

ORIGINAL ARTICLE

EATING BEHAVIOUR OF INTERNATIONAL STUDENTS IN UKRAINE

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ABSTRACT**The aim:** Investigate the eating behaviour of international students in Ukraine.**Materials and methods:** A cross-sectional quantitative research approach was taken in conducting this study. 193 international students (98 males, 95 females) filled the questionnaire assessing their diet for the past 7 days, perceived changes made to their diet since their arrival to Ukraine, knowledge of healthy dietary habits, and perceived barriers to maintaining a healthy diet. At the time of this study, the students were between the ages of 18 and 36 years, of 11 nationalities, and enrolled at both undergraduate and postgraduate levels in 12 Ukrainian tertiary institutions.**Results:** Assessment of the students' diet quality reveals that 75.1% of the students consume fruits at least 2 times/day and 73.1% consume vegetables at least 3 times/day. More students consume poultry daily and fish at least twice a week than beef and pork daily. More than half of the students consume starchy foods, mostly rice daily. Only 7.3% of the students consume up to 1 alcoholic beverage daily. Gender significantly affects the consumption of alcohol, dairy products, low fat milk and milk products, and marginally affects beef and dark chocolate.

95 % of the student have made changes to their diet since coming to Ukraine.

Conclusions: The dietary behaviour of international students in Ukraine is characterized by: high consumption of fruits and vegetables, high intake of lean meats and fish, higher consumption of unsaturated fats and oils than saturated ones, and low consumption of soft and alcoholic drinks.**KEY WORDS:** Nutrition, healthy diet, barriers, habits

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INTRODUCTION

In recent years, the importance of diet in the promotion and maintenance of health has been the focus of numerous studies [1,2]. Dietary habits are dictated by cultural, socio-economic, religious and various other demographic factors as much as personal tastes and preferences. Every culture around the world has its own unique food and dietary habits. It is therefore expected that an individual's dietary habits change when they migrate to a region with differing cultural background. Various studies have shown that students' knowledge of healthy and unhealthy diet habits, and nutritional knowledge needed improvement [3,4]. Although most of some studies look at the effects of long-term migration on dietary habits, even short-term migration or temporary translocation as in the case of international students has been shown to cause similar undesirable changes [5,6].

Unsurprisingly, after migration to a new country people often have to make adjustments to their dietary habits to match their new environment. This changes are usually due to an unavailability of foods which make up their traditional foods [7], the social context of migration, new social networks, the strength of ties maintained with country of origin, age and life phase, and work or school attendance [8]. The so-called stage of «emerging adulthood» which is defined as the period between the ages of 18 and 25 years is characterized by the development of lifelong habits includ-

ing dietary habits [9]. Most people within this age group are leaving home for the first time to higher institutions and have to take responsibility for their own feeding.

Ukraine boasts a large and steadily growing population of international students currently studying in her many higher institutions. The Ukrainian State Centre for International Education estimates that there are about 64000 international students from 147 different countries every year. The position of these international students in Ukraine as temporary migrants as well as students of higher institution therefore increases their chances of adopting unhealthy dietary habits. Even in cases where their traditional foods are available, the costs are often too high for migrants consistently incorporate them into their routine dietary practices [10]. Some changes in dietary habits also depend on an individual's duration of stay in their new environment, knowledge of local language(s) in the new environment, and degree of contact with locals. Thereby, the problem of investigate the eating behaviour of international students in Ukraine becomes especially poignant.

THE AIM

Therefore, the aim of this study is to: investigate the eating behaviour of international students in Ukraine. The object of this study is the behavioural features of nutrition of international students in Ukraine; the subject is the eat-

ing behaviours, knowledge of healthy diet, and perceived barriers to maintaining a healthy diet.

MATERIALS AND METHODS

A cross-sectional quantitative research approach was taken in conducting this study. Quantitative data in the form of food frequency and closed-ended questionnaire was produced [11]. For this study, we aimed to assess the eating behaviour of the students by analysing the frequencies of consumption of selected food items. Additionally, we sort to assess the students' knowledge of healthy dietary recommendations, perceived changes to diet, and perceived barriers to maintaining a healthy diet. For this we chose close-ended questionnaires which have been validated and used in a prior study [12] due to the high costs and time required for the development and validation of such questionnaires.

Between February and May 2019, international students enrolled in Ukrainian higher institutions were asked to fill an anonymous questionnaire. Inclusion criteria for the survey were: enrolment in a higher institution in Ukraine at the time of the survey; English language as the medium of study; and Non-Ukrainian origin.

A total of 193 undergraduate and postgraduate students filled in the questionnaires. Gender distribution was roughly even, with males being in the majority (50.8%). The age of respondents ranged from 18 to 36 years (mean 23.46 ± 3.24). Most of the participants (86.5%) were aged between 18 and 26 years. The participants were of 11 nationalities in total. Most of the participants were from Nigeria (45.6%), Ghana (14.5%) and Pakistan (14.0%). A majority of the students were studying Medicine (78.2%), mostly studying at the Vinnitsa National Medical University I.M. Pirogov (21.8%). Subjects' mean duration of stay in Ukraine at the time of this study was 42.69 ± 25.81 months, ranging from 2 to 114 months.

Participation in this survey was completely voluntary. All data were collected anonymously and stored in an unidentifiable format. The Statistical Package for the Social Sciences (SPSS for Windows, version 25, 2017, SPSS, Chicago, IL, USA) was used for data analysis. A «P» value of .05 was considered statistically significant in all analyses.

We considered various ethical concerns during the course of carrying out this study. Firstly, the issue of informed consent of the respondents. Information about the aim, objectives and scope of this study was provided at the beginning of the questionnaire after which the respondents were required to provide consent before filling in the questionnaire. All data was collected and stored in an unidentifiable format. The complete confidentiality of the respondents was therefore guaranteed. All data collected for the purpose of this study was used only for the study. All results have been reported whether positive or negative.

Certain limitations were faced over the course of carrying out this study. The first drawback was in enlisting the necessary quantity of respondents. We had no access to any databases with contacts of all international students

currently in Ukraine. We were therefore forced to resort to recruiting based on convenience. This and restrictions by time resulted in a relatively small sample size. Secondly, portion sizes were initially included in the questionnaires for data collection. Portion sizes make it possible to estimate the energy and nutrient intakes and compare against a standardized food composition database [13] However, only a negligible portion of the respondents provided usable data on portion sizes. Thus, forcing us to omit this data from the study altogether.

RESULTS

The frequencies of consumption for selected food items by international students in Ukraine show that 75.1% of the students consume 2 or more fruits daily. In addition, 73.1% consume vegetables 3 or more times daily. More students consume poultry (45.1%) when compared to the proportion of students that eat red meat (beef – 20.2%, pork – 13.5%) at least once a day. Furthermore, 58.5% percent report eating oily fish (salmon, trout, tuna, swordfish and mackerel) while 43.5% percent of the students report consuming white fish (halibut, tilapia, cod, bass, grouper, haddock) at least twice a week. A smaller proportion (21.2%) report eating other types of seafood at least twice a week. Rice, pasta and potatoes are consumed at least once daily by 54.9, 30.1 and 38.9 percent of the students respectively. Vegetable oil is consumed by 29.5% of the students less than once daily while butter and margarine are consumed daily by 5.7% of the students. Only 7.3% of the student report intake of at least one alcoholic beverage daily. 72 percent of the students report consuming less than one soft/fizzy drink daily. Over 77 percent of the students report consuming processed meat and meat products (sausages, ham and bacon) less than one time a day.

However, some of the trends which negatively impact health are also seen. Daily consumption of low-fat milk and milk products was reported by only 7.8% of the students. Daily consumption of whole milk and milk products is seen in a larger proportion (15.5%) of students. The consumption of sweets and snacks (cakes, puddings, sweet biscuits, cream crackers, sweets and toffees) at least once a day was reported by 96.9% of the students.

Comparisons between male and female students shows marginal differences in the eating frequencies of most food items. Daily consumption of low-fat milk and milk products is reported by a larger portion of female students (12.6%) than in male students (3.1%). Daily consumption of butter and margarine by female students is lower (1.1% and 2.1% respectively) than by male students (10.2 and 9.2 respectively). Consumption of at least one alcoholic beverage by male students is higher (12.2%) than their female counterparts (2.1%). Consumption of beef and pork at least once daily are reported by 25.3% and 9.5% of female students respectively compared to 15.3% and 17.3% for male students. A similar trend is observed for chocolate consumption with 1.1% and 8.4% of female students reporting daily consumption of at least one dark and white

chocolate respectively. Daily consumption of at least one dark and white chocolate is reported by 6.1% and 3.1% of male students respectively.

Comparison of the three age groups also reveal certain trends in the eating behaviours of the students. More of the older students report consuming at least two fruits a day with 86.5% of the students aged 26 years and above (Group C), 80.6% of students between from age 23 to 25 years (Group B), and 62.2% of the students aged 22 years and below (Group A). In a similar fashion, 26.9% of students in Group C report eating pork at least once daily while 11.9% in Group B and 5.4% in Group A report doing so. In Group C, 32.7% of the students also report eating processed meat or meat products daily compared to 10.8% and 26.9% in Groups A and B respectively. Additionally, 73.1% of students in Group C eat oily fish at least twice a week while 47.3% and 59.7% of students in Groups A and B respectively report doing so.

When asked if they have made changes to their diet since arriving in Ukraine, 94.8% of the students agree that they have made changes. 36% of the students are of the opinion that they eat less fruits and vegetables since first arriving in Ukraine while another 34.7% believe they eat more and 29.5% say they consume the same amount. A large portion of the students (48.7%) believe that they drink less soft/fizzy drinks while 32.6% believe they drink more soft/fizzy drinks than they did before coming to Ukraine and 18.7% drink just as much as they did.

For fried foods, 40.4% of the students believe they eat less since they came to Ukraine while 36.3% say they consume more and the other 23.3% believe they consume the same amount. 42 percent of the students are of the opinion that they consume less sugar and other sugary confectionaries compared to the 27.5% who consume more and 30.6% who consume the same since coming to Ukraine. Increase in consumption of low fat milk products is reported by 20.7% of the students while 45.6% report consuming less and 33.7% consume the same amount. Lastly, 45.6% of the students report eating more processed/fast foods whereas 37.3% report eating less and the other 17.1% eat the same amount.

Results show the responses of the respondents when asked about their opinion on what is important in maintaining a healthy diet. A majority of the students agree that reduction of fatty and fried foods intake (63.7%), eating lots of fruits and vegetables (80.3%), eating fibre rich foods (69.9%), and increased intake of whole grain cereal (53.9%) are all important in maintaining a healthy diet. Furthermore, 41.5% of the students agree that a reduction in intake of refined foods is also important for maintaining a healthy diet.

Gender has a significant effect on overall knowledge of healthy diet ($p=0.004$). Female students have a better knowledge healthy diet than male students with a mean score of $7.14+2.08$ compared to $6.34+1.73$ for male students. Age and duration of stay in Ukraine don't have any significant effects on estimated knowledge of healthy diet.

Some results show the responses of the students on the

perceived barriers to maintaining healthy diet. A majority of the students consider lack of will power to make healthy choices (66.8%) and high prices of healthy foods (57.5%) as the major barriers to maintaining a healthy diet. The students' opinions on the lack of information on healthy foods and healthy foods being boring as barriers to maintaining a healthy diet are marginally balance. 35% of the students agree that a lack of information hinders them from maintaining a healthy diet whereas 38.9% disagree. 40% of the students also consider healthy being boring to eat to be one of the factors that hinders them while another 38.3% disagrees with this opinion. Age, gender and duration of stay in Ukraine have no significant effects on the perceived barriers.

DISCUSSION

The importance of diet in the promotion of health and general wellbeing is well established. Therefore, the evaluation of dietary habits, knowledge and attitudes towards diet as well as facilitators and barriers to adoption and adherence to healthy dietary habits is of utmost importance. This is even more so for subpopulations that are at risk of adopting unhealthy dietary habits such as international students.

The results of our study show that the rate of fruit and vegetable consumption amongst international students in Ukraine is high. Over 70% of students consume at least 2 portions of fruits and 3 portions of vegetables a day as per the 400g/day recommendation. A larger portion of the students also include more lean meat (poultry – 45.1%, white fish – 43.5% and oily fish – 58.5%) in their diet compared to red meat (beef – 20.2% and pork – 13.5%). Only a small portion of the students drink soft/fizzy drinks daily (28%). Consumption of alcoholic beverages is low amongst international students with daily consumption reported by only 7.3%.

The results of this study show that sweets and snack including cakes, puddings, sweet biscuits cream crackers, candies and toffees are consumed daily by 96.9% of students. We suspect that this high rate of consumption of convenience foods is in part as a result of the university schedule of the students which does not allow them time to prepare meals [14].

Results from a DEDIPAC study show the broad range of factors influencing dietary behaviour among ethnic minority groups living in Europe [15]. Our study shows that only 14% the students eat nuts and legumes up to once daily. More students who have been in Ukraine for 2 – 4 years believe they consume more soft/fizzy drinks since coming to Ukraine (46%) than those who have been in Ukraine for less than 2 years (22%). The findings of our study show that with longer stay, more students start to adopt some eating behaviours that are common in Ukraine. For example a larger proportion of students who have been in Ukraine for more than 4 years eat pork (25.6%), beef (29.5%) and processed meat (38.5%) daily compared to those students who have been in Ukraine for shorter periods.

The effects of gender on dietary patterns and food choices

have been reported [16] In line with this, our study found that female students have better knowledge and are more likely to make healthier food choices than their male counterparts. Female students are more likely to choose low-fat over whole milk and milk products as well as vegetable oils over butter and/or margarine. Female students (2.1%) are also less likely to consume alcoholic beverages than their male counterparts (12.2%).

Overall knowledge of a healthy diet as estimated by our overall knowledge score show that the students' mean score is $6.74+1.95$. Female students appear to have a better knowledge of healthy dietary habits with a mean score of $7.14+2.08$ than their male counterparts who have a mean score of $6.34+1.73$.

A study of the changes in dietary habits of international students in Belgium revealed a perceived lack of information and price as the main factors that hinder adoption and adherence to a healthy diet.[17] The findings of our study agree with the findings of Perez-Cuerto et al., 2009 with 57.5% of students stating price as a barrier. However, results of our study show that only a small proportion of international students (23.8%) in Ukraine consider lack of information on healthy foods to be one of the barriers to healthy diet. On the contrary, 66.8% of the students perceive lack of willpower to make healthy food choices as a major factor that hinders them from adhering to a healthy diet.

Some of the limitations of this study include the relatively small sample used. A larger sample was not attained due to time and budget constraints. However, the results of this study give an insight into the diet of these students and serve as a starting point for further studies.

CONCLUSIONS

1. This study shows that the dietary behaviour of international students in Ukraine is characterized by: high consumption of fruits and vegetables, high intake of lean meats, high intake of fish, higher consumption of unsaturated fats and oils than saturated ones, and low consumption of soft/fizzy and alcoholic drinks.
2. The assessment of the effects socio-demographic factors on dietary habits shows that gender, age and duration of stay in Ukraine all have effects on the dietary behaviour of the students. Duration of stay: (a) students who have been in Ukraine longer consume more fruits, (b) more red meat (beef and pork), (c) more processed meat and meat products, d) less soft/fizzy drinks, and (e) more fish and seafood. Gender: Female students are (a) more likely to consume low-fat milk and (b) less likely to consume alcoholic beverages than their male counterparts. Age: older students are more likely to consume (a) more fruits, (b) more pork, (c) more processed meat products, and (d) more fish. More attention should be paid to the younger students and those students who have only been in Ukraine for up to 2 years. More education on the importance of low-fat milk consumption and decreased alcohol consumption should be provided especially to male students.
3. Assessment of perceived changes shows that almost all students have made changes to their dietary habits since coming to Ukraine. Perceived changes include: (a) increase in the consumption of refined and fast foods, (b) decrease in the consumption of soft/fizzy drinks (c) decreased consumption of fried foods, (d) decreased intake of low-fat milk and milk products, and (e) decreased consumption of sugar and confectionaries. Female students have better knowledge about healthy dietary habits than their male counterparts.
4. Assessment of the perceived barriers to maintaining a healthy diet by international students in Ukraine shows that the main barriers are: (a) high price of healthy food, and (b) lack of willpower. Therefore, all of these factors should be considered when organizing information and educational programs about healthy dietary habits for international students, especially those studying in Ukraine.

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The Authors declare no conflict of interest.

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