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

Presented by

Ms. Pajaree Abdullakasim
Ph.D. candidate in Public Health,
College of Public Health Science, Chulalongkorn University
14 December 2012
October 15 – 17, 2012: **Oral presentation in subtheme Cardiovascular disease at The 44th 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.**
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)

- ประสิทธิผลของโครงการองค์กรสุขภาพดีด้วยกระบวนการให้การสนับสนุนแบบมีส่วนร่วมต่อการลดปัจจัยเสี่ยงของการเกิดโรคหัวใจและหลอดเลือดในพนักงานการไฟฟ้าฝ่ายผลิตแห่งประเทศไทย
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.

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.
Study Samples: General characteristics

- 384 employees (75.7% of total employees),
- Aged 22 – 60 years (mean ± SD; 48.1 ± 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:
- Engineer: 21%
- Technician: 52%
- Administrator: 11%
- Administrative staff: 3%
- Professional staff: 5%
- Accountant: 4%
- Others: 4%

Income:
- ≤10,000: 3%
- 10,000-19,999: 9%
- 20,000-39,999: 13%
- 40,000-59,999: 23%
- 60,000-99,999: 23%
- ≥100,000: 46%
Results

- Health Status

**Prior medical condition**

<table>
<thead>
<tr>
<th>Condition</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diabetes</td>
<td>11.7</td>
<td>13.8</td>
<td>13.8</td>
</tr>
<tr>
<td>Hypertension</td>
<td>27.3</td>
<td>3.1</td>
<td>30.5</td>
</tr>
<tr>
<td>Hypercholesterolemia</td>
<td>34.6</td>
<td>3.9</td>
<td>38.5</td>
</tr>
<tr>
<td>Coronary heart diseases</td>
<td>3.6</td>
<td>1.0</td>
<td>4.7</td>
</tr>
</tbody>
</table>
Results

- RAMA EGAT score

Probability of CVD development in 10 years (%)

<table>
<thead>
<tr>
<th></th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>60.6</td>
<td>14.4</td>
<td>46.2</td>
</tr>
<tr>
<td>Moderate</td>
<td>16.7</td>
<td>15.7</td>
<td>16.7</td>
</tr>
<tr>
<td>High</td>
<td>22.8</td>
<td>0</td>
<td>22.8</td>
</tr>
</tbody>
</table>

Gender differences: $p < 0.001$
Results

- Smoking status

<table>
<thead>
<tr>
<th>Smoking status</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never smoked</td>
<td>40.6</td>
<td>14.4</td>
<td>55.1</td>
</tr>
<tr>
<td>Past smokers</td>
<td>27</td>
<td>0.3</td>
<td>27.3</td>
</tr>
<tr>
<td>Less often smokers</td>
<td>0</td>
<td>0.3</td>
<td>0.3</td>
</tr>
<tr>
<td>Everyday smokers</td>
<td>14.2</td>
<td>0</td>
<td>14.2</td>
</tr>
</tbody>
</table>
Results

- Alcohol drinking status

<table>
<thead>
<tr>
<th>Alcohol drinking status</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never</td>
<td>15.2</td>
<td>9.8</td>
<td>9.8</td>
</tr>
<tr>
<td>Less often drinkers</td>
<td>73.3</td>
<td>9.6</td>
<td>9.6</td>
</tr>
<tr>
<td>Everyday drinkers</td>
<td>11.5</td>
<td>11.5</td>
<td>11.5</td>
</tr>
</tbody>
</table>
Results

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

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

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

<table>
<thead>
<tr>
<th></th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inactive</td>
<td>13.7</td>
<td>4.6</td>
<td>9.1</td>
</tr>
<tr>
<td>Moderately Inactive</td>
<td>16.1</td>
<td>4.6</td>
<td>11.5</td>
</tr>
<tr>
<td>Moderate</td>
<td>21.4</td>
<td>2.1</td>
<td>19.3</td>
</tr>
<tr>
<td>Active</td>
<td>48.8</td>
<td>3.2</td>
<td>45.6</td>
</tr>
</tbody>
</table>
Results

• Stress Levels

<table>
<thead>
<tr>
<th>Stress Level</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-5 (Less)</td>
<td>21.8</td>
<td>2.6</td>
<td>24.4</td>
</tr>
<tr>
<td>6-17 (normal)</td>
<td>24.4</td>
<td>47.8</td>
<td>7.9</td>
</tr>
<tr>
<td>18-25 (slightly more than normal)</td>
<td>55.6</td>
<td>11.5</td>
<td>13.9</td>
</tr>
<tr>
<td>26-29 (moderate)</td>
<td>1.3</td>
<td>0</td>
<td>1.3</td>
</tr>
<tr>
<td>≥30 (severe)</td>
<td>3.1</td>
<td>1.6</td>
<td>4.7</td>
</tr>
</tbody>
</table>
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

- **Advisor:** Ratana Somrongthong, Ph.D.
- **Co-Advisor:** Piyamitr Sritara, M.D.
- **EGAT staff:** Orawan Chaisantikulwat, R.N.
- **Participants:** Employees at South Bangkok Power Plant of EGAT
- **Research grants:** The Office of the Higher Education Commission, Ministry of Education and the 90th anniversary of Chulalongkorn University fund (Ratchadaphiseksomphoth Endowment Fund).