

EFFECTIVENESS OF HEALTHY ORGANIZATION BY PARTICIPATORY
ENCOURAGEMENT (HOPE) PROJECT ON REDUCING CARDIOVASCULAR
RISK FACTORS IN EMPLOYEES OF THE ELECTRIC GENERATING
AUTHORITY OF THAILAND (EGAT)

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บทคัดย่อและแฟ้มข้อมูลฉบับเต็มของวิทยานิพนธ์ตั้งแต่ปีการศึกษา 2554 ที่ให้บริการในคลังปัญญาจุฬาฯ (CUIR)
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ประสิทธิผลของโครงการองค์กรสุขภาพดีด้วยกระบวนการให้การสนับสนุนแบบมีส่วนร่วมต่อ
การลดปัจจัยเสี่ยงของการเกิดโรคหัวใจและหลอดเลือดในพนักงาน
การไฟฟ้าฝ่ายผลิตแห่งประเทศไทย (กฟผ.)

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ปาจริย์ อับดุลลาฮาซิม : ประสิทธิภาพของโครงการองค์กรสุขภาพที่ดีด้วยกระบวนการให้การสนับสนุนแบบมีส่วนร่วมต่อการลดปัจจัยเสี่ยงของการเกิดโรคหัวใจและหลอดเลือดในพนักงานการไฟฟ้าฝ่ายผลิตแห่งประเทศไทย(EFFECTIVENESS OF HEALTHY ORGANIZATION BY PARTICIPATORY ENCOURAGEMENT (HOPE) PROJECT ON REDUCING CARDIOVASCULAR RISK FACTORS IN EMPLOYEES OF THE ELECTRIC GENERATING AUTHORITY OF THAILAND (EGAT)) อ. ที่ปรึกษาวิทยานิพนธ์หลัก: ผศ.ดร.รัตนา สำโรงทอง, อ. ที่ปรึกษาวิทยานิพนธ์ร่วม: ศ.นพ.ปิยะมิตร ศรีธรา, 166 หน้า.

วัตถุประสงค์ 1) เพื่อประเมินความรู้ การรับรู้ความเสี่ยง และความสามารถของตนเอง พฤติกรรมเสี่ยงที่สัมพันธ์กับโรคหัวใจและหลอดเลือด สถานะสุขภาพ และการมีส่วนร่วมของชุมชน 2) พัฒนาโครงการองค์กรสุขภาพที่ดีด้วยกระบวนการมีส่วนร่วมเพื่อปรับเปลี่ยนความเสี่ยงต่อโรคหัวใจและหลอดเลือดด้วยการสร้างความตระหนัก แรงจูงใจ และความสามารถในการปฏิบัติ รวมทั้งสนับสนุนศักยภาพขององค์กรในการประเมินและควบคุมปัจจัยเสี่ยงต่อโรคหัวใจและหลอดเลือด 3) ประเมินประสิทธิผลของโครงการที่พัฒนาขึ้นด้วยการลดปัจจัยเสี่ยงต่อโรคหัวใจและหลอดเลือดในพนักงานการไฟฟ้าฝ่ายผลิตแห่งประเทศไทย (กฟผ.) ที่ปฏิบัติงาน ณ โรงไฟฟ้าพระนครใต้ จ.สมุทรปราการ ประเทศไทย ในเดือนเมษายน 2554 ถึงเดือนกันยายน 2555

รูปแบบและวิธีการศึกษา การศึกษานี้เป็นการทดสอบก่อนและหลังในกลุ่มเดียวกันด้วยการใช้แบบสอบถามด้วยตนเอง ซึ่งประกอบด้วย ข้อมูลทางประชากร ประวัติสุขภาพ ความรู้ การรับรู้ความเสี่ยง ความสามารถของตนเอง สถานะการสูบบุหรี่ พฤติกรรมการดื่มแอลกอฮอล์ ความถี่การบริโภคอาหาร รูปแบบการเคลื่อนไหวทางกาย และระดับความเครียด ใช้เครื่องมือ RAMA EGAT ในการคำนวณความเสี่ยงรวมต่อการเกิดโรคหัวใจและหลอดเลือด ประยุกต์ใช้กระบวนการเข้าถึงแบบมีส่วนร่วมเป็นแกนหลักในการพัฒนาโครงการ โครงการองค์กรสุขภาพที่ดีด้วยกระบวนการมีส่วนร่วมประกอบด้วย 4 ระยะ ได้แก่ 1) การสร้างศักยภาพ 2) การประเมินความเสี่ยง 3) การป้องกันและแก้ไขปัญหา และ 4) การกำกับควบคุมและเผยแพร่ ประสิทธิภาพของโครงการฯ ประเมินได้จากการเปลี่ยนแปลงของความรู้ การรับรู้ความเสี่ยง ความสามารถของตนเอง สถานะการสูบบุหรี่ พฤติกรรมการดื่มแอลกอฮอล์ ความถี่การบริโภคอาหาร รูปแบบการเคลื่อนไหวทางกาย ระดับความเครียด คะแนนความเสี่ยงรวมจาก RAMA EGAT การวัดองค์ประกอบของร่างกาย และการมีส่วนร่วมของชุมชน

ผลการศึกษา จากจำนวนพนักงาน 507 คนของโรงไฟฟ้าพระนครใต้ มีพนักงาน 384 คน อายุระหว่าง 22-60 ปี (อายุเฉลี่ย 48.2 ± 10.1 (SD) ปี เป็นผู้ชายร้อยละ 85.7) ที่ตอบแบบสอบถามกลับในการเก็บข้อมูลพื้นฐานด้วยการศึกษาแบบภาคตัดขวาง มีอาสาสมัครเพียง 36 คนที่สมัครใจเข้าร่วมกิจกรรมแบบพิเศษของโครงการต่อไป หลังจากเสร็จสิ้นโครงการอาสาสมัครมีความรู้เพิ่มขึ้นอย่างมีนัยสำคัญทางสถิติ ($p = 0.040$) คะแนนความเสี่ยงรวมต่อของเกิดโรคหัวใจและหลอดเลือดและโอกาสในการเกิดโรคหัวใจและหลอดเลือดใน 10 ปีข้างหน้า มีค่าเฉลี่ยของคะแนนและร้อยละลดลงอย่างมีนัยสำคัญทางสถิติด้วยเช่นเดียวกัน ($p = 0.031$ และ $p = 0.003$) การเปลี่ยนแปลงใน 5 มิติการมีส่วนร่วมของชุมชน มีเพียงมิติของการเคลื่อนไหวของทรัพยากรที่มีการเปลี่ยนแปลงในช่วงกว้างระหว่างก่อนและหลังเข้าร่วมโครงการ

การสรุปและอภิปรายผล ผลการศึกษาแสดงให้เห็นว่าพนักงานกฟผ.ที่ปฏิบัติงาน ณ โรงไฟฟ้าพระนครใต้ให้การยอมรับโครงการฯนี้เป็นอย่างดี และโครงการฯได้ให้ประสิทธิผลในการเพิ่มความรู้เกี่ยวกับปัจจัยเสี่ยงต่อโรคหัวใจและหลอดเลือด และลดความเสี่ยงรวมต่อการเกิดโรคหัวใจและหลอดเลือด การเพิ่มขึ้นของการมีส่วนร่วมของชุมชนเป็นอีกหนึ่งกลยุทธ์แห่งความสำเร็จของกลยุทธ์การส่งเสริมสุขภาพในสถานที่ทำงานนี้

สาขาวิชา.....สาขารณสุขศาสตร์.....ลายมือชื่อ.....
ปีการศึกษา.....2555.....ลายมือชื่อ อ.ที่ปรึกษาวิทยานิพนธ์หลัก.....
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PAJAREE ABDULLAKASIM : EFFECTIVENESS OF HEALTHY ORGANIZATION BY PARTICIPATORY ENCOURAGEMENT (HOPE) PROJECT ON REDUCING CARDIOVASCULAR RISK FACTORS IN EMPLOYEES OF THE ELECTRIC GENERATING AUTHORITY OF THAILAND (EGAT). ADVISOR: ASST. PROF. RATANA SOMRONGTHONG, Ph.D., CO-ADVISOR : PROF. PIYAMITR SRITARA, M.D., 166 pp.

Objectives 1) To evaluate the knowledge, risk perceptions, and self-efficacy about CVD, CVD risk behaviors, health status, and community participation, 2) To develop the healthy organization by participatory encouragement (HOPE) project related to modify CVD risks by raising awareness, motivation, and abilities to action and also support the organizational capability to assess and control CVD risk factors, and 3) To evaluate effectiveness of the developed program involved with reducing CVD risk factors among the EGAT employees in the South Bangkok Power Plant in Samutprakarn province, Thailand over the period April 2011 to September 2012.

Methods This study was one group pre- and posttest design using self-administrative questionnaires including demographic information, medical history, knowledge, risk perception, self-efficacy, smoking status, alcohol drinking habit, food frequency eating behavior, physical activity pattern, and stress level. RAMA-EGAT score was used as a tool for the total CVD risk calculation. Participatory approach was applied as a core process of the intervention development. HOPE project comprised 4 phases including 1) capacity building, 2) risk analysis, 3) problem solving and prevention, and 4) monitoring and dissemination. The effectiveness of HOPE project was evaluated through the change of knowledge, risk perception, self-efficacy, smoking status, alcohol drinking habit, food frequency eating behavior, physical activity pattern, and stress level, RAMA-EGAT score, body composition, and community participation.

Results Of 507 employees at the South Bangkok Power Plant, 384 employees, aged between 22 – 60 years (mean \pm SD; 48.2 ± 10.1 years, 85.7% were male) returned the questionnaires for the cross-sectional survey at baseline. Only 36 participants had willingly to attend the further exclusive intervention program. After intervention, the participants had a significantly increased the mean score of CVD knowledge ($p = 0.040$). Total CVD risk score and probability of CVD development in 10 years also showed the significantly decreasing of the mean score and percentage ($p = 0.031$ and $p = 0.003$). The change in 5 dimensions of community participation, only the dimensions of resource mobilization was observed the wide range between baseline and after intervention.

Conclusion The findings revealed that the EGAT employees of South Bangkok Power Plant accepted the HOPE project quite well and the project was effective in increasing knowledge about CVD risk factors and reducing the total CVD risks. Increasing community participation was also a key success in the health promotion strategy in the workplace.

Field of Study : Public Health Student's Signature

Academic Year : 2012 Advisor's Signature

Co-advisor's Signature

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CHAPTER I

INTRODUCTION

1.1. Background and Rationale

Cardiovascular diseases (CVD) is the major leading cause of mortality in every regions of the world, particularly in developed countries or industrialized countries since 1920, except sub-Saharan Africa, and it is predicted that CVD will dominate the present leader in that region, infectious disease, within the next few years (Bonow, et al, 2002; Yusuf, et al., 2001). According to World Health Organization (WHO) estimates, CVD killed 17.1 million individuals in 2004, representing 29% of all global deaths each year. Of these deaths, an estimated 7.2 million were due to coronary heart disease and 5.7 million were due to stroke. By the year of 2030, almost 23.6 million people will die from CVD each year, mainly from heart disease and stroke and 82% of deaths take place in low- and middle-income countries and occur almost equally in men and women. (Murray and Lopez, 1997; Michaud et al, 2001; WHO, 2009). CVD have been considered as also a reflection of socioeconomic evolution.

Compared to developed countries, the mortality rates from these potentially preventable diseases are much lower in developing countries. However, it was predicted that an increase in CVD would occur in poor countries undergoing industrialized societies, evolution, and adoption of a typical Western lifestyle. CVD has become the major cause of death in many developing countries, especially among adults aged between 30 to 69 years (Reddy and Yusuf, 1998). In the Asia Pacific Cohort Studies Collaboration (APCSC) has data from 513,000 Asians. It includes 35 studies from Asia: 16 from mainland China, 12 from Japan, two from Taiwan and from Singapore and one each from Hong Kong, South Korea and Thailand. This study shows that increasing systolic blood pressure is an important risk factor for mortality from both haemorrhagic and ischaemic stroke and coronary heart disease (CHD) in Asia. Diabetes and smoking are also important risk factors for all three of these outcomes. Increasing total cholesterol (TC) is a significant risk factor for CHD death, and almost significant for ischaemic stroke. Increasing body mass index (BMI) also increases the risk of coronary death significantly. For increasing triglycerides, there is

a suggestion of an increased risk of all three types of cardiovascular death (Tai et al, 2009). This study showed similarity of the major risk factors contributing to CVD between Asian and Western countries. It is no surprise that the major leading risk factors contributing to disease developments, disabilities and death for CVD in developed countries are physical inactivity, tobacco consumption, high blood pressure, high cholesterol level, overweight, and low fruit and vegetable intake (Woodward and Reid, 2003).

In Thailand, changes in disease patterns have been consistent in parallel with “*epidemiologic transition*”. Over the economic development periods from the first National Economic Development Plan (1961-1966), disease pattern has been in a transition from infectious diseases to noncommunicable diseases such as CVD and cancer (Antarasen, 1994; Omran, 1971, Petcharoen et al, 2006). CVD has become one of the leading causes of death for Thai population. From the annual reports of Ministry of Public Health (MoPH) in 2007, CVD was ranked in top 3 of the major leading cause of morbidity and mortality. Over the past 5 years, morbidity rates of CVD were increased by about 3 to 17 times. Statistics in 2006 show that the morbidity rate among Thais because of CVD was 618.53 per 100,000 persons and the mortality rate was 28.4 per 100,000, or 49 persons a day on average (Bureau of Policy and Strategy, MoPH, 2007). Interestingly, CVD patients were more likely to be higher in the younger age group (NESDB, 2008). According to the high incidence of CVD morbidity and mortality leads to huge expense in health care costs and also lost of productivity of the country because it can cause premature death in working age group.

From the largest and longest longitudinal cohort study of cardiovascular and metabolic risks in Thailand, involving more than 9,000 employees of the Electric Generating Authority of Thailand (EGAT) corporation, represented as working age population. There are three waves of the study, the original EGAT study started in 1985 and now reaching 25th year, the second wave was conducted in 1998, twelve years ago, and the latest one has just started in the year of 2009. Regarding the original study of EGAT with 12-year follow-up (1985 – 1997) of 3,499 employees (average age 43 years), showed that they were increased mean levels of systolic and diastolic blood pressure, body mass index, total cholesterol and high density

lipoprotein (HDL) cholesterol over 12 years of follow-up period. The prevalence of diabetes also rose over the same time. The most frequent cause of death were vascular diseases, were positively associated with age, blood pressure, diabetes, male gender, smoking status, and total cholesterol, but reverse association with HDL cholesterol. The results can be implied that EGAT employees comprised predominately the urban middle-class workers were more likely to have cardiovascular risk factors and also have been raising the prevalence of cardiovascular risk factors over 12 years of follow-up periods including hypertension, dyslipidemia, smoking, diabetes, and obesity (Sritara et al, 2003; Aekplakorn, et al. 2007; Sritara et al, 2007). However, this study only generally described the common risk characteristics and trends related to CVD development among EGAT population over time.

Regarding the health examination survey of the observational study at EGAT after the year of 2004, health promotion division, under the medical care unit of EGAT which has duties on training and organizing health education programs about occupational health and safety for all level of EGAT people, started to provide health promotion program, particularly on CVD risk factors reduction and control. Nevertheless, all of the projects for CVD risk factors reduction and control were mainly implemented in the central office of EGAT, North Bangkok Power Plant in Nonthaburi province. For the other Power Plants under EGAT, they can generate health promotion activities in workplace depending on their own resources and readiness. Therefore this study was involved with the other settings of EGAT that still have no health promotion activity in the workplace and the South Bangkok Power Plant of the Electric Generating Authority of Thailand (EGAT) was selected as the study area.

From the EGAT employee health report at department of health of South Bangkok Power Plant in 2010, total study population were 505, aged between 24 – 60 years (mean \pm SD; 49.7 ± 7.0 years, 86.9% male and 13.1% female). The prevalence of overweight (BMI ≥ 23 kg/m²) and obesity (BMI ≥ 25 kg/m²) in this group were 15.4% and 31.7%, respectively. They had waist circumference greater than 90 and 80 centimeters by 34.9% and 30.3% in men and women, respectively. The health examination showed the diagnosis of CVD risk factors including hypertension (7.9%), high total cholesterol (36.6%), low HDL-cholesterol (4.0%), and high fasting blood

glucose (21.8%). The findings revealed that the EGAT employees in South Bangkok Power Plant are at risk for CVD. From qualitative study, administrative officers and health care staffs of department of health were aware of their employee's health regarding the organizational policy and there was regularly individual counseling program for only high-risk employees at department of health. Therefore, it was a challenging task to develop a comprehensive workplace health promotion program using a participatory approach. The program should focusing on cardiovascular health of the employees, by promoting healthy lifestyle with physically active, healthy diet, avoids smoking, and stress management.

According to the health promotion literature, there were several best and assuring practices have been identified. A more comprehensive approach to worksite health promotion across multiple risk factors is favorable to one that adopts a single focus, targeting a subset of the employee population with a particular risk (Pelletier, 2005). Achieving organizational commitment, offering incentives to participate, providing effective screening and triage, having state-of-the-art interventions, and providing ongoing program evaluation are also considered as assuring practices (Goetzel et al, 2007). The key organizational factors have identified that associated with successful outcomes. Because of the large number of stakeholders involved and the complexity of the problem, participatory approach may be an effective means to formulate a comprehensive workplace participatory health promotion program. Participatory action research refers to a research approach in which academic researchers and organizational members equitably participate in all phases of research, including identification of community health concerns, intervention design, study implementation, data analysis, and the interpretation and dissemination of study results (Rockville, 2001; Israel et al, 2005). This has led some researchers to the search for participatory research methodologies that facilitate the construction of studies leading to an integral comprehension of work related health problems and which, at the same time, promote consciousness raising and organization among workers taking into account existing conditions, i.e. the circumstances under which workers act and the type of intervention that is sought. Such a methodology should at least include the following characteristics: be accessible to groups of organized workers, produce reliable information on risks and health damage, be action oriented

and based on epidemiological and preventive criteria (Laurell et al, 1992). However, very little research has been directed at the application of a comprehensive workplace participatory health promotion programs and encouraged skills to practices into workplace. The utilization of knowledge and perception into practice and skill for individual CVD risk management are the important key point for the further study.

Therefore, all those issues addressed were what would be appropriate to raise awareness of the need for EGAT workplace health promotion programs with the ultimate aim of engaging them in activities to reduce CVD among their employees. The concept of the study program was the healthy organization by participatory encouragement (HOPE) project. The developed intervention program under the HOPE project were evaluated the effectiveness on improving employee cardiovascular health in the EGAT employees. The findings can be applied as an evidence-based and a best practice model of the comprehensive workplace participatory health promotion program in term of improved health, reduced medical costs, and increased productivity in the future and also encourages the employers or the private sectors investment for healthy and productive workers within their organization.

1.2 Research Objectives

1. To evaluate the knowledge, risk perceptions, and self-efficacy of the person about CVD, CVD risk behaviors, health status, and community participation among EGAT employees in the South Bangkok Power Plant in Samutprakarn province, Thailand.

2. To develop the healthy organization by participatory encouragement (HOPE) project related to modify CVD risks by raising awareness, motivation, and abilities to action and also support the organizational capability to assess and control CVD risk factors among EGAT employees in the South Bangkok Power Plant in Samutprakarn province, Thailand.

3. To evaluate effectiveness of the developed program involved with reducing CVD risk factors in the EGAT employees in the South Bangkok Power Plant in Samutprakarn province, Thailand.

1.3 Research Question

1. Is the healthy organization by participatory encouragement (HOPE) project effective in improving awareness, motivation, and abilities to action on cardiovascular risk factors and also effect on reducing CVD risks among EGAT employees?

2. Does the HOPE project enabling support and encourage the organization capability to assess and control CVD risk factors?

1.4 Research Hypothesis

Null Hypothesis: The changes in level of knowledge, attitude, risk perceptions about CVD, CVD risk behaviors, health status, and community participation are not different compared between pre- and post-test of the healthy organization by participatory encouragement (HOPE) project.

Alternative Hypothesis: The changes in level of knowledge, attitude, risk perceptions about CVD, CVD risk behaviors, health status, and community participation are different compared between pre- and post-test of the healthy organization by participatory encouragement (HOPE) project.

Research Hypothesis: The healthy organization by participatory encouragement (HOPE) project resulted in better improvement in the knowledge, attitude, risk perceptions about CVD, CVD risk behaviors, health status, and community participation among the EGAT employees compared between the pre- and post-test.

1.5 Scope of this Study

This study was conducted at South Bangkok Power Plant of EGAT in Samutprakarn province, Thailand during April 2011 to September 2012. The study population was the EGAT employees aged between 22 – 60 years who work at the South Bangkok Power Plant of EGAT. The study samples who had moderate to high CVD risk levels were recruited into the developed program, categorized by RAMA-EGAT heart score and their willingly to participate in every steps of the project.

The study intervention was the healthy organization by participatory encouragement (HOPE) project that applied participatory action research as a core

process, including four phases: capacity building (3 months), risk analysis (3 months), problem solving and prevention (3 months), and monitoring and dissemination (6 months). The I-change model was applied as the behavioral change theory to support and monitor the intervention program. The study duration covers 15 months for all phases of the study. Firstly, the capacity building phase included: arranging meeting to draw on collaboration and interaction of stakeholders, baseline survey, identify core group and skill training for CVD risk assessments and managements. Secondly, the risk analysis phase included: the researchers and the stakeholders participated in finding appropriate solution, developing the intervention program, creating and schedule activities. Thirdly, the problem solving and prevention phase included: action planning for implementation and follow-up training visit. Lastly, the monitoring and dissemination phase included: monitoring the community participation, process and outcome evaluation of the intervention program, and dissemination and feedback results to all stakeholders.

The effectiveness of the study program was evaluated by the change in the mean scores of knowledge, attitude, risk perceptions about CVD, CVD risk behaviors, health status, and community participation. The research instruments were composed of self-administrative questionnaires, physical and biological CVD risk indicators, guidelines for in-depth interview and focus group discussion, and community participation evaluation checklist. For self-administrative questionnaires, they consisted of socio-demographic information, medical history, knowledge, risk perceptions, and self-efficacy about CVD and CVD risk factors, usual eating pattern, physical activity, smoking and alcohol drinking status, and stress level. Physical and biological CVD risk indicators were assessed as weight, height, waist and hip circumference, lipid profiles including total cholesterol, high density lipoprotein cholesterol and low density lipoprotein cholesterol, blood pressure, and fasting plasma glucose. RAMA-EGAT heart score was used for calculating the total CVD risk score and percentage of probability of CVD development over 10 years. This score refers to the change in overall CVD risk factors.

1.6 Conceptual framework

The conceptual framework of this study applied from Social Ecological Model (Stokols, 1996) is presented in the schematic below (figure 1.1). The social ecological paradigm recognizes the inter-relationship that exists between the individual and their environment. These factors consisted of external and internal environment factors in the organization, non-modifiable and modifiable risk factors in the individuals.

The goal of this study was to reduce CVD risk factors among the EGAT employees by improving desired health behaviors included: increased physical activity, healthy diet, avoid smoking, and stress management. This developed program regarding Social Ecological Model aimed to encourage and support organizational capability to assess and control the risks, building community partnership, and increasing awareness, motivation, and abilities to action among the individuals. These influencing factors were evaluated by monitoring the changes in knowledge, risk perceptions, self-efficacy about CVD, CVD risk behaviors, health status, and community participation among the EGAT employees.

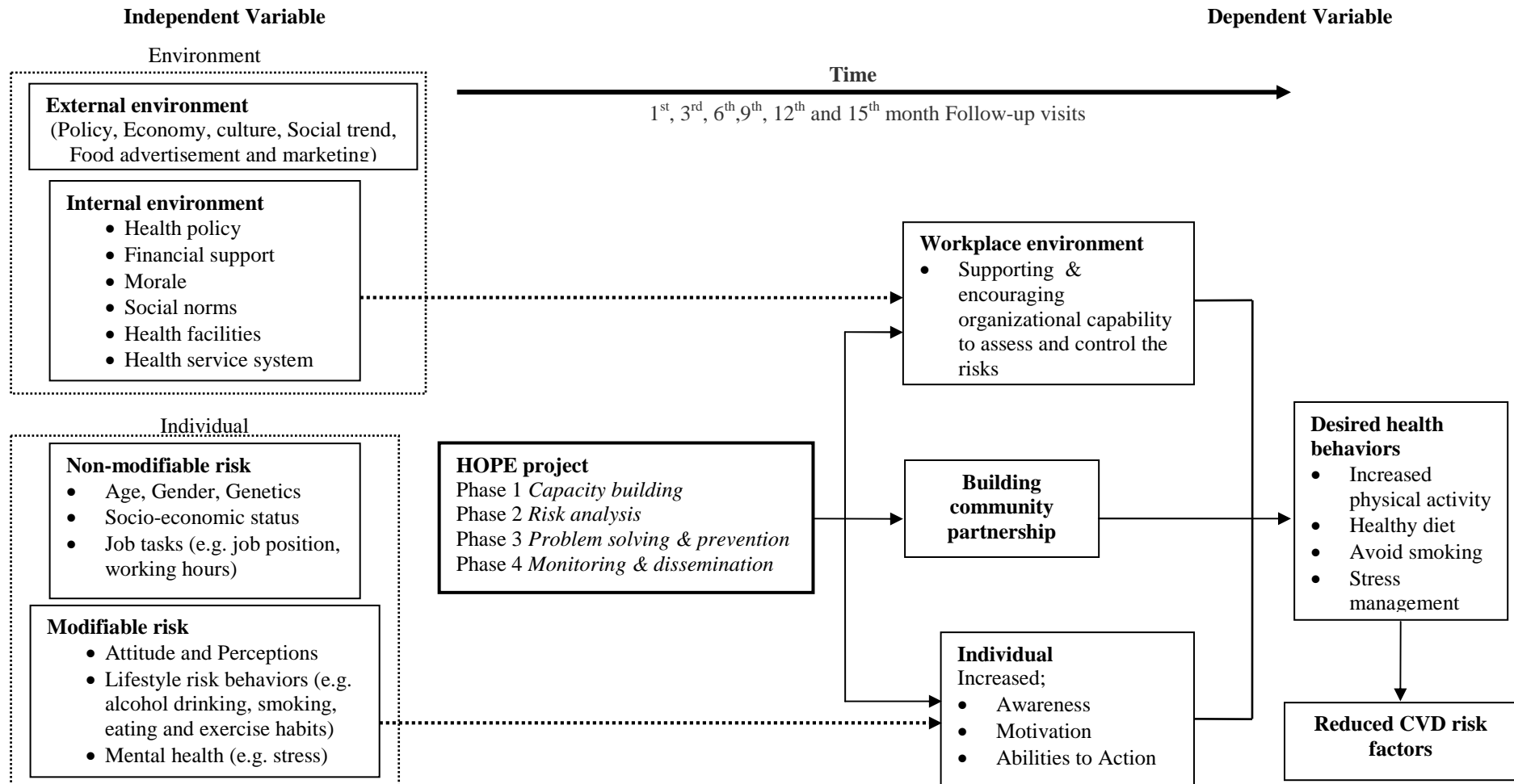


Figure 1.1 Conceptual framework of the study

1.7 Operational Definition

1. **Cardiovascular disease (CVD)** is a class of diseases that involve the heart or blood vessels: arteries, capillaries and veins (Maton, 1993). It refers to any disease that affects the cardiovascular system, principally cardiac disease, vascular diseases of the brain and kidney, and peripheral arterial disease, including arteriosclerosis, coronary artery disease, heart valve disease, arrhythmia, heart failure, hypertension, orthostatic hypotension, shock, endocarditis, disorders of the peripheral vascular system, and congenital heart disease and stroke (Bridget, 2010).

2. **Cardiovascular disease risk factors** refer to risk factors for CVD that can be modified by the HOPE project including behavioral risk factors (physical inactivity, unhealthy diets, stress, and smoking) as well as environmental support in workplace.

3. **Modifiable CVD risk factors** refer to knowledge, attitude, perceptions, lifestyle risk behaviors, mental health, and workplace environmental support.

4. **Non-modifiable CVD risk factors** refer to age, gender, genetics, socioeconomic status, and job task.

5. **CVD risk assessment** refers to RAMA-EGAT heart score methods for CVD risk assessment. It comprises 8 weighted risk factors, including sex, age, total cholesterol (TC), diabetes mellitus, hypertension, current smoking status, and waist circumference. The score was utilized as an indicator for change of overall CVD risk factors and percentage of probability of CVD development over 10 years (Yamwong et al, 2005).

6. **Participatory action research** refers to a research approach in which academic researchers and organizational members equitably participate in all phases of research, including identification of community health concerns, intervention design, study implementation, data analysis, and the interpretation and dissemination of study results (Kemmis and McTaggart, 1988).

7. **The Healthy Organization by Participatory Encouragement (HOPE) project** refer to a comprehensive workplace participatory health promotion program promoting employee's health by using participatory approach across multiple CVD risk factors. **The focus is on risk assessment and management** for the most important risk behaviors like unhealthy diet, physical inactivity, mental health, and

tobacco abuse. The intervention program was **developed by integration of the I-Change model.**

8. Effectiveness of the study refers to assess the effect of HOPE project on CVD risks knowledge, risk perceptions, self-efficacy, and risk behaviors, anthropometric measures, biological indicators, and community participation.

9. CVD risk behaviors refer to unhealthy diets, physical inactivity, smoking, alcohol drinking, and stress.

10. Biological indicators for CVD refer to lipid profiles including total cholesterol, high density lipoprotein cholesterol and low density lipoprotein cholesterol, blood pressure, and fasting plasma glucose.

11. Anthropometric measures refer to body mass index (BMI), waist and hip circumference, and body composition analysis.

12. Body composition analysis refers to Bioelectrical Impedance Analysis (BIA) or InBody 720 (Biospace Co.Ltd., Seoul, Korea) for measuring the changes in fat, fat-free mass, lean body mass, visceral fat, body water, basal metabolism, and fitness score.

13. Employees refer to employees of EGAT who regularly work at South Bangkok Power Plant in Samutprakarn province, aged between 22 and 60 years.

14. The I-Change Model refers to the three phases of behavioural changing process that focusing on awareness, motivation, and ability to action.

15. Awareness refers to knowledge and risk perceptions of the person about CVD risk behaviors.

16. Motivation refers to determination of three factors influencing CVD risk behaviors including attitudes, social influences, and self-efficacy expectations.

17. Abilities to action refer to self-efficacy, action planning, and goal setting for CVD risk behaviors management.

18. Workplace social-environment refers to the policies, practices, physical environment, and informal structures of an organization which constrain or promote recommended behaviors for CVD risk reduction including peers, friends, rules, regulation, health care facilities, and policies in workplace to support behavioral change.

19. Community participation refer to the level of community participation based on 5 dimensions of the community initiative including leadership, organization, needs assessment, management, and resource mobilization.

CHAPTER II

LITERATURE REVIEW

Regarding the study framework, literature reviews include knowledge, theories, and relevant research to support as described follow;

2.1 Cardiovascular diseases (CVD)

Cardiovascular pertains to cardio (heart) and vascular (blood vessels). Thus, cardiovascular disease (CVD) refers to dysfunctional conditions of the heart (heart disease) and vessels (particularly the arteries) that supply oxygen to organs and tissues throughout the body, including the brain, heart, and other vital organs (defined by American Federation for Aging Research). CVD includes arteriosclerosis, coronary artery disease, heart valve disease, arrhythmia, heart failure, hypertension, orthostatic hypotension, shock, endocarditis, disorders of the peripheral vascular system, and congenital heart disease and stroke. Heart attacks and strokes are usually acute events and are mainly caused by a blockage that prevents blood from flowing to the heart or brain. The most common reason for this event is a build-up of fatty deposits on the inner walls of the blood vessels that supply the heart or brain. Strokes can also be caused by bleeding from a blood vessel in the brain or from blood clots (WHO, 2009).

CVD is the leading cause of death globally. Of the 16.7 million deaths from CVD every year, 7.2 million are due to ischemic heart disease, 5.5 million to cerebrovascular disease, and an additional 3.9 million to hypertensive and other heart conditions. As well, at least 20 million people survive heart attacks and strokes every year, a significant proportion of them requiring costly clinical care, which puts a huge burden on long-term care resources. By the year of 2030, almost 23.6 million people will die from CVD, mainly from heart disease and stroke. These are projected to remain the single leading causes of death. The largest percentage increase will occur in the Eastern Mediterranean Region. The largest increase in number of deaths will occur in the South-East Asia Region (American Heart Association, 2007; Tai et al, 2009; WHO, 2009). CVD has no geographic, gender or socio-economic boundaries. CVD affects people in their mid-life years, undermining the socioeconomic development, not only of affected

individuals, but families and nations. Lower socioeconomic groups generally have a greater prevalence of risk factors, diseases and mortality in developed countries, and a similar pattern is emerging as the CVD epidemic matures in developing countries (Yusuf et al, 2001). Low- and middle-income countries are disproportionately affected: 82% of CVD deaths take place in low- and middle-income countries and occur almost equally in men and women. It is estimated that CVD will be the leading cause of death in developing countries by 2010 (Woodward and Reid, 2003; WHO, 2009).

Cardiovascular disease risk factors

Extensive clinical and epidemiological studies have identified several factors that increase the risk of coronary heart disease and heart attack. Major risks factors are those that research has shown significantly increase the risk of heart and blood vessel (cardiovascular) disease. Other factors are associated with increased risk of cardiovascular disease, but their significance and prevalence haven't yet been precisely determined. They're called contributing risk factors (Erhardt, 2007; Rippe, Angelopoulos, and Zukley, 2007). The American Heart Association has identified several risk factors. Some of them can be modified, treated or controlled, and some cannot. *The more risk factors you have, the greater your chance of developing coronary heart disease.* And, the greater the level of each risk factor, the greater the risk as well (American Heart Association, 2007). Overall the risk factors for CVD are categorized into 2 major groups in order to the risk managements that they are 1) non-modifiable risks and 2) modifiable risks (American Heart Association, 2007; Erhardt, 2007; Rippe et al, 2007; Stamler et al, 2000; Woodward and Reid, 2003; WHO, 2009; Wilson et al, 1998) as follow;

Non-modifiable major CVD risk factors comprise age, heredity or genetics, and gender as described below;

- *Increasing age:* Over 83% of people who die of CVD are 65 or older. At older ages, women who have heart attacks are more likely than men are to die from them within a few weeks.
- *Heredity or Genetics (including Race):* Children of parents with CVD are more likely to develop it themselves. African Americans have more

severe high blood pressure than Caucasians and a higher risk of CVD. Heart disease risk is also higher among Mexican Americans, American Indians, native Hawaiians and some Asian Americans. This is partly due to the higher rates of obesity and diabetes as well. Most people with a strong family history of CVD having one or more other risk factors are more likely to have the higher risk for CVD development.

- *Male sex (gender)*: Men have a greater risk of heart attack than women do, and they have attacks earlier in life. Even after menopause, when women's death rate from CVD increases, it's not as great as men's.

Modifiable CVD risk factors comprise tobacco consumption, High blood cholesterol, high blood pressure, physical inactivity, overweight and obesity, unhealthy dietary practices, and diabetes mellitus as described below;

- *Tobacco consumption*: Smokers' risk of developing CVD is 2–4 times that of nonsmokers. Cigarette smoking is a powerful independent risk factor for sudden cardiac death in patients with coronary heart disease; smokers have about twice the risk of nonsmokers. Cigarette smoking also acts with other risk factors to greatly increase the risk for CVD. People who smoke cigars or pipes seem to have a higher risk of death from CVD (and possibly stroke) but their risk isn't as great as cigarette smokers'. Exposure to other people's smoke increases the risk of heart disease even for nonsmokers.
- *High blood cholesterol*: As blood cholesterol rises, so does risk of CVD. When other risk factors (such as high blood pressure and tobacco consumption) are present, this risk increases even more. A person's cholesterol level is also affected by age, gender, heredity and diet.
- *High blood pressure*: High blood pressure increases the heart's workload, causing the heart to thicken and become stiffer. It also increases the risk of stroke, heart attack, kidney failure and congestive heart failure. When high blood pressure exists with obesity, smoking, high blood cholesterol levels or diabetes, the risk of heart attack or stroke increases several times.

- *Physical inactivity*: An inactive lifestyle is a risk factor for CVD. Regular, moderate-to-vigorous physical activity helps prevent heart and blood vessel disease. The more vigorous the activity, the greater health benefits. However, even moderate-intensity activities help if done regularly and long term. Physical activity can help control blood cholesterol, diabetes and obesity, as well as help lower blood pressure in some people.
- *Overweight and obesity*: People who have excess body fat, particularly if a lot of it is at the waist (abdominal fat), are more likely to develop heart disease and stroke even if they have no other risk factors. Excess weight increases the heart's work. It also raises blood pressure and blood total cholesterol and triglyceride levels, and lowers HDL ("good") cholesterol levels. It can also make diabetes more likely to develop. Many obese and overweight people may have difficulty losing weight. But by losing even as few as 10 pounds (4.5 kilograms), this can lower the CVD risk (Eckel and Krauss, 1998).
- *Unhealthy dietary practices* include the high consumption of saturated fats, salt and refined carbohydrates, as well as low consumption of fruit and vegetables. These risk factors tend to cluster.
- *Diabetes mellitus*: Diabetes seriously increases the risk of developing CVD. Even when glucose (blood sugar) levels are under control, diabetes increases the risk of heart disease and stroke, but the risks are even greater if blood sugar is not well controlled. About three-quarters of people with diabetes die of some form of heart or blood vessel disease. Thus, it's extremely important to manage and control diabetes and any other related risk factors.

In addition, there are also other factors contribute to CVD risk factors comprise stress and alcohol drinking as described below;

- Individual response to *stress* may be a contributing factor. Some scientists have noted a relationship between CVD risk and stress in a person's life, their health behaviors and socioeconomic status. These factors may affect established risk factors. For example, people under

stress may overeat, start smoking or smoke more than they otherwise would.

- *Drinking*: too much alcohol can raise blood pressure, cause heart failure and lead to stroke. It can contribute to high triglycerides, cancer and other diseases, and produce irregular heartbeats. It also contributes to obesity, alcoholism, suicide and accidents. The risk of CVD in people who drink moderate amounts of alcohol (an average of one drink for women or two drinks for men per day) is lower than in nondrinkers. One drink is defined as 1-1/2 fluid ounces (fl oz) of 80-proof spirits (such as bourbon, Scotch, vodka, gin, etc.), 1 fl oz of 100-proof spirits, 4 fl oz of wine or 12 fl oz of beer. It's not recommended that nondrinkers start using alcohol or that drinker's increase the amount they drink.

Just as we cannot control age, gender, race, and family history, therefore, it is even more important to treat and control any other risk factors that can be modified by behavioral lifestyle change.

Cardiovascular disease risk management and control

Cardiovascular disease can be prevented through healthy diet, regular physical activity and avoiding tobacco smoke. Individuals can reduce their risk of CVD by engaging in regular physical activity, avoiding tobacco use and second-hand tobacco smoke, choosing a diet rich in fruit and vegetables and avoiding foods that are high in fat, sugar and salt, and maintaining a healthy body weight (Erhardt, 2007; Rippe, Angelopoulos, and Zukley, 2007). Compelling evidence indicates that the following strategies are effective in preventing CVD, and in helping manage the disease (Mosca et al, 2005):

- Limit energy intake from total fats and shift fat consumption away from saturated fats to unsaturated fats and towards the elimination of trans-fatty acids
- Increase consumption of omega-3 fatty acids from fish oil or plant source
- Consume a diet high in fruits vegetables, nuts and whole grains, and low in refined grains

- Avoid excessively salty or sugary foods
- At least 30 minutes of regular physical activity daily
- Avoid smoking
- Maintain a healthy weight

In addition, *comprehensive and integrated action* is the means to prevent and control CVD (WHO, 2009).

- Comprehensive action requires combining approaches that seek to reduce the risks throughout the entire population with strategies that target individuals at high risk or with established disease.
- Examples of population-wide interventions that can be implemented to reduce CVD include: comprehensive tobacco control policies, taxation to reduce the intake of foods that are high in fat, sugar and salt, building walking and cycle ways to increase physical activity, providing healthy school meals to children.
- Integrated approaches focus on the main common risk factors for a range of chronic diseases such as CVD, diabetes and cancer: unhealthy diet, physically inactivity and tobacco use.

However, the most cost-effective methods of reducing risk among an entire population are population-wide interventions, combining effective policies and broad health promotion policies. These should be the first to be considered in all settings. In many countries, too much focus is being placed on one-on-one interventions among people at medium risk for CVD. A better use of resources would be to focus on those at elevated risk and to use other resources to introduce population-wide efforts to reduce risk factors through multiple economic and educational policies and programs. These risk factors include diet and physical activity. The dietary intake of fats, especially their quality, strongly influences the risk of CVD like coronary heart disease and stroke, through effects on blood lipids, thrombosis, blood pressure, arterial function, arrhythmogenesis and inflammation. Excessive salt intake has a significant impact on blood pressure levels as well (Mosca et al, 2005; WHO 2009).

Effective interventions for CVD prevention and control

From WHO report (WHO, 2009), it includes the results of the successful CVD prevention and control program worldwide, for instance;

- In the *United Kingdom*, a government-promoted program in consort with the food and drink manufacturing industry successfully reduced salt content in almost a quarter of manufactured foods over several years.

- In *Mauritius*, cholesterol reduction was achieved largely by a government-led effort switching the main source of cooking oil from palm to soya bean oil.

- *Korea* has worked to retain elements of the traditional diet. Civil society and government initiatives led mass media campaigns to promote local foods, traditional cooking methods and the need to support local farmers.

- In *Japan*, government-led health campaigns have greatly reduced general salt intake and together with increased blood pressure treatment have reduced blood pressure population-wide. Meanwhile stroke rates have fallen by more than 70%.

- In *Finland*, community-based and national interventions, including health promotion and nutrition interventions, led to population-wide reductions in cholesterol and other risks, closely followed by a precipitous decline in heart disease and stroke mortality.

- In the *USA*, a decrease in saturated fat intake in the late 1960s began the large decline in coronary heart disease deaths seen in the last few decades there.

- In *New Zealand*, introduction of labeling logos for healthier foods led many companies to reformulate their products. The benefits included large decreases in the salt content of processed foods.

All those programs are the population-based community intervention program as the country level. In addition, there are getting more interested in organizational levels to promote employee health in working conditions. It is worthwhile to invest health promotion program in workplace because working age groups are the major power to produce productivity of the country.

2.2 Health promotion in workplace

According to Ottawa Charter for Health Promotion definition, “**health promotion** is the process of enabling people to increase control over and to improve their health” (WHO, 1986). Health promotion represents a comprehensive social and political process, it not only embraces actions directed at strengthening the skills and capabilities of individuals, but also action directed towards social changing, environmental and economic conditions so as to alleviate their impact on public and individual health. Health promotion is the process of enabling people to increase control over the *determinants of health* and thereby improves their *health*. *Participation* is essential to sustain health promotion action (WHO, 1986; 1998).

The **Ottawa Charter** identifies *three basic strategies* for health promotion. These are *advocacy* for health to create the essential conditions for health indicated above; *enabling* all people to achieve their full health potential; and *mediating* between the different interests in society in the pursuit of health. These strategies are supported by five priority action areas as outlined in the Ottawa Charter for health promotion as follow (Nutbeam, 1986; WHO, 1986; 1998):

- Build healthy public policy
- Create supportive environments for health
- Strengthen community action for health
- Develop personal skills
- Re-orient health services

The **Jakarta Declaration** (WHO, 1997) on leading health promotion into the 21st Century from July 1997 confirmed that these strategies and action areas are relevant for all countries as well. Furthermore, there are clear evidences that *comprehensive approaches* to health development are the most effective. Those that use combinations of the five strategies are more effective than single-track approaches. Settings for health promotion offer practical opportunities for the implementation of comprehensive strategies; *Participation is essential to sustain efforts*. People have to be at the centre of health promotion action and decision-making processes for them to be effective; *Health literacy/ health learning* foster

participation. Access to education and information is important to achieving effective participation and the *empowerment* of people and communities as well. For health promotion in the 21st century the Jakarta Declaration identifies five priorities included;

- Promote social responsibility for health
- Increase investments for health development
- Expand partnerships for health promotion
- Increase community capacity and empower the individual
- Secure an infrastructure for health promotion

The *workplace* has been internationally recognized as an appropriate setting for health promotion. The importance of workplace health promotion was addressed in 1950 and later updated in a 1995 joint International Labor Organization/World Health Organization (WHO) Session on Occupational Health (WHO Regional office for Europe, 2002). Since this time, health promotion in the workplace has been broadly recommended by international bodies through numerous charters and declarations, including the 1986 Ottawa Charter for Health Promotion (WHO, 1986), the 1997 Jakarta Declaration on Leading Health Promotion into the 21st Century (WHO, 1997), and the 2005 Bangkok Charter for Health Promotion in a Globalized World (WHO, 2005; 2006). The European Network for Workplace Health Promotion (ENWHP, 2007) has similarly issued a number of statements in support of workplace health promotion, including the Luxemburg Declaration on Workplace Health Promotion in the European Union, the Lisbon Statement on Workplace Health in Small/Medium Sized Enterprises, and the Barcelona Declaration on Developing Good Workplace Health Practice in Europe (WHO, 2006).

The *WHO's 2004 Global Strategy on Diet, Physical Activity and Health*, as endorsed by the Fifty-seventh World Health Assembly in resolution WHA57.17, highlights the workplace as an important setting for health promotion in Point 62:

"Workplaces are important settings for health promotion and disease prevention. People need to be given the opportunity to make healthy choices in the

workplace in order to reduce their exposure to risk. Further, the cost to employers of morbidity attributed to noncommunicable diseases is increasing rapidly. Workplaces should make possible healthy food choices and support and encourage physical activity" (WHO, 2003; 2007).

Moreover, the **WHO's Global Plan of Action on Worker's Health 2008-2017**, as endorsed by the Sixtieth World Health Assembly in resolution WHA60.26, states in Point 14:

"Health promotion and prevention of noncommunicable diseases should be further stimulated in the workplace, in particular by advocating healthy diet and physical activity among workers, and promoting mental health at work..." (WHO, 2007).

The term **"health promotion in the workplace"** (Shain and Kramer, 2004) *is a multidimensional concept that embraces at least two major philosophies about what health is and how it is influenced. The first philosophy sees health as largely the product of individual behavior and as an individual responsibility. It may acknowledge the role of genetics and environment to some degree, but the type of health promotion arising from this set of beliefs focuses on individual behavior. Consequently, the workplace is seen primarily as a venue through which various program can be delivered. Examples of program areas are: fitness, stress management, smoking cessation, back care, weight reduction/nutrition, and medication. The second philosophy sees health as being influenced by a number of forces, a significant number of which are outside the individual's control. While acknowledging the individual's responsibility for his or her own health, this set of beliefs focuses on the role of the environment. Consequently, the workplace is seen as an influence on health in its own right. The attention here tends to be on the organization and design of work in both its physical and psychosocial dimensions (Heaney & Goetzel, 1997).*

In conclusion, health promotion in workplace as modified from WHO principles of health promotion, it should;

- be applicable to all groups in the workforce by undertaken in partnership with the workforce;
- be directed at the underlying causes of illness;

- combine different methods and approaches;
- focus on an effective participation on the part of the workers;
- be part of work organization and working conditions rather than primarily a medical activity.

Therefore, the workforce should be consulted, listen to, and actively involves, not only in health activities but also in managing and driving forward overall of the entire process of the program activities. Specialists with multidisciplinary team, such as work organization, physicians, communications, management, and the other fields should play a significant role along with the process as well (Fedotov, 1998).

Best and promising practices in workplace health promotion for cardiovascular health

No other disease has a greater impact on the health of the workforce and its bottom line than CVD. Therefore, employers can yield a \$3 to \$6 return on investment for each dollar invested over a 2 to 5 year period and improve employee cardiovascular health by investing in the comprehensive workplace health promotion programs, and by choosing health plans that provide adequate coverage and support for essential preventive services (Koffman et al, 2005). The most effective interventions in workplace are those that provide sustained individual follow-up risk factor education and counseling and other interventions within the context of a comprehensive health promotion program including (Erfurt et al, 1997);

- screening, health risk assessments, and referrals
- environmental supports for behavior change (e.g., access to healthy food choices)
- financial and other incentives support
- corporate policies that support healthy lifestyles (e.g., tobacco free policies)

Comprehensive workplace health promotion programs related to CVD prevention and control, health plans that cover preventive benefits and effective healthcare systems will have the greatest impact on heart disease and stroke and

are likely to reduce employers' health and productivity-related costs. Providing a comprehensive health promotion program that includes sustained individualized cardiovascular risk reduction counseling for high-risk employees may be the most effective worksite approach for preventing CVD (Koffman et al, 2005; Fedotov, 1998; Heaney, 1997; Pelletier, 1997). *Participatory approach* is also an important strategy to sustain the efforts and contribute significantly to successful outcomes for managing CVD risk factors (Rifkin et al, 2000). Thus, preventing and controlling major CVD risk factors can be achieved through early detection and treatment of illness and by providing preventive health services and policy and environmental interventions using participatory action research approach to help people modify and improve worker health habits in workplace environment.

2.3 Participatory action research (PAR)

Participatory action research (PAR) is a method of research where creating a positive social change is the predominant driving force. PAR grew out of social and educational research and exists today as one of the few research methods which embrace principles of participation and reflection, and empowerment and emancipation of groups seeking to improve their social situation. Participatory action research can be defined as "collective, self-reflective enquiry undertaken by participants in social situations in order to improve the rationality and justice of their own social practices" (Kemmis and McTaggart, 1988). Principles of PAR comprise encouraging participatory activities, using practical solutions, focusing on achievement, using local wisdom, and considering all ideas and opinions. Thus, PAR emphasizes on participation, capability building, ownership of knowledge and empowerment, is still fundamentally an extractive and intellectual exercise. The benefits PRA brings to local communities can be intangible and even disappointing (Grundy, 1986; Rifkin et al, 2000).

Research using PAR as its method will happen in the four moments of action research, namely reflection, planning, action and observation. These research moments exist interdependently and follow each other in a spiral or cycle. Kemmis and McTaggart (Kemmis and McTaggart, 1988) see PAR as a spiral (figure 2) and believe that "the approach is only action research when it is

collaborative, though it is important to realize that the action research of the group is achieved through the critically examined action of individual group members".

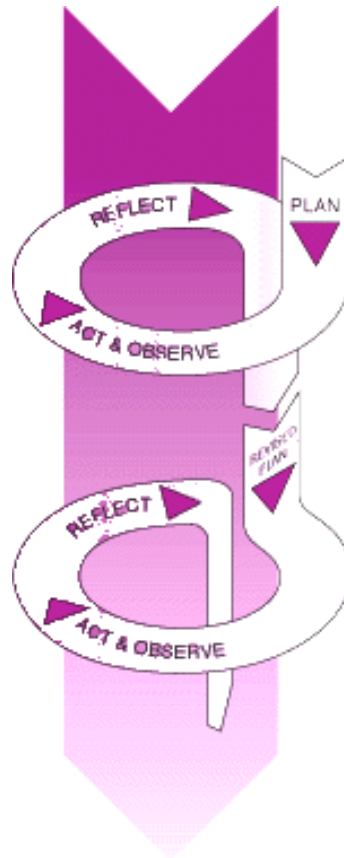


Figure2.1 A spiral of PAR

- *Reflection* in PAR is that moment where the research participants examine and construct, then evaluate and reconstruct their concerns (Grundy, 1986). Reflection includes the pre-emptive discussion of participants where they identify a shared concern or problem.
- *Planning* in PAR is constructive and arises during discussions among the participants (Kemmis and McTaggart, 1988). The Plan must be for critically examined action of each of the participants and include evaluation of the change.
- *Action* happens when the Plan is put into place and the hoped for improvements to the social situation occur. This action will be deliberate and

strategic (Grundy, 1986). It is here PAR differs from other research methods in that the action or change is happening in reality and not as an experiment 'just to see if it works'.

- *Observation* in PAR is the 'research' portion of PAR' where the changes as outlined in the Plan are observed for its effects and the context of the situation (Kemmis and McTaggart 1988). In this moment research tools, such as questionnaires, can be utilized to ensure proper scientific methods are followed and results have meaning. Observation and Action often occur simultaneously.

The beginning of a PAR project may be difficult to point. It could conceivably begin with a tearoom chat or a group meeting about problems being experienced in the workplace. Whatever the origins of such a project it will begin with a group acknowledging a shared concern. This group may not even be able to define this concern very concretely but the PAR cycle has begun any way. Table 1 describes one way of undertaking a PAR project (Kemmis and McTaggart, 1988).

Table 2.1 The way of undertaking a PAR project

Cycle	Moment	What's happening
Cycle 1	1. Reflection	The group and thematic concern are identified through discourse.
	2. Plan	The group Plan to undertake an examination of the thematic concern and the social situation, in order to define and describe both accurately. <i>As well as getting ALL stakeholders together and deciding how much participation constitutes collaboration.</i>
	3. Action, and 4. Observation	The plan is put into Action and the group collects their Observations to reconvene.
Cycle 2	1. Reflection	The group will now Reflect on their findings to more accurately define their thematic concern. This reflection would also include self-reflection by the participants.
	2. Plan	The group can now plan a change in practice to improve the social situation. It should include the methods of critical examination to be utilized. Potential problems need to be dealt with and approval sort from the Ethics Committee, where applicable.
	3. Action	A change in practice is affected and the research is commenced.
	4. Observation	The group observes the consequences of the change in practice and use the research method outlined in the plan to examine the results.
Cycle 3	1. Reflection	It would be unusual for the project to only go through 2 PAR cycles. The cycles would continue until the group was satisfied with the outcomes. The possibility of the project not reaching an end is realistic. This does not mean the original problem remains same or that the group never finds any social justice in their situation.

PAR represents an attractive alternate research method for health promotion in workplace because it allows them to be exposed to research in a collegial collaborative environment and it emphasizes both naturalistic and

humanistic scientific methods. While it may be attractive it is not 'easier' than other research methods, merely different. This difference is exemplified by the collaborative approach and the practical nature of PAR. PAR works directly with local political/development capacities to bring real, visible organizational structures, effective local advocacy, and a durable change in power relations with the center. Therefore, PAR is fine and suitable for promoting health in workplace (Rifkin et al. 2000; Laurell et al, 1992; Henning et al, 2009). It is best reserved for situations where the external researchers are aware of the potential for program failure, both to themselves and more importantly to the disempowered in the workplace. It also works best where the external researchers have a clear status and relationship with the organization and can manage resources for a long-term commitment.

2.4 Social Ecological Models (S-E Models)

The Social Ecological Model is one of the models that applied as a framework for disease prevention on health promotion. It is based, not on a singular discipline or theory, but rather on board, overarching paradigm that across several different fields of research. The social ecological paradigm recognizes the inter-relationship that exists between the individual and their environment. While individuals are responsible for instituting and maintaining the lifestyle changes necessary to reduce risk and improve health, individual behavior is determined to a large extent by social environment, e.g. community norms and values, regulations, and policies. Barriers to healthy behaviors are shared among the community as a whole. As these barriers are lowered or removed, behavior change becomes more achievable and sustainable. It becomes easier to "*push the ball up the hill*". The most effective approach leading to healthy behaviors is a combination of the efforts at all levels; individual, interpersonal, organizational, community, and public policy or societal level as shown in Figure 3 (Stokols, 1996; Dahlberg and Krug, 2002).



Figure 2.2 The inter-relationship between the individual and their environment (from Dahlberg & Krug, 2002)

Preventive strategies should include a continuum of activities that address multiple levels of the model. Those activities should be appropriately development and conducted across the lifespan. This approach is more likely to sustain prevention efforts over time than any single intervention. For a socio-ecological perspective: levels of influence, each level of the model can be expanded (National Cancer Institute, 2007; Richards, 1996; Stokols, 1992, 1996) as follow;

- *Individual level* - The first level identifies individual characteristics that influence behavior, such as biological and personal history factors, knowledge, attitudes, beliefs, and personality traits that increase the likelihood of becoming at risk for diseases. Motivating change in individual behavior by increasing knowledge, or influencing attitudes or challenging beliefs.
- *Interpersonal relationship level* - The second level includes interpersonal processes and primary groups' factors that provide social identity, support and role definition including peers, friends, intimate partners, and family

members. A person's closest social circle-peers, partners and family members-influences their behavior and contributes to their range of experience. Recognizing that groups provide social identity and support, interpersonal interventions target groups, such as family members or peers.

- *Organizational level* - The third level comprises rules, regulation, policies, and informal structures, which constrain or promote recommended behaviors. Changing the policies, practices, and physical environment of an organization (e.g., a workplace, health care setting, a school/child care, a faith organization, or another type of community organization) to support behavior change.
- *Community level* - The fourth level explores the settings, such as schools, workplaces, and neighborhoods, in which social relationships occur and seeks to identify the characteristics of these settings including social networks and norms, or standards, which exist as formal or informal among individuals, groups, and organizations that are associated with diseases development. Coordinating the efforts of all members of a community (organizations, community leaders, and citizens) to bring about change.
- *Public policy level* - The fifth level looks at the broad societal factors that help create a climate in which diseases is encouraged or inhibited. These factors include social and cultural norms, local, state, federal policies and laws that regulate or support healthy actions and practices for disease prevention, early detection, control, and management. Other large societal factors include the health, economic, educational and social policies that help to maintain economic or social inequalities between groups in society. Developing and enforcing state and local policies that can increase beneficial health behaviors. Developing media campaigns that promote public awareness of the health need and advocacy for change.

This model is an explanatory theory to demonstrate the value of applying a social ecological analytic framework to formative data in conjunction with behavioral change theory (the I-Change model) to ensure a high degree of social ecological program integration as illustrated through a comprehensive health promotion program for employees in workplace.

2.5 The I-CHANGE model

The Integrated Model for explaining motivational and behavioral change, or the I-CHANGE Model, is derived from the Attitude – Social influence – self-Efficacy Model (ASE model) (De Vries et al., 1988; De Vries & Mudde, 1998), that can be considered as an integration of ideas of Theory of Planned Behavior, Social Cognitive Theory, Transtheoretical Model, the Health Belief Model, and goal setting theories. Previous versions of this model (referred to as the ASE-model) have been used to explain a variety of types of health behavior. The I-Change model (version 2.0) combines the ASE model with insight from stages of change models and action planning models to provide a comprehensive framework to study and facilitate behavioral change processes (De Vries, 2008).

The I-Change Model states that covert and overt behaviors are determined by a person's motivation or intention to carry out a particular type of behavior. Behavior is the result of a person's intentions and abilities. Intentions can range from not contemplating behavioral change to contemplating to change the behavior very rapidly, e.g. within a month. A person's abilities, such as being able to prepare and execute specific plans to reach the goal behavior (e.g. implementation intentions) as well as actual behavioral skills will increase the likelihood that intentions will be transferred into actions, while barriers can lower these chances. A person's motivation is determined by three factors including attitudes, social influences, and self-efficacy expectations. A person's attitude consists of the perceived cognitive and emotional advantages and disadvantages of the behavior. Social influences consist of the perception of others carrying out this type of behavior (social modelling), the norms that people have with respect to these behaviors (social norms) and the support that they encounter from others in carrying out a particular type of behavior. Self-efficacy refers to a person's

perception of his capability to carry out the type of behavior. Different types of self-efficacy may exist, such as social-, stress-, skills- and routine self-efficacy (De Vries et al., 1988; De Vries, 2008).

The I-Change Model assumes these motivational factors are determined by various distal factors such as awareness factors (e.g. knowledge, risk perceptions and cues to action), predisposing factors such as behavioral factors (e.g. life styles), psychological factors (e.g. personality), biological factors (e.g. gender, genetic predisposition), social and cultural factors (e.g. the price of cigarettes, policies), and information factors (the quality of messages, channels and sources used). The I-Change Model as can be seen from the figure 4 (De Vries, 2008).

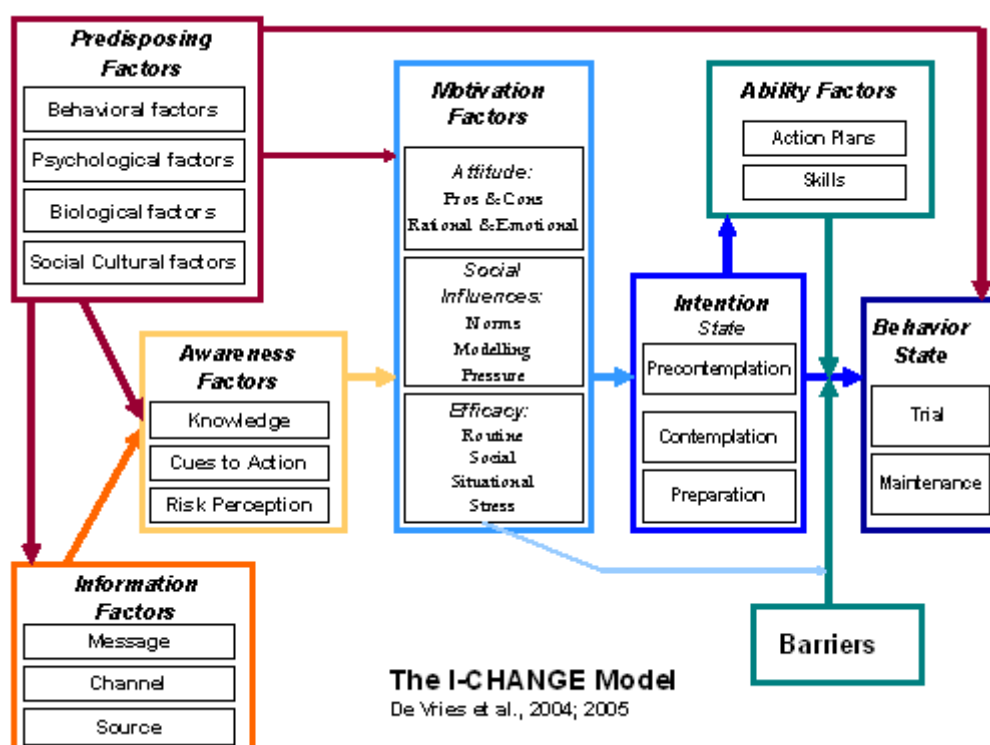


Figure 2.3 The I-Change model

Phases of behavioral change - The I-Change Model is focusing more on the three phases of behavioral change process can be distinguished: 1) Awareness; 2) Motivation ; 3) Action. For each phase particular determinants are more relevant as shown in Figure 5 (De Vries et al., 1988; De Vries, 2008).

Awareness: Awareness of a particular problem in a person is the result of accurate knowledge and risk perceptions of the person about his own behavior, but not all persons are aware of the level of their own behavior, for instance, many persons overestimate the amount of their physical activity. Cues in their environment (e.g. a person with cancer) may also prompt a person to become more aware of a particular risk and the need to adopt a particular health behavior.

Motivation: Motivation to change a behavior is considered to be dependent on a person's attitude (the results of perceived advantages and disadvantages of the behavior), social influence beliefs (norms of others, behavior of others, and support of others) and self-efficacy expectations (the perceived ability to perform a particular health behavior). The ultimate result in level of motivation to adopt a health behavior can be measured by intentions, a concept derived from Theory of Reasoned Action (Fishbein and Ajzen, 1975) or related concepts such as the stage of change concept of the Trans Theoretical Model (Prochaska and Velicer, 1997).

Action: Intentions do not necessarily lead to behavior. Factors determining action, besides a positive intention, are again self-efficacy, action planning and goal setting. Regarding action planning, it can be discriminated by preparation planning (planning actions required to change), initiation planning (planning the actions needed to perform the new behavior for the first time) and coping or maintenance planning (planning the actions to cope with barriers and relapse in order to maintain the realized changes). Additionally, the development of skills required for the new health behavior is needed as well.

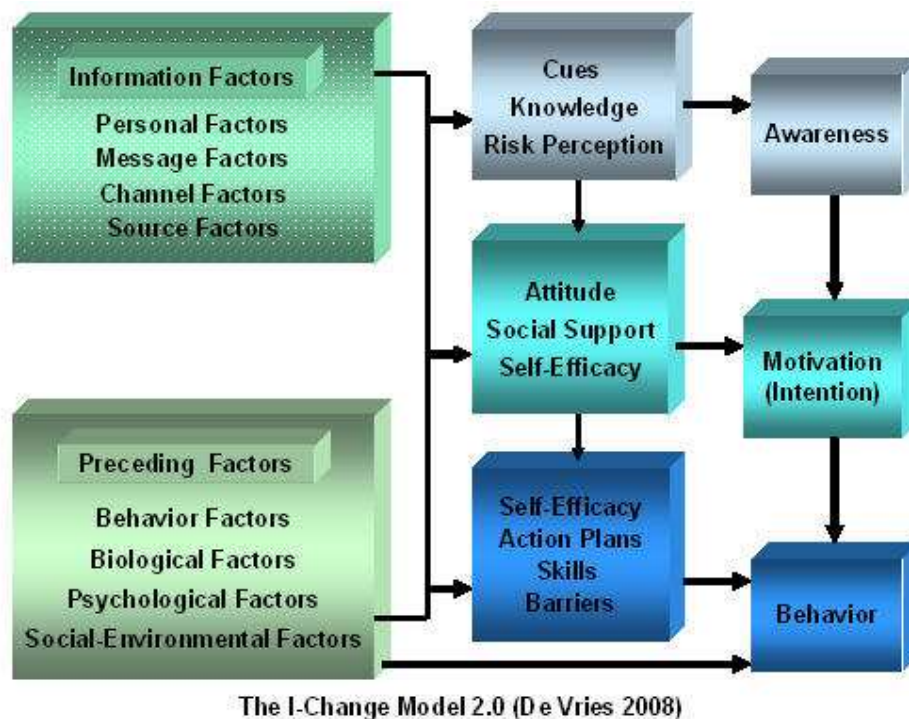


Figure 2.4 Phases of behavioural change of the I-Change model

This model was applied for the intention to implement a smoking cessation intervention in Dutch general practices (GP). The I-Change Model was recognized that offering an opportunity to try out the expert system (trial ability) could encourage the transition from adoption (planning to start using an intervention) to implementation (embedding an intervention into daily practice). This research aimed to study factors related to this transition among Dutch GP after a trial ability opportunity. Eighty-nine individuals from 55 practices responded (73%). GPs were more often intenders than general practice assistants. Practice staff who had actively offered the expert system to their patients was more likely to be an intender. A more positive social norm towards smoking cessation activities in general practice and stronger self-efficacy expectations to use the expert system appear to positively influence the intention to use the expert system in the future as well. These findings are in line with the outline of the I-Change Model, which states *that attitude, social influence and self-efficacy have an influence on the intention to change or maintain certain behavior*, in this case,

the continuation of using the expert system. Practices that actively pointed out the possibility of using the expert system to their smoking clients were more likely to intend to keep using the expert system. Although there is a difference between intention to perform certain behavior and the actual behavior, if intenders continue to implement the expert system, they are in the position to motivate and stimulate other general practices to start using the expert system. If the trial ability of the expert system is increased, a more positive attitude towards the expert system can be established, as well as an increased confidence to eventually implement the expert system into daily practice (Hoving, 2007). The I-Change can act as the outlines or the core process for monitoring and evaluation of the intervention program that focusing on modifiable behavioral risk factors. Thus, this model was selected as the theory to support behavioral change of the study intervention.

2.6 Relevant research

Recently study done by Suwanphan, et al. (Suwanphan et al, 2009) aimed to investigate the effectiveness of the coronary heart disease (CHD) risk among hypertensive patients (aged 35 – 64 years) in Thai community hospital. The intervention program included providing training about the overview of CHD and global risk assessments and patient training about risk factors modification skill on topics about healthy diet, physical activity, and smoking. The 5A's, assess, advice, agree, assist, and arrange was applied for behavior counseling. RAMA EGAT heart score and risk factors were evaluated after 1 year of the implementation as the effectiveness of the program. The changes in RAMA EGAT were -0.3 VS +0.9 for the intervention and control group, respectively. The statistically significant changes were found between 2 groups in high density lipoprotein cholesterol, waist circumference, systolic and diastolic blood pressure, and serum cholesterol level. The CHD knowledge was significantly improved between the both groups, but no significantly different in smoking quit-rate. The intervention program was significant association only with the improvement in knowledge score, HDL-C, and waist circumference. Although the program did not sufficiently reduce the change of the CHD risk score, only some risk factors were

improved significantly. Therefore, the risk assessment for CHD should be more integrated with behavioral counseling and treatment activities for these patients.

With similarity to this study that promoting health by using risks assessment and behavioral modification among health personnel for CVD in Rajavithi Hospital (Wongwiwattananon et al, 2008). Because health promotion for personnel is one of the components in getting to be health promoting hospital, therefore in Rajavithi Hospital, a project was setting up for behavior modification to decrease the risk for cardiovascular and cerebrovascular diseases by exercising, having healthy food at lunch and quit smoking. This study surveyed 547 personnel's risk for the diseases by collecting risk factors such as gender, age, systolic blood pressure, total cholesterol, HDL-C, fasting blood glucose, and waist circumference, together with body composition analysis. An experimental cohort study was then carried out by collecting data before and after registering to behavior modification project. They found that more than 90 percent of the participants had low risk for the diseases, but more than 60 percent had high cholesterol and more than 40 percent of the female had high waist circumference. The result of behavior modification showed that there was a significant decreasing in serum cholesterol ($P < 0.01$) and also for other related risk factors such as waist circumference, percent body fat, body weight and body mass index. The total risk scores using Framingham heart score, modified Framingham stroke score, and RAMA EGAT score were not changed significantly or changed significantly while the average risk scores not more than 3 percent.

For the study that applied PAR to promote health for informal workers in Thailand (Manothum, and Rukijkanpanich, 2010), it aimed to promote occupational health in the informal sector by using a participatory approach. The intervention was assessed the success based on knowledge, attitudes, and behaviors in occupational health and safety, work practice, and working condition improvement. The participants consisted of 4 local occupations in different regions of Thailand, including a ceramic group in the Northeast, and a pandanus weaving group in the South. The results showed that the working conditions of the informal sector were improved to meet necessary standards after completing the participatory process. The change of average scores on the occupational health

and safety knowledge, attitudes and behaviors measures, and the work practice improvement measures were significantly higher than the baseline scores ($p < 0.05$) as well. Therefore, the participatory approach is an effective process to apply for promoting health safety of the informal sector and also encouraging the workers to willingly improve their quality of life.

For the recently published study as the study protocol (Broekhuizen et al, 2010) applied the I-Change model for behavioral change intervention, PRO-FIT study. This project design is a randomized controlled trial in which individuals with Familial Hypercholesterolemia (FH). They will be randomly assigned to a control or intervention group. In the intervention group ($n = 200$) will receive a personalized intervention which is a combination of web-based tailored lifestyle advice and personal counseling by a lifestyle coach. The control group ($n = 200$) will receive care as usual. Primary outcomes are biological indicators of CVD risk including systolic blood pressure, glucose, BMI, waist circumference and lipids (triglycerides, total, LDL and HDL cholesterol). Secondary outcomes are healthy lifestyle behaviors (with regard to smoking, physical activity, dietary pattern and compliance to statin therapy) and psychological correlates and determinants of healthy lifestyle behaviors (knowledge, attitude, risk perception, social influence, self-efficacy, cues to action, intention and autonomy). Measurement will take place after randomization at baseline, and at 3 and 12 months. Additionally, a throughout process-evaluation will be conducted to assess and monitor intervention implementation during the trial. When this study is completed, the results of the PRO-FIT project will provide information about the effects and implementation of a healthy lifestyle intervention for individuals with FH. This intervention will be indicative about the suitability, feasibility and benefits of this approach for future interventions in other high-risk groups, such as Familial Combined Hypercholesterolemia (FCH) and diabetes. For the results of this study will be published later on.

From literature review, it was clearly explained and supported the study principles about health promotion in workplace as a comprehensive program using participatory approach and integrating the Social Ecological and the I-change model into the program intervention to promote desired health behaviors

and to encourage workplace social-environment for CVD risks reduction. This developed project was applied on the EGAT working conditions and organizational managements.

CHAPTER III

RESEARCH METHODOLOGY

This chapter described and explained the research methodology used in this study as followed;

- 3.1 Research design
- 3.2 Study area and study period
- 3.3 Sample, Sampling technique, and Sample size
- 3.4 Study procedure and planning
- 3.5 Structure of Intervention model
- 3.6 Measurement tools
- 3.7 Data collection
- 3.8 Data analysis
- 3.9 Ethical Consideration

3.1 Research Design

This study was a participatory action research (PAR) to conduct as a process of the intervention development and implementation. One group with pretest and posttest design was used to evaluate an effectiveness of the study.

3.2 Study Area and study period

This study was carried out at the South Bangkok Power Plant of the Electric Generating Authority of Thailand (EGAT) in Poochaosamingprai Road, Bangprong, Muang District, Samutprakarn province, Thailand. The periods of overall study processes, including 4 phases, capacity building (3 months), risk analysis (3 months), problem solving and prevention (3 months), and monitoring and dissemination (6 months), were 15 months.

3.3 Sample, Sampling technique, and Sample size

Study population

The study population was the EGAT employees aged between 22 – 60 years who work at the South Bangkok Power Plant of EGAT in Samutprakarn province, Thailand.

Sampling technique

Based on purpose of the study, Purposive sampling technique will be applied in this study. Because it involves studying the entire population of some limited group (South Bangkok Power Plant of EGAT) or a subset of a population (EGAT employees and EGAT staffs). In addition, because of the principle of participatory approach was to develop action details for implementation the program in contextual situation and need a lot of participation from the group, therefore small sample size was appropriate and the participants could join in every activities of this study.

Snowball sampling was another sampling technique in which a researcher identifies the core group member of EGAT employees and then asks that them to identify others in their departments or groups to join the intervention program. This technique was more appropriate for study samples recruitment where members of a special and specific population (EGAT employees) were difficult to locate.

Study samples

Study samples were divided into 2 groups including;

- Administrative officers, supervisors, and health care personnel of EGAT were involved in the qualitative part.
- EGAT employees aged between 22 – 60 years who work at the South Bangkok Power Plant of EGAT in Samutprakarn province, they were selected regarding the criteria as follow;

Inclusion criteria

1. EGAT employees aged between 22 – 60 years
2. Moderate to High level of CVD risk factors according to RAMA-EGAT heart score
3. Regularly work at the South Bangkok Power Plant of EGAT in Samutprakarn province
4. Willing to participate in all activities of the project

Exclusion criteria

1. Could not participate throughout the study
2. were move for on duties outside the study site

3. had diseases specific treatment or some seriously chronic diseases (e.g. CVD, DM, cancer, liver and kidney diseases)

Sample size

Regarding the key highlight of participatory approach, small sample size was the most effective and appropriate for implementation and evaluation the effectiveness of the developed intervention program. Thus, participants were selected based on the study populations who had the annual health examination in the year of 2010.

3.4 Study procedure and planning

Study procedures of HOPE project were corresponding to the PAR as a strategic approach, including 4 phases as shown in the figure 3.1. For the details of each phase were described as follow;

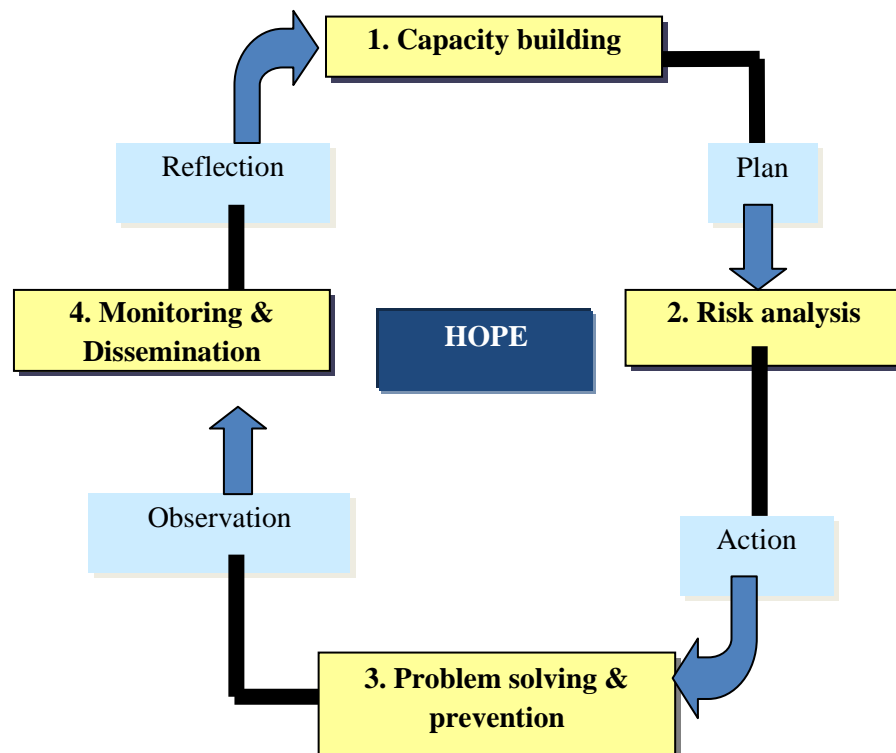


Figure 3.1 Study procedure of the HOPE project as corresponding to the PAR process

Phase 1: Capacity building

The aim of this phase was to help participants learn the concepts for improving their health in working conditions. This phase involved the organizational preparation, baseline survey and encouraging employees to understand their health problem, particularly CVD risk factors by participatory learning activities, meeting, and group discussion. The process approach in order to accomplish the objective was consisted of;

1.1 Arranging meeting to draw on collaboration and interaction of stakeholders

This stage involved with the representative of administrative board, the head of department of health, health care personnel, and employees of South Bangkok Power Plant. They were all stakeholders in this study. The activities of this stage were composed of;

1.1.1 One of the administrators and a head of department of health were invited to interview about the existing health policies of EGAT and introducing the project planning.

1.1.2 Stakeholders' analysis and identification barriers of the existing health promotion programs were performed together with the head of department of health, two health care personnel, and two EGAT employees at the department of health by using focus group discussion. They were a team leader of the intervention development.

1.1.3 Development of communication plan in the organization together with the team leader and identify their management, support, and facilities for the intervention development.

This stage was be applied and modified for the intervention development regarding their comments, current situation, and policies as appropriate for EGAT context at South Bangkok Power Plant.

1.2 Baseline survey and identify core group

This stage involved with the team leader and the representative of employees to identify the core group and surveyed the baseline situation of the organization and employees. The activities of this stage were composed of;

1.2.1 The team leader and researcher collected the baseline situation of the organization and employees including the existing behavioral and social-environmental factors associated with CVD by using self-administrative questionnaires, physical and biological indicators examination, and using RAMA-EGAT heart score for screening the participants. All employees at South Bangkok Power Plant were invited to participate and surveyed using the questionnaires. The baseline situation survey was conducted by the team leader; they distributed the questionnaires to all employees and collected the questionnaires by then.

1.2.2 From the baseline situation data, the team leader identified a core group (at least 5 persons) selected from the employees who actively participate to the study and the core group had an important role in working with the team leader and the researchers as facilitators and coordinators throughout the study.

The core group was selected based on the following criteria;

- They were accepted and allowed by their supervisors.
- They had to agree and willingly participate in all activities throughout the study.
- They had available time to work for the program.

1.3 The core group and the team leader skill training for CVD risk assessments and managements

Objective of this stage was to help participants to understand and aware their health problems, particularly CVD risk factors. This stage involved with the team leader and the core group. They were invited to join 2 meetings (depending on their available time) and details of the meetings were described as follow;

- The first meeting, they were introduced the objectives and scope of the study and informed their mission in this study. Results of the baseline survey were presented to them and also let them discuss and identify their problem together based on the existing data from the baseline survey.

- The second meeting, they were trained for CVD risk assessments skill according to guideline in clinical practices and using RAMA EGAT-score as a learning tool.

Phase 2 Risk analysis

This phase involved with analyzing current or existing problem. The objective was to facilitate participants understanding and raise awareness of risk factors associated with CVD. The process approaches were included;

2.1 Finding appropriate solution by applying risk communication technique

This stage involved with the core group, the team leader, and employees who interested and willingly to participate the activities. There were 119 employees enrolled to the study. The activities of this stage were composed of;

2.1.1 Starting with risk assessment analysis, it was done to enable employees to participate in identifying and assessing their risks for CVD. The core group invited more participants who meet the criteria to join the meetings; schedule was organized depending on their available time.

2.1.2 Regarding the predisposition character of the risk and its high dependency current lifestyle behavior, participants were presented with:

- Feedback on CVD risk behaviors to educate them about the contribution of these CVD risk factors to their overall CVD risk
- Information on the changeability of these factors
- Cues about how these risk behaviors may be changed

2.2 Developing intervention program

The risk factors, their changeability and the cues to action were presented to the participants on the participatory activities by group discussion and feedback letters. The information from their brainstorming of this stage was utilized to develop intervention program for health promotion in workplace conditions using the I-Change model as a main strategy for the development. According to the model, it assumes that the behavioral change process can be distinguished in three phases: 1) awareness, 2) motivation and 3) action. The

earlier-mentioned factors of behavioral change identified in the I-Change model were focused on during the development of the intervention. A more detailed description of these factors, the strategies that was employed, as well as the intervention components was outlined in table 3.1.

2.3 Create and schedule activities

At the end of this phase, the developed intervention program was generated action plan for schedule activities that feasible, flexible, and suitable in their lifestyle within working condition.

Table 3.1 Strategies to develop intervention through influence factors of behavioral change

Factors of behavioral change	Strategy
Awareness factors: knowledge, risk perception and cues to action	<ul style="list-style-type: none"> ▪ Educating participants on their current CVD risk factors, with regard to their size and changeability (risk communication). ▪ Translating this to behavioral change in their personal situation. ▪ Raising awareness by providing personal and normative behavioral feedback following motivational interviewing techniques and group activities.
Awareness factors: knowledge, risk perception and cues to action	<ul style="list-style-type: none"> ▪ Educating participants on their current CVD risk factors, with regard to their size and changeability (risk communication). ▪ Translating this to behavioral change in their personal situation. ▪ Raising awareness by providing personal and normative behavioral feedback following motivational interviewing techniques and group activities.

Table 3.1 (Continued) Strategies to develop intervention through influence factors of behavioral change

Factors of behavioral change	Strategy
Predisposing factors: genetic predisposition, current lifestyle, personal characteristics and information factors.	<ul style="list-style-type: none"> ▪ Tailoring the communication of CVD risk factors and lifestyle group counseling to the genetically predisposed risk of the participants and their personal characteristics (age, gender, family histories) and their current lifestyle behavior. ▪ A multi-channel approach is chosen, thereby offering the intervention by self-management manual, face-to-face, group discussion, and by telephone and e-mail follow-up.
Motivational factors: attitude, social influence and self-efficacy	Giving personal feedback to participant's self-reported attitude and self-efficacy and by involving the social and physical environment in workplace of the participants in making action plans.
Ability factors	Stimulating participants to make action plans and discussing how to overcome possible barriers in behavioral change, thereby following group discussion techniques.

Phase 3: Problem solving and prevention

This phase followed the previous phase according to the risk assessment analysis and risk communication. The objective was to engage participants on improving their lifestyle risk behaviors. There were 36 participants who willingly to participate all activities. The process approaches were included;

3.1 Action planning for implementation;

The intervention for solution offered by the employees that applied on the I-Change model from the previous phase was implemented with the participants. The intervention consists of the personalized health counseling and

health examinations, workshops for health education and skill training, and interesting learning medias. The goal of the intervention was to;

- improve awareness of the CVD risk through an increase of specific knowledge, cues to action and change in risk perception.
- improve motivation with respect to healthy behavior through an increase of specific knowledge and a change in risk perception, self-efficacy, and social influences.
- adopt and maintain a healthier lifestyle, with regard to physical activity, healthy eating (focusing on saturated fat intake, salt, sweets, fruit and vegetables intake), coping with emotions, and avoid smoking.
- lower the level of total cholesterol, LDL-C, higher the level of HDL-C and other biological CVD risk indicators (e.g. blood pressure, fasting plasma glucose) and thereby a reduction of the CVD risk using RAMA EGAT heart score.

Before beginning the intervention, the participants were assessed pre-test included knowledge, attitude, and action (behavioral risks) for CVD, and their physical examination. The intervention program model planning was composed of 6 milestones (2 days training activities from milestone 2 – 6 depending on their available day and time) as shown in Table 3.2.

Table 3.2 The details planning for the developed intervention program

Planning	Activities
A Kick-Off event	<ul style="list-style-type: none"> • Overview the program and baseline measurements (Pre-test)
Milestone 1: Hitting “CVD” overview	<p>“Know yourself” by individual counseling</p> <ul style="list-style-type: none"> • The first personalized health counseling and health examinations <p>Contents: Feedback on CVD risk assessments and Educating participants on their current CVD risk factors, with regard to their size and changeability</p>

Table 3.2 (continued) The details planning for the intervention program

Planning	Activities
Milestone 2: Overview how to manage the CVD risks	<p>“Manage your lifestyle” by workshop</p> <p>Contents:</p> <ul style="list-style-type: none"> • CVD facts and its consequences, how to assess risks and level of risk for CVD, added a personal behaviors factors contributing to their current risk. • Merged knowledge and practice for behaviors factors management including eating habits, physical activity, mental health, and tobacco use.
Milestone 3: Healthy eating room	<p>“Eat right” by workshop</p> <p>Contents: Review of healthy diet approach to protect heart health and weight control (focusing on saturated fat intake, salt, sweets, fruit and vegetables intake). Covers 3 basic tenets: moderation, balance, and variety of diets. Activities on reading food labels, identifying serving sizes (with food models), healthful dining out, and understanding nutrition claims.</p>
Milestone 4: Enjoy exercise class	<p>“Get you moving” by workshop</p> <p>Contents: Benefits of physical activity for heart, barriers to exercise, and determining alternative way.</p>
Milestone 5: Coping with emotions skills	<p>“Without stress” by workshop</p> <p>Contents: How to manage stress, common triggers, and how to identify true emotions? Activity to identify ways to cope and reshape self-thoughts.</p>
Milestone 6: Smoking cessation class	<p>“Avoid Smoking” by group discussion</p> <p>Contents: Tobacco use and effects on heart health, and how to reduce smoking.</p>
The final program	<ul style="list-style-type: none"> • The first personalized health counseling and health examinations • Conclusion overall program • Assess the study outcomes (Post-test), and the acceptability of the program

All participants should participate in all activities of the intervention program. For the workshops, specialists of each topic were invited to share knowledge and best practices that emphasize on self management of participants. Then, they worked together as in groups. The core group worked as facilitators of their own group for the group activities. If they attended in every milestone and won the group competition, they got some rewards (e.g. prize drawing or a healthful meal) from the research team and their own supervisors.

3.2 Action planning for follow-up training visit

After 2 days training, they were scheduled depending on their available time for follow-up training visit in every 4 weeks for 2 times. The objective is to encourage participants maintaining their healthy lifestyle during the intervention period. The core group organized and facilitated the activities together with the leader team and researcher. The activities were included repeated knowledge, attitude, and action (behavioral risks) for CVD and group discussion for sharing their problems and barriers.

Phase 4 Monitoring & Dissemination

Objective was to confirm benefits and sustain the problem solving activities. This phase was used to monitor and follow up all of the study processes. The process approaches were included;

4.1 Monitoring and Evaluation,

This stage was divided into 3 parts as follow;

4.1.1 Monitoring the community participation, this included;

- Number of participants engaged in every activity since the first phase until the last phase was recorded.

- Rifkin and coworkers identified five dimensions influencing participation (Figure 3.2) that could be incorporated into an analytical pentagram framework: needs assessment, leadership, resource mobilization, management and organization. For each factor, a five-point ranking scale that measures the degree of participation is provided, ranging from minimal (ranked 1) to maximal (ranked 5) with three levels in between of restricted (ranked 2), fair (ranked 3) and open (ranked 4) (Eyre R & Gauld R. 2003).

Level of participation was assessed at the time establishing the program, during the program implementation and by the end of the program.

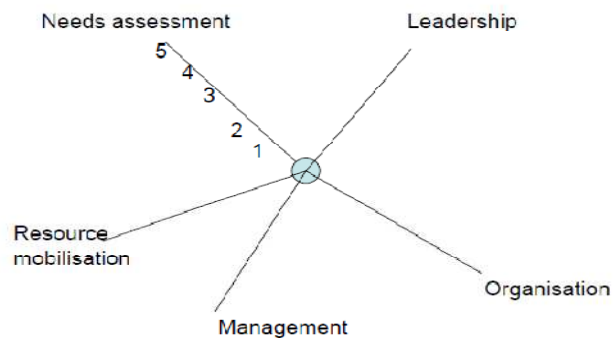


Figure 3.2 Five dimensions influencing community participation

4.1.2 Monitoring and process evaluation, this included;

- The core group was the key agent as the leadership for monitoring and process evaluation. The important responsibilities of them were facilitators and monitors participants and check monthly feedback to their supervisors. They were monitored by observation and checking their tasks under supervision of EGAT staffs and the researcher. Making group discussions for evaluation was conducted at the end of the study.

- The study program was monitored by comparing all processes as checklists between the original plans and actual practices. Feedback meeting was undertaken as a group discussion with EGAT staffs and research team in order to evaluate the effectiveness of the program and the community participation every month.

4.1.3 Outcome evaluation

- The developed intervention program of HOPE project was evaluated the effectiveness by measuring the study outcomes in order to the goal of the intervention and then comparing the change of all parameters from pre- and post-test. A structured self-administration questionnaire form and physical examination was used. The same method for selecting the respondent, the same questionnaire, and the same examiner was used for follow up survey.

- Follow up survey was done 6 months after implementing the intervention program of HOPE project among EGAT employees to assess the improvement in knowledge, attitude and practice/intention to practice of CVD risk managements and reduction in CVD risk score. Participants were evaluated their behavioral changing by checking their self-management manual which comprised all contents following schedule activities and record their behavior.

4.2 Dissemination and feedback results to all stakeholders

The discussion with and feedback from all stakeholders of EGAT at the end of this study were analyzed and summarized by group discussion with the core group and EGAT staffs. The lesson learn of the project was record and report to the administrative officers of EGAT. The results of this study both of success and failure points were communicated and feedback to all participants via the core group at the last meeting. All study procedures can be more easily seen in the figure 3.3 and Table 3.3

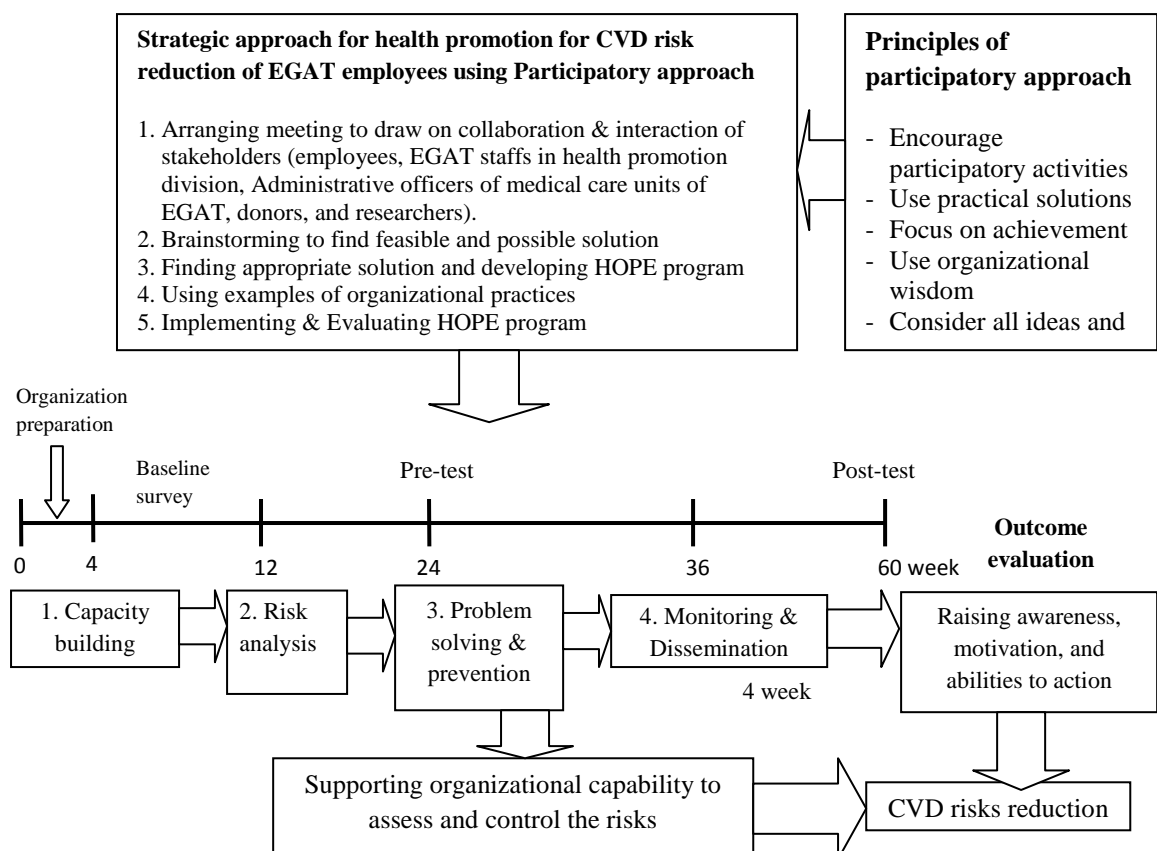


Figure 3.3 Study procedures according to the concept for promoting health in workplace using participatory approach (Modified from Manothum and Rukijkanpanich, 2010)

Table 3.3 Summary of HOPE project procedures

Phase 1	Capacity building
1.1	Arranging meeting to draw on collaboration and interaction of stakeholders
1.2	Baseline survey and identify core group
1.3	Core group and team leader skill training for CVD risk assessments and managements
Phase 2	Risk analysis
2.1	Finding appropriate solution
2.2	Developing intervention program and schedule activities
Phase 3	Problem solving & prevention
	Action planning for implementation and follow-up training visit
Phase 4	Monitoring & Dissemination
4.1	Monitoring and evaluation the community participation process, and outcome
4.2	Dissemination and feedback results to all stakeholders

3.5 Measurement tools

The tools for outcome measurements including;

3.5.1 Questionnaires

The participants were asked to complete a self-administered questionnaire which consisted of; demographic questionnaire, the Heart Disease Fact Questionnaire (HDFQ), risk perceptions, and self-efficacy, food frequency questionnaire (FFQ), physical Activity Patterns Questionnaire, smoking and alcohol drinking status, and stress questionnaire (Appendix B1 and B2). The details of each questionnaire were described as follow;

Section 1 Socio-demographic information

This part was developed measuring socio-demographic characteristics including age, marital status, education, current employment position at EGAT, monthly income, personal prior medical conditions, family health history, and current medications.

Section 2 Knowledge about CVD and CVD risk factors

The Heart Disease Fact Questionnaire (HDFQ) was applied to measure knowledge of CVD risk factor in people with diabetes (Wegner, Lacey, Chyun, & Abbott, 2005; 2006) comprised 25 questions using the response options including 'true' or 'false' or 'do not know' to statements concerning heart

disease, for example of the question was “A person always knows when they have heart disease.” Correct responses were scored 1, incorrect and do not know responses were scored 0. The total score ranges from 0 to 25, with the higher scores, the greater knowledge of CVD risk factors. Based on data of the previous studies, the instrument showed acceptable content validity and internal consistency reliability (Kuder-Richardson-20 formula = .77) (Wagner et al., 2005), and test–retest reliability ($r = 0.89$) (Lacy K et al, 2001). Any question that <70% of the participant answered correctly was considered a knowledge deficit.

Section 3 Risk perception and self-efficacy about CVD

Risk perceptions were developed with 5 questions of the perceptions and 5 questions of attitude about CVD and CVD risk factors adapted from Broekhuizen, et al, 2010 that were scored on a five-point Likert scale ranging from I totally disagree to I totally agree (from 1 for “strongly disagree” to 5 for “strongly agree”). For example of the perceived CVD risk question was ‘*How likely is your chance of getting a CVD within the next 10 years?*’ and the attitude question was ‘*I think Cardiovascular disease is an unprotectable disease*’. All Items were summed for a total score range from 10 to 50, with higher scores indicating higher perceived risk. The score was classified by percentage, ≤ 60.00 % was low level, $> 60.00 - 80.00$ % was moderate, and > 80.00 % was high level. Therefore, the level of risk perception was categorized into three groups as follow;

Score	Level
< 30	Low
30 - 40	Moderate
> 40	High

Self-efficacy was measured with 3 questions of personal control and 2 questions of social influence adapted from Broekhuizen, et al, 2010. Participants responded which statement best reflects their opinions on a scale ranging from 1 (strongly agree) to 5 (strongly disagree). For example of the social influence and personal control were ‘*Peer pressures (from colleagues, friends, and, family) have influenced me to change my lifestyle behaviors*’ and ‘*I believe that lifestyle*

improvement is effective and sustainable in reducing CVD risks'. The highest score was 25 and the lowest score was 5. The higher scores reflect the greater personal control and optimistic bias. The score was classified by percentage, $\leq 60.00\%$ was low level, $> 60.00 - 80.00\%$ was moderate, and $> 80.00\%$ was high level. Thus, the level of self-efficacy were categorized into three groups as follow;

Score	Level
< 15	Low
15 - 20	Moderate
> 20	High

Section 4 Food Frequency Questionnaire

The Food Frequency Questionnaire (FFQ) was used to measure usual eating pattern for reducing and balancing dietary energy intake (modified from Sasnil S, 1998). The FFQ had been shown to be the internal consistency reliable (Cronbach's alpha coefficients = 0.914) in this study. The FFQ consisted of 26 negative items. Each item was ranked on a 5-point scale according to how frequently the behavior was performed as followed;

Score	Frequency
5	being never or hardly ever,
4	rarely
3	sometimes
2	often
1	always or almost always

The higher scored on the FFQ indicated correlation to lower dietary energy intake and tend to have healthy dietary intake. The scored is ranged from 0 to 130 points.

Section 5 Physical Activity Patterns Questionnaire

The General Practice Physical Activity Questionnaire (GPPAQ) was applied (NSH, 2009) for the physical activity assessment. It was commissioned by the Department of Health (DH) of National Health Service (NSH) and developed by the London School of Hygiene & Tropical Medicine as a validated

short measure of physical activity in 2006 and updated in 2009 as part of Physical Activity Policy, Health Improvement Directorate. GPPAQ was included physical activity related to occupation and physical exercise (cycling, walking, housework/childcare, and gardening/DIY). That is correlated to CVD risk. GPPAQ provides simple, 4-level Physical Activity Index (PAI) categorizing participants as: Active, Moderately Active, Moderately Inactive, and Inactive as followed;

- Inactive Sedentary job and no physical exercise or cycling
- Moderately inactive Sedentary job and some but < 1 hour physical exercise and / or cycling per week OR Standing job and no physical exercise or cycling
- Moderately active Sedentary job and 1-2.9 hours physical exercise and / or cycling per week OR Standing job and some but < 1 hour physical exercise and / or cycling per week OR Physical job and no physical exercise or cycling
- Active Sedentary job and \geq 3 hours physical exercise and / or cycling per week OR Standing job and 1-2.9 hours physical exercise and / or cycling per week OR Physical job and some but < 1 hour physical exercise and / or cycling per week OR Heavy manual job

Section 6 Smoking status and alcohol drinking habit

Smoking status was assessed by a self-reported measure, asking participants if they are a current smoker, an ex-smoker, or a never smoker, how many years they smoke (d) and how many cigarettes or other tobacco products they smoke (d) a day.

Alcohol drinking habit was assessed by a self-reported measure asking participants if they drink, how many years they drink, how often, and quantity that they drink a time (according to the standard quantity of alcohol drinking).

Section 7 Stress assessment

Stress was assessed by a self-analyzed and self-evaluated stress test measure comprised 20 questions, applied from the Department of Mental Health, Ministry of Public Health, Thailand, asking participants if they have symptoms related to stress (Department of Mental health in Ministry of Public health, 2008). The main question was “*Have you experienced any of these stress symptoms in last month?*” and rating the score according to the frequency experiencing these stress symptoms for last month as followed;

Frequent = One time a week

As often = 2-4 times per month

Occasionally = 1-2 times per month

Never = One or none symptom per month

Total score is 60, the higher scored indicated correlation to more likely to experience stress related illness. Stress score was interpreted at five stress levels. There were as follows;

0-5 points = less stress than a normal level

6-17 points = stressed at a normal level

18-25 points = moderate level of stress

26 – 29 points = high level of stress

30 points and above = severe stress

The internal consistency reliability of the questionnaire was adequate (Cronbach’s alpha coefficients = 0.914) in this study.

3.5.2 Cardiovascular risk assessments

Cardiovascular risk assessments were included the annually health check-up report and CVD risk indicator using RAMA EGAT score. The annually health check-up report were lipid profiles (High-Density Lipoprotein (HDL) and Total cholesterol), blood pressure, and fasting plasma glucose) and anthropometric measures (weight, height, Body Mass Index (BMI), and waist circumference). Furthermore, body composition analysis was measured using Segmental Bioelectrical Impedance Analysis (SBIA).

CVD risk assessment; RAMA-EGAT heart score (Yamwong, 2005) was used for evaluating CVD risks; it comprises 8 weighted risk factors, including sex, age, total cholesterol (TC), diabetes mellitus, hypertension, current smoking status, and waist circumference as can be seen in Table 3.4. For the CVD risk assessment cut-off points of each parameter were based on the RAMA-EGAT heart score, generated by the distribution of CVD risk database of the original EGAT cohort study (Yamwong et al, 2005; Pattanaprichakul et al, 2007). For Blood pressure (in mmHg) with systolic blood pressure (SBP) and diastolic blood pressure (DBP) was classified participants as hypertensive if their blood pressure was $\geq 140/90$ mmHg, or if they were currently taking prescribed blood pressure lowering therapy. High total cholesterol was defined as a total cholesterol level > 280 mg/dL or current use of cholesterol lowering therapy. Diabetes was classified based on the basis of any of a fasting plasma glucose ≥ 126 mg/dL or a prior clinical diagnosis. Overweight and obesity were defined as BMI ≥ 23 and ≥ 25 kg/m², respectively. Abdominal obesity was classified by waist circumference (WC) ≥ 90 cm (36 inches) in men and ≥ 80 cm (32 inches) in women. Smoking refers to those who were currently using tobacco at the time of interview (Appendix C1 and C2).

Table 3.4 RAMA-EGAT heart score

Score	-2	0	2	3	4	5	6	8	10
Age (y)	35-39	40-44	45-49		50-54		55-59	60-65	≥ 65
Gender		Female		Male					
Total cholesterol (mg/dL)		<280				>280 or drug therapy			
Smoking		No	Yes						
Diabetes		No				Yes			
Hypertention		No		Yes					
Waist circumference*		Below		Above					

* waist circumference ≥ 90 cm (36 inches) in men and ≥ 80 cm (32 inches) in women

This score refers to the change in overall CVD risk factors. The total risk score was categorized into three risk levels as low (-2 to 5), moderate (6 to 10),

and high (≥ 11) and then it was converted to a percentage of probability of CVD development in 10 years as low ($\leq 1\%$), moderate (1 – 3%), and high ($\geq 4\%$)

Bioelectrical Impedance Analysis (BIA) or InBody 720 (Biospace Co.Ltd., Seoul, Korea), multifrequency analyzers was an instrument for measuring the changes in fat, fat-free mass, lean body mass, and basal metabolism (Appendix G). Before any measurement were made, subjects were in a 12-hour fasting, no consumption of alcohol for 12 hours before measurement, no meal for 2h before measurement, no exercise and no shower in the day of the test and after void. In accordance with the manufacturer's guidelines, participants wiped the bottom of their feet with a proprietary electrolyte tissue before standing on the electrodes embedded in the scale platform of the respective analyzers. The participants were instructed to stand upright and to grasp the handles of the analyzer, thereby providing contact with a total of 8 electrodes (2 for each foot and hand). The participant's identification number, height, age, and sex were entered into the analyzer, and the participant was instructed to slightly abduct his or her arms and remain still during the assessment. A participant's BM was automatically determined when he or she stood on the electrodes embedded within the scale platform of each octapolar analyzer; these weights were also recorded. InBody is very accuracy, reliable, reproducible and useful device as body composition analysis (Cha et al, 1996).

3.5.3 Guidelines of qualitative study

Observation, in-depth interview, and focus group discussion were applied for the qualitative study methods. Qualitative study was utilized for collecting baseline survey about the organizational background related to health care, the existing problem and barriers, behavioral and social-environmental contexts of the organization associated with CVD risk factors. These data was applied and supported for the intervention development regarding their comments, current situation, and policies as appropriate for EGAT context (Appendix D1 and D2).

3.5.4 Community participation evaluation

Community participation was assessed by using ranking scale for measuring community participation in five process dimensions including needs assessment, leadership, resource mobilization, management and organization For

each factor, a five-point ranking scale that measures the degree of participation is provided, ranging from minimal (ranked 1) to maximal (ranked 5) with three levels in between of restricted (ranked 2), fair (ranked 3) and open (ranked 4) (Eyre R & Gauld R. 2003). Level of community participation was assessed at the time establishing the program, during the program implementation and by the end of the program (Appendix E1 and E2).

3.5.6 Acceptability of the Intervention program

Acceptability of the intervention program was assessed using self-assessment questionnaire (Appendix F). The questionnaire was included 5 dimensions of acceptability as followed; 1) instructor, 2) place/time/food, 3) service of staff 4) knowledge, and 5) application of knowledge. The opinion of participants was scored on a scale ranging from 1 (poor) to 5 (excellent).

3.6 Data collection

Data collection was completed by incorporating a mixed-method of quantitative and qualitative research methods. Data was collected following the outcome measurements as follows;

3.6.1 Qualitative data

Qualitative data was collected by the research team who were trained in interviewing techniques and briefed on the interview and discussion topics. The methods were included observation, in-depth interview, focus group discussion, and peer interview. The data was collected in order to the semi-structured, and unstructured, open-ended interviews. Questions focused on about the organizational background related to health care, the existing problem and barriers, behavioral and social-environmental contexts of the organization associated with CVD risk factors. Semi-structured interviews were audio recorded, and a unique identifier was recorded in place of the participant's name. All interviews were taken time about 1 hours. Focus group discussions and in-depth interviews were performed at department of health of the Power Plant.

Observational data was collected by working at the department of health of the Power Plant. Field notes were done as what we saw, heard, and

experienced at baseline, during program implementation, and at the end of the study.

3.6.2 Quantitative data

Quantitative data was relied on self-administered questionnaires including socio-demographic data, prior medical condition, knowledge, risk perception, and self-efficacy about CVD, eating behaviors, physical activity patterns, smoking status and alcohol drinking behaviors, and stress. In addition, the acceptance and feedback of the intervention program were collected by self-report as well. InBody 720 (Biospace Co.Ltd., Seoul, Korea), multifrequency analyzers was an instrument for measuring the changes in fat, fat-free mass, lean body mass, and basal metabolism.

For the community participation of the intervention program was evaluated by the researcher incorporation with the qualitative data. The annually health check-up was collected from the employee's health report at the department of health and CVD risk assessment following the RAMA-EGAT heart score was calculated by the researcher.

3.7 Data analysis

3.7.1 Quantitative data was analyzed depending on the data category as followed;

- Descriptive analysis for socio-demographic characteristics, physical and laboratory examination data, risk behaviors, CVD risk score, knowledge, risk perceptions, and self-efficacy about CVD risk managements were expressed as mean \pm standard deviation (SD), frequency, and percentage.
- Chi-square and McNemar's Chi square test were used for analyzing the different change between categorical variable of the risk behaviors and CVD risk score level.
- Paired t-test and Wilcoxon signed rank test were used for analyzing pre- and post-test differences for expected outcomes of the intervention program.

- Pearson's correlation coefficient was used for exploring the associations.
- P-values less than .05 was considered as statistically significant and performed by SPSS 17 for windows.

3.7.2 Qualitative data was analyzed using content analysis method by systematically organizing and interpreting information using categories, themes and motifs that identify patterns and relationships. Data was coded and cleansed before analysis.

3.8 Ethical consideration

The study protocol was reviewed and approved by Institutional Ethical Review Board of College of Public Health Science, Chulalongkorn University for the protection of human subjects (Protocol No. 116.2/53; Appendix H). The participants had to agree and willingly participate of the study protocol by signing an informed consent form. Information collected was kept confidential by using numbers and codes.

CHAPTER IV

RESULTS

This chapter included the analysis and interpretation of the data obtained from the EGAT employees who participated in this study. The results were shown into three parts: the first part presented the cross-sectional study, the second part expressed effectiveness of the intervention program, and the third part demonstrated community participation assessment.

4.1 Cross-sectional study

This study was one group pre-test post-test design applied for the examination of the effectiveness of the HOPE project. In this part were results of the baseline survey including both quantitative and qualitative study of the EGAT staffs and employees at South Bangkok Power Plant.

4.1.1 Baseline survey of the EGAT employees at South Bangkok Power Plant

In this section showed the general information of EGAT employees including socio-demographic information, prior medical condition, CVD risk assessments, CVD risk knowledge, risk perceptions and self-efficacy about CVD, behavioral risk assessments (food intake behavior, physical activity, smoking and alcohol drinking status, and stress), and qualitative study from in-depth interview and focus group discussion.

4.1.1.1 socio-demographic characteristics

Total 507 employees at South Bangkok Power Plant, 22 to 60 years of age, the majority employees were male (87% of the total). Of the 507 employees, 384 employees or 75.7% of the total employees (mean \pm SD; 48.2 \pm 10.1 years, 85.7% were male) were returned the self-administered questionnaires. Female were more likely to have higher response rate than male (83.3% and 74.6%, respectively). Mostly they were 45 to 54 years of age and no significantly different of age distribution between male and female (Table 4.1). The majority of the participants

were Buddhist and they had completed vocational education or diploma and bachelor degree by 43.3% and 34.7%, respectively, related to their occupation; mostly they are technician and engineer (51.9% and 21%). For the others of employment position included all of the minority positions, about 42% among them were nurse, trainer, security guard, programmer, scientist, driver, and others. They also had high monthly income, 22.5% and 46.3% among them had current salary between 40,000-59,999 THB (or 1,300 – 1,950 USD) and 60,000 – 99,999 THB (or 1,950 – 3,250 USD), respectively. There were the significantly different in education, employment position, and income between male and female.

Table 4.1 Demographic characteristics of employees

Characteristic	n (%)			P-value	
	Total (n = 384)	Male (n = 329)	Female (n= 55)		
Age (year)	mean (SD)	48.2 (10.1)	48.1 (10.4)	48.3 (7.8)	0.906
▪ 22 – 34		45 (11.7)	41 (12.5)	4 (7.4)	0.597
▪ 35 – 44		67 (17.5)	56 (17.0)	11 (20.4)	
▪ 45 – 54		152 (39.7)	128 (38.9)	24 (44.4)	
▪ 55 – 60		119 (31.1)	104 (31.6)	15 (27.8)	
Marital status					
▪ Single		67 (17.6)	56 (17.2)	11 (20.0)	<0.001
▪ Married and Couple		285 (74.8)	253 (77.6)	32 (58.2)	
▪ Widow		8 (2.1)	4 (1.2)	4 (7.3)	
▪ Divorced and Separated		21 (5.5)	13 (4.0)	8 (14.5)	
Religion					
▪ Buddhist		355 (97.0)	305 (96.8)	50 (98.0)	0.640
▪ Islam		7 (1.9)	7 (2.2)	0 (0.0)	
▪ Christ		4 (1.1)	3 (1.0)	1 (2.0)	

Table 4.1 (continued) Demographic characteristics of employees

Characteristic	n (%)			P-value
	Total (n = 384)	Male (n = 329)	Female (n= 55)	
Education				
▪ Secondary school level and lower	53 (13.8)	47 (14.3)	6 (10.9)	0.049
▪ Vocational Education or Diploma	166 (43.3)	150 (45.7)	16 (29.1)	
▪ Bachelor degree	133 (34.7)	106 (32.3)	27 (49.1)	
▪ Master degree and Higher	31 (8.1)	25 (7.6)	6 (10.9)	
Employment Position				
▪ Engineer	79 (21.0)	75 (23.1)	4 (7.8)	<0.001
▪ Technician	195 (51.9)	191 (58.8)	4 (7.8)	
▪ Administrator	14 (3.7)	12 (3.7)	2 (3.9)	
▪ Administrative staff	20 (5.3)	11 (3.4)	9 (11.6)	
▪ Professional staff	16 (4.3)	6 (1.8)	10 (19.6)	
▪ Accountant	10 (2.7)	2 (0.6)	8 (15.7)	
▪ Others	42 (11.2)	28 (8.6)	14 (21.5)	
Income (THB*/month)				
▪ ≤10,000 (≤ US\$325)	13 (3.4)	13 (4.0)	0 (0)	0.004
▪ 10,000-19,999 (US\$325 – 650)	24 (6.3)	23 (7.1)	1 (1.9)	
▪ 20,000-39,999 (US\$ 650 – 1300)	47 (12.4)	33 (10.2)	14 (25.9)	
▪ 40,000-59,999 (US\$1300 – 1950)	85 (22.5)	70 (21.6)	15 (27.8)	
▪ 60,000-99,999 (\$1950 – 3250)	175 (46.3)	152 (46.9)	23 (42.6)	
▪ ≥100,000 (≥ \$3250)	34 (9.0)	33 (10.2)	1 (1.9)	

* Currency Exchange Rate 1 THB ≈ 0.0325 USD

4.1.1.2 Prior medical conditions

Prior medical condition of participants from their self-report as shown in Table 4.2, the results showed that the prevalence of overweight and obesity were 15.4% and 31.7%, respectively. Female had significantly higher prevalence of

overweight and obesity than male by about 1.32 and 1.29 times, respectively. Consideration of waist circumference, men had significantly greater waist circumference than women, but they had significantly lower prevalence of abdominal obesity than women. From the prior medical condition, mostly they had hypercholesterolemia and hypertension by 38.5% and 30.5%, respectively. There was no significantly gender different of CVD risk prevalence including diabetes, hypertension, hypercholesterolemia, and coronary heart disease; however men were more likely to have prevalence of all CVD risk factors than women.

Table 4.2 Prior medical condition of employees

CVD risk factors		Total	Male	Female	P-value
		(n = 384)	(n = 329)	(n= 55)	
BMI (kg/m ²)	mean (SD)	25.6 (4.6)	25.6 (4.5)	25.3 (5.1)	0.646
▪ Overweight (%)		17.0	17.9	12.2	<0.001
▪ Obesity (%)		57.4	58.6	51.0	<0.001
Waist circumference (cm)	mean (SD)	89.4 (11.3)	90.4 (11.0)	83.3 (11.5)	<0.001
▪ Abdominal obesity (%) ^a			47.8	58.0	
Diabetes (%) ^b		13.8	13.7	14.5	0.972
Hypertension (%) ^b		30.5	31.9	21.8	0.312
Hypercholesterolemia (%) ^b		38.5	40.4	27.3	0.169
Coronary heart diseases (%) ^b		4.7	4.3	7.3	0.619

^aWC ≥ 90 cm (36 inches) in men and ≥ 80 cm (32 inches) in women

^b From employee's self-report

4.1.1.3 CVD risk assessments

For the participant's total CVD risks score, the average score were 11.1 (SD = 5.3) and male had significantly higher score than female (Table 4.3). When the total CVD risk scores were converted to the probability of CVD development in 10 years, 22.8% of participants were categorized into high risk level and they were all male. Male were more likely to have significantly higher CVD risk development in 10 years than female.

Table 4.3 Cardiovascular risk calculation (RAMA EGAT heart score) of employees

RAMA EGAT		Total (n = 312)	Male (n = 264)	Female (n= 48)	P-value	
Total CVD risk score		mean (SD)	11.1 (5.3)	11.7 (5.2)	7.9 (4.1)	<0.001
		Range	(-2, 24)	(1, 24)	(-2, 16)	
Probability of CVD development in 10 years (%)		mean (SD)	5.5 (4.7)	6.0 (4.8)	2.5 (1.9)	<0.001
		Range	(0, 20)	(1, 20)	(0, 9)	
▪ Low	n (%)	56 (16.5)	44 (15.2)	12 (24.0)		<0.001
▪ Moderate	n (%)	81 (23.9)	56 (19.4)	25 (50.0)		
▪ High	n (%)	202 (59.6)	189 (65.4)	13 (26.0)		

4.1.1.4 CVD risk knowledge, risk perceptions and self-efficacy about CVD

Of the 384 participants, 381 participants completed the HDFQ. Regarding HDFQ score, out of a possible 25 points, the participants had the average score by about 15.5 (SD = 5.6) and female had significantly higher knowledge score than male ($p < 0.001$). There was a score range from 0 to 25. Out of 25 items, suggesting they obsessed an average to below average level of knowledge about CVD and associated risk factors. Item analysis showed that only 8 questions were answered correctly $\geq 70\%$ of participants answered correctly. As can be seen in Table 4.4, top three questions correctly answered most often were related to physical activity, cholesterol, and blood pressure. Top three questions answered correctly least often were related to HDL-cholesterol, people with diabetes and HDL-cholesterol level, and gender differences with diabetes. The 2 questions were found the significant gender difference, only female answered correctly $\geq 70\%$ among those who correctly answered. For our study, Kuder-Richardson-20 was adequate ($\alpha = 0.87$).

Table 4.4 Cardiovascular disease Knowledge (HDFQ) of employees

		n (%)			P-value
		Total (n = 381)	Male (n = 328)	Female (n= 53)	
Cardiovascular disease Knowledge (HDFQ) score	mean	15.5	15.2 (5.6)	17.2 (4.9)	0.014
	(SD)	(5.6)			
	Range	(0, 25)	(0, 25)	(2, 24)	
▪	Diabetes is a risk factor for developing heart disease	229 (60.1)	188 (57.3)	41 (77.4)	0.006
▪	A person who has diabetes can reduce their risk of developing heart disease if they keep their weight under control	216 (56.7)	174 (53.0)	42 (79.2)	<0.001
Three questions correctly answered most often:					
▪	Regular physical activity will lower a person's chance of getting heart disease	346 (90.8)	296 (90.5)	49 (92.5)	0.656
▪	High cholesterol is a risk factor for developing heart disease	331 (86.9)	285 (86.9)	46 (86.8)	0.984
▪	Keeping blood pressure under control will reduce a person's risk for developing heart disease	325 (85.3)	277 (84.5)	48 (90.6)	0.243
Three questions correctly answered least often:					
▪	If your good cholesterol (HDL) is high you are at risk for heart disease	147 (38.6)	122 (37.2)	25 (47.2)	0.166
▪	People with diabetes tend to have a low HDL (good) cholesterol	99 (26.0)	82 (25.0)	17 (32.1)	0.276
▪	Men with diabetes have a higher risk of heart disease than women with diabetes	55 (14.4)	48 (14.6)	7 (13.2)	0.784

The majority of participants (96.6%) reported they had low level of risk perceptions about CVD as shown in Table 4.5. For self-efficacy, mostly they were classified in moderate level (62.5%) and the gender significantly difference was also found. Female were more likely to have greater knowledge, personal control and

greater optimistic bias than male. In addition, the knowledge, risk perception, and self-efficacy about CVD were found the significant associations with education level ($r = 0.305, p < 0.001$; $r = 0.142, p = 0.005$; $r = 0.212, p < 0.001$, respectively), and self-efficacy score ($r = 0.309, p < 0.001$). Knowledge about CVD were also found the statistically significant correlation with the risk perception ($r = 0.160, p = 0.002$) and self-efficacy score ($r = 0.305, p < 0.001$). Interestingly, knowledge and risk perceptions had the significant negative correlation with the probability of CVD development in 10 years ($r = -0.110, p = 0.042$ and $r = -0.174, p = 0.001$).

Table 4.5 Risk perceptions and self-efficacy of employees

		n (%)			P-value
		Total (n = 384)	Male (n = 329)	Female (n = 55)	
Risk perceptions score	mean (SD)	32.4 (5.9)	32.5 (6.1)	32.1 (4.6)	0.670
	Range	(19, 44)	(19, 44)	(20, 43)	
	▪ Low	371 (96.6)	318 (96.7)	53 (96.4)	0.911
	▪ High	13 (3.4)	11 (3.3)	2 (3.6)	
Self-efficacy score	mean (SD)	18.8 (3.4)	18.6 (3.5)	20.0 (2.2)	0.004
	Range	(8, 25)	(8, 25)	(15, 25)	
	▪ Low	47 (12.2)	44 (13.4)	3 (5.5)	0.005
	▪ Moderate	241 (62.5)	212 (64.4)	29 (52.7)	
	▪ High	96 (25.0)	73 (22.2)	23 (41.8)	

From the self-report about smoking and alcohol drinking status (Table 4.6), 14.2% among them were the everyday smokers and all of them were men. Of those who were the current smokers, the average number of smoked cigarette was 11.0 (SD = 7.9) per day. There was the past smokers about 27% and the average age of quit smoking was 34.7 (SD = 10.6) years. They reported that they started smoking at the average age 20.5 (SD = 5.3) years. The majority of participants were occasionally drinkers or socially drinkers (73.3%). They reported that the average age of start and quit drinking were 20.9 (SD = 4.7) years and 38.2 (SD = 11.5) years, respectively. The range of drinking amount was 10 to 5150 cc and the drinking time

range between 0 to 5 times per day, mostly they usually drank 1 times a day (21.7%). The type of their favorite drinking was alcohol (21.9%) and beer (20.7%).

Table 4.6 Smoking and alcohol drinking status of employees

	n (%)			P-value
	Total (n = 374)	Male (n = 319)	Female (n= 55)	
Smoking status				
▪ Never smoke	206 (55.1)	152 (40.6)	54 (14.4)	<0.001
▪ Past smokers	101 (27.0)	100(26.7)	1 (0.3)	
▪ Less often smokers	14 (3.7)	14 (3.7)	0 (0.0)	
▪ Everyday smokers	53 (14.2)	53 (14.2)	0 (0.0)	
Alcohol drinking status				
▪ Never drink	54 (15.2)	35 (9.8)	19 (5.3)	<0.001
▪ Occasionally drinkers/ Socially drinkers	261 (73.3)	227(63.8)	34 (9.6)	
▪ Everyday drinkers	41 (11.5)	41 (11.5)	0 (0.0)	

Regarding GPPAQ score, it was calculated and expressed as Physical Activity Index (PAI). Mostly they were active (48.8%) and moderately active (21.4%). The significant gender difference was also found ($p < 0.001$), men were more likely to be more active than women as shown in Figure 4.1. Employment position and education had the significant association with PAI ($r = 0.142$, $p = 0.007$ and $r = -0.294$, $p < 0.001$, respectively). Furthermore, BMI also had the significant association with PAI ($r = -0.123$, $p = 0.025$).

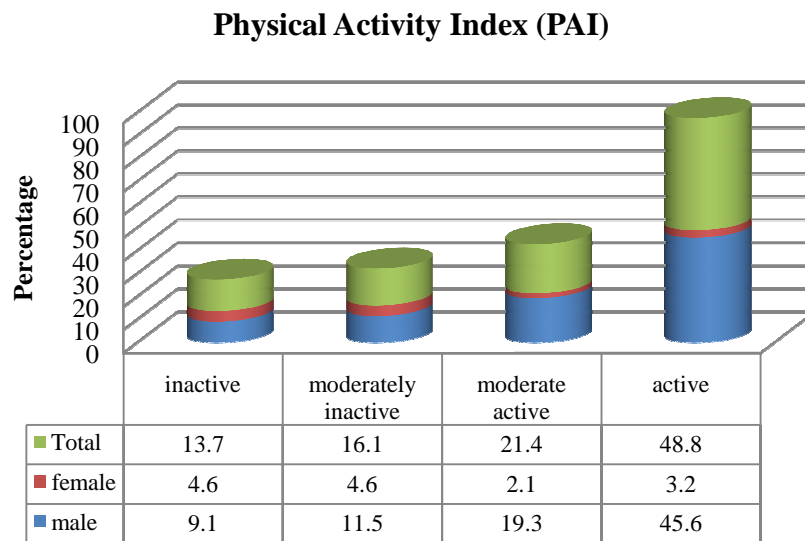


Figure 4.1 Physical Activity Index (PAI) of employees

The score of frequency of food intake behavior among the participants as shown in Table 4.7, the mean score of food frequency intake was 65.5 (SD = 14.8). The significant gender different was also found ($t = 2.132$, $df = 374$, $p = 0.034$), men had the significantly higher food intake than women. Seven of food frequency intake items were found the significantly different between men and women at $p < 0.05$ as followed; high-fat meat, offal, fish enriched fat, deep fried food, desserts, alcohol, eat more than 2 ladles of rice. Food frequency score was also found the significant correlations with Income, PAI, and stress ($r = -0.216$, $p < 0.001$ and $r = 0.106$, $p = 0.042$, and $r = 0.213$, $p < 0.001$, respectively).

Table 4.7 Food Frequency Score of employees' eating behavior

Food Frequency Score		Total (n = 376)	Male (n = 323)	Female (n= 53)	P-value
Total score	mean (SD)	65.5 (14.8)	66.2 (14.7)	61.5 (15.2)	0.034
	Range	(26, 114)	(26, 104)	(32, 114)	

For the stress assessments, mostly they were in the normal stress level (55.6%). For those who had stress, 4.7% of them were in the severe stress level as can be seen in Figure 4.2. There was no gender difference in stress level ($p = 0.118$). Stress had the significant relationship with income and diabetes from their self-report ($r = -0.118$, $p = 0.022$ and $r = 0.103$, $p = 0.044$, respectively).

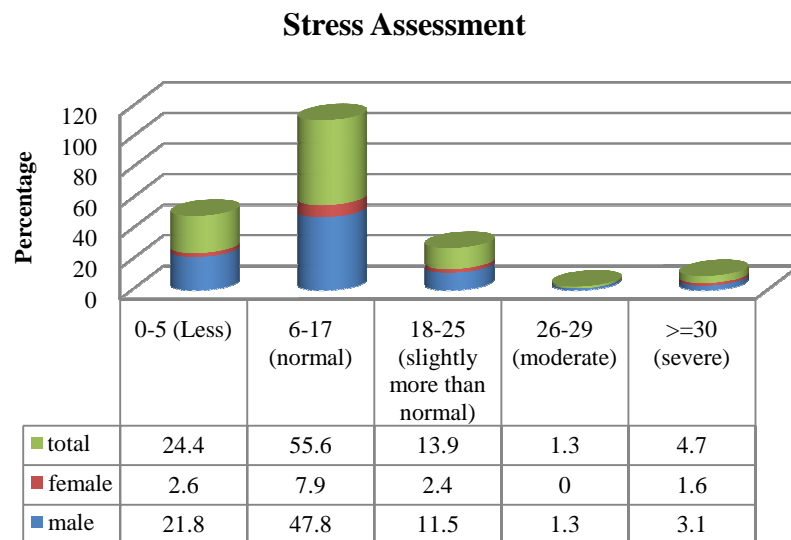


Figure 4.2 Stress assessments of employees

4.1.2 Qualitative study of the EGAT employees at South Bangkok Power Plant

Qualitative study was applied using in-depth interview and focus group discussion methods with the administrators, health care personnel, and employees who were the representatives and key informants of the South Bangkok Power Plant. These findings were a part of the baseline survey for the community situation analysis. The one administrator from executive board and one of the head of the department of health were invited to be the respondents of the in-depth interview. Three health care personnel at the department of health and 16 employees were invited to join the focus group discussion.

4.1.2.1 In-depth interview

From the in-depth interview with the administrator and the head of department of health, the organizational background, health policy, existing health promotion activity, and policy implication were obtained. The invited administrator was an engineer level 11, representative of the executive board. The head of department of health was a nurse level 10 and the major responsibility was to provide health care facilities for all employees.

Organizational background

As well-known that the Electricity Generating Authority of Thailand (EGAT) has the national responsibility for generating and transmitting power and EGAT now accounts for 96% of Thailand's electric energy production. The South Bangkok Power Plant station is one of the Power Plants under the EGAT, the third largest large power plant in Thailand which located on Poochaosamingprai Road, Bangprong, Muang District in Samutprakarn province. This power plant is under the authority of the first deputy general manager electric and the department of health is under the division of general services of the power plant. The total employees were 507 in 2011 and mostly they were technicians and engineers who shift work in generating the electric in the power plant.

Health policy

For the health policy, it was corresponded with the major policy and planning of the central of EGAT. In general, the health care services of this power plant were mostly provided treatment of diseases and medication at the department of health for all employees with free of charge. For the health promotion activity, the health care staffs only provided individual counseling for the high risk group as diabetes and hypertension. They were limited in the man power; only 3 nurses regularly work at the department and employed the part time doctors and nurses in every week. Therefore, the health promotion activity for all employees was also restricted due to the lacked of health care staffs or health care professionals to generate and support that activity.

Existing health promotion activity

The head of department of health tried to initiate the health promotion activity for the high risk employees by collaborating with the provincial health office of Samutprakarn province in 2010 under the project of “konthairaipung” of department of health, Ministry of Public Health. There were 60 employees attending the project and the organization also allocated the existing resources to support the project including partial budgets, training place, transportation, and man powers. The acceptability and feedback of the project was very good but unfortunately the provincial health office had limited budget and no longer repeated followed-up activity. However, the organization was always ready for supporting the health promotion activity for the employees according to the health policy and head of department of health were aware of the employee’s health, the annually health check-up and regularly individual counseling program for only the high risk group are the first priority responsibility of the department of health regarding their current work capacity.

Policy Implication

The head of department of health was interviewed again after completed the program intervention. Because of the acceptability of the intervention was quite well with several positive feedbacks, the head of department of health had tried to encourage the human resource department to add the health promotion training for all employees as an annually program. According to the policy of EGAT, this program could be implemented under the health policy to sustain the health promotion activities in long run. Furthermore, the annually health check-up for all employees should be added the body composition analysis because the participants were very interested and appreciated this instrument and the analysis results were also very useful for monitoring their health.

All these plans were on the process in generating the action plan for submitting to the executive board. The program may be started to implement by the year of 2013, if possible.

4.1.2.2 Focus group discussion

For the focus group discussion, three health care personnel at the department of health and 16 employees were invited to join the focus group discussion. In case the employees who were limited in their time for attending the activity because they mostly work as the shift works. The researcher had to distribute the invitation letters and give opened end question about the intervention program in their opinions and needs. They also signed the informed consents for the further exclusive intervention program.

Participant's needs

From the discussion and comments of participants, mostly they needed the health promotion activity that did not interfere in their current work. The program should be fun and not boring and can motivate them to attend throughout the study period. They did not like to attend the activity as a student in the class, only lectured and the instructor should be active, professional, and interesting. Feasibility of the program was very important for them. This information was valuable for the intervention development.

“Please be informed me about the program schedule as least 1 or 2 months because I may not join the activity if I am on duty” (Employee 2; Male)

“The program activity must encourage me to join and be interesting (not boring) with suitable time and place” (Employee 11; Male)

Suggestions

The participants also gave some suggestions in their point of views for the intervention development. Mostly they would like to see the continuous activity and follow-up over time. The program should not be taken too long time and too many topics; it should be focused on the important principles related to diet and exercise for promoting their health. The program schedules should be detailed in activities, place, and time under their acceptance.

“I would like to suggest that the program should have follow-up period together with my annually health check-up” (Employee 5; Male)

“In my opinion, the program should be held more than 2 days, it was enough” (Employee 1; Male)

According to these suggestions, the researcher could estimate the interest of employees in the health promotion program and all comments and feedback were useful for the intervention development.

Intervention development

After the baseline survey was finished, the team leader and the core group were invited to attend the meeting to discuss about the intervention development. They offered the program characteristics including time schedules, place, and budgets. The program schedule should be arranged at least 2 hours for each topic, if it was held on the day at work. However, mostly they preferred the program training which was composed of all the issues related to CVD risks prevention and control within 2 days at the training place of EGAT, outside Samutprakarn province such as at Bangpakong training center in Chachoengsao province or at Srinakarin Dam in Kanchanaburi province depends on the availability of the place. After the meeting, the team leader and the core group turned to ask participants for their opinion and let them voted for the right place. Finally, they would rather go to Srinakasin Dam at weekend (Saturday and Sunday) because they were free and it was not interfere with their regularly work. The team leader was the organizer to reserve the training place, accommodation, and transportation. They also manage the budgets in part of their partial support for food costs from the organization and the participants. The researcher only helped them as a coordinator with the instructor team from King Chulalongkorn Memorial Hospital and supported the budgets in part of the instructor’s fees and food costs.

4.2 Effectiveness of the intervention program

This part involved with the monitoring and evaluation of the developed intervention program divided into four sections; 1) recruitment of participants, 2) baseline characteristics of participants, 3) evaluation of the intervention program, and 4) acceptability of the intervention program.

4.2.1 Recruitment of participants

Of 507 employees at the South Bangkok Power Plant, 384 employees returned the questionnaires for the cross-sectional survey at baseline. Out of 384 employees, 14 employees were excluded due to they were retired in September 2011. Therefore, 370 employees were invited to participate to the intervention program and 119 employees responded to be the participants. They were examined body composition and given individual counseling at department of health of the Power Plant. Of those 119 participants, only 36 participants had willingly to attend the further exclusive intervention program. Unfortunately, there were 4 participants lost to follow-up at the end of study period (1 of them died by accident and 3 left did not return the follow-up questionnaires).

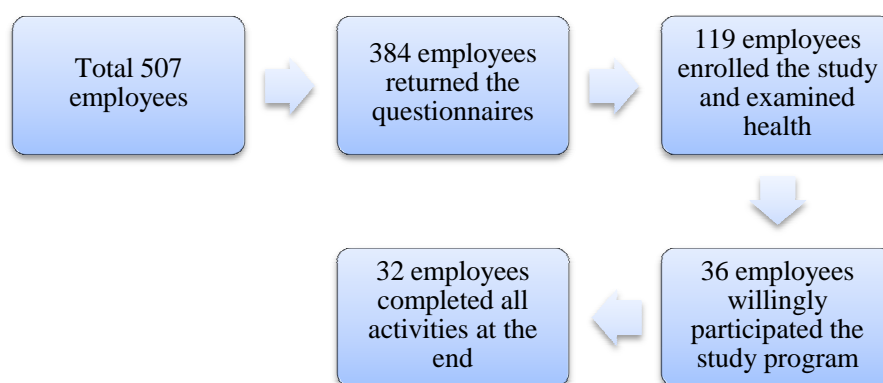


Figure 4.3 Participant recruitments diagram

4.2.2 Baseline characteristics of participants

4.2.2.1 Demographic characteristics

As can be seen in Table 4.8, the participants who were interested to attend the intervention program aged 50.9 years in average; mostly they were 45 – 54 years of age (57.6%). Majority were married and couple (78.8%) and Buddhist (97%). Mostly they had completed vocational education or diploma (42.2%) and bachelor degree (39.4%). Technicians (30.3%) and high income participants (60,000 – 99,999 THB) most commonly attended to the study. No statistically significant gender differences in age, marital status, religion, education, and income were found.

Table 4.8 Demographic characteristics of participants

Characteristic		n (%)			P-value
		Total (n = 36)	Male (n = 23)	Female (n= 13)	
Age (year)	mean	50.9	50.9	50.9	0.995
	(SD)	(5.7)	(5.7)	(5.8)	
▪ 35 – 44		6 (18.2)	3 (14.3)	3 (25.0)	0.882
▪ 45 – 54		19 (57.6)	13 (61.9)	6 (50.0)	
▪ 55 – 60		8 (24.2)	5 (23.8)	3 (25.0)	
Marital status					
▪ Single		2 (6.1)	1 (4.8)	1 (8.3)	0.130
▪ Married and Couple		26 (78.8)	19 (90.5)	7 (58.3)	
▪ Widow		2 (6.1)	0 (0.0)	2 (16.7)	
▪ Divorced and Separated		3 (9.1)	1 (4.8)	2 (16.7)	
Religion					
▪ Buddhist		32 (97.0)	20 (97.0)	12 (100.0)	0.443
▪ Islam		1 (3.0)	1 (4.8)	0 (0.0)	
Education					
▪ Secondary school and lower		4 (12.1)	4 (19.0)	0 (0.0)	0.436
▪ Vocational Education or Diploma		14 (42.4)	8 (38.12)	6 (50.0)	
▪ Bachelor degree		13 (39.4)	8 (38.1)	5 (41.7)	
▪ Master degree and Higher		2 (6.1)	1 (4.8)	1 (8.3)	

Table 4.8 (Continued) Demographic characteristics of participants

Characteristic	n (%)			P-value
	Total (n = 36)	Male (n = 23)	Female (n= 13)	
Employment Position				
▪ Engineer	4 (12.1)	4 (19.0)	0 (0.0)	0.001
▪ Technician	10 (30.3)	10 (47.6)	0 (0.0)	
▪ Administrator	5 (12.1)	4 (19.0)	1 (8.3)	
▪ Administrative staff	4 (15.2)	0 (12.1)	4 (33.3)	
▪ Professional staff	5 (15.2)	1 (4.8)	4 (33.3)	
▪ Accountant	1 (3.0)	0 (0.0)	1 (8.3)	
▪ Others	4 (12.1)	2 (9.5)	2 (16.7)	
Income (THB*/month)				
▪ 20,000-39,999 (\$ 650 – 1300)	1 (3.0)	0 (0.0)	1 (8.3)	0.264
▪ 40,000-59,999 (\$1300 – 1950)	10 (30.3)	8 (38.1)	2 (16.7)	
▪ 60,000-99,999 (\$1950 – 3250)	21 (63.6)	12 (57.1)	9 (75.0)	
▪ ≥100,000 (≥ \$3250)	1 (3.0)	1 (4.8)	0 (0.0)	

4.2.2.2 Prior medical condition and CVD risk score

From the prior medical condition (Table 4.9), participants with obesity and abdominal obesity, diabetes, hypertention, hypercholesterolemia, coronary heart disease enrolled the study intervention. Mostly they had obesity (71.4%), hypertention (57.6%), and hypercholesterolemia (51.5%). Cardiovascular risk calculation (RAMA EGAT heart score) of Participants (Table 4.10) showed that total CVD risk score was 11.1 in average and mostly they had probability of CVD development in 10 years in high level (50%) and males tend to have higher risk than female.

Table 4.9 Prior medical condition of Participants

CVD risk factors		Total (n = 36)	Male (n = 23)	Female (n= 13)	P-value
BMI (kg/m ²)	mean (SD)	27.0 (4.5)	26.8 (3.8)	27.5 (5.7)	0.636
▪ Overweight (%)		17.1	17.4	16.7	0.852
▪ Obesity (%)		71.4	73.9	66.7	
Waist circumference (cm)	mean (SD)	90.0 (11.6)	92.4 (9.1)	85.8 (14.5)	0.100
▪ Abdominal obesity (%) ^a			60.9	61.5	
Diabetes (%) ^b		15.2	19.0	8.3	0.630
Hypertension (%) ^b		57.6	61.9	50.0	0.506
Hypercholesterolemia (%) ^b		51.5	71.4	16.7	0.002
Coronary heart diseases (%) ^b		6.1	4.8	8.3	1.000

^aWC ≥ 90 cm (36 inches) in men and ≥ 80 cm (32 inches) in women

^bFrom employee's self-report

Table 4.10 Cardiovascular risk calculation (RAMA EGAT heart score) of Participants

RAMA EGAT		Total (n = 36)	Male (n = 23)	Female (n= 13)	P-value
Total CVD risk score	mean (SD)	11.1 (4.1)	11.9 (4.6)	9.6 (2.5)	0.115
	Range	(3, 20)	(3, 20)	(1, 20)	
Probability of CVD development in 10 years (%)	mean (SD)	4.8 (4.0)	5.9 (4.6)	2.9 (1.2)	0.434
	Range	(1, 20)	(1, 20)	(1, 5)	
▪ Low	n (%)	3 (8.3)	2 (8.7)	1 (7.7)	0.678
▪ Moderate	n (%)	15 (41.7)	8 (34.8)	7 (53.8)	
▪ High	n (%)	18 (50.0)	13 (56.5)	5 (38.5)	

4.2.3 Evaluation of the intervention program

Effectiveness of the intervention program under the HOPE project was evaluated by comparing knowledge, risk perception, self-efficacy, food frequency

score, stress, and physical activity index (PAI), smoking and alcohol drinking status, CVD risk parameters, RAMA EGAT heart score, body composition analysis, and acceptability of the intervention program at baseline and after intervention periods.

4.2.3.1 Comparison of knowledge, risk perception, and self-efficacy about CVD

After intervention, the participants had a significantly increased the mean score of CVD knowledge or HDFQ score ($p = 0.040$). However, the change of risk perceptions and self-efficacy score were not found at the significant change the end of study period (Table 4.11). Detail of the participants' answer of each knowledge, risk perceptions, and self-efficacy items were presented in appendix A (Table A1 and A2).

Table 4.11 Change in cardiovascular disease knowledge (HDFQ) baseline and after intervention of participants

Variable		Baseline (n = 36)	After Intervention (n= 32)	P-value	
Cardiovascular disease knowledge (HDFQ) score	mean (SD)	16.2 (6.3)	18.3 (3.9)	0.040	
	Range	(0, 24)	(9, 24)		
Risk perceptions score	mean (SD)	32.8 (4.4)	32.7 (3.8)	0.973	
	Range	(23, 40)	(26, 41)		
	▪ Low	n (%)	36 (100.0)	30 (96.8)	1.000
	▪ High	n (%)	0 (0.0)	1 (3.2)	
Self-efficacy score	mean (SD)	19.3 (3.0)	19,3 (2.1)	0.907	
	Range	(9, 25)	(13, 22)		
	▪ Low	n (%)	7 (19.4)	1 (2.8)	0.549
	▪ Moderate	n (%)	21 (58.3)	21 (58.3)	
	▪ High	n (%)	8 (22.2)	9 (25.0)	

4.2.3.2 Comparison of food frequency score, stress, and physical activity index (PAI)

As shown in Table 4.12, no significantly changes in food frequency score, stress score, and PAI were observed among the participants. For the change of food frequency in each item were presented in Appendix A (Table A3). Only two items of food frequency intake behavior, high caloric fruit and tea or coffee with coffee mate were found significantly different between baseline and after intervention.

Table 4.12 Change in food frequency score, stress score and PAI of participants

Variable		Baseline (n = 36)	After Intervention (n= 32)	P-value
Food Frequency Score	mean (SD)	61.8 (14.2)	60.8 (12.4)	0.721
	Range	(36, 88)	(39, 82)	
Stress score	mean (SD)	11.8 (11.1)	10.7 (9.3)	0.257
	Range	(0, 60)	(0, 46)	
Less	n (%)	9 (27.3)	12 (38.7)	0.476
Normal	n (%)	18 (54.5)	14 (45.2)	
Slightly than normal	n (%)	5 (15.2)	4 (12.9)	
Moderate	n (%)	0 (0.0)	0 (0.0)	
Severe	n (%)	1 (3.0)	1 (3.2)	
PAI				
Inactive	n (%)	7 (21.9)	7 (22.6)	0.176
Moderately Inactive	n (%)	8 (25.0)	3 (9.7)	
Moderately Active	n (%)	8 (25.0)	7 (22.6)	
Active	n (%)	8 (28.1)	14 (45.2)	

4.2.3.3 Comparison of smoking and alcohol drinking status

For smoking and alcohol drinking status, no significant different changes were found at the end of intervention program as can be seen in Table 4.13. This is not a real surprise as people usually have difficulties in changing their daily habits (see also discussion 5.1 and recommendations 5.2).

Table 4.13 Change in smoking and alcohol drinking status of Participants

		Baseline (n = 36)	After Intervention (n= 32)	P-value
Smoking status				
▪ Never smoke	n (%)	22 (66.7)	20 (64.5)	0.607
▪ Past smokers	n (%)	6(18.2)	5 (16.1)	
▪ Less often smokers	n (%)	3 (9.1)	4 (12.9)	
▪ Everyday smokers	n (%)	2 (6.1)	2 (6.5)	
Alcohol drinking status				
▪ Never drink	n (%)	4 (11.1)	5 (17.2)	0.368
▪ Occasionally drinkers/ Socially drinkers	n (%)	25(69.4)	22 (75.9)	
▪ Everyday drinkers	n (%)	2 (5.6)	2 (6.9)	

4.2.3.4 Comparison of CVD risk factors and RAMA EGAT heart score

Considering CVD risk indicators as shown in Table 4.14, no statistically significant changes were found in the mean of BMI and waist circumference, but the categorized BMI as overweight and obesity have shown a significant change (see Table 4.16, body composition analysis and its significance 4.2.3.5). For CVD risk indicators from the employee's health check up at baseline and after intervention showed that no significant change in the mean of total cholesterol, low-density lipoprotein cholesterol, fasting plasma glucose, systolic blood pressure, and diastolic blood pressure. However, high-density lipoprotein cholesterol that significantly decreased over time was not the expected finding of this study. It is a fact that changes in medical parameters like cholesterol, blood pressure as a consequence of lifestyle changes take time, and risk factors like stress (influence of high cortisol level for example) can even have a very short effect on these parameters as well as an opulent dinner with alcohol the day before the intervention. For an exact picture

of the values of these CVD risk factors, regular testing over an extended period is probably the right way to get realistic results.

Table 4.14 Change in CVD risk factors of Participants

CVD risk factors		Baseline (n = 36)	After Intervention (n= 32)	P- value
BMI (kg/m ²)	mean (SD)	27.2 (4.6)	27.0 (4.7)	0.424
	Range	(19.8, 39.9)	(19.8, 39.8)	
▪ Overweight (23 – 24.9 kg/m ²)	n (%)	6 (17.1)	7 (20.6)	<0.001
▪ Obesity (≥ 25 kg/m ²)	n (%)	25 (71.4)	23 (67.6)	
Waist circumference (cm)	mean (SD)	90.0 (11.9)	91.7 (11.9)	0.122
	Range	(68, 120)	(70, 123)	
Total cholesterol (mg/dL) ^b	mean (SD)	215.1 (37.4)	222.5 (35.6)	0.216
	Range	(116, 327)	(138, 292)	
High-density lipoprotein cholesterol (mg/dL) ^b	mean (SD)	51.0 (13.4)	46.9 (13.7)	<0.001
	Range	(34, 92)	(23, 92)	
Low-density lipoprotein cholesterol (mg/dL) ^b	mean (SD)	134.8 (37.6)	144.5 (33.7)	0.142
	Range	(42, 228)	(64, 193)	
Fasting plasma glucose (mg/dL) ^b	mean (SD)	110.7 (37.8)	110.8 (21.1)	0.120
	Range	(82, 309)	(85, 176)	
Systolic blood pressure (mmHg) ^b	mean (SD)	134.5 (16.6)	132.3 (17.8)	0.537
	Range	(102, 190)	(104, 176)	
Diastolic blood pressure (mmHg) ^b	mean (SD)	82.9 (11.0)	85.4 (9.9)	0.208
	Range	(56, 120)	(69, 105)	

^a WC ≥ 90 cm (36 inches) in men and ≥ 80 cm (32 inches) in women

^b From employee's health check-up

According to RAMA EGAT heart score, total CVD risk score which was calculated using all CVD risks factors including age, gender, total cholesterol, blood pressure, waist circumference, diabetes, and smoking status, showed the significant decrease of the mean score as presented in Table 4.15. This finding similarly changes in the mean of probability of CVD development in 10 years. Furthermore, in the categorized probability of CVD development over 10 years as low, moderate,

and high level the results show a significant decreased in number of participants in low, moderate and high risk group after intervention, probably due to a better understanding of the CVD risks and problems.

Table 4.15 Change in RAMA EGAT score of Participants

RAMA EGAT Score		Baseline	After	P-value
		(n = 36)	Intervention (n= 32)	
Total CVD risk score	mean (SD)	11.1 (4.1)	9.7 (4.1)	0.031
	Range	(3, 20)	(0, 17)	
Probability of CVD development in 10 years (%)	mean (SD)	4.8 (4.0)	3.6 (2.5)	0.003
	Range	(1, 20)	(0, 11)	
▪ Low	n (%)	3 (8.3)	7 (19.4)	0.118
▪ Moderate	n (%)	15 (41.7)	15 (41.7)	
▪ High	n (%)	18 (50.0)	14 (38.9)	

4.2.3.5 Comparison of body composition analysis

The body composition analysis or bioelectrical impedance analysis (BIA) is a commonly used method for estimating body composition and in particular body fat (Appendix G). The results showed that no significant change in body weight, BMI, body fat, body water, and Waist Hip Ratio were found as shown in Table 4.16. the slightly differences in muscle mass, visceral fat, body water (a vital factor for optimizing physical function), basal metabolic rate, and fitness score can be ignored as the measurement conditions may have been slightly different (full or empty stomach, for example). Like for medical parameters, changes in body composition take time and are also influenced by factors like smoking, alcohol drinking, stress, and even sleep.

Table 4.16 Change in body composition of participants

		Baseline (n = 36)	After Intervention (n= 32)	P-value
Body weight (kg)	mean (SD)	71.2 (16.6)	70.7 (17.7)	0.294
	Range	(51, 112)	(50, 117)	
▪ Muscle mass (kg)	mean (SD)	25.3 (5.2)	24.9 (5.1)	0.008
	Range	(18, 37)	(18, 35)	
▪ Fat mass (kg)	mean (SD)	25.0 (12.0)	25.2 (12.6)	0.689
	Range	(11, 54)	(10, 54)	
BMI (kg/m ²)	mean (SD)	27.1 (5.7)	26.9 (6.0)	0.349
	Range	(20, 40)	(20, 40)	
Body fat (%)	mean (SD)	34.0 (9.3)	34.3 (9.5)	0.327
	Range	(18, 52)	(19, 52)	
Waist Hip Ratio (WHR)	mean (SD)	0.94 (0.52)	0.94 (0.54)	0.379
	Range	(1.0, 1.0)	(1.0, 1.0)	
Visceral fat (cm ²)	mean (SD)	120.8 (38.5)	120.9 (39.4)	0.584
	Range	(48, 211)	(75, 205)	
Total body water (L)	mean (SD)	33.9 (6.3)	33.5 (1.4)	0.014
	Range	(25, 48)	(25, 48)	
Intracellular fluid (L)	mean (SD)	20.9 (3.9)	20.6 (3.9)	0.009
	Range	(14, 34)	(15, 29)	
Extracellular fluid (L)	mean (SD)	13.0 (2.4)	12.9 (2.5)	0.045
	Range	(9, 12)	(9, 19)	
Basal Metabolic Rate (BMR)	mean (SD)	1365.7 (184.1)	1352.8 (185.27)	0.012
	Range	(1102, 1781)	(1102, 1753)	
Fitness score	mean (SD)	66.3 (7.8)	65.4 (7.9)	0.020
	Range	(48, 84)	(49, 77)	

4.2.4 Acceptability of the intervention program

After finishing the intervention activities, the acceptability of intervention program were assessed by the participants. The acceptability of intervention in 5 dimensions seemed to be quite high acceptability of both intervention activities as can be seen in Table 4.17. Moreover, participant also gave some opinion and feedback as followed; the activities really useful for them,

particularly the high risk employees and should be also held at least 1 times a year for the new generation and healthy employees that they can prevent themselves from CVD developments. They also gave some comments about the intervention period and activities; it should be extended time of the activities, really appreciated the invited instructors, and need more learning media e.g. email, booklet, and brochure.

Table 4.17 Summary of acceptability of interventions among participants

Variables	Total score		Intervention 1	Intervention 2
			(n = 66)	(n= 37)
1. Instructor	30	mean (SD)	26.9 (2.7)	26.2 (2.7)
		Range	(21, 30)	(22, 30)
2. Place/Time/Food	20	mean (SD)	16.5 (1.7)	16.0 (2.3)
		Range	(13, 20)	(10, 20)
3. Service of staffs	20	mean (SD)	16.0 (2.10)	17.0 (1.7)
		Range	(12, 20)	(13, 20)
4. Knowledge	35	mean (SD)	12.0 (1.4)	29.8 (2.9)
		Range	(8, 15)	(23, 35)
5. Application of knowledge	20	mean (SD)	16 (1.9)	16.9 (1.7)
		Range	(12, 20)	(12, 20)

Intervention 1 = Health education training, Intervention 2 = Skill training

4.3 Community participation assessment

Community participation was assessed by the researcher, the invited instructors, the representatives of health care staffs and all respondents who participated in the intervention program using structured interviews and observations during the intervention activities and compared to the baseline assessment. The findings were evaluated with the help of personal experiences and knowledge about the project, as well as information from the interviews and observations based on 5 dimensions of the community participation including need assessment, leadership, organization, resource mobilization, and management.

4.3.1 Need assessment

At baseline survey of the study, need assessment was assessed by observation and in-depth interview. The process evaluation of need assessment was conducted by the researcher. Administrators, head of department of health, health care staffs, and the representative of employees at South Bangkok Plant were interested and considered the possible problems about CVD risks regarding the researcher viewpoint and the health promotion issue was also one of the health policies of the organization. The organization diagnosis was based on annual health statistics, organizational data, and stakeholders' feedback. The intervention was thus designed and the project plan was presented to those organizations interested in participating. Therefore, the need assessment was ranked as minimal (1).

After intervention, the administrators began to play a more outstanding role on the administrative board of the organization and tried to promote the health promotion intervention into health policy as the routine training program for their employees. Most of the participants had the good feedbacks and need to involve again in the intervention program as an annual activity in the organization. They also helped improving details of the intervention plan and activities by specifying their responsibilities, setting schedules, resource mobilization in term of budget allocation and providing the place and staffs for implementation. However, they still needed the outsider's viewpoints in systematic analysis of needs and problems. Thus the need assessment was ranked as restricted (2).

4.3.2 Leadership

At baseline, only head of department of health and the health care staffs took the leadership role from the beginning of the intervention program. The leadership team and the researcher made decision together with the participants for the program development and activities planning. Therefore, the leadership was ranked as fair (3).

After intervention, the leadership team and participants still made decision together with the researcher for all health promotion activities, implementation, and

evaluation the change of knowledge and CVD risk factors among participants. Thus, the leadership was ranked as fair (3).

4.3.3 Management

All health care activities regarding the health policies were started by head of department of health and the health care staffs. There was collaboration with the provincial health office of Samutprakarn province in health promotion activities but without control and sustainability of the program after the program ending. Therefore, management at the beginning of the intervention program was ranked as restricted (2).

After intervention, most of health promotion activities were created and facilitated by health care professionals and researchers, the leadership team and participants actively involved in implementation and monitoring the intervention program. In addition, the administrators in each sector of the organization gave support to allow their supervisees attending the training activities and health examination at the department of health. They also included this project into their monthly organizational meeting and also organized the meetings with the researcher for planning and monitoring the progress of the intervention program. The leadership team had an important role in program implementation and monitoring under supervision of the researcher. Therefore, the management was ranked as fair (3).

4.3.4 Organization

The leadership team of department of health had directly responsibility in all activities related to health care and health promotion. They usually initiated and implemented health activities incorporate with doctors, nurses, and outside health care professionals under their health policies of the organization. Therefore, at baseline the organization was ranked as restricted (2).

Mostly, the health promotion program activities were created and facilitated by health professionals and the researcher. However, the leadership team was a key success of program implementation because they gave support to arrange the

program schedule, select the suitable place for activities setting, distribute the questionnaires and coordinate all participants. The leadership team had the important role in program implementation and monitoring. Thus, the organization after intervention was ranked as fair (3).

4.3.5 Resource mobilization

The organization had resources allocation for their employees in allowance, transportation, training places, and some budget for health care spending. From the previous health promotion program incorporation with the provincial health office of Samutprakarn province, the organization gave support to resource allocation in term of allowance, transportation, training places, and accommodations for the program implementation. Therefore, at baseline the resource mobilization was ranked as restricted (2).

Similarly to the previous program, this study was also partial supported by the organization resources as mention earlier. In addition, the participants also gave their some money to support the program implementation. After the intervention activities ending, the leadership team carried out the meeting with the researcher for the budget summary and discussion about the facing unexpected barriers during the program implementation. Therefore, the resource mobilization was ranked as open (4).

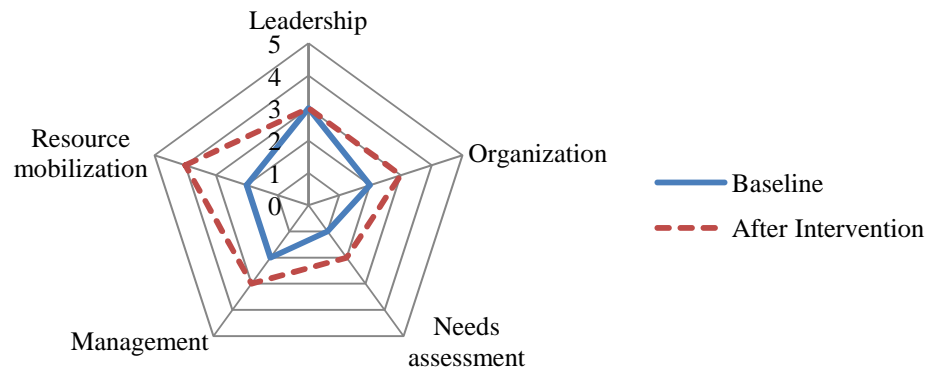


Figure 4.4 Community participation of the HOPE project at baseline and after intervention

As can be seen in Figure 4.4 for the change in 5 dimensions of community participation at baseline and after intervention, the spider-gram showed the ranges between baseline and after intervention were quite narrow in the dimensions of leadership, organization, need assessment, and management. On other hand, the spider-gram showed the wide range between baseline and after intervention in the dimensions of resource mobilization.

CHAPTER V

DISCUSSIONS, CONCLUSION & RECOMMENDATIONS

The main objective of this study was to evaluate the effectiveness of the HOPE project involved with reducing CVD risk factors among the EGAT employees in the South Bangkok Power Plant in Samutprakarn province, Thailand over the period April 2011 to September 2012. This study was conducted with the expectation of improving the knowledge, risk perceptions, and self-efficacy about CVD, CVD risk behaviors, health status, and community participation through participatory approach and encourages the organizational capability to assess and control CVD risk factors.

One group with pre-test and posttest design was used to evaluate an effectiveness of the study. The developed intervention program emphasized on raising self-awareness, motivation, and abilities to action and also supports the organizational capability to assess and control CVD risk factors. Of 384 employees at baseline survey as a cross sectional study, 36 employees had willingly to attend the developed intervention program in their social and organizational context. After 6 months of the intervention, the change in knowledge, risk perceptions, and self-efficacy about CVD, CVD risk behaviors (food intake behavior, physical activity pattern, smoking status, alcohol drinking habit, and stress management), health status (health check-up report, total CVD risk calculation, and body composition), and community participation were assessed as the effectiveness of the study.

5.1 Discussion

5.1.1 Cross sectional study

This study was conducted with the EGAT population that comprised predominately the urban middle-class socioeconomic status. According to the organizational background, the Electricity Generating Authority of Thailand (EGAT) is a state enterprise that owns and manages the majority of Thailand's electricity generation capacity, as well as the nation's transmission network. It is such a big organization

comprised more over 23,000 employees of both metropolitan and provincial offices and including also private company's networks and cooperation with private power companies and neighboring countries (Electricity Generating Authority of Thailand (EGAT), 2009). The South Bangkok Power Plant is one of power plants under the EGAT network. The results of the EGAT populations at Bangkok South Power Plant were prone to have CVD risk factors regarding the prior medical condition, mostly they had hypercholesterolemia and hypertension by 38.5% and 30.5%, respectively, as well as the prevalence of overweight and obesity were 15.4% and 31.7%, respectively. The probability of CVD development in 10 years, 22.8% of participants was also categorized as high risk level. Similarly to the previous study of EGAT with 12-year follow-up (1985 – 1997) of 3,499 employees (average age 43 years), showed that they were increased mean levels of systolic and diastolic blood pressure, body mass index, total cholesterol and high density lipoprotein (HDL) cholesterol over 12 years of follow-up period. The most frequent causes of death were vascular diseases, and were positively associated with age, blood pressure, diabetes, male gender, smoking status, and total cholesterol, but reverse association with HDL cholesterol. (Sritara et al, 2003; Aekplakorn, et al. 2007; Sritara et al, 2007). Our findings confirmed that the common risk characteristics and trends related to CVD development among EGAT employees at the South Bangkok Power Plant were similar to the EGAT cohort study and they are one of the high risk groups among Thai population as well.

Because the EGAT is electricity generation organization, it is more likely to employ men more than women. The majority occupations of employees are technicians and engineers who regularly work at the power plant. Therefore mostly they had completed vocational education and bachelor degree with the longer period on their duties, the higher their monthly income. The majority of the participants were pre-aging (≥ 45 years) by about 70% of the total. Therefore they were more likely to have the higher risk for CVD than the younger age group. From our findings, the probability of CVD development in 10 years among the participants showed the positive correlation

with their age ($r = 0.485$, $p < 0.001$), income ($r = 0.546$, $p < 0.001$), and employment position ($r = 0.170$, $p = 0.002$). These findings confirmed the previous study about the epidemiologic transition theory and the hypothesis that people in higher socioeconomic status and in more developed areas in Thailand are more likely to be at risk for CVD morbidity and mortality (Petcharoen et al, 2006). This may be due to people who live in urban areas and that higher socioeconomic status increase the risk of CVD morbidity and mortality because of the presence of hazardous physical and social environments, and greater influence of unhealthy behavior.

The findings also indicated that there were the gender differences in CVD risk factors; the probability of CVD development over 10 years, 22.8% of participants were categorized into high risk level and they were all men. Women had the lower risk for the probability of CVD development over 10 years than men, consistent with several epidemiological studies that men have a greater risk of CVD than women (American Heart Association, 2007). This may be due to women have been delayed for CVD development about 10 – 15 years and even after menopause, when women's death rate from CVD increases, it's not as great as men's. It may be due to the effect of higher HDL-C level and estrogen (American Heart Association, 2007; Anand et al, 2008). In this study, we also found that women tend to have higher prevalence of overweight, obesity, and abdominal obesity than men; however, men always have a greater waist circumference than women due to a different fat distribution in the body. It can be explained that waist circumference is a strong predictor of intra-abdominal adiposity, which is known to be a strong predictor of the different features of the Metabolic Syndrome associated with a higher risk of cardiovascular disease and diabetes, namely abnormal lipid profile, hypertension, abnormal glucose metabolism and inflammation (Balkau et al, 2007).

This study was the first to evaluate not only the major CVD risk factors among the EGAT employees but also access the EGAT employees' knowledge, risk perception, and self-efficacy to prevent and control CVD risks. The findings indicated that

knowledge about CVD (the HDFQ) was low level among EGAT employees (mean score 15.5, SD = 5.6) when compared to the previous studies. For the English version of HDFQ (mean score 20.4, SD = 3.0) (Wagner et al., 2005), and the Spanish version of HDFQ (mean score 17.7, SD = 4.9) (Wagner et al., 2005) and the Chinese version of HDFQ (mean score 16.2, SD = 5.1) (Kam-Hung Lee & Ann Tak-Ying Shiu, 2012). The Thai version of the HDFQ used for the first time in our study performed very well; Kuder-Richardson-20 was adequate ($\alpha = 0.87$). Similarly to the original version of HDFQ, Kuder-Richardson-20 was 0.77 (Wagner et al., 2005), the Spanish version of the HDFQ, Kuder-Richardson-20 was 0.86 (Wagner et al., 2005), and the Chinese version of the HDFQ also demonstrated acceptable reliability and validity; Kuder-Richardson-20 internal consistency coefficient of 0.86 (Kam-Hung Lee & Ann Tak-Ying Shiu, 2012). The consistency of the instrument showed acceptable content validity and internal consistency reliability of every version of HDFQ including our study.

Regarding the risk perceptions, most of them also had low risk perceptions. It was noticed that knowledge was significantly related to their risk perceptions, and self-efficacy. Our finding followed the outline of the I-Change Model which composed by the relationship between knowledge, risk perception, and self-efficacy and all variables has an influence on the intention to change or maintain certain behavior. Interestingly, women were more likely to have higher knowledge, and self-efficacy than men. This finding had been corresponded to the significantly lower risk of the probability of CVD development over 10 years among women in this study. That's mean women had more personal control and belief in their social support than men. These findings are consistent with the other previous studies. Recently study with young African American adults aged 18 – 26 years (Winham and Jones, 2011), it had been found that knowledge about heart disease differ by gender and education level. Women and those respondents with a college education had significantly higher summary index values of the symptoms and outcomes of heart disease knowledge than men. From the study of the high CVD risk patients, aged between 18 to 85 years, at Temple University Hospital and Geisinger

Medical Center in Pennsylvania (Hamko, et al, 2008), the study found that women were more knowledgeable than men about CVD and also perceived their risk higher than men. However, the risk perceptions about CVD did not show the gender differences in our study. Moreover, our finding had also found that the knowledge and risk perceptions had the significant negative correlation with the probability of CVD development over 10 years. In contrast, the study of Hamko (Hamko, 2008) found no association between perceived and actual CVD risk, as measured by the Framingham risk score, or between knowledge and either perceived or actual CVD risk. In contrast, Wartak's study (Wartak et al., 2011) found that gender was not associated with knowledge of risk for CVD. In our study, the internal consistency reliability of the risk perception subscale performed moderate; Cronbach's $\alpha = 0.65$ and for the self-efficacy subscale was also the same with Cronbach's $\alpha = 0.65$. The consistency of the instrument showed acceptable internal consistency reliability but not enough for a good acceptable level.

Although increasing the knowledge of CVD risks do not always lead to increased risk perception, and self-efficacy to carry-out lifestyle risk behaviors reduction. However, to adopt a healthier behavior, people must have enough CVD risk factor knowledge (increasing awareness), perceive themselves as susceptible to the disease (CVD risk perception), and believe that they are capable of doing something to prevent or cure the disease (self-efficacy). Therefore, the preventive measures for the maximum benefits are to raise awareness for CVD risks among individuals and encourage them to modify desired health behaviors. This was an important stage, screening and risk assessment, for the further beginning of health promotion strategies in the workplace (Erfurt et al, 1991; De Vries et al., 1988; De Vries, 2008).

According to the Physical Activity Index (PAI), most participants were active (48.8%) or moderately active (21.4%). The significant gender difference was also found ($p < 0.001$), men were more likely to be active than women. This may be due to PAI had the relationship with employment position and education ($r = 0.142$, $p = 0.007$ and $r = -0.294$, $p < 0.001$, respectively). Because the majority employees were men and mostly

they were technicians and engineer who had to work on machines in the power plant and to be more active than women. Furthermore, BMI also had the significant reverse association with PAI ($r = -0.123$, $p = 0.025$). Considering the BMI, 57.4% of them were categorized as obese; it was quite high and related to the physical activity pattern, the higher BMI, the lower physical activity level.

For the food intake behavior, a significant gender different was also found ($t = 2.132$, $df = 374$, $p = 0.034$), men had the significantly higher food intake than women. High-fat meat, offal, fish enriched fat, deep fried foods, desserts, alcohol, eating more than 2 ladles of rice were the gender different items. Interestingly, food frequency score was also found in a significant correlations with stress ($r = 0.213$, $p < 0.001$). Even the severe stress was less (4.7%) but continued stress leads to chronically high cortisol levels with all its devastating consequences (stimulating feeling of hunger, craving for sugar and high fat food; increasing abdominal fat, favoring hyper glycemia and hypercholesterolemia, high blood pressure) increasing the risk for CVD and type 2 diabetes (Djuric et al., 2008).

5.1.2 Effectiveness of the intervention program

After the intervention was developed, 119 employees responded to be the participants at the first recruitment. Following the intervention package, they were examined for health and the body composition; individual counseling was also provided for them. At the next stage, they were invited to attend the further exclusive program and follow-up them at 6 months later. Only 36 employees intended to attend the program, the response rate was quite low (30.3%) This may be due to the fact that they were interested only in body composition examination, a new technology and free of charge for the study participants. Unfortunately, there were 4 participants lost for the follow-up at the end of study period (one of them died by accident and three left did not return the follow-up questionnaires), the response rate was about 88.9%. Therefore, the motivation strategy to keep the completion rate throughout the study period should be improved.

The intervention program under the HOPE project evaluated the effectiveness by comparing knowledge, risk perception, self-efficacy, food frequency score, stress, and physical activity index (PAI), smoking and alcohol drinking status, CVD risk parameters, RAMA EGAT heart score, body composition analysis, and acceptability of the intervention program at baseline and after intervention periods.

5.1.2.1 Knowledge, risk perception, and self-efficacy about CVD

This study revealed that there was a significant change in knowledge (HDFQ score) about CVD (mean change = 2.1, $p = 0.04$). However, the mean of total HDFQ score remained low (before and after intervention mean score 16.2, SD = 6.3 and mean score 18.3, SD = 3.9, respectively) when compared to the previous studies. For the English version of HDFQ (mean score 20.4, SD = 3.0) (Wagner et al., 2005), and the Spanish version of HDFQ (mean score 17.7, SD = 4.9) (Wagner et al., 2005). In addition, the items analysis of each HDFQ question (Appendix A, Table A1) showed that after intervention the percent correct of the participants only 4 items were found the lower percent correct than baseline. The questions were about the CVD risk development related to family history of heart disease, quit smoking, high blood pressure, and gender difference with diabetes and the risk of heart disease. Therefore, the further health education should be more emphasized on these issues for the better improvement of knowledge about CVD. Same for a study, where the increasing knowledge of CVD risk factors among African Americans community health workers were found (mean different = +2.64) after a 6-week tailored educational program with counseling sessions and demonstrations (Elvan et al, 2012).

For the risk perception, and self-efficacy about CVD, no significant changes were observed after intervention. Nevertheless, the items analysis (Appendix A, Table A2) showed that for only one item asking about “*If I have risks for heart disease, I exactly have heart disease in the future*” the significant change ($p = 0.041$) was found. This finding referring to the risk perception of participant was increased and they may better

understand the risks for CVD and more concern about their health after the intervention.

5.1.2.2 Food frequency score, stress, physical activity index (PAI), smoking and alcohol drinking status

No significantly change was found in food frequency score. However, the change of food frequency in each item (Appendix A, Table A3) showed that only two items of food frequency intake behavior, high caloric fruit and tea or coffee with coffee mate were found significantly different between baseline and after intervention. The participants had the higher food frequency score in high calorie fruit e.g. durian, longan, sapodilla, ripe mango, this may be related to the season of those fruits during the follow-up period (May to September 2012). Only the frequency score of tea, coffee with coffee mate, and sugar was significantly decreased after the intervention; this was a positive beginning for the ability to a better change in the food intake behavior.

Stress level and PAI were also observed with no significant change after the intervention. However, the normal stress level and physically active status were still the same, referring the participants had the ability to continue their current level. Similarly, they also kept smoking and alcohol drinking status with no significant different changes after the intervention. Motivation seems to be a key issue to this matter (Huang, 2005; Golay et al., 2007).

5.1.2.3 CVD risk factors, RAMA EGAT heart score, and body composition

The findings from the health report and body composition analysis were similar in the mean of BMI and waist circumference with no significant changes in all other parameters. Changes in body composition take time and depend on primary on lifestyle changes over as extended period (see also comments recommendation, 5.2)

For CVD risk indicators, no significant change in the mean of total cholesterol, low-density lipoprotein cholesterol, fasting plasma glucose, systolic blood pressure, and

diastolic blood pressure. However, high-density lipoprotein cholesterol that significantly decreased over time was not the expected finding of this study.

According to RAMA EGAT heart score, total CVD risk score showed a significant decrease of the mean score. This finding similarly changes in the mean of probability of CVD development over 10 years. Nevertheless, the categorized probability of CVD development over 10 years as low, moderate, and high level had found the expected results that the significantly increased number of participants in moderate and high risk group after intervention, probably due to a better understanding of the CVD risks after intervention. The RAMA-EGAT heart score (Yamwong, 2005) was used as an alternative screening test for early detection of Acute Coronary Syndromes (ACS) in the Thai population. Therefore, this tool was useful for estimating the total risk for CVD and it was clearly expressed that the more risks, the greater risks for CVD development and shown as the score and percentage of probability of CVD development over 10 years. Therefore, health care staffs such as nurses at South Bangkok can use it as a screening tool for estimating the risk of ACS in the organization.

There were several community-based health promotion interventions. The Health Lifestyle Change Program (HLCP) was one community-based health intervention developed and implemented using community-based participatory research methods (Bazzano, et al., 2009). This study involved 431 community-dwelling adults with developmental disabilities aged 18 – 65 years, who were overweight or obese with further risk factor for diabetes and metabolic syndrome. The finding showed that the HLCP (a 7-month, twice-weekly education and exercise program) resulted in improved lifestyles, weight loss success, and increased community capacity building, indicating that a community-based program with significant participation of those with developmental disabilities is feasible. Similarly to the study of Rankin et al. (Rankin, et al., 2011), the study of a 30-day lifestyle modification program (Coronary Health Improvement Project) delivered by volunteers in a community setting. This study determined the change in selected biometric measures of 5,070 participants in the project in North America. The

findings were achieved by the significant reductions in CVD risk factors and also providing a cost-effective mode of administering lifestyle medicine. The previous study clearly presented the effectiveness of the intervention program due to the large sample sizes and the intensive lifestyle modification program.

5.1.2.5 Acceptability of the intervention program

The acceptability of intervention in 5 dimensions; instructor, place/time/food, services of staffs, knowledge, and application of knowledge seemed to be a quite high acceptability and had a positive feedback. This was the first step to success in health promotion activity and implied that the participants appreciated the intervention program and they mostly would like to attend an activity like this again. Their opinions were also valuable for the further health promotion program and this could hopefully encourage the administrators of South Bangkok Power Plant to generate and extend the program for all employees in the future.

5.1.3 Community participation assessment

Community participation assessment is an important indicator to evaluate the process and outcome of the participatory approach in this study. Regarding the 5 dimensions of the community participation assessments, the influencing factors of the community participation were needs assessment, leadership, organization, resource mobilization and management. These were the indicators to express the changes of participation in the intervention. The change in 5 dimensions of community participation at baseline and after intervention, the spider-gram showed the ranges between baseline and after intervention were quite narrow in the dimensions of leadership, organization, need assessment, and management. On the other hand, the spider-gram showed the wide range between baseline and after intervention in the dimensions of resource mobilization. These findings implied that the South Bangkok Power Plant is the organization that is active in resource mobilization for health promotion activities. Department of health of

the Power Plant has the main responsibility in health services for the employees, generally providing health care services in treatment of diseases and health examination in their routine work. Health promotion activities were not the first priority because they were limited in man power and health care professional to support and generate the program. The organizational policy also included disease prevention and control as the health promotion for their employees. Therefore, they allocated the existing resources to support the study intervention including partial budgets, training place, transportation, and man power. Organization and management were also ranked as fair, because the health promotion program activities were created and facilitated by health professionals and the researcher. Even if the leadership team and participants were actively involved in implementation and monitoring the intervention program, the self-management and the cooperation of the organization should be improved to sustain the health promotion activity by themselves. They were restricted in the need assessment because they remain needed the outsider's viewpoints in systematic analysis of needs and problems. This indicator should be incorporated with the leadership of the organization to make the decision for all health promotion activities, implementation, and evaluation. If the leadership team is actively initiated in the health promotion activities, they could involve in exploring and seeking the needs and solving the problem by themselves (Gilley et al., 2009).

Community participation is the key success of actually every community-based developed project. This method was developed using a pentagram model for assessing community participation in health programs (Rifkin et al., 1998). Therefore, it could be useful for the maintenance phase of a health intervention program and could serve as a guideline for decisions on future directions of the program.

5.2 Recommendations

Limitations of the cross sectional study, from the study design, a cross sectional survey, causality cannot be inferred from the observed associations. The sample was not randomly assigned and included the employee only at one site of EGAT in Samutprakarn province. The findings may not be generalized to the EGAT population all over the country because they were in different social cultural and environmental contexts. Our study was also limited in gender balance among the sample, because the majority of EGAT employees at this power plant were male. This may reflect in the statistical power analysis of the gender difference.

For the effectiveness of the study, this study was also limited in time to monitor and follow-up, the clearly change after the intervention might not be observed. A healthy lifestyle determines our health and reduces the risk for cardiovascular disease as thousands of studies worldwide have shown. Healthy eating, regularly exercising, getting enough sleep are important lifestyle strategies to protect against main risk factors for heart disease and stroke. In general, people are not much motivated to change their lifestyle to start a regular exercise routine for example. It is not easy to pack a regular workout into a busy day, even people know about the benefit of such as actively. Regularly exercise devotees somehow muster the motivation to get on track regularly. Motivation is the key for any lifestyle change and further research should probably more focus on this fact (Huang, 2005; Golay et al., 2007). Only ongoing changes will show good results. This may be one of the key conclusions of this study. Furthermore, the schedule of intervention activities were not arranged following the plan because of the barriers from flooding situation during October to December 2011, the project was paused and started again in January 2012. This might affect the effectiveness of the intervention program. Thus, the continuous activities should be performed for the adherence of participants and maintaining their certain behaviors over time.

According to the design, one group with pre- and post test, the effectiveness of the intervention program might not be accurate enough because this study evaluated only the

change within group. The further study should be designed as a comparison with a control group. Last but not least, the changes may not be clearly observed due to the sensitivity of the instruments. In addition, small sample sizes have less power to detect changes and therefore larger sample sizes should be considered for further studies. The selected stress questionnaire is a self-evaluation tool and widely use among Thai population similar to the General Practice Physical Activity Questionnaire (GPPAQ), a validated screening tool for using in primary health care exclusively. The selected stress questionnaire may not reflect the effective stress level of each participant and further studies should focus on deep stress questionnaires as stress is an important play maker in the “CVD game”, stimulating the so called “heavyweight” of the cardiovascular risk factors – hypertension, cholesterol, diabetes – through the release of high amounts of hormone cortisol. Chronically high cortisol levels leads to hypercortisolism, the well known Cushing syndrome, increasing cardiovascular morbidity and mortality (Holsboer, 2001; Chiodini, 2011). In addition, further studies should make optimal use of specific instruments for change of each parameter and this may increase the effectiveness of the intervention in the other aspects.

This study applied a participatory approach as the core process; therefore the community participation should be focused on improving the 5 dimensions of community participation including leadership, organization, management, needs assessment, and resource mobilization. This was really one of the key successes of the intervention program that performed in the real situation within the community.

5.3 Conclusion

Today, as health care costs continue to rise, more and more companies invest in health promotion programs for their employees with the reasoning that healthier employees are happier and more productive. EGAT, the Electric Generating Authority of Thailand, is by no means an exception. The findings revealed that the EGAT employees of South Bangkok Power Plant accepted the HOPE project quite well and the project was

effective in increasing knowledge about CVD risk factors and reducing the total CVD risks especially, however, risk perception, and self-efficacy should be better improved because all those variables have a huge influence on the intention and motivation to change or maintain certain behavior related to prevent CVD risk development as well as overall health. The findings revealed that increasing community participation was also a key success in the health promotion strategy at the workplace.

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APPENDICES

APPENDIX A

Appendix A Items analysis

Table A1 Change in frequency of Heart Disease Fact Questionnaire's items

Questions	Percent Correct	
	Baseline (n = 36)	After Intervention (n = 32)
1. A person always knows when they have heart disease	62.1	50.0
2. If you have a family history of heart disease, you are at risk for developing heart disease	34.5	20.0
3. The older a person is, the greater their risk of having heart disease	93.1	100.0
4. Smoking is a risk factor for heart disease.	82.8	100.0
5. A person who stops smoking will lower their risk of developing heart disease	65.5	60.0
6. High blood pressure is a risk factor for heart disease	86.2	80.0
7. Keeping blood pressure under control will reduce a person's risk for developing heart disease	82.8	100.0
8. High cholesterol is a risk factor for developing heart disease	82.8	90.0
9. Eating fatty foods does not affect blood cholesterol levels	65.5	70.0
10. If your 'good' cholesterol (HDL) is high you are at risk for heart disease	37.9	40.0
11. If your 'bad' cholesterol (LDL) is high you are at risk for heart disease	48.3	50.0
12. Being overweight increases a person's risk for heart disease	86.2	100.0
13. Regular physical activity will lower a person's chance of getting heart disease	96.6	100.0
14. Only exercising at a gym or in an exercise class will lower a person's chance of developing heart disease	69.0	74.2
15. Walking and gardening are considered exercise that will help lower a person's chance of developing heart disease	93.1	87.1
16. Diabetes is a risk factor for developing heart disease	62.1	74.2
17. High blood sugar puts a strain on the heart	48.3	74.2

Table A1 (Continued) Change in frequency of Heart Disease Fact
Questionnaire's items

Questions	Percent Correct	
	Baseline (n = 36)	After Intervention (n = 32)
18. If your blood sugar is high over several months it can cause your cholesterol level to go up and increase your risk of heart disease	55.2	74.2
19. A person who has diabetes can reduce their risk of developing heart disease if they keep their blood sugar levels under control	62.1	67.7
20. People with diabetes rarely have high cholesterol	41.4	61.3
21. If a person has diabetes, keeping their cholesterol under control will help to lower their chance of developing heart disease	51.7	67.7
22. People with diabetes tend to have low HDL (good) cholesterol	20.7	45.2
23. A person who has diabetes can reduce their risk of developing heart disease if they keep their blood pressure under control	48.3	77.4
24. A person who has diabetes can reduce their risk of developing heart disease if they keep their weight under control	51.7	80.6
25. Men with diabetes have a higher risk of heart disease than women with diabetes	13.8	6.5

Table A2 Change in Risk perceptions and Self-efficacy's items

Questions	Mean (SD)		P-value
	Baseline (n = 36)	After Intervention (n = 32)	
1. I think heart disease is unprotectable disease.	4.0 (0.6)	4.2 (0.4)	0.376
2. If I have heart disease, my chance of death is faster than others.	2.3 (1.1)	2.5 (1.0)	0.574
3. If my family sick or death from heart disease, I must	4.2 (0.6)	4.0 (0.5)	0.284
4. I think patients with heart disease always depend on their	4.1 (0.7)	3.9 (1.0)	0.282
5. If I have risks for heart disease, I exactly have heart disease in the future.	4.1 (0.8)	3.6 (1.0)	0.041
6. I actually know about my CVD risks.	2.9 (0.9)	3.0 (1.0)	0.779
7. When I think of my CVD risks, I feel very anxious.	3.3 (1.0)	2.9 (1.0)	0.141
8. For my own feeling, my chance of developing CVD within next 10 years is big.	3.5 (1.0)	3.1 (1.2)	0.156
9. According to me, my chance of developing CVD within the next 10 years is higher than the average men/women of my age without CVD risks.	3.5 (1.0)	2.9 (1.1)	0.057
10. Of 100 men/women of my age, I think that approximately 10 people will develop CVD within the next 10 years.	3.0 (1.1)	2.6 (0.9)	0.103
11. In general, when CVD risk comes to my health, I would rather have an expert tell me what I should do.	4.2 (0.6)	4.1 (0.7)	0.678
12. I believe that medication therapy alone is the most effective way in reducing CVD risks.	3.5 (1.2)	3.9 (0.6)	0.187
13. I believe that lifestyle improvement is effective and sustainable in reducing CVD risks.	4.2 (0.9)	4.1 (0.6)	0.476
14. Whether relatives/friends having CVD, an elevated CVD risks and/or death of relatives/friends through CVD are cues to change my lifestyle behaviors.	3.8 (0.7)	3.7 (0.8)	0.731
15. Peer pressures (from colleagues, friends, and, family) have influenced me to change my lifestyle behaviors.	4.0 (0.7)	3.8 (0.6)	0.247

Table A3 Change in food frequency score of each item

Type of food	Mean (SD)		P-value
	Baseline (n = 36)	After Intervention (n = 32)	
1. Whole milk, milk products (butter, margarine)	2.6 (1.0)	2.5 (0.9)	0.526
2. Ice cream with milk	2.2 (0.9)	1.9 (0.8)	0.103
3. High-fat meat (pork, beef, feet, duck-chicken skin)	2.5 (1.0)	2.6 (0.9)	0.541
4. Lean meat (pork, beef, feet, duck-chicken without skin)	3.3 (1.0)	3.3 (0.9)	0.879
5. Meat products (sausage, bacon, ham, etc.)	2.3 (1.0)	2.2 (0.9)	0.557
6. Offal	1.7 (0.8)	1.9 (0.8)	0.305
7. Fatty fish (cat fish)	2.5 (1.1)	2.4 (1.1)	0.752
8. High cholesterol sea food (e.g. oyster, squid, lobster)	2.5 (1.0)	2.2 (1.0)	0.293
9. Whole egg	3.3 (1.1)	3.4 (0.9)	0.573
10. Fried food e.g. Phad Thai, Fried mussel	2.5 (1.0)	2.6 (1.0)	0.455
11. Deep fried food e.g. deep fried fish, meat; deep fried beef, omelet, fried egg, fried vegetable	3.2 (1.1)	3.3 (0.9)	0.763
12. Food in coconut milk e.g. curry cooked with coconut milk	2.5 (1.0)	2.6 (0.8)	0.557
13. High calorie fruit e.g. durian, longan, sapodilla, ripe mango	1.9 (0.9)	2.3 (1.0)	0.043
14. Fruit in syrup, preserved fruits e.g. banana, jujube	1.7 (0.9)	1.7 (0.9)	0.839
15. Fruit juice	2.5 (0.9)	2.5 (1.0)	1.000
16. Deep fried snack e.g. donut, fried banana, fried durian	2.0 (1.1)	1.8 (0.9)	0.362
17. Bakery e.g. pizza, pie, cake, cookie	1.9 (1.2)	1.9 (1.0)	0.861
18. Desserts cook with coconut	1.9 (0.9)	1.9 (0.8)	1.000
19. Sweet dessert e.g. thong yord, thong yip, mun cheum	1.7 (0.8)	1.7 (0.8)	0.69
20. Snack e.g. potato, crispy rice	1.9 (0.8)	1.9 (0.8)	0.677
21. Soft drinks	2.1 (1.0)	1.9 (1.1)	0.264
22. Alcohol beverages	1.7 (1.1)	1.8 (1.0)	0.541
23. Tea, coffee with coffee mate, and sugar	3.3 (1.4)	2.8 (1.6)	0.003
24. Noodle with sugar added	2.6 (1.2)	2.5 (1.2)	0.722
25. Eat more than 2 ladles of rice, or more than 1 ladle of sticky rice, or more than 2 slices of bread each meal	3.3 (1.2)	3.3 (1.1)	1.000
26. Food with no fresh vegetable	2.3 (1.1)	2.0 (0.9)	0.088

APPENDIX B

**Appendix B1 Baseline and After intervention questionnaire
(English version)**

No.....

Date.....

QUESTIONNAIRE

**“Effectiveness of Healthy Organization by Participatory Encouragement (HOPE)
project on reducing Cardiovascular risk factors in employees of the Electric
Generating Authority of Thailand (EGAT)”**

Instruction: Please check into the or write down the blank
The questionnaires were consisted of 6 parts as below listed;

Part 1 Socio-demographic information and Medical history

Part 2 Knowledge and perception for Cardiovascular diseases

Part 3 Food Frequency Questionnaire (FFQ)

Part 4 Physical-Activity questionnaire

Part 5 Smoking status and Alcohol drinking habit

Part 6 Stress management questionnaire

Part 1 Socio-demographic information and Medical history

1.1 Socio-demographic information

1. Employee number.....
2. Gender 1. Male 2. Female
3. Address.....Telephone number
4. Date of birth..... Age.....years.....months
5. Marital status 1. Single 2. Married with couple 3. Widowed
 4. Divorced 5. Separated
6. Religious 1. Islam 2. Buddhist 3. Christ 4. Other.....
7. Education 1. No education 2. Primary school 3. Secondary school
 4. Below Bachelor degree 5. Bachelor degree
 6. Higher Bachelor degree 7. Other.....
8. Occupation (current employment position at EGAT)
 1. Accountant 2. Engineer 3. Administrative officer
 4. Nurse 5. Doctor 6. Programmer
 7. Technicians 8. Other (Specify)

9. Monthly income

1. Less than 10,000 baht 2. 10,000 – 19,999 baht
 3. 20,000 – 39,999 baht 4. 40,000 – 59,999 baht
 5. 60,000 – 99,999 baht. 6. Do not answer/other.....

10. Is it enough for spending?

1. Enough and saved 2. Enough but can not be saved 3. Not enough

1.2 Medical History

11. Have you currently any ailment to be treated?

1. Yes 2. No

If yes, please specify.....

12. Have you currently taken regular medication?

1. Yes 2. No

If yes, please specify.....

13. Do you have any following diseases or disorders?

- | | | | |
|--------------------|---------------------------------|--------------------------------|---|
| 1.1 Diabetes | <input type="checkbox"/> 1. Yes | <input type="checkbox"/> 2. No | <input type="checkbox"/> 3. Do not know |
| 1.2 Hypertension | <input type="checkbox"/> 1. Yes | <input type="checkbox"/> 2. No | <input type="checkbox"/> 3. Do not know |
| 1.3 Dyslipidemia | <input type="checkbox"/> 1. Yes | <input type="checkbox"/> 2. No | <input type="checkbox"/> 3. Do not know |
| 1.4 Heart disease | <input type="checkbox"/> 1. Yes | <input type="checkbox"/> 2. No | <input type="checkbox"/> 3. Do not know |
| 1.5 Kidney disease | <input type="checkbox"/> 1. Yes | <input type="checkbox"/> 2. No | <input type="checkbox"/> 3. Do not know |
| 1.6 Liver disease | <input type="checkbox"/> 1. Yes | <input type="checkbox"/> 2. No | <input type="checkbox"/> 3. Do not know |

14. Do your parents have any following diseases or disorders?

- | | | | |
|-------------------|---------------------------------|--------------------------------|---|
| 1.1 Diabetes | <input type="checkbox"/> 1. Yes | <input type="checkbox"/> 2. No | <input type="checkbox"/> 3. Do not know |
| 1.2 Hypertension | <input type="checkbox"/> 1. Yes | <input type="checkbox"/> 2. No | <input type="checkbox"/> 3. Do not know |
| 1.3 Dyslipidemia | <input type="checkbox"/> 1. Yes | <input type="checkbox"/> 2. No | <input type="checkbox"/> 3. Do not know |
| 1.4 Heart disease | <input type="checkbox"/> 1. Yes | <input type="checkbox"/> 2. No | <input type="checkbox"/> 3. Do not know |

15. Have you regular taken supplementation such as vitamin and minerals?

1. Yes 2. No

If yes, please specify.....

Part 2 Knowledge, Perceptions, and Self-efficacy for cardiovascular diseases (CVD)

2.1 knowledge about cardiovascular diseases

Questions	True	False	Don't know
1. A person always knows when they have heart disease			
2. If you have a family history of heart disease, you are at risk for developing heart disease			
3. The older a person is, the greater their risk of having heart disease			
4. Smoking is a risk factor for heart disease.			
5. A person who stops smoking will lower their risk of developing heart disease			
6. High blood pressure is a risk factor for heart disease			
7. Keeping blood pressure under control will reduce a person's risk for developing heart disease			
8. High cholesterol is a risk factor for developing heart disease			
9. Eating fatty foods does not affect blood cholesterol levels			
10. If your 'good' cholesterol (HDL) is high you are at risk for heart disease			
11. If your 'bad' cholesterol (LDL) is high you are at risk for heart disease			
12. Being overweight increases a person's risk for heart disease			
13. Regular physical activity will lower a person's chance of getting heart disease			
14. Only exercising at a gym or in an exercise class will lower a person's chance of developing heart disease			
15. Walking and gardening are considered exercise that will help lower a person's chance of developing heart disease			
16. Diabetes is a risk factor for developing heart disease			
17. High blood sugar puts a strain on the heart			
18. If your blood sugar is high over several months it can cause your cholesterol level to go up and increase your risk of heart disease			
19. A person who has diabetes can reduce their risk of developing heart disease if they keep their blood sugar levels under control			
20. People with diabetes rarely have high cholesterol			
21. If a person has diabetes, keeping their cholesterol under control will help to lower their chance of developing heart disease			
22. People with diabetes tend to have low HDL (good) cholesterol			
23. A person who has diabetes can reduce their risk of developing heart disease if they keep their blood pressure under control			
24. A person who has diabetes can reduce their risk of developing heart disease if they keep their weight under control			
25. Men with diabetes have a higher risk of heart disease than women with diabetes			

2.2 Perceptions and Self-efficacy for cardiovascular diseases

Questions	Strongly agree	Tend to agree	Neither agree nor disagree	Tend to disagree	Strongly disagree
1. I think heart disease is unprotectable disease.					
2. If I have heart disease, my chance of death is faster than others.					
3. If my family sick or death from heart disease, I must					
4. I think patients with heart disease always depend on their					
5. If I have risks for heart disease, I exactly have heart disease in the future.					
6. I actually know about my CVD risks.					
7. When I think of my CVD risks, I feel very anxious.					
8. For my own feeling, my chance of developing CVD within next 10 years is big.					
9. According to me, my chance of developing CVD within the next 10 years is higher than the average men/women of my age without CVD risks.					
10. Of 100 men/women of my age, I think that approximately 10 people will develop CVD within the next 10 years.					
11. In general, when CVD risk comes to my health, I would rather have an expert tell me what I should do.					
12. I believe that medication therapy alone is the most effective way in reducing CVD risks.					
13. I believe that lifestyle improvement is effective and sustainable in reducing CVD risks.					
14. Whether relatives/friends having CVD, an elevated CVD risks and/or death of relatives/friends through CVD are cues to change my lifestyle behaviors.					
15. Peer pressures (from colleagues, friends, and, family) have influenced me to change my lifestyle behaviors.					

Part 3 Food Frequency Questionnaire (FFQ)

Instruction: Regularly, do you intake the following food? Please check the blank according to your frequency of eating for past week.

Always = More than one time a day

Usually = One time a day

Sometimes = 4-5 times per week

Rarely = 2-3 times per week

Never = One or none intake per week

Type of food	Never	Rarely	Sometimes	Usually	Always
1. Whole milk, milk products (butter, margarine)					
2. Ice cream with milk					
3. High-fat meat (pork, beef, feet, duck-chicken skin)					
4. Lean meat (pork, beef, feet, duck-chicken without skin)					
5. Meat products (sausage, bacon, ham, etc.)					
6. Offal					
7. Fatty fish (cat fish)					
8. High cholesterol sea food (e.g. oyster, squid, lobster)					
9. Whole egg					
10. Fried food e.g. Phad Thai, Fried mussel					
11. Deep fried food e.g. deep fried fish, meat; deep fried beef, omelet, fried egg, fried vegetable					
12. Food in coconut milk e.g. curry cooked with coconut milk					
13. High calorie fruit e.g. durian, longan, sapodilla, ripe mango					
14. Fruit in syrup, preserved fruits e.g. banana, jujube					
15. Fruit juice					
16. Deep fried snack e.g. donut, fried banana, fried durian					
17. Bakery e.g. pizza, pie, cake, cookie					
18. Desserts cook with coconut					
19. Sweet dessert e.g. thong yord, thong yip, mun cheum					
20. Snack e.g. potato, crispy rice					
21. Soft drinks					
22. Alcohol beverages					
23. Tea, coffee with coffee mate, and sugar					
24. Noodle with sugar added					
25. Eat more than 2 ladles of rice, or more than 1 ladle of sticky rice, or more than 2 slices of bread each meal					
26. Food with no fresh vegetable					

Part 4 Physical Activity Questionnaire

Instruction: Please tell us the type and amount of physical activity involved in your work. Please tick one box that is closest to your present work from the following five possibilities:

No.	Question	Please mark one box only
1	I spend most of my time at work sitting (such as in an office)	
2	I spend most of my time at work standing or walking. However, my work does not require much intense physical effort (e.g. shop assistant, hairdresser, security guard, childminder, etc.)	
3	My work involves definite physical effort including handling of heavy objects and use of tools (e.g. plumber, electrician, carpenter, cleaner, hospital nurse, gardener, postal delivery workers etc.)	
4	My work involves vigorous physical activity including handling of very heavy objects (e.g. scaffolder, construction worker, refuse collector, etc.)	

During the *last week*, how many hours did you spend on each of the following activities?

Please answer whether you are in employment or not

Please mark one box only on each row

No.	Question	None	Some but less than 1 hour	1 hour but less than 3 hours	3 hours or more
1	Physical exercise such as swimming, jogging, aerobics, football, tennis, gym workout etc.				
2	Cycling, including cycling to work and during leisure time				
3	Walking, including walking to work, shopping, for pleasure etc.				
4	Housework/Childcare				
5	Gardening/DIY				

How would you describe your usual walking pace? Please mark one box only.

Slow pace
(i.e. less than 3 mph)
Brisk pace

Steady average pace

Fast pace
(i.e. over 4mph)

Part 5 Smoking status and Alcohol drinking habit

Instruction: Please check \surd into the or write down the blank

Part 1 Smoking status

1. Do you now smoke cigarettes, cigars, pipes or any other tobacco products?

- 1. No, not at all
- 2. No, but used to smoke in the past, **Go to question 2**
- 2. Yes, but less often than weekly
- 3. Yes, not everyday, but at least one day a week
- 4. Yes, everyday (at least one cigarette per day), **Go to question 4**

2. In the past, did you ever smoke cigarettes, cigars, pipes or any other tobacco products?

- 1. Yes, daily (at least one cigarette per day)
- 2. Yes, 100 or more cigarettes, but never daily
- 3. No, not at all, or less than 100 cigarettes in my life time

3. What age did you stop smoking at all?years

4. What age did you start smoking daily?years

5. How many cigarettes (or any other tobacco products) do you smoke daily?
.....sticks/day

Part 2 Alcohol drinking habit

6. Do you usually consumed 1 or more drinks of any type of alcoholic beverage, such as beer, coolers, wine, spirit or fermented cider?

- 1. No, not at all; never drink in my life time
- 2. No, but used to drink in the past, **Go to question 7**
- 2. Yes, but less often than weekly or occasionally drinking or social drinking
- 3. Yes, not everyday, but at least one day a week
- 4. Yes, everyday (at least 1 or more drinks per day), **Go to question 10**

7. In the past year, how often did you consume 1 or more drinks any type of alcoholic beverage?

- 1. Daily (at least one standard drink per day)
- 2. Not everyday, but at least one day a week
- 3. Less often than weekly or occasionally drinking or social drinking

8. What age did you stop drinking any type of alcoholic beverage at all?

.....years

9. What age did you start drinking any type of alcoholic beverage daily?

.....years

10. How many standard drinks of any type of alcoholic beverages do you consume each time?standard drinks

11. How often do you drink of any type of alcoholic beverages in a single day?

.....times/day

12 what type of alcoholic beverages do you prefer drinking most?

Beer

Wine

Coolers

Spirit

Fermented cider

other (specify).....

Part 6 Stress management questionnaire

Instruction: Please check ✓ into the or write down the blank

(It's important that you answer the questions honestly. If you find that more than one answer applies to you, choose the one that applies to you best.)

“Have you experienced any of these stress symptoms in last month?”

Please check ✓ the blank according to your frequency experiencing these stress symptoms for last month.

Frequent = One time a week

As often = 2-4 times per month

Occasionally = 1-2 times per month

Never = One or none symptom per month

symptom	Never	Occasionally	As often	Frequent
1. Insomnia or nervous				
2. Feel annoying				
3. Cannot do anything because of the nervous tension				
4. Upheavals of mind				
5. Does not want to meet up people				
6. Migraines or headaches on both sides of the forehead				
7. Feel unhappy and miserable				
8. Despair in life				
9. Feel that life has no value				
10. Anxiety over time				
11. Inability to concentrate				
12. Feeling tired and no energy to do anything				
13. Feel boring and want to do nothing				
14. Increased heart beat				
15. Ringer to vibrate or shake when upset				
16. Afraid of doing things wrong				
17. Muscle pain or neck or shoulder area				
18. Emotional events that are not familiar with				
19. Dazed or dizzy				
20. Decreased sexual pleasure				

**Appendix B2 Baseline and After intervention questionnaire
(Thai version)**

เลขที่.....

วันที่.....

ส่วนที่ 1 แบบสอบถาม

**ประสิทธิผลของโครงการรณรงค์สุขภาพดีด้วยกระบวนการให้การสนับสนุนแบบมีส่วนร่วมต่อการลด
ปัจจัยเสี่ยงของการเกิดโรคหัวใจและหลอดเลือดในพนักงานการไฟฟ้าฝ่ายผลิตแห่งประเทศไทย**

คำแนะนำ: กรุณากรอกข้อมูลในแบบสอบถามให้ครบถ้วน โดยเติมคำลงในช่องว่างหรือทำเครื่องหมาย ✓
ในช่องที่ท่านเลือก

แบบสอบถามชุดนี้ประกอบไปด้วย

1. แบบสอบถามรายละเอียดของผู้เข้าร่วมโครงการ
2. แบบประเมินความรู้ความเข้าใจและทัศนคติเกี่ยวกับโรคหัวใจและหลอดเลือด
3. แบบสอบถามความถี่ในการบริโภคอาหาร
4. แบบประเมินพฤติกรรมการออกกำลังกาย
5. แบบสอบถามการสูบบุหรี่และการดื่มเครื่องดื่มแอลกอฮอล์
6. แบบประเมินความเครียด

1. แบบสอบถามรายละเอียดของผู้เข้าร่วมโครงการ

ส่วนที่ 1 ข้อมูลทั่วไป

1. รหัสพนักงาน
2. เพศ 1. ชาย 2. หญิง
3. ที่อยู่: เลขที่..... หมู่บ้าน/อาคาร..... ซอย ตำบล/แขวง
อำเภอ/เขต จังหวัด รหัสไปรษณีย์
- เบอร์โทรศัพท์ที่ติดต่อได้สะดวก
4. วัน-เดือน-ปี เกิด อายุ ปี เดือน
5. สถานภาพสมรส 1. โสด 2. สมรส 3. ม่าย (คู่สมรสเสียชีวิต)
 4. หย่า 5. แยกกันอยู่
6. ศาสนา 1. พุทธ 2. อิสลาม 3. คริสต์ 4. อื่นๆ (ระบุ).....
7. ระดับการศึกษา 1. ไม่ได้เรียน 2. ประถมศึกษา 3. มัธยมศึกษา
 4. อนุปริญญา/ปวช./ปวส. 5. ปริญญาตรี 6. สูงกว่าปริญญาตรี
 7. อื่นๆ (ระบุ)

8. อาชีพ (ตำแหน่งหน้าที่ปัจจุบันที่ กฟผ.)

1. พนักงานบัญชี 2. วิศวกร 3. เจ้าหน้าที่ฝ่ายบริหารจัดการ
 4. พยาบาล 5. แพทย์ 6. โปรแกรมเมอร์
 7. ช่างเทคนิค 8. อื่นๆ(ระบุ)

9. รายได้ต่อเดือน

1. น้อยกว่า 10,000 บาท 2. 10,000 – 19,999 บาท 3. 20,000 – 39,999 บาท
 4. 40,000 – 59,999 บาท 5. 60,000 – 99,999 บาท 6. มากกว่า 100,000 บาท
 7. อื่นๆ (ระบุ)

10. รายได้เพียงพอกับค่าใช้จ่ายต่อเดือนหรือไม่

1. เพียงพอและมีเหลือเก็บ 2. พอแต่ไม่เหลือเก็บ 3. ไม่เพียงพอ

ส่วนที่ 2 ประสิทธิภาพ

11. ปัจจุบันท่านมีโรคประจำตัวที่ต้องรับการรักษาภายใต้การดูแลของแพทย์/ต้องรับประทานยาเป็นประจำหรือไม่

1. ไม่มี 2. มี ถ้ามีโปรดระบุ.....

12. ปัจจุบันท่านมียาที่ต้องรับประทานเป็นประจำหรือไม่

1. ไม่มี 2. มี ถ้ามีโปรดระบุ.....

13. ท่านมีประวัติการเจ็บป่วยด้วยโรคดังต่อไปนี้หรือไม่ (ที่เคยได้รับการวินิจฉัยโดยแพทย์เท่านั้น)

- | | |
|----------------------|--|
| 13.1 เบาหวาน | <input type="checkbox"/> 1. เป็น <input type="checkbox"/> 2. ไม่เป็น <input type="checkbox"/> 3. ไม่ทราบ |
| 13.2 ความดันโลหิตสูง | <input type="checkbox"/> 1. เป็น <input type="checkbox"/> 2. ไม่เป็น <input type="checkbox"/> 3. ไม่ทราบ |
| 13.3 ไขมันในเลือดสูง | <input type="checkbox"/> 1. เป็น <input type="checkbox"/> 2. ไม่เป็น <input type="checkbox"/> 3. ไม่ทราบ |
| 13.4 โรคหัวใจ | <input type="checkbox"/> 1. เป็น <input type="checkbox"/> 2. ไม่เป็น <input type="checkbox"/> 3. ไม่ทราบ |
| 13.5 โรคไต | <input type="checkbox"/> 1. เป็น <input type="checkbox"/> 2. ไม่เป็น <input type="checkbox"/> 3. ไม่ทราบ |
| 13.6 โรคตับ | <input type="checkbox"/> 1. เป็น <input type="checkbox"/> 2. ไม่เป็น <input type="checkbox"/> 3. ไม่ทราบ |

14. มีประวัติบิดา/มารดาหรือพี่น้องร่วมสายโลหิตเจ็บป่วยหรือมีประวัติการเจ็บป่วยด้วยโรคดังต่อไปนี้หรือไม่

- | | |
|----------------------|--|
| 14.1 เบาหวาน | <input type="checkbox"/> 1. เคย <input type="checkbox"/> 2. ไม่เคย <input type="checkbox"/> 3. ไม่ทราบ |
| 14.2 ความดันโลหิตสูง | <input type="checkbox"/> 1. เคย <input type="checkbox"/> 2. ไม่เคย <input type="checkbox"/> 3. ไม่ทราบ |
| 14.3 ไขมันในเลือดสูง | <input type="checkbox"/> 1. เคย <input type="checkbox"/> 2. ไม่เคย <input type="checkbox"/> 3. ไม่ทราบ |
| 14.4 โรคหัวใจ | <input type="checkbox"/> 1. เคย <input type="checkbox"/> 2. ไม่เคย <input type="checkbox"/> 3. ไม่ทราบ |

16. ท่านมีการบริโภคอาหารเสริมหรือวิตามินเป็นประจำหรือไม่

1. ไม่มี 2. มี ถ้ามีโปรดระบุ.....

2. แบบประเมินความรู้ความเข้าใจและทัศนคติเกี่ยวกับโรคหัวใจและหลอดเลือด

คำชี้แจง: กรุณากรอกข้อมูลโดยทำเครื่องหมาย ✓ ในช่องที่ท่านเลือก

ส่วนที่ 1 ความรู้เกี่ยวกับโรคหัวใจและหลอดเลือด

คำถาม	ถูก	ผิด	ไม่ทราบ
1. เราทุกคนมีรูปร่างของตัวเองได้เสมอว่าเป็นโรคหัวใจ			
2. ท่านจะมีความเสี่ยงต่อการเกิดโรคหัวใจ ถ้าหากท่านมีประวัติคนในครอบครัวเคยเป็นโรคหัวใจ			
3. ยิ่งอายุมากขึ้น ยิ่งมีความเสี่ยงต่อการเกิดโรคหัวใจมากขึ้นด้วย			
4. การสูบบุหรี่เป็นปัจจัยเสี่ยงหนึ่งต่อการเกิดโรคหัวใจ			
5. คนที่เลิกสูบบุหรี่จะมีความเสี่ยงต่อการเกิดโรคหัวใจลดลง			
6. ความดันโลหิตสูงเป็นปัจจัยเสี่ยงหนึ่งต่อการเกิดโรคหัวใจ			
7. การควบคุมความดันโลหิตได้ดีจะช่วยลดความเสี่ยงในการเกิดโรคหัวใจได้			
8. การมีโคเลสเตอรอลในเลือดสูงทำให้มีความเสี่ยงต่อการเกิดโรคหัวใจได้			
9. การบริโภคอาหารที่มีไขมัน ไม่มีผลต่อระดับโคเลสเตอรอลในเลือด			
10. ถ้าท่านมีโคเลสเตอรอลตัวที่ดี (เอช ดี แอล) สูง จะทำให้มีความเสี่ยงต่อการเกิดโรคหัวใจสูงด้วย			
11. ถ้าท่านมีโคเลสเตอรอลตัวที่ไม่ดี (แอล ดี แอล) สูง จะทำให้มีความเสี่ยงต่อการเกิดโรคหัวใจสูงด้วย			
12. การที่มีน้ำหนักเกินเป็นการเพิ่มความเสี่ยงต่อการเกิดโรคหัวใจ			
13. การออกกำลังกายเป็นประจำจะช่วยลดโอกาสในการเกิดโรคหัวใจได้			
14. การเล่นกีฬาในฟิตเนสหรือในสถานที่ออกกำลังกายเท่านั้นจะช่วยลดโอกาสในการเกิดโรคหัวใจได้			
15. การเดินหรือการทำสวนจัดว่าเป็นการออกกำลังกายที่ช่วยลดโอกาสในการเกิดโรคหัวใจได้			
16. โรคเบาหวานเป็นปัจจัยเสี่ยงต่อการเกิดโรคหัวใจ			
17. ระดับน้ำตาลในเลือดที่สูงทำให้หัวใจทำงานหนัก			
18. ถ้าระดับน้ำตาลในเลือดสูงอยู่เป็นเวลาหลายเดือนจะเป็นสาเหตุให้ระดับโคเลสเตอรอลในเลือดสูงขึ้นไปด้วย ทำให้เพิ่มความเสี่ยงต่อการเกิดโรคหัวใจด้วย			
19. คนที่เป็นเบาหวานสามารถลดความเสี่ยงต่อการเกิดโรคหัวใจและหลอดเลือดได้ ถ้าควบคุมระดับน้ำตาลในเลือดได้เป็นอย่างดี			

ส่วนที่ 1 ความรู้เกี่ยวกับโรคหัวใจและหลอดเลือด (ต่อ)

คำถาม	ถูก	ผิด	ไม่ทราบ
20. คนที่เป็นเบาหวานมักไม่ค่อยมีโคเลสเตอรอลในเลือดสูง			
21. ถ้าคนที่เป็นเบาหวานสามารถควบคุมระดับโคเลสเตอรอลได้จะช่วยลดโอกาสในการเกิดโรคหัวใจได้			
22. คนที่เป็นเบาหวานมีแนวโน้มที่จะมีระดับเอช ดี แอล โคลเลสเตอรอล (โคเลสเตอรอลที่ดี) ที่ต่ำ			
23. คนที่เป็นเบาหวานสามารถลดความเสี่ยงต่อการเกิดโรคหัวใจได้ถ้ามีการควบคุมความดันโลหิตได้ดี			
24. คนที่เป็นเบาหวานสามารถลดความเสี่ยงต่อการเกิดโรคหัวใจได้ถ้ามีการควบคุมน้ำหนักตัวได้ดี			
25. ผู้ชายที่เป็นเบาหวานมีความเสี่ยงต่อการเกิดโรคหัวใจสูงกว่าผู้หญิงที่เป็นเบาหวานเหมือนกัน			

ส่วนที่ 2 การรับรู้และทัศนคติต่อโรคหัวใจและหลอดเลือด

คำถาม	เห็นด้วยอย่างยิ่ง	เห็นด้วย	เฉยๆ	ไม่เห็นด้วย	ไม่เห็นด้วยอย่างยิ่ง
1. ฉันคิดว่าโรคหัวใจเป็นโรคที่ไม่สามารถป้องกันได้เลย					
2. ถ้าฉันเป็นโรคหัวใจ ฉันมีโอกาสเสียชีวิตได้เร็วขึ้นกว่าคนอื่น					
3. ถ้ามีคนในครอบครัวของฉันป่วยหรือเสียชีวิตด้วยโรคหัวใจ ฉันจะต้องเป็นโรคหัวใจตามพวกเขาแน่นอนโดยที่ไม่สามารถป้องกันได้					
4. ฉันคิดว่าคนที่ป่วยเป็นโรคหัวใจ มักเป็นภาระที่พึ่งพิงกับคนรอบข้าง ไม่สามารถช่วยเหลือตนเองได้					
5. ถ้าฉันมีความเสี่ยงต่อการเป็นโรคหัวใจแล้ว ฉันจะต้องเป็นโรคหัวใจในอนาคตอย่างแน่นอน					

ส่วนที่ 2 การรับรู้และทัศนคติต่อโรคหัวใจและหลอดเลือด (ต่อ)

คำถาม	เห็นด้วย อย่างยิ่ง	เห็น ด้วย	เฉยๆ	ไม่ เห็น ด้วย	ไม่เห็น ด้วยอย่าง ยิ่ง
6. ฉันรับรู้ได้ว่าฉันมีความเสี่ยงต่อการเป็นโรคหัวใจ					
7. เมื่อฉันคิดว่าฉันมีความเสี่ยงต่อการเกิดโรคหัวใจ ฉันรู้สึกวิตกกังวลมาก					
8. ในความรู้สึกส่วนตัวของฉัน ฉันมีโอกาสสูงที่จะ เป็นโรคหัวใจภายในอีก 10 ปีข้างหน้า					
9. โอกาสในการเกิดโรคหัวใจภายในอีก 10 ปี ข้างหน้าของฉันสูงกว่าคนอายุเท่ากับฉันที่ไม่มีความ เสี่ยงต่อโรคหัวใจ					
10. ในจำนวนคน 100 คนที่อายุเท่ากับฉัน ฉันคิดว่า จะมีประมาณ 10 คนที่มีโอกาสเกิดโรคหัวใจภายใน อีก 10 ปีข้างหน้า					
11. โดยทั่วไปเมื่อฉันมีความเสี่ยงต่อโรคหัวใจเกิดขึ้น ฉันจะไปพบแพทย์/ผู้เชี่ยวชาญเพื่อขอคำแนะนำใน สิ่งที่ฉันควรจะทำ					
12. ฉันเชื่อว่าการรักษาด้วยยาอย่างเดียวเป็นวิธีที่มี ประสิทธิภาพมากที่สุดในการลดความเสี่ยงต่อการ เกิดโรคหัวใจ					
13. ฉันเชื่อว่าการปรับเปลี่ยนวิถีชีวิตเป็นการลดความ เสี่ยงต่อการเกิดโรคหัวใจที่มีประสิทธิภาพและมี ความยั่งยืนที่สุด					
14. ไม่ว่าจะป็นญาติ/เพื่อนที่มีความเสี่ยงต่อการเกิด โรคหัวใจเพิ่มมากขึ้นหรือได้เป็นโรคหัวใจแล้ว หรือ การที่มีญาติ/เพื่อนที่เสียชีวิตด้วยโรคหัวใจเป็น สิ่งกระตุ้นให้ฉันเปลี่ยนพฤติกรรมในวิถีชีวิต					
15. แรงสนับสนุนจากเพื่อนร่วมงาน เพื่อน และ ครอบครัวมีอิทธิพลให้ฉันเปลี่ยนแปลงพฤติกรรมใน วิถีชีวิตได้					

ส่วนที่ 3. แบบสอบถามความถี่ในการบริโภคอาหาร

คำชี้แจง : กรุณาตอบความถี่การบริโภคอาหารในแต่ละรายการในช่วง 1 สัปดาห์ที่ผ่านมา โดยประเมินความถี่ ดังนี้

เป็นประจำ/บ่อยๆ = มากกว่า 1 ครั้งต่อวัน

เป็นปกติ = 1 ครั้งต่อวัน

บางครั้ง = 4-5 ครั้งต่อสัปดาห์

นานๆครั้ง = 2-3 ต่อสัปดาห์

น้อยครั้ง/ไม่เคย = 1 ครั้งต่อสัปดาห์หรือไม่เคยเลย

ชนิดอาหาร	น้อย ครั้ง/ ไม่เคย	นานๆ ครั้ง	บางครั้ง	เป็น ปกติ	เป็น ประจำ/ บ่อยๆ
1. นมสด, ผลิตภัณฑ์จากนม เช่น เนย มากา린					
2. ไอศกรีมที่มีส่วนผสมของนม					
3. เนื้อสัตว์ไขมันสูง/ติดมัน เช่น เนื้อหมู เนื้อวัว หนังไก่ หนังเป็ด					
4. เนื้อสัตว์ไม่ติดมัน เช่น เนื้อหมู เนื้อวัวส่วนที่ไม่ติดมัน เนื้อเป็ดและเนื้อไก่ ไม่มีหนัง					
5. ผลิตภัณฑ์จากเนื้อสัตว์ เช่น ไส้กรอก เบคอน แฮม					
6. เครื่องในสัตว์					
7. ปลาที่มีไขมัน เช่น ปลาแซลมอน ปลาทูน่า ปลา ซาร์ดีน ปลาแมกเคอเรล ปลาเทราท์					
8. อาหารทะเลที่มีโคเลสเตอรอลสูง เช่น หอยนางรม ปลาหมึก กุ้ง					
9. ไข่ทั้งฟอง					
10. อาหารผัด/ทอด เช่น ผัดไทย หอยทอด					
11. อาหารทอดในน้ำมัน เช่น ปลาทอด ไก่ทอด เนื้อทอด ไข่เจียว ไข่ทอด ผักทอด					
12. อาหารใส่กะทิ เช่น แกงกะทิต่างๆ					
13. ผลไม้พลังงานสูง เช่น ทูเรียน ลำไย ละมุด มะม่วงสุก					
14. ผลไม้ในน้ำเชื่อม ผลไม้ดอง เช่น กลิ้วยเชื่อม พุทรา เชื่อม					
15. น้ำผลไม้					
16. ขนมทอดในน้ำมัน เช่น โดนัท กลิ้วยทอด ทูเรียน ทอด					
17. เบเกอรี่ เช่น พิซซ่า พาย ขนมเค้ก คุกกี้					

3. แบบสอบถามความถี่ในการบริโภคอาหาร (ต่อ)

ชนิดอาหาร	น้อย ครั้ง/ ไม่เคย	นานๆ ครั้ง	บางครั้ง	เป็น ปกติ	เป็น ประจำ/ บ่อยๆ
18. ขนมหวานใส่กะทิ					
19. ขนมหวาน เช่น ทองหยอด ทองหยิบ มันเชื่อม					
20. ขนมกรุบกรอบ เช่น มันฝรั่งทอด ข้าวเกรียบ					
21. น้ำอัดลม น้ำหวาน					
22. เครื่องดื่มแอลกอฮอล์					
23. ชาหรือกาแฟที่ใส่ครีมเทียมและน้ำตาล					
24. ก๋วยเตี๋ยวใส่น้ำตาล					
25. บริโภคข้าวมากกว่า 2 ทัพพี หรือ ข้าวเหนียวมากกว่า 1 ทัพพี หรือ ขนมปังมากกว่า 2 แผ่นในแต่ละมื้อ					
26. บริโภคอาหารที่ไม่มีผักเลยในแต่ละมื้อ					

ส่วนที่ 4. แบบประเมินพฤติกรรมการออกกำลังกาย

คำชี้แจง: กรุณาตอบแบบสอบถามถึงชนิดและกิจกรรมการออกกำลังกายที่ตรงกับการทำงานของท่านมากที่สุด

ข้อ	คำถาม	โปรด เลือก คำตอบใน ช่องนี้
1	ฉันใช้เวลาส่วนมากในการทำงานนั่งโต๊ะ นั่งทำงานในออฟฟิศ เช่น นั่งทำบัญชี นั่งพิมพ์เอกสาร หรือใช้คอมพิวเตอร์เป็นหลัก	
2	ฉันใช้เวลาในการทำงานส่วนมากด้วยการขึ้นหรือเดิน แต่ปกติงานของฉันไม่ใช่งานที่ต้องใช้แรงงานในการเดินหรือขึ้นในการทำงาน เช่น เกษกร การเดินออกตรวจสถานที่ พนักงานขึ้นตรวจสินค้าหรือถ่ายเอกสาร	
3	งานของฉันเป็นงานที่ต้องออกแรงในการทำงานมาก ต้องใช้แรงในการยกของ หรือใช้เครื่องมือเฉพาะในการทำงาน เช่น นายช่างสำรวจ วิศวกรภาคสนาม ช่างประปา ช่างไฟฟ้า พนักงานทำความสะอาด พยาบาล	
4	งานของฉันเป็นงานที่ต้องใช้แรงงานหนักในการยกของหนัก เช่น นายช่างคุมงานก่อสร้าง หรือทำงานใน โรงปั่นไฟฟ้า คนทำงานนั่งร้าน พนักงานทำงานก่อสร้าง	

1. ในช่วงสัปดาห์ที่ผ่านมา ท่านใช้เวลาในการทำกิจกรรมดังต่อไปนี้เป็นเวลาานานกี่ชั่วโมง
กรุณาตอบทุกข้อไม่ว่าท่านจะมีงานประจำทำหรือว่างงานก็ตาม

กรุณาเลือกตอบเพียง 1 ข้อเท่านั้นในแต่ละแถว ภายในช่องว่างที่กำหนด

ข้อ	คำถาม	ไม่ทำ เลย	เป็นบางครั้ง โดยไม่เกิน 1 ชั่วโมง	1 ชั่วโมง แต่ไม่เกิน 3 ชั่วโมง 1	3 ชั่วโมง หรือ มากกว่า นั้น 3
1	ออกกำลังกาย เช่น ว่ายน้ำ วิ่งเหยาะๆ เดิน แอโรบิก เล่นฟุตบอล เทนนิส ออกกำลังกาย ภายในโรงยิม				
2	ขี่จักรยาน รวมการขี่จักรยานไปทำงานและ ขี่จักรยานเล่นในเวลาว่างด้วย				
3	เดิน รวมการเดินไปทำงาน เดินซื้อของ หรือ เดินเล่น และอื่นๆ ฯลฯ				
4	ทำงานบ้าน หรือ เลี้ยงเด็ก				
5	ทำสวน หรือ ซ่อมแซมบ้านหรือสิ่งของ ด้วยตนเอง				

2. โปรดอธิบายถึงอัตราการเดินปกติของท่าน โดยเลือกตอบเพียง 1 ช่องเท่านั้น

เดินอย่างช้าๆ (น้อยกว่า 4 กม.ต่อชั่วโมง)	<input type="checkbox"/>	เดินคงที่สม่ำเสมอ	<input type="checkbox"/>
เดินว่องไวกระฉับกระเฉง	<input type="checkbox"/>	เดินอย่างรวดเร็ว (เกิน 6 กม.ต่อชั่วโมง)	<input type="checkbox"/>

ส่วนที่ 5. แบบสอบถามการสูบบุหรี่และการดื่มเครื่องดื่มแอลกอฮอล์

คำชี้แจง: กรุณากรอกข้อมูลในแบบสอบถามให้ครบถ้วนตามความเป็นจริง โดยเติมค่าลงในช่องว่างหรือ
ทำเครื่องหมาย \checkmark ในช่องที่ท่านเลือก

ส่วนที่ 1 การสูบบุหรี่

1. ปัจจุบันท่านสูบบุหรี่หรือไม่ (รวมทั้งสูบซิการ์ ไปป์ ยาเส้น หรืออื่นๆที่ใช้สูบได้)
- 1. ไม่เคยสูบเลย (ข้ามไปตอบส่วนที่ 2)
 - 2. เคยสูบในอดีต ปัจจุบันเลิกสูบแล้ว (ตอบข้อ 2)
 - 3. สูบ แต่ไม่บ่อย สูบนานๆ ครั้ง
 - 4. สูบทุกวัน อย่างน้อย 1 มวนต่อวัน (ข้ามไปตอบคำถามที่ 4 ต่อไป)

2. กรณีที่เคยสูบบุหรี่ในอดีต ท่านเคยสูบบุหรี่อย่างไร (รวมทั้งสูบบุหรี่ไปป์ ยาเส้น หรืออื่นๆที่ใช้สูบได้)

1. สูบเป็นประจำทุกวัน อย่างน้อย 1 มวนต่อวัน
2. ไม่ได้สูบทุกวัน แต่สูบจำนวนมากว่า 100 มวน
3. สูบจำนวนน้อยกว่า 100 มวนตลอดชีวิตของฉันท

3. ท่านเลิกสูบบุหรี่เมื่ออายุ ปี

4. ท่านเริ่มสูบบุหรี่เป็นประจำตั้งแต่อายุ ปี

5. โดยเฉลี่ยท่านสูบบุหรี่ (รวมทั้งสูบบุหรี่ไปป์ ยาเส้น หรือผลิตภัณฑ์อื่นๆที่ใช้สูบ) จำนวน มวนต่อวัน

ส่วนที่ 2 การดื่มเครื่องดื่มแอลกอฮอล์

6. ปกติท่านดื่มเครื่องดื่มแอลกอฮอล์ (เช่น เหล้า เบียร์ ไวน์ กุลเลอร์ เหล้าขาว ขาดองเหล้า) อย่างน้อย 1 ดั้มมาตรฐานหรือมากกว่านั้น หรือไม่

1. ไม่เคยดื่มเลยในชีวิต
2. ดั้ม แต่นานๆครั้ง หรือดั้มเมื่อมีงานสังสรรค์
3. ดั้มเป็นประจำหรือทุกวัน อย่างน้อย 1 ดั้มมาตรฐานหรือมากกว่านั้น (ข้ามไปตอบข้อ 10)

7. กรณีที่เคยดื่มแต่ปัจจุบันเลิกดื่มแล้ว ในอดีตท่านดื่มเครื่องดื่มแอลกอฮอล์บ่อยแค่ไหน

1. ดั้มเป็นประจำหรือทุกวัน (อย่างน้อย 1 ดั้มมาตรฐานต่อวัน)
2. ดั้มนานๆครั้งหรือดั้มเมื่อมีงานสังสรรค์

8. ท่านเลิกดื่มแอลกอฮอล์เมื่ออายุ ปี

9. ท่านเริ่มดื่มแอลกอฮอล์เมื่ออายุ ปี

10. ท่านดื่มเครื่องดื่มแอลกอฮอล์ในแต่ละครั้งเฉลี่ยปริมาณเท่าใด ดั้มมาตรฐาน

11. ท่านดื่มเครื่องดื่มแอลกอฮอล์จำนวน..... ครั้งต่อวัน

12. ท่านชอบดื่มเครื่องดื่มแอลกอฮอล์ชนิดใดมากที่สุด

- เหล้า เบียร์ ไวน์ กุลเลอร์
- สุรากลั่น (เช่น บรันดี วิสกี้ รัม วอดก้า)
- อื่นๆ (ระบุ)

ดั้มมาตรฐาน	
ปริมาณ (หน่วย)	
1 ถัง	= 30 cc.
1 ถัก	= 185 cc.
1 แบน	= 375 cc.
1 กลม/ขวด	= 750 cc.
1 กระจี๋อง	= 325 cc.

ส่วนที่ 6. แบบประเมินความเครียด

คำชี้แจง: โปรดประเมินว่าในระยะเวลา 1 เดือนที่ผ่านมาจนถึงปัจจุบันนี้ ท่านมีอาการ พฤติกรรมหรือความรู้สึกต่อไปนี้มากน้อยเพียงใด แล้วขีดเครื่องหมาย X ลงในช่องแสดงความถี่ของอาการที่เกิดขึ้นกับตัวท่านเอง ตอบตามความเป็นจริงมากที่สุด

อาการ พฤติกรรม หรือความรู้สึก	ระดับความถี่ของการเกิดอาการ			
	ไม่เคย เลย	เป็นครั้ง คราว (1-2 ครั้ง/ เดือน)	เป็นบ่อยๆ (3-4 ครั้ง/ เดือน)	เป็นประจำ (ทุกสัปดาห์)
1. นอนไม่หลับ เพราะคิดมากหรือกังวลใจ				
2. รู้สึกหงุดหงิด รำคาญใจ				
3. ทำอะไรไม่ได้เลย เพราะประสาทตึงเครียด				
4. มีความวุ่นวายใจ				
5. ไม่อยากพบปะผู้คน				
6. ปวดหัวข้างเดียวหรือปวดบริเวณขมับทั้ง 2 ข้าง				
7. รู้สึกไม่มีความสุขและเศร้าหมอง				
8. รู้สึกหมดหวังในชีวิต				
9. รู้สึกว่าชีวิตตนเองไม่มีคุณค่า				
10. กระวนกระวายอยู่ตลอดเวลา				
11. รู้สึกว่าตนเองไม่มีสมาธิ				
12. รู้สึกเพลีย จนไม่มีแรงจะทำอะไร				
13. รู้สึกเบื่อหน่าย ไม่อยากทำอะไร				
14. มีอาการหัวใจเต้นแรง				
15. เสี่ยงสั้น ปากสั้น หรือมือสั้นเวลาไม่พอใจ				
16. รู้สึกกลัวผิดพลาดในการทำสิ่งต่างๆ				
17. ปวดหรือเกร็งกล้ามเนื้อบริเวณท้ายทอย หลัง หรือไหล่				
18. ตื่นเต้นง่ายกับเหตุการณ์ที่ไม่คุ้นเคย				
19. มึนงงหรือเวียนศีรษะ				
20. ความรู้สึกทางเพศลดลง				

APPENDIX C

Appendix C1. RAMA-EGAT heart score
(For individual self-risk assessment)

Risk factors	Categories of score				Score
Gender	Female = 0, Male = 3				
Age (year)	35-39	40-44	45-49	50-54	
	-2	0	+2	+4	
Blood pressure (mmHg)	Yes = 3, No = 0				
Total cholesterol (mg/L)	< 280		≥ 280		
	0		+4		
Smoking status	Current smoking = 1, No smoking = 0				
Diabetes	Yes = +2, No = 0				
Waist circumference (cm)	For Male, ≥ 90 cm, If yes = +3, No = 0				
	For Female, ≥ 80 cm, If yes = +3, No = 0				
Total score					
Probability of CVD development in 10 years*					

* See table below for comparative score of probability of CVD development in 10 years

Score	Predicted probability risk for CVD development (%)	
≤ -3	<1	Low risk
- 2 to 0	<1	↓
1 to 5	1	
6	1	Moderate risk
7 to 9	2	↓
10	3	
11 to 12	4	High risk
14	6	↓
15	8	
16	9	
≥17	≥11	

Appendix C2.
แบบประเมินความเสี่ยงต่อการเกิดโรคหัวใจ RAMA-EGAT score
(สำหรับประเมินความเสี่ยงด้วยตนเอง)

ปัจจัยเสี่ยง	หมวดหมู่ของคะแนน				คะแนน
เพศ	หญิง = 0, ชาย = 3				
อายุ (ปี)	35-39	40-44	45-49	50-54	
	-2	0	+2	+4	
ความดันโลหิตสูง (มม.ปรอท)	เป็น = 2 , ไม่เป็น = 0				
โคเลสเตอรอลรวม (มก./ลิตร)	< 280		≥ 280		
	0		+4		
สถานะการสูบบุหรี่	สูบบุหรี่ = 1, ไม่สูบบุหรี่ = 0				
โรคเบาหวาน	เป็น = 2 , ไม่เป็น = 0				
เส้นรอบเอว (ซม.)	สำหรับเพศชาย > 90 ซม. , ถ้าใช่ = 3, ไม่มี = 0 สำหรับเพศหญิง > 80 ซม. , ถ้าใช่ = 3, ไม่มี = 0				
คะแนนรวม					
โอกาสในการเกิดโรคหัวใจและหลอดเลือดในอีก 10 ปีข้างหน้า *					

* ดูตารางเปรียบเทียบคะแนนความเสี่ยงกับโอกาสในการเกิดโรคหัวใจในอีก 10 ปีข้างหน้าด้านล่าง

คะแนน	โอกาสในการเกิดโรคหัวใจและหลอดเลือดในอีก 10 ปีข้างหน้า (%)	
≤ -3	<1	ต่ำ
- 2 ถึง 0	<1	
1 ถึง 5	1	ปานกลาง
6	1	
7 ถึง 9	2	
10	3	สูง
11 ถึง 12	4	
14	6	
15	8	
16	9	
≥17	≥11	

APPENDIX D

Appendix D1.

Guideline for indepth interview, and focus group discussion

In-depth interview guideline for administrative officers

Introduction

- Introducing interviewer and giving some information about the HOPE project
- Telling the scope of interview briefly
- letting them ask some questions (if any)

Warm up

- Interview some personal data of them which is related to their organization. (position, duration and responsibility of work)
- Interview their organization background briefly

Organization policies

- Interview their health policy for EGAT employees
- Interview their organization goal for health
- Interview their policy implementation (both in the past and ongoing projects, success or not?)
- Interview the barriers of their projects and how to solve their problem

Attitude of CVD risks prevention and control in organization

- Interview overall CVD risks situation of employees in their organization
- Interview their awareness about CVD and its organizational impact (in term of economic costs and lost productivity)
- Interview their opinions about our project and also ask for some comments or advises to improve the suitable intervention program in EGAT setting
- Interview their needs or what they want to see after finished the HOPE project

Comments

- Opened for discussion

Close interviewing

Focus group discussion guideline for employees

Introduction

- Introducing facilitator and describing the reasons and objective for the discussion group
- letting them introduce themselves and breaking the ice before the discussion

1. Awareness and health problems of CVD

- Asking their individual health problem related to CVD and sharing within the group
- Asking their health problem solving and discussing within the group
- Discussing about the health consequence of CVD in their knowledge and perception within the group

2. Eating habits and physical activity (How? and Why?)

- Asking their eating behaviors as they like eating frequently, listed all items and opened discussion about their food choices in the group
- Asking their knowledge about calories of food (in term of moderation, balance, and variety of diets), how to choose healthy food for control their weight and promoting heart health by discussing in the group
- Asking their physical activity behaviors (at home, office, and others) and exercise patterns (type of exercise, frequency, and duration) and also discussing their working characteristics and job tasks (affect on their physical activity?)
- Discussing in the group about their barrier of less physical activity

3. Experience of CVD prevention and control program (How? and Why?)

- Discussing in the group about their previous method or program or medication therapy related to reduce CVD risks that they used to or plan to participate
- Discussing in the group about their success or failure of attempting to manage the risks such as weight loss, blood pressure, blood sugar, and

blood lipids control, smoking cessation, and the problem after that (if it failed)

- Discussing in the group about the appropriate way or interesting method in their working conditions to reduce and control weight, blood pressure, blood sugar, blood lipids, and tobacco use with safety and sustainable

Comments

- Opened for discussion

Close group discussion

Appendix D2.

แนวทางการสัมภาษณ์เชิงลึกสำหรับเจ้าหน้าที่ฝ่ายบริหาร

ช่วงการแนะนำ

- ผู้สัมภาษณ์แนะนำและให้ข้อมูลเกี่ยวกับโครงการ HOPE
- ผู้สัมภาษณ์บอกขอบเขตของการสัมภาษณ์ในครั้งนี้โดยย่อ
- ผู้สัมภาษณ์เปิดโอกาสให้ผู้ถูกสัมภาษณ์ซักถาม (ถ้าหากมีข้อสงสัย)

ช่วงอุ่นเครื่อง

- สัมภาษณ์ข้อมูลทั่วไปของเจ้าหน้าที่ฝ่ายบริหารหรือผู้ที่เกี่ยวข้องขององค์กร

แนวคำถาม

- โดยตำแหน่ง ท่านมีหน้าที่ความรับผิดชอบอะไรบ้าง
- ช่วยเล่าถึงข้อดีของโครงสร้างขององค์กร/หน่วยงานของท่าน

1. สัมภาษณ์ถึงนโยบายขององค์กรด้านสุขภาพ

แนวคำถาม

- องค์กร/หน่วยงานของท่านมีนโยบายหรือให้การสนับสนุนด้านสุขภาพให้กับพนักงานในเรื่องใดบ้าง
- เป้าหมายด้านสุขภาพขององค์กรที่มีต่อพนักงานคืออะไร
- ท่านได้ปฏิบัติงานโครงการด้านสุขภาพตามนโยบายที่มีในเรื่องใดบ้าง (ทั้งโครงการที่ผ่านไปในอดีตและโครงการต่อเนื่อง โดยให้เล่าถึงโครงการทั้งที่ประสบความสำเร็จและไม่สำเร็จ)
- ท่านพบปัญหาและอุปสรรคของการดำเนินงานโครงการที่ผ่านมาและมีวิธีการแก้ปัญหาเหล่านั้นอย่างไรบ้าง

2. ทักษะในการป้องกันและการควบคุมความเสี่ยงต่อการเกิดโรคหัวใจและหลอดเลือดภายในองค์กร

แนวคำถาม

- สถานการณ์ความเสี่ยงต่อการเกิดโรคหัวใจและหลอดเลือดโดยรวมของพนักงานในองค์กรเป็นอย่างไรบ้าง
- ท่านตระหนักถึงความสำคัญและผลกระทบของโรคหัวใจและหลอดเลือดที่มีต่อองค์กรของท่านหรือไม่ อย่างไรบ้าง (ในแง่ของค่าใช้จ่ายทางเศรษฐกิจและการสูญเสียประสิทธิภาพของกำลังการผลิตขององค์กร)
- ท่านมีความคิดเห็นเกี่ยวกับโครงการ HOPE อย่างไรบ้าง (หลังจากที่ได้แนะนำโครงการ โดยย่อให้ทราบแล้ว) และท่านมีความคิดเห็นหรือคำแนะนำในการปรับปรุงโครงการนี้ให้เหมาะสมกับองค์กร และพนักงาน กฟผ. อย่างไรบ้าง
- ท่านมีความต้องการหรือมีความคาดหวังอยากจะได้เห็นผลสำเร็จจะอะไรบ้าง หลังจากนี้โครงการนี้เสร็จสิ้นลงแล้ว

ช่วงแสดงความคิดเห็น

- เปิดโอกาสการอภิปรายหรือเสนอข้อคิดเห็นได้อย่างอิสระ

ปิดการสัมภาษณ์

แนวทางคำถามในการสนทนากลุ่มสำหรับอาสาสมัคร

ช่วงการแนะนำ

- ผู้วิจัยให้คำแนะนำและอธิบายถึงเหตุผลและวัตถุประสงค์ในการทำสนทนากลุ่มครั้งนี้
 - ให้อาสาสมัครแนะนำตัวเองและทำความรู้จักคุ้นเคยก่อนที่จะเริ่มการสนทนากลุ่ม
1. สอบถามความตระหนักและปัญหาที่มีต่อสุขภาพของโรคหัวใจและหลอดเลือด
 - แต่ละท่านมีปัญหาสุขภาพของตนเองที่เกี่ยวข้องกับโรคหัวใจและหลอดเลือดหรือไม่ และแบ่งปันประสบการณ์ร่วมกันภายในกลุ่ม
 - แต่ละท่านท่านมีการดูแลหรือแก้ปัญหาสุขภาพเหล่านั้นอย่างไร และหาหรือแลกเปลี่ยนประสบการณ์ร่วมกันภายในกลุ่ม
 - ตามความรู้และความเข้าใจของแต่ละท่าน ได้ทราบถึงผลกระทบของโรคหัวใจและหลอดเลือดที่มีต่อสุขภาพหรือไม่ ถ้าทราบ มีผลกระทบอย่างไรบ้าง
 2. สอบถามอุปนิสัยการบริโภคและการออกกำลังกาย
 - ในแต่ละท่านมีพฤติกรรมการรับประทานอาหารเป็นอย่างไร อาหารที่ท่านชอบทานบ่อยๆมีอะไรบ้าง ยกตัวอย่าง และเปิดการอภิปรายเกี่ยวกับการเลือกอาหารของแต่ละท่านในกลุ่ม
 - ในแต่ละท่านมีความรู้เกี่ยวกับแคลอรีในอาหารบ้างหรือไม่ อย่างไรบ้าง และทราบถึงเลือกรับประทานอาหารให้สมดุลและมีความหลากหลายหรือไม่ อย่างไรบ้าง

- ในแต่ละท่านทราบถึงวิธีการเลือกอาหารเพื่อสุขภาพสำหรับการควบคุมน้ำหนักและเพื่อดูแลสุขภาพของหัวใจหรือไม่ อย่างไรบ้าง ยกตัวอย่างเมนูอาหารเพื่อสุขภาพที่ท่านทราบ
- ในแต่ละท่านมีพฤติกรรมการออกกำลังกายอย่างไรบ้าง ทั้งที่บ้าน ที่ทำงาน และที่อื่นๆ
- รูปแบบการออกกำลังกายของทุกท่านเป็นอย่างไร (ได้แก่ ประเภทของการออกกำลังกาย, ความถี่ และระยะเวลาในการออกกำลังกาย)
- ลักษณะการทำงานของทุกท่านเป็นอย่างไร และมีผลต่อการออกกำลังกายหรือการเคลื่อนไหวร่างกายของแต่ละท่านหรือไม่ ถ้ามีมีผลกระทบด้านใดบ้าง
- ในแต่ละท่านคิดว่าอุปสรรคสำคัญในการที่ทำให้ท่านได้ออกกำลังกายน้อยลงหรือไม่ได้ออกกำลังกายเลยคืออะไรบ้าง

3. สอบถามถึงประสบการณ์ในการป้องกันและควบคุมโรคหัวใจและหลอดเลือด

- ในแต่ละท่านเคยทราบหรือเคยได้ยินถึงโครงการที่มีอยู่เดิมในองค์กรหรือการรักษาด้วยยาที่เกี่ยวข้องกับการลดความเสี่ยงต่อโรคหัวใจและหลอดเลือดบ้างหรือไม่ ถ้าเคยมีโครงการอะไรบ้าง (เท่าที่ท่านทราบ) และทุกท่านเคยเข้าร่วมโครงการหรือการรักษาเหล่านั้นหรือไม่ ถ้าไม่ เหตุใดจึงไม่เข้าร่วม และทุกท่านมีแผนที่จะเข้าร่วมโครงการในอนาคตหรือไม่
- วิธีการใดบ้างที่ทุกท่านเคยทดลองปฏิบัติในการลดความเสี่ยงต่อโรคหัวใจและหลอดเลือด เช่น การลดน้ำหนัก การลดความดันโลหิต การควบคุมระดับน้ำตาลในเลือดและไขมันในเลือด และการเลิกสูบบุหรี่
- ในแต่ละท่านเคยประสบกับความสำเร็จหรือความล้มเหลวบ้างหรือไม่ในการพยายามที่จะจัดการกับความเสี่ยงต่อการเกิดโรคหัวใจและหลอดเลือด เช่น การลดน้ำหนัก การลดความดันโลหิต การควบคุมระดับน้ำตาลในเลือด ไขมันในเลือด และการเลิกสูบบุหรี่ และทุกท่านมีการจัดการหรือแก้ไขกับปัญหาต่อไปอย่างไร ในกรณีที่ประสบความล้มเหลวหลังจากที่พยายามแล้ว
- ในแต่ละท่านทราบหรือมีข้อเสนอแนะถึงวิธีการที่เหมาะสมหรือวิธีการที่น่าสนใจ ที่มีความปลอดภัยและยั่งยืนในการลดหรือควบคุมน้ำหนัก การควบคุมความดันโลหิต ระดับน้ำตาลในเลือด และไขมันในเลือด รวมทั้งการสูบบุหรี่ ในสถานที่ทำงานของทุกท่านหรือไม่ อย่างไรบ้าง

ช่วงแสดงความคิดเห็น

- เปิดโอกาสการอภิปรายหรือเสนอข้อคิดเห็นได้อย่างอิสระภายในกลุ่ม

ปิดการสนทนากลุ่ม

APPENDIX E

Appendix E1
Ranking scale for measuring community participation in five process dimensions

	Minimal 1	Restricted 2	Fair 3	Open 4	Maximal 5
Leadership	Community- based leadership represents only the wealthy minority and acts only in their interest	No collaboration among community- based leadership for community health; A health leader! Worker appointed by outside expert works independent of social interest groups	There is some collaborating community- based leadership functioning under an outside expert - appointed health leader/worker	Community-based leadership represents different groups in the community, is active and takes initiative in community health activities	Community-based leadership represents the variety of interests in the community and has ownership/control of community health activities
Organization	Outside expert does not use a community-based organization, or imposes one for project, which then remains inactive	Outside expert imposes a community-based organization or committee, but this organization develops some activities	Outside expert imposes a community-based organization, but this organization becomes fully active	Existing community organizations actively cooperate in community health activities	Existing community organizations, representing a broad constituency, incorporate or create their own mechanisms for introducing community health activities.
Needs assessment	Outside expert solely projects possible problems or conducts survey	Outside expert viewpoint dominates but community interests are considered, often through input of community-based leadership	Community-based leadership assessment of community views and needs dominates	Community-based leadership is actively involved in seeking out community members' viewpoint, and in analysis of needs	Community members involved in research and analysis of needs under active community-based leadership direction
Management	Activities induced by outside expert. Only outside expert conducts supervision of activities	An outside expert – appointed health leader/worker manages independently, under supervision of outside expert	Community-based leadership involved to some extent in management of activities but without control of activities	Community-based leadership is self-managed and involved in supervision of activities	The activities and supervision of the activities are the responsibility of the community-based leadership
Resource mobilization	Token amount contributed by community. Community-based leadership does not decide on any resources allocation	Mechanism established for resource generation, but community-based leadership has no control over use of resources	Continuing contribution of local resources, but no or limited community-based leadership control of resources	Continuing contribution of local resources, and community-based leadership controls use of funds	Considerable resources contributed by community or obtained otherwise by community-based leadership. Community- based leadership allocates available resources

Appendix E2

แนวทางประเมินการมีส่วนร่วมของชุมชน

ข้อคำถาม
1. ปัจจัยด้านการประเมินความต้องการของชุมชน
1.1 ระบุปัญหาด้านการป้องกันและควบคุมการเกิดโรคหัวใจและหลอดเลือดของพนักงานกฟผ.อย่างไร
1.2 ใครเป็นผู้ระบุความต้องการในการลดความเสี่ยงต่อการเกิดโรคหัวใจและหลอดเลือดในพนักงานกฟผ.
1.3 ความต้องการของผู้บริหารในการแก้ปัญหานี้เป็นอย่างไร
1.4 ผู้ใดมีส่วนร่วมในการคิดออกแบบสำรวจปัญหาด้านความเสี่ยงต่อการเกิดโรคหัวใจและหลอดเลือด
1.5 การสำรวจได้ข้อมูลที่เกิดประโยชน์ต่อองค์กรมากน้อยแค่ไหน
1.6 ผู้ที่ได้รับประโยชน์เกี่ยวข้องกับการวิเคราะห์ผลหรือไม่
1.7 การประเมินปัญหานี้มีประโยชน์ในการวางแผนอนาคตหน้าอย่างไร
2. ปัจจัยด้านผู้นำชุมชน
2.1 กลุ่มใดที่เป็นตัวแทนผู้นำขององค์กรในกฟผ.
2.2 อาสาสมัครแกนนำพนักงานกฟผ.มีบทบาทหน้าที่อะไรในโครงการวิจัยนี้
2.3 อาสาสมัครแกนนำพนักงานกฟผ.มีส่วนรับผิดชอบต่อชุมชนและโครงการวิจัยนี้
2.4 ผู้บริหารมีส่วนร่วมในการตัดสินใจในการปรับเปลี่ยนแผนงานโครงการวิจัยนี้
2.5 ผู้บริหารเปิดโอกาสในตัวแทนกลุ่มใดมีส่วนร่วมในการตัดสินใจในการปรับเปลี่ยนแผนงานโครงการวิจัยนี้
2.6 พนักงานกลุ่มใดได้รับประโยชน์จากผู้นำชุมชนในโครงการวิจัยนี้
3. ปัจจัยที่เกี่ยวข้องกับทรัพยากรในชุมชน
3.1 พนักงาน กฟผ.ได้รับประโยชน์ด้านทรัพยากรอะไรจากโครงการวิจัยนี้
3.2 ใครมีบทบาทในการตัดสินใจการใช้ทรัพยากรภายในหน่วยงานขององค์กร กฟผ.
3.3 คนทุกกลุ่มในกฟผ. มีบทบาทในการตัดสินใจเรื่องการจัดสรรทรัพยากรในโครงการวิจัยนี้หรือไม่ มากน้อยแค่ไหน
3.4 คนกลุ่มใดมีอิทธิพลในการเปลี่ยนแปลงการใช้ทรัพยากรในองค์กร กฟผ.
3.5 มีพัฒนาการใดในจัดสรรและกระจายทรัพยากรอย่างไร
3.6 พนักงาน กฟผ. มีส่วนร่วมในการจัดสรรสนับสนุนทรัพยากรในโครงการวิจัยนี้อย่างไร

แบบประเมินการมีส่วนร่วมของชุมชน (ต่อ)

ข้อความ
4. ปัจจัยที่เกี่ยวข้ององค์กรท้องถิ่น
4.1 ทีมผู้บริหารฝ่ายแพทย์และอนามัยและเจ้าหน้าที่ที่รับผิดชอบงานในกลุ่มงานส่งเสริมสุขภาพของ กฟผ. มีส่วนร่วมใน โครงการวิจัยนี้อย่างไร
4.2 ความสัมพันธ์ระหว่างพนักงาน และเจ้าหน้าที่กลุ่มงานส่งเสริมสุขภาพ พนักงานมีบทบาทใน ตัดสินใจและแสดงความคิดเห็นใน โครงการวิจัยนี้หรือไม่
4.3 ความสัมพันธ์ระหว่างทีมนักวิจัยกับผู้บริหารฝ่ายแพทย์และอนามัยเป็นอย่างไร
4.4 ทีมนักวิจัยได้รับแหล่งข้อมูลที่เป็นประโยชน์ต่อโครงการวิจัยอย่างไร
4.5 พนักงานกลุ่มใดที่มีความเกี่ยวข้องกับทีมผู้บริหารฝ่ายแพทย์และอนามัยและเจ้าหน้าที่กลุ่มงาน ส่งเสริมสุขภาพ
4.6 ความสัมพันธ์ระหว่างเจ้าหน้าที่แพทย์และพยาบาลในสถานพยาบาลขององค์กรกฟผ.กับ หน่วยงานฝ่ายส่งเสริมสุขภาพเป็นอย่างไร
5. ปัจจัยด้านการบริหารจัดการ
5.1 หน้าที่ความรับผิดชอบของท่านในการบริหารจัดการใน โครงการวิจัยนี้คืออะไร
5.2 เจ้าหน้าที่กลุ่มงานส่งเสริมสุขภาพของกฟผ. มีหน้าที่ความรับผิดชอบใน โครงการวิจัยนี้หรือไม่
5.3 เจ้าหน้าที่กลุ่มงานส่งเสริมสุขภาพของกฟผ. มีหน้าที่ความรับผิดชอบใน โครงการวิจัยนี้คืออะไร
5.4 ใครมีบทบาทในการตัดสินใจเรื่องการใช้ทรัพยากรในกิจกรรมต่างๆของโครงการ

APPENDIX F

Appendix F. Acceptability assessment questionnaire

แบบประเมินความพึงพอใจ / ความรู้ความเข้าใจ / การนำไปใช้

ของผู้เข้ารับการอบรม / สัมมนา

ชื่อโครงการ

คำอธิบาย แบบประเมินฉบับนี้มีทั้งหมด 3 ตอน ขอให้ผู้ตอบแบบประเมินตอบให้ครบทั้ง 3 ตอน เพื่อให้การดำเนินโครงการเป็นไปตามวัตถุประสงค์และเพื่อเป็นประโยชน์ในการนำไปใช้ต่อไป

ตอนที่ 1 สถานภาพทั่วไป

คำชี้แจง โปรดทำเครื่องหมาย / ลงในช่องหน้าข้อความ

1. เพศ หญิง ชาย
2. อายุ น้อยกว่า 25 ปี 25-35 ปี 36-45 ปี 46-55 ปี 56 ปีขึ้นไป
3. การศึกษา ม.6 ปวช. ปวส. ปริญญาตรี ปริญญาโท ปริญญาเอก
4. ตำแหน่งงาน วิศวกร ช่างเทคนิค พนักงานบัญชี เจ้าหน้าที่ฝ่ายบริหารจัดการ พยาบาล พนักงานธุรการ อื่นๆ (ระบุ).....

ตอนที่ 2 ระดับความพึงพอใจ / ความรู้ความเข้าใจ / การนำไปใช้ ต่อการเข้าร่วมโครงการ

คำชี้แจง โปรดทำเครื่องหมาย / ลงในช่องที่ตรงกับความพึงพอใจ / ความรู้ความเข้าใจ / การนำไปใช้ของท่าน เพียงระดับเดียว

ประเด็นความคิดเห็น	ระดับความพึงพอใจ / ความรู้ความเข้าใจ / การนำความรู้ไปใช้				
	มากที่สุด 5	มาก 4	ปานกลาง 3	น้อย 2	น้อยที่สุด 1
ด้านวิทยากร					
1. การเตรียมตัวและความพร้อมของวิทยากร					
2. การถ่ายทอดของวิทยากร					
3. สามารถอธิบายเนื้อหาได้ชัดเจนและตรงประเด็น					
4. ใช้ภาษาที่เหมาะสมและเข้าใจง่าย					
5. การตอบคำถามของวิทยากร					
6. เอกสาร/สื่อ ประกอบการบรรยายเหมาะสม					

ตอนที่ 2 ระดับความพึงพอใจ / ความรู้ความเข้าใจ / การนำไปใช้ ต่อการเข้าร่วมโครงการ (ต่อ)

ประเด็นความคิดเห็น	ระดับความพึงพอใจ / ความรู้ความเข้าใจ / การนำความรู้ไปใช้				
	มากที่สุด 5	มาก 4	ปานกลาง 3	น้อย 2	น้อยที่สุด 1
ด้านสถานที่ / ระยะเวลา / อาหาร					
1. สถานที่สะอาดและมีความเหมาะสม					
2. ความพร้อมของอุปกรณ์/วัสดุอุปกรณ์					
3. ระยะเวลาในการอบรม / สัมมนา มีความเหมาะสม					
4. อาหาร/ มีความเหมาะสม					
ด้านการให้บริการของเจ้าหน้าที่					
1. การบริการของเจ้าหน้าที่					
2. การประสานงานของเจ้าหน้าที่โครงการ					
3. การอำนวยความสะดวกของเจ้าหน้าที่					
4. การให้คำแนะนำหรือตอบข้อซักถามของเจ้าหน้าที่					
ด้านความรู้ความเข้าใจ					
1. ความรู้ ความเข้าใจในเรื่องนี้ก่อนการอบรม					
2. ความรู้ ความเข้าใจในเรื่องนี้หลังการอบรม					
3. สามารถบอกประโยชน์ได้					
4. สามารถบอกข้อดีได้					
5. สามารถอธิบายรายละเอียดได้					
6. สามารถจัดระบบความคิด/ประมวลความคิด สู่การพัฒนาอย่างเป็นระบบ					
7. บูรณาการทางความคิดสู่การทำงานเป็นทีม/ การปรับตัวของบุคลากร/การปฏิรูประบบการทำงาน ในการปฏิบัติงาน					

ตอนที่ 2 ระดับความพึงพอใจ / ความรู้ความเข้าใจ / การนำไปใช้ ต่อการเข้าร่วมโครงการ (ต่อ)

ประเด็นความคิดเห็น	ระดับความพึงพอใจ / ความรู้ความเข้าใจ / การนำความรู้ไปใช้				
	มากที่สุด 5	มาก 4	ปานกลาง 3	น้อย 2	น้อยที่สุด 1
ด้านการนำความรู้ไปใช้					
1. สามารถนำความรู้ที่ได้รับ ไปประยุกต์ใช้ในการปฏิบัติงานได้					
2. สามารถนำความรู้ไปเผยแพร่ / ถ่ายทอดแก่ชุมชนได้					
3. สามารถให้คำปรึกษาแก่เพื่อนร่วมงานได้					
4. มีความมั่นใจและสามารถนำความรู้ที่ได้รับไปใช้ได้					

ตอนที่ 3 ข้อเสนอแนะอื่นๆ

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APPENDIX G

Appendix G Body Composition analysis

InBody 720

วิเคราะห์องค์ประกอบร่างกาย

I.D.	AGE	HEIGHT	GENDER	DATE / TIME
376841	60	152cm	Male	19.06.2012 10:16:09 (5936)

องค์ประกอบร่างกาย

องค์ประกอบต่างๆ	ค่าที่วัดได้	น้ำหนักเฉลี่ยในวัยชาย	น้ำหนักเฉลี่ยในวัยรวมเพศ	มวลรวมที่ไม่รวมไขมัน	น้ำหนัก	ค่าปกติ
น้ำหนักโมเลกุล (g)	16.3	26.5	34.0	36.1	52.2	17.7 ~ 21.7
น้ำหนักของเซลล์ (g)	10.2					10.9 ~ 13.3
โปรตีน (kg)	7.1					7.7 ~ 9.4
เกลือแร่ (kg)	2.48	2.04				2.65 ~ 3.23
มวลไขมัน (kg)	16.1					6.1 ~ 12.2

วิเคราะห์กล้ามเนื้อ-ไขมัน

น้ำหนัก (kg)	ต่ำกว่าปกติ	ปกติ	สูงกว่าปกติ	ค่าปกติ
น้ำหนัก (kg)	55	70-115	130-205	43.2 ~ 58.4
มวลกล้ามเนื้อ (kg)	70	80-110	120-170	21.3 ~ 26.1
มวลไขมัน (kg)	40	60-160	200-520	6.1 ~ 12.2

การวินิจฉัยโรคอ้วน

ดัชนีมวลกาย (kg/m ²)	ต่ำกว่าปกติ	ปกติ	สูงกว่าปกติ	ค่าปกติ
ดัชนีมวลกาย (kg/m ²)	10	15-22	23-35	18.5 ~ 23.0
ปริมาณไขมันร้อยละ (%)	0	5-25	26-30	10.0 ~ 20.0
การกระจายของไขมัน (อัตราส่วนเอว/สะโพก)	0.65	0.70-0.90	0.95-1.15	0.75 ~ 0.85

ความสมดุลของกล้ามเนื้อ

ส่วน	ต่ำกว่าปกติ	ปกติ	สูงกว่าปกติ	ค่าปกติ
แขนขวา (kg)	40	50-100	110-180	1.71
แขนซ้าย (kg)	40	50-100	110-180	1.69
ลำตัว (kg)	70	80-140	150-180	16.0
ขาขวา (kg)	70	80-140	150-180	5.48
ขาซ้าย (kg)	70	80-140	150-180	5.15

ความสมดุลของร่างกาย

ส่วน	ต่ำกว่าปกติ	ปกติ	สูงกว่าปกติ	ค่าปกติ
ส่วนบน	0.328	0.328-0.375	0.41-0.46	0.328 ~ 0.375
ส่วนล่าง	0.330	0.330-0.377	0.35-0.43	0.330 ~ 0.377
ส่วนบน-ล่าง	0.338	0.338-0.385	0.31-0.36	0.338 ~ 0.385
ส่วนบน-ล่าง-เอว	0.335	0.335-0.382	0.28-0.33	0.335 ~ 0.382
ส่วนบน-ล่าง-เอว-สะโพก	0.347	0.347-0.394	0.338-0.385	0.347 ~ 0.394

การวินิจฉัยโรคอ้วน

ดัชนีมวลกาย ปกติ สูงเกินไป ต่ำเกินไป

ปริมาณไขมัน ปกติ สูงเกินไป ต่ำเกินไป

การกระจายของไขมัน ปกติ สูงเกินไป ต่ำเกินไป

การควบคุมน้ำหนัก

น้ำหนักเป้าหมาย	50.9 kg
น้ำหนักที่ต้องควบคุม	- 1.3 kg
ไขมันที่ต้องควบคุม	- 8.5 kg
กล้ามเนื้อที่ต้องควบคุม	+ 7.2 kg
Fitness Score	64 Points

ความต้านทานกระแสไฟฟ้าของร่างกาย

Z	RA	LA	TR	RL	LL
1kHz	407.6	408.3	30.1	270.5	267.7
5kHz	437.2	400.0	28.9	267.3	287.4
50kHz	353.5	357.7	24.8	236.6	262.1
250kHz	319.6	325.6	21.2	213.9	242.0
500kHz	308.6	315.4	20.1	207.8	235.8
1MHz	298.7	305.8	19.5	203.0	229.8

Body Composition History

DATE / TIME	Weight	SMM	Fat	Score	ECW/TBW
17/10/11 09:25	52.3	19.6	15.8	65	0.385
19/06/12 10:16	52.2	19.3	16.1	64	0.385

Additional Data (Normal Range)

Obesity Degree=102% 90 ~ 110

BCM = 23.4 kg 25.4 ~ 31.0

BMC = 2.04 kg 2.18 ~ 2.66

BMR = 1148kcal 1231 ~ 1423

A C = 28.2cm

AMC = 22.0cm

Segmental fat is estimated.

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APPENDIX H

Appendix H. Ethical documents

IRB Certificate Approval

AF 02-11

 **The Ethics Review Committee for Research Involving Human Research Subjects,
Health Science Group, Chulalongkorn University**
Institute Building 2, 4 Floor, Soi Chulalongkorn 62, Phyat hai Rd., Bangkok 10330, Thailand,
Tel: 0-2218-8147 Fax: 0-2218-8147 E-mail: eccu@chula.ac.th

COA No. 018/2011

Certificate of Approval

Study Title No.116.2/53 : **EFFECTIVENESS OF HEALTHY ORGANIZATION BY PARTICIPATORY ENCOURAGEMENT (HOPE) PROJECT ON REDUCING CARDIOVASCULAR RISK FACTORS IN EMPLOYEES OF THE ELECTRIC GENERATING AUTHORITY OF THAILAND (EGAT)**

Principle Investigator : Miss Pajaree Abdullakasim

Place of Proposed Study/Institution : College of Public Health Sciences,
Chulalongkorn University

The Ethics Review Committee for Research Involving Human Research Subjects, Health Science Group, Chulalongkorn University, Thailand, has approved constituted in accordance with the International Conference on Harmonization – Good Clinical Practice (ICH-GCP) and/or Code of Conduct in Animal Use of NRCT version 2000.

Signature:  Signature: 

(Associate Professor Prida Tasanapradit, M.D.) (Assistant Professor Dr. Nuntaree Chaichanawongsaraj)

Chairman Secretary

Date of Approval : 2 February 2011 Approval Expire date : 1 February 2012

The approval documents including

- 1) Research proposal
- 2) Patient/Participant Information Sheet and Informed Consent Form
- 3) Researcher's
- 4) Questionnaire



Protocol No. 116.2/53
Date of Approval 02 FEB 2011
Approval Expire Date 01 FEB 2012

The approved investigator must comply with the following conditions:

1. The research/project activities must end on the approval expired date of the Ethical Review Committee for Research Involving Human Research Subjects, Health Science Group, Chulalongkorn University (ECCU). In case the research/project is unable to complete within that date, the project extension can be applied one month prior to the ECCU approval expired date.
2. Strictly conduct the research/project activities as written in the proposal.
3. Using only the documents that bearing the ECCU's seal of approval with the subjects/volunteers (including subject information sheet, consent form, invitation letter for project/research participation (if available); and return the first subject's copy of the above documents to the ECCU.
4. Report to the ECCU for any serious adverse events within 5 working days
5. Report to the ECCU for any change of the research/project activities prior to conduct the activities.
6. Final report (AF 03-11) and abstract is required for a one year (or less) research/project and report within 30 days after the completion of the research/project. For thesis, abstract is required and report within 30 days after the completion of the research/project.
7. Annual progress report is needed for a two-year (or more) research/project and submit the progress report before the expire date of certificate. After the completion of the research/project processes as No. 6.

APPENDIX I

บันทึกสุขภาพประจำตัว

1. ข้อมูลทั่วไป

ชื่อ _____ นามสกุล _____ อายุ _____ ปี

เพศ ชาย หญิง ส่วนสูง _____ ซม.

2. บันทึกผลการตรวจสุขภาพประจำปีที่สำคัญ

วันที่ตรวจ	น้ำหนัก (กก.)	เส้นรอบคอ (ซม.)	ความดันโลหิต (mmHg)	ระดับไขมันในเลือด			ระดับน้ำตาลในเลือด (mg/dL)
				Total cholesterol (mg/dL)	HDL-cholesterol (mg/dL)	LDL-cholesterol (mg/dL)	

3. การประเมินความเสี่ยงด้วยตนเอง

จากผลการตรวจสุขภาพ ท่านสามารถประเมินความเสี่ยงต่อการเกิดโรคในภาพรวมได้ด้วยตนเองเบื้องต้น และสามารถใช้อุปกรณ์อื่นในการติดตามภาวะสุขภาพของตนเองได้โดยง่าย ด้วยวิธีดังต่อไปนี้

- 3.1 การประเมินดัชนีมวลกาย
- 3.2 การประเมินความเสี่ยงต่อโรคหัวใจและหลอดเลือด
- 3.3 การประเมินความเสี่ยงต่อการเกิดโรคเบาหวาน
- 3.4 การประเมินความเสี่ยงด้วยตนเอง

โดยในแต่ละวิธีมีการประเมินค่าต่าง ดังนี้

3.1 การประเมินดัชนีมวลกาย

ดัชนีมวลกาย - น้ำหนัก(กก.)
ส่วนสูง(ม.)²

ตัวอย่างการคำนวณ : ส่วนสูง 170 ซม. น้ำหนัก 85 กก.

1. น้ำหนักตัว 86 กก.
2. ส่วนสูงส่วนสูง - 1.70*1.70=2.89
3. ดัชนีมวลกาย - 86/2.89=29.75 กก/ตารางเมตร

ดัชนีมวลกายน้อยกว่า 18.5

คุณมีน้ำหนักน้อยเกินไป ซึ่งอาจเกิดจากน้ำหนักที่ออกกำลังกายมาก และได้รับสารอาหารไม่เพียงพอ วิธีแก้ไขต้องรับประทานอาหารที่มีคุณภาพ และมีปริมาณพลังงานเพียงพอ และออกกำลังกายอย่างเหมาะสม

ดัชนีมวลกายระหว่าง 18.5-22.9

คุณมีน้ำหนักปกติและมีปริมาณไขมันอยู่ในเกณฑ์ปกติ มักจะไม่ค่อยมีโรคภัย อุบัติการณ์ของโรคเบาหวาน ความดันโลหิตสูงต่ำกว่าผู้ที่อ้วนกว่านี้

ดัชนีมวลกายอยู่ระหว่าง 23-24.9

คุณเริ่มจะมีน้ำหนักเกิน หากคุณมีกรรมพันธุ์เป็นโรคเบาหวานหรือไขมันในเลือดสูงต้องพยายามลดน้ำหนักให้ดัชนีมวลกายต่ำกว่า 23

ดัชนีมวลกายอยู่ระหว่าง 25-29.9

คุณจัดว่าเป็นคนอ้วนระดับ 1 และหากคุณมีเส้นรอบเอวมากกว่า 90 ซม. (ชาย) หรือ 80 ซม. (หญิง) คุณจะมีความเสี่ยงเกิดโรคความดัน เบาหวานสูง จำเป็นต้องควบคุมอาหาร และออกกำลังกาย

ดัชนีมวลกายมากกว่า 30

คุณจัดว่าอ้วนระดับ 2 คุณเสี่ยงต่อการเกิดโรคที่มากับความอ้วน หากคุณมีเส้นรอบเอวมกกว่าเกณฑ์ปกติคุณจะต้องลดการเกิดโรคสูง คุณต้องควบคุมอาหาร และออกกำลังกายอย่างจริงจัง

หมายเหตุ: การจัดระดับอ้วนนี้ใช้ตามการศึกษาของ The Asia Pacific Perspective: Redefining obesity and its treatment, Feb 2000

3.2 ประเมินความเสี่ยงในการเกิดโรคหัวใจ (RAMA EGAT SCORE)

โรคเส้นเลือดหัวใจตีบ	
ประวัติ	คะแนนความเสี่ยง
อายุ	
35 - 39 ปี	-2
40 - 44 ปี	0
45 - 49 ปี	2
50- 54 ปี	4
เพศ	
หญิง	0
ชาย	3
สูบบุหรี่	
ไม่สูบ	0
สูบ	2
ความดันโลหิตสูง*	
ไม่เป็น	0
เป็น	3
รอบคอ (ชาย > 90 ซม. หญิง > 80 ซม.)	
ไม่ใหญ่	0
ใหญ่	4
รวม

* ความดันโลหิตตั้งแต่ 140/90 ขึ้นไป

หมวดความเสี่ยง	โรคเส้นเลือดหัวใจตีบรุนแรงในเวลา 10 ปี	ข้อแนะนำสำหรับผู้ที่มีระดับความเสี่ยงต่อการเกิดโรคหัวใจ
รวม	(%)	
-2	0	ความเสี่ยงน้อย : สุขภาพของคุณอยู่ในเกณฑ์ดี ควรออกกำลังกายอย่างสม่ำเสมอ และตรวจสุขภาพประจำปีเพื่อป้องกันการเกิดโรคหลอดเลือดหัวใจ
0	0	
1	1	
2	1	
3	1	
4	1	ความเสี่ยงปานกลาง : ควรออกกำลังกายอย่างสม่ำเสมอ ควบคุมอาหารลดไขมัน และเค็มจัด งดการสูบบุหรี่ทันที และควรปรึกษาแพทย์เพื่อขอคำแนะนำที่ถูกต้องต่อไป
5	1	
6	2	
7	2	
8	2	
9	3	ความเสี่ยงสูง : ควรออกกำลังกายอย่างสม่ำเสมอ ควบคุมอาหารลดไขมัน และเค็มจัด งดการสูบบุหรี่ทันที และควรปรึกษาแพทย์เพื่อขอคำแนะนำที่ถูกต้องโดยเร็ว
10	4	
11	4	
12	5	
13	7	
14	0	ความเสี่ยงสูงมาก : ควรปรับพฤติกรรม เลิกบุหรี่ ออกกำลังกาย ควบคุมอาหาร ปรึกษาความดันโลหิตอย่างสม่ำเสมอ งดทานเหล้า และรีบปรึกษาแพทย์เพื่อขอคำแนะนำที่ถูกต้องทันที
15	10	
16	12	

ผู้จัดทำ: สุจิตต์ แยมวรงค์และคณะ, การพัฒนาแบบประเมินความเสี่ยงต่อโรคหลอดเลือดหัวใจ, มูลนิธิสาธารณสุข, 2008

3.3 การประเมินความเสี่ยงในการเกิดโรคเบาหวาน

ประวัติ	ประเภทความเสี่ยง		
	คะแนน	ความเสี่ยง	
อายุ			
34 - 39 ปี	0	ความเสี่ยงต่ำ	
40 - 44 ปี	0		
45 - 49 ปี	1		
มากกว่า 50	2		
เพศ			
หญิง	0	ความเสี่ยงปานกลาง	
ชาย	2		
BMI (kg/m ²)			
น้อยกว่า 23	0		
มากกว่าหรือเท่ากับ 23 แต่ไม่เกิน 27.5	3		
มากกว่าหรือเท่ากับ 27.5	5	ความเสี่ยงสูง	
รอบคอ (ชาย > 90 ซม. หญิง > 80 ซม.)			
ไม่ใหญ่	0		
ใหญ่	2		
ความดันโลหิตสูง*			
ไม่เป็น	0	ความเสี่ยงสูงมาก	
เป็น	2		
รวมครั้งมีประวัติเป็นเบาหวาน			
ไม่มี	0		
มี	4		
รวม**		

คะแนนรวม	ความเสี่ยงต่อการเป็นเบาหวานใน 12 ปี (%)	ข้อแนะนำสำหรับผู้ที่มีความเสี่ยงต่อการเกิดโรคเบาหวาน
1	3	ความเสี่ยงต่ำ : สุขภาพของคุณอยู่ในเกณฑ์ดี ควรออกกำลังกายอย่างสม่ำเสมอ และตรวจสุขภาพประจำปีเพื่อป้องกันการเกิดโรคหลอดเลือดหัวใจ
2	4	
3	5	
4	6	
5	7	
6	1	ความเสี่ยงปานกลาง : ควรออกกำลังกายอย่างสม่ำเสมอ ควบคุมอาหารลดไขมัน และเค็มจัด งดการสูบบุหรี่ทันที และควรปรึกษาแพทย์เพื่อขอคำแนะนำที่ถูกต้องต่อไป
7	1	
8	2	
9	2	
10	2	
11	3	ความเสี่ยงสูง : ควรออกกำลังกายอย่างสม่ำเสมอ ควบคุมอาหารลดไขมัน และเค็มจัด งดการสูบบุหรี่ทันที และควรปรึกษาแพทย์เพื่อขอคำแนะนำที่ถูกต้องโดยเร็ว
12	4	
13	4	
14	5	
15	7	
16	8	ความเสี่ยงสูงมาก : ควรปรับพฤติกรรม เลิกบุหรี่ ออกกำลังกาย ควบคุมอาหาร ปรึกษาความดันโลหิตอย่างสม่ำเสมอ และรีบปรึกษาแพทย์เพื่อขอคำแนะนำที่ถูกต้องทันที
17	10	

3.4 แบบประเมินความเครียดด้วยตนเอง

คำชี้แจง: โปรดประเมินว่าในระยะเวลา 2 เดือนที่ผ่านมาจนถึงปัจจุบันนี้ ท่านมีอาการ พฤติกรรมหรือ ความรู้สึกต่อไปนี้มากน้อยเพียงใด แล้วขีดเครื่องหมาย X ลงในช่องแสดงความถี่ของอาการที่เกิดขึ้นกับตัวท่านเอง ตามความเป็นจริงมากที่สุด

อาการ พฤติกรรม หรือความรู้สึก	ระดับความถี่ของอาการ/พฤติกรรม			
	0	1	2	3
	ไม่เคย	เป็นครั้ง คราว (1-2 ครั้ง/ เดือน)	เป็นบ่อยๆ (3-4 ครั้ง/ เดือน)	เป็นประจำ (ทุก สัปดาห์)
1. นอนไม่หลับ เพราะคิดมากหรือกังวลใจ				
2. รู้สึกหงุดหงิด ง่ายมาก				
3. หายใจไม่สะดวก เพราะประสาทตึงเครียด				
4. มีความวิตกกังวล				
5. ไม่อยากพบผู้ป่วย				
6. ปวดหัวข้างเดียวหรือปวดบริเวณขมับทั้ง 2 ข้าง				
7. รู้สึกไม่มีความสุขและเศร้าหมอง				
8. รู้สึกหมดพลังในชีวิต				
9. รู้สึกว่าชีวิตตนเองไม่มีคุณค่า				
10. กระวนกระวายอยู่ตลอดเวลา				
11. รู้สึกว่าตนเองไม่มีสมาธิ				
12. รู้สึกเหนื่อย จนไม่มีแรงจะทำอะไร				
13. รู้สึกเบื่อหน่าย ไม่อยากทำอะไร				
14. มีอาการหัวใจเต้นแรง				
15. เสียงิน ปากคัน หรือมือคันแสบๆคันๆ				
16. รู้สึกกลัววิตกกังวลในการทำสิ่งต่างๆ				
17. ปวดหรือเกร็งกล้ามเนื้อบริเวณท้ายทอย หลังหรือไหล่				
18. ค้นเห็นสายกับเหตุการณ์ที่ไม่คุ้นเคย				
19. มีแรงหรืออ่อนศีรษะ				
20. ความรู้สึกทางเพศลดลง				
คะแนนรวม				

ผลการประเมินและวิเคราะห์ความเครียด

0-5 คะแนน มีความเครียดอยู่ในระดับต่ำกว่าเกณฑ์ปกติ

แสดงว่า ท่านตอบไม่ตรงความเป็นจริง / ไม่แน่ใจหรือไม่เข้าใจในคำถาม / อาจเป็นคนขาดแรงจูงใจ มีความเหนื่อย / มีชีวิตประจำวันซ้ำซากจำเจ น่าเบื่อ ปราศจากความตื่นเต้น

6-17 คะแนน มีความเครียดอยู่ในระดับเกณฑ์ปกติ

แสดงว่า ท่านสามารถจัดการกับความเครียดในชีวิตประจำวันและสามารถปรับตัวกับสถานการณ์ต่างๆได้อย่างเหมาะสม รู้สึกพึงพอใจเกี่ยวกับตนเองและสิ่งแวดล้อมข้างมาก

ความเครียดในระดับนี้คือว่ามีประโยชน์ในการดำเนินชีวิตประจำวัน เป็นแรงจูงใจที่นำไปสู่ความสำเร็จในชีวิตได้

18-25 คะแนน มีความเครียดอยู่ในระดับเกณฑ์สูงกว่าปกติเล็กน้อย

แสดงว่า ท่านมีความเครียดที่ถือว่าเป็นความเครียดที่พบได้ในชีวิตประจำวันโดยไม่รู้สึกหรืออาจรู้สึกไม่สบายใจ

เปลี่ยนแปลงของร่างกาย อารมณ์ ความรู้สึก และพฤติกรรมบ้างเล็กน้อย ซึ่งต้องใช้เวลาในการปรับตัว แต่ในที่สุดท่านก็สามารถปรับตัวกับห้วงเวลาได้ ความเครียดระดับนี้ไม่มีผลเสียต่อท่านในชีวิต

ท่านสามารถผ่อนคลายความเครียดได้ด้วยวิธีการธรรมดาที่เพิ่มพลัง เช่น การออกกำลังกายเล่นกีฬา ทำสิ่งสนุกสนานเพลิดเพลิน ดูหนังฟังเพลง อ่านหนังสือ หรือทำงานอดิเรกต่างๆ ในขณะที่พยายามอยู่กับผู้ป่วยที่ว่างใจได้ พิจารณาและลงมือแก้ไขปัญหาตามลำดับความสำคัญ

26-29 คะแนน มีความเครียดอยู่ในระดับเกณฑ์สูงกว่าปกติปานกลาง

แสดงว่า ขณะนี้ท่านเริ่มมีความตึงเครียดในระดับค่อนข้างสูง และได้รับความเดือดร้อนเป็นอย่างมากจากปัญหาทางอารมณ์ที่เกิดจากความขัดแย้ง และวิกฤตการณ์ในชีวิต เป็นสัญญาณเตือนขึ้นล่วงหน้าท่านกำลังเผชิญกับ

ภาวะวิกฤติและความขัดแย้ง ซึ่งท่านจัดการแก้ไขด้วยความยากลำบาก อาจเพิ่มความรู้สึกเครียด และมีผลกระทบกับการทำงาน จำเป็นต้องหาวิธีแก้ไขข้อขัดแย้งให้ลดน้อยลงหรือหมดไปด้วยวิธีการอย่างใดอย่างหนึ่ง

สิ่งแรกที่ควรรับจัดการ คือ ท่านต้องวิธีคลายเครียดที่ดีและสม่ำเสมอทุกวัน วันละ 1-2 ครั้ง ครั้งละ 10 นาที โดยนั่งในท่าที่สบาย หายใจลึกๆ โฟกัสที่หน้าผาก หายใจออกช้าๆ นับ 1-10 ไปด้วย ท่านจะใช้วิธีนี้ไม่สม่ำเสมอ

สวดมนต์ก็ได้ และท่านควรหาวิธีอื่นโดยค้นหาสาเหตุของปัญหา หาวิธีแก้ปัญหาหลายวิธี หรือทั้งพิจารณาผลเสีย ของแต่ละวิธี และเลือกริธีที่เหมาะสมกับภาวะของตนเองมากที่สุดที่ไม่สร้างปัญหาให้เพิ่มขึ้นและทำให้ผู้อื่นเดือดร้อน ควรวางแผนแก้ไขปัญหามาเป็นลำดับขั้นตอน และลงมือแก้ไขปัญหานั้น หากท่าน

ไม่สามารถจัดการแก้ไขปัญหาได้ด้วยตนเองควรปรึกษากับผู้ให้คำปรึกษาปัญหาสุขภาพจิตตามหน่วยงานต่างๆ

30-60 คะแนน มีความเครียดอยู่ในระดับสูงกว่าเกณฑ์ปกติมาก

แสดงว่า ท่านกำลังตกอยู่ในภาวะเชิงเครียด หรือกำลังเผชิญกับวิกฤตการณ์ในชีวิตอย่างรุนแรง เช่น การเจ็บป่วยรุนแรงเรื่อง ความพิการ การสูญเสีย ปัญหาความรุนแรงในครอบครัว ปัญหาเศรษฐกิจ ซึ่งส่งผลกระทบต่อสุขภาพกายและสุขภาพจิตอย่างชัดเจน ทำให้ชีวิตมีความยุ่งวุ่นวาย คิดลึกลงใจผิดพลาด ขาดความยับยั้งชั่งใจ อาจ

แก้ปัญหาได้บ้าง บางครั้งก็พบพฤติกรรมก้าวร้าวรุนแรง เช่น ทะเยอทะยาน ขี้บ่นบ่นเสียงของ ความเครียดระดับนี้รุนแรงมาก หากปล่อยไว้โดยไม่ดำเนินการแก้ไขอย่างเหมาะสมและถูกวิธี อาจนำไปสู่ความเจ็บป่วยทางจิตที่รุนแรง ซึ่งส่งผลกระทบต่อตนเองและบุคคลใกล้ชิดต่อไปได้ ท่านต้องไปปรึกษาหาวิธีเข้ารับการรักษาปัญหาสุขภาพจิตทางโทรศัพท์ ซึ่งอาจจะช่วยให้ท่านมองเห็นปัญหาและแนวทางแก้ไขที่ชัดเจนและเหมาะสมต่อไป

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