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Zagorodnov Mykola, Andreeva Tetyana

NaUKMA STUDENTS' NUTRITION

This article presents results of investigation of food consumption patterns among students of the National University of «Kyiv-Mohyla Academy» based on a non-experimental cross-sectional survey held among students of Bachelor and Master programmes of NaUKMA throughout year 2007. As it turned out, students who live in the dormitories or rented apartments have less diverse and less healthy nutrition than those students who live at home with parents; besides, they are more likely to skip breakfast. Several policy and educational measures are proposed to be undertaken in order to improve the situation.

Introduction

Cardiovascular diseases (further - CVD) are the leading cause of death in Ukraine accounting for 60 % of all deaths and 30 % of the disease burden [15; 17]. Alcohol and tobacco consumption, raised blood pressure, cholesterol level and overweight are known to be the main risk factors for development of a CVD. It's quite obvious that the last three of them may occur as a result of improper nutrition. And the foundations of it may be started in early college years. That's why knowing the condition of students' diet, their eating behavior and barriers to healthy eating among students can help to predict some diseases (including cancer of the large bowel - colon and rectum, type II diabetes, obesity, and CVD), develop recommendations and nutrition standards for the canteens, and to organize certain interventions.

Many international studies have proven that there is considerable scope to reduce the incidence

of the above mentioned diseases by having a proper and balanced diet (low fat content and high vegetable fibre); proper consumption of food (to have three simple meals a day and to avoid snacks between meals) and increasing physical activity [12]. Notably, schools were found to be a critical setting for programming where health status indicators, such as body composition, chronic disease risk factors and fitness, can all be positively impacted, while university and college arenas are seen to represent the final opportunity for the health and nutritional education of a large number of young adults [7; 14]. Meanwhile, there's a shortage of research and analytical information in Ukraine concerning condition of population's diet in general and of students in particular.

The overall goal of this research was to explore nutrition of students of the National University of «Kyiv-Mohyla Academy» (NaUKMA). The paper

presents short literature review regarding proper nutrition and key findings of research, including students' lifestyles.

Concept of proper nutrition

Theory of proper nutrition is an important part of modern public health approaches. A balanced diet must contain adequate protein, essential vitamins, certain mineral salts and plenty of fibre as this has a protective action against many diseases, including colonic diseases and ischaemic heart disease. As the modern world has developed foods rich in animal proteins, more fat is being eaten and carbohydrates rich in sugar have become popular. However, there is mounting evidence that such a diet is not ideal and the marked increase in ischaemic heart disease, certain colonic diseases and obesity lately has been connected with these trends. At present, there's a move towards diets in which dairy fats are reduced and foods rich in fibre are increased.

A good example of modern scientific approach to definition of a healthy diet is a Healthy Eating Pyramid created by nutrition experts from the Harvard School of Public Health [8]. It is based on the best available scientific evidence about the links between diet and health and offers sound information to help people make better choices about what to eat. The Healthy Eating Pyramid sits on a foundation of daily exercise and weight control. Moving from bottom to top of the Pyramid, the healthiest groups of products are replaced by the least healthy ones. The bricks of the Pyramid include: whole grain foods (at most meals) such as oatmeal, whole wheat bread, and brown rice (they are the best source of carbohydrates needed by the human body mainly for energy); plant oils (which are good sources of healthy unsaturated fats and include olive, canola, soy, corn, sunflower, peanut, and other vegetable oils, as well as fatty fish such as salmon); vegetables (in abundance) and fruits (2 to 3 times); fish, poultry, and eggs (0 to 2 times), which are important sources of protein; nuts and legumes (1 to 3 times), which are excellent sources of protein, fiber, vitamins, and minerals; dairy or calcium supplement (1 to 2 times) required for building one's bones and keeping them strong; red meat and butter sit at the top of the Healthy Eating Pyramid because they contain lots of saturated fat and should be used sparingly; white rice, white bread, potatoes, white pasta, soda, and sweets (use sparingly) - they can cause fast and furious increases in blood sugar that can lead to weight gain, diabetes, heart disease, and other chronic disorders. Besides these, a daily multivitamin and multimineral supplement offers a kind of nutritional backup, while alcohol is recommended to be used in moderation (for men, a good balance point is 1 to 2 drinks a day; for women, it's at most one drink a day).

Individual nutritional problems are directly related to the type, amount and variety of foodstuffs consumed. Food must supply the energy needs of the body in the form of calories and protein necessary for growth and tissue replacement. That's why the correct proportion of proteins, carbohydrates and fats must be present in the diet which should also contain adequate amounts of vitamins, minerals and fibre [10]. The more fruits and vegetables people consume, the better is their protection from CVDs [11]. Estimations show that an increase in consumption for an average of 150 grams of these products per day can lower the mortality risk from ischaemic heart disease by 20-40 %, from stroke - by 25 % and from CVDs by 6-22 %; in the lowest values of estimations the influence of smoking and/or alcohol consumption is taken into consideration [11].

Zatonski et al. [18] investigated reasons for reduction of mortality from ischaemic heart disease in Poland starting with 1991, after two decades of its growth. Taking into account the potential role of changes in food supplies, smoking, alcohol consumption, stress and medical help, the authors related the sizeable decrease of premature death rates with the reduction in saturated fats consumption and the increase of fruits and vegetables supplies. The alike changes in nutrition also happened in Czech Republic [5].

The key findings of different studies aimed at exploring the state of students' diet and used for the current research, are:

- college students tend to have poor eating habits, like non-regular consumption of meals, low frequency of vegetables, fruits and fish consumption, preferring fatty products and poor physical activity [2; 16];
- between group comparisons of dietary changes showed that since starting University, students living away from home tend to develop more unfavourable eating habits than students living at the family home [13];
- students, participating in sport activities have a more balanced nutrition than those who don't go in for sports; skipping of breakfast is also more common among students living away from home and having no sport activity [2];
- pro-healthy behaviours are more disseminated among students living in cities in comparison with students coming from villages and small towns [16];
- food insufficiency among school-children and students is associated with significantly poorer cognitive functioning, aggression, anxiety, decreased school attendance, or diminished academic achievement; dairy products tend to have greatest independent influence on achievements [9];

- nutrition interventions in this young population are recommended to be encouraged to promote healthier diets and lifestyles [4; 16].

Another issue of importance is related to skipping breakfast. There appears to be a negative impact of skipping breakfast on academic performance and cognitive functioning in the short term [1]. School breakfast programs seem to improve attendance and decrease tardiness [6]. Besides, it is proved that a greater number of eating episodes each day is associated with a lower risk of obesity [3].

Research methods and target groups

This research is based on a non-experimental cross-sectional survey held among students of Bachelor and Master programmes of NaUKMA in all the 6 departments of the University throughout year 2007. It was done with the help of a questionnaire created by a team of students of the School of Public Health of Kyiv-Mohyla Academy and included different sets of questions aimed to investigate young people's lifestyles relevant to alcohol and tobacco consumption, dental and general health, weight and nutrition, as well as socio-economic questions: place of birth, living, family's income, year of study, age, sex and employment. Convenience sampling was performed to obtain as many responses as possible. As a result, the sample amounted to 965 correctly filled answer-sheets. Several responses were discarded due to incomplete or unacceptable answers. 640 female and 262 male students aged 16 to 35 years old were questioned. In 63 response-sheets information on gender status was missing.

The choice of students as a target group is motivated by the idea that young adults who are enrolled in higher education have access to different sources of information, have a wide circle of communication, good employment opportunities, and higher than average levels of personal motivation and responsibility. Thus, besides being potentially vulnerable to nutrition-related health risk factors, majority of these students are very likely to become future leaders of their generation and will have all opportunities to demonstrate healthy lifestyles by their own examples to their less lucky peers and younger generations.

The basic study group was also divided into two sub-groups: students who live in a dormitory or rent an apartment with other students, and those students who keep living with parents after entering the University. This action is based on the hypothesis that those students who live separately from their parents do not receive enough nutrients which are essential for maintaining good health and cheerful spirits; they are more likely to skip breakfasts.

The concept «healthy eating» used in this paper means that a person is following recommendations

on proper nutrition suggested by the Harvard Healthy Eating Pyramid [8].

Data from the survey was analyzed using SPSS software for Windows, version 10.05. Cross tabulation was used for comparison of nutritional preferences in the two groups of students. Case processing summary was giving around 79 % of valid cases. Pearson Chi-square and Odds Ratios calculations were used for bivariate analysis of categorical variables.

Contents of the students' menu

Consumption rates of students are compared with regard to quantities, recommended by Harvard Healthy Eating Pyramid (in case these quantities are not reached by any group of respondents - best score available is shown).

There is practically no difference between the two groups of students in levels of consumptions of whole grains: only 12,8 % of home-living and 14,6 % of dormitory/apartment students have grains at least once per day, while only 6,3 % and 6,6 %, respectively, eat grains 2 times a day or more (while the Harvard Healthy Eating Pyramid recommends to do it at most meals during the day).

At the same time members of home living group of students are less likely to use mayonnaise with their salads - 35,2 % compared to 47,4 % among dormitory/apartment group; do not differ with regard to use of sun-flower seed oil - 33,3 % and 31,3 % respectively; and have much higher odds of using olive oil - 17,2 % compared to 8,3% respectively.

Students who live with parents (Group 1) tend to drink more fruit juices than those who live separately (Group 2): 11,9 % in the first group versus 4,8 % in the second do it at least once a day; 6,9 % compared to 3,5 %, respectively, have juice two times per day, and 6,4% compared to 2,0% drink juice three or more times per day.

Situation is even worse with fresh juices - the percentage of students who consume fresh juices at least once a week is twice higher among Group 1 - 16,7 % versus 7,3 % respectively; 7,4 % of home living students do it 2-4 times per week, compared to 2,8 % among dormitory/apartment living respondents.

Students living with parents are more likely to consume fruit daily - 16,9 % compared to 8,5 % in dormitory students; 2 times per day - 14,2 % compared to 4,5 % respectively; and 3 or more times per day - 9,3 % compared to 4,0 %.

Students living with parents tend to eat vegetables (besides potatoes and carrots) more often than those who live separately - 12,8 % have vegetables at least once a day, compared to 6,3 % respectively; 7,7 % do it 2 times per day, compared to 3,0 % re-

spectively; and 1,6 % eat vegetables 3 or more times per day, compared to 0,5 % respectively.

Consumption of carrots and potatoes was measured by a separate question. Results of comparison showed that a higher proportion of home living students eat carrots: 16,9 % compared to 14,0 % among dormitory/apartment group do it at least 2-4 times per week; 4,1 % compared to 1,3 %, respectively, have carrots almost every day; only 3,8 % and 2,3 %, respectively, have carrots once a day or more.

At the same time, students who live in a dormitory or rented apartment are less likely to eat potatoes: 47,9 % use potatoes sparingly (once a week or less), compared to 31,4 % among students who live at home with parents. This may be explained by parental input because cooking potatoes is rather time-consuming.

Representatives of Group 1 consume milk, cheese, cottage cheese or other dairy products more often than in Group 2 - 24,4 % compared to 13,9 % do it once a day, and 13,9 % compared to 5,3 % consume these products 2 times per day.

Students who live at home are more likely to consume fish and poultry more often than once a week. Speaking about fish consumption, neither group of students receives satisfying amounts of this product - 21,4 % members of Group 1 eat fish at least 2-4 days a week, compared to 13,6 % in Group 2; 2,5 % have fish almost every day, compared to 1,0 % respectively; only 2 % of home living respondents and 0,8 % of their dormitory/apartment living schoolmates consume fish more than once per day. At the same time, 35,7 % of home-living students have poultry at least 2-4 days a week, compared to 19,3 % in Group 2; 6,0 % eat poultry almost every day, compared to 2,5 % respectively; only 3 % of home living respondents and 1,6 % of their dormitory/apartment living schoolmates consume poultry more than once per day.

On the other hand, home-living students also tend to consume more high-fat red meats (hamburgers, pork chops, ribs, hot dogs, pot roast, sausage, bologna, steaks other than round steak, etc). The proportion of students who eat these products less often than one time per week is higher among respondents who live in dormitory or rented apartment than among those who live at home with parents: 52,4 % compared to 39,9 % respectively. This means that the rest of respondents - 47,6 % among dormitory/apartment and 60,1 % among home living students - consume high-fat red meat once a week or more, which is not recommended by scientists who created Harvard Healthy Eating Pyramid.

In general, students who live with parents have higher odds of eating fish more frequently or equal to meat: 18,5 % of home-living students have fish regularly, compared to 12,5 % in the second group.

When asked about consumption of sweets (chocolate, etc.), it turned out that the proportions of students who eat these goods less often than one time per week are equal among the two groups of respondents: 12,7 % for home living and 12,1 % for dormitory/apartment living students. 40,1 % among home living students and 52,5 % among dormitory/apartment consume sweets 2-6 times per week, while 47,2 % and 3,4 %, respectively, have sweets once a day or more, which is not recommended by Harvard Healthy Eating Pyramid.

As for sweet drinks («soda») consumption, the odds of both groups of students to consume this product once per week or less are the same: 77,7 % among dormitory/apartment living students and 77,6 % among home living ones. This means that only 22,3 % of students from both groups consume soda drinks exceeding recommendations of Harvard Healthy Eating Pyramid, which is a good sign.

Consumption of alcohol is also considered in the Healthy Eating Pyramid - it recommends using alcohol «in moderation, if appropriate». As it turned out, there's practically no difference between the two compared groups of students when they consume alcohol less than once a week - 79,5 % among home living students and 81,2 % among dormitory/apartment living ones; or almost every day - 1,2 % and 0,8 % respectively. But the odds of dormitory/apartment living students to consume alcohol several times per week are almost twice higher than among their home living respondents: 6,5 % compared to 3,6 % respectively.

Table 1 presents the key findings regarding the content of the student menu.

So, students of Kyiv-Mohyla Academy are not having a well-balanced nutrition, which may be reached through consumption of a variety of products recommended by the Harvard Healthy Eating Pyramid. Nutrition of the group of students who live in the dormitories or apartments, rented with other students is generally worse than that of home living group.

Eating habits, traditions and lifestyles

Students living in the dormitory or rented apartment are more likely to skip their breakfast: 20,2 % skip breakfast 2-4 times per week, compared to 9,2 % in home living students; 16,9 % do it almost every day compared to 6,6 % respectively; 13,6 % never have breakfast at all, compared to 8,3 % respectively.

In general, students who live in dormitories or rented apartments tend to come from families where traditional diet includes smaller quantities of fresh vegetables, more meat and where animal fat, butter or margarine are more likely to be used for cooking. This is not a surprising finding, taking into account

Table 1. Students' menu (according to the survey)

Selected positions in students' menu	Students who keep living with parents	Students who live in a dormitory or rent an apartment with other students
<i>Recommended by Harvard Healthy Eating Pyramid</i>		
Whole grain foods (should be at most meal during the day)	12,8 % at least once a day 6,3 % eat 2 times a day or more	14,6 % at least once a day 6,6 % eat grains 2 times a day more
Fruit juices	11,9 % at least once a day 6,9 % have two times per day	4,8 % at least once a day 3,5 % have two times per day
Fruits	16,9 % at least once a day	8,5 % at least once a day
Vegetables (besides potatoes and carrots)	12,8 % at least once a day	6,3 % at least once a day
Fish	21,4 % at least 2-4 days a week	13,6 % at least 2-4 days a week
Poultry	35,7 % at least 2-4 days a week	19,3 % at least 2-4 days a week
Milk, cheese, cottage cheese or other dairy products	24,4 % once a day	13,9 % once a day
<i>Not recommended by Harvard Healthy Eating Pyramid</i>		
High-fat red meats (hamburgers, pork chops, ribs, hot dogs, pot roast, sausage, bologna, steaks other than round steak, etc.)	60,1 % once a week or more	47,6 % once a week or more
Sweets (chocolate, etc.)	40,1 % 2-6 times per week	52,5 % 2-6 times per week
Sweet drinks («soda»)	77,6 % once a week	77,7 % once a week

that students from this group mostly come from much smaller provincial towns where eating patterns are likely to be different than the ones in a big city like Kyiv. But the difference is not striking.

For example, 36,3 % of local students (who live with parents) reported that in their families vegetables are mostly used fresh, when 32,2 % of dormitory/apartment students claimed the same. 59,7 % of dormitory/apartment living students mostly agreed with the statement that a traditional meal in their parents' home would be considered incomplete without a meat dish, compared to 54,4 % of home-living students. Meanwhile, proportion of respondents who disagreed with this statement is higher among home living students - 45,6 % compared to 40,4 % among those who live in a dormitory or apartment.

Another issue of interest related to family traditions is concerned with overeating. Having big family dinners with a variety of meals which usually lead to overeating is more typical for families of students who live in a dormitory or rented apartment: 7,3 % of dormitory students reported that overeating was typical for their families and it happened not only during celebration of some events, while only 5,0 % of local students reported the same. 69,9 % among dormitory respondents reported that overeating in their families usually happens on holidays or special occasions, compared to 64,5 % among their home-living classmates. At the same time, 30,5 % of home living students claimed that overeating was not traditional for their family, compared to 22,9 % among dormitory/apartment group.

There's practically no difference between the two groups of students regarding use of sunflower

oil for cooking: 79,4 % of dormitory/apartment students and 77,4 % of home-living ones.

At the same time, the odds of using olive oil are much higher in families of local students: 12,6 % of students coming from Kyiv, compared to only 6,3 % of their provincial classmates.

On the other hand, the odds of using animal fat for cooking are higher in families of dormitory students: 8,6 % for dormitory/apartment living respondents versus 2,7 % among home-living ones.

Higher proportions of home living students than their dormitory/apartment classmates tend to consume healthy types of breads: 45,5 % have black/rye bread most frequently, compared to 33,3 % respectively; 27,3 % eat whole grain breads, compared to 16,7 % respectively. White bread, which is the least healthy, is chosen by students who live in dormitory or rented apartment more often than by home living students - 33,3 % compared to 18,2 % respectively.

Surprisingly, students who live at home with parents have a more positive attitude to fast food than those students who live in a dormitory or rented apartment: 8,8 % of home-living students, compared to 6,6 % of dormitory ones. Only 19,8 % of home students have a completely negative attitude towards fast food and claimed that they never eat fast food, while 24,0 % among the dormitory students claimed the same. The reason for a majority of students to consume fast food, while having a negative attitude to it, is that it is convenient when one is in a rush: 41,1 % compared to 45,8 % respectively.

Proportion of students who consider their lifestyle healthy is higher among those who live at

home with: 71 % compared to 56 % in students who live in the dormitory or rented apartment.

Proportion of students who consider their diet healthy is also higher among home living respondents than among dormitory/apartment living ones: 50,5 % compared to 33,9 % respectively.

When asked a question on what changes respondents would like to have in their diet (up to three response options could be chosen), 39,1 % of home living students would like to reduce sugar consumption, compared to 26,7 % among students who live in a dormitory or rented apartment. A higher proportion of respondents from the above-mentioned first group of student would also like to reduce consumption of fatty products - 29,8 %, compared to 21,4 % among the second group. A very high proportion of dormitory/apartment living students want to increase consumption of fresh fruit and vegetables - 70,5 %, compared to 55,2 % among home living respondents. There is also a higher proportion of students who would like to eat more regularly among dormitory/apartment living group of students - 56,2 % compared to 45,1 % among students who live at home with parents.

As it turned out, home living students are more likely to have sufficient level of daily exercise than their classmates who live in a dormitory or rent an apartment, which means that they either go in for sports regularly (23,1 % compared to 16,7 %, respectively), or attend physical training classes at the university (27,9 % and 27,0 %, respectively), or do some training at home (8,4 % compared to 6,8 %, respectively), or do some light physical exercises almost every day (14,2 % and 15,4 %, respectively).

The survey results show that moving away from the family home and assuming responsibility for food preparation and purchasing for the first time affects dietary habits of the NaUKMA students; this means that place of residence is a strong influential factor on students' nutrition. Comparison of eating habits revealed that dormitory/apartment living students have much higher odds of skipping breakfast, which means that they are in higher risk of developing overweight or even obesity and some other health disorders. It is worth to mention that representatives of both study groups have desires for changes in diet which are quite adequate to the drawbacks they are actually experiencing. Hence, interventions should be aimed at overcoming barriers to healthy eating identified by students.

Major barriers to healthy nutrition among students

When asked a question about how often students happen to find themselves in a situation when they are hungry but do not have possibility to buy a meal

because they do not have enough money for it, only a small proportion of respondents from both groups answered that it happens to them almost every day - 3,9 % (cumulative for both groups), or frequently - 6,6 %. The highest proportion of respondents claim to never find themselves in a situation like that - 36,8 %; 31,5 % report to get down to saving on food once in a while; and 21,1 % do it sometimes. Notably, there's practically no difference between students who live at home with parents and those who live in a dormitory or rent an apartment with other students. Thereby, the majority of respondents have an opportunity to eat regularly but dormitory/apartment living students may be making wrong food choices or healthier food is more expensive than unhealthy snacks.

Among the reasons of unhealthy diet students living in the dormitory or rented apartment are more likely to mention lack of time - 62,4 % versus 55,5 % in those who live with parents and lack of money - 52,1 % compared to 26,2 % respectively.

At the same time home living students more than their dormitory/apartment living schoolmates tend to suffer from lack of self-control - 50,3 % compared to 45,9 % respectively and also consider healthy food unpleasant - 18,6 % compared to 7,8 % respectively.

Equal proportions (around 18,5 %) from both groups of students claim to have lack of knowledge which prevents them from eating a healthier diet.

To sum up, the major barriers to healthy nutrition between both groups of students are identified to be: 1) lack of time (higher for dormitory/apartment group), 2) lack of money (much higher for dormitory/apartment group), 3) lack of self control, 4) lack of knowledge to make healthy food choices (almost equal for both groups), 5) consider healthy food unpleasant (higher for home living group).

Recommendations to the administration of NaUKMA

1. A «Healthy Food» policy needs to be developed and introduced by the University administration. It has to pay special attention to the availability of healthy foods in the canteens and options for snacks, such as fruits, vegetables (in salads without high fat mayonnaise dressing), and variety of juices, fish, poultry and dairy products as well as involvement of students into physical activities.

2. In order to improve nutrition of those students who live separately from their parents it is recommended to organize affordable pre-packed nutritious breakfasts that will include essential products which are missing in students' everyday menu, like nuts, raisins, fresh or dried fruits and vegetables, juice, dairy products, etc. They should be distributed in

places convenient for students to stop by on their way for classrooms before the first and second classes, This intervention will remove two basic barriers - will save students' time and money.

3. An information campaign with advice on healthy nutrition should be started on University mass-media channels (radio, printed newspapers and journal, web-pages). Information boards picturing Harvard Healthy Eating Pyramid are recom-

mended to be organized in the University canteens and dormitories.

4. «Health promotion» course is proposed to be further used as an important link in health education of students;

5. A special attention should be paid to the living conditions in the dormitories and further research on their influence on students' nutrition is recommended.

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Загороднов Микола, Андреева Тетяна

ХАРЧУВАННЯ СТУДЕНТІВ НАУКМА

У статті представлено результати дослідження стану харчування студентів Національного університету «Києво-Могилянська академія», що базувалося на крос-секційному одномоментному опитуванні, проведеному серед студентів бакалаврських та магістерських програм НАУКМА протягом 2007р. Як виявилось, студенти, які мешкають у гуртожитках або винаймають квартири разом з іншими студентами, мають менш різноманітне та менш здорове харчування, ніж студенти, які живуть із батьками; крім того, вони частіше не снідають взагалі. Для покращення ситуації авторами запропоновано кілька варіантів заходів освітнього характеру, а також пропозицій щодо зміни політики НАУКМА стосовно харчування студентів.