



วิทยาลัยวิทยาศาสตร์สาธารณสุข  
จุฬาลงกรณ์มหาวิทยาลัย  
COLLEGE OF PUBLIC HEALTH SCIENCES  
CHULALONGKORN UNIVERSITY



**จุฬาลงกรณ์มหาวิทยาลัย**  
**Chulalongkorn University**  
Pillar of the Kingdom

## **Stress and Cardiovascular Disease Risks among Employees at South Bangkok Power Plant of the Electric Generating Authority of Thailand (EGAT)**

**Presented by**

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# Background

- October 15 – 17, 2012: **Oral presentation in subtheme Cardiovascular disease at The 44<sup>th</sup> Asia-Pacific Academic Consortium on Public Health (APACPH),** Hosted by Faculty of Medicine, University of Colombo, in Colombo, Srilanka.
- November 14 – 16, 2012: **Poster presentation at Commission on Higher Education Congress V- University Staff Development Consortium (CHE-USDC congress V),** the Ambassador City Jomtien, Pattaya, Chonburi.

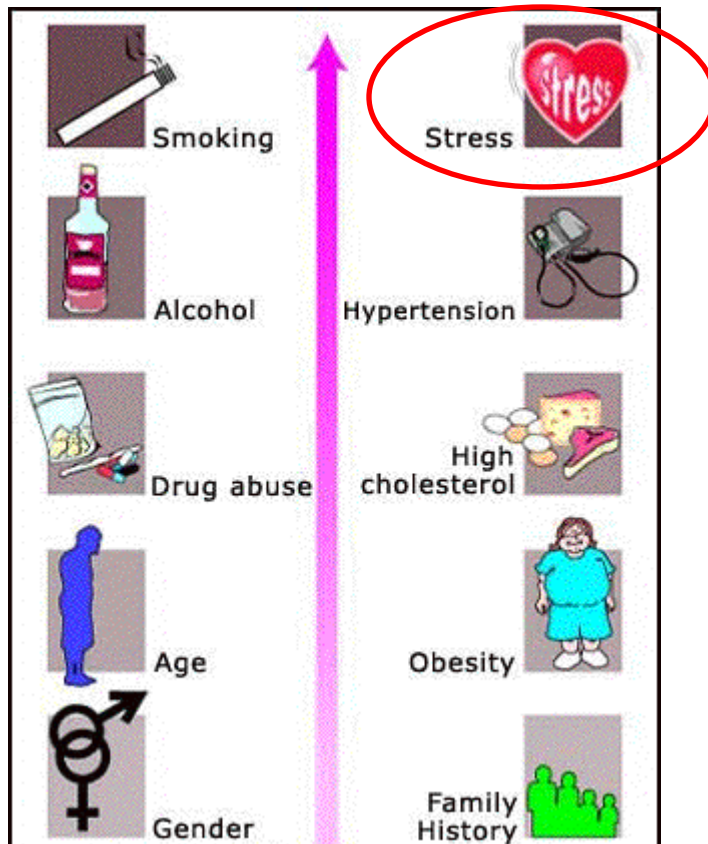
# Background

A part of dissertation, entitled;

- Effectiveness of Healthy Organization by Participatory Encouragement (HOPE) project on reducing cardiovascular risk factors in employees of the Electric Generating Authority of Thailand (EGAT)
- ประสิทธิภาพของโครงการองค์กรสุขภาพดีด้วยกระบวนการให้การสนับสนุนแบบมีส่วนร่วมต่อการลดปัจจัยเสี่ยงของการเกิดโรคหัวใจและหลอดเลือดในพนักงานการไฟฟ้าฝ่ายผลิตแห่งประเทศไทย

# Background

- The major risk factors contributing to CVD



The more risk factors  
The greater the risk of CVD



# Background

## Mental ill-health

- *Depression* is associated with an increased risk of coronary heart disease.

## Psychosocial stress

- *Chronic life stress, social isolation and anxiety* increase the risk of heart disease and stroke.



(Atlas of Heart Disease and Stroke, WHO, 2004)

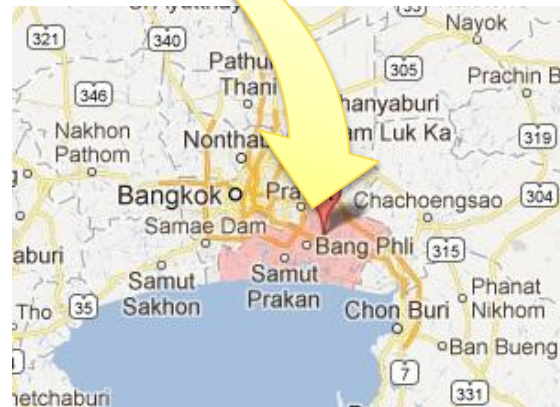
# Objectives

- ❖ To explore the situation and the relationship between cardiovascular disease (CVD) risks and stress among employees at South Bangkok Power Plant of the Electric Generating Authority of Thailand (EGAT).



# Methods

- ❖ **A cross-sectional study (May – June 2011)**
- ❖ **Study area: South Bangkok Power Plant of EGAT in Samutprakarn province, Thailand**



# Methods

- ❖ **Measurement tools** : self-administrative questionnaires;
  - **General characteristics** : Socio-demographic information
  - **Health status** : Prior medical condition
  - **CVD risk assessment** : RAMA EGAT
  - **Risk behaviors** : smoking, alcohol drinking, diet, physical activity, and stress





# Methods

## **Stress assessment:** “The Self Analyzed and Self Evaluated Stress Test”

- A self-reported measure comprised 20 questions asking about the symptoms related to stress
- Applied from the Department of Mental Health, Ministry of Public Health, Thailand
- Total score is 60, **the higher scored indicated correlation to more likely to experience stress related illness.**

# Methods

## ❖ Ethical consideration:

- Reviewed and approved by **Institutional Ethical Review Board of College of Public Health Sciences, Chulalongkorn University (Protocol No. 116.2/53)**.
- The participants had to **agree and willingly participate** of the study protocol by signing an informed consent form.



# Results

## Study Samples: General characteristics

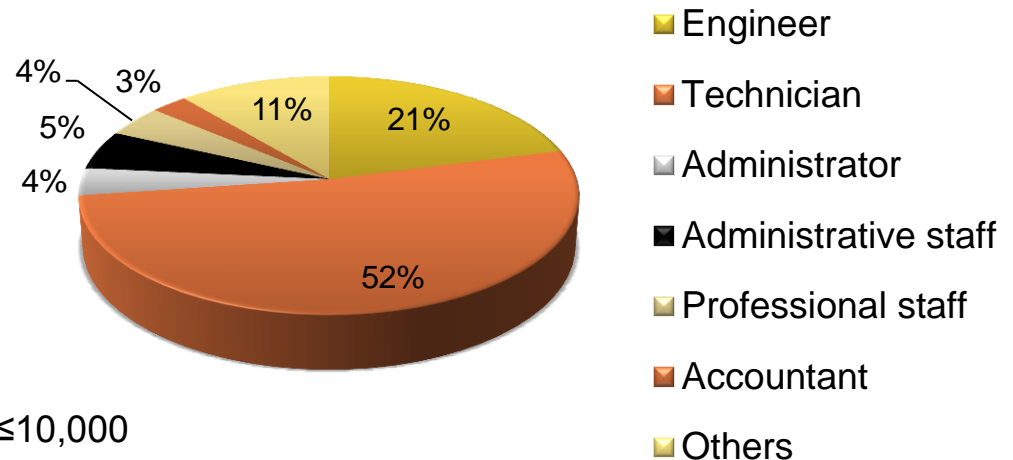
- 384 employees (75.7% of total employees),
- Aged 22 – 60 years (mean  $\pm$  SD; 48.1  $\pm$  10.1 years)
- 85.7% were male.
- 97% were Buddhist.
- 74.8% were married.
- 57.9% and 21% were technician and engineers.

# Results

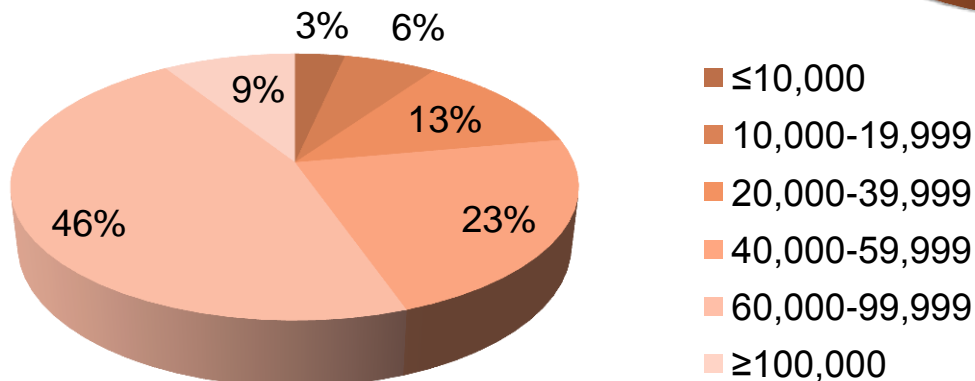
## Study Samples: General characteristics

- Well – educated
- High income

### Employment position



### Income

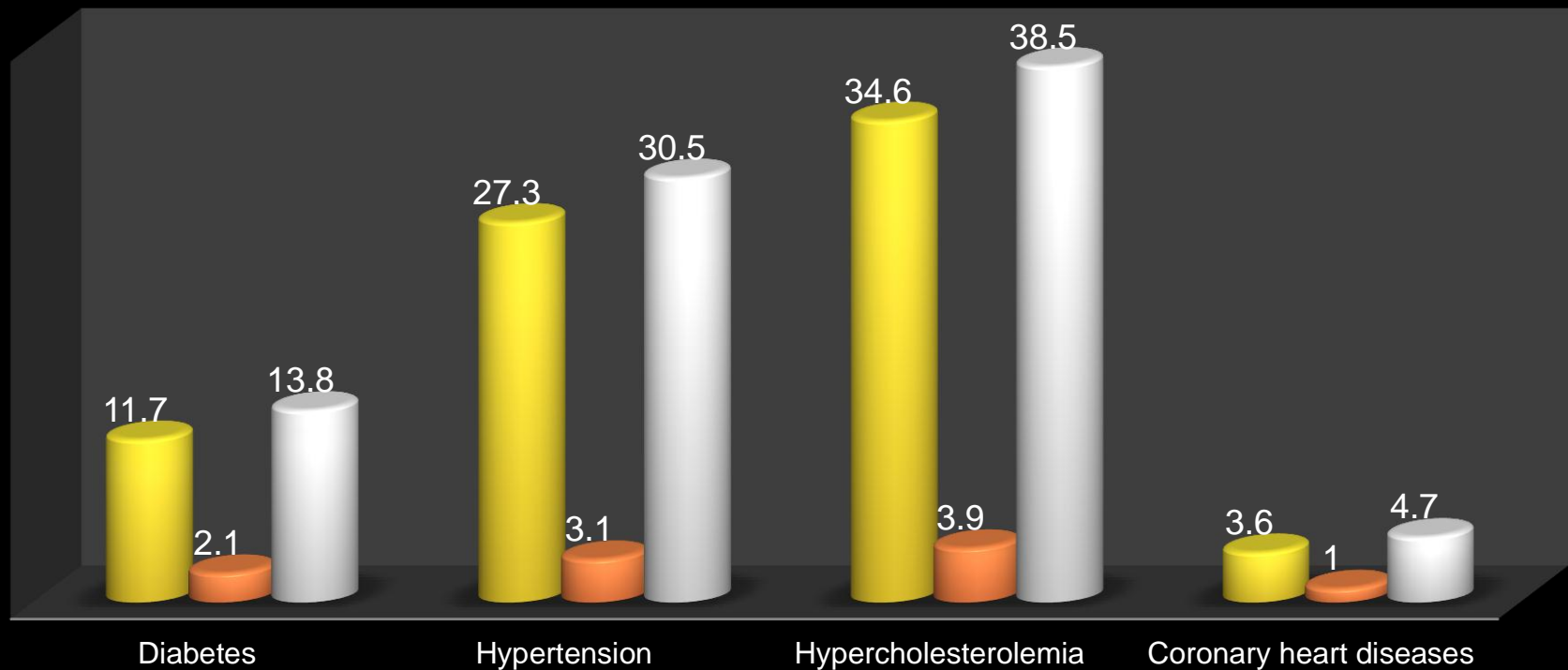


# Results

- Health Status

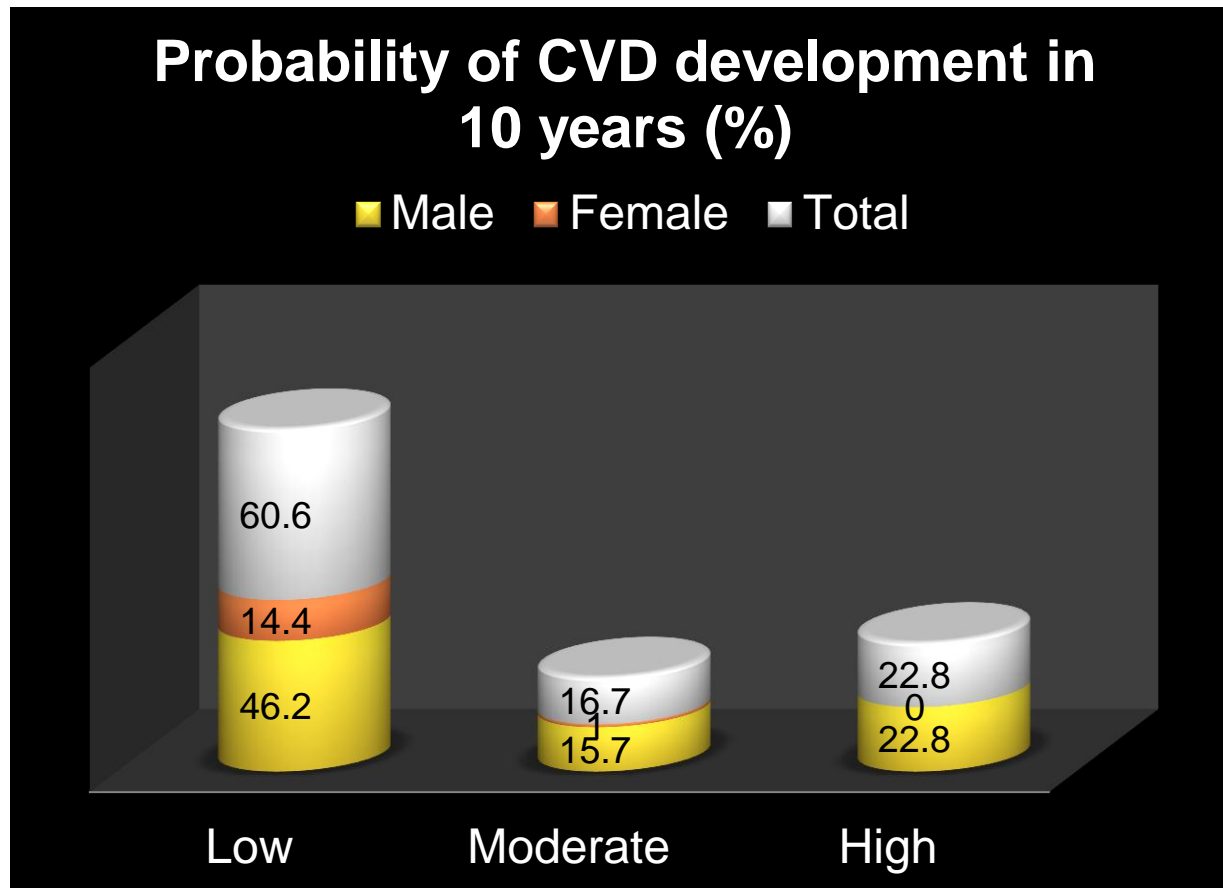
## Prior medical condition

■ Male ■ Female ■ Total



# Results

- RAMA EGAT score



Gender differences :  $p < 0.001$

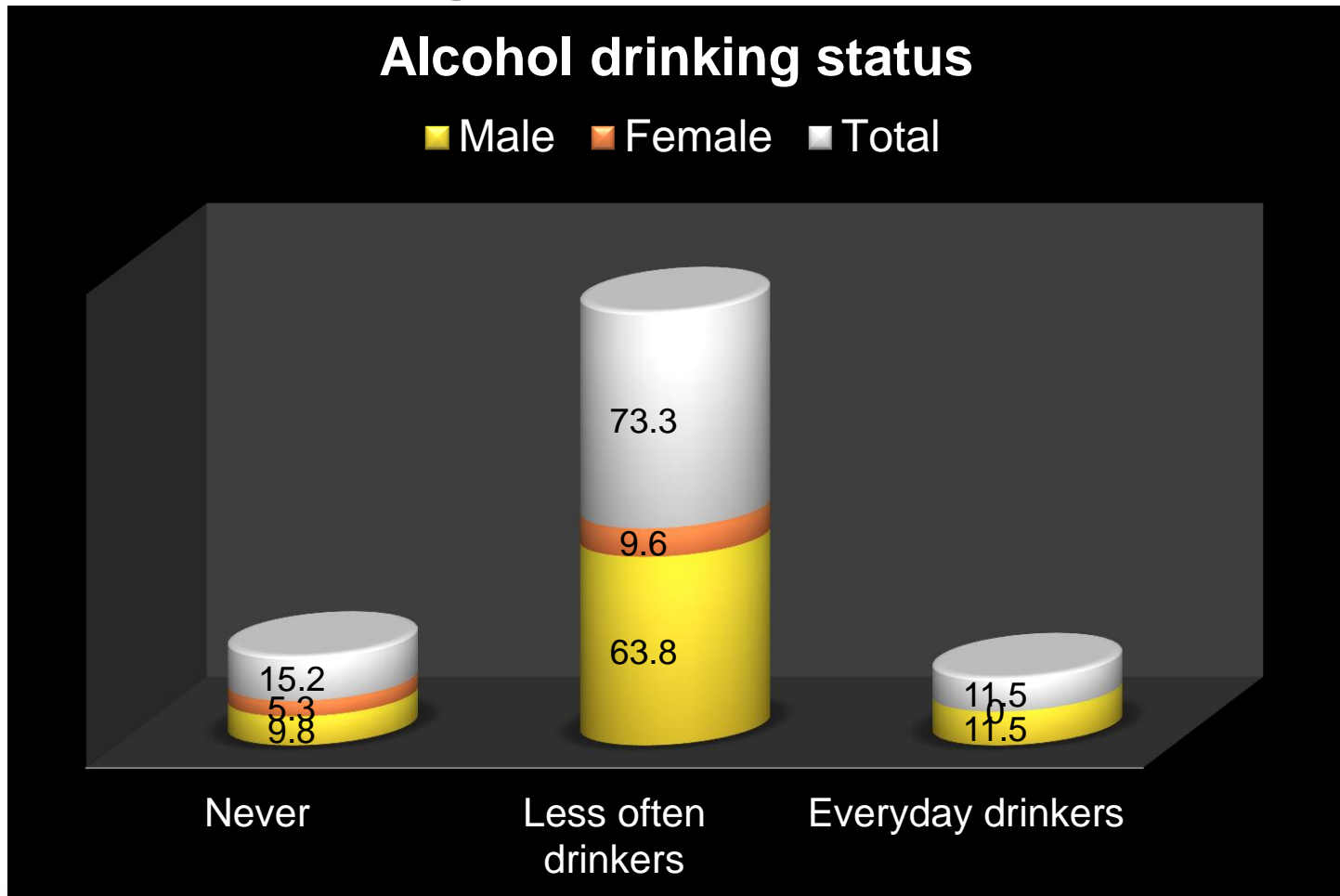
# Results

- Smoking status



# Results

- Alcohol drinking status





# Results

- **Eating Habit : Food Frequency Score (26 of food items and total score =130)**

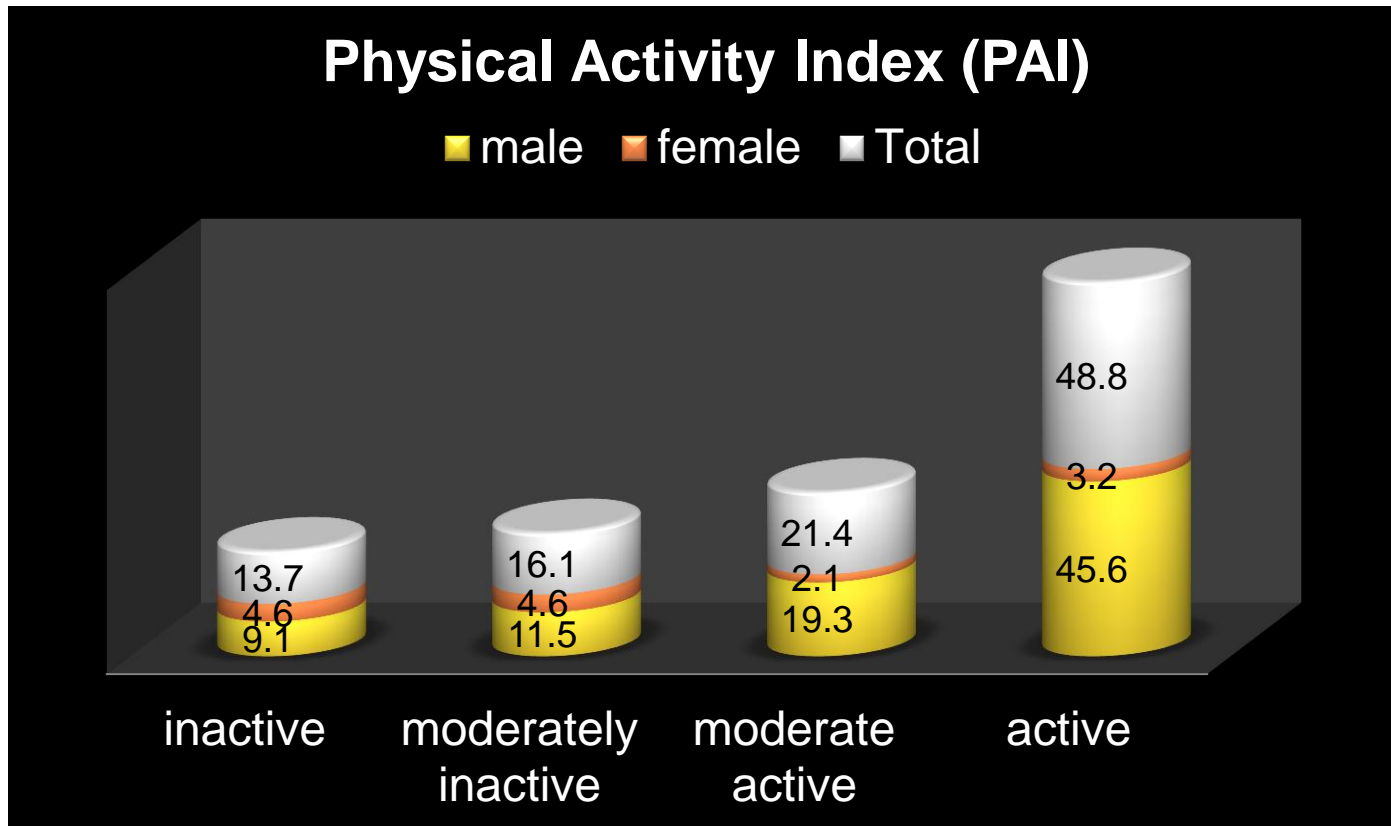
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<b>Food Frequency Score</b>		<b>Total</b> (n = 376)	<b>Male</b> (n = 323)	<b>Female</b> (n= 53)	<b>P-value</b>
<b>Total score</b>	mean (SD)	65.5 (14.8)	66.2 (14.7)	61.5 (15.2)	0.034
	Range	(26, 114)	(26, 104)	(32, 114)	

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# Results

- General Practice Physical Activity Questionnaire :  
Physical Activity Index (PAI)

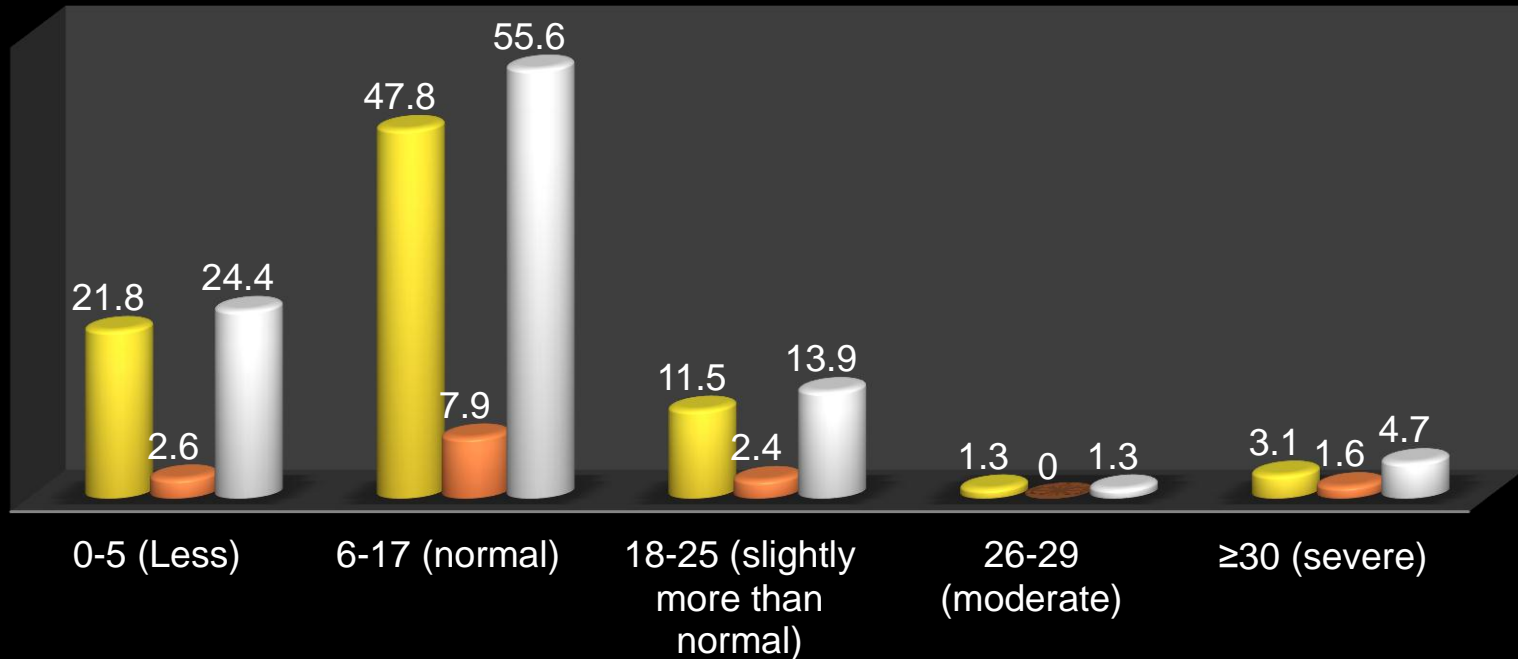


# Results

- **Stress Levels**

## Stress Assessment

■ male ■ female ■ total



# Results

- The stress levels had significant negative correlation with **age** ( $r = -0.106$ ;  $p = 0.039$ ) and **income** ( $r = -0.132$ ;  $p = 0.011$ ).
- **Diabetes** ( $r = 0.107$ ;  $p = 0.037$ ) and **coronary heart disease** ( $r = 0.102$ ;  $p = 0.048$ ) were found with the significant positive correlation.
- The stress levels also had significant association with **Food frequency score** ( $r = 0.258$ ;  $p < 0.001$ ).

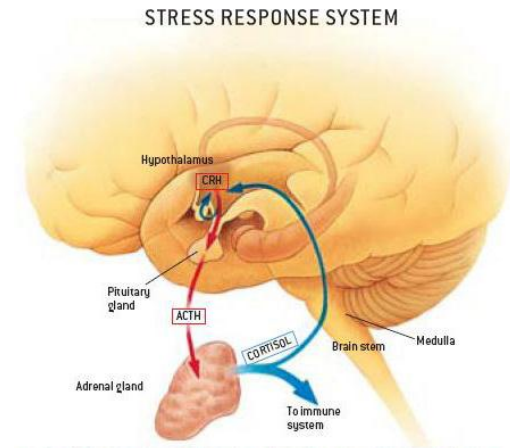
# Discussion

- Age and income may affect stress response.
- Stress may have response patterns in disease development, particularly diabetes and coronary heart disease.
- Stress also had associated with eating behavior.



# Discussion

- Continued stress can increase cortisol level, stimulating feelings of hunger.
- Cortisol is responsible for cravings for sugar and high fat foods. It also **contributes to the formation of abdominal fat, and increase the greater risk for cardiovascular disease, increased blood pressure and Type II diabetes.**



Scott E (2011)

# Conclusion

- Stress may play an important role in the risk of developing cardiovascular diseases among the employees.
- CVD is a multifactorial disease and its associated risk factors should be improved through preventive strategies.





# Acknowledgements

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- ❖ **EGAT staff:** Orawan Chaisantikulwat, R.N.
- ❖ **Participants:** Employees at South Bangkok Power Plant of EGAT
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