Dietary habits and nutritional knowledge among high health institute students in Basrah

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ABSTRACT

Introduction: **Nutrition is vital for the maintenance of health and prevention of disease. The burden of nutrition-related chronic diseases (such as CVD, cancer, diabetes and osteoporosis) and obesity is increasing rapidly world-wide. Nutritional knowledge may play a pivotal role in the adoption of healthier food habits but it must be noted that knowledge on its own cannot bring about the desired changes due to the complex nature of food behavior.**

OBJECTIVE: **It was to assess dietary habits and nutritional knowledge of the high health institute female students in Basrah and the relationship between nutritional knowledge and socio-demographic factors.**

Methods**: Seventy eight female students of the high health institute were administered a special questionnaire form regarding their dietary habits and nutritional knowledge.**

Results: **The majority of the students 82.1% were in the age group ≤ 24 years old. The mean body mass index (BMI) was (23.56 kg/m²) however twenty three students were classified as overweight. Academic study was the main source of information for 56.4% of the students. The mean survey scores were 70.78% for dietary habits and 73.32% for nutritional knowledge. No statistical significant association was found between dietary habits and nutritional knowledge. A significant association was found between the students' BMI and their nutritional knowledge level (p<0.05). The level of knowledge consistently decreased with the increase in BMI. Much like habits and knowledge, none of the other association between other variables (age, place of residence, paternal education level) showed any statistical significance.**

Conclusions: **Important point observed in the present study was that though the students had good level of nutritional knowledge and dietary habits, the association between them was not statistically significant. It may be suggested that the adequate nutritional knowledge observed may not have translated into the appropriate dietary habits in the students.**

Key words: **Dietary habits, nutritional knowledge, Basrah.**

دراسة العادات والمعارف الغذائية لدى طلبة معهد الصحه العالي في البصره

المقدمة: التغذية أمر حيوي للحفاظ على الصحة والوقاية من المرض. يتزايد عبء الأمراض المزمنة المرتبطة بالتغذية (مثل الأمراض القلبية الوعائية والسرطان والسكري وهشاشة العظام) والسمنة بسرعة في جميع أنحاء العالم. قد تلعب المعارف التغذوية دورا محوريا في تبني عادات غذائية صحية ، لكن يجب ملاحظة أن المعرفه وحدها لا يمكن أن تحدث التغييرات المطلوبة بسبب الطبيعة المعقدة للسلوك الغذائي.

الغرض: تقييم العادات والمعارف الغذائية لطالبات المعهد العالي للصحة في البصرة والعلاقه بين العوامل الغذائيه والسمات الاجتماعية والديموغرافية.

المنهجية: تم الاستجواب لثمانية وسبعين طالبه من معهد المهن الصحية العالي بأستخدام أستمارة استبيان خاصه فيما يتعلق بالعادات والمعارف الغذائية.

النتائج: أربعة وستون طالبة (٨٢.١٪) كانوا في الفئة العمرية أكبر من ٢٤ عامًا. بلغ متوسط مؤشر كتلة الجسم (٢٣.٥٦) ولكن تم تصنيف ثلاثة وعشرون طالبًه كزيادة وزن. كانت الدراسة الأكاديمية هي المصدر الرئيسي للمعلومات لـ (٥٦.٤٪) من الطالبات. كانت متوسط درجات الاستبيان

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(٧٠.٧٨٪) للعادات الغذائية و (٧٣.٣٢٪) للمعارف التغذوية. لم يتم العثور على ارتباط إحصائي مؤثر بين العادات الغذائية والمعارف الغذائية. تم العثور على ارتباط مؤثر بين مؤشر كتلة الجسم للطالبات ومستوى المعارف التغذوية ($P < 0.05$). انخفض مستوى المعرفة بشكل ملائم مع الزيادة في مؤشر كتلة الجسم. مثل العادات والمعارف الغذائية ، لم يظهر أي من الأرتباطات أخرى بين المتغيرات الأخرى (العمر، مكان الإقامة، مستوى تعليم الأبوين) أي دلالة إحصائية.

الاستنتاجات: كانت النقطة الهامة التي لوحظت في الدراسة الحالية أنه على الرغم من أن الطالبات لديهم مستوى جيد من المعارف والعادات الغذائية، فإن العلاقة بينهم لم تكن ذات دلالة إحصائية. من المقترح أن المعرفة الغذائية الكافية التي تمت ملاحظتها قد لا تكون قد ترجمت إلى العادات الغذائية المناسبة لدى الطالبات.

الكلمات المفتاحية: العادات الغذائية، المعرفة الغذائية، البصرة

INTRODUCTION

Nutrition is vital to the maintenance of health and prevention of disease. The burden of nutrition-related chronic diseases (such as cardiovascular disease, cancer, diabetes, and osteoporosis) and obesity is increasing rapidly world-wide. [1] It is estimated that up to 30% of deaths from coronary heart disease (CHD), a major form of cardiovascular disease (CVD) are due to unhealthy diets. [2] Good nutrition knowledge is one of the few modifiable determinants of dietary behavior and contributes to strengthening the skills and the abilities needed to resist the environmental factors leading to unbalanced and unhealthy diets.[3] Increased nutrition knowledge has been associated with improved dietary habits and lower rates of obesity. [4] Many medical schools have been trying to improve their nutrition education curricula. However, there is evidence that medical professionals have serious deficits in their nutrition knowledge.[5] Given that, one of the main goals of universities is to broaden the knowledge of people of the society, because this subsequently will lead to more food-conscious society and more healthy people. [6] Nutritional knowledge may play a pivotal role in the adoption of healthier food habits but it must be noted that knowledge on its own cannot bring about the desired changes due to the complex nature of food behavior. [7] In the United States many people are not eating a diet with sufficient or quality proportion of nutrients. Many are over consuming total kilocalories, added sugars, and saturated fats while under consuming several vitamins and minerals. The estimated proportion of adults in the United States with a poor quality diet is 45.6% and less than 10% of adults are meeting the recommended consumption of fruit and vegetables.[8] Urbanization in developing countries has brought challenges in food systems and markets. A shift toward consumption of fast foods characterized by high sugar and fat has been on the rise. [9] In a study carried out among members of the general public in Turkey, it was found that only 21.6% of the participants had received nutrition education previously.[7] In Iran, Ahvas University Research results showed that students need to learn proper nutrition and there is an obvious decline in their sports nutrition quality.[10] Results from community- based national survey in Kuwait showed that prevalence of overweight, obesity, and metabolic syndrome in adult Kuwaiti population were 80.4%, 47.5%, and 36.2%, respectively. [11] In 2014 the nutrition research institute report in Iraq showed that 38% of women and 26% of men were obese (NCD survey), at the same time 35.5% of women were anemic (IFHS survey). [12] Unfortunately in our country there are scarce data about dietary habits and nutritional knowledge assessment. The purpose of the study was:

1. *To identify the level of dietary habits and nutritional knowledge of high health institute students in Basrah.*

2. *To examine the relationship between dietary habits and nutritional knowledge among high health vocations institute students.*
3. *To find out the relationship between nutritional knowledge and socio-demographic factors.*

METHODS

Study design and setting: A cross sectional descriptive study was conducted at high health institute in Basrah during a period of 2 months extending from the 24th of January 2018 to the 24th of March 2018.

Ethical consideration: Agreement of the Basrah Directorate of Health to carry out the study on students of high health vocations institute was obtained before starting the study.

Sampling: Purposive sampling method was adopted to select the second year high health vocations institute students (of both nursing and midwifery departments). Seventy eight female students were administered a questionnaire on their dietary habits and their nutritional knowledge at the end of lectures on two separate occasions that were few days apart. The questionnaire was filled in anonymously, in the presence of the researcher and the time required was approximately ten minutes. Neither communication between students was allowed, nor was any further explanation beyond the general instructions given.

Procedure: This study utilized a pre-validated survey from Giroux.[13] The researcher had selected 10 questions to assess dietary habits and 10 questions to measure students' nutritional knowledge with relation to the institute's nutrition course curriculum. The questionnaire was translated into Arabic and their information was divided into three main sections: **Section I information** consists of general socio-demographic characteristics including age, place of residence, mother's education level, father's education level, weight, height and BMI (body mass index): The body weight in kilograms divided by the square of height of the height in meters (i.e., kg/m^2). [14]

Section II information includes questions to assess the dietary habits, it consists of 10 questions. These questions included how often the students consumed food from certain portion of the food pyramid, as well as consumption of beverages, sweets and vitamins supplements. Food intake and skipping meals were also examined. For this section, answers ranged from always (4) to never (1). Questions 4,6,10 numbers were reversed scored. Meaning that if the student answered the question with (never) then she was awarded 4 points The scores possible range was from 10-40, students scoring a total of 10-15 points (lower than 40%) were regarded as having poor dietary habits, from 16-27 points (40- less than 70%) were regarded as moderate level, scoring a total greater than or equal to 28 out of possible 40 points (70-100%) were regarded as having good dietary habits.

Section III information this section was used to test the level of knowledge about nutrition for each student. This section also contained 10 questions. The student was asked to indicate to what degree she agreed with each statement. The range was from strongly agree (4) to strongly disagree (1). The same scoring system used for dietary habits was depended in the knowledge level.

Statistical analysis: The data were analyzed by the statistical package for social sciences (SPSS) version 23. Descriptive statistics like the socio-demographic characteristics were presented as frequencies, and percentages. The relationship between two categorical variables was analyzed using Chi square test or Fisher exact test. A P-value of ≤ 0.05 was the criterion of statistical significance. [15]

RESULTS

(Table-1), shows characteristics of the study population. The study included 78 female students, their age ranged from 19-46 years. The majority were in the age group ≤ 24 years (82.1%). The mean age was (22.72) years. Nearly half of the students (52.6%) were rural, the remaining (47.4%) were urban. In total (62.8%) of the students had a BMI between 18.5 and 24.9 kg/m² (normal range). There were some students (29.6%) classified as overweight; however an equal percentage of 3.8 was for underweight and obese students. The mean BMI was (23.56). Less than half of the students' mothers (44.9%) and half of their fathers had between 7 and 12 years of education, while (42.3%) of the mothers and (19.2%) of the fathers had 6 years of schooling or less. Only (12.8%) of the students' mothers and (30.8%) of the students' fathers with 13 years and above.

Table 1. Characteristics of the study population

Variable	*No.*	*%*
Age (years)		
≤ 24	**64**	**82.1**
25-35 and above	**14**	**17.9**
Place of residence		
Urban	**37**	**47.4**
Rural	**41**	**52.6**
Body mass index (BMI)		
Underweight (< 18.5)	**3**	**3.8**
Normal (18.5-24.9)	**49**	**62.8**
Overweight (25- 29.9)	**23**	**29.6**
Obese class I (30-34.9)	**3**	**3.8**
Mother's education (years)		
≤ 6	**33**	**42.3**
7- 12	**35**	**44.9**
≥ 13	**10**	**12.8**
Father's education (years)		
≤ 6	**15**	**19.2**
7-12	**39**	**50**
≥ 13	**24**	**30.8**

When the students were asked to name their source of nutritional information, their responses are shown in (Table-2). Academic study was the main source of information for (56.4%) of the students, followed by family and internet (41%) for each, while TV was the source for 14% of the students.

Table 2. Source of information on nutrition

Information source	No.	%
Academic study	**44**	**56.4**
Family	**32**	**41**
Internet and social media	**32**	**41**
TV	**11**	**14**
Friends	**4**	**5**

The mean and percentage scores for dietary habits and nutritional knowledge are summarized in (Table-3)**.**

Table 3. Mean, standard deviation & percentage survey scores for dietary habits and nutritional knowledge

	Mean	Std. Dev	%
Dietary habits	**28.31**	**3.82**	**70.78**
Nutritional knowledge	**29.27**	**3.36**	**73.32**

Dietary habits data are shown in (Table-4). About one quarter of the students always consume breakfast and only 19.2% always have 3 base meals per day. The intake of water can be considered inadequate since only (34.6%) of the students always drink water. In total (43.6%) of the students always consume vitamins supplements. Regarding specific food group (breads and rice, sweetened beverages, fruits, vegetables, milk, cakes and other sweets) were always consumed by (26.9%, 38.5%, 23.1%, 29.5%, 14.1%and 6.4%) of the students respectively.

Table 4. Dietary habits: descriptive statistics for food frequency

Dietary habit	Food frequency							
	Always		*Often*		*Sometimes*		*Never*	
	No.	%	No.	%	No.	%	No.	%
Eating breakfast in the morning	21	26.9	19	24.4	30	38.5	8	10.3
Eating 3 base meals per day	15	19.2	31	39.7	23	29.5	9	11.5
Food group								
Water	27	34.6	32	41	18	23.1	1	1.3
Vitamins supplements	34	43.6	18	23.1	16	20.5	10	12.8
Breads, cereals, pasta and rice	21	26.9	24	30.8	32	41	1	1.3
Sweetened beverages	30	38.5	30	38.5	12	15.4	6	7.7
Fruits	18	23.1	37	47.4	21	26.9	2	2.6
Vegetables	23	29.5	37	47.4	15	19.2	3	3.8
Milk	11	14.1	42	53.8	9	11.5	16	20.5
Cakes, cookies and other sweets	5	6.4	36	46.2	25	32.1	12	15.4

The distribution of answers about nutritional knowledge is presented in (Table-5). More than two third of the students strongly agree that skipping breakfast can affect their performance. Only (17.9%) of all students strongly believe that 60% of total calories should come from CHO. The most problematic area was recognition of the percentage of body fat in female and frequency of meat group consumption that were correctly answered by only (9%) of the students. Questions about (excess vitamins toxicity, vitamin C, CHO & fatty acids, anemia, nuts& beans, best iron sources) were correctly answered by (23.1%, 23.1%, 26.9%, 71.8%, 47.4%, 9%and 39.7%) of the students respectively.

Table 5. Nutritional knowledge: distribution of answers

Question on	Distribution of answers							
	Strongly agree		*Agee somewhat*		*Disagree somewhat*		*Strongly disagree*	
	No.	*%*	*No.*	*%*	*No.*	*%*	*No.*	*%*
Skipping breakfast can affect performance	**53**	**67.9**	**19**	**24.4**	**4**	**5.1**	**2**	**2.6**
60% of total calories should come from CHO	**14**	**17.9**	**54**	**69.2**	**10**	**12.8**	**0**	**0**
Percentage of body fat in female is 20-25%	**7**	**9**	**51**	**65.4**	**17**	**21.8**	**3**	**3.8**
Excess vitamin consumption can be toxic	**18**	**23.1**	**24**	**30.8**	**22**	**28.2**	**14**	**17.9**
Vitamin C is known as ascorbic acid	**18**	**23.1**	**17**	**21.8**	**16**	**20.5**	**27**	**34.6**
CHO are less fattening than fatty acid	**21**	**26.9**	**34**	**43.6**	**14**	**17.9**	**9**	**11.5**
Anemia is a deficiency in iron	**56**	**71.8**	**10**	**12.8**	**8**	**10.3**	**4**	**5.1**
Nuts & beans are good source of plant-proteins	**37**	**47.4**	**33**	**42.3**	**5**	**6.4**	**3**	**3.8**
We should consume 2-3 servings from meat group	**7**	**9**	**18**	**23.1**	**22**	**28.2**	**31**	**39.7**
Animal products & fish are the best sources of iron	**31**	**39.7**	**37**	**47.4**	**4**	**5.1**	**6**	**7.7**

The association between dietary habits and nutritional knowledge level was examined in (Table-6). There was a non-significant association between total dietary habits and nutritional knowledge scores (X^2= 2.405, P = 0.121).

Table 6. The association between dietary habits and nutritional knowledge scores

Nutritional knowledge level	Dietary habits score				Total	
	Moderate (40 - < 70%)		Good (70 - 100%)			
	No.	*%*	*No.*	*%*	*No.*	*%*
Moderate (40- < 70%)	6	30	14	70	20	100.0
Good (70-100%)	29	50	29	50	58	100.0
Total	35	44.9	43	55.1	78	100.0

X^2 = 2.405, P > 0.05

(Table-7), represents factors affecting level of knowledge. No significant association was found between the student's age, place of residence, paternal education level and the nutritional knowledge level (P > 0.05). A significant association was found between the students' BMI and their nutritional knowledge level (P < 0.05). The level of knowledge consistently decreased with the increase in BMI.

Table 7. Factors affecting the level of knowledge

Age	Nutritional knowledge level				Total	
	Moderate		*Good*			
	No.	*%*	*No.*	*%*	*No.*	*%*
≤ 24	17	26.6	47	73.4	64	100.0
25-35 and above	3	21.4	11	78.6	14	100.0
Total	20	25.6	58	74.4	78	100.0
Fisher Exact=0.489				*P > 0.05*		
Place of residence						
Urban	11	29.7	26	70.3	37	100.0
Rural	9	22	32	78.0	41	100.0
Total	20	25.6	58	74.4	78	100.0
X^2=0.617				*P > 0.05*		
BMI						
Underweight (<18.5)	0	0.0	3	100.0	3	100.0
Normal (18.5-24.9)	8	16.3	41	83.7	49	100.0
Overweight (25-29.9)	10	43.5	13	56.5	23	100.0
Obese class I (30-34.9)	2	66.7	1	33.3	3	100.0
Total	20	25.6	58	74.4	78	100.0
Fisher Exact = 8.898				*P < 0.05*		
Mother's education (years)						
≤ 6	11	33.3	22	66.7	33	100.0
7-12	8	22.7	27	77.1	35	100.0
≥ 13	1	10	9	90	10	100.0
Total	20	25.6	58	74.4	78	100.0
Fisher Exact = 2.188				*P > 0.05*		
Father's education (years)						
≤ 6	1	6.7	14	93.3	15	100.0
7-12	14	35.9	25	64.1	39	100.0
≥ 13	5	20.8	19	79.2	24	100.0
Total	20	25.6	58	74.4	78	100.0
Fisher Exact =5.101				*P > 0.05*		

DISCUSSION

Essential nutrition knowledge appeared well established in students of the present study. The results of this research showed that high health institute students' BMI mean is normal condition (23.56) and obesity spread is low (3.8%) but spread of overweight is high (29.6%). Ebrahimi and his colleagues (2011) showed that overweight among Iranian students was (14.1%) and obesity was (2.2%). [6] In Syria (62.2%) of the university students had normal BMI whereas (26.2%) and (5.3%) of the students were overweight and obese.[16] The sources of nutrition information play a significant role in building up the nutrition knowledge and dietary habits of students. The major sources of nutrition information of the students were from academic study (56.4%), family (41%), internet (41%), while a study in university of Philippine showed that the parents were the major source of students' knowledge (38.82%). [17] In this research, the mean dietary habits score was (70.78%) which is higher than that reported in college athletes in USA. [13] The mean nutritional knowledge score of the students in our study was (73.18%) which shows that the students have good nutrition knowledge and it is higher level than Iranian students' knowledge level which was (56.71%), and Sultan Qaboos University's students in Oman that was (49%), [6,18] this may be related to the dense content of the health institutes' curricula including nutrition issues. Findings that (73.1%) of the participating students reported no regular breakfast, (80.0%) consumed < 3 base meal per day that was more than Croatian study.[19] Water consumption shows similarity with the Croatian study but lower than that reported among rugby league players in UK.[19,20] Consumption of bread, cereals and rice was much more than UK, but lower than Croatia. Sweetened beverages, fruits, vegetables, milk, cakes and other sweets were consumed by students in our study more than other European studies.[19,20] By looking at the results from the study, the association between nutritional knowledge and dietary habits was not statistically significant (X^2=2.405, P=0.121). This can be compared with the insignificant association found in a similar study in USA,[13] but inconsistent with the results obtained from university of Philippine.[17] This illustrates the need, not only for more nutrition education, but also for system that teaches them how to apply the recommendations and provides them the tools to do so. A significant association was found between BMI and nutritional knowledge level BMI. Thus allowing one to make the conclusion that if one is knowledgeable about the basics of nutrition, and make healthy food choices then BMI and weight will reflect those healthy food choices. This is in contrast to the results obtained in Kuwaiti study which did not report a significant difference in overall nutrition knowledge between obese and non-obese participants.[21] Much like habits and knowledge, none of the other association between other variables (age, place of residence, parental education level) showed any statistical significance, similar findings have been previously reported in USA and Italy.[13,22] This result shows that nutritional knowledge is not influenced by the socio-demographic variables considered.

CONCLUSIONS

Important points observed in the present study were: first that though students had good level of nutritional knowledge and dietary habits, the association between them was not statistically significant, this indicates the presence of barriers hindering this association. Although a relative small sample size may explain the lack of significant association, it may be suggested that the adequate nutritional knowledge observed may not have translated into the appropriate dietary habits in the students. Undoubtedly nursing and medical institutes' curricula are very dense in content including nutrition issue. "What to teach" in nutrition program is an emerging major question

nowadays. Inflexibility in the curriculum and inability to define the proper aspects of the subjects to be taught are thought as the main obstacles. Second, a significant association was found between BMI and nutritional knowledge level, this shows that the knowledge that the students possess of nutrition reflects their BMI.

RECOMMENDATIONS

1. Continuing educational workshops and seminars are necessary to improve the nutritional knowledge and dietary practices of students in medical institutes.
2. According to this study, the researcher suggests to have bigger numbers of respondents, from different universities and institutes for the future research.
3. Further research be conducted using a 24-hour recall of food may give a better and more accurate picture of the dietary habits of students.

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