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Comparable characteristics of biologically driven eating behavior in different ethnic groups of medical students

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Introduction: Eating behavior is one of the key factors which may lead to eating disorders, including obesity and metabolic diseases. It is different among ethnically and socio-culturally diverse groups and strongly related to the influence of various factors, including the contribution of environment and lifestyle, especially for young people.

Aim: To examine the lifestyle-related eating behavior pattern of foreign medical students from Danylo Halytsky Lviv National Medical University (LNMU, Ukraine) in the different ethnic groups.

Methods: The study group includes 209 respondents who are foreign students (aged 17 to 28) who studied in LNMU while residing in dormitories or rented apartments. Participants were surveyed using the English version of the Dutch Eating Behavior Questionnaire DEBQ (Van Strien et al., 2002) and additional original questions about nutritional interventions for healthy food habits. BMI was calculated based on self-reported height and weight. Statistical analysis with JAMOVI provided Cronbach's α coefficient analysis with determination of confidence interval – 95%CI.

Results: Ethnic groups involved in the study were: African – 16.1%, Asian – 39.2%, European – 41.4%, Hispanic – 1.4%, Mixed – 1.9%.

According to the 1st section, eating pattern changes, if the food smells, looks and tastes good, and 54% of total participants (TPs) tend to eat more than they planned; 68.9% will have the desire to eat even if they are not hungry, and 53.2% will eat immediately after they purchase these foods. Obtained data in the 2nd section (emotional eating) has shown that the influence of negative emotions and states like feeling depressed was present in 42.1% of TPs, lonely – 51.4%, anxious, sad, overwhelmed – 30.7% when participants tend to overeat. The 3d section concerns the tendency for external eating. 64.6% of participants tend to overeat during meetings with friends, and 67.5% choose to give food as a gift when they go on a visit. 46.4% of participants tend to overeat on holidays, vacations, hiking trips. The 4th section is about nutritional interventions –

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69.3% of TPs eat less than usual, try to avoid snacks; 56.0% of participants choose their food intentionally, are mindful of consumed calories if they want to lose weight; 52.6% choose to eat less during the day if they consumed too many calories the day before.

Conclusion: Taken together with the results from different ethnic groups, the association between the emotional condition and eating behavior differed depending on the ethnicity. Most of the participants know about principles of healthy eating, but they also realize that their eating behavior changes to adapt to current lifestyle factors, like gender, chronic stress, demanding academic learning, sedentary lifestyle, and macro-social factors.

Keywords: Medical students, eating behavior, DEBQ, overeating, ethnic groups.

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Фінансування. Автори декларують відсутність фінансування у підготовці даної статті.

англійської версії анкети DEBQ (голландської харчової поведінки) (Van Strien et al., 2002) з доданими оригінальними запитаннями про принципи здорового харчування. Обрахунок індексу маси тіла здійснювали за поданими респондентами власними даними про масу тіла і зріст. Статистичний аналіз проведено за допомогою Microsoft Excel, визначення коефіцієнту надійності – альфа Кронбаха і обрахуванням 95% довірчого інтервалу (confidence interval – 95%CI).

Порівняння характеристик біологічно обумовленої харчової поведінки серед студентів-медиків різної етнічної приналежності

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Вступ. Харчова поведінка є одним з ключових факторів, який може призвести до появи порушень харчування, що спричиняють метаболічні захворювання та ожиріння. Харчові вподобання значно відрізняються серед різних етнічних і соціально-культурних груп населення і залежать від впливу факторів навколишнього середовища та способу життя, що яскраво простежується у молоді.

Мета. Вивчити особливості харчової поведінки серед студентів-медиків Львівського національного медичного університету імені Данила Галицького (ЛНМУ, Україна) різної етнічної приналежності.

Методи: У групу дослідження включено 209 респондентів – студентів-іноземців (віком від 17 до 28 років), які навчаються у ЛНМУ та проживають у гуртожитках або орендованих апартаментах. Учасники пройшли опитування з використанням

Результати: Співвідношення між етнічними групами, які взяли участь у дослідженні наступні: африканські – 16.1%, азіатські – 39.2%, європейські – 41.4%, іспаномовні – 1.4%, змішані – 1.9%.

Згідно до першого розділу опитування, встановлено, що на кількість спожитої їжі впливав її приємний аромат і гарний вигляд. 54% усіх учасників визнали, що прагнуть з'їсти більше, аніж планували, а 68.9% – мали бажання їсти, навіть якщо вони не голодні; 53.2% з опитаних з'їдали усі продукти відразу після придбання. Такі тенденції переважали у азіатів. Дані, отримані у другому розділі, пов'язані на змінах харчової поведінки залежно від емоційного стану, показали, що вплив негативних емоцій призводить до схильності переїдати. Серед таких емоцій провідні місця займають самотність – 51.4%, депресія – 42.1% та нудьга – 39.7%, а вже пізніше руйнування планів – 34.5%, тривожність і сум – 30.7%, переживання труднощів – 28.7%. На запитання у 3-му розділі про характер харчування за межами дому (у соціумі) 64.6% учасників визнали, що схильні переїдати під час зустрічей з друзями, а 67.5%, йдучи у гості, вважають гарною ідеєю принести їжу як подарунок. Схильність переїдати під час відпустки, канікул чи поїздки на природу виявлено у 46.4% учасників опитування. У 4-му розділі, присвяченому регулюванню харчування, виявлено, що найчастіше студенти починають їсти менше звичайного, намагаються відмовитись від перекусів (69.3%), разом з тим 56.0% учасників обирають продукти цілеспрямовано, розраховуючи калорійність продуктів; 52.6% учасників обмежують себе у їжі, якщо напередодні спожили надто багато калорійних продуктів. Описані тенденції у 2-4 розділах переважали у європейців.

Висновок: Отримані дані шляхом опитування різних етнічних груп показали на відмінності у взаємозв'язках між емоційним станом і харчовою поведінкою студентів медиків.

Більшість учасників дослідження знали про засади здорового харчування, але разом з тим відмічали, що їх харчова поведінка прямо залежить від чинників зовнішнього середовища, способу життя, статі, хронічного стресу, відчуття особистої відповідальності на її формування та соціальних факторів.

Ключові слова: студенти-медики, харчова поведінка, DEBQ, переїдання, етнічні групи.

Introduction

Eating behavior is one of the manifestations of individual lifestyle and influence of environmental

factors, the living standard which is related to social, economic, and cultural influence [10]. Among the environmental factors which affect the physiological background of eating behavior manifested on the food choice, time of the meal, amount of consumed food, and type of consumed food is chronic job-related stress and modern lifestyle [1]. One of the population groups with an extraordinary lifestyle are students of universities and colleges [15]. Students of medical faculties belong to student groups with demanding academic learning, their lifestyle is characterized by consumption of unhealthy food, the overload of unhealthy carbohydrates, participation in rotations, and little or poor-quality sleep, which brings a lot of distress to their everyday life [17]. Moreover, living in the era of globalization, more and more young people in their twenties want to study abroad. Being consumed with the excitement of living in

a new country and away from the family home, experiencing a new culture, and meeting other students from all around the world, they find themselves in a new environment with different geographical, social, intergroup interaction, and changes in life quality standard. One of the early manifestations of such lifestyle changes includes modulations in eating behavior [18]. A recent study argued that disrupted behavior towards eating is the direct cause of eating disorders; it also reached out to urge all healthcare providers to make it an obligatory point to ask the patient about their eating behavior. In some cases, it may help respond to the problem of harmful eating behavior before it develops into a severe psychological disease, that we have little knowledge of successful treatment and management [18]. According to the Dutch Eating Behavior Questionnaire (DEBQ), adults have are three eating behavior components: emotional, restrained or

external eating patterns [20]. A recent study suggested that eating behavior is related to individual stress-responsibility [15]; however, the nutritional interventions for healthier diets in the young population is not fully known. Thus, we hypothesized that the study of eating patterns in different ethnic groups of foreign students of the medical faculty at Danylo Halytsky Lviv National Medical University (LNMU) whose life away from their homelands, in the new environment will help detect early changes in individual eating behavior peculiarities depending on ethnicity and will help educate future doctors about the impact of lifestyle factors on health as well as help them keep healthy food habits.

Materials and methods

Study group

The study group involved 209 foreign medical students from different years of study of the LNMU (Lviv, Ukraine), who live in dormitories or rented apartments.

Methods

Recruitment was based on self-reporting via QR code in a Google Form by answering questions related to socio-demographic characteristics: age (gender, educational status, place of birth, ethnicity, current place of residence). The eating behavior was tested using the English version in the Google Questionnaire of

the Dutch Eating Behavior Questionnaire DEBQ [15], which helped reveal eating disorders. It consists of four sections: 1) related to eating behavior based on our senses; 2) focused on how different emotional states influence our desire to eat; 3) external eating; 4) nutritional interventions. Responses were given on a six-point scale (1-6), with higher values indicating greater levels of eating behavior trait. Item scores were summated into scale scores in four sections: eating pattern changes (ten items, 1-10), emotional eating (thirteen items, 11-23), social overeating (twelve items, 24-35), nutritional interventions (ten items, 36-45). Students with a dietary-related health condition (e.g. diabetes; food allergy) or on a prescribed diet (e.g. gluten-free) were excluded.

Statistical analysis using JAMOVI provided Cronbach's α coefficient analysis and descriptive analysis.

Results and discussion

The study group included 95 females and 114 males. Females constituted 45.5% and males made up 54.5% of total participants.

The main socio-demographic characteristic of participants is presented in Tab. 1. Ethnic groups involved in the study were: Asian – 39.2% (82 persons), African – 16.1% (34 persons), European – 41.4% (86 persons), Hispanic – 1.4% (3 persons), Mixed – 1.9% (4 persons).

Table 1.

Characteristics of participants

	Women (n=95)	Men (n=114)	Total (n=209)
Age**	21.19 17-28	21.60 17-28	21.18 17-28
BMI**	16.22	18.22	17.20
Educational level Medical school incomplete*	100	100	100

* Percentage

** Mean

Table 2.

The total and Cronbach's correlations between different parts of subscales in self-reports

	α	I-T corr (range)	I-T corr (mean)
Dietary restraint	0.851	0.825-0.868	0.837
Emotional eating	0.944	0.937-0.944	0.939
External eating	0.834	0.807-0.829	0.818
Nutritional interventions	0.886	0.868-0.889	0.876

Table 2 represents the total and Cronbach's correlations between Dietary restraint (RE), Emotional eating (EME), External eating (EE), and Nutritional interventions (NE). The internal consistency of the subscales was good, *Cronbach's α for each part of subscales: Eating pattern changes – 0.851, Emotional eating – 0.944, External eating – 0.834; Nutritional interventions – 0.886.*

According to results obtained in the 1st section, eating pattern changes if the food smells, looks and tastes good, and 54.1% (95%CI 47.3 – 60.8) of total participants tend to eat

more than they planned; 68.9% (95%CI 62,6 – 75,1) will have the desire to eat even if they are not hungry, and 53.1% (95%CI 46,3 – 59.8) will eat immediately after they purchase these foods (Fig. 1). Regarding ethnicity, we defined that these tendencies prevail in the Asian group of participants (Fig. 2).

Data obtained in the 2nd section has shown that negative emotions and states had an impact on participants and they tended to over-eat when feeling depressed – 42.1% (95%CI 35.4 – 48.8), lonely – 51.4% (95%CI 44.6

Figure 1. Prevalence of eating pattern changes based on dietary restraint subscales

Figure 2. Prevalent tendencies in eating behavior evaluated using DEBQ [19, 20] positive answers among African, Asian and European groups of participants

- 58.1), anxious, sad, overwhelmed – 30.7% (95%CI 24.4 - 36.9), when plans did not work out – 34.5% (95%CI 28.0 - 40.9), when they felt in trouble – 28.7% (95%CI 22.5 - 34.8), bored – 39.7% (95%CI 33.0 - 46.3). In addition, it was revealed that tendencies to emotional eating prevail in the European group of participants (Fig. 2).

In the 3d section, which concerns weight loss, 69.3% (95%CI 63.0 - 75.5) of TPs eat less than usual, but still consume main meals – breakfast, lunch, dinner – yet in smaller amounts and choosing not to eat snacks between these meals. Moreover, 56% (95%CI 49.2 - 62.7) of participants choose their food intentionally, they are mindful of consumed calories if they want to lose weight. Concerning chronicity of eating, 52.6% (95%CI 45.8 - 59.3) choose to eat less during the day if they consumed too many calories the day before. Ethnicity data shows that behaviors related to weight loss in section 3 prevail in the European group of participants (Fig. 2).

The 4th section shows a tendency for external eating behavior. 64.6% (95%CI 58.1 - 71.0) tend to overeat during meetings with friends, also finding it difficult to refuse food when it is offered to them. What is more, 67.5% (95%CI 61.1 - 73.8) chooses to give food as a gift when they go on a visit. 46.4% (95%CI 39.6 - 53.1) of participants show a tendency to overeat on holidays, vacations, hiking trips. It also shows that 53.1% (95%CI 46.3 - 59.8) of participants get their mind set on overeating before going out or visiting friends. Moreover, 61.7% (95%CI 55.1 - 68.2) of TPs find it difficult to refuse food and alcohol to some extent. In terms of ethnicity, we defined that these tendencies prevail in the European group of participants (Fig. 2).

We obtained results that have shown that eating behavior was emotional in about 70% of medical students who live in a new environment. It could be influential for creating a phenomenon of an obesogenic environment, which may be considered as an epigenetic factor that triggers silent individual genetic predispositions to obesity [13]. Obesity is a multifactorial non-infectious disease of the 21st century [12]. Among key factors in its etiology are stress, nu-

trition, sedentary lifestyle, microsocial factors, genetic predisposition, and side effects of drugs [19]. According to the recent data proposed by World Population Review, the rate of obesity in the USA was 36.20%, in Poland – 23.10%, Ukraine – 24.10% in 2019 [21]. In our study, we have found that Europeans have eating behavior which is more predisposing to obesity than Asian or African groups of participants.

Recognition of factors leading to the development of obesity is crucial to the application of pathogenicity-based treatment.

Taking into account gender differences, women are more predisposed to the development of obesity than men [12], and our data has shown the same relationship.

A recent study has shown that there are more overweight people in less educated economic groups, but our results detected that medical students, future resources of healthcare, tend to overeat which could contribute developing factors for metabolic diseases, as well as obesity [2, 4, 6].

To sum up our study, medical students who start living in a new place tend to eat while they are not hungry; the rate of overeating when food is appealing is high, which may be the outcome of underlying problems with negative emotions caused by stress related to highly demanding learning and staying far from home. Also, overeating at social events may be the compensatory mechanism of emotional disturbances related to fear of not being accepted by peers, friends, or maybe to masking their insecurities. Moreover, the topic of nutritional interventions among medical students is popular, but there is less knowledge about how to introduce them in the promotion of healthier diets and lifestyles, as well as for adhering to healthy food habits.

Study limitations: The overall aim of our study was to define medical student's opinions on the impact of eating behavior on their lifestyles, and differences related to ethnicity. This article presents only preliminary data on eating behaviors among medical students of the LNMU, and future directions for this study will include long-term assessment of students'

eating behaviors and will provide education to understand healthy nutrition based on a multidisciplinary approach with comprehensive questions.

Bioethics: This study was done as voluntary E-survey, regarding to the approval of University's International Department. Local ethics approval was not required.

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