The Degree of Emotional Eating Among Female University Students and Its Impact on Their Pattern of Eating Behaviors

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Abstract **Background:** The transition from high school often coincides with impact on emotional eating (EE), potentially leading to disruptions in eating patterns. Even though, the impact of EE on patterns of eating behavior among Saudi female university students is not fully investigated. **Aim:** To assess the impact of EE on patterns of eating behavior among Saudi female University students. **Methods:** A total of 359 female students (King Abdulaziz University, Jeddah, Saudi Arabia) participated in a cross-sectional study. Data was collected using online questionnaire including general characteristics, Emotional Eating Questionnaire (EEQ) and Eating Behavior Pattern Questionnaire (EBPQ). **Results:** 41.2% of participants were categorized as somewhat emotional eaters with a mean EEQ score of 13.80±6.84. EE was positively associated with eating out, frequent snacking, consumption of sweets and biscuits, and meal skipping ($p<0.05$). Additionally, EBPQ score was positively correlated with weight/BMI ($r=0.28$, $r=0.29$) while negatively correlated with adherence to low-fat diet ($r=-0.30$, $r=-0.26$). Significant association between EEQ scores and BMI ($p<0.001$), with increased emotional eating score among overweight/obese individuals. **Conclusion:** Female university participants exhibited somewhat emotional eating tendencies, highlighting the complexity of the interaction between different parameters. These findings underscore the importance of addressing EE behaviors and its subsequent impact on dietary patterns; and promoting healthier dietary habits among Saudi female university students.

1. Introduction

Emotional eating (EE) denotes a condition characterized by increased consumption of food in response to negative emotions. Originally, EE was defined as eating solely to cope with adverse emotional states [1]. Al-Musharaf suggests that EE arises from an inability to differentiate between the urge to eat to manage negative emotions and physiological hunger cues, thereby transforming food into a coping mechanism for unpleasant emotional experiences [2]. This phenomenon is influenced by various factors including genetic predisposition, sociodemographic background, and environmental influences. With a decline in parental influence during the transition to college, dietary habits established during childhood may undergo shifts during the college years. Research indicates that a significant proportion of students experience weight gain during their initial year at college [3]. The transition from high school to university presents challenges and adjustments, leading to unhealthy eating behaviors such as binge eating and irregular eating patterns during stress-

ful periods [4]. Predicting how emotions influence dietary preferences during the transitional phase from adolescence to early adulthood is complex [5]. For young individuals, the transition to university marks a critical period where they assume responsibility for their dietary choices. Inexperienced in cooking and exposed to environments promoting sedentary lifestyles and unhealthy food options, university students may develop poor dietary habits and gain weight that persists into adulthood [6].

University students often manifest distinct dietary and behavioral patterns compared to their counterparts in previous educational stages, a phenomenon attributed to various factors. Throughout the academic year, college students commonly adopt unhealthy habits characterized by low levels of physical activity, excessive consumption of junk food, indulgence in evening snacking, and heightened levels of perceived stress [7]. These behaviors underscore the importance of targeting college students as a pivotal demographic for initiatives aimed at promoting healthy lifestyles and reducing

the prevalence of chronic non-communicable diseases in adulthood. The university environment itself can contribute to the development of psychological issues such as stress, anxiety, and depression among students [8].

Despite the growing recognition of EE as a significant issue among university students, assessment of its impact on eating behavior patterns among female university students in Saudi Arabia remains unexplored. Moreover, the relationship with other parameters such academic stress, presence of comorbidities and BMI has yet to be investigated. Therefore, addressing this gap is crucial for understanding the challenges encountered by Saudi female university students regarding the repercussions of EE on eating behavior patterns. Moreover, it is essential for informing targeted interventions to promote healthier dietary habits and overall well-being during the University academic years.

2. Subjects and Methods

This cross-sectional study was carried out from June 2023 to September 2023 by using self-administered questionnaires. The participants were female students aged 18-25 years from King Abdulaziz University in Jeddah, Saudi Arabia. The Helsinki Declaration was followed in the conduct of the study. Every participant gave written, informed consent.

The inclusion criteria included the following parameters: Saudi nationality, enrollment as a student at King Abdulaziz University, female gender, and an age range of 18 to 25 years. Participants belonged to diverse socio-economic backgrounds and different body mass index (BMI). The study exclusively focused on undergraduate students pursuing bachelor's degrees. Conversely, pregnant women, individuals suffering from sleep disorders, mental health issues, and any other disease that might influence on dietary habits and behavior were excluded from the study. Adherence to the ethical principles delineated in the Helsinki Declaration were respected during this research. Prior to inclusion, all participants provided written, informed consent.

A. Demographic data

The demographic data included age, academic university year, monthly income, presence of comorbidities such as chronic of physiological disease and any physiological condition, diet type if present, caffeine consumption and energy intake.

B. Anthropometric measurements

Participants were asked about their height (cm) and weight (kg). These measurements were utilized to compute the BMI (Kg/m²) using the standard formula recommended by the World Health Organization (WHO). Subsequently, participants were categorized into four distinct BMI classifications: underweight, normal weight, overweight, and obese, in accordance with WHO guidelines [9].

C. Study tools

The emotional eating was assessed using an adapted version of the questionnaire developed by Garaulet et al. [10]. The Emotional Eating Questionnaire (EEQ) was specifically designed to measure the relationship between food intake and emotional states. Selection of this questionnaire was based on its ease of administration and suitability to the aim of this study. It comprised 10 questions, with following possible responses: 1. Never, 2. Sometimes, 3. Usually; and 4. Always. Responses were scored accordingly from 0 to 3, with each participant receiving a total score ranging from 0 to 30. Interpretation of scores categorized participants into four distinct groups: scores of 0–5 denoted non-emotional eaters, 6–10 indicated moderate emotional eating tendencies, 11–20 signified emotional eaters, and scores of 21–30 identified individuals with highly emotional eating behaviours.

In addition to the Eating Behavior Pattern Questionnaire (EBPQ) that was adapted from Schlundt et al. [11]. and tailored to suit the specific requirements of the study aim. It served as a pivotal instrument in assessing participants' eating behavior patterns. This questionnaire was considered because of its simplicity, generality, and applicability to a broad spectrum of eating habits, without exclusive focus on any particular eating disorder. It contained 23 items covering various aspects of eating behavior, including low-fat eating, healthy eating, eating out, snacking, consumption of sweets and biscuits, emotional eating, meal skipping, intake of caffeinated beverages, and culture. In addition to the EBPQ, 3 items were selected from a questionnaire developed by Radwan et al. [12] to evaluate participants' caffeine consumption habits. Responses to the questions were based on a 5-points Likert scale, ranging from "Strongly Disagree" to "Strongly Agree," with each response option assigned a numerical value from 1 to 5, where 1= strongly disagree and 5= strongly agree. The final score for each pattern was determined by summing the ratings of the individual items.

Both EEQ and EBPQ, all questionnaires underwent translation from English to Arabic to ensure comprehension among the study participants. The translated questionnaire was revised by experts to refine the Arabic language to guarantee its clarity and coherence within the sampled population.

D. Pilot study

Prior to its utilization for data collection, the questionnaire underwent distribution among a subset of individuals selected from the same targeted community as the main study sample. This preliminary investigation, termed a pilot study, sought to gauge the timeliness and clarity of the questionnaire within an environment mirroring that of the primary study cohort. Emphasis was placed on ensuring the comprehensibility of the questionnaire items and their logical arrangement. This pilot study aimed to identify any potential errors or barriers encountered by participants during the completion of the questionnaire. Through this process, adjustments were made to optimize the questionnaire's clarity and coherence. Notably, revisions were implemented to streamline question

phrasing and improve the overall flow of the questionnaire. Feedback from participants regarding timing and questionnaire format was also carefully considered to enhance the data collection process for maximal efficiency and participant engagement.

For reliability assessment, the Alpha Cronbach's coefficient was calculated as 0.73 and 0.79 for the EEQ and EBPQ, respectively. Additionally, the overall Alpha Cronbach's coefficient (α) for the entire questionnaire was determined to be 0.83, indicating satisfactory internal consistency. Therefore, the questionnaire exhibited good reliability, rendering it suitable for use in the study.

E. Statistical analysis

The collected data were computerized and statistically analyzed using SPSS program (Statistical Package for Social Science) version 27.0 (IBM, 2020). Qualitative data were represented as frequencies and relative percentages. Chi2 test was used to calculate difference between qualitative variables. Fisher's exact test was used when one or more of the studied cells was less than 5. Quantitative data were expressed as mean ± SD (Standard deviation). Independent T test and ANOVA was used to calculate difference between quantitative variables in two groups in normally distributed data. Pearson's correlation coefficient used to calculate correlation between quantitative variables. P value of <0.05 indicates significant results and of <0.001 indicates highly significant results [13].

3. Results

A total of 359 female university students participated in the study. The mean age of the participants was 21.49 ± 1.75 years. The average weight and height were 57.44 ± 15.19 Kg and 1.59 ± 0.06 m, respectively. The Body Mass Index (BMI) exhibited a mean of 22.73 ± 5.43 Kg/m². The distribution of BMI categories revealed that over half of the participants (53.2%) were classified as having a normal weight. Furthermore, approximately one-third of the participants were in their fourth academic year, while nearly two-thirds reported an income below 5000 Saudi Riyals. Comorbidities were present in 11.1% of the study sample, with being on diet reported by 8.9% of participants, predominantly involving caloric restrictions. Caffeine consumption was prevalent among 70.8% of the participants, while energy drink consumption was reported by 20.9% (Table 1).

Table 2 presents the results obtained from the EEQ and the EBPQ. Analysis of the EEQ scores revealed that the majority of participants were categorized as somewhat emotional eaters (41.2%), followed by non-emotional eaters (26.7%). The mean EEQ score across all participants was 13.80±6.84. As for the EBPQ results, the mean scores for various eating behavior patterns were as follows: emotional eating (22.38±6.08), low-fat eating (8.30±2.91), healthy eating (4.43±1.93), eating out (12.03±3.92), snacking (5.52±2.19), sweets and biscuits (8.02±2.83), meal skipping (12.45±2.97), and culture (3.43±1.18).

The results of correlation analysis between the Emotional Eating Questionnaire (EEQ) scores and various parameters among the study population are presented in Table 3. A statistically significant positive correlation was observed between the EEQ score and weight, BMI, as well as specific domains of the Eating Behavior Pattern Questionnaire (EBPQ), such as emotional eating, eating out, snacking, sweet & biscuits, and meal skipping. Overall, the correlations observed between the EEQ scores and the investigated parameters were predominantly weak, except for emotional eating, which demonstrated a moderate correlation coefficient (r = 0.63).

Table 4 presents a summary of the correlation analysis between the EBPQ and various studied parameters. Significant findings include a positive correlation between emotional eating and both weight and BMI, with correlation coefficients of r = 0.28 and r = 0.29, respectively. Conversely, a significant negative correlation was observed between adherence to a low-fat diet and both weight and BMI, with correlation coefficients of r = -0.30 and r = -0.26, respectively. Additionally, a positive correlation was identified between adherence to a low-fat diet and the year of study (r = 0.23, p = 0.05). It is worth noting that all of these correlations are considered weak based on the obtained correlation coefficient (r). Regarding the association between the EEQ scores and the general characteristics of the studied population, the analysis revealed that BMI was the only parameter significantly associated, as indicated by a p-value of <0.001 (Table 5). The analysis of EBPQ scores in relation to BMI revealed that there was a statistically significant increase in the score indicative of emotional eating among individuals classified as overweight and obese. Conversely, a statistically significant decrease in the score reflecting adherence to low-fat eating patterns was observed among individuals categorized as obese (Table 6).

There was a statistical significance increase in frequency of over weight & obese among highly emotional eating (Table 5).

According to the results illustrated in Table 7 no significant relationship was observed between comorbidity and EBPQ scores. However, participants who adhered to a diet exhibited a statistically significant decrease in scores related to eating out, snacking, and meal skipping, along with an increase in scores indicative of adherence to low-fat and healthy dietary patterns compared to those who did not follow a diet. Moreover, a significant increase in scores related to snacking and consumption of sweets was observed among individuals who consumed energy drinks compared to those who did not.

4. Discussion

College students find themselves in a transitional phase between biological maturation and adulthood, often characterized by incomplete psycho-social development [14]. This period marks a significant juncture where numerous lifestyle changes commonly occur upon commencing college, notably affecting dietary habits. These changes may encompass the

Variable		(n=359)	
Age: (years)	Mean ± Sd	21.49±1.75	
	Range	18-25	
Weight: (Kg)	Mean ± Sd	57.44±15.19	
	Range	30-175	
Height: (m)	Mean ± Sd	1.59±0.06	
	Range	1.4-1.89	
BMI: (Kg/m2)	Mean ± Sd	22.73±5.43	
	Range	13.33-64.28	
Variable		No	%
BMI class:	Underweight	70	19.5
	Normal	191	53.2
	Overweight	75	20.9
	Obese class I	16	4.5
	Obese class II	4	1.1
	Obese class III	3	0.8
Year:	1	31	8.6
	2	68	18.9
	3	63	17.5
	4	117	32.6
	5	36	10
	6	15	4.2
	7	29	8.1
Income:	<5000	240	66.9
	5000-10000	78	21.7
	>10000	41	11.4
Comorbidity:	No	319	88.9
	Yes	40	11.1
Diet:	No	327	91.1
	Yes	32	8.9
Diet type:	Caloric counting	13	40.6
	Healthy choices	9	28.1
	Intermittent fasting	5	15.6
	Keto	2	6.3
	Gluten free	2	6.3
	High protein	1	3.1
Caffeine:	No	105	29.2
	1-4	186	51.8
	>4	68	18.9
Energy drinks:	No	284	79.1
	Yes	75	20.9

Table 1: General characteristics of the studied population (n=359)

Variable			(n=359)
EEQ:		Mean ± Sd	13.80±6.84
		Median (Range)	13 (1-30)
		Non-emotional eater	96 (26.7%)
		Somewhat emotional eater	148 (41.2%)
		Emotional eater	64 (17.8%)
		Highly emotional eater.	51 (14.2%)
EBPQ:	Emotional eating:	Mean ± Sd	22.38±6.08
		Range	7-35
	Low fat eating:	Mean ± Sd	8.3±2.91
		Range	3-15
	Healthy eating:	Mean ± Sd	4.43±1.93
		Range	2-10
	Eating out:	Mean ± Sd	12.03±3.92
		Range	4-20
	Snacking:	Mean ± Sd	5.52±2.19
		Range	2-10
	Sweet & biscuits:	Mean ± Sd	8.02±2.83
		Range	3-15
	Meal skipping:	Mean ± Sd	12.45±2.97
		Range	4-20
	Culture:	Mean ± Sd	3.43±1.18
		Range	1-5

Table 2: Emotional Eating Questionnaire (EEQ) & Eating Behavior Pattern Questionnaire (EBPQ) among the studied population

Variable	EEQ (n=359)	
	r	P
Age	-0.06	0.26 NS
Weight	0.25	0.03*
BMI	0.26	0.03*
Year	-0.03	0.59 NS
Income	-0.08	0.11 NS
Caffeine intake	0.01	0.83 NS
Emotional eating	0.63	<0.001**
Low fat eating	0.09	0.08 NS
Healthy eating	0.05	0.39 NS
Eating out	0.27	0.02*
Snacking	0.42	<0.001**
Sweet & biscuits	0.24	0.04*
Meal skipping	0.30	0.009*
Culture	0.09	0.36 NS

Table 3: Correlation between Emotional Eating Questionnaire (EEQ) and different parameters among the studied females

adoption of poor eating practices and alterations in diet, such as skipping meals, undereating, and frequent consumption of fast food [15].

Eating Disorders (EDs) represent severe mental health conditions characterized by sudden behavioral shifts and an overwhelming fixation on one's weight and/or body shape related to significant dissatisfaction with their physical appearance [16]. These disorders are notably prevalent among young individuals, highlighting the vulnerability of this demographic to such mental health challenges.

In the present study, the distribution of weight categories among participants revealed that more than half were of normal weight. Furthermore, a mere 8.9% reported following specific diet. These findings are consistent with those reported by Alharbi et al. [17], who noted that 49.2% of individuals did not maintain a healthy diet at home, with approximately half of the subjects failing to adhere to a diet plan. Similarly, Choi [4] reported that only 24.2% of respondents were actively following a diet. Additionally, Radwan et al. [18] stated that 45.3% of students refrained from adhering to a diet due to busy exam schedules and demanding academic commitments. Some students tended to neglect prioritizing the quality of their dietary choices and overall health throughout the day. This behavior is often driven by the consumption of high-calorie, high-sugar foods such as coffee, croissants, and sandwiches early in the day, which can disrupt blood sugar levels and contribute to fluctuations in mood for the remainder of the day.

Saudi Arabia is recognized for having a high prevalence of obesity (20%) [19], as reported by the Saudi Ministry of Health through the World Health Organization's Global Health Survey (KSAWHS) in 2019. According to this data, approximately 20% of the Saudi population is classified as obese, with females exhibiting a slightly higher prevalence at 21% [20]. These figures represent a notable contrast to the latest national average for overweight and obese young Saudis, which stands at a staggering 38% [21].

In our study, analysis of the EEQ yielded a mean score of 13.80±6.84, indicating the average level of emotional eating tendencies among participants. Specifically, 26.7% of participants were classified as non-emotional eaters based on their EEQ scores. Furthermore, examination of the EBPQ provided mean scores that facilitated the development of insights into the eating behavior patterns observed among the study participants. Our findings align with Al-Musharaf [2], who revealed that young Saudi women commonly engage in overeating as a response to emotional stimuli. A comparable study conducted in Riyadh among women also corroborated these findings [22], reporting an average Emotional Eating (EE) score of 27.5±16. According to this study, 12.4% of participants exhibited high levels of EE [2]. Moreover, Işık and Cengiz [23] found that the average EE score among Turkish university students was 73.29 ± 20.85, belonging to the usual range for EE. However, a study published in Aloudah [24] reported a significantly higher prevalence of emotional eating, with 38.6% of the study participants engaging in this behavior. Discrepancies between these findings may arise from variations in the tools used to assess EE and the geographical distance between study populations. Additionally, differences in baseline characteristics among study cohorts may also contribute to disparities in reported EE prevalence rates. Carlos et al. [25] revealing that approximately 28.2% of their sample could be categorized as non-emotional eaters, 40.4% as somewhat emotional eaters, 29% as emotional eaters, and 2.4% as extremely emotional eaters. Similarly, Alharbi et al. [17] reported an average EE value of 29.4±12.3, with EE classification scores indicating that 44.7% exhibited low EE, 43.9% moderate EE, and 11.3% high EE. In contrast, Al-Musharaf [2] found that the majority of participants (47.2%) were classified as low emotional eaters, followed by moderate (40.4%) and high (12.4%) emotional eaters.

In our current study, we observed a significant positive correlation between EEQ score and weight, BMI, as well as the EE domain of the EBPQ, encompassing factors such as eating out, snacking, sweet & biscuits consumption, and meal skipping. These findings underscore the complex relationship between emotional eating behavior and various physiological and dietary factors. Bilici et al. [26] reported results consistent with our own findings. Furthermore, by performing regression analyses, these authors revealed that for each one-unit increase in BMI, there were corresponding increases in scores for negative situations (0.293), negative emotions (0.626), and the overall negative total EMAQ scores (0.919). Similarly, Al-Musharaf [2] reported a positive correlation (p<0.005) between overall Emotional Eating Scale (EES) scores and BMI. Additionally, a positive correlation was observed between EES scores and the number of meals consumed, as well as calorie intake. Ling et al. [27] demonstrated a positive correlation between students' BMI and self-reported stress. Taken together, these findings highlight the interplay between BMI, emotional eating behaviors, and stress levels among college students.

Al-Musharaf [2] conducted multiple linear regression

Variable	Age (n=359)		Weight (n=359)		BMI (n=359)		Year (n=359)		Income (n=359)		Caffeine intake (n=359)	
	r	P	r	P	r	P	r	P	r	P	r	P
Emotional eating	-0.03	0.63 NS	0.28	0.01*	0.29	0.01*	-0.03	0.52 NS	-0.03	0.57 NS	-0.009	0.87 NS
Low fat eating	0.09	0.11 NS	-0.30	0.009*	-0.26	0.03*	0.23	0.05*	0.07	0.16 NS	0.09	0.08 NS
Healthy eating	0.09	0.08 NS	0.07	0.17 NS	0.04	0.47 NS	0.08	0.12 NS	-0.05	0.36 NS	0.03	0.57 NS
Eating out	-0.08	0.11 NS	0.01	0.87 NS	0.01	0.99 NS	0.06	0.29 NS	-0.003	0.96 NS	0.07	0.21 NS
Snacking	-0.07	0.16 NS	0.02	0.66 NS	0.04	0.49 NS	0.02	0.68 NS	-0.01	0.81 NS	0.17	0.09 NS
Sweet & biscuits	-0.10	0.07 NS	-0.05	0.31 NS	-0.06	0.24 NS	-0.07	0.20 NS	0.18	0.12 NS	0.12	0.11 NS
Meal skipping	-0.10	0.06 NS	0.08	0.15 Ns	0.07	0.22 NS	-0.04	0.47 NS	-0.003	0.96 NS	-0.03	0.54 NS
Culture	0.09	0.10 NS	-0.03	0.53 NS	-0.04	0.44 NS	0.09	0.10 NS	-0.01	0.82 NS	-0.03	0.55 NS

Table 4: correlation between Eating behavior pattern Questionnaire (EBPQ) and different parameters among the studied population

Variable		EEQ								P
		No		Somewhat		Emotional		Highly emotional		
		N	%	N	%	N	%	N	%	
BMI:	Underweight	13	18.6	27	38.6	29	41.4	1	1.4	<0.001 **
	Normal	15	7.9	57	29.8	85	44.5	34	17.8	
	Overweight	4	5.3	11	14.7	30	40	30	40	
	Obese	2	8.7	4	17.4	11	47.8	6	26.1	
Comorbidity:	No	32	10	88	27.6	138	43.3	61	19.1	0.67 NS
	Yes	2	5	11	27.5	17	42.5	10	25	
Diet:	No	33	10.1	88	26.9	142	43.4	64	19.6	0.53 NS
	Yes	1	3.1	11	34.4	13	40.6	7	21.9	
Caffeine:	No	13	12.4	23	21.9	47	44.8	22	21	0.25 NS
	1-4	16	8.6	59	31.7	81	43.5	30	16.1	
	>4	5	7.4	17	25	27	39.7	19	27.9	
Energy drinks:	No	31	10.9	79	27.8	125	44	49	17.3	0.054 NS
	Yes	3	4	20	26.7	30	40	22	29.3	

Table 5: Association between EEQ and general characteristics of the studied population

analyses, which unveiled several factors positively correlated with Emotional Eating Scale (EES) scores such as the number of meals consumed, sugary food consumption, BMI, stress levels, energy intake, and frequency of fast-food consumption. Of these factors, BMI, stress levels, and frequency of fast-food intake were labeled as key indicators of emotional eating. Furthermore, Ling et al. [27] revealed a positive correlation between sweet intake and emotional eating, as well as perceived stress levels. Sze et al. [28] demonstrated that female students with lower EE ratings exhibited significantly lower levels of life satisfaction and lower body fat indexes. It is established that negative EE tendencies may pose an increased risk of weight gain [29], [30], these studies suggested that emotional dysregulation directly influences BMI through emotional eating behaviors. In fact, higher levels of emotional dysregulation were found to be associated with elevated EE levels, subsequently leading to higher BMI levels. Additionally, a study conducted in Riyadh revealed a significant association between emotional eating and increased snacking behaviors [24]. Further evidence from a study conducted in Bahrain indicated that university students tended to consume high-calorie foods during episodes of emotional eating [31]. Similarly, a research on demonstrated a correlation between regular consumption of unhealthy, high-fat fast food and emotional eating tendencies among students [32].

Commercially baked products often represent low-quality, low-nutrient breakfast options, and skipping breakfast has been recognized to influence various health-related behaviors. Furthermore, poor mental health indicators and risk factors are pertinent considerations [33]. A study demonstrated a relationship between depression and breakfast skipping, revealing that individuals who infrequently consumed breakfast were more likely to experience symptoms of depression compared to those who regularly ate breakfast [34]. These variations in findings can be attributed to differences in research objectives, participant demographics, study settings, assessment tools, and age groups under investigation.

In contrast, Alharbi and Alharbi [17] did not obtain any significant relationship between EE and BMI. Similarly, Korean studies did not report any correlations between EE and BMI, fat mass, or waist-hip circumference [35]. Another study involving overweight individuals also reported no correlation between BMI and EE [36]. These discrepancies could be explained by difference in culture and study populations. However, our current study revealed a significant positive correlation between emotional eating and BMI. Additionally, a statistically significant negative relationship was observed between BMI and adherence to a low-fat diet, suggesting that individuals with higher BMIs were less likely

EBPQ	BMI	N	Mean	Sd	F	P
Emotional Eating:	Underweight	70	20.76	5.45	4.59	0.004*
	Normal	191	22.09	5.91		
	Overweight	75	24.00	6.38		
	Obese	23	24.43	6.84		
Low fat:	Underweight	70	9	2.83	3.15	0.03*
	Normal	191	8.48	2.97		
	Overweight	75	8.49	2.62		
	Obese	23	7.93	2.96		
Healthy Eating:	Underweight	70	3.70	1.70	2.63	0.26 NS
	Normal	191	4.59	1.96		
	Overweight	75	4.48	1.96		
	Obese	23	3.87	1.89		
Eating Out:	Underweight	70	12.13	3.79	0.58	0.63 NS
	Normal	191	11.88	4.05		
	Overweight	75	12.03	3.71		
	Obese	23	13.0	4.07		
Snacking:	Underweight	70	5.53	2.06	0.40	0.75 NS
	Normal	191	5.43	2.18		
	Overweight	75	5.76	2.34		
	Obese	23	5.48	2.25		
Sweet:	Underweight	70	8.51	2.98	1.40	0.24 NS
	Normal	191	7.96	2.82		
	Overweight	75	7.60	2.70		
	Obese	23	8.35	2.81		
Skipping meal:	Underweight	70	12.30	2.86	0.37	0.78 NS
	Normal	191	12.38	2.83		
	Overweight	75	12.65	3.34		
	Obese	23	12.87	3.33		
Culture:	Underweight	70	3.51	1.19	0.16	0.93 NS
	Normal	191	3.41	1.20		
	Overweight	75	3.41	1.12		
	Obese	23	3.48	1.24		

Table 6: Eating behavior pattern Questionnaire (EBPQ) according to BMI among the studied population

to follow a low-fat diet. Furthermore, there was a positive correlation observed between emotional eating and the duration of the study period. Similarly, a positive correlation between emotional eating and BMI, with obese individuals exhibiting significantly higher rates of emotional eating compared to those of normal weight [37]. This suggests that emotional eating behaviors may contribute to weight gain in individuals, potentially forming part of a broader behavioral pattern associated with body weight [26].

Conversely, Choi [4] found that while consuming snacks such as cakes, candies, and soft drinks had a negative impact on BMI, consuming fast food had a beneficial effect on BMI. These contrasting findings highlight the complexity of dietary influences on BMI and the need for further investigation. Furthermore, our study revealed a statistically significant increase in the frequency of overweight or obesity among highly emotional eaters. This finding is consistent with research by Cecchetto et al. [38], who found that higher BMI scores were associated with increased emotional eating and binge eating behaviors.

Moreover, our research indicated that emotional eating significantly increased with higher BMI and higher levels of alexithymia, consistent with existing literature [39]. Additionally, prior research has shown that higher stress levels are associated with increased binge eating scores among individuals with higher BMIs, which in turn predicts higher binge eating among those with higher stress scores [40], [41]. These

findings pinpoint the multifaceted nature of emotional eating behaviors and their implications for weight management and psychological well-being.

As per limitation, the authors consider the focus on data collected from a single university, which may limit the generalizability of findings to the broader population of Saudi females aged between 18-25 years. However, it is noteworthy that this research represents the first comprehensive investigation into EE and its association with various parameters. Despite its limitation, the study's findings hold significant value and serve as a foundation for future research endeavors in this area.

5. Conclusions

Emotional eating emerges as a significant risk factor for obesity, eating disorders, and the increased prevalence of metabolic diseases such as diabetes and heart disease. Our findings suggest that emotional eating tendencies are influenced by various dietary behaviors, including eating out, frequent snacking, consumption of sweets and biscuits, and meal skipping. Understanding emotional eating patterns provides valuable insights into the lifestyles of Saudi University female youth and may help identify metabolic abnormalities associated with emerging eating disorders.

Furthermore, the findings obtained from this study could contribute to identify specific metabolic abnormalities associated with evolving eating disorders of young Saudi women. By shedding light on the importance of healthy eating for

Variable			N	Mean	Sd	t	P
Co-morbidity	Emotional Eating:	No	319	22.35	6.16	0.24	0.81 NS
		Yes	40	22.6	5.46		
	Low fat:	No	319	8.26	2.93	0.80	0.432 NS
		Yes	40	8.65	2.83		
	Healthy Eating:	No	319	4.39	1.94	1.2	0.23 NS
		Yes	40	4	1.88		
	Eating Out:	No	319	12.04	3.92	0.14	0.89 NS
		Yes	40	11.95	4.03		
	Snacking:	No	319	5.45	2.19	1.7	0.09 NS
		Yes	40	6.08	2.11		
	Sweet:	No	319	7.98	2.87	0.61	0.54 NS
		Yes	40	8.28	2.53		
	Skipping meal:	No	319	12.39	2.95	1.18	0.24 NS
		Yes	40	12.98	3.13		
	Culture:	No	319	3.41	1.19	1.23	0.22 NS
		Yes	40	3.65	1.05		
Diet	Emotional Eating:	No	327	22.54	6.12	1.56	0.12 NS
		Yes	32	20.78	5.51		
	Low fat:	No	327	8.05	2.84	5.5	<0.001 **
		Yes	32	10.91	2.35		
	Healthy Eating:	No	327	4.22	1.86	4.01	<0.001 **
		Yes	32	5.63	2.20		
	Eating Out:	No	327	12.21	3.96	3.50	0.001*
		Yes	32	10.19	3		
	Snacking:	No	327	5.62	2.21	2.8	0.005*
		Yes	32	4.5	1.68		
	Sweet:	No	327	8.09	2.86	1.68	0.10 NS
		Yes	32	7.22	2.38		
	Skipping meal:	No	327	12.58	2.94	2.61	0.01*
		Yes	32	11.16	3		
	Culture:	No	327	3.4	1.19	1.59	0.11 NS
		Yes	32	3.75	0.95		
Energy drinks:	Emotional Eating:	No	284	22.21	6.19	1.06	0.29 NS
		Yes	75	23.04	5.63		
	Low fat:	No	284	8.33	2.91	0.35	0.37 NS
		Yes	75	8.2	2.95		
	Healthy Eating:	No	284	4.24	1.87	1.95	0.05 NS
		Yes	75	4.76	2.12		
	Eating Out:	No	284	11.83	3.99	1.85	0.07 NS
		Yes	75	12.77	3.59		
	Snacking:	No	284	5.38	2.20	2.50	0.01*
		Yes	75	6.08	2.07		
	Sweet:	No	284	7.80	2.88	2.91	0.004*
		Yes	75	8.85	2.45		
	Skipping meal:	No	284	12.39	3.08	1.1	0.27 NS
		Yes	75	12.79	2.51		
	Culture:	No	284	3.46	1.23	0.95	0.34 NS
		Yes	75	3.32	0.65		

Table 7: Eating behavior pattern Questionnaire (EBPQ) according to comorbidity, diet and energy drinks among the studied population

overall well-being, our results underscore the significance of emotional eating and its relationship to the consumption of calorie-dense foods. This awareness can inform targeted interventions aimed at promoting healthier eating habits and preventing the adverse health consequences associated with emotional eating behaviors among this specific group of the Saudi population.

Conflict of interest
Author declares no conflict of interests. Author read and approved final version of the paper.

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