



The Difference in Emotional Eating Among Different Majors in Different Universities

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Abstract

Background: Academic stress is thought to affect eating behaviors among students from different majors. The aim of this study was to examine the relationship between stress and emotional eating among undergraduate students belonging to varied majors in different Lebanese universities.

Method: The current study design was cross-sectional and included 190 undergraduate students, belonging to sciences, architecture, business, engineering and technology and social sciences majors. Data were collected through an online self-administered survey that included some demographic questions and three validated tools: The Perception of Academic Stress Scale (PASS), Emotional Eater Questionnaire (EEQ) and Physical Activity Questionnaire (PAQ).

Results: The findings revealed a positive correlation between stress and emotional eating and a negative correlation between stress and physical activity. Indeed, higher stress and emotional eating levels were detected in architecture, sciences, and engineering & technology majors. Moreover, students have a high tendency to consume caloric dense and empty calorie foods, (sweets and fast foods) throughout an emotional eating episode.

Conclusion: Eating habits are negatively impacted by stress. Therefore, our findings highlight the necessity of an intervention that aims at helping university students to manage their stress effectively, thus maintaining healthier eating habits.

Keywords: emotional eating, stress, majors, undergraduate students, physical activity

Introduction

The National Institute of Health (NIH) defines stress as a state of mental or emotional strain that people experience as they encounter changes in life irrespective of the developmental stage. Besides, academic stress is perceived by the students as the unpleasant circumstances that arise as a result of excessive requirements, pressure, struggles, deadlines and competitions and are imposed on them. Academic stress is manifested by an increased anxiety, depression, decreased exercise, changes in eating habits, and sleep disturbance (Nagle & Sharma, 2018). The relationship between eating habits and emotions may vary depending on the mood or characteristics of the individual.

According to Goldschmidt et al. (2017), emotional eating is a state of over or under-eating as a way to cope with negative emotions such as stress, anger, or anxiety. It has been linked with an overindulgence of calorie-dense foods, overweight, obesity as well as eating disorders.

Stress and eating behavior

According to Ganasegeran et.al (2012), students commonly face stress during their university journey which might negatively affect their eating habits. As such, people under stress often struggle to control the meal portion sizes and are more prone to binge eating (Ertem & Karakaş, 2020). Indeed, previous studies indicated that highly stressed individuals tend to have unhealthy eating habits such as high consumption of energy-dense food, low consumption of fruits and vegetables and irregular meal or snack schedules (Al-Asadi , 2014; Kuo, 2017). This was further explained by Alalwan et. al. (2019) and Ertem and Karakaş (2020), who described those palatable food as “comfort food”, inducing a sensation of satisfaction, relief and distraction. In contrast, Alalwan et. al, 2019 indicated that most of the students tend to decrease their dietary

intake as a result of negative feelings or moods. Nevertheless, a series of recent studies has identified a difference in eating habits between genders. In general, women are more concerned about their body image; therefore, they tend to follow a restricted diet under normal conditions (Al-Asadi, 2014). Whereas under stress, females tend to overindulge on sweets or skip meals while males are more likely to snack on high-calorie savory foods or use smoking as a coping mechanism for stress. (Al-Asadi, 2014; Alalwan et. al, 2019; Sinha & Jastreboff, 2013). Overall, university can create a stressful environment for students, making them susceptible to unhealthy eating habits.

Stress in Universities

Aihie and Ohanaka (2019) asserted that senior students experience more stress as compared to junior, sophomore and freshmen students, which was explained by the fact that the latter have less projects and research work. Furthermore, final year students fear failing any of their courses, which might delay their graduation, in addition to their concern about unemployment. In contrast, Jia and Loa (2018) and Khan, Altaf and Kausar (2013) claimed that first year students encounter more stress than other students. Nevertheless, Aihie and Ohanaka (2019) also noted that males are more prone to stress as compared to females, which can be attributed to the patriarchal society where they are expected to succeed, or because they are more likely to postpone their studies; this accumulates the work and leads to an increased stress. Therefore, the academic environment can be a stressful experience for the students. However, results are inconsistent regarding the level of stress among the different educational stages.

Limited research has examined the differences in stress levels and the degree of emotional eating across majors. For instance, Aihie and Ohanaka (2019) and Prabu (2015) acknowledged that faculties of sciences have higher stress level than faculties of arts and commerce due to the disparity in workload. According to Al-Asadi (2014), higher academic stress was seen among

medical students. This was consistent with the findings of Ganasegeran et. al. (2012), where it was highlighted that medical students consumed more frequent snacks and meals when stressed. However, there is a disagreement regarding the type of snacks consumed; while Ganasegeran et. al. (2012) argued that medical students focused on fruits and vegetables due to their health knowledge, Alzahrani et. al. (2020) reported that fast food is their snack of choice since they are more affordable and convenient. Likewise, Ertem and Karakaş (2020) claimed that the majority of nursing students were more subject to binge eating and frequent snacking under stress conditions. Previous research has examined the effect of stress on eating behaviors among university students (Alalwan et.al., 2019; Aihie et.al., 2019). Some past studies have examined emotional eating in specific majors, such as medicine (Ganasegeran et.al., 2012; Alzahrani et.al., 2020), as well as nursing (Ertem and Karakaş 2020). However, no studies have examined yet the difference in emotional eating between majors. Therefore, this study will be the first of its kind to examine this relationship.

Method

Study Design

A cross-sectional study was conducted among undergraduate male and female students from different universities during the fall 2020 semester. For data collection, an online questionnaire was created using Google Forms. Then, the surveys were sent to the participants via E-mail or WhatsApp application. The questionnaire was only available in English and was divided into four parts. The first part included the demographic questions, (age, gender, weight, and height). Additional questions concerning the major, medical history, dieting and smoking status were also included. The second part aimed to assess the academic stress, using the Perception of Academic

Stress Scale (PASS), (Bedewy & Gabriel, 2015). This tool consists of 18 Likert-scale questions with responses on a 5-point Likert scale, ranging from strongly agree (1) to strongly disagree (5). It characterizes sources of academic stress among university students into three main components: first, stress related to academic expectations; Second, stress related to students' academic self-perceptions; And third, stress related to faculty work and examinations. For each student, the mean of the answers will be computed. A mean at or above 3, indicates that the individual is stressed. This instrument is reliable and was validated by 12 experts from the Faculties of Psychology and Educational Psychology at Tanta University. The third part assessed the emotional eating behaviors through the Emotional Eater Behavior questionnaire (EEQ) (Garaulet et.al., 2012). It consists of 10 Likert-scale questions. Each question had four possible options with a score ranging from 0 to 3. The lower the score, the healthier the behavior. This tool was validated by Garaulet et.al (2012) in the University of Murcia, Spain. This section also included a question related to the food choice in relation to emotional eating. In the final part, physical activity levels were estimated based on the Physical Activity Questionnaire which assesses the type, frequency, intensity, duration, and overall length of their participation in the physical activity, (Cho, 2016). For each item, a 5-point Likert-type response format with values ranging from 1 to 5 was used. This tool was developed and validated in a university in Korea in 2016.

Participants

The study consisted of 190 participants from different universities in Lebanon, out of which 45% were males and 55% were females. The participants had different educational backgrounds: 7.9 % were Architecture students, 31.6 % were sciences students, 17.9 % were business students, 25.8 % were Engineering and Technology students and 16.8 % were social science students. The majority of the participants fall within a similar age range, divided into four different levels of education:

26.3 % freshmen and sophomore, 20.5 % junior and 53.2 % senior. The students included in this study were healthy undergraduate students. The participants that were diagnosed with an eating disorder (Anorexia Nervosa, Bulimia, Binge eating...) or any diet-related diseases (diabetes, hypertension, cholesterol...) were excluded from this study.

Ethical Approval

An informed consent was obtained prior to data collection. This study was approved by the International Review Board (IRB) of the Lebanese American University. Hence, anonymity and confidentiality were guaranteed, as no personal information, (such as the name, religions and background), was required. The purpose of the survey was made clear for the participants, through a brief description of the research topic and its aim at the beginning of the questionnaire, in which the required filling time was also specified.

Data analysis

After data collection, the results of the questionnaires were translated and organized into charts, tables and diagrams using SPSS. A descriptive analysis was conducted to obtain the mean and the standard deviation of the sample, in addition to the inferential statistics to run ANOVA and t-test for independent samples.

Results

Relationships between stress, emotional eating and physical activity

		PAS score	EE score	PA level
PAS score	Pearson Correlation	1	0.48**	-0.15 [*]
	Sig. (2-tailed)		0	0.04
	N	190	190	190
EE score	Pearson Correlation	0.48**	1	-0.14 [*]
	Sig. (2-tailed)	0		0.05
	N	190	190	190
PA level	Pearson Correlation	-0.18 [*]	-0.14 [*]	1
	Sig. (2-tailed)	0.04	0.05	
	N	190	190	190

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

PAS: Perceived Academic Stress

EE: Emotional eating

PA: Physical Activity

Table 1 reveals a positive correlation between stress and emotional eating. In contrast, a negative correlation was seen between stress and physical activity, suggesting that a higher level of physical activity is associated with a lower level of stress. Similarly, emotional eating and physical activity were negatively correlated.

Stress level among different majors

Hypothesis 1: There is a significant difference in the levels of perceived academic stress among students in different majors.

Table 2a: Table representing the descriptive statistics of expressed stress among majors

	N	Mean (M)*
Architecture	15	3.54
Business	34	2.59
Engineering & Technology	49	3.17
Social Sciences	32	2.73
Sciences	60	3.59
Total	190	3.15

Mean \leq 3 : Non-stressed students

Mean $>$ 3 : Stressed students

Table 2b. Table representing a summary of ANOVA results of academic stress levels among majors.

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	30.63	4	7.66	24.35	.000
Within Groups	58.19	185	0.32		
Total	88.82	189			

The descriptive statistics displayed in **Table 2.a** indicate that the science majors have the highest mean ($u= 3.5944$; $std=0.45598$), followed by the architecture ($M=3.54$; $SD=0.62$) and then engineering & Technology ($u= 3.17$; $SD=0.69$) respectively, implying that those majors have the highest stress level. In contrast, the business and social sciences majors have a mean below 3 ($M=2.59$; $M=2.73$ and $SD= 0.53$; $SD=0.52$ respectively) indicating a lower stress level. A one-way ANOVA test was conducted to determine if there is a significant difference in academic stress among the different majors ($\alpha < 0.05$) (**Table 2b**). After adjustment using the post hoc/Tukey test (**Table 2c**), results indicated that the difference in the perceived academic stress level among majors, is statistically significant between the architecture and business majors as well as architecture and social sciences majors. These results are also illustrated in **Figure 1**. A significant difference was also detected between the sciences and business, social sciences, engineering & technology majors. Similarly, the difference between the engineering & technology and social sciences majors was significant.

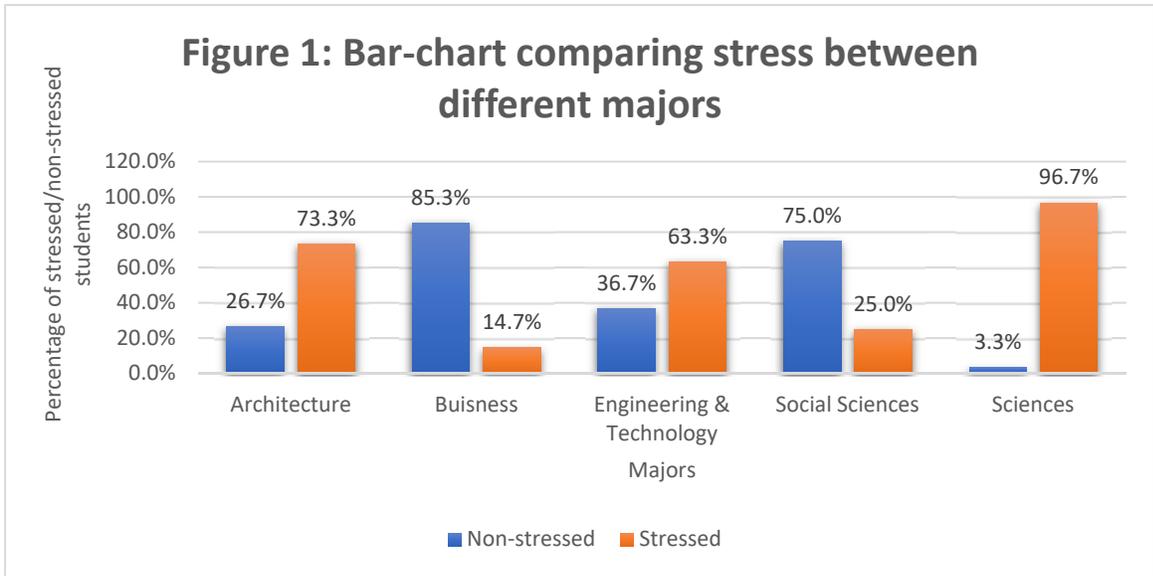


Table 2c: Multiple comparisons (Post-hoc/ Tukey HSD) of the differences in the perceived academic stress level among majors

(I) Majors	(J) Majors	Mean Difference (I-J)	Sig.
Architecture	Business	0.96*	.000
	Engineering & Technology	0.37	.167
	Social Sciences	0.81*	.000
	Sciences	-0.05	.997
Business	Architecture	-0.96*	.000
	Engineering & Technology	-0.58*	.000
	Social Sciences	-0.15	.828
	Sciences	-1*	.000
Engineering & Technology	Architecture	-0.37	.167
	Business	0.58*	.000
	Social Sciences	0.44*	.006
	Sciences	-0.43*	.001
Social Sciences	Architecture	-0.81*	.000
	Business	0.46	.828
	Engineering & Technology	-0.44*	.006
	Sciences	-0.86*	.000
Sciences	Architecture	0.05	.997
	Business	1*	.000
	Engineering & Technology	0.43*	.001
	Social Sciences	0.86*	.000

*. The mean difference is significant at the 0.05 level.

Emotional eating among majors

Hypothesis 2: There is a significant difference in the degree of Emotional eating among students from different majors.

Table 3a representing the descriptive statistics of Emotional eating levels among majors.

	N	Mean*	Std. Deviation
Architecture	15	16.20	7.12
Business	34	9.32	5.45
Engineering & Technology	49	11.22	5.59
Social Sciences	32	12.38	6.55
Sciences	60	15.62	6.63
Total	190	12.86	6.63

EE score: 0-5: non emotional eater (EE); 6-10: low EE; 11-20: EE; 21-30: very EE

Table 3b representing a summary of ANOVA results of Emotional eating levels among majors

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1187.11	4	296.78	7.72	.000
Within Groups	7112.06	185	38.44		
Total	8299.16	189			

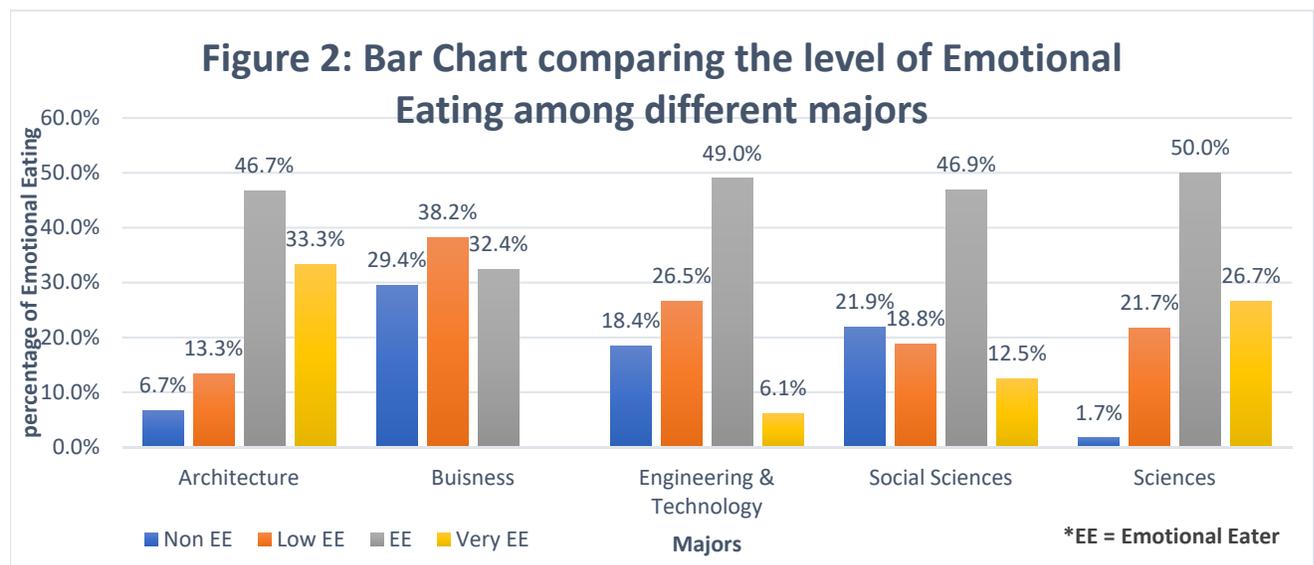
Table 3a shows that the highest levels of emotional eating are seen among the architecture students (M=16.2), followed by sciences students (M=15.6167).

As it was seen in **Table 1**, emotional eating and stress are positively correlated. Those results are consistent with the findings in **Table 2a**, which demonstrate that architecture and sciences majors had the highest level of stress. Moreover, **Table 3b** shows the F value=7.720, d.f=4 and p value=0, which is less than <0.05; thus, the null hypothesis (the means are equal) was rejected. In addition, the results of the post-hoc test/Tukey test (**Table 3c**) indicated a statistical difference (p<0.05) in the degree of emotional eating between the architecture and business students, as well as between the sciences and business students, and sciences and engineering & technology students. The results are also illustrated in **Figure 2**.

Table 3c representing multiple comparisons (Post-hoc/ Tukey HSD) of the differences in the perceived academic stress level among majors

(I) Majors	(J) Majors	Mean Difference (I-J)	Sig.
Architecture	Business	6.88*	.004
	Engineering & Technology	4.98	.055
	Social Sciences	3.83	.284
	Sciences	0.58	.998
Business	Architecture	-6.88*	.004
	Engineering & Technology	-1.90	.645
	Social Sciences	-3.05	.271
	Sciences	-6.29*	.000
Engineering & Technology	Architecture	-4.98	.055
	Business	1.90	.645
	Social Sciences	-1.15	.925
	Sciences	-4.39*	.003
Social Sciences	Architecture	-3.83	.284
	Business	3.05	.271
	Engineering & Technology	1.15	.925
	Sciences	-3.24	.123
Sciences	Architecture	-0.58	.998
	Business	6.29*	.000
	Engineering & Technology	4.39*	.003
	Social Sciences	3.24	.123

*. The mean difference is significant at the 0.05 level.



Emotional eating and genders

Hypothesis 3: Females are more likely to have a higher level of emotional eating.

Table 4a representing the descriptive statistics of emotional eating (EE) level between genders

	Gender	N	Mean	Std. Deviation
EE	Male	86	10.73	6.06
	Female	104	14.62	6.58

Table 4b representing the results of independent samples t-test on the difference in the level of emotional eating between genders

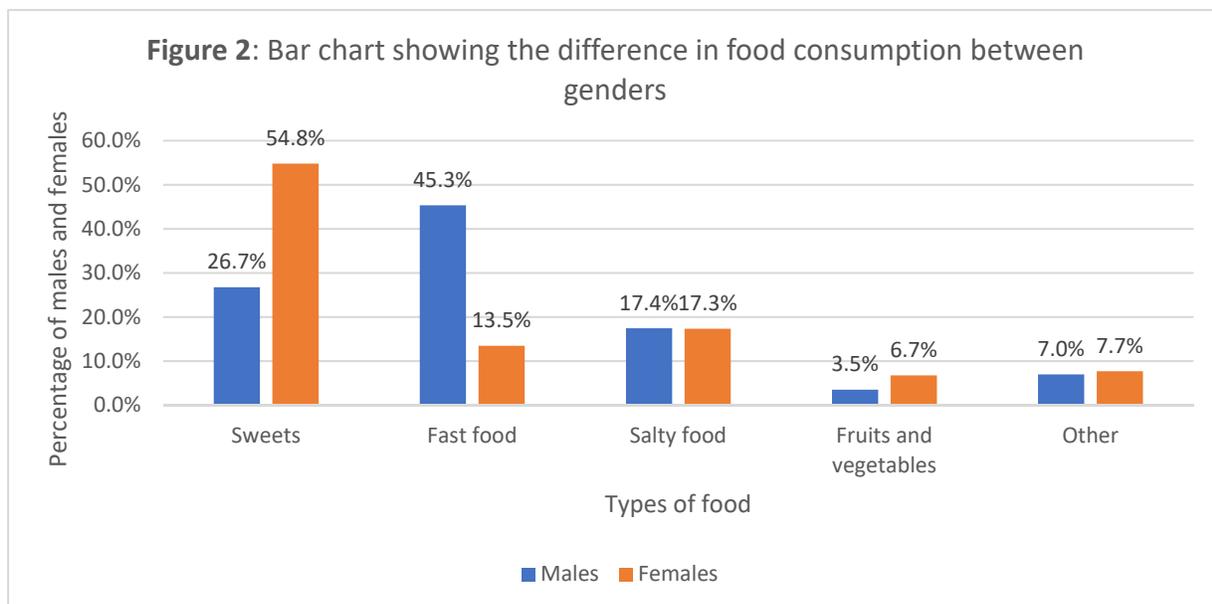
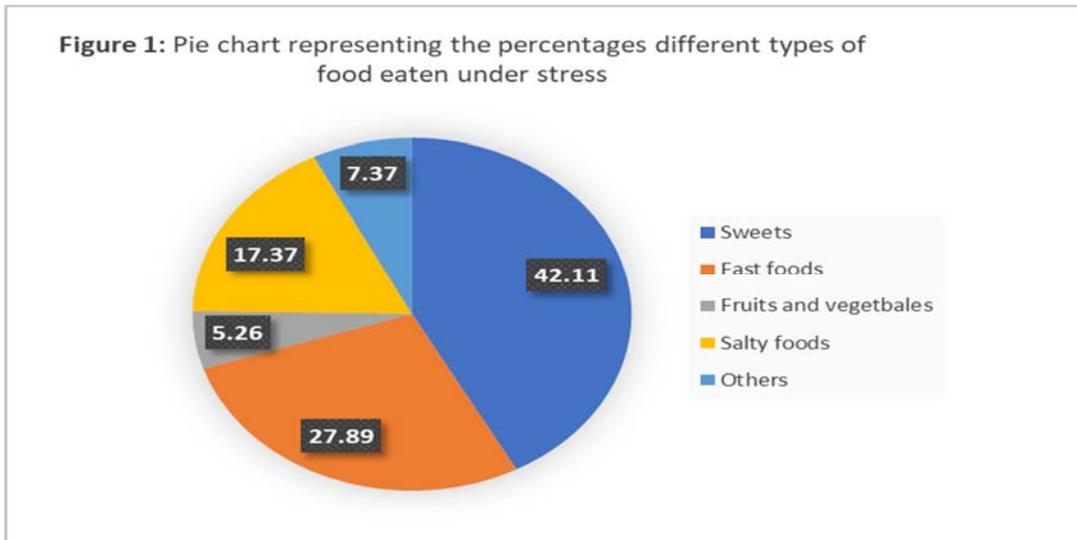
		Levene's Test for Equality of Variances		t-test for Equality of Means				
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
EE	Equal variances assumed	.80	.37	-4.19	188	.000	-3.88	.93
	Equal variances not assumed			-4.23	185.8	.000	-3.88	.92

Table 4a reveals that females have a higher mean of emotional eating (M=14.6154) compared to males (M=10.7326). Hence, females belong to the category of Emotional eaters (11 – 20) whereas males belong to the low emotional eaters’ category (5 – 10). Furthermore, **Table 4b** shows a statistically significant difference in the emotional eating level between males and females (P<0.05).

Food and stress

Hypothesis 4: Sweets are the most food consumed under stress.

Hypothesis 5: Females are more likely to consume sweets under stress while males prefer fast foods.



The pie chart (**Figure 1**) reveals that the most common food consumed under stress are sweets (42.11%), followed by fast foods (27.89%). As for the difference between males and females in regard to food preference, **Figure 2** shows that women tend to consume more sweets (54.8%), while males are more likely to consume fast food under stress (45.3%).

Discussion

The aim of the present study was to assess the emotional eating levels among different majors. The results of this study revealed that there is a positive correlation between stress and emotional eating which was consistent with the findings of Ganasegeran et.al (2012) and Ertem and Karakaş, (2020). This can be explained by the fact that stress elevates hunger hormones (mainly cortisol) in the body, which in turn increases appetite and causes overeating. Additionally, high cortisol levels from stress can increase cravings for sweets or fatty foods. This was aligned with the findings of our study which indicated that sugary foods are mostly consumed under stress, followed by fast foods. This might be due to the decreased serotonin (a calming and relaxing hormone) metabolism in the body after the ingestion of sugar rich foods (Inam et.al, 2016). Specifically, our results showed that women tend to consume more sweets, while males are more likely to consume fast food under stress. This was also found by Al-Asadi, (2014), Alalwan et. al, (2019) and Sinha and Jastreboff, (2013).

In accordance with other studies (Aihie and Ohanaka, 2019 and Prabu, 2015), our study found that science majors have the highest stress levels which was followed by the architecture and engineering and technology, respectively. This may be due to the workload and nature of courses in the Sciences which comprises lots of practical work, reports writing and field visits. This result supports the findings of Deepa (2016) which showed that science students reported higher academic stress levels than students in the business and humanities. The results are also consistent with Prabu (2015) who found that students in science subjects had higher levels of academic stress than humanities and arts students. As for the architecture students, the constant pressure towards excellence and the exhaustion from daily creativity increase their stress levels.

In contrast to the findings of Aihie and Ohanaka (2019), Jia and Loa (2018) and Khan, Altaf and Kausar (2013), our results did not indicate a significant difference in the stress levels between the first year and senior year students. This discrepancy could be attributed to the fact that students at all levels might experience some level of stress: first year students are new to the university life and the increased workload which they should adapt to. Therefore, they might struggle to build up new social relationships, and are faced with anxiety, depression and disorientation. As for the senior students, stress can be caused by their worry about future employment, in addition to the research work and final year projects.

Furthermore, our study revealed that students in the science, architecture as well as engineering and technology faculties, had the highest emotional eating score. This was expected since stress and emotional eating were positively correlated, as it was mentioned above. This finding is in consonance with Ertem and Karakaş, 2020, Al-Asadi, 2014 and Kuo, 2017. The results of this study revealed that many students eat because of negative emotions like stress, anxiety and tension. In fact, stress is a general response, that affects the body's ability to maintain homeostasis and regulate appetite.

Nevertheless, our study also indicated a negative association between stress and physical activity. Likewise, emotional eating and physical activity were negatively correlated as well. Indeed, exercise decreases the body's stress hormones level: adrenaline and cortisol. It also promotes the release of certain chemicals in the brain -endorphins- which are analgesics and mood enhancers. On the other hand, smoking was not found to lower the stress level, as opposed to the findings of Al-Asadi, 2014, Alalwan et. al, 2019 and Sinha and Jastreboff, 2013. While nicotine induces relaxation, this effect is temporary and might be followed by withdrawal symptoms and cravings.

Limitations

Although this study contributes important findings to the existing literature on the difference in emotional eating among majors, some of the factors related to data collection were not ideal.

First, even though our sample targeted various Lebanese universities, the majority of the responders were LAU students, mainly seniors. Secondly, responses were self-reported; thus, they might be biased. For instance, under-reporting of food intake is very common which impact the accuracy of the results. Third, the questionnaires were sent mostly during the month of November, meaning in the second half of the fall 2020 semester. In fact, during this period, there is much more workload, exams and final projects. Eventually all students can experience some kind of stress at this point. Likewise, the economic situation and the challenging circumstances in Lebanon might have also influenced the well-being of the students. Finally, this study was conducted during the pandemic, where major changes in the education system occurred, this could have affected the way they responded. Therefore, all these factors might have altered their responses on the perception of academic stress scale (PASS).

Conclusion

In light of the data obtained throughout our research, the results demonstrated a strong effect of stress on emotional eating. Indeed, science, architecture and engineering and technology students were more prone to emotional eating as a result of an increased stress level. This is an issue for future research to explore in order to validate the kinds of conclusions that can be drawn from this study. Besides, our findings highlight the importance of providing counselling sessions for stress management. Strategies to cope with stress should be reinforced throughout students' academic experience, to help them build efficient coping mechanisms to overcome the adverse

consequences of stress, promote healthier eating habits and improve the overall quality of their life.

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NOTICE OF IRB EXEMPTION DETERMINATION

To: Dr. Nadine Zeeni
Associate Professor
School of Arts & Sciences

APPROVAL ISSUED: 3 November 2020
EXPIRATION DATE: 3 November 2022
REVIEW TYPE: EXEMPT CATEGORY B

Date: November 3, 2020

RE: **IRB #:** LAU.SAS.NZ1.23/Mar/2020

Protocol Title: Assessment of the Stress Effect on Eating Behavior Among Students from Different Majors

Your application for the above referenced research project has been reviewed by the Lebanese American University, Institutional Review Board (LAU IRB). This research project qualifies as exempt under the category noted in the Review Type

This notice is limited to the activities described in the Protocol Exempt Application and all submitted documents listed on page 2 of this letter. **Final reviewed consent documents or recruitment materials and data collection tools released with this notice are part of this determination and must be used in this research project.**

CONDITIONS FOR ALL LAU NOTICE OF IRB EXEMPTION DETERMINATION

LAU RESEARCH POLICIES: All individuals engaged in the research project must adhere to the approved protocol and all applicable LAU IRB Research Policies. **PARTICIPANTS must NOT be involved in any research related activity prior to IRB notice date or after the expiration date.**

EXEMPT CATEGORIES: Activities that are exempt from IRB review are not exempt from IRB ethical review and the necessity for ethical conduct.

PROTOCOL EXPIRATION: **PROTOCOL EXPIRATION:** The LAU IRB notice expiry date for studies that fall under Exemption is 2 years after this notice, as noted above. If the study will continue beyond this date, a request for an extension must be submitted at least 2 weeks prior to the Expiry date.

MODIFICATIONS AND AMENDMENTS: Certain changes may change the review criteria and disqualify the research from exemption status; therefore, any proposed changes to the previously IRB reviewed exempt study must be reviewed and cleared by the IRB before implementation.

RETENTION: Study files must be retained for a period of 3 years from the date of project completion.

IN THE EVENT OF NON-COMPLIANCE WITH ABOVE CONDITIONS, THE PRINCIPAL INVESTIGATOR SHOULD MEET WITH THE REPRESENTATIVES OF THE IRB OFFICE IN ORDER TO RESOLVE SUCH CONDITIONS. IRB CLEARANCE CANNOT BE GRANTED UNTIL NON-COMPLIANT ISSUES HAVE BEEN RESOLVED.

If you have any questions concerning this information, please contact the IRB office by email at irb@lau.edu.lb

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The IRB operates in compliance with the national regulations pertaining to research under the Lebanese Minister of Public Health's Decision No.141 dated 27/1/2016 under LAU IRB Authorization reference 2016/3708, the international guidelines for Good Clinical Practice, the US Office of Human Research Protection (45CFR46) and the Food and Drug Administration (21CFR56). LAU IRB U.S. Identifier as an international institution: FWA00014723 and IRB Registration # IRB00006954 LAUIRB#1

Dr. Joseph Stephan
Chair, Institutional Review Board

DOCUMENTS SUBMITTED:

LAU IRB Exempt Protocol Application	Received 31 October 2020
Protocol	Received 31 October 2020
Link to online survey	Received 31 October 2020, amended 3 November 2020
2 November 2020	3 November 2020
CITI Training – Nadine Zeeni	Cert.# 31976663 Dated (4 July 2019)
CITI Training – Nour Gereige	Cert.# 38592948 Dated (24 September 2020)
CITI Training – Karen Zgheib	Cert.# 38593497 Dated (24 September 2020)
CITI Training – Yara Moawad	Cert.# 38592985 Dated (24 September 2020)

