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Food Consumption in Association with Perceived Stress and Depressive Symptoms: A Cross Sectional Study from Five Universities and Three Colleges in Gaza Strip, Palestine

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Abstract: University/college period is one of the stressful stage of life, and depressive symptoms and stress are health problems among students worldwide. Understanding nutrition-mood associations may enable students to make healthier food choices that lead to a healthier life style. The present study investigated the relationship between food consumption and stress and depressive symptoms among university/college students in Gaza strip, Palestine. A cross-sectional survey was undertaken among undergraduates enrolled across 5 universities and 3 colleges in Gaza Strip (n=1409). Self-administered questionnaires included a 12-item food frequency questionnaire; Cohen's Perceived Stress Scale and modified Beck Depression Inventory. Gender and university comparisons were performed. Univariable and multivariable regression analyses were computed for each of the two outcomes; perceived stress and depressive symptoms. In general, females consumed sweets, snacks, fresh fruits and salad/raw vegetables and cooked vegetables more commonly than males, whereas males generally consumed fast food/canned food and cake/cookies, meat/sausage products, fish/sea food, cereal/cereal products and dairy/dairy products more commonly than females with differences across various universities/colleges. Perceived stress and depressive symptoms scores were generally higher among females than males. The univariable analysis showed that significant associations between various food groups and perceived stress and depressive symptoms were more evident for males. In addition, for males, all food groups were negatively associated with perceived stress as well as with depressive symptoms. For females, the exceptions of such negative associations were observed with meat/sausage products, fish/sea food and cereal/cereal products for perceived stress, and only with cereal/cereal products for depressive symptoms. The multivariable analysis indicated that frequent consumption of 'unhealthy' food such as sweets/cookies/snacks/fast food was significantly associated with lower perceived stress among males only. In addition, frequent consumption of 'healthy' foods such as fruits/vegetables was significantly associated with lower depressive symptoms, but for both sexes. In conclusion, university/college students used food whether 'unhealthy' or/and 'healthy' as a coping strategy to reduce tremendous and continuous stress due to the imposed Israeli siege since the year 2006 which affects all aspects of life in Gaza strip.

Keywords: Food Consumption, Stress, Depressive Symptoms, University/College Students, Gaza Strip, Palestine

1. Introduction

Food patterns and consumption frequencies, and their relation to mental health particularly among university/college students have attracted scientists' research elsewhere. University/college period is one of the stressful stage of life, and depressive symptoms and stress are health problems among students worldwide [1-4]. The major contributors of stress among university/college students may include new socializations, homesickness with increased responsibility, academic workload, time management, achieving academic success despite financial constraints and

aspects related to residency [5-7].

Stress is often related to appetite changes and patterns of food consumption. Eating behavior has been assumed to be as a coping strategy for stressful conditions [8]. However, patterns of diet seem to affect people mood and possibly vice versa. Consumption of certain food stuff has been suggested to relieve depressive moods [9]. On the other hand, stress and depressive symptoms were reported to result in poorer food choices [10]. Indeed, people experiencing periods of stress reported overeating food they would normally avoid, and that they ate these foods to feel better [11]. In addition, the effect of stress level on food choice seems to be different for men and women [12].

Associations between food stuff choice and perceived stress or depressive symptoms were documented. Ingestion of carbohydrate-rich diet seems to relieve depression. Such is the case for carbohydrate craving during depression that often leads to obesity and vice versa [13, 14]. Under stressful conditions, individuals with increased appetite preferred more types of sweet foods [15, 16]. Fast-food and commercial baked goods consumption was linked to a greater risk of suffering from depression [17]. However, a recent meta-analysis indicates that high-fish consumption can reduce the risk of depression [18]. Similarly, daily intake of five servings of fruit and vegetable was associated with lower psychological distress [19]. In addition, a dietary pattern of meat and dairy products was inversely related to stress level whereas intake of processed meat was associated with more psychological symptoms [10, 20].

Although many researchers examined the relationship between food consumption and mental health indicators represented by perceived stress and depressive symptoms among university/college students across the globe [1, 3, 21], no previous study explored such relationship in Gaza Strip. Understanding nutrition-mood associations may enable students to make healthier food decisions that lead to a healthier physical and emotional state. The general goal of the present study was to assess food consumption in relation to perceived stress and depressive symptoms across five universities and three colleges in Gaza strip. The specific objectives were to: 1) describe the food consumption behavior and two mental health indicators (perceived stress and depressive symptoms) of students by university/college and by sex, 2) examine the associations between food consumption behavior (individual food groups separately) and two mental health indicators by sex (univariable analysis) and 3) investigate the associations between food consumption behavior (all food groups together) and two mental health indicators by sex (multivariable analysis).

2. Materials and Methods

2.1. Sampling and Sample Size

The present data were collected from five universities and three colleges in Gaza strip. The total sample was 1409 students. The numbers of students (n) per university/college were: Al-Azhar University (n=352), Al-Aqsa University (n=327), Palestine University (232), The Islamic University (173), Gaza University (54), College of Applied Sciences (n=223), Palestine college of Nursing (26) and Dar Al Dawa and Humanities College (n=22). Ethical approval was provided by the participating institutions. Students were informed about the study aims and that by completing a questionnaire they provided their informed consent to participate in the study. Data were confidential, and participation was voluntary and anonymous. For quality assurance, data were computer entered at one site to minimize potential data entry errors. Based on the number of returned questionnaires, the response rate was ≈85%.

2.2. Assessment of Dietary Intake

Dietary intake was assessed for the previous month. Students completed a food frequency questionnaire (12 indicator variables) that measured their consumption of sweets, cake/cookies, snacks, fast food/canned food, fresh fruits, salad/raw vegetables, cooked vegetables, lemonade/soft drinks, meat/sausage products, fish/sea food, dairy/dairy products and cereal/cereal products (See table 1). The instrument was created to include food groups that are important when studying dietary habits [22]. The introductory question, "How often do you eat the following foods?" asked students about the frequency of their usual consumption of each food group separately (rated on a 5-point scale: several times a day, daily, several times a week, 1–4 times a month, and never). The face and content validity of the instrument were ascertained by grounding the questionnaire on wide range of literature review. No formal test of validity was performed, but the questionnaire was similar to other food frequency questionnaires that had been validated [1, 3].

2.3. Stress and Depressive Symptoms Measures

Perceived stress was measured with Cohen's Perceived Stress Scale (PSS-4 items), which assesses the degree to which situations in one's life are appraised as stressful [23]. It has been widely used in research on stress and health status. The questions in the scale ask about feelings and thoughts during the last month, using a 5-point Likert scale response format (1 = Never, 5 = Very Often). Scores for individual students were obtained by summing their responses to all 4 items. In our sample of students, the scale had an excellent internal reliability where Cronbach's alpha of the PSS was 0.85. Depressive symptoms were measured using the modified Beck Depression Inventory (M-BDI) [24]. The modification of the original BDI included two approaches: (a) the four items per symptom, which assessed the specific symptom's intensity in the original BDI, were replaced by a single statement per symptom with a six-point Likert scale measuring its frequency in the last 4 weeks (with the two extreme categories labeled as 1 = Never, 6 = Almost Always), and (b) one symptom, which exhibited low specificity (loss of weight) was excluded. Sample items

include: "I feel sad", "I feel I am being failed", "I feel I am being punished", "I have thoughts of killing myself", "I have lost interest in other people", "I am worried about my appearance", and "I have no appetite". For every student, M-BDI score was the sum of student's response to all 20 items. In our sample, Cronbach's alpha of the M-BDI was 0.90.

2.4. Statistical Analysis

The means of the consumption frequency of the various food groups as well as mental health indicators by university and sex were computed. Perceived Stress Score variable (PSS) was generated by dividing by 4 the sum of the responses to all 4 items of Cohen's Perceived Stress Scale (5-point Likert scale response format, 1 = Never, 5 = Very Often). In addition, M-BDI score (6-point Likert scale response format, 1 = Never, 6 = Almost Always) was computed by summing up the responses to all 20 items that measure this mental health indicator (Table 1). For the univariable analysis, associations between consumption of each food group individually and both mental health indicators were assessed using linear regression stratified by sex and adjusted for university. For the multivariable analysis, multiple linear regressions were used to assess associations between consumption of all food groups together and both mental health indicators, stratified by sex and adjusted for university. Hence, the authors were able to control for the effects of the other food groups while assessing the associations of any given food group.

3. Results

3.1. Characteristics of the Study Population

As indicated in Table 1, the study population comprised 1,409 students (632 males and 777 females; mean age=20.6 years ± SD 2.6 years) from 5 universities and 3 colleges in Gaza Strip: Al-Azhar University (n=352, 25.0% of the sample, mean age=19.8 years), Al-Aqsa University (n=327, 23.2% of the sample, mean age=19.9 years), Palestine University (n=232, 16.5% of the sample, mean age=20.2 years), College of Applied Sciences (n=223, 15.8% of the sample, mean age=21.4 years), Islamic University (n=173, 12.3% of sample, mean age=21.5 years), Gaza University (n=54, 3.8% of sample, mean age=21.8 years), Palestine College of Nursing (n=26, 1.8% of the sample, mean age=22.5 years) and Dar Al Dawa and Humanities College (n=22, 1.6% of the sample, mean age=23.3 years). The sample included first year undergraduates (n=491, 34.8%), second year undergraduates (n=385, 27.3%), third year undergraduates (n=235, 16.7%), fourth year undergraduates (n=258, 18.3%), and fifth year or more undergraduates (n=40, 2.8%). The sex distribution of students varied by each university/college**:** Al-Azhar University (61.6% females), Al-Aqsa University (68.2%), Palestine University (24.6%), College of Applied Sciences (54.7%), Islamic University (56.6%), Gaza University (61.1%), Palestine College of Nursing (50.0%) and Dar Al Dawa and Humanities College

(63.6%), reflecting the nature of the enrolled student populations at the different universities/colleges in Gaza Strip.

3.2. Food Consumption Behavior and Mental Health Indicators by University and Gender

The frequency of food consumption differed by university and gender of students (Table 1). Females generally consumed sweets more commonly than males except at Al-Azhar, Palestine and Gaza Universities. Snacks were also more common among females except at Al-Aqsa and Palestine Universities. In contrast, males generally consumed fast food/canned food and cake/cookies more commonly than females except at Al-Aqsa and Islamic universities, and Dar Al Daw and Humanities College. Females also consumed fresh fruits more commonly (except at Al-Azhar university), and also consumed salad/raw vegetables and cooked vegetables (except at Al-Azhar and Islamic universities, and Palestine College of Nursing) more commonly than males. Conversely, consumption of meat/sausage products and fish/sea food was more common among males that females except at Al-Aqsa university and Dar Al Daw and Humanities College. Males also consumed cereal/cereal products more commonly (except at Islamic university), and also consumed dairy/dairy products (except at Al-Aqsa, Palestine and Islamic universities) more commonly than females. Concerning mental health indicators, females showed higher perceived stress (except at Dar Al Daw and Humanities College) and had higher depressive symptoms scores (except at Palestine College of Nursing). There were differences in perceived stress and depressive symptoms scores across the studied universities/colleges.

3.3. Food Consumption Behavior (Each Food Group Individually) in Relation to Mental Health Indicators by Gender (Univariable Analysis)

As indicated by univariable analysis (Table 2), significant associations between various food groups and perceived stress and depressive symptoms were more evident for males (perceived stress: 11 significant food groups for males *versus* 1 food group for females; depressive symptoms: 11 significant food groups for males *versus* 7 food groups for females). For males, the significant associations between food groups and each of perceived stress and depressive symptoms were equal (11 associations for perceived stress, 11 associations for depressive symptoms). However, for females, the significant associations between food groups and each of perceived stress and depressive symptoms were not equal (1 association for perceived stress, 7 associations for depressive symptoms). In addition, for males, all food groups were negatively associated with perceived stress as well as with depressive symptoms. For females, the exceptions of such negative associations i.e. positive associations were observed with meat/sausage products, fish/sea food and cereal/cereal products for perceived stress, and only with cereal/cereal products for depressive symptoms.

Table 1. *Food consumption and mental health indicators (perceived stress and depressive symptoms) by university and gender.*

University/Sex	Al-Azhar University		Al-Aqsa University		Palestine University		College of Applied Sciences		Islamic University		Gaza University		Palestine College of Nursing		Dar Al Dawa and Humanities College	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Sample size	n=352		n=327		n=232		n=223		n=173		n=54		n=26		n=22	
	135	217	104	223	175	57	101	122	75	98	21	33	13	13	8	14
					Dietary intake – Consumption of food groups*											
Sweets	3.56	3.44	3.51	3.59	3.59	3.42	3.39	3.50	3.35	3.70	3.90	3.45	3.62	3.85	3.38	3.57
Cake/cookies	3.33	3.21	3.14	3.40	3.34	3.23	3.28	3.22	3.15	3.37	3.10	3.21	3.46	3.38	3.25	3.50
Snacks	3.42	3.55	3.54	3.28	3.51	3.30	3.26	3.43	3.32	3.71	3.38	3.45	3.00	3.01	2.38	3.57
Fast food/canned food	2.81	2.67	2.92	3.02	3.16	2.65	2.72	2.59	2.77	3.00	2.76	2.70	2.92	2.38	1.88	2.36
Fresh fruits	3.36	3.29	3.18	3.31	3.47	3.54	3.24	3.34	3.25	3.27	3.57	3.61	2.92	3.23	2.88	3.50
Salad/raw vegetables	3.16	3.15	3.05	3.14	3.35	3.70	3.09	3.16	3.36	3.26	3.14	3.64	3.46	3.23	3.00	3.36
Cooked vegetables	2.87	2.81	2.80	2.95	3.11	3.19	2.99	2.83	3.23	3.00	2.71	3.00	3.23	3.08	3.00	3.43
Lemonade/soft drinks	3.16	2.89	3.00	3.32	3.23	3.04	3.25	2.81	2.99	2.79	3.19	3.42	3.08	3.46	2.50	2.86
Meat/sausage products	3.05	2.88	2.80	3.15	3.23	2.88	3.00	2.93	2.91	2.87	3.24	3.15	3.15	2.38	2.75	2.79
Fish/sea food	2.55	2.32	2.42	2.68	2.92	2.63	2.66	2.65	2.52	2.38	2.67	2.58	2.77	2.23	2.38	2.86
Dairy/dairy products	2.92	2.65	2.54	2.98	2.98	3.11	2.85	2.61	2.49	2.74	2.86	2.42	2.85	1.69	2.75	2.64
Cereal/cereal products	3.90	3.62	3.73	3.63	3.54	3.47	3.91	3.51	3.61	3.70	3.52	3.45	3.69	3.38	3.88	3.50
					Mental health – Perceived stress and depressive symptoms											
PSS**	M = 12.32		M = 11.84		M = 11.90		M = 12.00		M = 12.28		M = 11.81		M = 12.42		M = 10.55	
	12.04	12.49	11.76	11.87	11.71	12.47	11.52	12.39	12.25	12.31	11.76	11.85	11.77	13.08	12.00	9.71
	t = 1.73		t = 0.35		t = 1.53		t = 2.22		t = 0.14		t = 0.09		t = 1.26		t = -1.75	
MBDI***	M = 54.75		M = 57.38		M = 53.47		M = 55.04		M = 49.68		M = 57.13		M = 54.04		M = 43.95	
	51.10	57.02	54.46	58.74	52.82	55.46	50.58	58.52	47.75	51.16	55.29	58.30	55.62	52.46	35.38	48.86
	t = 3.03		t = 1.86		t = 0.98		t = 3.09		t = 1.25		t = 0.64		t = -0.68		t = 1.83	

*Mean of the consumption frequency scale (1=never, 5=several times/day), **Perceived Stress Scale by Cohen, higher scores indicate higher perceived stress, ***Modified Beck Depression Inventory, higher scores indicate stronger depressive symptoms, all cell values represent mean scores except MBDI where cell values are the sum of responses.

Table 2. *Associations between food consumption behavior and perceived stress and depressive symptoms (univariable analysis).*

Food group	Perceived Stress Score (PSS)				Depressive Symptoms Score (M-BDI)			
	Female		Male		Female		Male	
	P-value	Estimate*	P-value	Estimate*	P-value	Estimate*	P-value	Estimate*
Sweets	0.189	-0.047	0.005	-0.111	0.464	-0.026	0.051	-0.078
Cake/cookies	0.003	-0.078	0.001	-0.130	0.001	-0.120	0.005	-0.112
Snacks	0.515	-0.023	0.000	-0.146	0.489	-0.025	0.002	-0.124
Fast food/canned food	0.865	-0.006	0.000	-0.142	0.840	-0.007	0.030	-0.086
Fresh fruits	0.274	-0.039	0.003	-0.117	0.000	-0.168	0.000	-0.201
Salad/raw vegetables	0.654	-0.016	0.039	-0.082	0.000	-0.133	0.000	-0.214
Cooked vegetables	0.226	-0.044	0.024	-0.090	0.005	-0.101	0.000	-0.165
Lemonade/soft drinks	0.540	-0.022	0.001	-0.133	0.008	-0.094	0.002	-0.126
Meat/sausage products	0.907	0.004	0.006	-0.109	0.042	-0.073	0.000	-0.147
Fish/sea food	0.785	0.010	0.006	-0.109	0.240	-0.040	0.001	-0.126
Dairy/dairy products	0.957	-0.002	0.026	-0.089	0.015	-0.088	0.032	-0.086
Cereal/cereal products	0.262	0.040	0.227	-0.048	0.923	0.003	0.026	-0.089

Each food group adjusted only for university; separate models for males and females and for both mental health indicators; estimates are the Standardized Coefficients; *change in the corresponding score (PSS or M-BDI) per one unit of the food group frequency scale.

3.4. Food Consumption Behavior (All Food Groups Together) in Relation to Mental Health Indicators by Gender (Multivariable Analysis)

The multivariable analysis between food consumption frequency and perceived stress and depressive symptoms stratified by gender is presented in Table 3. Frequent consumption of sweets/cookies/snacks/fast food was significantly associated with lower perceived stress among males only. In addition, frequent consumption of fruits/vegetables was also significantly associated with lower depressive symptoms, but for both sexes. However,

consumption of lemonade/soft drinks, meat/sausage products, fish/sea food, dairy/dairy products, and cereal/cereal products was not associated with either perceived stress or depressive symptoms among males and females.

Table 3. Associations between food consumption behavior and perceived stress and depressive symptoms (multivariable analysis).

Food group or subscale	Perceived Stress Score (PSS)				Depressive Symptoms Score (M-BDI)			
	Female		Male		Female		Male	
	P-value	Estimate*	P-value	Estimate*	P-value	Estimate*	P-value	Estimate*
Sweets/Cookies/Snacks/fast food**	0.141	-0.054	0.003	-0.136	0.348	-0.034	0.327	-0.043
Fruits/vegetables***	0.224	-0.050	0.473	-0.033	0.000	-0.159	0.000	-0.198
Lemonade/soft drinks	0.766	-0.012	0.148	-0.065	0.493	-0.027	0.731	-0.015
Meat/sausage products	0.664	0.018	0.955	-0.003	0.572	-0.023	0.366	-0.042
Fish/sea food	0.513	0.027	0.436	-0.036	0.429	0.032	0.494	-0.031
Dairy/dairy products	0.839	-0.008	0.949	-0.003	0.125	-0.059	0.405	0.037
Cereal/cereal products	0.164	0.052	0.827	-0.009	0.178	0.050	0.218	-0.050

Each food group adjusted for university and for all other variables in the table; separate models for males and females and for both mental health indicators; estimates are the Standardized Coefficients; *change in the corresponding score (PSS or MBDI) per one unit of the food group frequency scale; **Sweets/cookies/snacks/fast food subscale: mean of four items (sweets, cakes/cookies, snacks, fast food); ***Fruits/vegetables subscale: mean of three items (fresh fruits, salads, cooked vegetables).

4. Discussion

University/college students are of particular concern as they have greater freedom and control over their lifestyles, and unhealthy food practices and habits could impose health risks later in their life. Therefore, it is worthwhile to assess food patterns and consumption frequencies in relation to mental health indicators such as perceived stress and depressive symptoms among university/college students. Better understanding of such relationships may 1) enable students to make healthier food behavior that leads to a healthier physical and emotional state and 2) could be valuable in intervention strategies to reduce stress and depressive symptoms especially in Gaza strip where people encountered tremendous and continuous stress due to the imposed Israeli siege since the year 2006 which affects all aspects of life.

Data presented in this study revealed that females generally consumed sweets and snacks more commonly than males, with differences across various universities/colleges. Such result is in agreement with other university/college studies carried out in three European countries including Germany, Poland and Bulgaria [1], Saudi Arabia [25] and in Egypt [26] that used similar food frequency questionnaire. In addition, females also consumed fresh fruits, salad/raw vegetables and cooked vegetables more commonly than males. Previous research articles around the globe coincided with this result in reporting that female university students ate more fruits and vegetables than males [27-29]. In this context, one can say that females behaved healthier than males in terms of consuming healthier food such as fruits and vegetables. Indeed, gender difference towards such healthy food consumption was documented, but not well understood [30].

For male students, consumption of fast food/canned food and cake/cookies was generally more frequent than females. Similar results were reported among university/college students from USA [31]; Bangladesh [32]; Lebanon [33] and from Italy [29]. In addition, a study from China showed that the average monthly cost and calorie intake of fast food were significantly higher in male students than females [34]. This implies that male students ate more unhealthy food such as fast food which is characterized by being rich in calories, salt, saturated fat and simple carbohydrates that contribute to obesity and cardiovascular disease [35, 36]. Meat/sausage products and fish/sea food consumption was also generally more common among male students. Previous research from Greece [37] and United Kingdom [3] pointed out that male students ate meat and fish more frequent with a statistically significant difference than females. Similarly, consumption of cereal/cereal products and dairy/dairy products were more common among male students. Such finding was in concurrent with the results of other authors [38, 39].

As indicated in the present investigation, female students generally showed higher perceived stress and depressive symptoms scores than males. Similar results were obtained [40, 41]. In this regard and as previously mentioned, the differences in students' nutritional behavior as well as in mental health indicators across the participating universities/colleges in Gaza strip do exist. The causes stand behind such differences are intricate to be explained and few studies were able to raise out our understandings of such discrepancies and relations. However, several factors were suggested including student-level variables and/or university-level features [42]. Despite that, many confounding factors that could confound such complex relations are usually not measured.

As illustrated by univariable analysis (assessed the relationship between individual food group and two mental health indicators by gender), significant associations between various food groups and perceived stress and depressive symptoms were more evident for males. All food groups were negatively associated with perceived stress and depressive symptoms among males. For females, the exceptions of such negative associations were observed with meat/sausage products, fish/sea food and cereal/cereal products for perceived stress, and only with cereal/cereal products for depressive symptoms. The overall interesting point of such results is that male students in Gaza strip consumed various 'unhealthy' and 'healthy' foods more frequently than females as a coping strategy for tremendous and continuous stress due to the

imposed Israeli siege which affects all aspects of life. It is accepted that eating behavior is more likely to be a coping strategy for stressful conditions [16, 43]. However physiologic modulation of eating behavior and stress to one another is still not fully understood. One of the attractive proposed mechanism is the interactions between the hypothalamic-pituitary-adrenal axis and eating [44].

In addition to initial univariable analysis, it is essential to clarify the relationships between the various food groups (collectively) and the mental health indicators. Hence, multivariable analysis was subsequently employed to control for all the other variables under investigation. This coincides with a previous investigation which have pointed out that it is more important to study the overall dietary pattern than isolated nutrients [45]. In the present research, multivariable analysis revealed that frequent consumption of 'unhealthy' food such as sweets/cookies/snacks/fast food was significantly associated with lower perceived stress among males only. This finding supports research on stress and dietary behavior among first-year university students in Australia that found a distinct difference in food selection patterns between stressed male and female students, with stress being a more significant predictor of unhealthy food selection among male students [39]. There is some evidence that preference of foods high in fat and sugar may influence opioid releases in the brain as a coping "reward" after a stressful situation which produces behavioral reinforcement [46].

In connection to 'healthy' food consumption such as fruits/vegetables, the current study found that frequent consumption of this food group was significantly associated with lower depressive symptoms, but for both sexes. Again this finding is in agreement with that previously reported [3] and coincides with the general conception that food consumption reduces stress [47]. However, the question "how do fruits and vegetables alleviate stress?" needs to be resolved. One study hypothesized that folate substance present in fruit and vegetables increases methylation processes and the regulation of neurotransmitters, such as serotonin which, in turn, is associated with a lower risk of depression [48]. Another study proposed that eating fresh fruit and vegetables improve absorption of the amino acid L-tryptophan which causes the body to release serotonin making the person to feel good and relaxed as a result of stress relief [49]. Therefore, food consumption may impact stress both physiologically and psychologically. Future research is needed, perhaps employing quantitative and qualitative methodologies to uncover how stress and eating behavior are associated among university populations of young adults. In addition, launching of comprehensive nutritional health promotion programmes may have the potential to influence positively on students' life during stressful university/college period.

5. Conclusions

Perceived stress and depressive symptoms scores were generally higher among females than males. Significant associations between various food groups and perceived stress and depressive symptoms were more evident for males. University/college students used food whether 'unhealthy' or/and 'healthy' as a coping strategy to reduce tremendous and continuous stress due to the imposed Israeli siege since the year 2006 which affects all aspects of life in Gaza strip.

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