

# Association between Stress and Obesity among Female Student during COVID 19 Pandemic at Health Colleges in Qassim University

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## Abstract

**Background:** Physical activity and lifestyle are influenced by a number of things. The lockdown imposed by the coronavirus disease (COVID19) has limited student activity and altered their daily routine. Accordingly, obesity is a huge public health issue that has negative consequences for both physical and mental health. **Aim:** to find out association between stress and obesity among female student during COVID 19 pandemic at health colleges in Qassim university, kingdom Saudi Arabia. **Subject and methods:** A cross-sectional study was carried out from 15 October to December 2020. A total of 425 female students at health colleges (Medical, Nursing, Pharmacy, Medical laboratory) at Qassim university, KSA responded to the self-administered online survey. Two instruments, namely factors upshifting body weight and stress and the anthropometric, measurements, were used. Statistical tools such as frequency, percentage, were used for the descriptive analysis. **Results:** Most of student's suffered stresses with the major sources are academic, financial or economic, relationship, and future /career growth source. Also, there are a statistically significant relation was found student's sociodemographic data and their body mass index mainly in items related to age and marital status. Furthermore, there are statistically significant relations were found student's body mass index and all items related to their dietary habits during stress ( $p < 0.000$ ). **Conclusion & recommendations:** Students need for receive regular; periodic in-service dietary program contains methods of coping with stresses which indirectly added stressor on student's psychological status and indirectly affect their dietary habits and behavior. There is an evident necessitate for designed curriculum in the colleges regarding benefits of physical activity and eating patterns in health colleges. Further studies are needed to study the coping strategies that influence university students' eating behavior with the study stressors.

**Keywords:** Stress, Obesity, Covid 19 pandemic, Student Health Colleges, Qassim University.

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## INTRODUCTION

The pandemic of Coronavirus Disease 2019 (COVID19) has the potential to cause significant morbidity and mortality, affecting people and health-care systems all over the world (Garry *et al.*, 2020). To minimize disease transmission and contain the COVID-19 outbreak, most countries used restrictive measures such as limiting cultural activities, restricting social events, home confinement, and lockdown (Lippi *et al.*, 2020). Educational facilities were closed and online instruction was developed to prevent the spread of COVID-19. Although these restrictions reduced COVID-19 dissemination, they may also contribute to health risk behaviors<sup>3</sup> and have an impact on students' physical activity, eating habits, sleeping hours, social

habits, and mental health (López-Bueno *et al.*, 2020; Wang *et al.*, 2020). These health-related issues may have an impact on college students' ability to maintain a healthy body weight (Rubin & Wessely, 2020).

Obesity is a term that refers to an excess of bodily fat accumulation (Al-Ghamdi *et al.*, 2018). According to, (WHO, 2021) mentioned overweight people have a BMI of over 25, and obese people have a BMI of over 30. According to the global burden of illness, nearly 4 million people died in 2017 as a result of being overweight or obese. "Labels indicate ranges of weight that are more than what is generally considered healthy for a given height," according to the Centers for Disease Control and Prevention (CDC). When a person consumes more energy than he or she

can use, this is referred to as primary obesity (Mukherjee *et al.*, 2017). This is responsible for 95% of global obesity. Secondary obesity is defined as the buildup of body fat due to an underlying biological cause (Mukherjee *et al.*, 2017). Obesity [body mass index (BMI) greater than 30 kg/m<sup>2</sup>] has been increasing globally among different age groups and among young people (Salarzadeh Jenatabadi *et al.*, 2020), with more than 1.9 billion adults aged 18 and up being overweight, with over 650 million being obese (O'Brien *et al.*, 2016; Sanders *et al.*, 2015).

According to a research of obesity and eating habits, there is a quick socio-cultural change as a result of the Arab region's expanding economy. This has influenced eating habits, and as a result, recent rises in overweight and obesity among Saudis have been documented (Althumir *et al.*, 2021). Psychological stress, such as that experienced in medical school, is another key role in obesity. (Mansour *et al.*, 2020). College can play an important role in encouraging students to engage in healthy behaviors. The prevalence of unhealthy lifestyles among college students necessitates the integration of health education programs for college students (Saghafi-Asl *et al.*, 2020).

Due to the rising number of COVID-19 instances, the Kingdom of Saudi Arabia (KSA) has imposed a series of restrictions. To prevent the spread of COVID-19, the lockdown began on March 23 and lasted on June 21, 2020. People could leave their homes for essential shopping from 6 a.m. to 7 p.m. during the partial lockdown and 6 a.m. to 3 p.m. during the increased lockdown. Due to lockdown movements, students' physical activity (Tornaghi *et al.*, 2020) has been restricted, which may have an impact on their BMI. Physical inactivity, which can be accelerated or delayed by a variety of environmental circumstances, is one of the most common primary contributors to the obesity or overweight epidemic (Gray *et al.*, 2018).

Stress can be defined as "a state or sensation experienced once an individual perceives that the demands positioned on them surpass the resources the individual has accessible (Dwivedi *et al.*, 2020). As a result, stress might be defined as a perceived lack of coordination between the demands of daily life and an individual's ability to respond. In Africa, reports on the association between mental health and obesity are scarce. One study in Canada found that 18.7% of students at a Quebec university were overweight, 57 percent were considered sedentary, and the majority had eating problems (Sankoff, 2017).

Even in these circumstances, literature on the impact of race on populations obesity and mental health have a shaky link. The few that exist are contradictory. Obesity and overweight are extremely common in Saudi Arabia (Al-Ghamdi *et al.*, 2018). Despite this, there appears to be a scarcity of research on such

people's mental health. In young people, stress has been linked to eating patterns, and dietary responses to stress are personalized (Althumir *et al.*, 2021).

(Huh *et al.*, 2015) high levels of hunger and tension were shown to be linked to the afternoon and evening hours, according to these researchers. In a sample of male individuals, (Torres *et al.*, 2014) found no links between cardiovascular or psychological stress and obesity. Eating after stress, according to (Koski & Naukkarinen, 2017) can damage health, especially in people who have dysfunctional eating practices. Obesity was explained by (McInnis *et al.*, 2014) in terms of cellular abnormalities. Obesity and overweight may be explained by a compensatory process triggered by maladaptive stress. Although several etiological variables for obesity have been found, stress in obesity is still poorly understood. All health workers endure stress around the world due to time constraints, workload, various tasks, and emotional concerns. Medical students, like health professionals, are stressed (Eva *et al.*, 2015). Also, because the transition from adolescence to adulthood is a critical period for adopting health-related behaviors to prevent illness, and health care students play an important role in promoting community health and despite contradictory findings in studies, a regional difference in lifestyle is important. We conducted a study among health college's students to find out association between stress and obesity among female student during COVID 19 pandemic at health colleges in Qassim University, kingdom Saudi Arabia.

## SUBJECTS AND METHODS

A cross-sectional study was carried out from 15 October to December 2020. A total of 425 female students at health colleges (Medical, Nursing, Pharmacy, Medical laboratory) at Qassim university, KSA responded to the self-administered online survey. This online survey study used as preventive measures of COVID 19 pandemic through prevent spread of infection via papers. An inclusion criterion was as follows: had personal Facebook and Twitter accounts, whatsapp and were willing to participate in the study.

### Survey instruments

Data was gathered using a three-part self-administered questionnaire: First part consists of Demographic data as age, marital status, studies Level, college's name. Second part: Anthropometric data: Height, weight, arm circumference, body mass index (BMI), The body math index (BMI) was computed by dividing self-reported body weight (kg) by squared height (m<sup>2</sup>). After that, the BMI was divided into four groups: underweight, normal weight, overweight, and obesity. Underweight (BMI 18.5), normal weight (BMI 18.5-24.9), overweight (BMI 25 to <30 kg/m<sup>2</sup>), and obese (BMI ≥30 kg/m<sup>2</sup>) (Al-Raddadi *et al.*, 2019). Third part: this tool adapted and adopted to assess the

factors effecting body weight and stress which consisted of 28 questions. To determine the extent to which emotions influence eating behavior, a ten-item questionnaire was created. The Emotional Eater Questionnaire was the name of the survey (EEQ). There were four alternative responses to each question: 1) Never, 2) Occasionally, 3) Typically, and 4) Always. Each response was given a value from 1 to 4, with lower scores indicating healthier behavior. The Mindful Eating Questionnaire (MEQ) (13) refers to a nonjudgmental awareness of physical and emotional feelings related to eating (Garaulet *et al.*, 2012).

### Data gathering

Students were invited to participate in an online poll by sending personal messages or posting invitations on their personal social media accounts, such as Twitter and Facebook. This invitation includes a consent form that informs them of their rights and responsibilities, as well as the fact that no personally identifiable information that may be linked to their responses will be included. If the respondents are interested, they can access the questionnaires by clicking on the embedded web link provided. The welcome screen on the website invites female health college students to participate, as well as a consent form. The willing students were also instructed to thoroughly read the consent form before clicking "I accept" on the web connection. Following the student's approval to participate, the student's demographic will appear. The two questionnaires were then followed by a statement expressing gratitude for the student's engagement. Once the student has completed the course, when she is finished answering the questions, she will click the submit button icon. It took about 10- 15 minutes to complete the questionnaire. After the data was collected, the web link was closed, and the data was deleted. Were retrieved and saved in password-protected office folders. Only a limited number of students had access to the data. With the consent of the researchers and other institutions

### Ethical consideration

The proposal of the investigation was official by the Research Center of college of Nursing, Qassim University, KSA. The participants gave their informed consent, which stated the research objective and goal, their voluntary involvement, their right to autonomy and secrecy, and their freedom to withdraw from the study. Furthermore, the site connection did not collect IP addresses or any other data.

### DATA ANALYSIS

Statistical treatment: Descriptive statistics and testing of hypothesis were used for the analysis. The data were analyzed using SPSS V.16.0 (SPSS Inc; Chicago, IL, USA). The Chi-square test was used to examine the association between different variables.  $P < 0.05$  was considered as statistically significant.

### Limitation

The use of a cross-sectional design is the primary limitation of this study. A longitudinal prospective study design would be more informative.

### RESULTS

Table (1) illustrates a total of 425 students who participated in the study, slightly more than two-third quarter (80.8%) of the students between 19-25 years old followed by ( 81.2% ) of them single . Additionally, more than one quarter (42.7%) from Nursing College, about one quarter of students (23.3) from fourth year.

Table (2) : shows that nearly half of studied student (48.7) often have a tone muscle ,sore neck and back slightly more than half (55.2% , 52.2% , 56.9% , 45.7) of them often experience fatigue, insomnia, feel anxiety, boredom and depression frequently have guilty feelings if they relax and do nothing respectively, while most of them (85.7% , 80.7%) always fell anxiety and anger respectively . In addition, (55.5%) of them never experience eat more of their favorite food and with less control when they are alone.

As indicated in Table (3), slightly more than half of studied student (59.3% ) between 50-60 Kg of body weight , (57.3%) of them from 151-160 cm height while below one quarter (22.2%) have body mass index between 25-30 kg/m while (33.3%) of them have arm circumferences between 20-30 cm

Table 4: describe that there are a statistically significant relation was found student's sociodemographic data and their body mass index mainly in items related to age and marital status with  $p = (0.000)$

Table 5: showed that there are a statistically significant relation was found student's body mass index and all items related to their dietary habits during stress, with  $p = (0.007, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000)$  respectively

Table 6: showed that nearly half of students with 18.5-25 kg/m of body mass index (47.9%) suffered academic stress while (46.2%) , (41.2%) suffered finical or economic stress , (40.0%) suffered relationship stress , (40.2%) suffered Future /career growth stress , while (41.7%) of them haven't experience any type of stress

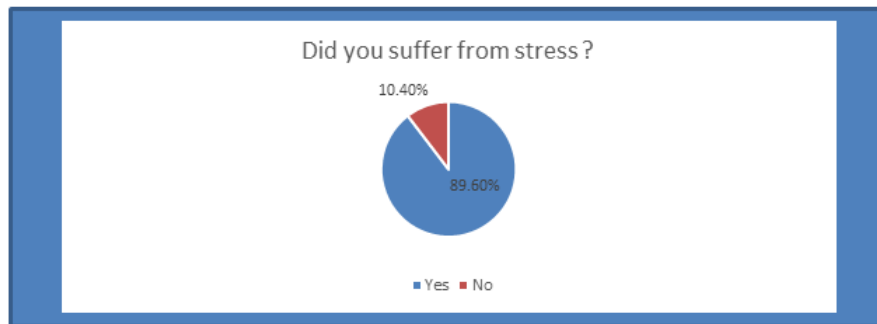
Figure 1: shows that most of student's (89.60 %) suffered stress while (10.40%) haven't stress experience

Figure 2: shows that the most types of stress faced students (39 %) from future/ career growth stress followed by (33.10%) from relationship stress

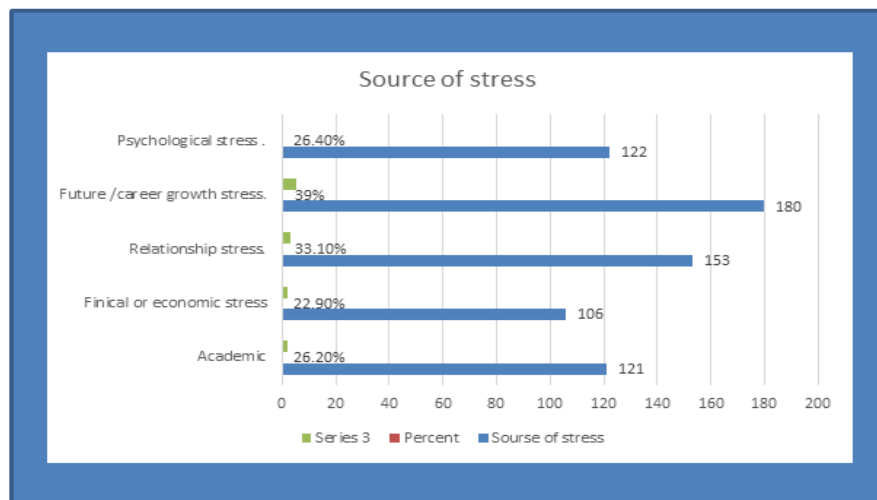
Figure 3: shows that more than half of students (56.86 %) overeat without control when faced stress situation

**Table-1: Distribution of the studied students according to their socio demographic characteristics**

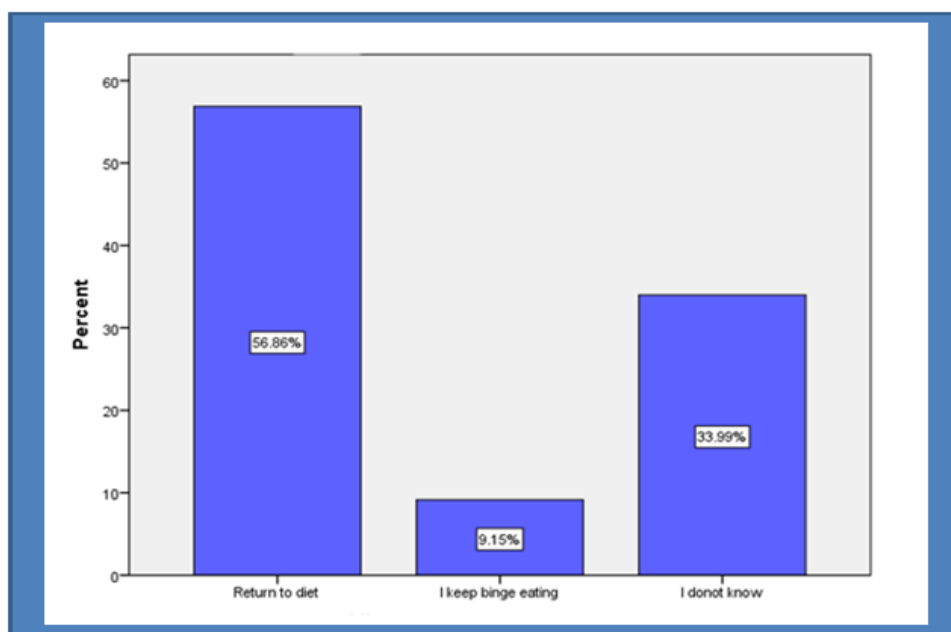
Socio Demographic Characteristics	No	%	
<b>Age</b>	19-25	371	80.8
	26-30	28	6.1
	31-36	21	4.6
	37-40	17	3.7
	More than 40	22	4.8
<b>Marital status</b>	Single	367	81.2
	Married	80	17.7
	Divorced	5	1.1
<b>Health college</b>	Medical student	76	16.6
	Nursing student	196	42.7
	Pharmacy student	36	7.8
	applied medical science student	46	10.0
	Dental student	13	2.8
	Nutrition student	28	6.1
	Medical rehabilitation student	24	5.2
	Public health &health information	40	8.7
<b>Level</b>	First year	75	17.6
	Second year	64	15.1
	Third year	82	19.3
	Fourth year	99	23.3
	Fifth year	44	10.4
	Six year	61	14.4



**Fig-1: Distribution of student's according to their stress experience**



**Fig-2: Distribution of types of stress faced students**



**Fig-3: Distribution of student's dietary habit during stress experience**

**Table-2: Ranking distribution of student's attitude towards stress & eating patterns**

student's attitude	Never		Rarely		Often		Always	
	N	%	N	%	N	%	N	%
Do the weight scales have a great power over you?	104	22.5	19	4.1	143	31.0	196	42.4
Is the change in your weight changing your mood?	47	10.2	70	15.2	194	42.0	151	32.7
Do you have a tone muscle, sore neck and back?	52	11.3	54	11.7	225	48.7	131	28.4
Do you have fatigue?	12	2.6	47	10.2	255	55.2	148	32.0
Do you have anxiety?	64	13.9	1	.2	1	.2	396	85.7
Did you have insomnia ?	30	6.5	95	20.6	241	52.2	96	20.8
Did you feel bouts of anger ?	87	18.8	0	0	2	.4	373	80.7
Do you feel boredom, depression?	17	3.7	75	16.2	263	56.9	107	23.2
Not enough hours in the day to do all the things that I must do	16	3.5	42	9.1	182	39.4	222	48.1
I do the jobs myself to ensure they are done properly	2	.4	18	3.9	113	24.5	329	71.2
I underestimate how long it takes to do things	36	7.8	92	19.9	186	40.3	148	32.0
My self-confidence/ self-esteem is lower than I would like it to be	90	19.5	86	18.6	172	37.2	114	24.7
I frequently have guilty feelings if I relax and do nothing	26	5.6	66	14.3	191	41.3	179	38.7
I find myself thinking about problems even when I am supposed to be relaxing	40	8.7	59	12.8	185	40.0	178	38.5
I feel fatigued or tired even when I wake after an adequate sleep	38	8.2	78	16.9	211	45.7	135	29.2
I have a tendency to eat, talk, walk and drive quickly	47	10.2	105	22.7	179	38.7	131	28.4
My appetite has changed, have either a desire to binge or have a loss of appetite/ may skip meals	26	5.6	67	14.5	169	36.6	200	43.3
I use food to cope with my emotions	98	21.2	110	23.8	140	30.3	114	24.7
How often do you feel that food controls you, rather than you controlling food?	83	18.0	142	30.7	140	30.3	97	21.0
Do you feel guilty when eat "forbidden" foods, like sweets or snacks?	131	28.4	101	21.9	136	29.4	94	20.3
Is it difficult for you to stop eating sweet things, especially chocolate?	130	28.1	76	16.5	140	30.3	116	25.1
Do you have problems controlling the amount of certain types of food you eat when you stressed?	166	35.9	40	8.7	132	28.6	124	26.8
Do you eat when you are stressed, angry or bored?	97	21.0	76	16.5	159	34.4	130	28.1
Do you eat more of your favorite food and with less control when you are alone?	252	55.5	00	00	00	00	207	44.5
Do you feel less control over your diet when you are tired after	51	11.0	65	14.1	200	43.3	143	31.0

work at night?								
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**Table-3: Distribution of student's Anthropometric measurements**

Anthropometric Measurements		No	%
<b>Weight</b>	50-60 kg	272	59.3
	61-70 kg	85	18.5
	71-80 kg	55	12.0
	81-90 kg	36	7.8
	More than 90 kg	11	2.4
<b>High</b>	140-150 cm	77	16.8
	151-160 cm	263	57.3
	161-170 cm	103	22.4
	171-180 cm	16	3.5
<b>Body mass index</b>	Less than 16 kg/m	38	8.3
	16-17 kg/m	101	22.0
	18.5-25 kg/m	184	40.1
	25-30 kg/m	102	22.2
	30-35 kg/m	34	7.4
<b>ARM circumference</b>	10-20 cm	83	18.0
	20-30 cm	154	33.3
	30-40 cm	138	29.9
	40-50 cm	27	5.8
	More than 50 cm	9	1.9

**Table-4: Relationship between sociodemographic data & body mass index**

Sociodemographic Data		Body mass index						P value
		Less than 16 kg/m	16-17 kg/m	18.5-25 kg/m	25-30 kg/m	30-35 kg/m	35-40 kg/m	
		%	%	%	%	%	%	
Age	19-25	10.0%	22.4%	41.5%	23.7%	2.4%	0.0%	0.000*
	26-30	3.6%	25.0%	32.1%	10.7%	28.6%	0.0%	
	31-36	0.0%	9.5%	57.1%	0.0%	33.3%	0.0%	
	37-40	0.0%	0.0%	47.1%	29.4%	23.5%	0.0%	
	More than 40	0.0%	40.9%	4.5%	27.3%	27.3%	0.0%	
Marital status	Single	10.1%	22.9%	39.8%	24.3%	3.0%	0.0%	0.000*
	Married	0.0%	13.8%	43.8%	15.0%	27.5%	0.0%	
	Widowed	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
	Divorced	20.0%	60.0%	0.0%	20.0%	0.0%	0.0%	
Health college	Medical student	6.6%	28.9%	43.4%	13.2%	7.9%	0.0%	0.101
	Nursing student	9.7%	20.4%	43.4%	18.4%	8.2%	0.0%	
	Pharmacy student	13.9%	25.0%	41.7%	16.7%	2.8%	0.0%	
	applied medical science student	6.5%	15.2%	34.8%	41.3%	2.2%	0.0%	
	Dental student	0.0%	15.4%	23.1%	46.2%	15.4%	0.0%	
	Nutrition student	10.7%	28.6%	32.1%	25.0%	3.6%	0.0%	
	Medical rehabilitation student	4.2%	25.0%	37.5%	16.7%	16.7%	0.0%	
	Public health & health information	5.0%	17.5%	35.0%	35.0%	7.5%	0.0%	
Level	First year	8.0%	17.3%	46.7%	21.3%	6.7%	0.0%	0.778
	Second year	9.4%	21.9%	40.6%	21.9%	6.3%	0.0%	
	Third year	9.8%	26.8%	35.4%	25.6%	2.4%	0.0%	
	Fourth year	7.1%	22.2%	44.4%	22.2%	4.0%	0.0%	
	Fifth year	4.5%	22.7%	45.5%	15.9%	11.4%	0.0%	
	Six year	6.6%	26.2%	31.1%	24.6%	11.5%	0.0%	

**Table-5: Relationship between student's dietary habits during stress & their body mass index**

Student's Dietary Habits		Body mass index						P-value
		Less than 16 kg/m %	16-17 kg/m %	18.5-25 kg/m %	25-30 kg/m %	30-35 kg/m %	35-40 kg/m %	
I have a tendency to eat, talk, walk and drive quickly	Often	3.9%	20.8%	44.4%	24.7%	6.2%	0.0%	0.007*
	Never	19.6%	34.8%	30.4%	10.9%	4.3%	0.0%	
	Always	10.8%	18.5%	34.6%	26.9%	9.2%	0.0%	
	Rarely	7.6%	22.9%	43.8%	17.1%	8.6%	0.0%	
My appetite has changed, have either a desire to binge or have a loss of appetite/ may skip meals	Often	7.1%	19.6%	41.1%	25.0%	7.1%	0.0%	0.000*
	Never	4.0%	52.0%	32.0%	8.0%	4.0%	0.0%	
	Always	11.1%	23.6%	37.2%	23.6%	4.5%	0.0%	
	Rarely	4.5%	11.9%	49.3%	16.4%	17.9%	0.0%	
I use food to cope with my emotions	Often	0.7%	27.1%	35.0%	30.7%	6.4%	0.0%	0.000*
	Never	16.5%	28.9%	39.2%	8.2%	7.2%	0.0%	
	Always	10.6%	11.5%	34.5%	31.9%	11.5%	0.0%	
	Rarely	8.3%	20.2%	53.2%	13.8%	4.6%	0.0%	
How often do you feel that food controls you, rather than you controlling food?	Often	1.4%	22.9%	37.9%	30.7%	7.1%	0.0%	0.000*
	Never	13.4%	42.7%	37.8%	3.7%	2.4%	0.0%	
	Always	13.7%	6.3%	26.3%	41.1%	12.6%	0.0%	
	Rarely	8.5%	19.7%	52.8%	12.0%	7.0%	0.0%	
Do you feel guilty when eat "forbidden" foods, like sweets or snacks?	Often	1.5%	15.6%	45.2%	28.9%	8.9%	0.0%	0.000*
	Never	14.6%	32.3%	33.8%	13.8%	5.4%	0.0%	
	Always	7.5%	11.8%	38.7%	29.0%	12.9%	0.0%	
	Rarely	9.9%	26.7%	42.6%	17.8%	3.0%	0.0%	
Is it difficult for you to stop eating sweet things, especially chocolate?	Often	4.3%	20.9%	43.9%	23.7%	7.2%	0.0%	0.000*
	Never	10.1%	27.9%	45.0%	14.0%	3.1%	0.0%	
	Always	9.6%	8.7%	33.9%	33.9%	13.9%	0.0%	
	Rarely	10.5%	34.2%	34.2%	15.8%	5.3%	0.0%	
Do you have problems controlling the amount of certain types of food you eat when you stressed?	Often	3.8%	15.2%	39.4%	32.6%	9.1%	0.0%	0.000*
	Never	9.8%	34.8%	39.6%	12.8%	3.0%	0.0%	
	Always	8.9%	9.8%	43.1%	26.0%	12.2%	0.0%	
	Rarely	15.0%	30.0%	35.0%	15.0%	5.0%	0.0%	
Do you eat when you are stressed, angry or bored?	Often	7.0%	25.3%	37.3%	23.4%	7.0%	0.0%	0.000*
	Never	12.5%	33.3%	38.5%	8.3%	7.3%	0.0%	
	Always	7.0%	11.6%	38.8%	34.1%	8.5%	0.0%	
	Rarely	7.9%	18.4%	50.0%	17.1%	6.6%	0.0%	
Do you eat more of your favorite food and with less control when you are alone?	Often	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.000*
	Never	10.6%	27.5%	43.5%	13.5%	4.8%	0.0%	
	Always	6.3%	17.5%	37.3%	29.4%	9.5%	0.0%	
	Rarely	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
Do you feel less control over your diet when you are tired after work at night?	Often	6.5%	24.5%	42.0%	22.5%	4.5%	0.0%	0.000*
	Never	15.7%	41.2%	35.3%	5.9%	2.0%	0.0%	
	Always	6.3%	16.1%	35.0%	31.5%	11.2%	0.0%	
	Rarely	12.3%	12.3%	49.2%	13.8%	12.3%	0.0%	

**Table-6: Distribution of experienced types of stress and student's Body Mass Index as an indicator of obesity**

Types of stress	Body Mass Index					
	Less than 16 kg/m %	16-17 kg/m %	18.5-25 kg/m %	25-30 kg/m %	30-35 kg/m %	35-40 kg/m %
No stress	6.3%	25.0%	41.7%	10.4%	16.7%	0.0%
Academic study	6.6%	17.4%	47.9%	17.4%	10.7%	0.0%
Finical or economic stress	9.4%	15.1%	46.2%	23.6%	5.7%	0.0%

<b>Relationship stress</b>	5.2%	24.8%	41.2%	22.9%	5.9%	0.0%
<b>Future /career growth stress</b>	10.0%	21.7%	40.0%	24.4%	3.9%	0.0%
<b>Psychological stress</b>	9.8%	26.2%	40.2%	20.5%	3.3%	0.0%

## DISCUSSION

University students are subject to stress due to academic force, empowerment and exchange from adolescence to adulthood stage. This young population may have a higher risk of focused disorders as eating disorders (ED) which could lead to negative academic results (*Spillebout et al., 2019*). Furthermore, early life overweight and obesity has become a serious public health distress, and the prevalence has been increasing at a freighting rate particularly in developing countries. Along with Chinese college students. Weight gain among college students could increase the risk of increasing physical and psychological health troubles. In addition to, psychological stress has numerous harmful consequences on academic achievements, physical and mental health results among university students (*Chen et al., 2020*).

Furthermore, the time of extensive outbreaks of infectious diseases can produce elevated stress and psychological health problems along with all individuals affected especially those sub-groups of the population that are at greater than before risk of psychological health problems. (*Debowska et al., 2020*). Concerning student's sociodemographic characteristics, the present study exposed that slightly more than two-third quarter (80.8%) of the students between 19-25 years old followed by (81.2%) of them single. Additionally, more than one quarter (42.7%) from Nursing College, about one quarter of students (23.3) from fourth year. These findings goes in the same line with *Chen et al., 2020* who reported that (22.7%) of males and (8.4%) of females aged 19–22 years were suffered obesity.

In Egypt, *Wahed & Hassan., 2017* who found that a significant quantity of medical students are suffering from depression, stress, and anxiety. Female sex, increasing age and obesity are considerable related factors. In China, *Gao et al., 2020* Anxiety turned out to be the mainly prevalent and serious concern for college students, especially for female students; while a emergent prevalence of depression was found among male students during college which an indicator take on collegiate policies reflecting the gender disparities.

As regards, student's physiological troubles that faced resulting from stress situations, the present study shows that nearly half of studied student often have a tone muscle, sore neck and back, slightly more than half of them often experience fatigue, insomnia, feel anxiety, boredom and depression frequently have guilty feelings if they are relax and do nothing, while most of them always fell anxiety and anger respectively. Finally more than half of them never

experience eat more of their favorite food and with less control when they are alone. These findings goes in the same line with *Wallace et al., 2017* who highlighted on that show that sleep quality rather than sleep quantity may be the better health alarm for young adults, suggestive of that intervention programs targeting depression, stress managing, and healthy sleep prototypes are justified.

In the southwestern United States *Benham., 2021* stressed on the needs for implemented measures of psychological stress and its impact resulting from the pandemic. As well, it seems essential that further studies examining the effect of the pandemic on sleep take up a widespread but eclectic combination of measures with the intention of fully imprision changes in sleep-related behaviour and experience.

In Australia, *Papier et al., 2015* mentioned that a patent difference in food choice patterns between stressed male and female students, with stress creature a more major predictor of unhealthy food choice among male students. While, in Sudan, *Yousif et al., 2019* concluded that eating patterns has stronger impact on BMI than physical activity. Troubling shapes regarding overweight and low physical activity among medical students and emphasize on magnitude and benefits of physical activity and eating patterns in medical curriculum. In Egypt, *Ghazawy et al., 2021* reported that University students are at promoted risk for mental health problems. Otherwise, the COVID-19 pandemic and consequent public health measures obtained to fighting it troubles the students' life with extra remarkable psychological forces. Accordingly, Egyptian students experience fluctuating levels of psychological trouble during COVID-19 pandemic.

Concerning source of stresses as student's perceived, the present study revealed that nearly half of students with 18.5-25 kg/m of body mass index suffered academic stress, finical or economic, relationship, and future /career growth stress. These findings supported with the findings of *Tariq et al., 2020* In Pakistan who proved that their study participants have high levels of stress from academics and psychosocial sources which study of medicine field is a complex and a stressful period in life due to hard-hitting education residence.

In KSA, *Mohamed et al., 2020* supposed stress led to unhealthy changes in eating patterns in both sexes, as evidenced by an increased favorite for sweets, snacks and cake/cookies among females and an increased favorite for fast food and meat among males which may be probable critical intentions for



interventions for stress-related food eating. In china, *Jiang et al. 2019* mentioned that interferences are needed to ease the high academic stress of college students, taking into consideration the adjusting effects of gender, grade, and college type. These interventions may add contribute to the prevention of obesity among college students.

As regard distributions of the student anthropometric measurements, the present study revealed that slightly more than half of studied student (59.3%) between 50-60 Kg of body weight, (57.3%) of them from 151-160 cm high while below one quarter (22.2%) have body mass index between 25-30 kg/m while (33.3%) of them have arm circumferences between 20-30 cm. These findings supported with *Ekanayake & Mudiyanse, 2020*. In Sri Lanka who revealed that the anthropometric measurements were calculated by via standardized equipment. Visceral fat was deliberate by the Bio Impedance analysis machine which reported that prevalence of all over obesity, and abdominal obesity were 19.9% and 10.1% respectively. Additionally, there was a statistically significant alliance between supposed stress level and the waist circumference categories which reflected a low prevalence of obesity among university students compared to the earlier reported 7.3% of prevalence between the female populations.

Moreover, *Kwok et al., 2020* exposed that obesity is considered as a talented independent risk factor for vulnerability to severity of corona virus disease 2019 (COVID-19) caused by the severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2). Earlier viral pandemics have proven that obesity, mainly severe obesity (BMI > 40 kg/m<sup>2</sup>), is correlated with increased risk of hospitalization, critical care and fatalities.

Concerning relation was found student's sociodemographic data and dietary habits with their body mass index, the present study revealed that there are a statistically significant relation was found student's sociodemographic data and their body mass index mainly in items related to age and marital status. These finding goes in the same way with *Darling et al., 2017* who reflected that between male students, social support faired the relationship between stress eating and BMI change. Also, social support may serve as a buffer aligned with the force of stress eating on student's weight gain during the freshman year of study in the college.

Regarding relationship between student's body mass index and their dietary habits, the present study revealed that that there are a statistically significant relation was found students body mass index and all items related to their dietary habits during stress. In addition to, more than half of students overeat without control when faced stress situation. These finding goes

in the same way with *Errisuriz et al., 2016* perceived stress was positively allied with past week soda, coffee, energy drink, salty snack, frozen food, and fast food eating. On the other hand, supposed stress supervision moderated the relationship between stress and sweet snack utilization which greater stress is connected with poor dietary selections among college freshmen. From another concern to obesity *Kwok et al., 2020* highlighted on the important implications of excess weight on global health usually represented by a raised body mass index (BMI), affects huge numbers of people globally as 39% of adults are overweight (BMI  $\geq$ 25.0 to 29.9 kg/m<sup>2</sup>) and 13% have clinical obesity (BMI  $\geq$ 30.0 kg/m<sup>2</sup>) worldwide. Western populations have noticeable higher rates of obesity as 40% of adults have obesity and another 32% are overweight in the United States, while in England 29% of adults have obesity and a further 36% are overweight.

In China, *Jiang et al., 2019* harassed on frequency of take-out food eating was major concern and concluded that Chinese college students, consumption of take-out food may be affected by major category, preference for HFHS food, degree level, and BMI which could offer direction on limits of high take-out food eating, which donates to high obesity prevalence and high risk for metabolic diseases.

Finally, *Al-Qahtani & Alsubaie, 2020* in KSA Pointed out that stress is not only a response to an environmental stimulus but also a progression through which individuals experience and challenge with the threats in their environments. Thus, there is an evident need for employ educational programs includes academic and group activity areas which recognized as the major significance stressors among female health profession students, and efforts to guided students regarding proper strategies to diminish their stress levels, enhance their quality of life and study experience. Furthermore, *Errisuriz et al., 2016* highlighted on the importance for college nutrition education programs to spotlight on the relationship between stress and diet and promote effective stress management performances. Hence, there is obvious requires for a new effective recognition of students who may move violently during next stages of the pandemic and crises outlook (*Debowska et al., 2020*).

## CONCLUSION & RECOMMENDATIONS

Based on study findings we can conclude that most of student's suffered stresses with the main sources are academic, finical or economic, relationship, and future /career growth source. Also, there are a statistically significant relation was found student's sociodemographic data and their body mass index mainly in items related to age and marital status. Furthermore there are statistically significant relations were found student's body mass index and all items related to their dietary habits during stress. From the

foregoing conclusion, students need for receive regular; periodic in-service dietary program contains methods of coping with stresses which indirectly added stressor on student's psychological status and indirectly affect their dietary habits and behavior. There is an evident necessitate for designed curriculum in the colleges regarding benefits of physical activity and eating patterns in health colleges. Further studies are needed to study the coping strategies that influence university students' eating behavior with the study stressors.

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