

## ORIGINAL RESEARCH

# Eating pattern among adolescent female student, Applied Medical Sciences College, University of Hafr-Al Batin

Asmaa Ghareeb Mohamed\*<sup>1,2</sup>, Suhair Salah Mohammed<sup>2</sup>

<sup>1</sup>Community Health Nursing, Faculty of Nursing, Assiut University, Egypt

<sup>2</sup>Nursing Department (CAMs), University of Hafr-Al Batin, Saudi Arabia

**Received:** October 30, 2018

**Accepted:** December 4, 2018

**Online Published:** December 24, 2018

**DOI:** 10.5430/jnep.v9n4p73

**URL:** <https://doi.org/10.5430/jnep.v9n4p73>

## ABSTRACT

The college students, representing the young age population of community, for different reasons are prone to eat unhealthy foods and to have bad health habits during their college years which might affect their well-being and increase the risk of obesity, diabetes, and coronary heart disease; like fast food consumption, lower vegetable and fruit intake in face of less physical activities and a lot of computer & TV watching hours. This study aimed to assess eating habits and patterns, factors affecting food choices and anthropometric measurements. Descriptive cross-sectional study method was followed. 230 students were included in the study. The findings revealed that 50.9% of the study sample were at age group (< 20 years), nearly half 48.7% were at a preparatory year. Results show also that 44.3% of the study sample don't take breakfast regularly; the most reported causes were not enough time at home 49% and that they don't prefer cafeteria food 24.6% nor there is no for a break in the timetable 21.6%. The results show that 53.04% had a normal BMI and 24.35% were overweight. The BMI had a significant relation with the consumption and snacking patterns among students ( $p = .000$ ). So, there is a greater need for constructing educational programs to be directed to enhance the nutritional status of the university adolescent students.

**Key Words:** Food consumption, Eating pattern, University students

## 1. INTRODUCTION

The university students, representing the young age population of a community, for different reasons are prone to eat unhealthy foods and to have bad health habits during their college years which might affect their well-being and increase the risk of obesity, diabetes, and coronary heart disease,<sup>[1]</sup> like fast food consumption, lower vegetable and fruit intake in face of less physical activities and a lot of computer & TV watching hours.

Worldwide, and especially in Saudi Arabia the dietary habits

have changed a lot over the past decades correlating with the rapid socioeconomic jump at the level of the government and the population, these dramatic lifestyle changes affected all the age groups mainly children and adolescent.<sup>[2-4]</sup>

In particular, university students living away from home develop unfavorable eating habits, showing a rapid change of the traditional diet in an undesirable direction and lifestyle modification towards globalized behaviors.<sup>[5-7]</sup> Studies have shown that the trend of fast food consumption among college students is increasing.<sup>[8-10]</sup>

\*Correspondence: Asmaa Ghareeb Mohamed; Email: [asmaagm@uohb.edu.sa](mailto:asmaagm@uohb.edu.sa); Address: Applied Medical Sciences College, University of Hafr-Al Batin, Saudi Arabia.

There is compelling evidence that dietary habits and lifestyle during adolescence are risk factors for several nutrition related non-communicable diseases in adulthood.<sup>[11]</sup> Understanding the dietary patterns and lifestyle behaviors of both children and adults is an essential step in constructing an effective intervention program to prevent diet-related diseases.

### 1.1 Significance of the study

Unhealthy dietary habits and lifestyles among adolescents are considered risk factors for several nutrition-related diseases in adulthood. Statistics show that children and adolescents in Arab countries, including Saudi Arabia, suffer from paradoxical nutritional problems: those associated with unsound food habits and nutrient deficiencies such as iron deficiency anemia, calcium, and vitamin D deficiencies, and underweight; and those associated with overnutrition and changes in lifestyle such as obesity, elevated blood pressure, and diabetes. This situation has created a great challenge for the Saudi Health Authority to address. However, studying the current food habits and lifestyles among various age groups in the Saudi community is the first step to establishing an effective intervention strategy.<sup>[12]</sup>

### 1.2 Aims of the study

- (1) To assess dietary habits, eating patterns and physical activity.
- (2) To assess anthropometric measurements of the students (weight, height, waist circumference) and body mass index.
- (3) To determine the association between meals consumption and BMI.

## 2. SUBJECTS & METHODS

### 2.1 Research design

A descriptive cross-sectional study design was utilized in this study.

### 2.2 Setting

The study was conducted at College of Applied Medical Sciences, Hafr Al Batin University from March 2017 to June 2017.

### 2.3 Sample

Multistage random sampling technique was used in selecting the study participants. First, the sample was stratified by level and specialty, and then one class was selected from each stratum. A total number of 230 female students were recruited representing (Preparatory, second, third and fourth year) students.

### 2.4 Tool of the study

One tool was developed and used by the researchers after reviewing the related literature. A structured self-administered

questionnaire was used to collect the research data. Students were asked to read and answer the questions carefully. The questionnaire consists of three parts as follow:

Part I: includes demographic characteristics such as age, grade year.

Part II: includes questions about dietary habits & lifestyle.

Part III: anthropometric measurements weight, height, and waist circumference were taken and body mass index (BMI) was calculated.

### 2.5 Procedure

An official permission was obtained from the administrative authority at the field of work (the dean of Applied Medical Sciences College) to conduct this study. An informed written consent was taken from all participated students after explaining the purpose of the study and they have the right to abstain from the study at any time regardless of the cause. Participants were assured that all their data are confidential and was only used for the purpose of research. The questionnaire was translated into the local language (Arabic) to easy data collection and translated back to the English language. The developed questionnaire was critically reviewed by the three juries who are experts in the field of pediatric and community health nursing to assess the validity of the tool and to avoid any repetition. A pilot study was carried out on 10% of study respondents (20 students) to test the clarity and applicability of the tool; these studied respondents were excluded from the total sample. Necessary modifications were done. Before starting taking the students measurements, a full explanation about measuring technique was provided to the students and after that, they were asked to remove their shoes and any heavy outer clothing they may be wear. Height was measured by stadiometer. The subjects were asked to stand in the center of the base with their back to the stadiometer. They informed to put their feet together and move back until their heels touch the bottom of the stadiometer upright. They told that their buttocks and upper part of their back should also be touching the stadiometer upright and their head does not have to touch the stadiometer. The measuring is taken to the closest cm. Weight was measured by an automatic scale with subjects wearing light shirt and skirt. BMI was then calculated as weight in kg divided by height in meters squared ( $\text{kg}/\text{m}^2$ ). Students were classified as underweight if their BMI was  $< 18.5$ , normal if it was between 18.5-24.9, overweight if it was 25-29.9 and obese if their BMI was greater than 30.<sup>[13]</sup> Waist Circumference was measured by a tape measure. The participants were asked to stand erect with the abdomen relaxed, the arms at the sides and the feet together. Then the tape measure was placed midway between the hip bone and the bottom of the ribs and wrap it around

the waist, in a horizontal plane, at the level of the natural waist, which is the narrowest part of the torso, as seen from the anterior aspect. The measurement was taken at the end of a normal expiration. A normal Waist Circumference level in women was defined as < 80 cm. An estimated time of 15-20 minutes was taken for each student to complete the questionnaire and take measurements.

### 2.6 Data analysis

Data collected were coded, analyzed and tabulated using the Statistical Package for Social Science (SPSS version 20). The qualitative variables were presented in tables as numbers and percentage; the figures used were portrayed in bars. The quantitative variables are presented as mean  $\pm$  SD. Frequencies. Chi-square test was used to examine the significant association between BMI and food consumption and snacks pattern. Statistical significant value considered at  $p$  value  $\leq$  .05.

### 3. RESULTS

Table 1 shows that more than half (50.9%) of the study sample aged less than 20 years old. The majority (48.7%) of the study participants were at a preparatory year and around half (45.7%) of them spent 7-8 hours daily at the college.

As regards to daily meals patterns among the students, Table 2 shows that more than half (55.7%, 53% and 47.8%) of the study participants mentioned taking breakfast, lunch, and dinner regularly respectively. While 44.3% of the respondents reported skipping breakfast. The most stated reasons for skipping breakfast were, not enough time at home (49%), don't prefer cafeteria food (24.6%) and others mentioned no enough break time in their schedules (21.6%). Results show that 60.2% of them bring the breakfast from home and 36.7% bring it from the college cafeteria. It was observed that nearly the same proportion (91.3% & 87.4%) of students mentioned taking snacks either between the breakfast and lunch or between the lunch and dinner respectively. Chi-square test revealed a highly statistically significant association between food consumption and snacks pattern and BMI ( $p$  value = .000).

Concerning the types of food consumed by the studied participants, Table 3 revealed that only 6.9% of the respondents reported eating fruits daily, while 30.4% consumed fruit rarely. In addition, the proportion of respondents who rarely consumed meat, fish & chicken were 14.3%. While those who consumed vegetables daily represents (21.3%). On the other hand, it was noticed that 30% of the respondents consumed milk daily.

The findings in the Table 4 revealed that 74.8% of students

eating while watching TV or using the internet and nearly half (46.5%) of them practice physical exercise 3-4 times a week.

**Table 1.** Demographic characteristics of the studied sample

Item	(N = 230)	
	No.	%
<b>Age</b>		
Less than 20	117	50.9
20-22	101	43.9
23 and more	12	5.2
<b>Grade year</b>		
Preparatory	112	48.7
Second	53	23
Third	32	13.9
Fourth	33	14.3
<b>Hours spend at college</b>		
5-6 hours	42	18.3
7-8 hours	105	45.7
More than 8 hours	83	36.1
Total	230	100.0

**Table 2.** Food consumption and snacking patterns among students

Item	No.	%
<b>Take breakfast regularly*</b>		
Yes	128	55.7
No	102	44.3
Total	230	100
<b>Breakfast source</b>		
Home	77	60.2
College cafeteria	47	36.7
Delivery	4	3.1
Total	128	100
<b>Causes for breakfast skipping</b>		
Not enough time at home	50	49
No time for a break in the timetable	22	21.6
Do not like cafeteria food	25	24.6
Others	5	4.9
Total	102	100.0
<b>Take lunch regularly*</b>		
Yes	122	53
No	108	46.5
<b>Take dinner regularly*</b>		
Yes	110	47.8
No	120	52.2
<b>Take Snack between breakfast and lunch*</b>		
Yes	210	91.3
No	20	8.7
<b>Take Snack between lunch and dinner*</b>		
Yes	201	87.4
No	29	12.6

\*A significant association with BMI ( $p$  value = .000)

**Table 3.** Types and frequency of food consumed

Types of food		Frequency				Total
		Daily	1-3 times/week	4-6 times/week	Rarely	
Fruits	No.	15	103	41	70	230
	%	6.9	44.8	17.8	30.4	100
Vegetable	No.	49	93	45	43	230
	%	21.3	20.4	19.6	18.7	230
Milk products	No.	69	76	39	46	230
	%	30	33	17	20	100
Meat, fish & chicken	No.	111	52	34	33	230
	%	48.3	22.6	14.8	14.3	100
Nuts	No.	43	57	33	97	230
	%	18.7	24.8	14.3	42.2	100
Canned juice	No.	56	87	40	47	230
	%	24.3	37.8	17.4	20.4	100

**Table 4.** Respondents eating and physical exercise lifestyle habits

Item	No.	%
<b>Eating while watching TV or using the internet</b>		
Yes	172	74.8
No	58	25.2
Total	230	100
<b>Physical exercise practicing per week</b>		
1-2 times	75	32.6
3-4 times	107	46.5
5-6 times	38	16.5
More than 7 times	10	4.2
Total	230	100

The anthropometric measurements results of the studied participants shown in the Table 5 revealed that the mean height,

weight, and waist circumference was  $1.58 \pm 0.55$  cm,  $58.47 \pm 11.53$  kg,  $65.21 \pm 16.5$  cm respectively.

As regard to BMI, Figure 1 shows that 17.39% of the studied participants classified underweight (BMI < 18.5), while half of them had a normal BMI (18.5 < 24.9), 24.35% classified as overweight (BMI 25-29.9) and the obese students represents 4.8% (BMI > than 30).

#### 4. DISCUSSION

The study findings revealed that the most average age of participants in this study was 17-19 years. Nearly half of them were at a preparatory year. The results also show that more than one-third of the studied participants reported spending 7-8 hours daily at the college. This result supported by that reported by Santos,<sup>[14]</sup> who found that 30.4% of students daily spent 7-9 hours at the university.

**Table 5.** Anthropometric measurements and BMI of the study participants

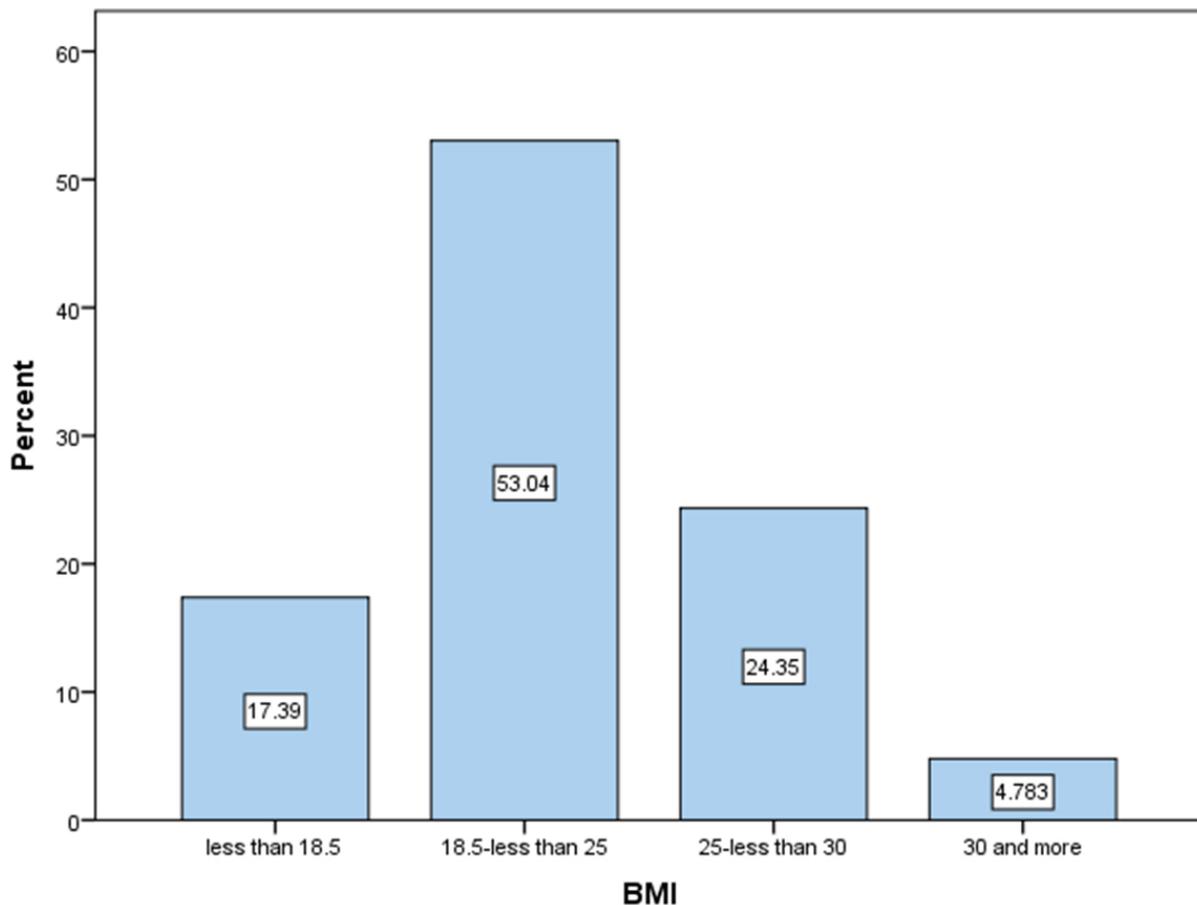
Measurement	Minimum	Maximum	Mean	SD
Weight (kg)	37	105.90	58.4683	11.529
Height (cm)	1.40	1.78	1.5787	0.5527
Waist (cm)	24	120	65.21	16.497
BMI (kg/m <sup>2</sup> )	42.12	14.52	23.44	4.389

Eating a nutritious breakfast regularly is an important contributor to a healthy lifestyle and health status. The current results revealed that more than one-third of students did not take breakfast regularly. They attributed that to lack of enough time in the morning to have breakfast meal, limited food choices at the college cafeteria, and shortness of break time between lectures. While on the other hand, more than half of them take lunch regularly, as after they return back

home they have lunch with their families. These findings confronted with another study conducted in Bahrain which revealed that highly proportion 56% of the adolescents did not consume breakfast regularly and the females who did not consume a regular lunch and supper more than half.<sup>[11]</sup> The current results also showed that the majority of the students take snack between breakfast and lunch and between lunch and dinner. These results agreed with that reported

by Musaiger & Kalam<sup>[15]</sup> who found that 74% and 67% of adolescents ate between breakfast and lunch, and between lunch and supper, respectively. Another study in the United Arab Emirates revealed that snacking between breakfast and

lunch among adolescents (12-17 years old) was a protective factor for obesity in females.<sup>[16]</sup>



**Figure 1.** Body mass index of the studied students

Despite the great importance of eating vegetables and fruits for the body, results showed that nearly half of the participants consumed meat and chicken daily compared to fruits and vegetables. This is similar to that reported by El-Qudah<sup>[17]</sup> who found that about half of the students eat vegetables, fruits, and milk/milk products on a daily basis. While other Saudi studies<sup>[18-21]</sup> show that vegetables and fruits which consumed in regular basis representing two-thirds of the students. One-third of the students consume canned juice 1-3 times. These findings were similar to that reported by Musaiger<sup>[10]</sup> who found that about one-quarter of the Bahraini adolescents reported eating fruit daily, while the proportion of respondents who rarely consumed vegetables was higher (38.1%) than those (26%) who consumed vegetables daily.

The current study results showed that more than two-thirds

of the students reported eating while watching T.V. or using the internet. This finding was supported by Musaiger & Kalam<sup>[15]</sup> who reported that higher rates of students ate while watching television.

The current data findings revealed that the mean BMI was 23.44 kg/m<sup>2</sup> which is considered a normal range according to National Institutes of health.<sup>[22]</sup> This result was in contrary with that reported by Al-Qahtani<sup>[18]</sup> who found that the average female BMI was 29.4 kg/m<sup>2</sup> which is considered in the overweight range. While another study to other female medical students in the US confirmed the current study result that students were within normal weight.<sup>[23]</sup> The current finding shows that more than half of students had normal BMI (18.5 -< 25 kg/m<sup>2</sup>), while 24.35% were overweight and 4.8% were obese. This finding was appropriate with another study results conducted by El-Qudah<sup>[17]</sup> who demonstrated

that most of the students fell in the category BMI (18.5-24.9 kg/m<sup>2</sup>). The study results revealed a statistically significant association between BMI and food consumption and snacking patterns among students ( $p = .000$ ). This finding is contrary to another study that found insignificant inverse correlations between BMI and snacks consumption rate ( $p = .018$ ).<sup>[24]</sup>

## 5. CONCLUSION & RECOMMENDATION

Almost of study participants had unhealthy dietary habits and have poor physical activity regardless of their academic levels. Near to half of them stay for a long period at the college and didn't take breakfast regularly which in turn mean that they need supplementary meals to satisfy their nutritional needs. Therefore, they need educational programs to enhance their nutrition and physical activity.

## Study limitations

- (1) One of the major study obstacles is to involve male students in the study because the college is only for female and secondly the Saudi education institutions were separate for both male and female and lastly, the Saudi culture didn't permit the female authors to directly contact with the male one.
- (2) The findings of the present study relied on self-reported questionnaires by the students, which in turn may result in missing some other important information.

## CONFLICTS OF INTEREST DISCLOSURE

The authors declare that there is no conflict of interest.

## REFERENCES

- [1] Antonio G, Chiara PA. A Natural Diet Versus Modern Western Diets? A New Approach to Prevent "Well-Being Syndromes". *Dig Dis Sci*. 2005; 50(1): 1-6. PMID:15712628 <https://doi.org/10.1007/s10620-005-1268-y>
- [2] Leslie E, Owen N, Salmon J, et al. Insufficiently active Australian college students: perceived personal, social, and environmental influences. *Prev Med*. 1999; 28: 20-7. PMID:9973584 <https://doi.org/10.1006/pmed.1998.0375>
- [3] Nelson MC, Story M, Larson NI, et al. Emerging adulthood and college-aged youth: an overlooked age for weight-related behavior change. *Obesity*. 2008; 16(10): 2205-2211. PMID:18719665 <https://doi.org/10.1038/oby.2008.365>
- [4] Mahfouz AA, Abdelmoneim I, Khan MY, et al. Obesity and Related Behaviors among Adolescent School Boys in Abha City, Southwestern Saudi Arabia. *J Trop Pediatr*. 2007; 54(2): 120-124. PMID:18039676 <https://doi.org/10.1093/tropej/fmm089>
- [5] El-Qudah JM. Food consumption patterns and prevalence of obesity in an adult population in Amman, Jordan. *Aust. J. Basic Appl. Sci*. 2008; 2(4): 1165-1171.
- [6] Nasreddine L, Hwalla N, Sibai A, et al. Food consumption patterns in an adult urban population in Beirut, Lebanon. *Pub. Health Nutr*. 2005; 9(2): 194-203.
- [7] Popkin BM, Duffey K, Gordon-Larsen P. Environmental influences on food choice. *Phys. Activit. Energ. Balance Physiol. Behav*. 2005; 86: 603-613.
- [8] Bodur S, Uguz M, Fiahin N. Behavioral risk factors for overweight and obesity in Turkish adolescents. *Nobel Med*. 2010; 6(3): 79-83.
- [9] Tayyem RF, Bawadi HA, Salameh MA. Dietary and physical activity profiles of a sample of college students in Jordan. *Jordan J. Agric. Sci*. 2008; 4(1): 52-64.
- [10] MUSAIGER AO, BADER Z, AL-ROOMI K, et al. Dietary and lifestyle habits amongst adolescents in Bahrain. *Food Nutr. Res*. 2011; 55: 7122.
- [11] World Health Organization (WHO). Diet, Nutrition and the Prevention of Chronic Diseases, Technical Report Series 916. Geneva, Switzerland. 2002.
- [12] Kamisha Hamilton Escoto, Melissa Nelson Laska, Nicole Larson, Dianne Neumark-Sztainer, Peter J. Hannan *Am J Health Behav*. 2012 Nov; 36(6): 786-796. PMID:23026037
- [13] Lee RD, Nieman DC. *Nutritional Assessment*. 3rd ed. McGraw-Hill Higher Education, New York. 2003.
- [14] Pereira-Santos M, Santana JM, de Carvalho ACN, et al. Dietary patterns among nutrition students at a public university in Brazil. *Rev Chil Nutr*. 2016.
- [15] MUSAIGER AO, KALAM F. Dietary habits and lifestyle among adolescents in Damascus, Syria. *Ann Agric Environ Med*. 2014; 21(2): 416-419. PMID:24959801 <https://doi.org/10.5604/1232-1966.1108616>
- [16] Bin Zaal AA, MUSAIGER AO, D'SOUZA R. Dietary habits associated with obesity among adolescents in Dubai, United Arab Emirates. *Nutrition Hospitaliria*. 2009; 24(4): 437-444.
- [17] El-Qudah JM, Al-Omran H, Abu-Alsoud B, et al. Nutritional Status among a Sample of Saudi College Students. *Current Research Journal of Biological Sciences*. 2012; 4(5): 557-562.
- [18] Al-Qahtani MH. Dietary Habits of Saudi Medical Students at University of Dammam. *International Journal of Health Sciences, Qassim University*. 2012.
- [19] Al-Rethaiaa AS, Fahmy AE, Al-Shwaiyat NM. Obesity and eating habits among college students in Saudi Arabia: a cross-sectional study. *Nutrition Journal*. 2010; 9: 39. PMID:20849655 <https://doi.org/10.1186/1475-2891-9-39>
- [20] Skemiene L, Ustinaviciene R, Piesine L, et al. Peculiarities of medical students' nutrition. 2007; 43(2): 145-52.
- [21] Alsunni AA, Badar A. Fruit and vegetable consumption and its determinants among Saudi university students. *Journal of Taibah University Medical Sciences*. 2015; 10(2).
- [22] National Institutes of Health, National Heart Lung, and Blood Institute. *Clinical Guidelines on the Identification, Evaluation, and Treatment of Overweight and Obesity in Adults*. 1998.
- [23] Frank E, Carrera JS, Elon L, et al. Basic demographics, health practices, and health status of U.S. medical students. *Am J Prev Med*. 2006 Dec; 31(6): 499-505.
- [24] Al-Rethaiaa AS, Fahmy AEA, Al-Shwaiyat AM. *Nutr Obesity and eating habits among college students in Saudi Arabia: a cross-sectional study J*. 2010; 9: 39.