia that age and gender were associated with CAD preventive behaviors (Badan penelitian, 2013). Religious attendance and religious salience were selected for the reason that from previous study among Muslim population in Muslim countries found that there were significant correlation between religious attendance, religious salience and cardiovascular prevention program (Hassan, 2015; Aboul-Enein, 2014). Another reason to overcome the characteristic of Aceh population is a religious population.

#### **3.1.1 Age**

3.1.1.1 Definition: Age is the length of time that a person has lived or a thing has existed. Age is acknowledged has relationship on the maintenance of positive health status.

3.1.1.2 Relationship to CAD preventive behavior : Health behavior change is thought to occur across lifespan at varying rate contingent on the individual position in the lifespan as well as personal and social association specific to a given life stage. For example, older individuals might be more inclined to engage in positive health behavior change to prevent poor health outcomes, due to their high probability of death and morbidity compared to young individuals. One can assume that older individuals with poorer health status will display positive health behavior change due to their life stage and their higher vulnerability for further morbidity and premature mortality. A previous study showed that change in health behavior differed by age group for food consumption, food preparation, and medical care, primarily showing negative change for old adult and positive change for individuals with cardiovascular disease (Zanjani et al., 2006). Another study reported that middle-aged adults had the highest proportion of obesity level compared older adults, and the prevalence of risky medical check-up behavior is increased for old-old adults compared to young-old adults (Cardi et al., 2009). People over 51 years of age were more likely participating in specific screening health checks than people at younger age (Deeks et al., 2009).



3.1.1.3 Measurement: Demographic characteristic questionnaire will be created by the researcher to collect data regarding age.

### **3.1.2. Gender**

3.1.2.1. Definition: Category that indicating sex which is refers to the state of being male or female.

3.1.2.2. Association to CAD preventive behaviors: Gender is likely to influence health related behaviors. Compared to men, women live longer but reported greater morbidity and disability and make greater use of health care service. Utilization of health service by women and men differs according to the health problem for which care is required. Women seek medical attention more frequently than men, yet there are no differences in the proportion of women and men that immediately seek medical advice when a chest pain appears (Nau et al., 2005). Compared to men, a higher percentage of women visited a medical practitioner, received home medical visits, and took medications (Redondo-Sendino et al., 2006). Another study reported that social network is more important for women than men to engage in health behaviors. Furthermore men are more likely to smoke than women (Gallant & Dorn, 2001).

3.1.2.3. Measurement: Gender will be quantified by Demographic characteristic questionnaire develop by researcher.

### **3.1.3. Religious Attendance**

3.1.3.1. Definition: Religious attendance is the frequency of a person attend to the religious denomination or service (Hill et al., 2006).

3.1.3.2. Relationship to CAD preventive behaviors: Religious attendance may serve to improve and maintain good health behavior, mental health, and social relationships. It seems clear that individuals who frequently attend religious services report a higher prevalence of good health behaviors, particularly not smoking, not drinking excessively, and being more involved in networks of community groups. Muslims are suggested to attend the mosque for praying 5 times a day. This suggestion is optional for Muslims indicating they may go or not. However, for men, it is compulsory to attend the mosque on every Friday afternoon about an hour to perform *Jum'ah* praying. During the attendance,

Islamic lecture is taught. The core teachings of Islam emphasize respect for the body and discourage any behaviors that lead to poor physical health or adversely affect the health of the community. Certain aspects such as diet, and personal hygiene are addressed specifically in Islamic Law (Koenig & Shohaib, 2014).

The Qur'an discourages excesses of all kinds, whether this relates to eating and food consumption or to extravagant living practices (Aboul-Enein, 2014). This also applies to having sexual relationship outside of marriage, which is strictly condemned in Islam. The Prophet Muhammad himself engaged in regular sport (archery, running) and encouraged Muslims to maintain their physical health in order to enhance their ability in worshiping. Although drug use and cigarette smoking are not mentioned clearly in the Qur'an, the Prophet certainly discouraged these. These teachings are continuously taught at the Mosque, yet in some cases, the teaching may be taught separately from praying times. Previous researches indicate that health behaviors are much better in Muslims who follow the teachings from religious attendance. Study in Kuwait found that religious commitment and religious activities affected systolic and diastolic blood pressure (Al-Kandari, 2003). Another study among Malaysian Muslims showed that health-related actions are strongly influenced both directly and indirectly by engaging daily basis in accordance with Islamic teachings (Hassan, 2015). Muslims who did not attend prayers compared to those who prayer on time were 2.87 times at risk of health problems (Sotodehasl et al., 2014).

3.1.3.3. Measurement: Religious attendance will be measured by the modified of religious attendance questionnaire developed by Hill, Burdette, Ellison, & Musick (2006). The questionnaire consists of 2 items that will obtain information regarding the frequency of the participants attending to the mosque or praying service.

#### **3.1.4. Religious Salience**

3.1.4.1. Definition: Religious salience refers to the important and the degree of commitment to religious faith (Koenig & Shohaib, 2014).

3.1.4.2. Relationship to CAD preventive behaviors: Salience in Islam is likely influence health through the belief and values. Islamic beliefs and practices are

based on the Qur'an, the Hadith (authentic sayings of the Prophet reported by others), Sunnah (doings of the Prophet reported by others), and the opinion of early Muslims scholars based on their interpretation of the Qur'an, Hadith and Sunnah. Islamic beliefs and practices are strongly related since devout Muslims do what they think is right and seek to avoid what is wrong in the terms of behavior. While the Qur'an is not medical book and does not specifically focus on health and healing, it contains a number of verses that directly or indirectly address issue of health, medicine, healthcare and attitude toward those who are sick. More sayings on health and healthcare are found in the Hadith. According to these Hadith, the Prophet Muhammad encouraged Muslims to seek treatment for illness, just as he sought treatment for himself (Koenig & Shohaib, 2014). Previous study in Saudi Arabia among college students discovered that students who were more salience were 15% less likely to smoke (Almutairi, 2015).

3.1.4.3. Measurement: From literature review there are various measurements for religious salience such as: the Intrinsic Spiritual Scale (ISS) (Hodge, 2003), the Intrinsic Spiritual Scale (ISS) for Muslims (Hodge et al., 2015), and the Centrality of Religiosity Scale (Huber & Huber, 2012).

In this study, the Intrinsic Spiritual Scale (ISS) for Muslims will be used to measure religious salience, because this scale addressed better for Muslim population. Questionnaire consisted of six questions with response key from 0 to 10, in which 0 corresponds to an absence or zero amount of attribute, while 5 corresponds to a medium or moderate amount of the attribute, and 10 corresponds to the maximum of the attribute.

## **3.2 Individual Perception**

Perceived susceptibility, perceived severity, perceived benefits, perceived barriers and self-efficacy were adopted to this study for the reason that from previous studies found that there were significant relationship between these factors with CAD preventive behaviors.

### **3.2.1 Perceived Susceptibility**

3.2.1.1 Perceived susceptibility is refers to someone's beliefs about likelihood of getting a disease of condition. Perceived susceptibility explains that people will

be more motivated to behave in healthy ways if they believe they are vulnerable to a particular negative health outcome (Rosenstock, 1974).

3.2.1.2. Relationship to CAD preventive behaviors: Perceived susceptibility is one of the most vigorous perceptions in convincing people to adopt healthier behaviors. The greater perceived risk, the better the likelihood of involving to a behavior to reduce the risk. When people believe they are at risk for a disease, they will be more likely to do something to prevent it from happening. Unfortunately, the opposite also occur. When people believe they are not at risk or have a low risk of susceptibility, unhealthy behaviors tend to result. Perceived susceptibility of CHD can predict CHD preventive behaviors among women and it accounted for 50.7% of the variance (Ali, 2002).

3.2.1.3. Measurement: Numerous Existing instruments available to measure perceived susceptibility such as: the Health Beliefs related to Cardiovascular (HBCVD) Scale (Tovar et al., 2010), HBM instrument to predict coronary heart disease preventive behaviors created by Ali (2002), and the Cerebrovascular Attitudes and Beliefs Scale (CABS-R) (Sullivan, White, Young, & Scott, 2010).

In this study, the HBCVD Scale will be used to quantify perceived susceptibility construct due to better consistency. The response format is a 4-point Likert scale ranging from *Strongly Disagree* (1) to *Strongly Agree* (4), consisted of 5 items.

### **3.2.2 Perceived Severity**

3.2.2.1 Definition: Perceived severity refers to an individual's beliefs about the seriousness of a disease or condition. If one perceived that an illness is severe, he/she is more likely to adopt preventive behavior (Rosenstock, 1974).

3.2.2.2 Relationship to CAD preventive behaviors: Perceived severity is often based on medical information or knowledge, it may also come from beliefs a person has about the difficulties a disease would create or the effects it would have on his or her life in general. A study reported that perceived severity was associated with exercise practice among CHD (Mirotnik et al., 1995). Another study found that perceived seriousness of CHD predict CHD behaviors among women and it explained about 76% of the variance (Ali, 2002).

3.2.2.3. Measurement: Several Existing instruments available to measure perceived severity such as : the HBCVD Scale developed by Tovar, Rayens, Clark, & Nguyen (2010), HBM instrument to predict coronary heart disease preventive behaviors created by Ali (2002), and the Cerebrovascular Attitudes and Beliefs Scale (CABS-R) developed by Sullivan, White, Young, & Scott (2010).

In this study, the HBCVD Scale will be used to quantify perceived severity construct. The response format is a 4-point Likert scale ranging from *Strongly Disagree* (1) to *Strongly Agree* (2), consisted of 5 items.

### 3.2.3 Perceived Benefits

3.2.3.1. Definition: Perceived benefits is an individual's opinion of the value or advantages of a new behavior in decreasing the risk of developing a disease. If one perceived that the benefit of taking action outweighs the costs of the barriers to performance, he/she is more likely to adopt preventive behavior (Rosenstock, 1974).

3.2.3.2. Relationship to CAD preventive behaviors: People would strive to eat five servings of fruits and vegetables a day if they believe it is beneficial. People would quit smoking if they believe it is better for their health. Evidence from a study discovered that perceived benefits was associated with exercise practice among CHD (Mirotznik et al., 1995). Study in Iran found that perceived benefits was a significant predictor of smoking behavior among pre-college students (Reisi et al., 2014).

3.2.3.3. Measurement : Various instruments available to measure perceived benefits such as: the Health Beliefs related to Cardiovascular Scale developed by Tovar, Rayens, Clark, & Nguyen (2010), HBM instrument to predict coronary heart disease preventive behaviors created by Ali (2002), and the Cerebrovascular Attitudes and Beliefs Scale (CABS-R) developed by Sullivan, White, Young, & Scott (2010).

In this study, the HBCVD Scale will be used to measure perceived benefits construct. The response format is a 4-point Likert scale ranging from *Strongly Disagree* (1) to *Strongly Agree* (2), consisted of 6 items.

### 3.2.4 Perceived Barriers

3.2.4.1. Definition: Perceived Barriers is an individual's own evaluation of the obstacles in the way of him or her adopting a new behavior.

3.2.4.2. Relationship to CAD preventive behaviors: In order for a new behavior to be adopted, a person need to believe the advantages of the new behavior outweigh the consequences of continuing the old behavior. A kind of cost benefit analysis is thought to occur wherein the individual weighs the action's effectiveness against perceptions that it may be expensive, dangerous, inconvenient, and unpleasant. Perceived barriers are the most significant in determining behavior change (Janz & Becker, 1984). Study showed that perceived barriers predicted nutrition and physical activity behaviors of cardiovascular disease among Tehran University students (Rahmati-Najarkolaei et al., 2015).

3.2.4.3. Measurement : Some existing instruments available to measure perceived barriers such as : the Health Beliefs related to Cardiovascular Scale developed by Tovar, Rayens, Clark, & Nguyen (2010), HBM instrument to predict coronary heart disease preventive behaviors created by Ali (2002), and the Cerebrovascular Attitudes and Beliefs Scale (CABS-R) developed by Sullivan, White, Young, & Scott (2010).

In this study, the HBCVD Scale will be used to measure perceived barriers construct. The response format is a 4-point Likert scale ranging from *Strongly Disagree* (1) to *Strongly Agree* (2), consisted of 9 items.

### 3.2.5 Self-Efficacy

3.2.5.1. Definition: Self-Efficacy is the belief in one's own ability to do something (Bandura, 1977).

3.2.5.2. Relationship to CAD preventive behaviors: People generally do not try to do something new unless they think they can do it. If someone believes that a new behavior is useful, and think that she/he is capable of doing it, the chances are that she/he will try the new behavior is greater (Bandura, 1977). A study discovered that self-efficacy was a strong positive and significant determinant of healthy behavior (Orji et al., 2012). Another study showed that self-efficacy was

important determinants of exercise behavior regulation among CHD patients (Slovenic D'Angelo et al., 2014).

3.2.5.3. Measurements: There are numerous existing instruments to measure cardiac self-efficacy such as: Bandura's exercise self-efficacy scale in cardiac rehabilitation setting (Everett, Salamonsen, & Davidson, 2009), self-efficacy beliefs in managing heart disease scale (Steca et al., 2015), and Self Efficacy Questionnaire on Health Behavior for vascular patients (Sol et al., 2006).

In this study, Self-Efficacy Questionnaire on Health Behavior for vascular patients by the reason that it is addressing the four behavioral indicators regarding heart disease (smoking, weight, diet and physical activity). The 9-item questionnaire is scored on a 5-point Likert scale. The last question "I think I am able to control my coronary artery disease" will be modified because it is inappropriate to the sample in this study, remaining 8-item questionnaire. The higher the score, the better the self-efficacy (5), the lower the score, the lower the self-efficacy (1) of total score 45.

#### **4. The Health Beliefs Model (HBM)**

The HBM was developed in the early 1950s by a group of social psychologists in order to understand the widespread failure of people to accept disease preventives or screening tests for the early detection of asymptomatic disease. It was later applied to patients' responses to symptoms and to compliance with prescribed medical regimens (Janz & Becker, 1984). The Health Belief Model is a framework for motivating people to take positive health actions that uses the desire to avoid a negative health consequence as the prime motivation. For example, CAD is a negative health consequence, and the desire to avoid CAD can be used to motivate engaging ideal cardiovascular health behaviors. Similarly, the perceived threat of a heart attack can be used to motivate a person with high blood pressure into exercising more often.

There are six constructs of the HBM. The first four constructs was developed as the original elements of the HBM: perceived susceptibility, perceived severity, perceived benefits and perceived barrier. The last two were added as research about the HBM evolved: cues to action and self-efficacy. From the original model, it revealed that the cues to action has not been subjected to carefully study (Rosenstock,

1974). For this reason, cues to action was not selected as one of independent variable of this study.

### **Perceived Susceptibility**

Perceived susceptibility refers to a person subjective perception of the risk of acquiring an illness or disease (Rosenstock, 1974). When people believe that they are at risk for a disease, they will be more likely to do something to prevent it from happening. The greater the perceived risk, the greater the likelihood of engaging in behaviors to decrease the risk.

### **Perceived Severity**

Perceived severity refers to a person's feeling on the seriousness of contracting an illness or disease. If one perceived that an illness is severe, he/she is more likely to adopt preventive behavior (Rosenstock, 1974). For example, most of us view flu as a relatively minor illness, we stay home few days and get better. However, if we have asthma, ailing flu could land us in hospital. In this case, our perception of the flu might be that it is a serious disease. When the perception of susceptibility is combined with severity, it is result with the perception of threat (Rosenstock, 1974).

### **Perceived Benefits**

Perceived benefits refer to a person's perception of the effectiveness of various actions available to reduce the threat of illness or disease. If one perceived that the benefit of taking action outweighs the costs of the barriers to performance, he/she is more likely to adopt preventive behavior (Rosenstock, 1974). For example, people would not quit smoking if they did not believe it was better for their health.

### **Perceived Barrier**

Perceived barrier refers to a person's feeling on the obstacles to performing a recommended health action. Even if a person perceives a health condition as threatening and believes that a particular action will effectively reduce the threat, barriers may prevent engagement in the health promoting behavior. In other words, the perceived benefits must outweigh the perceived barriers in order for behavior change to occur. For instance, in certain culture HIV-AIDS is a very taboo disease.



Those who diagnosed with HIV will be discriminated among the community. This phenomenon could be a barrier for the high risk group to do screening for HIV.

### **Modifying Variables**

The four major constructs of the perception are modified by the other variables, such as age, sex, ethnicity, socioeconomic, knowledge. These are individual characteristics that influence personal perceptions. For example, older people tend to perform health screening due to the impaired of body function.

### **Cues to Action**

In addition to the four perceptions and modifying variables, the HBM suggests that behavior is also influence by cues to action. Cues to Action is the stimulus needed to trigger the decision making process to accept a recommended health action. The cues can be internal (chest pain, wheezing) or external (advice from others, illness of family member, newspaper article, etc). From the original model, it revealed that the cues to action has not been subjected to carefully study (Rosenstock, 1974). For this reason, cues to action was not selected as one of independent variable of this study.

### **Self-Efficacy**

In 1988, self-efficacy was added to the original four beliefs of the HBM (Rosenstock et al., 1988). Self-efficacy refers to the level of a person's confidence in his or her ability to successfully perform a behavior. If someone believes that a new behavior is useful, and think that she/he is capable of doing it, the chances are that she/he will try the new behavior is greater (Bandura, 1977).

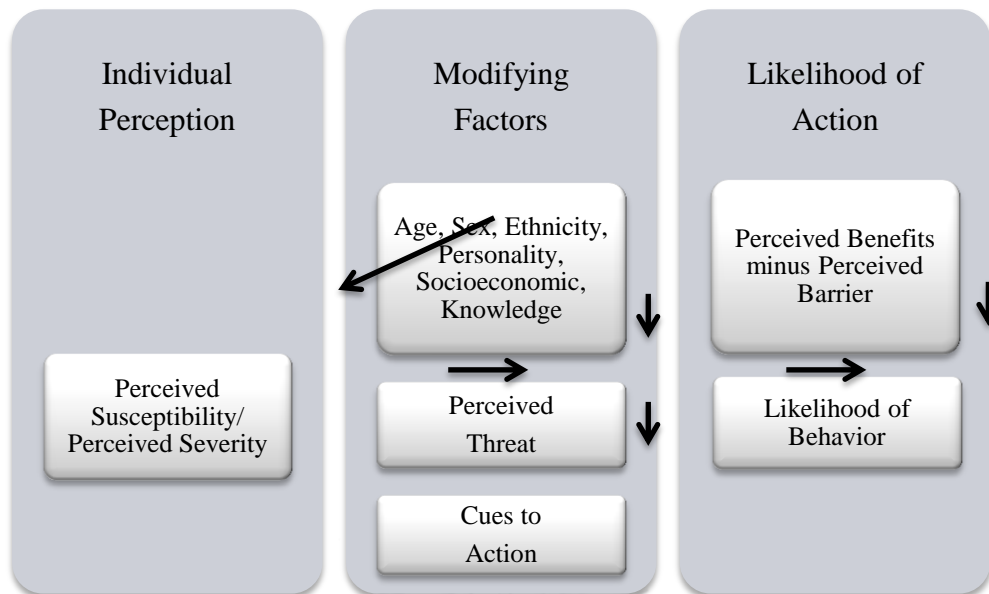


Figure 3 . Basic elements of the Health Belief Model adopted from Janz & Becker (1984)

## 5.. Related Literatures

Many previous studies have been conducted by adopting the HBM constructs in their study to predict health behaviors related to cardiovascular disease. Some of the studies are among CAD population. HBM is one of the most widely employed theories in the design and evaluation of health behavior interventions (Orji et al., 2012).

Rahmati-Najarkolaei, Tavafian, Gholami Fesharaki & Jafari (2015) in their study in Iran predicted factors related to unhealthy nutrition and inactive life among students of Tehran University concluded that perceived severity, perceived barrier and self-efficacy had significance association with physical activity behaviors among students.

Reisi, Javadzade, Shahnazi, Sharifirad, Charkazi, & Moodi (2014) in their study found that perceived susceptibility, perceived benefits and self-efficacy had significance association with health-related problem due to smoking.

A study by Reges, Vilchinsky, Leibowitz, Khaskia, Mosseri, & Kark (2014) in their research regarding illness recognition during cardiac prevention and

rehabilitation program found that perceived susceptibility and perceived benefits were associated to exercise among cardiac prevention patients.

Mirotznik, Feldman, & Stein (1995) found that Perceived severity of CHD and perceived benefits of exercise are associated with CHD exercise program. Another study by Horwood, Williams & Mandic (2015) found that Perceived benefits and perceived barriers were associated to exercise program among CAD patients. Muench (1987) found that Perceived benefits and perceived barriers were associated with cardiac exercise program.

Study in Taiwan by Chiou, Wang, Chan, Ding, Hsu & Kao (2009) among CAD patients revealed that self-efficacy was the strongest predictor of behavior to modify cardiovascular risk factors. Oka, Gortner, Stotts, & Haskell (1996) in their study resulted that Self-efficacy is a better predictor of performance of physical activity among heart disease patients. Orji, Vassileva, & Mandryk (2012) revealed self-efficacy and perceived susceptibility are significant determinants of healthy eating behavior. Lau-Walker (2007) found that Self-efficacy was associated with eating healthy diet and exercise among CHD patients. Slovenic D'Angelo, Pelletier, Reid & Huta (2014) discovered that self-efficacy is associated to exercise behavior among patients with coronary heart disease.

Ali (2002) discovered that there were significant relationship has been found between HBM constructs to cardiac related behaviors Perceived susceptibility of CHD and perceived seriousness of CHD explained 76% of the variance of CHD behaviors. Perceived severity of CHD was associated with cardiac-related self-management (Nau, Ellis, Kline-Rogers, Mallya, Eagle, & Erickson, 2005).

Troein, Råstam, & Selander (1997) studied the relationship between individual health beliefs and risk factors for coronary heart disease found that perceived threat to health cause by illness was related to exercise habits among CHD patients.

Katz et al. (2009) perceived susceptibility and perceived benefits were associated to quit smoking among acute coronary syndrome patients with chest pain symptom. Mahalik & Burns (2011) perceived benefits and barriers were associated with men's heart-healthy behaviors. Sharp, & Salyer (2012) discovered that Self-

efficacy and perceived barriers were associated to healthy dietary intake among cardiac patients.

In conclusion, from the literature review it appears that a growing number of Indonesian populations exposed to unhealthy behaviors such as smoking, unhealthy diet, less physical activity and obesity which will lead to increase CAD in the future. In Indonesia none of a theory-based study has been conducted to identify predicting factors of CAD preventive behavior. Nurses are challenged to better understand what is the most significant factors that influence Indonesian to practice CAD preventive behavior particularly among Muslim thus the appropriate nursing intervention can be developed in the future.

The independent variables in this study will be derived from HBM constructs and also from empirical literature review which are related to CAD preventive behavior. Age, gender, perceived susceptibility, perceived severity, perceived benefits, perceived barriers and self-efficacy are selected from both the HBM modifying factors and perceptions. Two religious variables (religious attendance and religious salience) will be added as the part of modifying factors in which from evidences are influencing CAD preventive behaviors at Muslim setting.

Therefore, Age, gender, religious attendance, religious salience, perceived susceptibility, perceived severity, perceived benefits, perceived barriers and self-efficacy will be the significant predictors of CAD preventive behaviors among Acehese adults as illustrated in conceptual framework.

## **6. Conceptual Framework**

In this study, CAD preventive behavior is defined based on American Heart Association definition as a continuously presence of 4 favorable health behaviors including abstinence from smoking within the last year, ideal BMI, physical activity at goal, healthy dietary pattern that promotes cardiovascular health, and the simultaneous presence of 4 favorable health factors which are abstinence from smoking within last year, untreated total cholesterol <200 mg/dl, untreated blood pressure <120/<80 mmHg, and absence of diabetes mellitus, as it illustrates on figure 4.

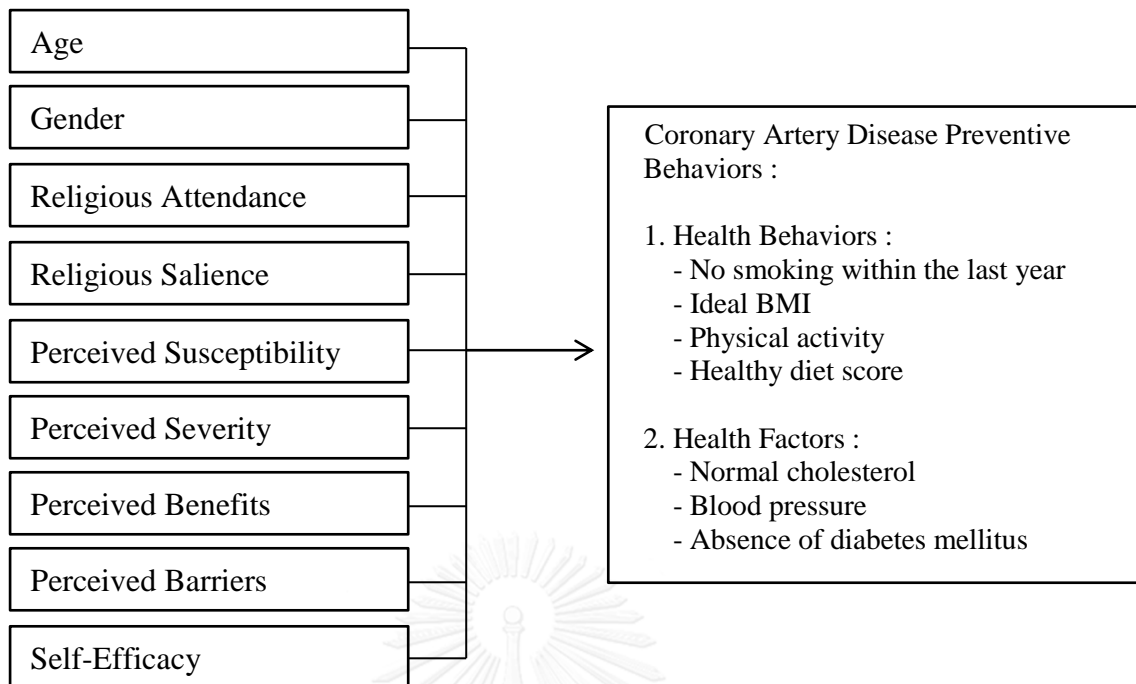


Figure 4. Conceptual Framework

## **CHAPTER III**

### **METHODOLOGY**

#### **Research Design**

This descriptive predictive research aimed to investigate Coronary Artery Disease (CAD) preventive behaviors among adults in Aceh province Indonesia, examine the association between gender, age, religious attendance, religious salience, perceived susceptibility, perceived severity, perceived benefits, perceived barrier, self-efficacy and CAD preventive behaviors of adults, and identify predictors of CAD preventive behaviors among adults in Aceh province, Indonesia. Therefore this study is a correlational predictive research.

#### **Settings**

Aceh province is one of the provinces in Indonesia. It consists of 23 districts. The territory is located at the northernmost of Sumatra Island. Its capital city is Banda Aceh. Aceh is the place where the spread of Islam in Indonesia was begun. It is the only province in Indonesia in which the Islamic law is applied. The population of Aceh province is about 5 million (Badan Pusat Statistik Provinsi Aceh, 2015).

According to National Survey 2013, Approximately 2.3 % of CAD incidences found in Aceh province which is the fourth highest province nationally. There are 5 districts with the highest CAD incidences, East Aceh accounted for 1.8% of total cases, followed by Aceh Singkil 1.5%, Sabang 1.3%, Lhokseumawe 1.2% and Langsa 1.1% (Badan Penelitian, 2013). This study was conducted at one primary hospital in the North Aceh district (Puskesmas Lhoksukon) and two secondary hospitals, one is in Langsa municipality (Rumah Sakit Umum Langsa Hospital ) and another one is in Lhokseumawe municipality (Rumah Sakit Cut Meutia Hospital). These settings were chosen because higher prevalence of CAD compared to other districts in Aceh based on the statistic above.

## Population and Sample

**Population:** The population of this study was adult patients who came for health care services from two secondary hospitals and one primary hospital in Aceh. Total adults patients who come to outpatient from the three settings are 21,670 (Badan Pusat Statistik Provinsi Aceh, 2015).

**Sample:** The sample of this study was 178 adult patients who came for health care services at outpatient units from two secondary hospitals (Rumah Sakit Umum Langsa Hospital and Cut Meutia Lhokseumawe Hospital), and one primary hospital (Puskesmas Lhoksukon) in Aceh. A convenience sampling technique was proportionally used in recruiting the subjects.

**Sample Size Justification:** The power analysis was employed to calculate the sample size using the Power Analysis and Sample Size (PASS) software. Based on the effect size of  $R = .3$ , to achieve a power of 80% at significant level of .05, 167 subjects is required. In order to overcome the missing data, 200 subjects were recruited. However, 22 subjects from Puskesmas Lhoksukon did not complete the questionnaire. The missing data occurred when the researcher came on Friday's aerobic activity at Puskesmas Lhoksukon. There were so many participants who were willing to participate in this study at the same time, and answer the questionnaire simultaneously. Thus the researcher missed to check the completion of the questionnaire of the 22 participants. Totally, 178 subjects remained in the study.

The following criteria were determined to recruit the participants:

1. Muslim male and female aged 20-59 years old who are not diagnosed with CAD.
2. Willing to participate in the study.
3. No limitation of communication in both written and spoken Indonesian language.
4. Having the report on cholesterol and fasting blood glucose in medical record during the last three months.

Finally, 60 participants were recruited from Rumah Sakit Umum Langsa hospital, 60 participants from Cut Meutia Hospital and 58 participants from Puskesmas Lhoksukon. Totally, 178 participants completed the data.

## **Research Instruments**

Data were collected using a set of questionnaires as follows:

### **1. Demographic Characteristic Questionnaire**

Demographic characteristic questionnaire was developed by the researcher. The questionnaire was a self-reported questionnaire which consisted of both closed-ended questions and open-ended questions including age, gender, marital status, level of education, occupation, the reason of coming to the hospital and health history.

### **2. CAD Preventive Behaviors**

The CAD preventive behaviors questionnaire developed by American Heart Association was used in this study. The questionnaire assessed four health behaviors and four health factors. It composed of a close-ended question asking about smoking behavior, BMI, physical activity and dietary, total cholesterol, blood pressure, and fasting plasma glucose.



Elements	Poor Health (scored 0)	Intermediate Health (scored 1)	Ideal Health (scored 2)
Current smoking	Yes	Former <12 month	Never or quit >12 month
Body mass index	>30 kg/m <sup>2</sup>	25-29.9 kg/m <sup>2</sup>	<25 kg/m <sup>2</sup>
Physical activity	None	1-149 minutes weekly moderate intensity or 1-74 minutes weekly vigorous intensity or 1-149 minutes weekly moderate + vigorous intensity.	>150 minutes/week moderate intensity or >75 minutes weekly vigorous intensity or >150 minutes moderate + vigorous.
Healthy diet Score	0-1 components	2-3 components	4-5 components
Total cholesterol	>240 mm/dl	200-239 mg/dl or treated to goal	<200 mg/dl
Blood pressure	Systole > 140 or diastole >90 mmHg	Systole 120-139 or diastole 80-89 mmHg or treated to goal.	Systole <120 or diastole <80 mmHg
Fasting plasma Glucose	>126 mm/dl	100-125 mm/dl or treated to goal	<100 mmHg

According to the four health behaviors and four health factors proposed by AHA, smoking behavior and factor were combined into one item. The fixed seven items were classified into three levels (poor = 0, intermediate = 1, ideal = 2). The total scores range from 0 to 14 points for all seven elements. The score is further categorized into three groups: inadequate (0 – 4 points), average (5 – 9 points), and optimum (10 – 14 points). To meet the ideal CAD preventive behaviors, an individual would need to meet the optimum level of the score. The content validity index of the questionnaire was 1. The pilot study with 30 participants showed that the reliability of the

questionnaire was .86 (Appendix J). From literature review, it was found that many previous studies used this measurement to measure cardiovascular health behaviors score (Folsom et al., 2011; Lachman et al., 2015; Liu et al., 2014; Miao et al., 2015; Wu et al., 2012).

In this section of questionnaire, the participants were asked to complete questions regarding smoking, physical activity and dietary pattern. For items regarding BMI, cholesterol value, blood pressure and fasting plasma glucose value were completed by the researcher by looking to the participants' medical record.

### **3. Religious Attendance**

Religious attendance questionnaire was modified from the religious attendance questionnaire (Hill et al., 2006). The original questionnaire consisted of 1 item that asking about the frequency of the participants attending to the religious service. In this study, it has been modified by replacing the religious service from "Church" to "Mosque" and one additional question has been added to represent the Islamic teaching class. The participants were asked to rate the frequency of praying attendance to the mosque. The frequency of praying score ranged from 0 to 4, in which 0 corresponded to an absence of attending to the mosque (never or once a year), 1 corresponded to minimum of attendance (monthly), 2 corresponded to low attendance (weekly), 3 corresponded to moderate frequency of attendance (1 to 3 times daily), and 4 corresponded to the maximum attendance (4 to 5 times daily). The additional question asked about how often the participants attend to the Islamic teaching class/lecture. The total score ranged from 0 to 4, in which 0 corresponded to an absence of attending to the Islamic lecture (never or once a year), 1 corresponded to minimum of attendance (monthly), 2 corresponded to low attendance (weekly), 3 corresponded to moderate frequency of attendance (daily), and 4 corresponded to the maximum attendance (more than once daily). The total scores of religious attendance ranged from 0 to 8, higher scores indicated higher religious attendance. The pilot study with 30 participants showed that the reliability of the questionnaire was .87 (Appendix J).

#### **4. Intrinsic Spirituality Scale**

The Intrinsic Spirituality Scale (ISS) for Muslims developed by Hodge (2015) was employed to capture religious salience in this study. It consisted of 6 items asking about information regarding the importance of Islam and the degree to which Acehnese adults involved in Islamic practice. The term “spirituality” was substituted by “Islam” since this study focuses on Muslim settings. The responses ranged from 0 to 10, in which 0 corresponded to an absence or zero amount of attribute, while 5 corresponded to a medium or moderate amount of the attribute, and 10 corresponded to the maximum of the attribute. The total scores ranged from 0 to 60 in which higher scores indicated the more important of Islam toward the participants and the more involved the participants in Islam practice. The pilot study with 30 participants showed that the reliability of the questionnaire was .94 (Appendix J).

#### **5. Health Beliefs related to Cardiovascular (HBCVD) Scale**

The HBCVD scale (Tovar et al., 2010) was used to measure the HBM constructs related to cardiovascular disease. The HBCVD scale consisted of 25 items. There were five items asking about the perceived susceptibility with the 4-point Likert type of response ranging from *Strongly Disagree* (1) to *Strongly Agree* (4). Perceived severity subscale also consisted of five items with the response format of 4-point Likert scale ranging from *Strongly Disagree* (1) to *Strongly Agree* (4). Perceived benefits subscale consisted of six items with the response format of a 4-point Likert scale ranging from *Strongly Disagree* (1) to *Strongly Agree* (4). Perceived barriers subscale consisted of 9 items with the response format of a 4-point Likert scale ranging from *Strongly Disagree* (1) to *Strongly Agree* (4). From the pilot study showed that the reliability susceptibility, severity and benefits items ranged from .72 to .93, respectively, and the reliability of barriers was .70. The content validity index of all questionnaire were 1.

#### **6. Self-Efficacy**

The Self Efficacy Questionnaire on Health Behavior for vascular patients developed by Sol, van der Graaf, van der Bijl, Goessens, & Visseren (2006) was used in this study to measure self-efficacy. It consisted of 9 items asking about the confidence of one’s ability to quit smoking, do exercise, control diet and weight. It

was a 5-point Likert scale. The participants were asked to respond yes (5), probably yes (4), maybe (3), probably not (2), and no (1). The higher the score indicated the better the self-efficacy to perform CAD preventive behavior. The last question “I think I am able to control my coronary artery disease” was modified to “I think I am able to prevent my coronary artery disease”. The higher the score, the better the self-efficacy (5), the lower the score, the lower the self-efficacy (1) of total score 45. From the pilot study, the reliability of questionnaire was .83, and the content validity was 1.

### **Instruments Translation**

Back translation was used to translate the instruments. Permission was granted by the authors of each existing instruments. English original instruments (CAD Behaviors questionnaire, religious attendance questionnaire, the ISS, the HBCVD, and the Self-efficacy Questionnaire on Health Behavior) were translated to Indonesian language by two bilingual experts who were studying overseas within English class of postgraduate nursing program. The first expert was requested to translate the original English instruments to Bahasa Indonesia. Then, the second expert was asked to re-translate the Indonesian version of the instrument back to English.

### **Content Validity Instruments**

The back translated instruments were compared to the original document to check the validity of the translation. An expert committee, comprised of three nursing professionals who are expert in adult nursing field in Indonesia held a meeting in terms of consolidating the different version to ensure the equivalence between the original and the translated version as well as to assess the content validity of the instruments (Jones, Lee, Phillips, Zhang, & Jaceldo, 2001). The criteria for the experts are two lecturers and one advanced practice nurses who have expertise in cardiovascular area. The three experts evaluated the content validity of the instruments and its relevance with a four-point item rating: 1 = not relevant, 2 = somewhat relevant, 3 = quite relevant, 4 = highly relevant (Polit & Beck, 2006). Additionally, the experts were asked to clarify their reasons if they did not agree with any of the items. One expert suggested to replace the wording used in Indonesian version. However, the researcher found that if the Indonesian words was replaced, it would change the meaning when translated back to English. Therefore the expert

agreed to keep the same words. All of the items (49 items) were rated as quite and highly relevant by the three experts. The I-CVI was calculated as the three experts giving a rating of either 3 or 4, divided by the total number of experts. The S-CVI was computed by calculating the average of I-CVI across items. The summary of the result is presented in table 2.

**Table 1 Content Validity of Instrument**

No	Instrument	Number of Items	I-CVI	S-CVI
1	Religious Attendance	2	1.00	1.00
2	Religious Saliency	6	1.00	1.00
3	Perceived Susceptibility	5	1.00	1.00
4	Perceived Severity	5	1.00	1.00
5	Perceived Benefit	6	1.00	1.00
6	Perceived Barriers	9	1.00	1.00
7	Self-Efficacy	9	1.00	1.00
8	CAD Preventive Behaviors	7	1.00	1.00

Table 2 depicted that both I-CVI and S-CVI of religious attendance, religious saliency, perceived susceptibility, perceived severity, perceived benefit, perceived barriers, self-efficacy, and CAD preventive behaviors were 1.

### **Instruments Reliability**

The acceptable level of Cronbach Alpha coefficient for newly developed psychosocial instruments is of .70 and is of .80 for well-developed instruments (Burn & Grove, 2009). In this study, a pilot study was carried out in early of may 2016 in Muslims who had similar characteristics with the sample of this study. Totally 30 subjects were selected for the pilot study which was conducted at Puskesmas Sampoiniet. Subsequently, Cronbach Alpha coefficients of CAD preventive behaviors questionnaire, religious attendance questionnaire, the ISS, the HBCVD and the Self-efficacy Questionnaire on Health Behavior were calculated. The summary of the results is illustrated in table 3. Cronbach's coefficients of all instruments were acceptable (= or > .70).

**Table 2 Instruments Reliability n = 30**

<b>Instruments</b>	<b>Number of Items</b>	<b>Reliability (n = 30)</b>
Religious Attendance	2	.87
Religious Saliency	6	.94
Perceived Susceptibility	5	.72
Religious Severity	5	.91
Perceived Benefit	6	.93
Perceived Barriers	9	.70
Self-Efficacy	9	.83
CAD Preventive Behaviors	7	.86

In conclusion, all instruments in this study demonstrated satisfactory validity and reliability. The original instruments and final version of the translated instruments used in this study are presented in the appendix.

### **Ethical Consideration**

The proposal of this study was approved by the Institutional Review Board (IRB) ethical committee of University of Sumatera Utara Medan (Approval Letter no. 813/IV/SP/2016). The approval Letter is attached in appendix B. Inform consent form was used for human rights protection of the participants.

### **Data Collection**

Data were gathered from May to June 2016. The processes of data collection in this study were as follow:

1. After the study was approved by the IRB from the Ethical Clearance University of Sumatera Utara Medan (the Approval Letter no. 813/IV/SP/2016), A letter requesting permission to collect data from Faculty of Nursing Chulalongkorn University was sent to the Director of Langsa Hospital, Cut Meutia Hospital Lhokseumawe, and Community Hospital of Lhoksukon.
2. The researcher met the directors or representative of each hospital to inform about the objectives, the importance, and the data collection processes of this study.

3. A liaison from each hospital was appointed to help the researcher deploying the questionnaire. Furthermore, the researcher clarified the liaison regarding the contents of the questionnaire as well as the processes during data collection.
4. At outpatient unit of each hospital, researcher and liaison approached potential subjects who met the inclusion criteria to participate in this study while they were waiting for health service.
5. Potential subjects who willing to participate in the study were informed about the details of the study by the researcher. The researcher introduced himself, clarified the purpose of this study, benefits of participants' contribution, and emphasized the confidentiality or anonymity of the participants' information. Those agreed to take part in the study were asked to sign consent form.
6. Later, a set of questionnaires were handed to the subjects after receiving health service at the *Mushalla* (a place for praying). The subjects were suggested to read all the information and the instructions given on the questionnaire. Any unclear information regarding questionnaire were explained if the subjects did not understand. The subjects answered the questionnaire by themselves accompanied by researcher during completing the questionnaire.
7. After the questionnaire completion, the researcher examined if any incomplete of data. Participants were asked to complete any missing data.
8. To appreciate their contribution in this study, souvenirs (key holder) were presented to the participants.

### **Data Analysis**

The level of significance of the study was set at  $\alpha = .05$ . The descriptive statistic was performed to describe demographic characteristics and CAD preventive behaviors of the subjects. Pearson's  $r$  correlation was tested to examine the relationship between age, religious attendance, religious salience, perceived susceptibility, perceived severity, perceived benefits, perceived barriers, self- efficacy and CAD preventive behaviors. Eta coefficient was conducted to examine the relationship between gender and CAD preventive behaviors. Since gender was nominal data, the dummy variable was used by recoding male participants as 0 and female participants as 1. Eventually, stepwise

multiple regression was computed to identify the predictors of CAD preventive behaviors among Indonesian adults.

### **Normality Testing**

The assumptions regarding normality of data distribution, linearity of relationship, and multicollinearity were executed. The histogram and probability plot showed that all variables were normally distributed. One sample Kolmogorov test was not significant ( $Z = .656, p = .782$ ) (Appendix I).

### **Linearity Testing**

The linearity between the independent variables and dependent variable was examined by looking at the residual scatter plot. The scatter plot revealed there was a linear relationship between independent variables and dependent variable (Appendix I).

### **Multicollinearity Testing**

The tolerance measures of multicollinearity among the independent variables ranging from 0 to 1, and the tolerance value that approaches zero indicates multicollinearity. It is worth noting that the values of VIF that are greater than 10 indicate a cause of concern (Mertler & Vannatta, 2002). In this study, the tolerance values ranged from .627 to 1.00 and VIF values ranged from 1.00 to 1.612, indicating that multicollinearity did not exist (Appendix I).



## **CHAPTER IV**

### **RESULTS**

This correlational predictive study aimed to 1) investigate Coronary Artery Disease (CAD) preventive behaviors among adults in Aceh province, Indonesia; 2) examine the association between gender, age, religious attendance, religious salience, perceived susceptibility, perceived severity, perceived benefits, perceived barriers, self-efficacy and CAD preventive behaviors; 3) identify predictors of CAD preventive behaviors among adults in Aceh province from gender, age, religious attendance, religious salience, perceived susceptibility, perceived severity, perceived benefits, perceived barrier, and self-efficacy.

The sample of this study was 178 adult patients who came for health care services at outpatient units from two secondary hospitals and one primary hospital in Aceh. The results of this study will be presented as follow:

Part I Demographic characteristic of the subjects.

Part II Descriptive data of Coronary Artery Disease preventive behaviors among adults in Aceh Province, Indonesia.

Part III Correlation between gender, age, religious attendance, religious salience, perceived susceptibility, perceived severity, perceived benefits, perceived barriers, self-efficacy and CAD preventive behaviors.

Part IV Predicting factors of CAD preventive behaviors among adults in Aceh Province.

#### **Part I Demographic Characteristics of the Sample**

A total of 178 Muslims both male and female who met the inclusion criteria were participated in this study. Demographic characteristics of the sample are presented in table below.

**Table 3 Frequency and percentage of subjects classified by demographic characteristics (n = 178)**

<b>Demographic Characteristics</b>	<b>Frequency</b>	<b>Percentage (%)</b>
<b>Age Group (Years Old)</b>		
20-29	39	21.9
30-39	62	34.8
40-49	38	21.3
50-59	39	21.9
$\bar{X} = 38.92, SD = 10.845$		
<b>Gender</b>		
Male	81	45.5
Female	97	54.5
<b>Marital Status</b>		
Single	27	15.2
Married	151	84.8
<b>Education</b>		
No Education	2	1.1
Primary School	31	17.4
Junior High School	63	35.4
Senior High School	46	25.8
Bachelor Degree	35	19.7
Master Degree or Higher	1	0.6
<b>Occupation</b>		
Civil Servant	40	22.5
Merchant	39	21.9
Gardener	23	12.9
Private Business	41	23
Labor	11	6.2
Sailor	2	1.1
Others	18	10.1
Unemployed	4	2.2

<b>Demographic Characteristics</b>	<b>Frequency</b>	<b>Percentage (%)</b>
<b>Reason Coming to the Hospital</b>		
Medical check up	34	19.1
Seeking medical service	144	80.9
<b>Current Disease</b>		
Diabetes	14	7.9
Hypertension	40	22.5
Dyspepsia	64	36
Stroke	1	0.6
Asthma	5	2.8
Migraine	10	5.6
Influenza	25	14.1
Low back pain	7	3.9
Rheumatoid arthritis	12	6.7

From Table 3, one third of the participants were aged between 30 to 39 years with the mean age of 38.92 years. More than half of participants (54.5%) were female, and 81 participants (45.5%) were male. The majority of the participants were married (84.8%). The level of education was mostly secondary school (35.4%), followed by tertiary school (25.8%). Most of the subjects came to the hospital for health services (80.9%). Participants were suffering mostly from dyspepsia (35.7%), followed by hypertension (21.9%).

**Part II Descriptive Data of Independent Variables and CAD Preventive Behaviors among Adults in Aceh Province Indonesia.**

The independent variables in this study are gender, age, religious attendance, religious salience, perceived susceptibility, perceived severity, perceived benefits, perceived barriers, and self-efficacy. The dependent variable in this study is CAD preventive behaviors. Descriptive statistics of the independent and dependent variables are presented by mean and standard deviation (SD) as shown in the Table 4.

**Table 4 Mean, Standard Deviation and Range of All Variables (n = 178)**

<b>Variables</b>	<b>Possible Range</b>	<b>Mean</b>	<b>SD</b>
Religious Attendance	0-8	3.71	1.399
Religious Salience	0-60	51.48	6.935
Perceived Susceptibility	1-20	11.79	2.930
Perceived Severity	1-20	13.76	2.935
Perceived Benefit	1-24	18.78	3.063
Perceived Barriers	1-27	19.29	3.005
Self-Efficacy	1-45	35.74	6.229
CAD Preventive Behaviors	0-14	8.80	2.516

Table 4 depicted that the mean score of religious attendance was 3.71 (SD = 1.399), with the range 0 to 8. The mean score of religious salience was 51.48 (SD = 6.935), with the range 0 to 60. The mean score of perceived susceptibility was 11.79 (SD = 2.930), with the range 1 to 20. The mean score of perceived severity was 13.76 (SD = 2.935), with the range 1 to 20. The mean score of perceived benefit was 18.78 (SD = 3.063), with the range 1 to 24. The mean score of perceived barriers was 19.29 (SD = 3.005) with the range 1 to 27. The mean score of self-efficacy was 35.74 (SD = 6.229), with the range 1 to 45. Finally, the mean score of CAD preventive behaviors was 8.80 (SD = 2.516), with the range 0 to 14.

**Table 5 The Level of CAD Preventive Behaviors of Adults in Aceh Province**

Category	Frequency (n = 178)	Percent (%)
Inadequate	7	3.9
Average	90	50.6
Optimum	81	45.5

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$\bar{X} = 8.80, SD = 2.516 = \text{Average}$

**Table 6 Item Analysis of CAD Preventive Behaviors Level**

Elements	Possible Range	$\bar{X}$	SD	Level
Health Behaviors:				
- Smoking	0 – 2	1.51	.311	Intermediate
- BMI	0 – 2	1.46	.345	Intermediate
- Physical Activity	0 – 2	1.13	.353	Intermediate
- Diet	0 – 2	.79	.228	Poor
Total	0 – 8	4.89	1.237	Average
Health Factors:				
- Total Cholesterol	0 – 2	1.20	.722	Intermediate
- Blood Pressure	0 – 2	1.22	.310	Intermediate
- Fasting Glucose	0 – 2	1.49	.247	Intermediate
Total	0 – 6	3.91	1.279	Average
Total score	0 – 14	8.80	2.516	Average

From table 5 and 6, it can be seen that overall Acehese adults performed average CAD preventive behaviors with the mean of 8.80, SD = 2.516. In addition, 45.5% of them performed optimum CAD preventive behaviors, 50.6% performed average CAD preventive behaviors, and only 3.9% performed inadequate CAD preventive behaviors.

**Part III Correlation between gender, age, religious attendance, religious salience, perceived susceptibility, perceived severity, perceived benefits, perceived barriers, self-efficacy and CAD preventive behaviors.**

Analyses of correlation coefficients were executed to examine the relationships between gender, age, religious attendance, religious salience, perceived susceptibility, perceived severity, perceived benefits, perceived barriers, self-efficacy and CAD preventive behaviors. The degree of the relationship was determined by the following criteria:  $r < .30$  = weak or low relationship,  $.30 > r < .50$  = moderate relationship, and  $r > .50$  = strong or high relationship (Burn & Grove, 2009). The results of the correlation coefficients of the variables are presented in table 6.

**Table 7 Correlation Coefficients of Independent Variables and Dependent variable**

Variables	Correlation Coefficients	p-value
Age	$r = .278^{**}$	.000
Gender (Female)	$\eta = .252^{**}$	.001
Religious Attendance	$r = .838^{**}$	.000
Religious Salience	$r = .602^{**}$	.000
Perceived Susceptibility	$r = .519^{**}$	.000
Perceived Severity	$r = .244^{**}$	.001
Perceived Benefits	$r = .405^{**}$	.000
Perceived Barriers	$r = -.070$	.177
Self-efficacy	$r = .285^{**}$	.000

\*\*Correlation is significant at the 0.01 level (2-tailed).

\*Correlation is significant at the 0.05 level (2-tailed).

Table 7 showed that there were strong positive relationship between religious attendance, religious salience, perceived susceptibility and CAD preventive behaviors ( $r = .838$ ,  $p < .01$ ;  $r = .602$ ,  $p < .01$ ; and  $r = .519$ ,  $p < .01$ , respectively). There was moderate positive relationship between perceived benefits and CAD preventive behaviors ( $r = .405$ ,  $p < .01$ ). Age, gender, perceived severity and self-efficacy were positively correlated with CAD preventive behaviors ( $r = .278$ ,  $p < .01$ ;  $\eta = .252$ ,  $p < .01$ ;  $r = .244$ ,  $p < .01$ ; and  $r = .285$ ,  $p < .01$ , respectively). Perceived barriers was not significant related to CAD preventive behaviors ( $r = -.070$ ,  $p < .177$ ).

#### Part IV Predicting Factors of CAD Preventive Behaviors

In order to identify the predictors of CAD preventive behaviors among adults in Aceh Province Indonesia from gender, age, religious attendance, religious salience, perceived susceptibility, perceived severity, perceived benefits, perceived barrier, and self-efficacy, stepwise multiple regression analysis was conducted. The results are illustrated in table 7 and 8.

**Table 8 Model Summary of CAD Preventive Behaviors Predictors**

Model	R	R <sup>2</sup>	Adjusted R <sup>2</sup>	R <sup>2</sup> Change	F	p-value
Religious Attendance	.838	.702	.701	.702	415.024	.000
Religious Attendance + Female	.874	.763	.760	.061	45.005	.000
Religious Attendance + Female + PBenefit	.888	.788	.785	.025	20.595	.000
Religious Attendance + Female + PBenefit + Salience	.892	.796	.792	.008	6.829	.010
Religious Attendance + Female + PBenefit + Salience + SEfficacy	.896	.803	.797	.007	5.768	.017

Table 8 manifested that religious attendance was the first variable selected into the model. Religious attendance explained 70.1 % of the variance for CAD preventive behaviors among adults in Aceh Province ( $R^2 = .701$ ,  $F = 415.024$ ,  $p < .01$ ), indicating that religious attendance independently and significantly predict CAD preventive behaviors for adults in Aceh Province.

The second variable entered the regression model was gender. It explained 6.1% of the variance ( $R^2_{\text{change}} = .061$ ,  $F = 45.005$ ,  $p < .01$ ), meaning that religious attendance and gender together statistically and significantly can predict CAD preventive behaviors for adults in Aceh Province.

Perceived benefit was the third variable chosen into the model. Perceived benefits explained 2.5% of the variance ( $R^2_{\text{change}} = .025$ ,  $F = 20.595$ ,  $p < .01$ ), signifying that religious attendance, gender and perceived benefits together can statistically predict CAD preventive behaviors for adults in Aceh Province.

The next variable selected into the model was religious salience. It explained 0.8% of the variance ( $R^2_{\text{change}} = .008$ ,  $F = 6.829$ ,  $p < .01$ ), indicating that religious attendance, gender, perceived benefits and religious salience together can statistically predict CAD preventive behaviors among adults in Aceh Province.

Self-efficacy was the last variable which entered to the regression model. Self-efficacy explained 0.7% of the variance ( $R^2_{\text{change}} = .007$ ,  $F = 5.768$ ,  $p < .05$ ), meaning that religious attendance, gender, perceived benefits, religious salience and self-efficacy together can statistically predict CAD preventive behaviors among adults in Aceh Province Indonesia.

**Table 9 Multiple Regression Coefficient of Religious Attendance, Gender, Perceived Benefits, Religious Salience and Self-Efficacy on CAD Preventive Behaviors.**

	b	SEb	Beta	T	p-value
(Constant)	-2.159	.884		-2.443	.016
Religious Attendance	1.288	.077	.716	16.662	.000
Gender (Female)	1.017	.178	.202	5.718	.000
Perceived Benefits	.126	.029	.153	4.311	.000
Religious Salience	.039	.015	.108	2.546	.012
Self-Efficacy	.035	.014	.085	2.402	.017
R = .803	Adj R <sup>2</sup> = .797	SE=1.133	F = 5.768	p – value = .017	

From table 8, the predicting equation of CAD preventive behaviors among adults in Aceh Province, Indonesia can be formulated as follow:

Unstandardized equation:

$$Y_{\text{CAD}} = -2.159 + 1.288X_1 + 1.017X_2 + .126X_3 + .039X_4 + .035X_5$$

Standardized equation:

$$Z_{\text{CAD}} = .716Z_1 + .202Z_2 + .153Z_3 + .108Z_4 + .085Z_5$$

$X_1$  and  $Z_1$  = Religious Attendance

$X_2$  and  $Z_2$  = Gender (female)

$X_3$  and  $Z_3$  = Perceived Benefits

$X_4$  and  $Z_4$  = Religious Salience

$X_5$  and  $Z_5$  = Self-Efficacy



From the unstandardized equation it can be interpreted that for each increase of 1 unit of religious attendance, the score of CAD preventive behaviors will increase 1.288 unit. For each female, the score of CAD preventive behaviors will increase 1.017. If the perceived benefits increase 1, the CAD preventive behaviors will increase .126. For each 10 of religious salience increase, the CAD preventive behaviors will increase .039. If the self-efficacy increase 1, the CAD preventive behaviors will increase .035.

From the standardized equation it can be interpreted that if the religious attendance increase 1, the CAD preventive behaviors score will increase .716. For each female, the score of CAD preventive behaviors will increase .202. If the perceived benefits increase 1, the CAD preventive behaviors will increase .153. For each 10 of religious salience increase, the CAD preventive behaviors will increase .108. If the self-efficacy increase 1, the CAD preventive behaviors will increase .085.

## **CHAPTER V**

### **CONCLUSION AND DISCUSSION**

The results of this study are concluded and discussed in this chapter. Furthermore, the implications for nursing practice and future research are proposed. Eventually, the recommendations of the study are addressed.

#### **Conclusion**

The purposes of this predictive correlational study was to investigate CAD preventive behaviors, examine the correlation between selected predicting factors, and identifying the predictors of CAD preventive behaviors among adults in Aceh Province, Indonesia. A convenience sampling technique was used to proportionally recruit 178 subjects from two secondary hospitals and one community hospital in Aceh Province. Data were collected from May to June 2016 with the IRB approval from University of Sumatera Utara.

The instruments used in this study were Demographic Characteristic form, Religious Attendance Questionnaire, the Intrinsic Spirituality Scale (ISS) for Muslims, Health Beliefs related to Cardiovascular Scale, and The Self- Efficacy Questionnaire on Health Behavior. All instruments demonstrated satisfactory validity and reliability. Descriptive statistics, bivariate correlation, and stepwise multiple regression were employed to analyze the data.

The results showed that overall Acehnese adults performed average CAD preventive behaviors (50.6%) with the  $\bar{X} = 8.80$ ,  $SD = 2.516$ . Age, gender, religious attendance, religious salience, perceived susceptibility, perceived severity, perceived benefits, and self-efficacy were positively and significantly associated with CAD preventive behaviors. In addition, perceived barriers was negatively and significantly correlated with CAD preventive behaviors. Lastly, the regression results showed that religious attendance, gender (female), perceived benefits, religious salience and self-efficacy were significant predictors of CAD preventive behaviors. They explained 79.9% of the variance of CAD preventive behaviors.

## Discussion

The discussion of this study was organized into three parts according to the objectives of the study.

### CAD Preventive Behaviors

CAD preventive behaviors in this study defined as continuously presence of 4 favorable health behaviors including abstinence from smoking within the last year, ideal BMI, physical activity at goal, healthy dietary pattern that promotes cardiovascular health, and the simultaneous presence of 4 favorable health factors which are abstinence from smoking within last year, untreated total cholesterol <200 mg/dl, untreated blood pressure <120/<80 mmHg, and absence of diabetes mellitus, and the absence of clinical cardiovascular disease. The smoking components was combined into 1 item, thus totally 7 components were used. It further categorized into three level as inadequate (0-4 points), moderate (5-9 points), and optimum level (10-14 points) of CAD preventive behaviors.

According to American Heart Association, to meet the complete definition of CAD preventive behaviors, an individual would need to meet the ideal levels of all 7 components of the health behaviors or within the optimum level (scored 10-14). Based on these criteria, this study found that adults in Aceh Province performed average level CAD preventive behaviors ( $\bar{X} = 8.80$ ,  $SD = 2.516$ ). There are several explanations can be discussed regarding to this finding.

One of favorable health behaviors is abstinence from smoking within the last year. However, smoking is an acceptable habit and become a part of culture among men in Indonesia. Men smoke during their social interactions, at parties, coffee shops, and ceremonies. Prior study revealed that there is a value among men saying that “if I do not smoke I will fill inferior to my friends because I am the only one who doesn’t smoke” (Ng, Weinehall, & Öhman, 2007). From the national survey data it was found that 56.7% of Indonesian are active smoker (Badan Penelitian, 2013). In addition, people believe that smoking does not have any adverse effects on health, and some believe that smoking can reduce stresses (Ghoury, Atcha, & Sheikh, 2006). On the policy point of view, currently there is no banning regulation for smoking implemented by the Indonesian Government (Sumartono et al., 2011). From these

reasons, it is evident that abstinence from smoking among Acehnese is challenging resulting in having average CAD preventive behaviors.

Regarding BMI, this study found that most of the participants were at intermediate level of BMI (25-29.9 kg/mg<sup>2</sup>). This is because from the items analysis found that the dietary pattern most of participants were poor. Poor dietary pattern may lead to unhealthy diet and resulting higher BMI. This finding is quite similar with the finding from National Survey In Indonesia reported that Approximately 26.1 % of Indonesian population classified as sedentary life style spreading to 22 provinces. Time constraint, facility constraint, low motivation, and knowledge about physical activity are reasons of Indonesian for not doing physical activity (Badan Penelitian, 2013).

Physical activity was found mostly at intermediate level. This finding may associate to the education of the participants. Lower education may leads to inappropriate intensity or duration when performing physical activity (Ng et al., 2009). Most of the participants in this study were low educated (Junior high school 35.4%, primary high school 17.4%, and no formal education 1.1%). Another reason related to gender. Women are sometimes less free to do sports and other physical exercises due to their bustle as household. Prior study in ASEAN countries including Indonesia found that education and gender (female) were significantly associated with physical activity (Ng et al., 2009). More than half of participants in this study were female (54.5%).

Regarding the dietary patterns, the natural cook of Indonesian food is oily. People put coconut milk in cooking with vegetables, fishes, and desserts. In addition, sugar consumption is also high. Previous studies discovered that 53.1% Indonesian food is sweet and 40.7% is fatty, people use coconut oil for cooking and consume it 20.2 grams per person daily. They also use palm oil 18.9 grams per person daily for frying. They consume sodium more than 2,000 mg per person daily. They also consume sugar more than 50 grams (150 kcal) per person daily (Badan Penelitian, 2013; Kartono et al., 2014; Usfar & Fahmida, 2011). These poor dietary patterns will lead to developing hypercholesterolemia, hypertension and higher fasting glucose value.

By the reason that smoking is an acceptable habit, low education level, and poor dietary pattern, Acehnese in Indonesia had average level of CAD preventive behaviors. In addition, this study found that 45.5% of the participants had optimum level of CAD preventive behaviors. The reason is from the item analysis it can be seen that most of the participants had better behaviors regarding smoking and having the ideal BMI (71.3 % and 61.2 % respectively). Moreover, most of the participants had ideal fasting glucose values (57.3%)

### **Correlation between Selected Factors and CAD Preventive Behaviors**

The results revealed that age, gender, religious attendance, religious salience, perceived susceptibility, perceived severity, perceived benefits and self-efficacy were positively and significantly correlated with CAD preventive behaviors. Perceived barriers was negatively and significantly correlated with CAD preventive behaviors. The findings are consistent with the hypotheses.

Age was significantly and positively correlated with CAD preventive behaviors ( $r = .278, p < .01$ ), indicating that older adults in Aceh were more likely to have better CAD preventive behaviors than younger adults. The reason is because older people feel more vulnerable to a disease due to the decrease of body function. Another reason is older people more likely to have health problem due to the aging process compared to younger. Prior studies showed that older people tend to have better health behaviors compared to younger individuals. A study by Deeks, Lombard, Michelmore & Teede, (2009) which found that People over 51 years of age were more likely participating in specific screening health checks than people at younger age. Another previous study showed that Middle-aged adults generally had poorer health behavior levels compared to older individuals (Zanjani et al., 2006). The prevalence of risky medical check-up behavior is increased for old-old adults compared to young-old adults (Cardi et al., 2009).

Gender was significantly and positively related to CAD preventive behaviors ( $\eta = .252, p < .01$ ), signifying that adults women in Aceh would adopt CAD preventive behaviors greater than men. In reality, women are less likely to smoke compared to men. From the descriptive statistics results appeared that more than half of participants in this study (54.5%) were female. Women were more likely to visit

their medical practitioner compared to men (Redondo-Sendino et al., 2006). It was found that adherence to 3 heart-healthy lifestyle behaviors (smoking abstinence, physical activity, fruit, vegetable intake) was higher among women than men (Mosca, Barrett-Connor, & Wenger, 2011). Women were more likely than men to maintain a healthy weight and women did not smoke compared to men (Soni, 2007). Regardless the discrepancy of prevalence of CAD between gender, women are considered to perform better CAD preventive behaviors compared to men.

Religious attendance was significantly and positively correlated with CAD preventive behaviors ( $r = .838$ ,  $p < .01$ ), emphasizing that the more an individual attended the mosque for congregational prayers or Islamic lectures, the better CAD preventive behaviors. Certain aspects such as diet, and personal hygiene are addressed specifically in Islamic Law (Koenig & Shohaib, 2014). By attending to the mosque, Muslims obtained information about health-related topic from the Islamic lectures. One of the teachings address about fasting, in which scientifically have been proven benefit in reducing glucose and cholesterol value as well as maintaining the ideal weight. Another teaching is about certain aspects of health such as prohibition of carrion, pig meat, blood, intoxicants, healing in honey, alcohol abstinence, and discouraging of free sex. These teachings lead to better health behaviors among Muslims. The finding of this study supported prior study discovered that Muslims who did not attend prayers compared to those who praying on time were 2.87 times at risk of health problems (Sotodehasl et al., 2014). A study in Kuwait found that religious commitment and religious activities affected systolic and diastolic blood pressure (Al-Kandari, 2003). Religious attendance was significantly associated with the use of preventive health care (Benjamins et al., 2006).

Religious salience was significantly and positively related to CAD preventive behaviors ( $r = .602$ ,  $p < .01$ ), meaning that the more salience the adults felt the more they implemented CAD preventive behaviors. Religious individuals with more salience may be more motivated to maintain their health in order to be physically able to lead a life consistently with their beliefs. Previous study in Saudi Arabia found that Muslims who more salience were 15% less likely to smoke. Religious salience was significantly associated with smoking status (Benjamins & Buck, 2008). The more

salience is a person the more he/she applying the belief to daily habits including behaviors related to heart disease (Koenig & Shohaib, 2014).

Perceived susceptibility was significantly and positively correlated with CAD preventive behaviors ( $r = .519, p < .01$ ), indicating that the more the people believed that they were susceptible to CAD, the better they engaged in CAD preventive behaviors. The reason of this significance is that older people tend to perceived themselves at high risk for developing CAD than younger people because they are more vulnerable to suffer CAD. In this study, 43.2% of the subjects were aged 40 to 59 years. People will be more motivated to behave in healthy ways if they believe they are vulnerable to a particular negative health outcome (Rosenstock, 1974). Past study revealed that perceived susceptibility of CHD can predict CHD preventive behaviors among women and it accounted for 50.7% of the variance (Ali, 2002). Prior study revealed that women who were older perceived heart disease to be more susceptible than younger women (Jones, Weaver, Grimley, Appel, & Ard, 2006). Perceived susceptibility to ischemic heart attack was associated with cardiac health related behavior among patient with chest pain (Katz et al., 2009). Perceived susceptibility to heart disease was independently associated with exercising after acute coronary syndrome (Reges et al., 2014).

Perceived severity was significantly and positively correlated with CAD preventive behaviors ( $r = .244, p < .01$ ), signifying that if adults perceived that CAD is a serious illness, they were more likely to adopt CAD preventive behaviors. This is because if one perceived that an illness is severe, he/she is more likely to adopt preventive behavior (Rosenstock, 1974). Prior study revealed that women who were older perceived heart disease to be more serious than younger women (Jones et al., 2006). Previous study by Ali (2002) found that perceived seriousness of CHD predict CHD behaviors among women and it explained about 76% of the variance. Perceived threat to health was related to exercise habits among coronary heart disease patients (Troein et al., 1997). Perceived severity predicted the willingness to engage in preventive health behaviors among cardiac patients (Nau et al., 2005).

Perceived benefits was significantly and positively correlated with CAD preventive behaviors ( $r = .405, p < .01$ ), emphasizing that the more the people

believed that a new behavior will decrease their chances of developing CAD, the more they involved in CAD preventive behaviors. The reason of this findings are because people tend to adopt healthier behaviors when they believe the new behavior will decrease their chances of developing a disease, and if one perceived that the benefit of taking action outweighs the costs of the barriers to performance, he/she is more likely to adopt preventive behavior (Rosenstock, 1974). Janz and Becker (1984) suggested that in order for a new behavior to be adopted, a person need to believe the advantages of the new behavior outweigh the consequences of continuing the old behavior. Earlier study revealed that perceived benefits was associated with exercise practice among coronary heart disease patients (Mirotznik et al., 1995). Perceived benefits of exercise predicted participation in cardiac prevention and rehabilitation programs among cardiac patients (Reges et al., 2014).

However, perceived barriers was found not significant correlated with CAD preventive behaviors ( $r = -.070$ ,  $p < .177$ ), meaning that although they had obstacles, they still adopted CAD preventive behaviors. This finding is different with most of previous studies found that there were significant association between perceived barriers and cardiac preventive behaviors (Sharp & Sayler, 2012; Mahalik & Burns, 2011). The item analysis showed that most of the participant disagreed that they had obstacles to preformed CAD preventive behaviors. For example, regarding the statement "I don't know appropriate exercise to reduce risk of cardiovascular disease", most of the participants (47.2%) disagreed, meaning they have sufficient knowledge about appropriate exercise. Regarding statement "I don't know what is the healthy diet that would prevent from cardiovascular disease", most of the participants (50%) also disagreed, meaning that they know the healthy diet to prevent from CAD. In addition, 53.9% of the participants had time for exercise 20 minutes a day. More than half of the participants answered that they could afford the healthy food. For these reasons, the result was not significant.

Self-efficacy was significantly and positively correlated with CAD preventive behaviors ( $r = .285$ ,  $p < .01$ ), indicating that the more the adults think that they were capable to perform the behaviors required, the greater the chance to perform CAD preventive behaviors. This is because if someone believes that she/he is capable of doing it, the chances are that she/he will try the new behavior is greater (Bandura,



1977). Previous study revealed that self-efficacy were important determinants of exercise behavior regulation among CHD patients (Slovinec D'Angelo et al., 2014). Self-efficacy was the strongest predictor of behavior to modify cardiovascular risk factors (Chiou et al., 2009). Self-efficacy was associated with cardiac exercise among patient with coronary heart disease (Lau-Walker, 2007). Self-efficacy improved the commitment to take healthy diet among cardiac patients (Sharp & Salyer, 2012).

All the findings of this study are consistent with all the hypotheses proposed in the background of the study. The findings are also parallel with the HBM theory in which the perception domain (perceived susceptibility, perceived severity, perceived benefits, perceived barriers, self-efficacy) and the modifying factors in this study (age, gender, religious attendance, religious salience), they are all associated with preventive behaviors.

### **Predicting Factors of Preventive Behaviors**

The third objective of this study was to identify predictors of CAD preventive behaviors among adults in Aceh province from age, gender religious attendance, religious salience, perceived susceptibility, perceived severity, perceived benefits, perceived barrier, and self-efficacy. The model summary of CAD preventive behaviors illustrated that only 5 of 9 selected factors (religious attendance, gender, perceived benefits, religious salience and self-efficacy) were significant predictors of CAD preventive behaviors (Adjust  $R^2 = .797$ ,  $F = 5.768$ ,  $p < .05$ ). They explained 79.7% of the variance of CAD preventive behaviors.

Religious attendance accounted for 70.1 % of the variance for CAD preventive behaviors among adults in Aceh Province ( $R^2 = .701$ ,  $F = 415.024$ ,  $p < .01$ ), indicating that among other variables, 70.1% of CAD preventive behaviors can be predicted by religious attendance. Aceh is the only Province in Indonesia which applying the Islamic *Shari'a* law into the practice. Prayer 5 times daily is compulsive for Muslims. According to *Shari'a* law, Muslims are suggested to attend the mosque 5 times daily for prayers. A teaching may be held after the prayer procession. The subject of the teachings are not only addressing about religiosity, but also about health-related behaviors. Therefore, the more a Muslims attend to the Mosque, the more information

regarding health-related behaviors he/she gain from the teachings. This finding is congruent with previous study among Muslims population that attending to religious activities affected systolic and diastolic blood pressure (Al-Kandari, 2003). Similar finding also reported among Christians that people with greater level of religious attendance were less likely to smoke (Feinstein, Liu, Ning, Fitchett, & Lloyd-Jones, 2010). Religious service attendance promoted health and lifestyle behaviors that lower CAD risk (Banerjee, Strachan, Boyle, Anand, & Oremus, 2014).

Gender (female) explained 6.1% of the variance ( $R^2_{\text{change}} = .061$ ,  $F = 45.005$ ,  $p < .01$ ) of CAD preventive behaviors, meaning that among other variables, 6.1% of CAD preventive behaviors can be predicted by gender. In spite of the prevalence of CAD in Indonesia among female is higher than male (Badan Penelitian, 2013), the finding of this study showed that female engaged in CAD preventive behaviors more than male. The reason is because women feel more vulnerable to a disease (Gallant & Dorn, 2001). In addition, culturally, women in Aceh are less likely to smoke compared to men. This finding supports prior study by Gallant & Dorn (2001) reported that gender (women) explained more variance than men for two behaviors (smoking and weight maintenance). Women who believed that heart disease could be prevented were less likely to have incidence of heart disease events, it was reported that this relation was not found for men (Korin et al., 2012). Female had a stronger predictor between pretreatment motivation and perceived risks of smoking compared to male (McKee et al., 2005). This result also consistent with the HBM theory proposed that gender as one of the modifying factors within the theory which play an important role in preventive behaviors of an individual.

The third predictor of CAD preventive behaviors for adults in Aceh Province was Perceived benefits accounted for 2.5% of the variance ( $R^2_{\text{change}} = .025$ ,  $F = 20.595$ ,  $p < .01$ ), signifying that perceived benefits can predict CAD preventive behaviors 2.5% compared to other variables. According to the Health Belief Model, if one perceived that the benefit of taking action outweighs the costs of the barriers to performance, he/she is more likely to adopt preventive behavior (Rosenstock, 1974). People would not adopt healthier behaviors if they do not believe that the new behaviors will lower the possibility of getting a disease. In addition, when the cost of the barriers is high, the likelihood to take the action decreases (Rosenstock, 1974).

This finding similar to previous study revealed that Perceived benefits of exercise predicted participation in cardiac prevention and rehabilitation programs among cardiac patients (Reges et al., 2014). Perceived benefits of exercise was the major determinant of cardiac prevention and rehabilitation programs among Arab and Jewish patients (Reges et al., 2013). The result of this study is consistent with HBM and the previous studies, therefore improving the benefits of an individual is vital to improve CAD preventive behaviors.

Religious salience explained 0.8% of the variance ( $R^2_{\text{change}} = .008$ ,  $F = 6.829$ ,  $p < .01$ ), meaning that among other variables, 0.8% of CAD preventive behaviors can be predicted by religious salience. The effect of religion on health behaviors may work directly through religious salience. Islamic beliefs and practices regarding health behaviors are depend on the Qur'an and the Hadith (sayings of Prophet Muhammad). There are twenty eight verses in the Qur'an which is relevant to preventive behaviors (Aboul-Enein, 2014). For instance, there is a verse addressing about eating what is good and lawful from the earth. This verse would influence Muslims to choose a healthier food in term of obeying the commandment from *Allah* (God). It even has a specific verse addressing about the heart. These religious verses are greatly influenced the behaviors and practices of the Muslims specifically for those who have greater salience. This finding supported previous study by Benjamins & Buck, (2008) revealed that religious salience was significant predictor of smoking. People who were more salience were 15% less likely to smoke (Almutairi, 2015). However, a study among Muslims in Kuwait reported that religious salience had a negative relationship with health behaviors in term of maintaining ideal systolic and diastolic pressure (Al-Kandari, 2003).

Self-efficacy explained 0.7% of the variance ( $R^2_{\text{change}} = .007$ ,  $F = 5.768$ ,  $p < .05$ ), meaning that among other variables, self-efficacy can predict 0.7% of CAD preventive behaviors. This finding indicated that adults who had greater self-efficacy felt more confident to perform CAD preventive behaviors. If someone believes that a new behavior is useful, and think that she/he is capable of doing it, the chances that she/he will try the new behavior is greater (Bandura, 1977).

Numerous previous studies about self-efficacy discovered the same results. Self-efficacy was the strongest predictor of behavior to modify cardiovascular risk

factors (Chiou et al., 2009). Self-efficacy explained 30% of the variance for exercise in a cardiac rehabilitation program for heart disease patients (Lau-Walker, 2007). Self-efficacy was important determinant of exercise behavior regulation among CHD patients (Slovinc Slovenic D'Angelo et al., 2014). Self-efficacy was the strongest predictor of physical activity for heart disease patients (Oka, Gortner, Stotts, & Haskell, 1996). The finding of this study supported previous studies, therefore it is essential to enhance an individual self-efficacy in term of CAD preventive behaviors.

However, 4 variables namely age, perceived susceptibility, perceived severity, and perceived barriers were not significant predictors of CAD preventive behaviors. Age was not a significant predictor of CAD preventive behaviors due to the correlation between age and CAD preventive behaviors was low ( $r = .278, p < .01$ ). Participants in this study were mostly aged 30 to 49 years (56.2%). People over 51 years of age were more likely participating in specific screening health checks than people at younger age (Deeks, Lombard, Michelmore & Teede, 2009). Perceived susceptibility was found not a significant predictor of CAD preventive behaviors. In spite the correlation result was moderate, however the questionnaire analysis showed that 66.3% of the subjects did not concern about the likelihood of having CAD in the future. From questionnaire analysis also appeared that 50.6% of the subjects did not feel that having CAD would cause the death, that is why perceived severity was not a significant predictor of CAD preventive behaviors. The reason is because the correlation between perceived severity and CAD preventive behaviors was low. Lastly, perceived barriers was not a significant predictor of CAD preventive behaviors. The reason is because the correlation between perceived barriers and CAD preventive behaviors was not significant ( $r = -.070, p < .177$ ).

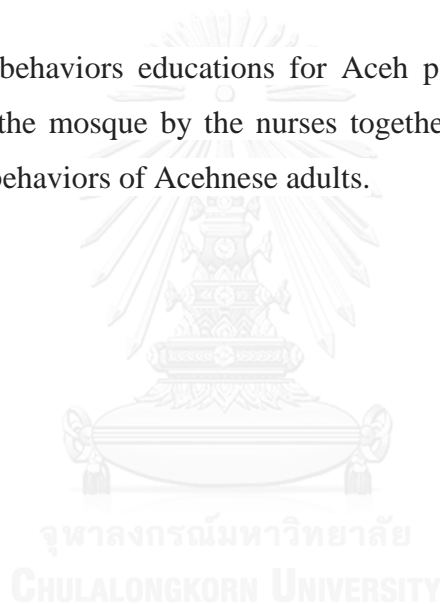
### **Limitation of the Study**

Indonesia is composed of hundreds of ethnics with different cultural backgrounds and languages. Thus the findings of this present study might not represent Indonesia generally since the data of the study were gathered from 2 secondary hospitals and 1 community hospital in Aceh Province. Therefore, a future multi-ethnic studies with a larger sample are recommended to fully understand CAD preventive behaviors description in Indonesia.

### **Implication of the Study**

From the findings of this present study, several recommendations are proposed:

1. A cultural-based nursing intervention regarding CAD preventive behaviors program should be developed by the health care providers to enhance CAD preventive behaviors. The program should enhance perceived benefits and self-efficacy. Finally, the program should be gender specific.
2. Predicting factors for CAD preventive behaviors should be identify by gender. In addition, some other cultural variables such as gender equity, values and norms are suggested.
3. CAD preventive behaviors educations for Aceh people should would be more effective held in the mosque by the nurses together with the Ulama to enhance CAD preventive behaviors of Acehnese adults.



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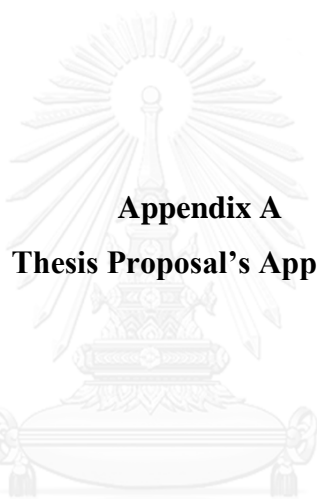


## APPENDIX



จุฬาลงกรณ์มหาวิทยาลัย  
CHULALONGKORN UNIVERSITY





**Appendix A**  
**Thesis Proposal's Approval**

จุฬาลงกรณ์มหาวิทยาลัย  
CHULALONGKORN UNIVERSITY



ประกาศ

(Announcement)

คณะพยาบาลศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย  
(Faculty of Nursing, Chulalongkorn University)

เรื่อง การอนุมัติหัวข้อวิทยานิพนธ์

(Proposal Approved)

ครั้งที่ 21/2558 ประจำปีการศึกษา 2558

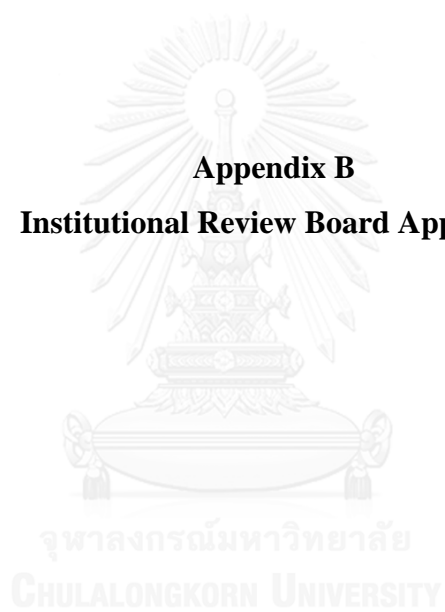
(No. 21/2558, Academic year 2015)

**นิสิตผู้ทำวิจัยและอาจารย์ที่ปรึกษาวิทยานิพนธ์**

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ประธานกรรมการสอบ (Chairperson)	รองศาสตราจารย์ ร.ต.อ.หญิง ดร. ยุพิน อังสุโรจน์ Assoc. Pol. Capt. Prof. Dr. Yupin Aungsurach
อาจารย์ที่ปรึกษาหลัก (Major-advisor)	รองศาสตราจารย์ ดร. รัตน์ศิริ ทาโต Assoc. Prof. Dr. Ratsiri Thato
ผู้ทรงคุณวุฒิภายนอก (External Examiner)	ดร. วัยวุฒม์ อยู่โนศล Dr. Waiyawut Yoonisil
ชื่อหัวข้อวิทยานิพนธ์ (Title of Thesis)	ปัจจัยทำนายพฤติกรรมการป้องกันโรคหลอดเลือดหัวใจของวัยผู้ใหญ่ ในจังหวัดอาเจะ ประเทศอินโดนีเซีย FACTORS PREDICTING PREVENTIVE BEHAVIORS FOR CORONARY ARTERY DISEASE AMONG ADULTS IN ACEH PROVINCE, INDONESIA
ครั้งที่อนุมัติ (Announcement No.)	21/2558
ระดับ (Level)	ปริญญาโท Master degree

*[Signature]*  
18 เม.ย. 2559

**Appendix B**  
**Institutional Review Board Approval**





MINISTRY OF EDUCATION  
FACULTY OF NURSING UNIVERSITY OF SUMATERA UTARA  
HEALTH RESEARCH ETHICS COMMISSION  
Jl. Prof.Maas No.3 Kampus USU Medan 20155 INDONESIA.  
Tel: + 62-61-8213318 Fax: + 62-61-8213318, E-Mail: Fkep\_kepk@yahoo.co.id

Number : 813/IV/SP/2016  
Re : Approval of Health Research Ethics Committee of the Faculty of Nursing University  
of Sumatera Utara

**Health Research Ethics Committee of the Faculty of Nursing University of  
Sumatera Utara, hereby declare the research:**

Name : Zamna Idyan  
Title : Factors Predicting Preventive Behaviors for Coronary Artery Disease  
Among Adults in Aceh Province, Indonesia

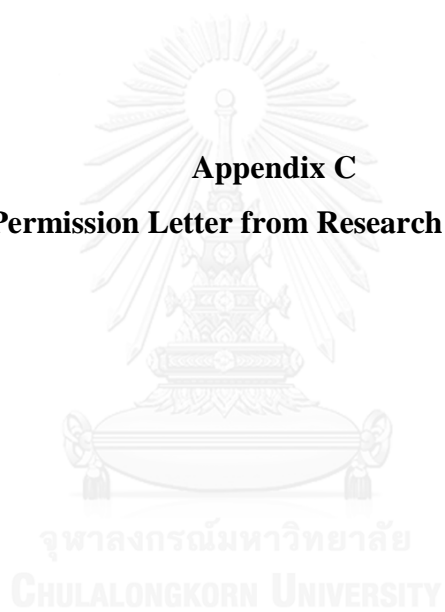
**has been assessed and it was decided that the research proposal is not contrary to  
the values and norms of humanity.**

Medan April 26, 2016  
IEC Nursing Faculty, USU  
Chairman,



*[Signature]*  
Siti Zahara Nasution, S.Kp, MNS  
NIP. 197103052001122001

**Appendix C**  
**Permission Letter from Research Settings**





**PEMERINTAH KOTA LANGSA**  
**RUMAH SAKIT UMUM DAERAH LANGSA**

Alamat: Jln. Jend. A.Yani No.1 Telp. (0641) 211009 – 21457 – 21662  
 Fax. (0641) 22051 E-mail: [rsulangsa@gmail.com](mailto:rsulangsa@gmail.com), [rsudiangsa@yahoo.com](mailto:rsudiangsa@yahoo.com)  
 Website : [www.rsud.langsakota.go.id](http://www.rsud.langsakota.go.id)  
**KOTA LANGSA**

Langsa, 09 Mei 2016

Nomor : 141/Diklat RSUDL/05/2016  
 Lamp : -  
 Perihal : Izin Penelitian

Kepada Yth,  
 Sincerely Faculty Of Nursing  
 Chulalongkorn University

Bangkok Thailand

Dengan Hormat,

Sehubungan dengan surat saudara nomor : 0654/2016 Tanggal 28 April 2016 tentang izin penelitian yang akan dilakukan oleh mahasiswa Faculty Of Nursing Chulalongkorn University Bangkok Thailand **An. Mr. Zamna Idyan** dengan judul "**Factors Predicting Preventive Behaviors For Coronary Artery Disease Among Adults In Aceh Province, Indonesia**". Pada dasarnya kami tidak keberatan memberikan izin kepada yang tersebut diatas untuk melakukan penelitian, selama yang bersangkutan mengikuti peraturan-peraturan yang telah ditetapkan.

Demikianlah surat ini kami sampaikan, atas kerjasama yang baik dihanturkan terima kasih.

Direktur Rumah Sakit Umum Langsa  
 Pemerintah Kota Langsa  
 c/q. Koordinator Diklat



**dr. DOLI DIAPARI SIREGAR**  
 Nip.19651218 200003 1 003

**Tembusan :**

1. Yang bersangkutan
2. Arsip



PEMERINTAH KABUPATEN ACEH UTARA  
DINAS KESEHATAN  
**PUSKESMAS LHOKSUKON**



JL. DIPONOGORO NO.1 TELP.0645 – 31089 FAX. 31089 KODE POS 24382

Number : 445/125/2016  
Subject : Data collection at Puskesmas Lhoksukon

To : Dean of Faculty of Nursing  
Chulalongkorn University,  
Bangkok

Based on your letter on April 28, 2016 number 0659/2016 regarding permission to do data collection at Puskesmas Lhoksukon regency of North Aceh in term of conducting Thesis, therefore we inform to you that :

Name : Zamna Idyan  
Student number : 5777164036, Chulalongkorn University's Student  
Thesis Title : Factors Predicting Preventive Behaviors for Coronary Artery Disease Among Adults in Aceh Province, Indonesia.

He had conducted data collection at Puskesmas Lhoksukon from May 9 until May 26 2016 with the total sample 80 people who are not diagnosed with coronary artery disease.

If you have any question, please do not hesitate to contact us at : [puskesmas.lhoksukon@gmail.com](mailto:puskesmas.lhoksukon@gmail.com)

Issued in : Lhoksukon  
Date : May 27, 2016

Director of Puskesmas Lhoksukon



Dr. Wahrad Umri  
Nip. 19800612201409 1 001



**PEMERINTAH KABUPATEN ACEH UTARA  
RUMAH SAKIT UMUM CUT MEUTIA  
KABUPATEN ACEH UTARA**

JLN. BANDA ACEH - MEDAN KM. 6 TELP. 46334 - 46222 FAX. 46222  
BUKET RATA LHKSEUMAWE ACEH



Kode RS : 1108015

Kode Pos : 24375

Lhokseumawe, 26 April 2016

Nomor : 897/057

Kepada,

Lampiran :-

Yth. Faculty of Nursing, Chulalongkom

Perihal : Sesuai Melakukan Pengambilan

University

Data awal

Di-

THAILAND

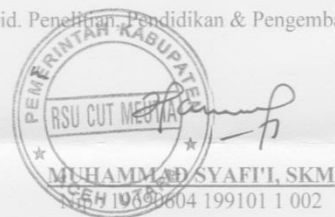
1. Sehubungan dengan surat Saudara Nomor : 0654/2016, Tanggal 28 April 2016, maka bersama ini kami beritahukan yang mana :

Nama : Zamna Idyan

Prodi : Master of Nursing

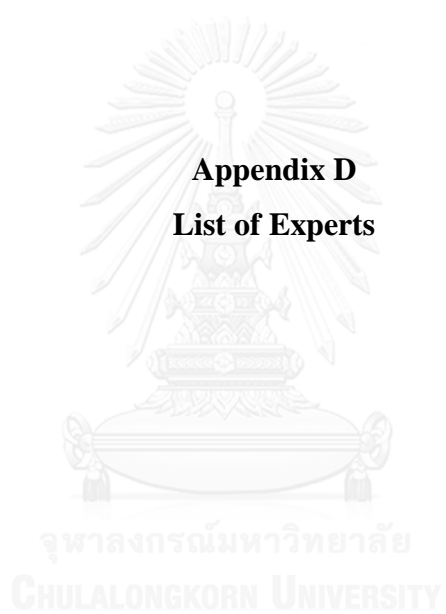
2. Benar nama yang tersebut diatas telah melakukan Pengambilan Data Awal pada RSUD Cut Meutia Aceh Utara, Tanggal 12 s/d 26 Mei 2016 dengan judul Skripsi " **Factors Predicting Preventive Behaviors For Coronary Artery Disease Among Adults In ACEH Province, INDONESIA** ".
3. Demikian Surat pemberitahuan ini kami buat agar dapat dipergunakan seperlunya.

Kabid. Penelitian, Pendidikan & Pengembangan RS





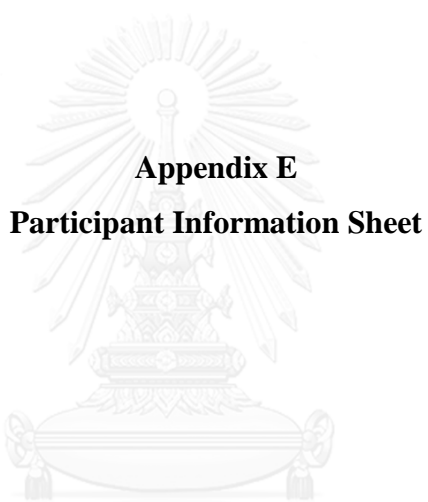
**Appendix D**  
**List of Experts**



### List of Experts

1. Pius A. L. Berek, S.Kep.,Ns.,M.Kep.,Sp.KV., Sp.KMB  
Nursing Academic of Belu Regency, Nusa Tenggara Timur, Indonesia.
2. Erwin, Ns., M.Kep., Sp.KV.,Sp.KMB  
National of Cardiovascular Center of Harapan Kita, Jakarta, Indonesia.
3. Halimuddin, SKP., M.Kep., Sp.KV., Sp.KMB  
Faculty of Nursing, University of Syiah Kuala, Aceh, Indonesia.





**Appendix E**  
**Participant Information Sheet**

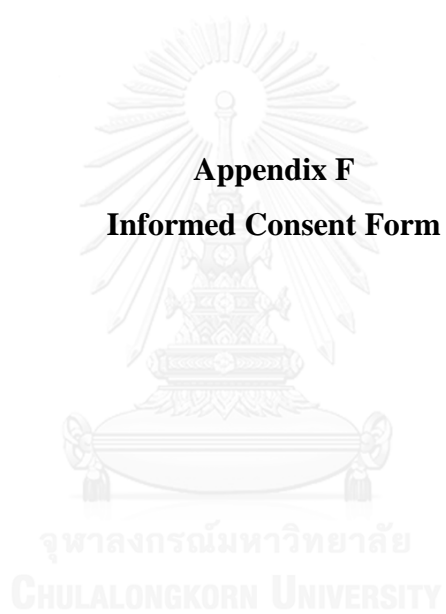
จุฬาลงกรณ์มหาวิทยาลัย  
CHULALONGKORN UNIVERSITY

### Participant Information Sheet

1. **Title of research project:** Factors Predicting Preventive Behaviors for Coronary Artery Disease Among Adults in Aceh Province, Indonesia.
2. **Researcher's name :** Zamna Idyan
3. **Office Address:** Badan Kepegawaian, Pendidikan dan Pelatihan (BKPP) Aceh Utara, Lhokseumawe.
4. **Home Address:** Dusun Tgk. Karieng – komplek Bulan Madu No.3 – Desa Geumata – Lhoksukon, Aceh Utara.
5. **Cell phone :** +6281384739183
6. **Email :** alzamna2012@gmail.com
7. You are being invited to take part in a research project. Before you decide to participate, it is important for you to understand why the research is being conducted and what it will involve. Please take time to read the following information carefully and do not hesitate to ask if anything is unclear or if you would like more information.
8. Objectives of the project
  - a. To investigate Coronary Artery Disease (CAD) preventive behaviors among adults in Aceh province, Indonesia.
  - b. To examine the association between gender, age, religious attendance, religious salience, perceived susceptibility, perceived severity, perceived benefits, perceived barriers, self-efficacy and CAD preventive behaviors of adults.
  - c. To identify predictors of CAD preventive behaviors among adults in Muslim setting.
9. The benefits of this study will help nurses, health care provider and policy maker to understand the prediction of CAD preventive behaviors among muslim setting in Aceh province so that the proper health policy strategies in term of CAD prevention can be established. In addition, the findings of this study can be as a guidance for nurses to develop appropriate cultural intervention regarding CAD preventive behaviors.

10. The participants of this study are adult outpatients who come for health care services.
11. The researcher explains the way to answer the questionnaires. When the subjects understand the method, the subject will answer all the questionnaires by themselves. When the questionnaires are handed back, the researcher will check that all the information will be completed. If any item are incomplete, the researcher will ask the subject to fill out the missing items.
12. There will be no harm for the participants in this study.
13. Protect the right of the individuals who volunteered as subjects by having each sign a consent form, which includes an explanation of the purpose of the research, assurance of confidentiality, informs about the questionnaire destruction when finishing the study as well as the option to withdraw from this study at any time with no consequence at all.
14. Information will include 'if you have any question or would like to obtain more information, the researcher can be reached at all time. If the researcher has new information regarding benefit on risk/harm, participants will be informed as soon as possible. This practice will provide an opportunity for participants to decide whether to stay/not stay within the project.
15. Information will include "Information related directly to you will be kept **confidential**. Results of the study will be reported as total picture. Any information which could be able to identify you will not appear in the report.

**Appendix F**  
**Informed Consent Form**



### Informed Consent Form

Hospital .....

Date .....

Participant's Code Number .....

I was informed by the researcher named Zamna Idyan, Master in Nursing Science student, Faculty of Nursing, Chulalongkorn University.

I am willing to take part in this researcher study, which helps nurses, health care provider and policy maker understand the predicting factors of Preventive Behaviors for Coronary Artery Disease Among Adults in Aceh Province. The responses will take about 25-30 minutes.

I have been told that I can take a break whenever I feel uncomfortable or tired. I know that I am strictly voluntary in this study, or I can drop out of the study at any time without penalty. Whenever I am in the study or not, there will be no affected on my health, or expenditure.

I understand that during the study I can contact the researcher by calling Zamna Idyan, at the Badan Kepegawaian, Pendidikan dan Pelatihan (BKPP) of North Aceh, contacting by cell phone +6281384739183, or by email: [alzamna2012@gmail.com](mailto:alzamna2012@gmail.com).

Signature

Signature

Signature

Zamna Idyan  
Researcher

( ..... )  
Participant

( ..... )  
Witness

**Appendix G**  
**Research Instruments**





## Research Instruments

### Section 1 : Sociodemographic Information

Instruction : Please read each question carefully. Write or tick the place provided which best indicates your situation.

1. Age : \_\_\_\_\_ years

2. Gender :             Male             Female

3. Marital status :     Single             Married             Divorced

4. Level of Education :

No formal education             Primary school

Junior high school             Senior high school

Undergraduate             Graduate

5. Occupation :         Civil servant/honorary             Merchant

Gardener             Private business

Labor             Student

Sailor             Unemployed

6. Reasons come to hospital :

Medical check up             Seeking medical help

7. Current disease :     Heart disease             Diabetes

Hypertension             Dyspepsia

Stroke             Other (Please specify)

.....

**Section 2 : Frequency of Attending to the religious service questionnaire**

Instruction : Please read each question carefully. Tick the place provided which best indicates your situation.

1. I attend to the mosque for shalat :

- |  |  |
|--|--|
| <input type="checkbox"/> Never           | <input type="checkbox"/> Monthly         |
| <input type="checkbox"/> Weekly          | <input type="checkbox"/> 1-3 times daily |
| <input type="checkbox"/> 4-5 times daily |  |

2. I attend to Islamic religious lectures :

- |   |                                  |
|---|----------------------------------|
| <input type="checkbox"/> Never                | <input type="checkbox"/> Monthly |
| <input type="checkbox"/> Weekly               | <input type="checkbox"/> Daily   |
| <input type="checkbox"/> More than once daily |                                  |

**Section 3 : Importance of Islam and the degree to which you involved to Islamic practice.**

Instructions : Please circle the number that best reflect your feeling.

1. In term of the questions I have about life, my Islam answers...

<b>No Questions</b>	0	1	2	3	4	5	6	7	8	9	10	<b>Absolutely all my questions</b>
---------------------	---	---	---	---	---	---	---	---	---	---	----	------------------------------------

2. Growing Islam is ..

<b>More important than anything else in my life</b>	10	9	8	7	6	5	4	3	2	1	0	<b>No important to me</b>
---	----	---	---	---	---	---	---	---	---	---	---	---------------------------

3. When I am faced with an important decision, my Islam..

<b>Plays absolutely No role</b>	0	1	2	3	4	5	6	7	8	9	10	<b>Is always the overriding consideration</b>
---------------------------------	---	---	---	---	---	---	---	---	---	---	----	---

4. Islam is..

<b>The master motive of my life, directing every other aspect of my life</b>	10	9	8	7	6	5	4	3	2	1	0	<b>Not part of my life</b>
--	----	---	---	---	---	---	---	---	---	---	---	----------------------------

5. When I think of the things that help me to grow and mature as a person, my Islam

<b>Has no effect on my personal growth</b>	0	1	2	3	4	5	6	7	8	9	10	<b>Is absolutely the most important factor in my personal growth</b>
--	---	---	---	---	---	---	---	---	---	---	----	--

6. My Islamic beliefs affect ..

<b>Absolutely every Aspect of my life</b>	10	9	8	7	6	5	4	3	2	1	0	<b>No aspect of My life</b>
---	----	---	---	---	---	---	---	---	---	---	---	-----------------------------

#### Section 4 : Perception related to coronary artery disease questionnaire

Instruction : please tick in the column that most appropriate feeling of each statement which correspond most closely to your desired response.

No	Statements	Strongly disagree	Disagree	Agree	Strongly agree
	<b>Perceived susceptibility</b>				
1	It is likely that I will suffer from a heart attack in the future				
2	My chances of suffering from a heart attack in the next few years are great				
3	I feel I will have a heart attack sometime during my life				
4	Having a heart attack is currently a possibility for me				
5	I am concerned about the likelihood of having heart attack in the near future				
	<b>Perceived severity</b>				
6	Having a heart attack is always fatal				
7	Having a heart attack will threaten my relationship with my significant other				
8	My whole life would change if I had a heart attack				
9	Having a heart attack would have a very bad effect on my sex life				
10	If I have a heart attack I will die within 10 years				

No	Statements	Strongly disagree	Disagree	Agree	Strongly agree
	<b>Perceived benefits</b>				
11	Increasing my exercise will decrease my chance of having a heart attack				
12	Eating a healthy diet will decrease my chance of having a heart attack				
13	Eating healthy diet and exercising for 30 minutes most days to prevent heart attack				
14	When I exercise I am doing something good for myself				
15	When I eat healthy I am doing something good for myself				
16	Eating a healthy diet will decrease my chance of dying from cardiovascular disease				
	<b>Perceived barriers</b>				
17	I don't know appropriate exercise to perform to reduce my risk of developing cardiovascular disease				
18	It is painful for me to walk for more than 5 minutes				
19	I have access to exercise facilities and/or equipment				
20	I have someone who will exercise with me				
21	I don't have time to exercise for 30 minutes a day on most days of the week				

No	Statements	Strongly disagree	Disagree	Agree	Strongly agree
22	I don't know what is considered a healthy diet that would prevent me from developing cardiovascular disease				
23	I don't have time to cook meals for myself				
24	I cannot afford to buy healthy food				
25	I have other problems more important than worrying about diet and exercise				



### Section 5 : Self-Efficacy Questionnaire on Health Behavior

Instruction : please tick the most appropriate feeling of each statement which correspond most closely to your desired response

No	I think I am able to :	Yes	Probably yes	Maybe	Probably not	No
1	Take my medication as prescribed					
2	Quit smoking					
3	Choose healthy food					
4	Choose healthy food when I am not at home					
5	Take the proper amount of exercise					
6	Take extra exercise					
7	Control my weight					
8	Lower my weight					
9	Control my coronary artery disease					

**Section 6 : Health Behaviors and Health Factors Questionnaire.**

Instruction : Please tick on the options given in the table. Question number 2, 5, 6 and 7 is completed by the researcher according to participants' medical record.

No	components	Options of answer (thick on the blank space)		
1	Current smoking	<input type="checkbox"/> Yes	<input type="checkbox"/> Former <12 month	<input type="checkbox"/> Never or quit >12 month
2	Body mass index	<input type="checkbox"/> >30 kg/m <sup>2</sup>	<input type="checkbox"/> 25-29.9 kg/m <sup>2</sup>	<input type="checkbox"/> <25 kg/m <sup>2</sup>
3	Physical activity	<input type="checkbox"/> None	<input type="checkbox"/> 1-149 minutes weekly moderate intensity (such as brisk walking). <input type="checkbox"/> 1-74 minutes weekly vigorous intensity (such as aerobic). <input type="checkbox"/> 1-149 minutes weekly moderate + vigorous. (brisk walking + aerobic).	<input type="checkbox"/> >150 minutes weekly moderate intensity (brisk walking). <input type="checkbox"/> >75 minutes weekly vigorous intensity (aerobic). <input type="checkbox"/> >150 minutes weekly moderate + vigorous (brisk walking + aerobic)
<b>Please circle option a, b, c, d, e, which is most likely describe your diet (You may circle more than one option)</b>				
4	Diet	<p>a. Fruits and vegetables : more than 4.5 cups per day (1 cup of fruit equals to 1 large orange or banana or 1 small apple, 1 cup of vegetable equals to 1 medium potato or large sweet potato or 1 cup of cooked greens or 2 medium carrots).</p> <p>b. Fish : more than 2 serving per week preferably oily fish (a serving of fish is 3.5 ounces, approximately the same size as a deck of cards).</p> <p>c. Fiber-rich whole grains : more than 1.1 g of fiber per day (2 cup of brown rice, 1 cup of corn, ½ cup of wheat)</p> <p>d. Salt : less than 1500 mg per day (less than ¾ teaspoon per day)</p> <p>e. Sugar : less than 450 kcal per week (less than 28 teaspoon per week, or no more than 4 teaspoon daily).</p>		
<b>Reported based on participants' medical record</b>				
5	Total cholesterol	<input type="checkbox"/> >240 mm/dl	<input type="checkbox"/> 200-239 mg/dl treated to goal	<input type="checkbox"/> <200 mg/dl
6	Blood pressure	<input type="checkbox"/> Systole >140 or diastole >90 mmHg	<input type="checkbox"/> Systole 120-139 or diastole 80-89 mmHg.	<input type="checkbox"/> Systole <120 or diastole <80 mmHg.
7	Fasting glucose	<input type="checkbox"/> >126 mm/dl	<input type="checkbox"/> 100-125 mm/dl or treated to goal	<input type="checkbox"/> <100 mmHg



## Questionnaire Analysis

### Section 2 : Frequency of Attending to the religious service questionnaire

Instruction : Please read each question carefully. Thick the place provided which best indicates your situation.

No	Statements	Never		Monthly		Weekly		1-3 times daily		4-5 times daily	
		N	%	N	%	N	%	N	%	N	%
1	I attend to the Mosque for Shalat	15	8.4	36	20.2	83	46.6	30	16.9	14	7.9
2	I attend to Islamic religious lectures	2	1.1	55	30.9	106	59.6	14	7.9	1	.6



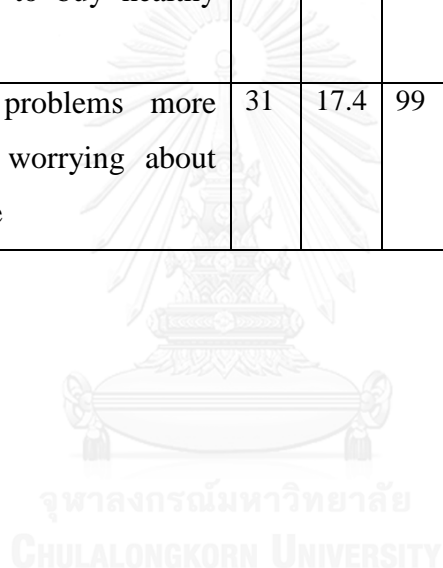
#### Section 4 : Perception related to coronary artery disease questionnaire

Instruction : please tick in the column that most appropriate feeling of each statement which correspond most closely to your desired response.

No	Statements	Strongly disagree		Disagree		Agree		Strongly agree	
		N	%	N	%	N	%	N	%
	<b>Perceived susceptibility</b>								
1	It is likely that I will suffer from a heart attack in the future	10	5.6	72	40.4	76	42.7	20	11.2
2	My chances of suffering from a heart attack in the next few years are great	18	10.1	99	55.6	44	24.7	17	9.7
3	I feel I will have a heart attack sometime during my life	12	6.7	86	48.3	72	40.4	8	4.5
4	Having a heart attack is currently a possibility for me	24	13.5	105	59	48	27	1	.6
5	I am concerned about the likelihood of having heart attack in the near future	20	11.2	118	66.3	37	20.8	3	1.7
	<b>Perceived severity</b>								
6	Having a heart attack is always fatal	8	4.5	22	12.4	115	64.6	33	18.5
7	Having a heart attack will threaten my relationship with my significant other	7	3.9	33	18.5	103	57.9	35	19.7
8	My whole life would change if I had a heart attack	19	10.7	43	24.2	84	47.2	32	18
9	Having a heart attack would have a very bad effect on my sex life	11	6.2	49	27.5	94	52.8	24	13.5
10	If I have a heart attack I will die within 10 years	35	19.7	90	50.6	44	24.7	9	5.1

No	Statements	Strongly disagree		Disagree		Agree		Strongly agree	
	<b>Perceived benefits</b>								
11	Increasing my exercise will decrease my chance of having a heart attack	3	1.7	4	2.2	121	60	50	28.1
12	Eating a healthy diet will decrease my chance of having a heart attack	2	1.1	13	7.3	114	64	49	27.5
13	Eating healthy diet and exercising for 30 minutes most days to prevent heart attack	2	1.1	18	10.1	110	61.8	48	27
14	When I exercise I am doing something good for myself	2	1.1	15	8.4	101	56.7	60	33.7
15	When I eat healthy I am doing something good for myself	2	1.1	17	9.6	100	56.2	59	33.1
16	Eating a healthy diet will decrease my chance of dying from cardiovascular disease	9	5.1	54	30.3	85	47.8	30	16.9
	<b>Perceived barriers</b>								
17	I don't know appropriate exercise to perform to reduce my risk of developing cardiovascular disease	16	9	84	47.2	71	39.9	7	3.9
18	It is painful for me to walk for more than 5 minutes	50	28.1	108	60.7	16	9	4	2.2
19	I have access to exercise facilities and/or equipment	7	3.9	120	67.4	42	23.6	9	5.1
20	I have someone who will exercise with me	9	5.1	119	66.9	40	22.5	10	5.6

No	Statements	Strongly disagree		Disagree		Agree		Strongly agree	
21	I don't have time to exercise for 30 minutes a day on most days of the week	27	15.2	96	53.9	50	28.1	5	2.8
22	I don't know what is considered a healthy diet that would prevent me from developing cardiovascular disease	29	16.3	89	50	57	32	3	1.7
23	I don't have time to cook meals for myself	32	18	103	57.9	39	21.9	4	2.2
24	I cannot afford to buy healthy food	52	29.2	99	55.6	25	14	2	1.1
25	I have other problems more important than worrying about diet and exercise	31	17.4	99	55.6	40	22.5	8	4.5



### Section 5 : Self-Efficacy Questionnaire on Health Behavior

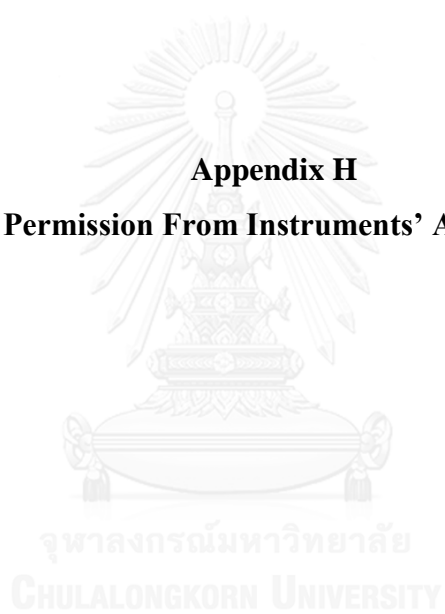
Instruction : please tick the most appropriate feeling of each statement which correspond most closely to your desired response

No	I think I am able to :	Yes		Probably yes		Maybe		Probably not		No	
		N	%	N	%	N	%	N	%	N	%
1	Take my medication as prescribed	153	86	16	9	6	3.4	3	1.7	-	-
2	Quit smoking	137	77	10	5.6	15	8.4	6	3.4	10	5.6
3	Choose healthy food	126	79.8	33	18.5	16	9	2	1.1	1	.6
4	Choose healthy food when I am not at home	71	39.9	51	28.7	27	15.2	18	10.1	11	6.2
5	Take the proper amount of exercise	60	33.7	57	32	33	18.5	16	9	12	6.7
6	Take extra exercise	37	20.8	48	27	37	20.8	25	14	31	17.4
7	Control my weight	78	43.8	36	20.2	36	20.2	14	7.9	14	7.9
8	Lower my weight	66	37.1	40	22.5	38	21.3	20	11.2	14	7.9
9	Prevent my coronary artery disease	48	27	49	27.5	56	31.5	10	5.6	15	8.4

### Section 6 : CAD Preventive Behaviors Questionnaire Descriptive Information

Elements	Scored 0 (Poor)		Scored 1 (Intermediate)		Scored 2 (Ideal)	
	N	%	N	%	N	%
Health Behaviors:						
- Smoking	36	20.2	15	8.4	127	71.3
- BMI	27	15.5	42	23.6	109	61.2
- Physical Activity	1	0.6	153	86	24	13.5
- Diet	70	39.3	76	42.7	32	18
Health Factors:						
- Total Cholesterol	37	20.8	68	38.2	73	41
- Blood Pressure	31	17.4	76	42.7	71	39.9
- Fasting Glucose	15	8.4	61	34.3	102	57.3

**Appendix H**  
**Permission From Instruments' Authors**



6/20/2016

Gmail - Supplication for Health Beliefs Related Cardiovascular Disease Scale



AI Zamna &lt;alzamna2012@gmail.com&gt;

**Supplication for Health Beliefs Related Cardiovascular Disease Scale**

3 pesan

**AI Zamna** <alzamna2012@gmail.com>  
Kepada: egres2@email.uky.edu

20 November 2015 06.49

Dear,

Elizabeth Gressle Tovar PhD RN FNP-C  
Assistant Professor  
University of Kentucky College of Nursing,  
Lexington, Kentucky, USA

My name is Zamna Idyan from Indonesia. Currently, I am an International graduate student at Faculty of Nursing, Chulalongkorn University, Thailand, with Adult Nursing Specialization. I am in the process of developing a study for my Master Degree's Thesis entitled "Factors Predicting Preventive Behaviors for Coronary Artery Disease Among Acehnese Adults in Aceh Province, Indonesia".

From literature review, I found that your study regarding "Development and Psychometric Testing of the Health Beliefs Related to Cardiovascular Disease Scale" in 2010, is likely applicable to my research. Therefore, I would like to ask your permission to employ the questionnaire from the article. As your information, I will have the questionnaire to be translated into Indonesian Language (Bahasa Indonesia) by experts.

I would be pleased to include a citation of your work and other acknowledgement as you might request. I would greatly appreciate your permission. If you require further information, or if there are any conditions that would facilitate the permission process, please do not hesitate to contact me at [alzamna2012@gmail.com](mailto:alzamna2012@gmail.com)

Hereby I enclosed my Student's ID and a letter from my University. Thank you for your consideration. I am looking forward to hearing from you.

Sincerely,

Zamna Idyan

Student of Intemational Program

Master in Nursing Science

Faculty of Nursing Chulalongkorn University

Bangkok, Thailand

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**2 lampiran**



6/20/2016

Gmail - Supplication for Health Beliefs Related Cardiovascular Disease Scale



**Alzamna Student ID.jpg**  
884K



**Letter From University.JPG**  
2747K

**Tovar, Elizabeth** <elizabeth.gressle@uky.edu>  
Kepada: Al Zamna <alzamna2012@gmail.com>

20 November 2015 18.16

Hello Zamna,  
Thank you for your email. You are welcome to use my questionnaire. Yes, please reference my work and I would love to know your results when your study is complete.

Good luck!

Elizabeth  
Sent from my iPhone  
[Kutipan teks disembunyikan]

<Alzamna Student ID.jpg>

<Letter From University.JPG>

**Al Zamna** <alzamna2012@gmail.com>  
Kepada: "Tovar, Elizabeth" <elizabeth.gressle@uky.edu>

20 November 2015 20.18

I am glad to hear a quick response from you. I would love to share the results of my study with you when it accomplished and thank you very much for your kindly permission.

Warm Regard,  
Zamna

[Kutipan teks disembunyikan]

6/20/2016

Gmail - Supplication of Permission for Religious Saliense Scale



AI Zamna &lt;alzamna2012@gmail.com&gt;

## Supplication of Permission for Religious Saliense Scale

5 pesan

AI Zamna <alzamna2012@gmail.com>  
Kepada: davidhodge@asu.edu

20 November 2015 08.07

Dear,

David R. Hodge  
Professor  
School of Social Work,  
Arizona State University,

My name is Zamna Idyan from Indonesia. Currently, I am an International graduate student at Faculty of Nursing, Chulalongkorn University, Thailand, with Adult Nursing Spesialization. I am in the process of developing a study for my Master Degree's Thesis entitled "Factors Predicting Preventive Behaviors for Coronary Artery Disease Among Acehnese Adults in Aceh Province, Indonesia". In my study, I will examine the relationship between Religious Saliense and health behaviors in term of cardiovascular disease prevention.

From literature review, I found that your study regarding "The Intrinsic Spirituality Scale: A New Six-item Instrument for Assessing the Saliense of Spirituality as a Motivational Construct" in 2006 is likely applicable to my research. Therefore, I would like to ask your permission to employ the questionnaire from the article. As your information, I will have the questionnaire to be translated to Indonesian Language (Bahasa Indonesia) by experts.

I would be pleased to include a citation of your work and other acknowledgement as you might request. I would greatly appreciate your permission. If you require further information, or if there are any conditions that would facilitate the permission process, please do not hesitate to contact me at [alzamna2012@gmail.com](mailto:alzamna2012@gmail.com)

Hereby I enclosed my Student's ID and a letter from my University. Thank you for your consideration. I am looking forward to hearing from you.

Sincerely,

Zamna Idyan

Student of International Program

Master in Nursing Science

Faculty of Nursing Chulalongkorn University

Bangkok, Thailand

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**2 lampiran**

6/20/2016

Gmail - Supplication of Permission for Religious Saliense Scale



**Alzamna Student ID.jpg**  
884K



**Letter From University.JPG**  
2747K

**David R. Hodge** <DavidHodge@asu.edu>  
Kepada: Al Zamna <alzamna2012@gmail.com>

20 November 2015 09.34

You have my permission although if y

David R. Hodge, MSW, PhD  
Professor and PhD Program Coordinator  
School of Social Work  
Arizona State University

**From:** Al Zamna [alzamna2012@gmail.com]  
**Sent:** Thursday, November 19, 2015 6:07 PM  
**To:** David R. Hodge  
**Subject:** Supplication of Permission for Religious Saliense Scale

[Kutipan teks disembunyikan]

**David R. Hodge** <DavidHodge@asu.edu>  
Kepada: Al Zamna <alzamna2012@gmail.com>

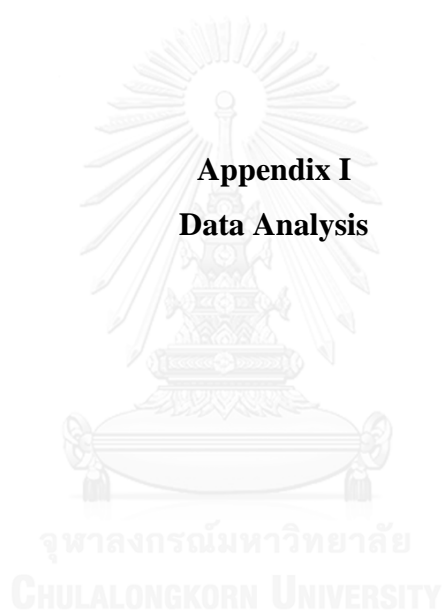
20 November 2015 09.35

You have my permission although if you are surveying Muslims, you might want to use my more recent scale.

David R. Hodge, MSW, PhD  
Professor and PhD Program Coordinator  
School of Social Work  
Arizona State University

**From:** Al Zamna [alzamna2012@gmail.com]  
**Sent:** Thursday, November 19, 2015 6:07 PM  
**To:** David R. Hodge  
**Subject:** Supplication of Permission for Religious Saliense Scale

**Appendix I**  
**Data Analysis**



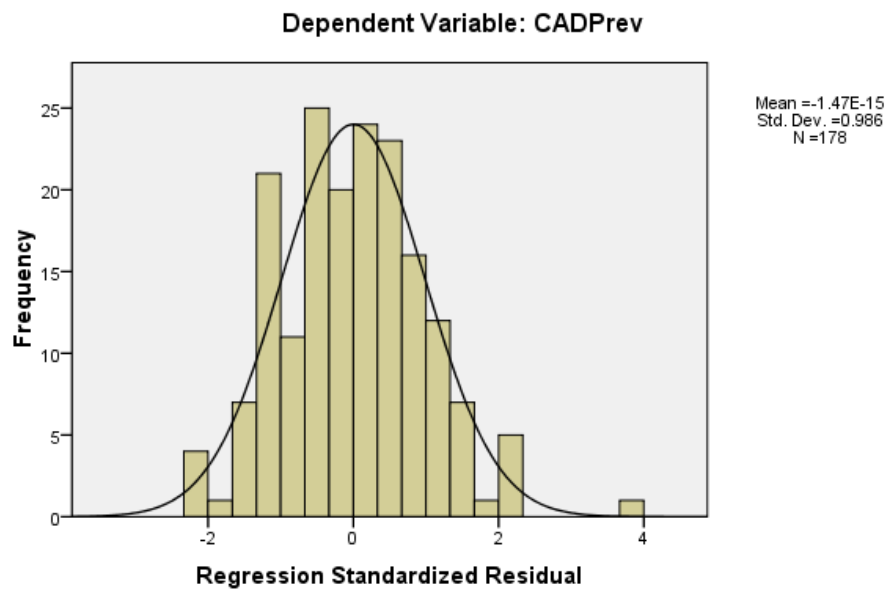
### One-Sample Kolmogorov-Smirnov Test

		Unstandardized Residual
N		178
Normal Parameters <sup>a,b</sup>	Mean	.0000000
	Std. Deviation	1.14632818
Most Extreme Differences	Absolute	.049
	Positive	.049
	Negative	-.028
Kolmogorov-Smirnov Z		.656
Asymp. Sig. (2-tailed)		.782

a. Test distribution is Normal.

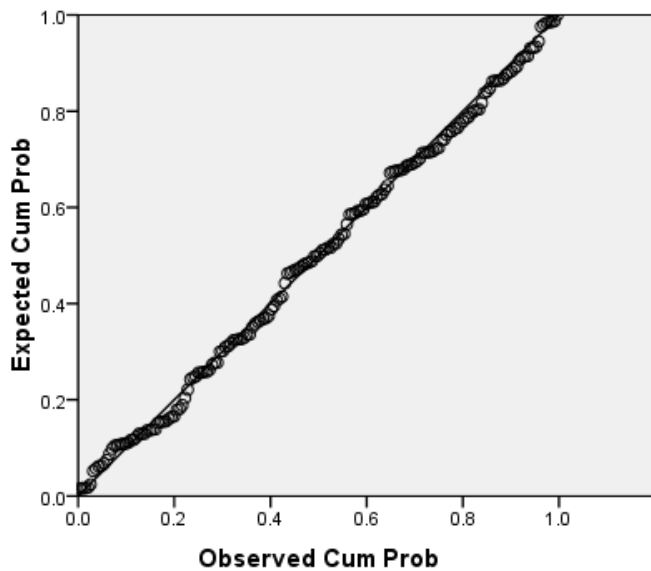
b. Calculated from data.

### Histogram



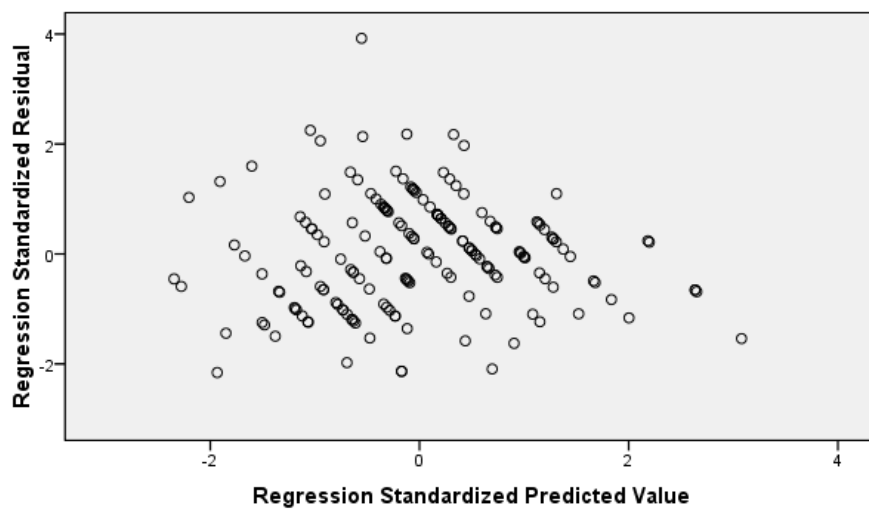
Normal P-P Plot of Regression Standardized Residual

Dependent Variable: CADPrev



Scatterplot

Dependent Variable: CADPrev



Collinearity Diagnostics<sup>a</sup>

Model	Dimensi on	Eigenvalue	Condition Index	Variance Proportions					
				(Constant)	RA	gender	PBen	RS	SEfficacy
1	1	1.936	1.000	.03	.03				
	2	.064	5.506	.97	.97				
2	1	2.583	1.000	.02	.02	.05			
	2	.356	2.694	.03	.07	.90			
	3	.061	6.495	.95	.91	.05			
3	1	3.529	1.000	.00	.01	.03	.00		
	2	.381	3.043	.00	.03	.94	.00		
	3	.076	6.794	.06	.96	.03	.05		
	4	.013	16.529	.93	.01	.00	.95		
4	1	4.501	1.000	.00	.00	.01	.00	.00	
	2	.397	3.366	.00	.01	.95	.00	.00	
	3	.078	7.580	.02	.70	.03	.03	.00	
	4	.017	16.499	.08	.02	.00	.87	.18	
	5	.006	26.457	.89	.26	.00	.09	.82	
5	1	5.468	1.000	.00	.00	.01	.00	.00	.00
	2	.401	3.691	.00	.01	.91	.00	.00	.00
	3	.085	8.018	.01	.68	.03	.01	.00	.03
	4	.025	14.901	.00	.01	.02	.39	.00	.61
	5	.015	19.327	.07	.05	.01	.49	.33	.24
	6	.006	30.512	.92	.25	.02	.10	.66	.12

a. Dependent Variable: CADPrev

## Religious attendance Cronbach's Alpha

<b>Reliability Statistics</b>				
Cronbach's Alpha	N of Items			
.878	2			

<b>Item-Total Statistics</b>				
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Re-Attendance1	2.07	.685	.814	. <sup>a</sup>
Re-Attendance2	2.80	1.200	.814	. <sup>a</sup>

a. The value is negative due to a negative average covariance among items. This violates reliability model assumptions. You may want to check item codings.

## Religious salience Cronbach's Alpha

<b>Reliability Statistics</b>				
Cronbach's Alpha	N of Items			
.941	6			

<b>Item-Total Statistics</b>				
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Salience1	41.13	53.154	.647	.952
Salience2	40.63	51.551	.839	.929
Salience3	40.67	47.540	.851	.927
Salience4	40.67	53.057	.848	.930
Salience5	40.97	45.620	.901	.921
Salience6	40.77	48.668	.900	.921



## Perceived susceptibility Cronbach's Alpha

<b>Reliability Statistics</b>	
Cronbach's Alpha	N of Items
.724	5

<b>Item-Total Statistics</b>				
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Susceptibility1	11.43	2.254	.476	.684
Susceptibility2	11.90	2.783	.299	.741
Susceptibility3	11.37	2.447	.396	.715
Susceptibility4	11.87	2.395	.607	.635
Susceptibility5	12.10	2.231	.701	.595

## Perceived severity Cronbach's Alpha

<b>Reliability Statistics</b>	
Cronbach's Alpha	N of Items
.919	5

<b>Item-Total Statistics</b>				
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Severity1	12.00	6.414	.783	.909
Severity2	12.03	5.964	.867	.892
Severity3	12.47	4.671	.891	.885
Severity4	12.30	5.252	.861	.887
Severity5	12.93	5.995	.661	.927

## Perceived benefits Cronbach's Alpha

<b>Reliability Statistics</b>				
Cronbach's Alpha	N of Items			
.936	6			

<b>Item-Total Statistics</b>				
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
P-Benefit1	17.00	5.655	.765	.930
P-Benefit2	16.87	5.913	.835	.921
P-Benefit3	16.87	5.913	.835	.921
P-Benefit4	16.90	5.955	.821	.923
P-Benefit5	16.87	5.775	.901	.913
P-Benefit5	17.17	5.523	.751	.934

## Perceived barriers Cronbach's Alpha

<b>Reliability Statistics</b>				
Cronbach's Alpha	N of Items			
.705	9			

<b>Item-Total Statistics</b>				
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
P-Barriers1	19.17	8.695	.658	.618
P-Barriers2	20.40	9.421	.665	.632
P-Barriers3	19.23	11.151	.162	.717
P-Barriers4	19.00	11.724	.220	.705
P-Barriers5	20.00	10.621	.285	.697
P-Barriers6	19.50	10.121	.448	.669
P-Barriers7	19.57	11.702	-.059	.794
P-Barriers8	19.77	8.047	.762	.588
P-Barriers9	19.63	9.275	.569	.642

### Self-efficacy Cronbach's Alpha

<b>Reliability Statistics</b>				
Cronbach's Alpha	N of Items			
.837	9			

<b>Item-Total Statistics</b>				
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
S-Efficacy1	28.87	45.706	.000	.850
S-Efficacy2	29.33	38.920	.439	.831
S-Efficacy3	29.07	42.754	.368	.838
S-Efficacy4	29.73	38.616	.594	.818
S-Efficacy5	31.13	35.637	.455	.836
S-Efficacy6	31.57	33.840	.699	.802
S-Efficacy7	30.20	30.648	.792	.787
S-Efficacy8	30.13	32.533	.808	.787
S-Efficacy9	30.90	32.990	.637	.810

### CAD Preventive Behaviors Cronbach's Alpha

<b>Reliability Statistics</b>	
Cronbach's Alpha	N of Items
.863	7



**Item-Total Statistics**

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
CAD Prev Behavior1	8.63	8.654	.496	.864
CAD Prev Behavior2	8.83	7.178	.889	.802
CAD Prev Behavior3	9.10	10.024	.362	.873
CAD Prev Behavior4	9.37	8.447	.487	.869
CAD Prev Behavior5	8.63	8.102	.807	.821
CAD Prev Behavior6	8.70	8.769	.753	.834
CAD Prev Behavior7	8.73	7.720	.734	.828



## VITA

My name is Zamna Idyan, usually called as Zamna. I am studying Master of Nursing Science Program in Adult Nursing Field at Faculty of Nursing Chulalongkorn University, Bangkok, Thailand. I was born in Bambi, Aceh, Indonesia. I am Muslim, my nationality is Indonesian. I graduated my Bachelor Degree of Nursing at University of Indonesia, Jakarta, Indonesia. To complete my bachelor degree, I studied “Relationship between prolong sitting and low back pain among Nursing student of Faculty of Nursing University of Indonesia”. Prior to this study, I worked at Community Hospital of Lhoksukon, North of Aceh. I was involved in many nursing programs for patients such as education program about heart disease, hypertension, and diabetes.

I was also appointed as the nursing students’ instructor at my working place. My job was guiding and teaching the nursing students during nursing practice in my hospital. After working for several years, I was looking to pursue Master Degree of Nursing overseas and granted a scholarship from graduate school of Chulalongkorn University during 2014 to 2016. Currently I conduct a research to comply the requirement to get MNS from the Faculty of Nursing Chulalongkorn University, entitled “Factors Predicting Preventive Behaviors for Coronary Artery Disease among Adults in Aceh Province, Indonesia”.

Hereby are my contact: email (alzamna2012@gmail.com), and phone (+66863152647).