

Exploring Factors Affecting Dietary Habits Of Mansoura University Students

Samia M. Abd El- Mouty

Community Health Nursing Department, Faculty of Nursing, Mansoura University, Egypt

Abstract

Background: Dietary habits frequently become worse during university and young adulthood. Unhealthy diets are linked with numerous chronic diseases including cardiovascular disease, diabetes, osteoporosis, certain cancers, overweight and obesity. Many factors affect young adult's dietary pattern and food choice that could be either internal or external. Internal factors are those that reside within individual and subject to their direct control including knowledge, attitudes, beliefs, values, self-efficacy, expectations and skills. External factors are those that out of individual control and related to the external food environment. Assessing these factors can work as a direction for steps to improve eating habits

Aim: To investigate factors influencing dietary habits of Mansoura university students.

Method: A cross-sectional study was conducted among (607) students and (17) food courts within Mansoura University, Egypt, from March to June 2014.

Results: Revealed that unsatisfactory score level of dietary habits among (99%) of students in relation to meal pattern, eating habits, food choice habits and food safety practice categories. Poor score level of knowledge regarding healthy diet for more than three fourth (83%) of students. Majority (89.3%, 97.9% and 92.4%) of them choose foods that have good shape, taste and smell respectively. (43.2%) showed poor score level related to beliefs on healthy and unhealthy diet. In relation to the food environment, all food courts were fast food restaurants that serve energy dense foods and beverages. Majority of them promote and place less healthy options of food and beverage where it is easily accessible to students and none of them display signage or menu that contain nutrition information about offered food and beverage.

Conclusion: The study concluded that students practiced several unhealthy dietary habits within the university campus and there are many factors attributed to their dietary habits, which can be either individual or environmental related factors.

Recommendations: It was recommended to develop multi- component strategy that address all influencing factors to promote dietary habits of the university students and create healthier nutrition environments .

Keywords: Unhealthy diets – Food environment – Dietary habits

I. Introduction

Dietary habits are one of the most important factors affecting health of individuals and community ⁽¹⁾. Optimal health is related to good nutrition. Individuals' dietary habits play an important role in a person's physical, mental, and emotional well-being. Dietary habits refer to the dietary intake data which includes information about usual daily food intake, eating pattern and usual nutrient intake, which can be either healthy or unhealthy ⁽²⁾

Transition period from high school to university is a critical period to understand the relation to dietary habits and health behaviors ⁽³⁾. Dietary habits established during university are likely to be maintained for life which will affect the future health of the university student and initiate life-long weight struggles with many related health problems ^(4,5)

Several studies have indicated that university students have poor nutrition habits and often exhibit at-risk weight control behaviors, they tend to engage in a number of unhealthy eating behaviors, including frequent snacking, meal skipping, low intake of fruit and vegetables, fast food consumption and sugar-sweetened beverages intake ^(6,7,8,9)

Many factors affect the adolescent individual and young adult's dietary pattern and food choice that are could be internal or external factors. Among the internal factors of university students are food preference, lack of knowledge about healthy food choices, and their body weight perception. External factors could be related to the nutrition environment in which food is purchased and consumed that place them at increased risk for developing unhealthy eating habits ⁽¹⁰⁻¹¹⁾

Glanz and colleagues described a conceptual model of nutrition environments that depicts multiple levels, including community nutrition environments (i.e., the number, type, location, and accessibility of food outlets) and consumer nutrition environments (i.e., the availability, price of food, and information about foods within those outlets) ⁽¹²⁾

There is worldwide consensus for dietary behavior change to halt the epidemic of chronic disease. WHO, acknowledges that prevention rather than treatment of these diseases is more effective at minimizing their impact⁽¹³⁾. Identifying dietary behaviors among university students and exploring factors influencing it could be a cornerstone for developing effective interventional strategy for promoting healthful dietary behavior among university students. Therefore, the main objective of this study was to assess dietary behavior of university students and exploring factors affecting it.

II. Material and Methods

This study **aims** to investigate factors influencing dietary habits of Mansoura university students

2.1 Research Question

What are the factors that influencing dietary habits of Mansoura university students

2.2 Research Design

A cross sectional design was used in this study.

2.3 Setting

This study was carried out at Mansoura University from March to June 2014.

2.4 Subjects and Sampling

2.4.1 Students: The actual numbers of students recruited in the study were 607 students calculated by using proportion allocation random method as followed: $\alpha=0.5\%$, Population size= 23190 students, desired precision= 4%, expected prevalence of the correct knowledge and beliefs about healthy diet = 50% and design effect= 1

2.4.2 Food courts responsible managers: All food courts responsible managers inside the university campus were interviewed to assess type and price of food and beverage available and to observe the food courts' physical characteristics and promotional measures

2.5 Study tools were collected by using seven tools that were developed by the researcher as following:

2.5.1 Tool I: Socio- demographic structured self-administered questionnaire concerned with elicitation information about demographic data of students such as sex, academic year, current and permanent place of residence. Fahmi and El Sherbeiny socioeconomic scale; was used to assess socioeconomic level of students⁽¹⁴⁾

2.5.2 Tool II : Dietary habits structured self-administered questionnaire used to explore student's dietary habits. The sheet was tested for validity before final usage through a pilot test conducted on 10 % of students (50 students) who were selected randomly. Also, validity was tested by a jury that involved five experts of community health nursing. Accordingly, any required modifications were done.

➤ The dietary habits sheet was classified into 4 categories, all of these categories are composed of 92 questions.

The total scores of dietary habits are 231 marks as the following:-

- Meal pattern (It includes 41 items = 55 marks)
- Eating habits (It includes 25 items = 100 marks)
- Food choice habits (It includes 16 items = 48 marks)
- Food safety practice (It includes 10 items = 10 marks)

The dietary habits level was categorized into two categories:-

- Satisfactory = scores 65% and more than 65% of total scores (138.5 and more)
- Unsatisfactory = scores less than 65% of total scores (less than 138.5)

2.5.3 Tool III: Knowledge about healthy diet structured self-administered questionnaire used to assess students' nutritional knowledge, which was classified into 7 categories, all of these categories are composed of 50 questions (31 multiple choice and 19 true & false questions) one mark awarded for each correct response as the following :-

- Healthy diet and food guide pyramid (It includes 8 items = 8 marks)
- Caloric content of food stuff (It includes 3 items = 3 marks)
- Types of food elements (It includes 3 items = 3 marks)
- Function of food elements (It includes 10 items = 10 marks)

- Sources of nutrients (It includes 14 items = 14 marks)
- Diet related disease (It includes 11 items = 11 marks)
- Food safety (It includes 1 item = 1 mark)

The total scores of the knowledge ranged from 0 to 50. The knowledge level was categorized into three categories:-

- Poor= scores less than 50% of total scores (less than 25)
- Fair= scores 50% to 65% of total scores (25- 32.5)
- Good= scores more than 65% of total scores (more than 32.5)

2.5.4 Tool IV: Food choice motives structured self-administered questionnaire used to assess the student's food choice motives, which was composed of 16 statements requiring a response on a 2-point Likert-rating scale with 2 continuum (affect & don't affect). A scoring system was used to quantify the students' food choice motives. 1 mark was given to affect, 0 marks don't affect which made up a total score of 16 marks as the following:-

- Food choice motives assessment (It includes 16 items = 16 marks)

The total scores of food choice motives ranged from 0 to 16. Its level was categorized into three categories:-

- Poor= scores less than 50% of total scores (less than 8)
- Fair= scores 50% to 65% of total scores (8- 10.4)
- Good= scores more than 65% of total scores (more than 10.4)

2.5.5 Tool V:- Beliefs on healthy diet structured self-administered questionnaire used to assess the student's beliefs on healthy diet, which was composed of 14 statements requiring a response on a 3-point Likert-rating scale with 3 continuum (agree, neutral, disagree). A scoring system was used to quantify the students' beliefs. 2 marks were given to agree, 1 mark to neutral and 0 to disagree which made up a total score of 28 marks as the following:-

- Students' beliefs about healthy and unhealthy food (It includes 14 items = 28 marks)

The total scores of student's beliefs ranged from 0 to 28. Its level was categorized into three categories:-

- Poor= scores less than 50% of total scores (less than 14)
- Fair= scores 50% to 65% of total scores (14- 18.5)
- Good= scores more than 65% of total scores (more than 18.5)

2.5.6 Tool VI: A structured questionnaire sheet of physical characteristics of food courts including (Name and type of food courts, working period, presented menu, available food and beverage and their price strategy).

2.5.7 Tool VII: observational checklist of measures used to promote offered food and beverage including (Criteria of menu and signage displayed, placement of products, and any accompanied nutrition information about nutrient, health claim and caloric content of offered food and beverage within these food courts).

2.6 Methods

2.6.1 Administrative process:

- Ethical approval on the study was obtained from the research ethics committee of the faculty of nursing, Mansoura University.
- Ethical considerations: verbal informed consent was obtained from food courts' owners. The purpose of the study was clarified. Anonymity and confidentiality were assured to participants. The investigator declared that participation is voluntary and confidential.
- Written informed consent was obtained from the students to participate in the study was obtained after explanation of the study purpose.

2.6.2 Development tools for data collection:

- The developed tools will be tested for their validity by five experts of community health nursing and the required modification will be carried out.
- A pilot study will be carried out on 10% of study sample that will not be included in the study to test the validity and reliability of the questionnaire. Accordingly any modification will be done to be more applicable.

- Interviewing students, and identifying their personal characteristics, their dietary habits and factors influencing their dietary habits (determinant of behavior).
- Interviewing food court responsible persons and observing food courts

2.7 Statistical analysis

- Descriptive and frequency statistics were performed. Data generated was analyzed by using Statistical Package for Social Sciences (SPSS version 20). Statistical techniques employed include descriptive statistics.

III. Results

Table(1): Distribution of university students according to Socio-Demographic Characteristics

Demographic characteristics	N=(607)	%
Sex		
Male	251	41.4
Female	356	58.6
Academic year		
First year	205	33.8
Second year	233	38.4
Third year	74	12.2
Fourth year	95	15.7
Current residence area		
House expatriates	20	3.3
University city	52	8.6
Home	535	88.1
Permanent residence area		
Urban	268	44.2
Rural	339	55.8
Marital status		
Single	588	96.9
Married	18	3.0
Divorced	1	.2
Socio- economic level		
High social standard	215	35.4
Middle social standard	298	49.1
Low social standard	80	13.2
Very low social standard	14	2.3

Table (1) reflects that more than half of students (58.6%) were female, more than one third of them (33.8% and 38.4%) studying at first and second academic year, respectively. Concerning current residence area, more than three fourth (88.1%) of them live at home. Regarding permanent residence area, more than half (55.8%) of them live in rural. Regarding their social status, majority (96.9%) of them were single. about one half (49.1%) of students belong to middle social standard, more than one third (35.4%) of them belong to high social standard, while only (15.5%) belong to low and very low social standard.

Table (2) and Figure 1: Distribution of students according to their dietary habits' scores level

Dietary habits categories	Score level			
	Unsatisfactory		Satisfactory	
	N=(607)	%	N=(607)	%
Meal pattern score = (55)	475	78.3	132	21.7
Mean ± SD	31.57±4.68			
Frequency of usual eating habits score = (100)	584	96.2	23	3.8
Mean ± SD	50.43±8.08			
Food choice habits score = (48)	565	93.1	42	6.9
Mean ± SD	19.88±7.61			
Food safety practice score = (10)	555	91.4	52	8.6
Mean ± SD	2.95±2.38			
Total practice score = (213)	601	99	6	1
Mean ± SD	104.84±13.47			



Table (2) and Fig. (1) Illustrates that more than three fourth (78.3%) of students showed unsatisfactory score level related to meal pattern category. In addition, (96.2%, 93.1%, 91.4%) of students showed unsatisfactory score level in relation to frequency of eating habits, food choice habits and food safety practice, respectively. Results also showed unsatisfactory score level of dietary habits among (99%) of students in relation to meal pattern, eating habits, food choice habits and food safety practice categories.

Figure 2: Distribution of students according to their knowledge scores level

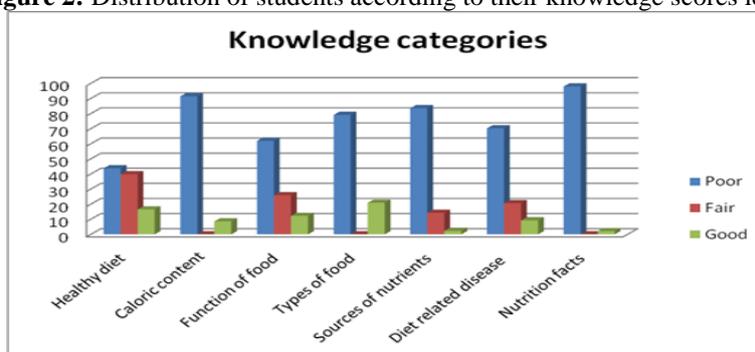


Figure (2) indicates that (43.7%) of students have poor score level related to knowledge about healthy diet and food guide pyramid categories. In relation to knowledge about caloric content of food stuff category, 91.4% of students showed poor score level. Concerning knowledge about types of food elements category, 79.1% of students showed poor score level. Regarding knowledge about function of food elements category, 61.9% of students showed poor score level. In relation to knowledge about sources of nutrients category, 83.5% of students showed poor score level. Concerning knowledge about diet related disease category, 70.2% of students showed poor score level. Regarding knowledge about food safety category, 97.9% of students showed poor score level.

Figure 3: Total scores level of student's knowledge regarding healthy diet

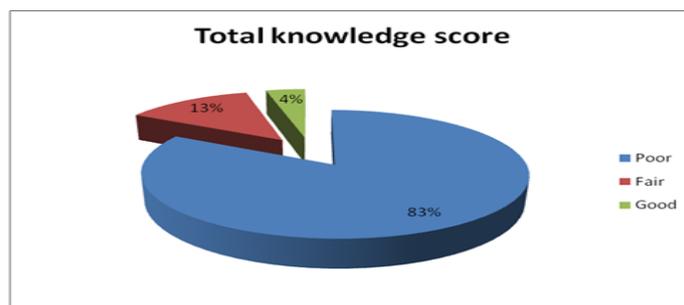


Figure (3) presented poor score level of knowledge regarding healthy diet for more than three fourth (83%) of students, with mean knowledge scores of 16.978 ± 7.64 points.

Table (4): Distribution of students according to their food choice motives

Food choice motives	N= (607)	%
Contains too little calories	315	51.9
Helps to lose weight	323	53.2
Contains no colors ,amendments & flavorings	356	58.6
Low in fat	387	63.8
Rich in fiber	400	65.9
Rich in protein	403	66.4

Ready made	430	70.8
Contains natural ingredients	469	77.3
Affordability	473	77.9
Availability	480	79.1
Accessibility	482	79.4
Familiarity	495	81.5
Shape	542	89.3
Match with religion and values	554	91.3
Smell	561	92.4
Taste	594	97.9

Table (4) reveals that majority (97.9%, 92.4% and 91.3%) of students choose foods that have good taste, smell and match with their religion, respectively. More than three fourth (89.3%, 81.5%, 79.1%, 79.4%, 77.9% and 77.3%) of students choose foods based on shape, familiarity, availability, accessibility, affordability and its containment, respectively. More than two third (70.8%, 66.4% and 65.9%) of them choose foods that are ready made, rich in protein and fiber, respectively, while more than half (53.2%, 51.9%, 58.6% and 63.8%) of them choose foods that help to lose weight, contain too little calories, no colors, amendments, flavorings and low in fat, respectively.

Table (5): Distribution of students according to their beliefs scores level

Beliefs on healthy diet	N= (607)	%
Too little intake of whole grains is related to occurrence of obesity	149	24.5
Food rich in fat is useful to human health	155	25.5
Too little intake of fiber lead to hypertension and cardiovascular disease	167	27.5
Too little intake of fruits and vegetables is related to occurrence of obesity	195	32.1
Too much intake of sugar is useful to human health	196	32.3
Too little intake of animal fat is useful to human health	217	35.7
Too much intake of animal fats increase risk of hypertension and cardiovascular disease	218	35.9
Too much intake of animal protein is useful to human health	224	36.9
Too little intake of food additives help in prevention of certain types of cancers	231	38.1
Too much intake of sugars leads to occurrence of diabetes mellitus	243	40
Too much intake of fruits and vegetables useful in prevention of cardiovascular disease	279	46
Dairy product is useful to human health	295	48.6
Variation in food intake is useful to human health	316	52.1
Fruits and vegetables is useful to human health	336	55.4
Student beliefs on healthy diet score(28)	N= (607)	%
Poor	262	43.2
Fair	105	17.3
Good	240	39.5
Mean ± SD	14.788 ± 6.56	

Table (5) reflects that more than half (55.4% and 52.1%) of students believe that fruits, vegetables and variation in food intake are useful to human health. In addition, (36.9%, 35.7%, 48.6%) of them believe that too much intake of animal protein, too little intake of animal fat and dairy product is useful to human health, respectively. Also, 46%, 40%, 35.9% of students believe that too much intake of fruits and vegetables.

Table (6): Distribution of food courts according to their physical characteristics.

Physical characteristics	N=(17)	%
Food court type*		
Grocery shops	16	94.1
Café	2	11.8
Fast-food	17	100
Menu type		
Signage and printed menu	16	94.1

Working period*		
During semester days only	17	100
During semester days and vacation	5	29.4
Working hours during semester days		
8 -10hours	7	41.2
11hours and more	10	58.8
Working hours during vacation's days		
8 -10 hours	3	17.6
11 hours and more	2	11.8

* More than one answers given.

Table (6) illustrates that all food courts were fast food restaurants. Regarding food courts managers working period, all of them work during semester activities, while for working hours, more than half (58.8%) of them work 11 hours or more during semester activities and only (17.6%) work 8-10 hours during semester vacation. Also, majority (94, 1%) of them presented signage and printed menu type

Table (7): Distribution of food courts according to available food & beverage

Available food & beverage	N=(17)	%
Vegetables		
Fresh salad	17	100
Beverage available*		
Fresh fruits juice , tea and coffee with skimmed or low fat milk	2	11.8
Whole fat milk and Bottled water	16	94.1
Diet soft drink and sweeten packed juice	15	88.2
Sweeten energy beverage	4	23.5
Soft drinks	17	100
Snacks and chips available*		
Full fat cheese and fried foods	17	100
Sandwiches without high fat food additives	1	5.9
Baked and boiled foods	3	17.6
Grilled foods	12	70.6
Low sugar foods	8	47.1

* More than one answers given.

Table (7) portrays that all food court's managers serve fresh salad, while none of them serve fresh, canned, frozen or dried fruits. Concerning beverage available, it was found that all of them serve soft drinks, while only (11.8%) of them serve fresh fruits juices, tea and coffee with skimmed or low fat milk. Regarding snacks and chips available, the results reflects that all of them serve full fat and fried foods, while none of them serve cracked bread, special diet for hypertensive or diabetic patients, skimmed or low fat food products. In relation to prices of food and beverage, the results shows that none of them neither offer discount nor subsidies on presented healthy items or increasing price of unhealthy items.

Table (8):- Distribution of food courts according to promotion measures of available food & beverage

Promotion	N=(17)	%
Signage present at food courts*		
Signage show healthy option of food and beverage	7	41.2
Signage show unhealthy option of food and beverage	15	88.2
Signage encourage healthy eating	1	5.9
Signage encourage intake large portion size	7	41.2
Placement and promotion of healthy food and beverage option		
Placement of healthy food and beverages is easily accessible	1	5.9
Menu *		
Menu shows small/medium portion size	13	76.5
Menu show baked food	2	11.8
Menu show fried food	16	94.1
Menu show grilled food	7	41.2
Menu show low fat nutritious food desert	9	52.9

* More than one answers given.

Table (8) presents that (88.2%) of food courts' managers display signage that shows unhealthy option of food and beverage. Only (5.9%) of them display signage that encourage healthy eating. In relation to menu served, it was found that (94.1%) of food courts' managers serve menu that showed fried food. Only (11.8%) of them serve menu that showed baked food, while, none of them serve one that show low fat items or labeled with colored code. Regarding food and beverage placement, it was observed that only (5.9%) of them place healthy foods and beverages options where it is easily accessible to students. Concerning nutrition information, it was

noted that all of them didn't serve information about calories, nutrition content, health claims, fat, salt or sugar in offered foods and beverages.

In relation to university food policy content, it was noted that the only presented and applied policy was for food safety issues, while comprehensive nutritional policy in the university concerned with increasing availability, promotion and advertising of healthy foods and beverages, labeling foods and providing nutrition education or changing price of foods to influence dietary behavior was not given any priority.

IV. Discussion

There is worldwide consensus for dietary behavior change to halt the epidemic of chronic disease. WHO acknowledges that prevention, rather than treatment of these diseases is more effective at minimizing their impact⁽¹³⁾. The present study was conducted mainly to evaluate dietary habits of Mansoura university students and examine factors influencing their dietary habits. This study aim was consistent with^(15,16). In relation to students socio- demographic status, the finding of the present study showed that more than half of students were female and from rural area. In addition, more than one third of them were at first and second academic years. These findings about socio- demographic status were consistent with the results of similar studies^(17,18).

According to the presented study's findings, it was cleared that students practiced several unhealthy dietary habits within the university campus. The present study showed that, the majority of students had unsatisfactory dietary habit's score level in relation to meal pattern, frequency of eating habits, food choice habits and food safety practice categories. Concerning meal pattern and frequency of eating habits, it was found that only one six of them were taking meals regularly especially in terms of breakfast and dinner intake. However, more than one third of them reported eating snacks at campus as a part from regular meals per day such as beans, tamya, pizza, koshary, shawerma and chips and minority of them reported daily intake of colored vegetables and fruits. These results come in agreement with similar studies which revealed that unhealthy eating habit of university students was noticed in the low intake of vegetables and fruits, high intake of fast food and frequent snacking^(19,20,21,22,23,24,25,26,27).

Regarding to food safety practices categories, nine items were identified as information that might be available in the food label and students may be looking at when buying the food packages. Although nearly three fourth stated that they read the food label, the findings showed that nearly two third of them paid attention to information about expire date only. These findings come in agreement with similar study that indicates that the consumers are always concerned about the risks which might appear from consuming expired foods that may cause diseases⁽²⁸⁾.

On the other hand, students paid less attention to information about package size, health claim, special usage, list of ingredients and nutrition facts as compared to the percent of students who read information about expire date. These findings come in agreement with similar studies that measured utilization, frequency and understanding of nutrition facts labels, results which indicated that 69.5% of college students don't read nutrition label completely and they focused least on percent daily value of nutrients and suggested to explain to them the relation between information provided on food label and person health to raise their nutritional awareness^(29,30).

Many factors attributed to student's dietary habits, which can be either individual or environmental related factors. Individual related factors are those that reside within the at risk individual and subject to their direct control. This usually includes cognitive factors and capabilities⁽³¹⁾.

Among the individual factors, knowledge, culture, and food choice motives. Regarding to student's nutritional knowledge, the results of this study revealed that more than three fourth of students had poor score level of knowledge related to healthy diet and food guide pyramid, caloric content of food stuff, types of food elements, function of food elements, sources of nutrients, diet related disease and food safety categories. These results come in agreement with similar studies that investigate nutritional knowledge among students and shown that their overall nutrition knowledge were low^(32,33,34,35,36,37).

Cultural factors influence food and eating behaviors⁽³⁸⁾. Shared values and beliefs are core aspects of all cultures and shape perceptions of food, health and illness. Concerning student's beliefs about healthy and unhealthy diet, the finding of the present study showed that more than one third of students showed poor score level related to student's beliefs about healthy and unhealthy diet category. This finding comes in the same line with finding of Laura,et al(2011)⁽³⁹⁾.

Regarding student's food choice motives, the finding of the present study showed that the major motives determining food choices among students were taste, smell, shape and familiarity. In contrast, the minor motives were caloric content in products and weight losing or organic products. These results come in agreement with similar studies that assess the psychosocial influence on students food choice, they found that "taste, price and sensory perception of food" were the first noticeable factors among almost all of the students, while "health and nutritious value of food" were noticeable among a few of them^(40,41,42).

The findings of the present study offer insight into environmental factors of food courts setting throughout the university campus that could affect individual dietary habits. Based on the current findings of food courts physical characteristics , it was revealed that all of them were fast food restaurants. These results come in agreement with similar studies which concluded that fast food restaurant is growing rapidly on an national and international level and is part of shifting eating patterns that has been noted by public health professionals^(43,44,45) .

A diverse options of food and beverage were available at food courts for students with no real variance in healthful choices among them. Concerning vegetables , fruits, snacks and chips available at food courts , the present study showed that all food court's managers serve fresh salad , high fat and fried foods while none of them serve fresh , canned , dried or frozen fruits , cracked bread, skimmed , low fat foods , special diet for hypertensive or diabetic patients . On the other hand, concerning beverage available ,it was found that all of them serve soft drinks and few of them serve fresh fruits juices , tea and coffee with skimmed or low fat milk. These results come in agreement with similar studies that provide detailed description of the food environment, and found that most of them offered high-fat and sugar cookies as cakes, chips, crackers ,candy , snack , ice cream, frozen desserts , pizza, burgers, sandwiches, French fries in addition to calorie-dense beverages such as soft drinks. Those studies, Concluded that these foods are acceptable and available at any time and displacing fruits and vegetables in the students diets which may contributes to the habituation of unhealthy dietary behavior.^(46,47,48,49,50,51) .

With regard to price of foods and beverages presented at food courts , the present study showed that there was no any form of discount, offers, subsidies on presented healthy item and there was no any form of increased price of the unhealthy items which served at all food courts inside the university campus. these finding are consistent with similar studies that measure the healthfulness of food environment and found that the higher cost were related to the healthier items without offering any form of discount or subsidy on them and the cheapest cost was for unhealthy items.^(52,53,54,55) In light of these findings, several studies have noticed that customers, especially those in low-income, tend to purchase and consume foods that are priced more affordably, and calling for the need to make healthier food items more affordable at fast food restaurants^(56,57) .

Generally, food court's managers failed various essential steps to promote more healthful eating pattern . Concerning signage's displayed , the present study showed that most of them display one that offer less healthful options and encourage unhealthy eating or overeating. As regards to the served menu, it was found that the majority of them serve menu that showed unhealthy items. These findings come in agreement with similar studies on promotional strategies used in fast food chains, they indicated that 80% of restaurants had promotions posted on the exterior of the building. Further, the products being promoted were found to be low in nutritional value, high in calories, sodium, saturated fat, and sugar and not aligned with current nutrition dietary recommendations for healthy adults which advocating for increased consumption of nutrient poor and calorie dense foods^(58,59,60,61,62) .

Regarding food and beverage placement, It was observed that only one food court's managers place healthy foods and beverages options where it is easily observable and accessible to students. These results come in agreement with similar two studies that assessed and identified the importance of the amount of shelf space devoted to fresh product and snacks and its influence on sales, it was found that, although some space devoted to fresh products, the greatest amount of space also devoted to unhealthy snack items, and reported that if the amount of shelf space for a particular item was doubled, sales of that item increased by about 40%^(63,64) .

Concerning availability of nutrition information about calories, health claims, nutrient content of fat, salt and sugar level in offered food and beverage either through signage ,menu board or printed menu, it was demonstrated that comprehensive nutrition information, was not available in all food courts inside the university campus . These results come in agreement with similar studies^(65,66) that assessed the availability of point-of-purchase nutrition information at fast-food restaurant, it was found that nutrition information at the point of decision-making is often difficult to find or completely absent.

V. Conclusion

Our findings are essential for contractors at the university campus to reassess their available suppliers and food, so further healthy food options can be accessible.

VI. Recommendation

This study was recommended to develop a strategy to create a healthier food environment that encourage eating further optimum food and shift the obvious face of all people in a healthier way.

Conflict Of Interest

The author declare no conflict of interest

Acknowledgements

The author is thankful to all participants in this study also she appreciate help provided by academic staff in community health department in data collection and conduction of the study. Finally grateful thanks for person who help in publishing this study.

References

- [1] John, E.N.: A balanced diet',2008. Located at <http://www.Google.com>, .
- [2] Kiran, N.U.: Handbook of Nutrition–For Health & Disease, 3rd ed. Paras Medical Publisher. India, 2006.
- [3] Lloyd-Richardson, E.E., Bailey, S., Fava, J.L. & Wing, R.: A prospective study of weight gain during the college freshman and sophomore years, *Prev Med*,48(3) ,2009,pp.256-261.
- [4] Ha, E.J. & Caine-Bish, N.: Effect of nutrition intervention using a general nutrition course for promoting fruit and vegetable consumption among college students, *Journal of Nutrition Education and Behavior*, 41(2,2009),pp.103-109.
- [5] Cluskey, M. & Grobe, D.: College weight gain and behavior transitions: Male and female differences, *J Am Diet Assoc*,109(2) ,2009,pp.325-329.
- [6] Savage, G.S., Ball, K., Worsley, A. & Crawford, D.: Food intake patterns among Australian adolescents, *Asia Pac J Clin Nutr*,16(5) ,2007,738–747.
- [7] adolescents in and preferences of school adolescents in Jiangsu Province, China, *Eur J Clin Nutr*,59(5) ,2005,pp.1439–1448.
- [8] American college health association: National college health assessment, spring 2006 reference group data report (abridged), *Journal of American college health*,55(4) ,2007,pp.195-206.
- [9] Gan, W.Y., Mohd, N.M., Zalilah, M.S. & Hazizi, A.S.: Differences in eating behaviours, dietary intake and body weight status between male and female Malaysian university students, *Mal J Nutr*, 17(2) ,2011,pp.213–228.
- [10] Davy, S.R., Benes, B.A. and Driskell, J.A.: Sex differences in dieting trends, eating habits, and nutrition beliefs of a group of Midwestern college students, *J Am Diet Assoc*, 106(5) ,2006, pp. 1673–1677.
- [11] Kolodinsky, J., Green, J., Michahelles, M. and Harvey-Berino, J.: The Use of Nutritional Labels by College Students in a Food-Court Setting, *Journal of American College Health*. 57(3) ,2008, pp.297-302. <http://search.ebscohost.com.ezproxy.selu.edu>
- [12] Glanz, K., Sallis, J.F., Saelens, B.E. & Frank, L.D.: Healthy nutrition environments: concepts and measures, *Am J Health Promot*, 19(5) ,2005,pp.330-3, ii.
- [13] World Health Organization: Global Status Report on Non-communicable Diseases 2010, Geneva: World Health Organization,2011. Available at: www.who.int/nmh/publications/ncd_report_full_en.pdf
- [14] Fahmy, S. & El Sherbeiny, A.: Determining simple parameters for social classification for health research, *Bulletin of high institute of public health*,13(5) , 1983 ,pp. 95-107.
- [15] Chourdakis, M., Tzellos, T., Papazisis, G., Toulis, K. & Kouvelas, D.: Eating habits, health attitudes and obesity indices among medical students in northern Greece, *Appetite*, 55(3) , 2010,pp.722–5.
- [16] Prell, H.C., Berg, M.C., Jonsson, L.M. & Lissner, L.: A school-based intervention to promote dietary change, *J Adolesc Health*,36 (10) , 2005,pp.529– 534.
- [17] Phelgona, A.: Eating practices, nutritional knowledge and body weight in nursing science students at the university of fort hare' Department of nutrition and dietetics, faculty of health science, university of the free state Bloemfontein,2009.
- [18] Vanden, V.L., Okeyo, A.P., Dannhauser, A. & Nel, M.: Body weight, eating practices and nutritional knowledge amongst university nursing students, Eastern Cape, South Africa', *Afr J Prm, Health Care Fam Med*,4(1), Art. #323, 9 pages,2012. Retrieved from: [http:// dx.doi.org/10.4102/phcfm.v4i1.323](http://dx.doi.org/10.4102/phcfm.v4i1.323)
- [19] Abdulkareem, M.S.: Eating habits and obesity and their relationship with certain socio-demographic characteristics among Saudi Nursing Students at the University of Dammam' *Journal of American Science*,9(8) , pp.8-29,3013. Retrieved from: <http://www.jofamericanscience.org>
- [20] Yahia, N., Achkar, A., Abdullah, A. & Rizk, S.: Eating habits and obesity among Lebanese University students, *Nutr J* , 7(5) ,2008,pp.32.
- [21] Deusinger, R.H.: Weight changes, exercise, and dietary patterns during freshman and sophomore years of college, *Journal of American College Health*,15(7) ,2005,pp. 245-255.
- [22] Moy, F.M., Johari, S., Ismail, Y., Mahad, R., Tie, F.H. & Ismail, W.M.: Breakfast skipping and its associated factors among undergraduates in a public university in Kuala Lumpur', *Mal J Nutr*, 15(2) ,2009,pp.165–174.
- [23] Alizadeh, M. & Ghabili, K.: Health related lifestyle among the Iranian medical students', *Res Biol Sci*, 3(1) ,2008,pp.4–9.
- [24] [Sakamaki, R., Amamoto, R., Mochida, Y., Shinfuku, N. & Toyama, K.A.: comparative study of food habits and body shape perception of university students in Japan and Korea, *Nutr J*, 4(2),pp.31,2005.
- [25] Mbhenyane, X.G., Venter, C.S., Vorster, H.H., & Steyn, H.S.: Nutrient intake and consumption of indigenous foods among college students in Limpopo Province, *South African Journal of Clinical Nutrition*, 18(1) ,2005,pp. 32-38.
- [26] Laska, M.N., Pasch, K.E., Lust, K., Story, M., Ehlinger, E.: Latent class analysis of lifestyle characteristics and health risk behaviors among college youth, *Prev Sci*,10(2) , 2009,pp. 376-386.
- [27] Al-Rethaiaa, A.S., Fahmy, A.A., Al-Shwaiyat, N.M.: Obesity and eating habits among college students in Saudi Arabia: a cross sectional study', *Nutrition Journal*, 9(1) , 2010,pp.39. Available at: <http://www.nutritionj.com/content>.
- [28] Washi, S.: Awareness of Food Labeling among Consumers in Groceries in Al-Ain, United Arab Emirates', *International Journal of Marketing Studies*, 4(1),2012,pp.5-16. Retrieved from: www.ccsenet.org/ijms
- [29] Norazmir, M., Norazlanshah, H., Naqieyah, N. & Anuar, M.K.: Understanding and use of food package nutrition label among education young adults', *Pakistan Journal of Nutrition*,11(10) ,2012,pp. 836-842.
- [30] Emirates Standardization and Metrology Authority: Labeling of prepackaged foodstuffs'2007, [Online] Available: <https://www.esma>.
- [31] Bartholomew, L.K., Parcel, G.S., Kok, G., Gottlieb, N.H. & Fernandez, M.E.: Planning Health Promotion Programs: An Intervention Mapping Approach', 3rd edition. JOSSEY-BASS,USA, 2011.
- [32] Al-Isa, A. & Alfaddagh A.: Nutritional knowledge among Kuwaiti college Students, *Health* 6(5) , 2014, pp.448-453. Retrieved from: <http://dx.doi.org>.
- [33] Zhong, Y.J., WANG, Q., yu, Z.J., et al: Investigation on nutritional knowledge, attitude and practice of students in a medical colleague and a normal university in Kunming, *Modern Preventive Medicine*, 14(5) , 2009,pp.20-25.
- [34] Zuercher, J.L., & Kranz, S.: College eating 101: Factors influencing students' food decisions', *International Journal of Child and Adolescent Health*, 5(1) , 2012, pp.3-6. Retrieved from: <http://www.researchgate.net>.

- [35] Nti, C.A., Pecku, E. and Obisaw, C.O.: Nutrition Knowledge, Meal Patterns and Nutritional Status of Energy Drink Users in a Ghanaian University', *Kamla-Raj. J Hum Ecol*, 49(1-2) , 2015,pp. 1-7.
- [36] Ling, Q. and Feng, L.: Investigation of the nutrition knowledge, attitudes and dietary behavior in non-medical students', *Henan Journal of Preventive Medicine*, 1(1) , 2009, pp.12-24.
- [37] Hendrie, G.A., Coveney, J. and Cox, D. Exploring nutrition knowledge and the demographic variation in knowledge levels in an Australian community sample, *Public Health Nutrition*, 11(5) , 2008, pp. 1365-1371. Retrieved from: <http://dx.doi.org>.
- [38] Caprio, S., Daniels, S., Drenowski, A., et al.: Influence of race, ethnicity, and culture on childhood obesity: Implications for prevention and treatment, *Diabetes Care*, 31(5) , 2008, pp.2211-2221.
- [39] McArthur, Laura, H., Karen, R. Greathouse, Erskine, R., Smith, Donald & Holbert: A Quantitative Assessment of the Cultural Knowledge, Attitudes, and Experiences of Junior and Senior Dietetics Students Original Research Article, *Journal of Nutrition Education and Behavior*, 43(6) ,2011, pp. 464-472.
- [40] Soyer, M.T., Ergin, I. and Gursoy, S.T.: Effects of social determinants on food choice and skipping meals among Turkish adolescents, *Asia Pac J Clin Nutr*, 17 (2) ,2008, pp.208-215.
- [41] Steenhuis, I.H., Waterlander, W.E., and Mul, A.: Consumer food choices: the role of price and pricing strategies, *Public Health Nutrition*, 14(12) ,2011, pp. 2220-2226. doi:10.1017/S1368980011001637.
- [42] Nurliyana, G., Norazmir, M., & Khairil, A.M. : Knowledge, attitude and practices of university students regarding the use of nutritional information and food labels, *Asian Journal of Clinical Nutrition*, 115(20), pp.12-24. doi: 10.3923/ajcn,2011.
- [43] QSR: "The Global 30." Retrieved July 20, 2013, from <http://www.qsrmagazine.com/content/global-30,2013>.
- [44] Hollands, S., Campbell, M. K., Gilliland, J., & Sarma, S.: A spatial analysis of the association between restaurant density and body mass index in Canadian adults. *Preventive Medicine*, 2013 [Epub ahead of print]. <http://dx.doi.org/10.1016/j.ypmed..07.002>, 2013.
- [45] Meetoo, D., McGovern, P., and Safadi, R: An Epidemiological Overview of Diabetes Across the World. *British Journal of Nursing*, 16(16) ,2007, 1002-1007.
- [46] Wechsler H, Brener ND, Kuester S, Miller C: Food service and foods and beverages available at school: results from the School Health Policies and Programs Study 2000. *J Sch Health*; 71, 2001, 313-324.
- [47] Nestle M. *Food Politics: How the Food Industry Influences Nutrition and Health*. Berkeley, Calif: University of California Press; 2002.
- [48] Simone A. French, , Mary Story, , Jayne A. Fulkerson, and Anne Faricy Gerlach, MPH, RD: Food Environment in Secondary Schools: A La Carte, Vending Machines, and Food Policies and Practices, *American Journal of Public Health* .Am J Public Health.; July, Vol 93, No. 7, 2003, 1161-1167.
- [49] Martha Y. Kubik, Leslie A. Lytle, Peter J. Hannan, Cheryl L. Perry, , and Mary Story,: The Association of the School Food Environment With Dietary Behaviors of Young Adolescents. *American Journal of Public Health*. July, Vol 93, No. 7 ;93:1168-1173, 2003.
- [50] Center for Science in the Public Interest (CSPI): Dispensing junk: How school vending undermines efforts to feed children well., 2004 Accessed on June 24, at: http://www.cspinet.org/dispensing_junk.pdf, 2008.
- [51] Gemmill, E. & Cotugna, N.: Vending machine policies and practices in Delaware. *The Journal of School Nursing*, 21(2): 94- [52] White M, Bunting J, Williams L, Raybould S, Adamson A, Mathers J: Do 'food deserts' Exist? A Multi-Level, Geographical Analysis of the Relationship Between Retail Food Access, Socio-Economic Position and Dietary Intake. Newcastle Tyne: Food Standards Agency; 2004.
- [52] Christina Black, Georgia Ntani, Hazel Inskip, Cyrus Cooper, Steven Cummins, Graham Moon and Janis Baird. Measuring the healthfulness of food retail stores: variations by store type and neighbourhood deprivation. Black et al. *International Journal of Behavioral Nutrition and Physical Activity* 2014, 11:69 <http://www.ijbnpa.org/content/11/1/69>
- [53] Karen M. Jetter, Diana L. Cassady, et al. The Availability and Cost of Healthier Food Alternatives. *American Journal of Preventive Medicine*, Am J Prev Med; 30(1):38-44 [55] Carter, M. A., & Swinburn, B. A. Measuring the 'obesogenic' food environment in New Zealand primary schools. *Health Promotion International*, 19(1), 15-20. doi:10.1093/heapro/dah103,2004.
- [54] Gordon-Larsen, P., Guilkey, D. K., & Popkin, B. M: An economic analysis of community-level fast food prices and individual-level fast food intake: Longitudinal effects. *Health Place*, 17(6) ,2009, 1235-1241. <http://dx.doi.org/10.1016/j.healthplace..07.011>, 2011.
- [55] Corey Hannah Basch, Danna Ethan & Sonali Rajan : Price, Promotion, and Availability of Nutrition Information: A Descriptive Study of a Popular Fast Food Chain in New York City. *Global Journal of Health Science*; Vol. 5, No. 6; 2013.
- [56] Bridging the Gap.: Exterior marketing practices of fast food restaurants. Retrieved July 20, 2013, from http://www.bridgingthegapresearch.org/_asset/2jc2wr/btg_fast_food_pricing_03.pdf, 2012.
- [57] [59] Larson, N., & Story, M.: A review of environmental influences on food choices. *Annals of Behavioral Medicine*, 38(1), S56-73, 2009.
- [58] [60] Seiders, K., & Petty, R. D.: Obesity and the role of food marketing: a policy analysis of issues and remedies. *Journal of Public Policy and Marketing*, 23(2), 153-169, 2004. <http://dx.doi.org/10.1509/jppm.23.2.153.51406>
- [59] [61] Grier, S. A., & Kumanyika, S. K.: The context for choice: health implications of targeted food and beverage marketing to African Americans. *American Journal of Public Health*, 98(8) ,2008, 1616-1629. <http://dx.doi.org/10.2105/AJPH.2007.115626>
- [60] Yancey, A. K., Cole, B. L., Brown, R., Williams, J. D., Hillier, A., & Kline, R. S.: A cross-sectional prevalence study of ethnically targeted and general audience outdoor obesity-related advertising. *Milbank Quarterly*, 87(1) ,2009, 155-184. <http://dx.doi.org/10.1111/j.1468-0009.2009.00551.x>
- [61] Farley TA, Rice J, Bodor JN, Cohen DA, Bluthenthal RN, Rose D: Measuring the food environment: shelf space of fruits, vegetables, and snack foods in stores. *J Urban Health*; 86(5) , 2009:672-682.
- [62] Cohen D, Farley TA: Eating as an automatic behavior. *Prev Chronic Dis*; 5(1) , 2008, A23, 2008.
- [63] Margo G. Wootan , Melissa Osborn, Claudia J. Malloy: Availability of point-of-purchase nutrition information at a fast-food restaurant. *Preventive Medicine* 43 458-459 Center for Science in the Public Interest, 1875 Connecticut Avenue, NW, Suite 300, Washington, DC 20009, USA Available online 28 August ,2006.
- [64] Wootan, M. G., & Osborn, M.: Availability of nutrition information from chain restaurants in the US. *American Journal of Preventive Medicine*, 30, 2006, 266-268. <http://dx.doi.org/10.1016/j.amepre.2005.10.006>