

THE ROAD MAP OF OCCUPATIONAL HEALTH RESEARCH OF GADJAH MADA UNIVERSITY SCHOOL OF
MEDICINE, YOGYAKARTA, INDONESIA

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INTRODUCTION

There are so many things that already happened in the industries that need to be taken into account, for instances :

- The risk factors of productivity
- The relationship between ergonomic position of labour and its productivity
- The influence of nutritional intake of labour to the labor's health level
- The different salary between male and female labor in relation to their productivity
- And so on.

In the context above there are many limitations to do research because of many aspects that need also to be considered deeply, for instances :

- Budget limitations
- The weakness of research methodology
- Time limitations
- Acceptance limitations
- And the like

Below is a summary of some selected researches report that already done by post graduate and Ph.D student of Gadjah Mada University School of Medicine that based on Occupational Health or Occupational Medicine.

METHOD & DISCUSSION

There will be used some researches findings of Gadjah Mada University School of Medicine's thesis and dissertation to show the variations of researches that ever been made as below :

1. Esau, Sarto & Maurits (2002)

The Amount of Mercury in emission & ambient with the amount of Mercury in Urine of people in the community around PT.GE Lighting Indonesia, Jogjakarta:

This is a cross-sectional research design that used 39 respondents that lived surround the industry more than 6 years. The amount of Hg were measured using Cold Vapor Atomic

Absorption Spectrophotometry. The statistical analysis that used was Anova test between the amount of ambient Hg and residence distance.

| Distance In metre | Hg of Urine Concentration (ppm) | |
|----------------------|---------------------------------|--------|
| | South | North |
| 20 | 0,0050 | 0,0024 |
| 40 | 0,0022 | 0,0016 |
| 140 | 0,0005 | 0,0002 |
| Rate | 0,0026 | 0,0014 |

Source : Esau et al (2002)

The above table is giving information that the nearest distance from the industry, then the higher Hg in urine will be, or the farthest the distance from the industry, then the smallest of Hg in urine will be.

Distribution frequency of Hg in the community's urine

| Hg in urine (ppm) | Number of People |
|-------------------|------------------|
| 0,0-0,9 ppm | 19 |
| 0,1-1,9 | 6 |
| 2,0-2,9 | 10 |
| 3,0-3,9 | 1 |
| 4,0-4,9 | 2 |
| 5,0-5,9 | 1 |

Source : Esau et al (2002)

The above table is giving information that there are many people that polluted by Hg in the community.

Statistical Analysis Results

| Variables | Corelation Coeficient | P |
|-----------------------------|-----------------------|-------|
| Hg ambient- distance | -0,8231 | 0,000 |
| Hg ambient – Hg urine | 0,7887 | 0,000 |
| Hg urine – distance | -0,7782 | 0,000 |
| Hg urine – length of living | -0,0106 | 0,092 |
| Hg urine – age | -0,0612 | 0,886 |

Source : Esau et al (2002)

The table is saying that Hg ambient and distance are related significantly, Hg ambient and Hg urine also related significantly, Hg urine and length of living are also related significantly.

2. Widodo; Ismail & Sutomo (2005) :

ATTITUDE, MANAGEMENT SUPPORT TO THE OCCUPATIONAL HEALTH AND SAFETY PROGRAM, PERSONAL PROTECTIVE EQUIPMENT AND OCCUPATIONAL SKIN DISEASE OF PT. ELITE PRESTIGE FURNITURE OF YOGYAKARTA.

Regression Statistic Results of Labor's attitude, the Use of PPE and Management's support to Occupational Skin Disease in PT. Elite Prestige Furniture of Yogyakarta 2005

| Variable | Koef. Beta | Standard Beta | SB | r-parsial | t | p |
|----------------------|---------------|---------------|----------|-----------|---------|-------|
| Konstanta | 57,5258 | 0,0000 | | | | |
| Attitude | -0,247848 | -0,247848 | 0,014019 | -0,559 | -17,679 | 0,000 |
| The Use of PPE | -0,036523 | -0,036523 | 0,013019 | -0,116 | -2,805 | 0,006 |
| Management's Support | -0,014057 | -0,014057 | 0,017067 | -0,052 | -0,824 | 0,583 |
| | R Correlation | = 0,847 | | | | |

Source : Widodo; Ismail & Sutomo (2005)

The above table is saying that attitude and the use of PPE are significant statistically to contribute the happening of Occupational Skin Disease.

3. Rantung; Maurits & Boediman (2009):

THE CORRELATION BETWEEN WORK HOUR, SHIFT WORK AND NUTRITIONAL STATUS WITH OCCUPATIONAL FATIGUE OF CLINICAL LABORATORY EMPLOYEES (The Case Study of Prodia Clinical Laboratory Employees of Manado, Indonesia)

Chi Square Results on the Relationship of work duration, shift work and nutritional level and Occupational Fatigue

| Variables | | Occ. Fatigue | Chi Square | P |
|-------------------|-----------|--------------|------------|-------|
| Work Duration | 8 hours | Fatigue | 0,407 | 0,523 |
| | ➤ 8 hours | not fatigue | | |
| Shift Work | Morning | Fatigue | 0,025 | 0,875 |
| | Afternoon | not fatigue | | |
| Nutritional Level | normal | fatigue | 0,020 | 0,886 |
| | abnormal | not fatigue | | |

Source : Rantung; Maurits & Boediman (2009)

The above table is saying that work duration, shift work and nutritional level of labors did not have any relation to occupational fatigue.

4. Pratiknya; Rasimin & Sutomo (1992) :

INTERACTIVE INFLUENCES BETWEEN PHYSICAL QUALITY AND NON PHYSICAL QUALITY TO WORK PRODUCTIVITY : STUDY ON THE LABORS OF NORTH SUMATRA AND CENTRAL JAVA.

Food intake----- · Nutrition level----- · Labor's productivity
Prestation motive

Work's satisfy
 Kind of job
 Sex
 Age
 Education
 Salary
 Marital status (Lingkungan social)
 Infeksi parasit (Lingkungan fisik/ biotic)
 Etc.

Regression Analysis Results of the Influence of Physical and Non Physical to Labors Productivity

| Variables | Physical and non physical | | | |
|--------------------|---------------------------|----------------|-----------------------|------------------------|
| | Calory Intake | Protein Intake | Satisfy In working | Prestation's motive |
| BOOK KEEPER | | | | |
| Anemia | - | - | - | - |
| Hb normal | + | + | + | + |
| SOIL STONE MAKER | | | | |
| Anemia | - | - | - | - |
| Hb normal | - | - | - | - |
| CIGARETTE MAKER | | | | |
| Anemia | - | - | - | - |
| Hb normal | ++ | ++ | + | + |
| SOIL CEILING MAKER | | | | |
| Anemia | - | - | - | ++ |
| Hb normal | - | - | + | - |

Source : Pratiknya; Rasimin & Sutomo (1992)

(+ = significant; ++ = Very significant ; - = not significant)

The above table is saying that the influence of food intake (calory and protein) to labors productivity is only happening to skilled healthy labors (not anemia, book keeper and cigarette maker). In addition, to the anemic and rough worker (soil stone maker and soil ceiling maker) its variable can not influence to their productivity.

Multiple Regression Analysis Results Based on Occupation and Gender

| Occupation | Statistic Results | Male | Female |
|-------------|-------------------|------------|------------|
| | | (n = 33) | (n = 99) |
| BOOK KEEPER | F | 1,65 | 2,42 |
| | P | 0,1800 (-) | 0,0325 (*) |
| | R square | 2,2344 | 0,1362 |

| | | | |
|--------------------|----------|-------------|-------------|
| SOIL STONE MAKER | F | 2,76 | 2,11 |
| | P | 0,0199 (**) | 0,0629 (-) |
| | R square | 0,2220 | 0,1531 |
| SOIL CEILING MAKER | F | 7,86 | 6,72 |
| | P | 0,0000 (**) | 0,0001 (**) |
| | R square | 0,3204 | 0,5147 |

Source : Pratiknya; Rasimin & Sutomo (1992)

(-) not significant; (*) significant; (**) very significant

The conclusion :

1.The influence of physical quality to labors productivity was interacted with calory and protein intake. When labors have a low level of physical quality, then food intake influence to is not clear compare to labors who have good physical quality that can be seen from normal level of haemoglobine

2.The influence of physical quality of labors to productivity were interacting with working satisfy factor and prestation's motive.When the labors have low level physical quality (low level of Hb), then the psychological factors (working satisfy and prestation's motive) influence does not clear compared to labors who have high level of physical quality.

3.The above results reporting that there are some different models of interaction of food intake and psychological factors to both gender and occupation in its relation to labor's productivity

5.Hariyani; Wilopo & Husodo (2006)

PRIMARY INFERTILITY OF WOMAN LABOR OF CIGARETTE FACTORY AT NGASEM PRIMARY HEALTH CARE, KEDIRI REGENCY, EAST JAVA PROVINCE, INDONESIA.

The relationship between Tobacco Exposure and Primary Infertility

| Variable | Infertile | | Not Infertile | | n | df | P | RR | CI 95% |
|------------------|-----------|-----|---------------|------|-----|-------|------|-----|-----------|
| | N | % | n | % | | | | | |
| Tobacco Exposure | | | | | | | | | |
| Yes | 12 | 2.6 | 218 | 47.4 | 230 | 0.470 | 0.49 | 1.5 | 0.61-3.66 |
| No | 8 | 1,7 | 222 | 48,3 | 230 | | | | |

Source : Hariyani;Wilopo & Husodo (2006)

The table is saying that the prevalence of Primary Infertility of labors who work in the industry was 5.21%,on the other hand, the prevalence of Primary Infertility of labors who did not work in industry was 3.47%.The risk of having primary infertility of cigarette woman labors was 1.5 compared to non cigarette woman labors, but it was statistically not significance (X square = 0.470; P = 0.49).

The Relationship Among length of working, (years), working duration (hour/day) and exposure to Cigarette to Primary Infertility of the Cigarette Maker of Kediri, East Java, Indonesia, 2006

| Variable of independent | infertile | | not infertile | | total | X square | P | RR | CI 95% |
|-------------------------|-----------|---|---------------|---|-------|----------|---|----|--------|
| | n | % | n | % | | | | | |
| | | | | | | df | | | |

| | | | | | | | | | |
|-------------------|-------|----|------|-----|-------|------|------|------|----------------|
| LENGTH OF WORKING | | | | | | 2.49 | 0.28 | | |
| 5-10 | Years | 7 | 1.5 | 208 | 45.2 | 215 | 1 | 1 | |
| 11-15 | years | 2 | 0.4 | 67 | 14.6 | 69 | | 0.89 | 0.19-4.19 |
| More than 15 | years | 11 | 2.4 | 165 | 35.9 | 176 | | 1.92 | 0.76-4.85 |
| WORKING DURATION | | | | | | 0.64 | 0.72 | | |
| 20-36 | hours | 15 | 3.26 | 293 | 63.69 | 308 | 2 | 1 | |
| 37-48 | hours | 2 | 0.43 | 66 | 14.35 | 68 | - | - | 0.6 0.14-2.58 |
| More than 48 | hours | 3 | 0.65 | 81 | 17.61 | 84 | - | - | 0.73 0.22-2.47 |
| INTENSITY | | | | | | 1.58 | 0.45 | | |
| Non | | 8 | 1.7 | 222 | 48.3 | 230 | 2 | - | 1 |
| Low | | 3 | 0.6 | 79 | 17.2 | 82 | | 1.05 | 0.29-3.87 |
| High | | 9 | 1.9 | 139 | 30.2 | 148 | | 1.75 | 0.69-4.43 |

Source :Hariyani; Wilopo & Husodo (2006)

Table above is saying that labors who works 11-15 years are having risk to have primary infertility (RR 0.89 CI 95% 0.19-4.19). Whereas for labors who work more than 15 years having risk of primary infertility 1.92 (CI 95% 0.76- 4.85) compared to woman labors who works 5-10 years, even though it was statistically not significance (X square 2.49; P = 0.28).

Based on the working hours, the table shows that working hours/ week do not increase the risk to have primary infertility (RR 0.6 CI 95% 0.14-2.58; RR 0.73 CI 95% 0.22-2.47), but statistically it was not significance to have primary infertility (X square = 0.64; P = 0.72).

The above table also shows that the high intensity of exposure is increasing the risk of having primary infertility 1.75 (CI 95% 0.69-4.43) compared to those who do not exposed by cigarette, even though statistically not significance (X square = 1,58; P = 0.45)

6. Bongakaraeng; Maurits & Hadi (2005):

THE USED OF ERGONOMIC CHAIR TO DECREASE PAIN SIMPTOM AND WORKING STRESS OF INCANDESCENT DEPARTMENT'S LABORS OF PT.GE LIGHTING INDONESIA

Results of t-test of mean difference of work stress between Pre-test and Post test

| Variable | Intervention Group | Mean | SD | Decrease (%) | t | P |
|-------------|--------------------|--------|-------|--------------|-------|-------|
| Work Stress | Pre-test | 52.238 | 11.93 | 16.24 % | 7.385 | 0.000 |
| | Post-test | 43.762 | 7.266 | | | |
| Physical | Pre-test | 19.238 | 5.069 | 20.5 % | 5.862 | 0.000 |
| | Post-test | 15.286 | 2.411 | | | |
| Attitude | Pre-test | 17.000 | 4.416 | 11.76 | 5.045 | 0.000 |
| | Post-test | 15.000 | 3.225 | | | |

| | | | | | | |
|-----------|-----------|--------|-------|---------|-------|-------|
| Emotional | Pre-test | 16.000 | 4.572 | 15.75 % | 4.448 | 0.000 |
| | Post-test | 13.476 | 2.713 | | | |

Source : Bongakaraeng; Maurits & Hadi (2005)

This was an experimental research with the pre test post test one group design that conducted subjects of 21 employees from July 21st to August 20th 2004. Data was analysed using SPSS 2000. The result of the correlated t-test showed the really significant painful complain reduction between the pre-test group (mean = 43.14) and post-test group (mean = 24.14) with $t = 11.771$; $P = 0.000$. The result of the correlated t-test showed the very significant work stress reduction between the pre-test group (mean = 52.238) and post test group (mean = 43.762) with the value of $t = 7.385$; $P = 0.000$

7. Adi Heru Sutomo (2001)

THE INFLUENCE OF PHYSICAL QUALITY OF WOMAN LABORS, INDOOR ENVIRONMENT AND TRANSPORTATION TO LABORS PRODUCTIVITY

(Study on the indoor and outdoor environment of PT Gudang Garam cigarette factory, Kediri Regency, East Java, Indonesia)

Using Path Analysis the results is as below :

| Variable | Z test |
|---|----------|
| Environmental Quality (Indoor & Outdoor) to Work Motivation | 0.4221 |
| Environmental Quality to Physical Quality of Labors | 0.5286 |
| Transportation Quality to Physical Quality of Labors | 0.8465 |
| Transportation Quality to Environmental Quality | 2.4547 |
| Physical Quality of Labors to Work Motivation | - 0.8550 |
| Work Motivation to Work's Prestation | - 0.2766 |
| Work's prestation to Work Productivity | 55.3759 |
| Physical Quality of Labors to Work's prestation | 1.0052 |
| Physical Quality of Labors to Work Efficiency | -0.0309 |
| Work Efficiency to Work Productivity | -0.1422 |

Source : Sutomo (2001)

The above model is having Goodness of Fit Index (GFI) 0.9883 that near to 1.0 and Chi Square of 0.07505 which is bigger than 0.05 it means that the model is fit to data. Then the results telling that labor's productivity will be increased if :

1. Labor's prestation is increased, and it is significant statistically ($Z > 2.0$)
2. Work efficiency is erased, but statistically not significant ($Z < 2.0$)

Work's prestation will be increased if :

1. physical quality of labors are increased, eventhough not significant statistically ($Z < 2.0$)
2. Eventhough work's motivation decreasing, but statistically not significant ($Z < 2.0$)

It means that physical quality of labors giving positive influence and indirect to work productivity, eventhough not significant statistically.

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