



The Relation Between Stress Level and Nutritional Status Among Primary School Pupils in Mosul City

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Abstract

Background and Aim : Stress is now considered a common problem in children, it has been liked with both increased and decreased dietary intake. The study aimed to identify the relationship between stress level and nutritional status among primary school pupils in Mosul City.

Materials and Methods : A cross-sectional study has been designed for a sample of children consist of (200) pupils from the primary schools in Mosul City, aged (10-13) years old. The study has been conducted from 1st of January to 30th of April 2019. Data were collected through the interview of the children which included the height and weight measurement which done in the classroom and then the questionnaire about demographic characteristics, stress level and dietary intake were distributed for them to be answered by the one of child's parents. The data were analyzed through the application of descriptive statistical analysis that included frequency, percentage and Chi square .

Results : The study indicated that the 78.5% of the children were 10-12 years old, 44.5% of them from moderate economic status , also show there are significant relationship between stress level and increase of weight, costumed saturated oils, meat, carbohydrate, low fruit and low vegetable intake at P-value=0.05.

Conclusion : This study found consistent association between stress level and unhealthy dietary intake. Pupils with higher stress had higher consumption of fat and sugar which lead to obesity .

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Recommendations : Pay attention to the child by the family and school, reduce the psychological stress, he has by addressing his social problems and enhancing his self-confidence .

Key words : Stress level , Nutritional status, Dietary intake, Obesity.

Introduction

Stress is defined as the body's physiological response as a result of pressures and events that overwhelm it and threaten and shake the person's ability to maintain balance (Torres and Nowson, 2007) .

Stress in the early stage of life has a negative impact on the development of the child, structure and function of the brain (Nelson, 2013; Charmandavi et al., 2003). Also its effect on physical activity, health behaviours, dietary intake and increasing risk of obesity (Nader et al., 2006 ; Telma et al., 2014) . Short -term stress can cause a people to lose their appetite, while long-term stress can lead to comfort eating which often involves the overeating of food that are rich of calories such as high fat and carbohydrates in an attempt to make them feel better (Sally, 2018; Honor, 2017) . Long time stress affects body functions and plays an important role in most of psychiatric disorders and indirect health behavior changes (Dohrenwend, 2006), One of the behavioral changes is food choice that affects health as a result of changes in appetite and dietary intake (Steptoe et al., 1998). Many people do not think about healthy eating at the time of stress, they often skip some meals

especially the breakfast or eat fast food outside the home which can leads to more emotional strain and adversely affect their health (Canfield, 2011).

School-age children need a well-balanced diet per day that is required to meet growth needs, as the child size increases (Edelman and Mandle, 1998), Over nutrition refers to an excessive intake of one or more nutrients which causes a stress on bodily function. Stress has been linked with high or low dietary intake (Geliebter and Aversa, 2003).

Obesity was considered a disease of stress (Tsenkova et al., 2013) . Excess of body weight is associated with many health problems such as heart disease, liver disease, high blood pressure, sleep apnea, gall bladder disease, depression, diabetes and endocrine disorders (Hurt, 2011).

The American Heart Association (AHA) , 2015 recommends limiting saturated fats which are found in butter , cheese , meat and fast foods, its can increase LDL -cholesterol and risk of heart disease. The increase in the frequency of eating meals (fast food and the snacks) away from home may be associated with the increase calories intake among children which lead to obesity (Davis et al., 2007). The low consumption of fruits and

vegetable help the continuous increase in adiposity among children (Trichesa and Giuglianib, 2005). Higher consumption of carbohydrate is associated with higher calories intake, it has been estimated that every additional glass of a sweetened beverage drink per day by children increases becoming obese by 60% (Barnfather, 2004). The study aimed to identify the relation between stress level and nutritional status among primary school pupils in Mosul City . The purpose of this study was firstly, to find the relationship between the level of stress and the body mass index (BMI) for school pupils, second, to identify the association between stress level and dietary intake in the study sample.

Materials and Methods

A cross-sectional study design was carried out from 1st of January to 30th of April 2019 at primary schools in Mosul City. Prior to the actual collection of data formal administrative approval was obtained from Ninevah Directorate of Education, Planning Department to conduct this study. A sample consist of 200 pupils (100 male and 100 female) from a private and governmental primary schools in Mosul City. From each school two classes where selected (fifth and sixth class) and then we selected the sample randomly for each class. Data were

collected through the interview of the children with help of their teacher, which include sociodemographic characteristics (age, gender, body mass index (BMI), socioeconomic level and mother education).

Anthropometric measures which adopted in the study include weight and height, for each pupil weight was measured by using electrical balance, height was measured by using vertical scale which done by the researchers in the classroom, then calculate the BMI = weight in kilograms over height in meters squared ($BMI = wt/ht^2$) (WHO, 2000).

The questionnaire was distributed for each pupil in the classroom to be filled by one of their parents and to bring it back the next day.

The international scale were used for measuring the family socioeconomic status level (WHO, 1985).

The questionnaire also included about dietary intake saturated and unsaturated fats, grains, fruits, vegetables, meat and carbohydrate.

A global scale were used to measure stress level and its relation to student's dietary intake (WHO, 2017; Ollingrath et al., 2014) .

The data were analyzed through the application of descriptive statistical analysis that include (Frequency, Percentage and Chi Square).

Results

Table (1) : Demographic Characteristics of the Study Sample N= 200

Variables	Frequency	Percentage
Age	No.	%
<10 years	14	7
10-12 years	157	78.5
≥ 13 years	29	14.5
Gender	No.	%
Male	100	50
Female	100	50
Body Mass Index (BMI)	No.	%
Underweight	24	12
Normal	87	43.5
Overweight	51	25.5
Obese	38	19
Socioeconomic status	No.	%
Low	49	24.5
Moderate	89	44.5
High	62	36
Mother Education	No.	%
Illiteracy	17	8.5
Primary school	42	21
Secondary school	53	26.5
College	88	44

This table shows that the most of the sample were (10-12) years old, they accounted 78.5 . 43.5 from study sample were normal weight , 44.5 of sample had an moderate economic level.

Table (2) : Stress level for pupils in relation with their BMI. No=200

Body Mass Index BMI	No stress		Low stress		High stress		P- value
	No.	%	No.	%	No.	%	
Underweight	5	2.5	12	6	7	3.5	0.153

Normal	49	24.5	22	11	16	8	0.527
Over weight	12	6	22	11	17	8.5	0.031*
Obese	3	1.5	14	7	21	10.5	0.014*
Total	69	34.5	70	35	61	30.5	

* Significant

This table shows that there are significant relationship between stress level and increase of weight at p-value= 0.05

Table (3) : Frequency and percentage of pupils regarding dietary intake. No.=200.

Dietary intake	F	%
Saturated fat	98	49
Unsaturated fat	102	51
Grains	186	93
Fruits	68	34
Vegetables	78	39
Meat	93	46.5
Carbohydrate	126	63

This table shows the majority of pupils (93%) ate grains while the lowest number of them ate fruits (34%).

Table (4) : The relation between Stress level for pupils and their dietary intake. No. = 200

Dietary intake	Stress level		P-value
	Low stress	High stress	
Global Dietary Index	0.72 ± 0.31	0.83 ± 0.25	0.001
Saturated fat	6.2 ± 5.5	8.7 ± 6.1	0.021*
Unsaturated fat	4.3 ± 3.1	4.3 ± 3.1	0.055
Grains	14.6 ± 5.3	11.3 ± 5.0	0.051
Low fruits intake	3.8 ± 2.4	5.3 ± 3.1	0.000**
Low vegetables intake	6.3 ± 3.3	6.1 ± 3.5	0.03*
Meat	15.1 ± 6.2	15.6 ± 6.7	0.000**
Carbohydrate	27.5 ± 9.3	23.9 ± 7.5	0.01*

* Significant

** High significant

This table shows that there are significant relationship between stress level and pupils who ate saturated fat, meat,

Discussion

The results of the study in table (1) showed that 78.5% of the children were 10-12 years old, 43.5% of them were are normal body mass index and 44.5% of them were moderate economic level.

Our finding at table (2) show that 25.5% of the children had overweight and 19% had obesity. Yahya et al., (2005) found there was no significant difference between the nutritional status of pupils and economic status, while there was a significant increase in cases of overweight for pupils in moderate economic status, in addition, overweight was diagnostic at 7.5% of students.

Table (2) also shows that there are significant relationship between stress level and increases of BMI for pupils, overweight $p=0.031$ while obese $p=0.014$ at $p\text{-value}=0.05$, we identified that stress affect on development of obesity. A finding in this study is agreement with Tsenkova et al. (2013), Moore and Cunningham (2012) and Tamashiro (2011) studies which have found clear relation between stress and obesity. While Nader et al. (2006); Pervanidou and Chrousos (2011); Koski and Naukkarinen (2017) and Honor (2017) have found that stress can causes and fuel and raise obesity risk. Nader et al., (2006) found that children which living in low-income housing are more likely to become obese due to early

carbohydrate, low fruits and vegetables intake at $p\text{-value}=0.05$

life stress. Moore and Cunningham (2012) pointed out that higher stress is associated with less healthy eating behavior, higher body weight and poor nutritional status. Evelyn et al., (2008) noted that obese children may be more prone to mental illness such as depression and self-impairment than non obese children.

Our study results in table (3) revealed that the majority of pupils 93% ate grains, 63% of them ate carbohydrate, while the lowest number of them ate fruits 34%.

The study of Yahya et al., (2005) reported that 60% of the pupils low consumption of fruits and vegetable and excess sweet intake in 25%. Gillis and Bar, (2003) compared the eating habits of obese to non-obese children, found that obese children consumed significantly more fast foods than the non-obese children. Chacar and Salameh (2011) found that the children who consumed very high of fried food, soft drinks and chocolate have been linked to higher energy intakes which may increase the risk of developing obesity . In this study high significant relationship was observed at table (4) between stress level and pupils who consumed food high of saturated fat $p=0.021$, meat $p=0.000$, carbohydrate $p=0.01$, and low consumed of fruit $p=0.000$ and low vegetables $p=0.03$ at $p\text{-value}=0.05$.

The results is agreed with the study of Honor, (2017) which noted that stress has

been linked with the consumption of food high in fat and sugar. Both Zellner et al. (2007) and Oliver and Wardle (1999) mentioned that all the evidence suggests that stress eating behavior, redirecting food choices to food with greater and energy value or high calories, like sugar and fats. Fernonda et al., (2016) noted that the studies looking at the effect of stress on eating habits have shown that the level of the stressor has an impact on the individuals eating habits, while Pollard et al., (1995) said that there are studies did not find any difference in food compensation as a result of different level of stress .

Most literature has indicated that point to positive associations between the consumption of foods rich in fats and carbohydrates and stress level are common . In the time of stress food choices are redirected to higher palatability food especially those high in sugar and fat (such as sweets) with reduce in the consumption of fresh food such as fruits and vegetables (Zellner et al., 2006; Mikolajczyk et al., 2009 and El-Ansari et al., 2014).

Conclusions

We believe our study is both necessary and important for children, where we have shown that there is a strong relationship between level of stress and unhealthy dietary intake. children with higher stress level had higher consumption of fast food and snacks which containing a high calories.

Recommendations

We must pay attention to the child by the family and school, reduce the physiological stress he has by addressing his social problems and enhancing his self-confidence. Families should take a positive approach to eating , eating more fruits and vegetables and reduce the consumption of high energy dense foods especially fast foods and sweets. Children should get at least one hour of physical activity every day with the possibility of participating in school sports activities according of their wishes.

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