



Risk assessment of cardiovascular disease among staff of Sakon Nakhon Rajabhat University

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Abstract

Cardiovascular disease is a major cause of disability and premature mortality among middle-aged adults in Thailand. This disease is influenced by preventable risk factors. Thus, risk assessment is necessary to identify risk levels and to design the preventive risk-reducing intervention for individual risk of cardiovascular disease. This descriptive research aimed to assess the risk of cardiovascular disease among staff at Sakon Nakhon Rajabhat University. For sample selection, the present attendance of annual health check-up was used as inclusion criteria (35 years old and over). A total of 101 staff who met all of the eligibility requirements were selected and completed a questionnaire from May to July in 2013. The questionnaire was applied from cardiovascular risk assessment for Thai people (Rama-EGAT Heart Score). Data were analyzed by descriptive statistics: means, standard deviation, and percentage. The results showed that the samples were female (64.4%); 62.4% were married and 44.6% were civil servants. 13.9% of samples were smokers. Regarding alcohol use, 10.9% reported habitual drinking alcohol. However, only 47.5% had annual health checks. The risk assessment of cardiovascular disease reported 7.9% and 5.0% of samples had high and moderate-risk levels, respectively. Therefore, these results have further suggested this organization in providing appropriate health intervention to reduce the cardiovascular risks among staff.

Keywords: Assessment, Risk, Cardiovascular disease, Staff

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1. Introduction

Rapid economic and social changes influence people's ways of living such as dietary imbalance, lack of exercises, and stress, and these factors contribute to cardiovascular disease. According to the World Health Organization since 2009, developed countries in the Western Hemisphere found that one in five causes of deaths was associated with CVD [1]. In Thailand, cardiovascular disease was the first leading causes of death followed by cancer and accidents. In addition, it was also found that cardiovascular disease trended to increase

every year. In 2007, one hundred thousand people die because of cardiovascular disease, rising to 55.2, 56.0, 55.2, and 61.9 in the years 2008 –2010, respectively [2]. Cardiovascular disease is also caused by atherosclerosis or blood vessels obstruction. The factors for cardiovascular disease can be grouped into three categories: 1) the unmodified risk factors that increase the risk of cardiovascular disease including age, gender, and genetics, 2) the modified risk factors such as, high-fat diet, lack of exercises, smoking, alcohol, stress, etc. The cardiovascular disease which is caused by modified risk factors can be controlled, and treated. Having modified behaviors, namely eating nutritious food, being physically active, avoiding tobacco use, and limiting alcohol intake can decrease chances for developing heart disease and stroke, and 3) the promoting factors such as diabetes, hypertension, obesity, etc. [3]. These factors are associated with the conditions of cholesterol and low-density lipoprotein (LDL). Smoking, alcohol consumption and diabetes will increase chances of heart disease and stroke. The study by A. Sukonthasarn concluded that if the blockage in the coronary arteries makes heart muscle ischemia or myocardial infarction within a period of six years, after the occurrence of myocardial infarction, then the first 16% of males and 35% of females will develop a myocardial infarction. If repeating for a second time, 7% of males and 6% of females will have a sudden death. In addition, 22% of males and 46% of females experience discomfort symptoms during heart failure [4].

American College of Physicians and the Heart of America [3] offer a guideline on secondary prevent of cardiovascular disease. The guideline involves guidance for the health team in controlling appropriately the risk of coronary heart disease patients and planning prevention and treatment to reduce the risk of cardiovascular problems, which may cause serious consequences in the future. The risk assessment of cardiovascular disease is also recommended to be taken account in assessing and managing a person's overall cardiovascular disease risk. The International approaches to risk assessment, including Framingham Heart Study, to predict a person's chance of having a heart attack in the next 10 years, are included. However, the rating form is a model that does not suit Thai context. However, the data retrieved from the international approach can be used as a basis for risk calculation to generate a precise and appropriate risk assessment model for cardiovascular disease in Thailand

Faculty of Medicine Ramathibodi Hospital and the National Health Foundation designed the risk assessment for cardiovascular disease (Rama-EGAT heart score) for Thai people. The simple assessment needs for laboratory results together with the validity of the Rama-EGAT heart scores of patients with severe coronary artery at Siriraj Hospital found that the Rama-EGAT heart score was accurate to predict risk in males and female on 0.754 and 0.849, respectively [5]. In sum, the earlier assessment approach can be applied in Thailand, and should be able to examine those who have disease risk factors in order to prevent further transmission effectively.

Sakon Nakhon Rajabhat University (SNRU), located in Sakon Nakhon province in Northeast Thailand, has a total of 684 staff [6] comprising government officials and university's officials and temporary employees both academic and support staff. One of the University focuses is quality improvement for health promotion for staff. Thus, the provision of continuous support for promoting healthy development and quality of life for staff has been set and provided annual health check for staff in each academic year. Most staff are entitled to reimburse the cost of an annual health check which is determined by the Ministry of Health, under the established programs in each age group (age less than 35 years or 35 years and older). The results of the annual health check will be sent

individually with advice on health care as a whole in line with the results of audits. Data collection showed that participating staff faced a risk of cardiovascular disease in the future [7]. However, the results from the annual health check of the staff did not provide detailed analysis of the risk of cardiovascular disease.

The study on the relationship between perceived risks of cardiovascular disease and healthy habits revealed that the perceived risks of cardiovascular disease are associated with health behaviors at a statistical significance of the 0.01 level [8]. It could be concluded that if people are able to predict and acknowledge the risk of cardiovascular disease for the next 10 years, they will increase awareness of disease preventive activities. Thus, to study the risk assessment of cardiovascular disease among staff at SNRU by using the Rama-EGAT Heart Score to determine the likelihood of cardiovascular disease within the next 10 years can be used as a guideline to reduce the risks of individual staff members and all university staff. The findings of this study also can be used as a baseline level for health promoting activities and disease prevention for staff at SNRU appropriately, and contribute a healthy organization

2. Materials and Methods

This research employed a quantitative survey.

1) Population: 684 staff, comprised government officials and university's officials and temporary employees both academic and support staff, were listed on the Register of Personnel Administration and Legal Affairs of SNRU in 2013.

2) Samples: 101 personnel, comprised government officials and university's officials and temporary employees both academic and support staff, were listed on the Register of Personnel Administration and Legal Affairs of SNRU in 2013. The sampling personnel aged 35 years and older, obtained through purposive sampling technique, taking part in a health check program of the Department of Health and Sanitation of Sakon Nakhon Rajabhat University [7]. Each participant was notified that study participation was completely voluntary and could be stopped at any time without negative consequence, and signed an informed consent document for health assessment on the risk of cardiovascular disease. The data collection period was between 1st May and 31st July 2013.

3) Research instruments: The research instrument was a questionnaire about assessment on the risk of cardiovascular disease based on a review of SNRU staff, relevant theory and application of risk assessment for cardiovascular disease for Thailand or Rama. EGAT Heart Score [9]. The questionnaire contained two sections: (1) annual health check result information involved the explanation about research purposes, advantages to be received health information, and health check required for the assessment, and a cooperate in signature of sample under certain conditions, and (2) assessment of the risk of cardiovascular disease for SNRU staff was divided into: General information about health and illness through the multiple choice questions, and filling gaps including,

gender, age, marital status, work, weight, height, waist measurement (cm.), smoking, alcohol consumption, the annual health check included blood pressure, cholesterol level, blood sugar level (fasting plasma glucose; FPG) and health history.

4) Data analysis, statistical and computer program: The statistics used descriptive statistics, frequency, percentage, mean, median, standard deviation, maximum and minimum, the analysis of the risk of cardiovascular disease were divided two cases: Case 1- using blood test results, and Case 2 - using non-blood test results.

5) Human right research: This research kept the samples informed about the research objectives, and advantages of data collection procedures. The ethical practices were also explained to the participants. For example, the participants' name would not appear in any resulting research publications. Participation was also voluntary and included the right to withdraw from the project anytime. The participants who agreed to take part in this study are asked to sign an informed consent form.

3. Results and Discussion

1) General and behavior data information: from Table 1, the sample group information showed that personnel who received a health check in the year 2013 at the age of 35 years and older were females (64.4%), participating personnel aged 50 years old (25.3%), married (62.4%) and single (30.7%), governors is 44.6%. The rate of cigarette smoking was 13.9% in the whole sample. For habitual drinking respondents, 10.9% reported drinking 2-3 times a week. Only 47.5% of participants had regularly annual health check.

2) Health conditions of participants: Table 2 revealed that the sample aged 35 years old and older were male with 90 cm. up waist (36.1%), and women with 80 cm. up waist (41.5%). The evaluation of nutritional status, and overweight and obesity was 50.6% and 21.8%, respectively. The evaluation also revealed that blood pressure level was 140/90 mmHg or higher (10.9%). In blood sugar level after a period of fasting, at least eight hours, the samples exceeded the threshold of 126 mg/dl or above (9.9%). The total cholesterol level was 280 mg/dl and above (5.0%).

3) The assessment of cardiovascular disease risk for the next 10 years using blood test results revealed that: In Table 3, the samples' results showed a high risk level of 7.9%. From Table 4, the samples' results revealed that there was no high risk found, but 94.1% of the samples had a low risk level. The study also showed the risk of cardiovascular disease in the next 10 years of Sakon Nakhon Rajabhat University staff. According to self-assessment, the risk factors included the concept of assessment RAMA - EGAT Score, using and not using the blood results. The results in both groups had different effects. When assessing the risk of cardiovascular disease by using blood test results, 7.9% of the samples were found having higher risk of cardiovascular disease in the next 10 years. 5.0% of the samples were found having a moderate risk when using non-blood test results. In addition, the study of S. Yamwong, 0.0% of the samples had higher risk, but 94.1% of participants had low risk [9]. This would be concluded that the above-mentioned evaluation of the risk of cardiovascular disease which was suitable for Thai

people. The evaluation form was used by medical personnel to calculate possible close proximity event. However, a self-assessment using blood test results will be less accurate due to the risk factors of cardiovascular disease. The aim of the evaluation was to further examine various factors in details, overall cholesterol levels, the occurrence of arterial occlusion and arteriosclerosis, heart disease, or to determine the blood glucose after fasting for 8 h (FPG) that affecting the risk of cardiovascular disease. In order to evaluate more accurate test results, the evaluation should be used to assess an assembly. In the case of the annual health check, the blood test results are also needed to evaluate.

Table 1 The frequency and percentage of the samples classified as general information (n = 101)

| general information | frequency | % |
|-------------------------------|-----------|------|
| Sex | | |
| Male | 36 | 35.6 |
| Female | 65 | 64.4 |
| Age (years old) | | |
| 35 – 39 | 22 | 13.6 |
| 40 – 44 | 20 | 12.3 |
| 45 – 49 | 18 | 11.1 |
| 50 and older | 41 | 25.3 |
| Status | | |
| Single | 31 | 30.7 |
| Married | 63 | 62.4 |
| Widowed | 7 | 7.0 |
| Smoking | | |
| Never smoked | 87 | 86.1 |
| Smoked but quit then | 13 | 12.9 |
| Smokers and current | 1 | 1.0 |
| smokers | | |
| Drinking alcoholic beverages | | |
| do not drink | 57 | 56.4 |
| Drink once (one time / week | 31 | 32.7 |
| or less) | | |
| Drink regularly (at least 2-3 | 11 | 10.9 |
| times / week) | | |

The risk of cardiovascular disease from the samples, only a small number of the samples have a high level of risk which is different from a study of J. Chukhiaw, C. Suwanno and T. Samienpetch [10] predicted the risk of disease. The results revealed that 29% of high blood pressure occurred in women who were treated in community hospital, at a rate of higher to highest level. There were however several possible reasons for these inconsistent results: 1) the risk assessment use was different. This study employed Framingham Global Risk Scoring assessment which was for analyzing other major risk factors, 2) Features did not involve in this study. They were high density lipoprotein, and secondary risk factors including waist-to-hip ratio, body mass index, triglyceride, low density

lipoprotein, cholesterol, and the activities of the body, and 3) A specific group of patients with high blood pressure was assessed. Thus, risk of cardiovascular disease was likely higher than the rate among staff.

Table 2 The frequency and percentage of the samples classified according to a medical examination (n = 101)

| general information | frequency | % |
|--|-----------|------|
| Waistline | | |
| Male | | |
| Less than 90 cm | 23 | 63.9 |
| Up to 90 cm | 13 | 36.1 |
| Female | | |
| Less than 80 cm | 38 | 58.5 |
| Up to 80 cm | 27 | 41.5 |
| Nutritional status and body mass index | | |
| Malnutrition (less than 18.5 kg / m ²). | 10 | 9.9 |
| Well nutrition (18.5 - 20.0 kg / m ²). | 10 | 9.9 |
| Malnutrition rare occasions (20 - 25 kg / m ²) | 51 | 50.5 |
| The risk of chronic complications associated with excess nutrients (25 - 30 kg / m ²). | 22 | 21.8 |
| Overweight / obese are at risk of complications (more than 30 kg / m ²). | 7 | 6.9 |
| Unchecked | 1 | 1.0 |

Table 3 The frequency and percentage of respondents classified the risk of cardiovascular disease in the next 10 years of the samples by using blood test results (n = 101)

| The risk score included factors | The risk of cardiovascular disease | frequency | % |
|---------------------------------|------------------------------------|-----------|------|
| ≤ 4 | normal / low risk | 88 | 87.1 |
| 5 - 9 | Risk | 5 | 5.0 |
| ≥ 10 | High risk | 8 | 7.9 |

Table 4 The frequency and percentage of respondents classified the risk of cardiovascular disease in the next 10 years of the samples by using non-blood test results (n = 101)

| The risk score included factors | The risk of cardiovascular disease | frequency | % |
|---------------------------------|------------------------------------|-----------|------|
| ≤ 4 | normal / low risk | 95 | 94.1 |
| 5 - 9 | Risk | 6 | 5.9 |
| ≥ 10 | High risk | 0 | 0.0 |

4. Conclusion

The assessment risk of cardiovascular disease in the next 10 years among staff by using the blood test results showed more prevalence of those who have high cardiovascular risk compare to the results by using without-blood test method. Staff who attended the annual health check program might get more benefits in considering their health risks while staff who did not attend this program might get less chance to be aware of those risks.

5. Suggestion

1) SNRU should set policies or activities to promote health and prevent risk factors for cardiovascular disease. The provision of risk factor reduction or avoiding risk factors that affected a quality of life and performance of staff should be included. In a case of personnel who had a moderate level risk should change their behaviors, such as taking regular exercises, avoiding sweet and salty diet, quit smoking, seeking medical advice. Personnel who had a high risk of developing cardiovascular disease should modify their behaviors, and consult medical doctor.

2) Universities and relevant departments should support public relations staff to join the program and assessed the risk of cardiovascular disease.

3) The future research could also be extended to other major chronic diseases, and may include studies on aspects of health behaviors related to heart cardiovascular disease, and chronic diseases.

4) The samples in this research were staff participating in the annual health checks. This sampling group tended to pay much attention to health care. Therefore, results from an evaluation of risk of cardiovascular disease were likely at a lower risk level. Subsequent studies should be considered.

5) The university should support projects on assessment for the risk of cardiovascular and application to assess the risk of cardiovascular disease in the future.

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