

## Workplace Stress, Physical Activity and Eating Behavior and Its Relation to Obesity among Medical and Paramedical Staff

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### ABSTRACT:

#### BACKGROUND:

Obesity is a medical condition in which excess body fat has accumulated to the extent that it may have a negative effect on health. Obesity increase the likelihood of various diseases and conditions, particularly cardiovascular diseases, type 2 diabetes, obstructive sleep apnea, certain types of cancer, osteoarthritis and depression

#### OBJECTIVE:

To clarify the effect of work place stress , physical activity and eating behavior as determinants of obesity.

#### SUBJECTS AND METHOD:

A cross-sectional study with an analytic element, was conducted in eight hospitals and primary health care centers in al-Najaf city selected by a convenient non randomized sampling technique during the period from 1<sup>st</sup> of April 2018 through 31 December 2018. The total sample of study was 350 medical and paramedical staff .a self rated questionnaire was filled by participants regarding their work place stress , physical activity and eating behavior, weight and height was measured and BMI was calculated .

#### RESULT :

the rate of obesity was 10.3% and the rate of overweight was 42.3% . The study show that there is no significant association between workplace stress and eating behavior with obesity while significant association found between obesity and physical activity

#### CONCLUSION:

Physical activity has an important role in the prevention of obesity , greater percentage of participants have normal BMI, greater percentage of participants have controlled eating. greater percentage of participants have low physical activity.

**KEY WORDS:** workplace stress, physical activity, eating behavior.

### INTRODUCTION:

People are considered obese when their body mass index (BMI), which is a measurement obtained by dividing the weight of person by the square meter of the height, is over or equal to 30 kg/m<sup>2</sup>, the range 25–29.9 kg/m<sup>2</sup> is defined as overweight.<sup>(1)</sup>

In Iraq, according to the chronic non communicable diseases risk factor survey in 2015 One third of the respondents were obese (33.5%), nearly another third were overweight (31.9%). Obesity was more prominent among women. Recently it is believed that obesity not necessary an indicator of affluence. It is partly due to consumption of unhealthy diet in addition to inadequate physical activity.<sup>(2)</sup>

### Factors affecting body weight:

#### Workplace stress

Stress is anything that poses a threat or challenge to the human. It has been defined as a process in which environmental demands exceed the adaptive capacity of a person , resulting in biological and psychological changes that may place persons at risk for diseases such as obesity.<sup>(3)</sup>

Work stress may contribute to obesity, also may influence eating behavior to lead to obesity. Work-related stress is reported to be associated with increased fatty food intake, which will lead to obesity.<sup>(4)</sup>

#### Physical activity

It is body movement that produced by contraction of the skeletal muscles and substantially increases energy expenditure. It includes sport and activities such as walking, cycling , cleaning the house and climbing the stairs, thus it is a part of daily life. In contrast to

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this, physical inactivity or sedentary life style is a major cause of diseases, disability and death. Approximately two million deaths every year are attributable to the physical inactivity, and results from WHO study on risk factors suggest that the sedentary life style is one of the ten leading causes of disability and deaths in the world.<sup>(5,6)</sup>

### **Eating behavior**

Determinants of weight gain that lead to overweight and obesity are clearly multifactorial and include both environmental and genetic factors. The most important dietary factors that are most often associated with overweight and obesity are: high fat intake,<sup>(7)</sup> overconsumption of energy-dense foods,<sup>(8)</sup> and based on recent research, diet rich in carbohydrate with high glycemic index compared to those with low glycemic index.<sup>(9)</sup> There are a number of determinants of weight gain during adulthood, although the key factor appears to be an environment that hasten a sedentary lifestyle and encourage dietary intake and eating behaviors linked to positive energy balance.

### **OBJECTIVES:**

- 1- to clarify the effect of the workplace stress as determinant of obesity.
- 2- To study the effect of the physical activity as determinant of obesity.
- 3- To clarify the effect of the eating behavior as determinant of obesity.
- 4- To find out which factor more influencing development of obesity.

### **SUBJECTS AND METHOD:**

a cross-sectional study with an analytic element was conducted in eight hospitals and primary health care centers in al-Najaf city during the period from 1<sup>st</sup> of April 2018 through 31 December 2018, the target population including all medical and paramedical staff working in the selected hospitals and primary health care centers regardless of their gender, age and specialty, excluding all pregnant health care workers. The eight hospitals and primary health care centers in al-Najaf city were selected by a convenient non-randomized sampling technique and any

health care worker who agree to participate was included in the study. The data was collected on average two to three times per week during a period from first of April to 30<sup>th</sup> of June using a self administered questionnaire form:

- Karlsson et. Al, 2000 for eating behavior. <sup>(10)</sup> 18 questions regarding the participant's eating behavior.
- The Job Stress Questionnaire.<sup>(11)</sup> 29 questions regarding psychological and physical stress of the participants
- The questionnaire of Baecke et al .for physical activity.<sup>(12)</sup> questions regarding the physical activity at work ,sport index and leisure time index.
- The questionnaire was filled by the participants after a brief interview.

### **Sample size calculation:**

The estimated sample size was 280 as a minimum according to the following equation: Estimated sample size (n)=  $z^2 * p(1-p) / w^2$  (Confidence interval corresponded to 95%) Z is equal to 1.96

P <sup>(13)</sup> percentage of estimated prevalence) that obtained from a previous study which is equal to (0.24)

W (margin of error which was selected to be 0.05)

$$n = (1.96)^2 * 0.24 * (1 - 0.24) / (0.05)^2$$

### **Statistical analysis**

The analysis of the data was carried out using the available statistical packages for social science version 20 (spss-20.0). data were presented in form of tables, numbers and percentages.

Chi-square test ( $\chi^2$ -test) was used for testing the significance of association between variables under study.

Statistical significance was considered whenever the p value was equal to or less than 0.05.

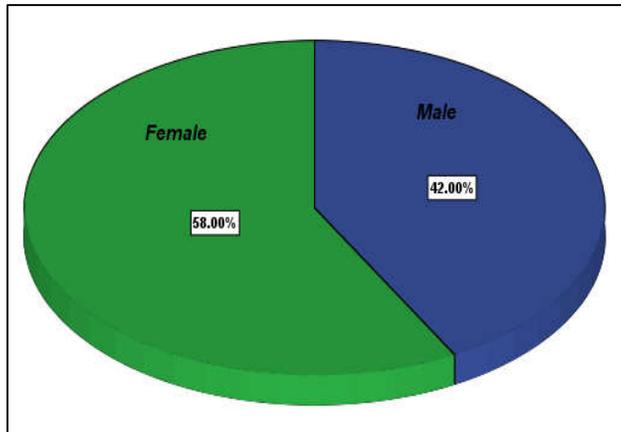
### **RESULTS:**

The total sample included in the study was 350 medical and paramedical staff, the distribution of study sample according to the sociodemographic characteristics shown in table (1)

**Table -1: sociodemographic characteristics of participants.**

|                       |              | Frequency | Percent% |
|-----------------------|--------------|-----------|----------|
| Age/years             | 20-30        | 135       | 38.6     |
|                       | 31-40        | 130       | 37.1     |
|                       | 41-50        | 60        | 17.1     |
|                       | >50          | 25        | 7.1      |
|                       | Total        | 350       | 100.0    |
| BMI kg/m <sup>2</sup> | Under weight | 2         | 0.6      |
|                       | Normal       | 164       | 46.9     |
|                       | Over weight  | 148       | 42.3     |
|                       | Obese        | 36        | 10.3     |
|                       | Total        | 350       | 100.0    |
| Marital status        | Single       | 95        | 27.1     |
|                       | Married      | 253       | 72.3     |
|                       | Divorced     | 2         | .6       |
|                       | Total        | 350       | 100.0    |
| job                   | Doctor       | 171       | 48.9     |
|                       | Dentist      | 30        | 8.6      |
|                       | Pharmacist   | 64        | 18.3     |
|                       | Nurse        | 85        | 24.3     |
|                       | Total        | 350       | 100.0    |
| Work place            | Hospital     | 191       | 54.6     |
|                       | PHC          | 159       | 45.4     |
|                       | Total        | 350       | 100.0    |

The distribution of study sample according to gender shown that the majority were females 203(58%) and others males 147(42%) as shown in figure (2)



**Figure -2: Gender distribution of participants.**

The mean age  $\pm$  SD of participants was 35.1 $\pm$ 9.25, range (22-65) year. The result show that the participants who have controlled eating (total restraint; constantly limiting food intake and never “giving in”), were 246(70.3%) and the other have uncontrolled eating (eating whatever you want, whenever you want it 104 (29.7%)

Half of participants who have controlled eating had BMI  $\geq$ 25 kg/m<sup>2</sup> and other half had BMI <25 kg/m<sup>2</sup>, while those who have uncontrolled eating divided in to 60 (57.7%) with BMI  $\geq$ 25 kg/m<sup>2</sup> and 44 (42.3%) with BMI <25 kg/m<sup>2</sup>, so there is no significant association between eating behavior and BMI as shown in table (3)

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**Table -3: Distribution of eating behavior and body mass index.**

|                 |                   | BMI kg/m <sup>2</sup> |       | Total  | X <sup>2</sup> | P value |
|-----------------|-------------------|-----------------------|-------|--------|----------------|---------|
|                 |                   | ≥25                   | <25   |        |                |         |
| Eating behavior | controlled eating | 123                   | 123   | 246    | 1.73           | 0.188   |
|                 |                   | 50.0%                 | 50.0% | 100.0% |                |         |
|                 | Uncontrolled      | 60                    | 44    | 104    |                |         |
|                 |                   | 57.7%                 | 42.3% | 100.0% |                |         |
| Total           |                   | 183                   | 167   | 350    |                |         |
|                 |                   | 52.3%                 | 47.7% | 100.0% |                |         |

Regarding the workplace stress(physical and psychological) of study participants ,the study sample show that the majority 322 (92%) suffering from physical stress(a number of symptoms that health care workers can develop during work such as feeling dizzy, joint ache and headache) as compared to 28 (8%) have no stress.

Of those who have physical stress 168 (52.2%) have BMI ≥25 kg/m<sup>2</sup> and 154(47.8%) have BMI <25 kg/m<sup>2</sup> . and of those who don't have physical stress 15(53.6%) have BMI ≥25 kg/m<sup>2</sup> and 13(46.4%) have BMI <25 kg/m<sup>2</sup> , no significant association between physical stress and elevated BMI as shown in table (4)

**Table -4: Distribution of workplace physical stress and body mass index.**

|                          |                      | BMI kg/m <sup>2</sup> |       | Total  | X <sup>2</sup> | P Value |
|--------------------------|----------------------|-----------------------|-------|--------|----------------|---------|
|                          |                      | ≥25                   | <25   |        |                |         |
| score of physical stress | physical stress(≥25) | 168                   | 154   | 322    | 0.02           | 0.887   |
|                          |                      | 52.2%                 | 47.8% | 100.0% |                |         |
|                          | no physical stress   | 15                    | 13    | 28     |                |         |
|                          |                      | 53.6%                 | 46.4% | 100.0% |                |         |
| Total                    |                      | 183                   | 167   | 350    |                |         |
|                          |                      | 52.3%                 | 47.7% | 100.0% |                |         |

Regarding workplace psychological stress 140(40%) of participants suffering from psychological stress (a number of psychological symptoms that health care workers can develop during work such as irritability, feeling angry and anxiety) whereas 210(60%) have no stress

Of those who have psychological stress 70(50%) have BMI ≥25 kg/m<sup>2</sup> and 70(50%) have BMI <25 kg/m<sup>2</sup> , and of those who don't have psychological stress 113(53.8%) have BMI ≥25 kg/m<sup>2</sup> and 97(46.2%) have BMI <25, no significant association between psychological stress and elevated BMI as shown in table (5)

**Table -5: Distribution of workplace psychological stress and body mass index.**

|                      |                  | BMI kg/m <sup>2</sup> |       | Total  | X <sup>2</sup> | P. Value |
|----------------------|------------------|-----------------------|-------|--------|----------------|----------|
|                      |                  | ≥25                   | <25   |        |                |          |
| psychological stress | stress(score≥51) | 70                    | 70    | 140    | 0.489          | 0.485    |
|                      |                  | 50.0%                 | 50.0% | 100.0% |                |          |
|                      | no stress        | 113                   | 97    | 210    |                |          |
|                      |                  | 53.8%                 | 46.2% | 100.0% |                |          |
| Total                |                  | 183                   | 167   | 350    |                |          |
|                      |                  | 52.3%                 | 47.7% | 100.0% |                |          |

Regarding physical activity of participants, the total study sample show that the participants who have low physical activity 243(69.4%) ,others have high physical activity 107(30.6%) as shown in table (6). Of those who have low physical activity 138(56.8%) have BMI ≥25

kg/m<sup>2</sup> and 105(43.2%) have BMI <25 kg/m<sup>2</sup> ,and of those who have high physical activity 45(42.1%) have BMI ≥25 kg/m<sup>2</sup> and 62(57.9%) have BMI <25 kg/m<sup>2</sup>, there is significant association between physical activity and elevated BMI, as shown in table (7)

Table -6: Distribution of physical activity and body mass index.

|                   |               | BMI kg/m <sup>2</sup> |       | Total  | X <sup>2</sup> | P.Value |
|-------------------|---------------|-----------------------|-------|--------|----------------|---------|
|                   |               | >=25                  | <25   |        |                |         |
| physical activity | Low activity  | 138                   | 105   | 243    | 6.464          | 0.01    |
|                   |               | 56.8%                 | 43.2% | 100.0% |                |         |
|                   | High activity | 45                    | 62    | 107    |                |         |
|                   |               | 42.1%                 | 57.9% | 100.0% |                |         |
| Total             |               | 183                   | 167   | 350    |                |         |
|                   |               | 52.3%                 | 47.7% | 100.0% |                |         |

Table -7: Logistic regression of variables.

|                      | B      | S.E.  | P value | OR    | 95% C.I.OR |       |
|----------------------|--------|-------|---------|-------|------------|-------|
|                      |        |       |         |       | Lower      | Upper |
| physical activity    | 0.551  | 0.246 | 0.025   | 1.735 | 1.072      | 2.808 |
| Eating behavior      | 0.174  | 0.245 | 0.479   | 1.190 | 0.736      | 1.923 |
| psychological stress | -0.110 | 0.224 | 0.625   | 0.896 | 0.578      | 1.391 |
| physical stress      | 0.134  | 0.406 | 0.742   | 1.143 | 0.515      | 2.535 |

The table show that physical activity is the only variable independently associated with high body mass index.

**DISCUSSION:**

our study show no significant association between eating behavior and body mass index, this disagree with a Santos et al. study<sup>(14)</sup> which conducted on a number of children and adolescents in Northeastern Brazil which support that the “obesogenic” pattern of eating consist of sweets and sugars the typical Brazilian dishes are correlated with increased BMI, after adjusting for confounders . This disagreement may be attributed to that nutritional intakes of children estimated in this study might not represent their true intakes and may depend on social desirability and recall bias.<sup>(15)</sup> furthermore this disagreement may be attributed to difference between age groups

our study show no significant association between workplace stress and body mass index, this agree with a study conducted in London in 2011 which found no significant association between work stress and obesity.<sup>(16)</sup>

Also agree with Saat et al. study<sup>(17)</sup> which conducted among medical students in Kualalumpur ,Malaysia found that there is no significant relationship between stress score and BMI. Regarding physical activity , our study found a significant association between physical activity and BMI, this agree with a Riou et al. study<sup>(18)</sup> which show that postmenopausal women with high physical activity and high dietary restraint have low body mass index compared to women with high physical activity and low dietary restraint. This

suggest that participation in physical activity induce the relationship between BMI and dietary restraint.

**CONCLUSION:**

1. eating behavior has no significant association with obesity
2. there is no significant association between workplace stress and obesity
3. physical activity has important role in the prevention of obesity

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