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CONSEQUENCES OF UNIVERSITY STUDENT'S INADEQUATE NUTRITION ON PHYSICAL AND PSYCHOLOGICAL WELL-BEING DURING ADULTHOOD: A PUBLIC HEALTH CONCERN

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ABSTRACT. A balanced diet is important for development and maintenance of physical and mental health throughout the life, especially during this period of study. Eating behavior undergoes changes in this transition from adolescence to young adulthood, changes that can have a significant impact on the development of diseases or eating disorders later in life. This paper aims to analyze the main social and psychological factors that influence students' eating habits (such as: food taste, time, stress, physical activity, budget, accessibility to healthy foods, nutritional attitudes, social influences, female gender, coffee, alcohol and tobacco consumption, acculturative stress and religion), what nutritional risks these development stages entail, as well as the contribution of public health in the prevention and treatment of eating disorders. In conclusion, the transition to another environment is likely to change the eating behaviors that will be maintained in adulthood. Thus, we need prevent programs to fight against unhealthy eating habits among students, in order to head off an increasing prevalence of overweight and obesity later in life.

Keywords*: student, eating behavior, adulthood, nutrition, transition, public health, eating disorders.*

REZUMAT. ***Impactul nutriției deficitare în studenție asupra sănătății adultului – o problemă de sănătate publică.*** O alimentație echilibrată este importantă pentru dezvoltarea și menținerea unei sănătăți fizice și psihice pe tot parcursul vieții, cât mai ales în perioada studenției. Comportamentul alimentar suferă modificări în tranziția aceasta de la perioada de adolescență la vârsta adultă tânără, modificări ce pot avea un impact semnificativ asupra dezvoltării unor boli sau tulburări alimentare mai târziu în viață. Lucrarea de față își propune să analizeze principalii factori sociali și psihologici ce influențează obiceiurile alimentare în rândul studenților (precum: gustul alimentelor, timpul, stresul,

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activitatea fizică, bugetul, accesibilitatea alimentelor sănătoase, atitudini nutriționale, influențele sociale, genul feminin, consumul de cafea, alcool, tutun, stresul aculturativ și religia), ce riscuri nutriționale presupun aceste etape de dezvoltare, precum și contribuția sănătății publice în prevenirea și tratamentul tulburărilor alimentare. În concluzie, tranziția într-un alt mediu de viață este de natură să modifice comportamentele alimentare ce se vor menține și la vârsta adultă. Astfel, sunt necesare programe de prevenție a luptei contra obiceiurilor alimentare nesănătoase în rândul studenților, cu scopul de a preîntâmpina o prevalență tot mai mare a excesului de greutate și a obezității mai târziu în viață.

Cuvinte cheie: *student, comportament alimentar, vârsta adultă, nutriție, tranziție, sănătate publică, tulburări alimentare.*

Introduction

Students are often perceived as having a privileged position in society and are immune to health and disability issues. Contrary to these beliefs, more and more evidence shows that a fairly large proportion of young people are experiencing poor physical health and that the prevalence of psychological disorders is higher in students than in the general population (Hussain et al., 2013). Moreover, globally, there is an increased prevalence of overweight and obesity, both in developed and developing countries. As they became more rapidly urbanized, the obesity rate has tripled in developing countries over the past 20 years, by increasing the consumption of high calorie foods and adopting a sedentary lifestyle (Peltzer et al., 2014).

University is a critical period in terms of weight gain. During transition from high school to university, students need to adapt to a new environment. When they fail to adapt properly, this can have negative consequences for their health and subsequent weight status. Eating behavior (in addition to physical activity and sedentary lifestyle) is an important factor that influences students' weight (Butler et al., 2004) some studies mentioning that students in the first year of college have a significant increase in weight (Peltzer et al., 2014).

A healthy diet consists of a balance established between the consumption of food and the energy expenditure of the individual, in which the respective foods can provide all the nutrients necessary for a good functioning of the body. The result of a nutritional balance is the optimal state of health, as well as maintaining a normal weight and constant body composition. The dietary balance can only be achieved when the diet provides everything the body needs in terms of carbohydrates, lipids, proteins, minerals, vitamins and water. As a result, food choices need to consider both the use of a particular food and the form of preparation in which it is consumed because there are various forms of

preservation and/or food combinations, but not all of these forms are as healthy for food consumption. In general, it is preferable to use those forms of foods that are rich in nutrients and have fewer calories (Mihai et al., 2018).

Eating behavior, as part of a healthy diet, involves dynamic processes that are based on the complex interaction between different homeostatic mechanisms, neuronal and sensory reward systems and socio-emotional capacity. Human eating behavior develops rapidly from childhood to school age. The way in which a child is raised, the social influences and the food environment influence the development of eating behaviors. Normal development of the individual should lead to adequate weight gain during childhood and healthy eating behavior followed throughout life (Worsley, 2002).

The development of eating behavior: from adolescence to young adulthood

It has been shown that eating habits from childhood are maintained even in adulthood and can have an extraordinary impact on subsequent health (Sleddens et al., 2015). The particularities and responsibilities of students during academic life were identified to be responsible for the physical and mental quality of their life. The transition to university education is significant because during this period young adults experience greater freedom to make choices regarding eating behavior and lifestyle, being a period that predisposes young adults to become less physically active, even sedentary (Tanton et al., 2015).

Among medical students, an increased prevalence of dyslipidemia, obesity and cardiovascular disease was identified due to unhealthy dietary habits, sedentary lifestyle and poor quality of food consumed by them (Yahia et al., 2008). Leaving the family environment (which is identified by the decrease in the number of healthy meals), economic restrictions and the freedom to choose foods (most often, fast food) are just a few of factors responsible for increasing the rate of practicing unhealthy eating habits (Papadaki et al., 2007; Pan et al., 1999). From this point of view it is essential to identify all the factors involved in influencing eating behaviors of students in order to be able to develop effective behavioral interventions that improve the quality of nutrition among young adults.

Taste

From an early age, taste and familiarity of products influences behavior towards food (Steiner, 1977). Parental verbal and non-verbal behaviors such as the pattern of appreciation and the joy of having healthy foods (avoiding sweets as rewards) and limiting childhood exposure to fast-food products are all

strategies that increase the likelihood that individuals will develop positive attitudes toward healthy eating (Catanzaro et al., 2013). Food preferences and aversions develop through experiences and are influenced by our attitudes, beliefs and expectations (Clarke, 1998). Early exposure to aromas in utero and during breastfeeding influence young children to respond positively to foods to which they have been exposed. After the baby is born, breastfeeding will expose him to the flavors of the mother's diet. As the child grows up and is fed with solid foods, he or she will experience foods that reflect the culture of the family and community he or she is a part of. If this "programming flavor" includes bitter vegetables, this increases the likelihood that the child will accept those with a bitter taste as healthy vegetables. If the "programming aroma" focuses on fast food, sweet foods, then these are the tastes that the child will look for during its development (Beauchamp & Mennella, 2011, Mennella et al., 2011).

Another study conducted in 2010 at 6 universities in Massachusetts and Louisiana revealed that taste is the most important reason even when choosing a drink. Many students are really obsessed with their favorite brands of sugar-sweetened beverages. Because of their strong pleasure in consuming these drinks, students felt that changing them with another option would be difficult. Some recognized that their attachment to certain sugary sweetened beverages is almost addiction and taste often overcomes a rational calculation of the potential harm that consumption of these drinks can get (Block et al., 2013).

It is recognized today that food influences our condition and our mood has a strong influence on choosing a food. In this regard, studies have found that underweight individuals have a lower dietary intake than normal-weight individuals during negative emotional states and situations (which may contribute to a reduced body weight in these individuals). On the other hand, overweight individuals had a much higher dietary intake during these negative emotions (Geliebter & Aversa, 2003).

Stress

For many students, transition from high school to university is accompanied by emotional and/or psychological stress (Papier et al., 2015). Sources of stress may include demands on academic tasks, living away from home, moving to a new development stage, peer pressure, possible student conflicts and high expectations about university life, frustrations, difficulties in adapting to a new social environment, financial difficulties (Hamaideh, 2011). There is substantial evidence that stress can affect an individual's health, not only through direct physiological processes, but also by changing behaviors that affect health, such as diet and more specifically, the amount of food consumed. Some studies have shown that individuals tended to increase their consumption of high-calorie, high-fat

snacks when they were feeling stressed, while other studies reported that individuals ate less of all foods when they were stressed.

Moreover, it has been found that the intake of fast foods, snacks, sweet foods (such as chocolate, cakes, ice cream) increases among students experiencing stress, while the intake of healthy foods, such as vegetables, tended to decrease. Also, a study carried out in Australia found that a significantly higher percentage of female students suffered from stress compared with male students, results which were similarly to that among students from Hong Kong and Turkey (Papier et al., 2015).

Schedule and spear time

Time seems to be a very valuable issue when it comes to student food practices. They indicated that they would spend more time doing other activities than cooking, especially when they have to cook only for themselves (Deliens et al., 2014). Studies have shown that eating "on the run" was associated with a less healthy eating pattern among young adults. This means that eating "on the run" was correlated with higher consumption of soft drinks, fast food, total fat and saturated fat, in both sexes. (Larson et al., 2009). Also, a busy schedule (both academic and social) of students affects their eating habits, which means that, for example, during exams students want to spend as much time as possible studding, which makes it difficult to keep a healthy food program. Consequences are linked by inadequate intake of healthy foods or by choosing unhealthy foods (AlJaber et al., 2019).

Physical activity

The benefits of an active lifestyle are well documented and can lead to the improvement of physical and psychological health. For example, engaging in regular physical activity can reduce the risk of early death, heart disease, stroke, type 2 diabetes, high blood pressure, dyslipidemia, colon and breast cancer, weight loss prevention, and metabolic syndrome. In addition, physical activity offers positive effects on mood and mental health, such as reducing depression and anxiety, physical well-being, and improving cognitive functions (Pauline, 2013). Unfortunately, the highest rate of physical activity decline occurs in early adulthood, between the ages of 18 and 24 (US Department of Health and Human Services 2000). This thing happens even though lack of physical activity and the existence of unhealthy eating patterns are the leading causes of death in the US, accounting at least 300,000 deaths per year (McGinnis & Foege, 1993). The results of the National College Health Risk Behavior Survey reported: of all students participating in the study, 37.6% practice intense physical activity ≥ 3

days / week, a smaller percentage of students practice muscle building exercises ≥ 3 days / week (29.9%) or 30 minutes of moderate physical activity, such as walking or cycling ≥ 5 days / week (19.5%).

Female students are more likely to exercise to lose weight or maintain their current weight but participate less in rigorous physical activity or muscle building than male students. Despite the recommendations that suggest the combination of physical activity and healthy eating choices to achieve weight loss, among students who tried to lose weight only 53.8% of women and 40.9% of men reported using both strategies for weight control (Lowry et al., 2000).

Social and economic influences

The socio-economic status and environmental factors contribute to the adoption of unhealthy eating habits among students. The numerous malls, shops, food trucks and fast food markets have created an alarming situation for students. They tend to make food choices based on lower cost and availability of fast food products. At the same time, students lack knowledge about healthy eating choices, and this can negatively affect their eating habits as well as their nutritional status (Ganasegeran et al., 2012). The accessibility of energy-dense and low-cost foods is widespread in many European countries. Economic data shows a significant increase in sales of snacks, pastry and soft drinks in the south-east European area.

Similarly, in the last decades there has been a dramatic increase in the number of fast-food restaurants throughout the European region. Traditional foods are easily replaced by a "modern" diet, with a higher proportion of calories coming from oils, fats, sugars and starches. In two decades (from 1989 to 2009), the number of McDonald's restaurants has increased by 1000 times, each meal taken in this enclosure offering 300-500 kcal of foods rich in saturated fat and trans fats, sugar and salt, being more poor in fruits, vegetables and fiber, compared to the recommendations of dietary guidelines (Savige et al., 2007). Moreover, the consumption of fast food is one of the factors that have been reported to be responsible for obesity. Factors that influence fast-food consumption are the convenience, costs, diversity, aroma and taste. Fast food consumption, large portion sizes and sugary sweetened beverages are positively associated with overweight and obesity. It was found that an increase of only one fast food meal in one week was associated with an increase in daily energy intake of 234.4 KJ. Also, the high body mass index (BMI) was found to be significantly associated with the intake of fast food during evening or night (Shah et al., 2014).

Several types of eating behaviors are related to the ingestion of unhealthy foods, including increasing the number of meals served in city and serving snacks. In European countries, snacks are very widespread, studies show that the most common contexts for serving snacks, among young people, are: after courses

(4.6 times a week), while watching TV (3, 5 times a week) and while staying with friends (2.4 times a week) (Savige et al., 2007). Also, the frequency of meals reported as being taken in the family, in their childhood, predicts the frequency of student meals taken with someone at present. The most important effects are observed at breakfast and dinner: these meals that students remember as being taken together with the family as a child, anticipate that at present students will have breakfast and dinner with someone (De Backer, 2013). However, the overall prevalence of medical students from a university in Mongolia who do not serve breakfast was 41.7% for men and 23.5% for women. Failure to serve breakfast was associated with adverse effects on cognitive function (including memory), psychosocial function, academic performance, attendance at courses, and on mood in children and youth (Sun et al., 2013).

Social support can have a beneficial effect on food choices (Devine et al., 2003). Social support from family and friends has been positively associated with improving fruit and vegetable consumption (Sorensen et al., 1998) and enhancing health promotion by adopting a sense of belonging to the group (Berkman, 1995), participation in positive health practices, which includes: adequate nutrition, exercise, relaxation and health promotion (Hubbard et al., 1984). In contrast, students with lower levels of social support smoked significantly more and consumed more alcohol than those with higher levels of social support (Steptoe et al., 1996).

Consumption of coffee, tobacco, alcohol

Coffee, tea and cocoa are important dietary sources of polyphenols and have potential beneficial effects on cardiovascular health (Larsson, 2014). Some results show that many students consume coffee regularly and thus obtain large amounts of energy from these drinks and from the snacks associated (Lim & Kim, 2012). Also, another study showed that people with a higher genetic predisposition to obesity appear to have a lower BMI associated with higher coffee consumption (Wang et al., 2017).

Regarding smoking, a study shows that stress during college may be a contributing factor to smoking initiation. Previous studies have found a relationship between smoking initiation and increased anxiety, which suggests that medical education may have an indirect negative effect on smoking (Senol et al., 2006). About a quarter of all US students smoke (Martinelli, 1999), and 75% of them continue to smoke in adulthood (Flay, 1993), placing future adults at greater risk of developing lung cancer and cardiovascular disease. Similar trends were also observed among students in Europe (Steptoe & Wardle, 2001).

Excessive alcohol consumption among students is a widespread problem in several university campuses, being associated with other unhealthy behaviors, among which are: smoking, risky sexual behaviors - contact with multiple sexual partners, non-use of the car seat belt (Jones et al., 2001). A more recent study found that living standards significantly influence the practice of alcohol consumption among university students (Al-Naggar et al., 2013). A similar study has shown that students living in student dormitories and form student associations, tend to drink more and report more negative alcohol-related consequences than those living with their parents (Martin & Hoffman, 1993; Montgomery & Hammerlie, 1993; Valliant & Scanlan, 1996). Statistics show that in Europe, among people over the age of 15, 11.3 L pure alcohol / person / per capita is consumed, with episodic alcoholic excess being more frequent among young people. In the world, in the same age category, the total alcohol consumption is 6.4 L pure alcohol / person (WHO, 2018).

Acculturative stress

Acculturation is the process through which an individual adopts beliefs, attitudes and behaviors of the dominant culture. Specifically, people often evaluate and change their physical appearance in the acculturation process to conform to the cultural standards of beauty (Van Diest et al., 2014).

The available research shows that there are many factors that contribute to acculturative stress in international students, such as the region from origin, English fluency and social support (Jackson et al., 2019). Acculturative stress is associated with a range of symptoms affecting mental health, such as general psychological stress, depression and suicide, drug use, and eating disorders. In addition, acculturative stress is associated with poorer physical health status and an increased risk of mortality (Van Diest et al., 2014).

In USA, in a sample of various international students, it was found that students from Europe, with a higher fluency of English and higher social support, had significantly less acculturative stress than those in non-European nations, with a lower fluency of English and less social support (Yeh & Inose, 2003). Also, another study shows that most international students are not satisfied with the food on the university campuses, looking for ways to adapt by ordering food from restaurants, visiting supermarkets and relocating to campus. At the same time, most international students felt uncomfortable with the drinking culture in the United States, although some of them felt drinking was a good way to socialize with Americans and explore American culture (Yan & FitzPatrick, 2016).

International students must learn how to adapt to the host's new cultural norms country - which is Singapore in this study. In this regard, it has been hypothesized that the country of origin should have an effect on acculturative

stress; for example: international students from Malaysia (neighboring country with cultural norms and language similar to Singapore) showed lower levels of acculturative stress compared to those in China and Myanmar (probably due to the larger linguistic and cultural differences). Furthermore, Malaysian students may be less discriminated and may be easy socially accepted due to lower difficulties in English language proficiency (Nasirudeen et al., 2019).

In view of the above, it is essential that universities to recognize the potential struggles of these students, reluctance to engage in services, the use of more coping strategies and address these issues openly on campus. For example, implementation of mentoring relationships and student organizations could help create social contacts for international students from the US or any other country. Furthermore, students could be encouraged to stay in touch with those at home while developing social relations. Last but not least, universities can reduce acculturative stress by preparing students for arrival in the U.S. through various forms of information (for example, housing assistance, connection with US students, online forums and so on) (Jackson et al., 2019).

Gender

Dietary habits and physical activity are strongly influenced by attitudes and behaviors that differ by gender and promote different healthy or unhealthy lifestyles among women and men. Moreover, unequal relationships between sexes interact strongly with social, economic and cultural differences. It is worrying that unhealthy behaviors (such as not consuming five or more portions of fruits and vegetables daily, skipping meals, often eating fast food, and not practicing moderate-intense physical activity at least five times a week) have been shown to be common among young adults. (Varì et al., 2016).

Among students, women demonstrate greater awareness and stronger beliefs about the importance of positive health habits (Wardle & Steptoe, 1999), have higher consumption of fruits and vegetables and tend to have a greater interest in healthy diets and a desire to eat foods that are lower in energy than men (Varì et al., 2016), but nonetheless, women have higher morbidity and visit health centers more than men (Popay et al., 1993).

Many researches on the relationship between acculturation and symptoms of eating disorders indicate that women belonging to ethnic minorities who have assimilated their culture into Western society have an increased risk of experiencing body shape dissatisfaction and symptoms of eating disorders. For example, women belonging to ethnic minorities moving from a non-westernized country to the United States have a higher risk of developing eating disorders than women remaining in their countries of origin (Dolan, 1991; Furukawa, 1994; Silber, 1986).

Overall, results indicate that women have a higher level of nutrition related to self-determined motivation, a better quality of diet than men and a higher level of self-regulated motivation is associated with a better quality of dietary intake. Also, factors such as nutritional knowledge and attitudes may explain some gender differences in food consumption and eating behaviors (Leblanc et al., 2015).

Religion

Religion could increase the risk of developing an eating disorder due to association: fasting rituals that emphasize weight loss with behavioral disorders and the conflict between conservative expectations of the religious family vs. Western irreligiosity. Young people from religious families who give a great importance to religious ideals, worrying about body image, food and sexuality, may be at greater risk of developing an eating disorder. High rates of eating disorders have been reported among Muslim women living in Western countries (undergoing cultural transition) or who are the first generation to be exposed to the Western media. The Muslim ritual of fasting Ramadan is also proposed as a risk factor for developing eating disorders. Thus, it was concluded that religion can only be a risk factor in a subset of the population with other risk factors, such as promoting unhealthy religious beliefs (Abraham & Birmingham, 2008).

On the other hand, religion can have a positive influence on international students, being a source of spiritual support that can help students overcome adjustment problems and better tolerate their situation. However, adaptation to the host country can be very slow and not easy, because the characteristics of the host country, such as religion, language, and many others, different from the country of origin of the students (Mehdizadeh & Scott, 2005).

Role of public health (late adolescence / period of young adult - periods of high risk)

At these stages, young women, but not only, are going through a transitional period with unique challenges, which can contribute to the development of eating disorders. Unintentionally, the university environment can contribute to the development of these eating disorders by introducing certain academic, financial or interpersonal stressors. Also, the student is faced with the desire or need to choose other types of food than he was used to, higher in carbohydrates and fats. Also, in order to be accepted into the group of friends, students may feel pressured to participate in various activities within the group that do not always encourage healthy eating (Irving et al., 2003).

Regarding mental health, the available evidence suggests that a significant proportion of young adults had mental health problems. Recent data have shown that mental disorders are among the four or five of ten causes which lead, globally, to disability-adjusted life years (DALYs) for young people aged 20-24, and 15, respectively, 19 years. The mental health of young adults is a point of interest, not only because of the total effect of the disease on the individual or on the whole population, but also because these diseases can start early in adolescence and can be maintained throughout life. Student-focused research has found that depression is at least as common among students, as compared to their age group, as in the general population (Hussain et al., 2013).

Rapid changes in the epidemiology of obesity over the past 20 years may also change the continuity patterns of obesity in individuals transitioning from adolescence to young adulthood. A study identifies that of the 480 participants with a BMI> 25 kg /m2 at 24 years, 33% were never overweight in adolescence, this proportion being higher in men than in women. The persistence of the overweight status in adolescents predicted the BMI to be greater than 25 kg/ m^2. In total, 70% of those who were overweight in adolescence were still overweight at 24 years of age, while women showed lower continuity. For obese adolescents, the rate of BMI greater than 25 kg /m^2 at 24 years was very high (Watts et al., 2016).

The results of these studies should be considered a first step in developing tailored and effective intervention programs that aim to improve student eating behaviors (Deliens et al., 2014). Thus, public health plays a very important role because it contributes to the development of nutrition education and physical activity programs among young populations, programs aimed to improve nutritional habits, maintaining weight and increasing physical activity in student groups (Alakaam et al., 2015 ; Gazibara et al., 2013).

It is recommended that university administrators and researchers provide information and tips to improve the way in which food is prepared by students as well as healthy food choices (through social media, for example), to increase self-discipline control, development of time management skills, strengthening of social support and providing healthy food at affordable prices by supplying vending machines with healthier products (Deliens et al., 2014). Also, most studies suggest the need for coordinated strategies and efforts at all levels to reduce the tendency of overweight, obesity and body fat, as well as to promote youth health (Alakaam et al., 2015; Gazibara et al., 2013).

Conclusions

It has been shown that students can be influenced by a wide range of factors that can change their eating behavior, such as: individual factors, economic factors, biological factors, social factors as well as the physical environment.

Moreover, the relationships between the determinants and the food behavior of the students seem to be modulated by the university characteristics, such as residence, student societies, university lifestyle and exams. After moving from high school to university, when independence grows, students are continually challenged to make healthy eating choices. In addition, students must take these healthy food choices in a specific university setting (for example, they live in a student dormitory, have many exams) and must depend on food availability and accessibility, food preferences and prices. Moreover, during these food choice processes, students may or may not be supervised by their parents or influenced by their friends and colleagues (Deliens et al., 2014).

Thus, the transition from high school to university is a critical moment for individuals who are beginning to take definitive steps towards independence, being the first major transition, a person faces. Despite efforts to promote health, young adults continue to engage in high-risk behaviors for their health. Modifying these health risk behaviors can improve nutritional status and reduce risk of chronic diseases later in life. Evidence suggests that diseases such as atherosclerosis, obesity and diabetes, related to lack of physical activity, are most found in the second and third decades of life. However, young adults do not correlate such risky health behaviors with development and progression of these diseases. However, there is an increasing need for health promotion efforts to endorse students as a target population and to make them aware that their health is an "important public health problem, but neglected" (Kwan et al., 2013).

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