

Prevalence and co-occurrence of several unhealthy alimentary habits among Romanian young people **Prevalența și prezența simultană a diferite obiceiuri alimentare nesănătoase în rândul tinerilor din România**

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Abstract

Background. Healthy nutrition is an important component of health promotion and disease prevention. The food habits of young people are important not only in ensuring an adequate diet to support growth and development, but also in developing lifelong patterns for maintaining health.

Aims. This study assesses the prevalence and co-occurrence of several unhealthy alimentary habits among Romanian young people, giving special attention to age and gender differences.

Methods. A cross-sectional study was performed among junior high schools, senior high schools and universities from 2 counties of Romania. Anonymous questionnaires which investigated skipping breakfast as well as less than daily consumption of fruits, vegetables and dairy products were used.

Results. The sample consisted of 1598 students aged between 11-25 years. The results show that many Romanian young people engage themselves in unhealthy alimentary behaviors and that a co-occurrence of several unhealthy behaviors is also observed. A percentage of around 70% of junior high school students, 80% of senior high school students and 90% of university subjects declared more than one unhealthy alimentary behavior.

Conclusions. The results underline that comprehensive programs, which address healthy nutrition, are required for Romanian young people.

Key words: nutrition, young people, health promotion.

Rezumat

Premize. Alimentația sănătoasă este o componentă importantă a promovării sănătății și prevenirii bolilor. Obiceiurile alimentare ale tinerilor sunt importante nu doar pentru a asigura creșterea și dezvoltarea, dar contribuie și la stabilirea unor obiceiuri care vor continua ulterior în viață, influențând starea de sănătate.

Obiective. Acest studiu evaluează prevalența și prezența simultană a diferite obiceiuri alimentare cu risc pentru sănătate în rândul tinerilor din România, acordând o atenție specială diferențelor care pot să existe între diferite categorii de vârstă, respectiv între fete și băieți.

Metode. A fost realizat un studiu transversal în rândul elevilor de școală generală, liceu și universitate din 2 județe din Transilvania. Au fost folosite chestionare anonime care au investigat consumul micului dejun, precum și consumul de legume, fructe și produse lactate, mai rar decât zilnic.

Rezultate. Eșantionul studiului a fost alcătuit din 1598 subiecți cu vârsta cuprinsă între 11-25 ani. Rezultatele arată faptul că mulți tineri români adoptă obiceiuri alimentare cu risc pentru sănătate, fiind observată existența concomitentă a mai multor obiceiuri nesănătoase. Un procent de aproximativ 70% dintre elevii de școală generală, 80% dintre elevii de liceu și 90% dintre studenți au declarat mai mult de un obicei alimentar nesănătos.

Concluzii. Rezultatele studiului subliniază faptul că este nevoie de programe ample care să promoveze o alimentație sănătoasă în rândul tinerilor din România.

Cuvinte cheie: nutriție, tineri, promovarea sănătății.

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Introduction

Healthy nutrition is an important component of health promotion and disease prevention. In childhood and adolescence, the health impact of nutrition is vital (***, 2002; ***, 2010). The food habits of adolescents are important not only in ensuring an adequate diet to support growth and development, but also in developing lifelong patterns for maintaining health. Eating habits are frequently established in childhood and adolescence and in addition to short-term consequences, they also have many long-term consequences, due to the fact that bad habits established during this period will generally continue during adulthood (Currie, 2008; Lotrean et al., 2005; Upton et al., 2012; Hamrani et al., 2014; Baharudin et al., 2012). Moreover, a co-occurrence of several unhealthy alimentary habits could be present, which increases the health and developmental risk (Acar et al., 2011).

The prevalence of unhealthy alimentary habits differs per country, as will the determinants of such behaviors (Mette et al., 2006; Fahlman et al., 2010; Currie, 2008). In order to develop efficient programs for encouraging healthy eating, it is very important to first identify the alimentary habits that should be corrected or improved (Granner & Evans, 2012). Nevertheless, in Romania there is little information with regard to the eating habits of Romanian young people. The only study based on a national representative study, namely Health Behaviour in School Aged Children, assessed several eating patterns of Romanian children aged 11, 13 and 15 years, besides several other health-risk behaviors. It showed that eating breakfast every school day varied from 41% for 15 year-old children to 51% among 11 year-old subjects. Use of fruits every day was around 46% among 11 year-old children and dropped significantly to 35% among 15 year-old children (Currie, 2008).

Hypothesis

This article will study the alimentary habits of Romanian youths, covering a broad age range, starting with junior high school students and continuing with senior high school students and university students. It has three main objectives. The first one is to assess the prevalence of several unhealthy alimentary behaviors among Romanian young people; the selected behaviors are some of the most relevant and common health-risk alimentary behaviors among youngsters: skipping breakfast, use of fruits and vegetables as well as use of dairy products less than daily. The second objective is to investigate the co-occurrence of these health-risk behaviors. Finally, the study will focus on identifying age and gender differences with regard to the prevalence of unhealthy alimentary habits and their interrelationship.

Material and methods

Research protocol

a) Period and place of the research

A cross-sectional study was conducted in school settings from two counties situated in the North-West of Romania, namely Cluj and Hunedoara counties. The study was performed in the period November 2003 - February 2004.

The study was approved by the Review Committee and the directorates of the participating schools; in Romania, school principals are entitled to decide whether or not their students may participate in health related surveys and educational programs. All participants read an introductory letter, which assured them that the study procedures were designed to protect student anonymity and allow for voluntary participation.

The study was conducted in each county capital (meaning Deva for Hunedoara county, Cluj-Napoca for Cluj county) and in a village from each county (Criscior in Hunedoara county, Cuzdrioara in Cluj county, respectively). In Romania, the school system comprises four types of education levels: elementary schools (7-11 year-old students), junior high schools or secondary schools (11-15 year-old students), senior high schools (15-19 year-old students) and universities (students aged 19 years or older).

In the urban areas, two junior high schools were randomly chosen, one located downtown and one in an adjacent neighborhood, so that subjects would have a different cultural and socio-economic level, and two senior high schools - one with a higher training level of the students (high grades at the high school entrance examination and remarkable results in school competitions) and one with a lower training level of the students were selected. In each of the two villages, there was only one junior high school and one senior high school, which were included in study. From each junior and senior high school, 1-2 classes were randomly chosen for each study year, and all pupils that were present in these selected classes on the day of the survey were included in the study. The consent for the participation of the students in the study was obtained from school administration - the standard procedure in Romania at that time. The principals of the selected schools were contacted personally by one of the members of the research team and were approached regarding the participation in a survey investigating health-related behaviors of young people. All principals agreed to participate.

In Cluj-Napoca, the study was also carried out among university students randomly chosen from 8 dorms belonging to the 4 main universities of the city; 40 girls, respectively 40 boys living in the selected dorms were randomly chosen from each university. In Deva, the study included 40 girls and 40 boys from the main town university, who were randomly chosen and asked to participate in the study during their university activity, because there were no dorms belonging to the university (Lotrean et al., 2010).

Subjects and groups

The study sample consisted of 1598 subjects: 630 junior high school students aged 11-15 years (324 boys and 306 girls, 498 from the urban area and 132 from the rural area), 568 senior high school students aged 15-19 years (281 boys and 287 girls, 325 from the urban area and 243 from the rural area), and 400 university students, aged 19 to 25 years (200 boys and 200 girls).

b) Tests applied

The study used anonymous questionnaires, which were filled in by the students. All study subjects were asked to fill in an anonymous questionnaire, which took approximately 50 minutes.

Among junior and senior high school students, the questionnaire was administered and collected in the classroom by members of the research team. Teachers were present in the classroom during data collection, but they stayed in the front of the class and did not take part in the questionnaire collection. No refusals were recorded; non-responses were exclusively due to absence during the day of assessment.

University students in Cluj-Napoca completed the questionnaire in the dorm and university students in Deva completed in at home; the researchers collected them afterwards. The refusal rate was low (2.7%) and the students who refused to participate were replaced with students chosen from the same university (Lotrean et al., 2010).

The questionnaire was developed for this research study based on literature data and included items related to demographics, as well as a broad range of healthy and unhealthy behaviors, the presence or absence of which might have immediate or long-term effects on the health status of adolescents and young adults (Lotrean et al., 2010).

For this analysis, we used 4 marker questions for eating behaviors. The first question investigated the frequency of eating breakfast and the variable created was skipping breakfast (never versus at least once a week) (Hoertel et al., 2014). Other investigated issues were consumption of fruits and vegetables (except potatoes) and the variables created were not using fruits and vegetables, respectively, every day (0-no, 1-yes), since recommendations are to use these products every day (Christian et al., 2013; Grutzmacher & Gross, 2011; Upton et al., 2012). The last question investigated the consumption of dairy products and again, the created variable was not consuming dairy products daily (0-no, 1-yes), while recommendations are to eat them daily (***, 2002; ***, 2010).

c) Statistical processing

First, the prevalence for each of the 4 unhealthy behaviors was calculated and chi² tests were used to assess age and gender differences.

Secondly, the co-occurrence of several unhealthy alimentary habits was calculated. The percentage of students who engaged in multiple risk behaviors was calculated by adding the number of the following risk alimentary behaviors reported by each student: (1) skipping breakfast (2) not eating vegetables every day (3) not eating fruits every day (4) not eating dairy products every day. Chi² tests were used to compare the students from the three age groups, as well as the girls and boys from each age group with respect to the prevalence of the co-occurrence of the studied alimentary habits.

Data analysis was performed with the SPSS-12 statistics program. Significant results were reported at $p < 0.05$.

Results

Prevalence of unhealthy alimentary habits

The results show that almost 60% of the subjects did not eat breakfast every day; the prevalence of this unhealthy habit increased statistically significantly with age (Table I), from 45% among junior high school students to 75% among university students. With respect to gender differences, Table 1 also shows that skipping breakfast was more frequent among girls than among boys for junior and senior high school students, while for university students, it was the other way around.

About 80% of the subjects did not eat vegetables every day, while two thirds of the students did not eat fruits on a daily basis. The prevalence of both behaviors increased statistically significantly with age. The frequency of not eating vegetables every day was similar for boys and girls in all three age groups. On the other hand, among both senior high school students and university students, the percentage of girls who did not eat fruits on a daily basis was lower compared to the percentage of boys from the same age group.

The percentage of the subjects who did not eat dairy products every day was lower than in the case of inadequate consumption of fruits and vegetables; only 45% of the students did not eat dairy products daily and no age differences were identified. No gender differences

Table I

Prevalence of unhealthy alimentary behaviors.

Alimentary habits	Total %	Junior high school %	Senior high school %	University %
<i>Total</i>				
Skipping breakfast	57.9	45.1 ^{a,b}	61.8 ^c	72.3
Inappropriate consumption of vegetables	81.2	73.9 ^{a,b}	81.8 ^c	90.5
Inappropriate consumption of fruits	61.2	49.2 ^{a,b}	60.5 ^c	80.2
Inappropriate consumption of dairy products	43.8	44.1	45.1	42.3
<i>Girls</i>				
Skipping breakfast	60.7	51.5 ^{a,b,d}	65.9 ^d	67.5 ^d
Inappropriate consumption of vegetables	79.9	71.6 ^{a,b}	81 ^c	91
Inappropriate consumption of fruits	56.2	46.4 ^{a,b}	55.3 ^{c,d}	71.9 ^d
Inappropriate consumption of dairy products	44.8	45 ^b	51.6 ^{c,d}	34.5 ^d
<i>Boys</i>				
Skipping breakfast	54.9	39.2 ^{a,b}	57.3 ^c	77.2
Inappropriate consumption of vegetables	82.6	75.9 ^b	82.3 ^c	92
Inappropriate consumption of fruits	66.2	51.2 ^{a,b}	65.4 ^c	88.4
Inappropriate consumption of dairy products	42.7	42.9	37.9 ^c	48

a) statistically significant differences using the chi² test ($p < 0.05$) between junior and senior high school students; b) statistically significant differences using the chi² test ($p < 0.05$) between junior high school students and university students; c) statistically significant differences using the chi² test ($p < 0.05$) between senior high school students and university students; d) statistically significant differences using the chi² test ($p < 0.05$) between girls and boys from the same age group

were observed among junior high school students, but among senior high school students the inadequate use of dairy products was more frequent in boys, while among university students it was the other way around.

Co-occurrence of unhealthy alimentary habits

Table II shows that less than 5% of the subjects were not engaged in unhealthy alimentary habits, with statistically significant differences between junior high school students, senior high school students and university students. The prevalence of more than one unhealthy alimentary habit was around 70% among junior high school students, 80% among senior high school students and 90% among university subjects. One out of five study subjects was engaged in all four unhealthy eating behaviors, with an increasing tendency between the three age groups. Actually, among junior and senior high school students, the co-occurrence of two unhealthy alimentary habits had the highest prevalence, while for university students, the co-occurrence of three risky eating habits was predominant.

With respect to gender differences, there were no differences regarding the absence of unhealthy alimentary habits or the presence of only one risky eating habit, except the fact that among university students, more girls than boys reported only one risky behavior. The main gender difference was the fact that the co-occurrence of all four alimentary habits was more frequent among girls than among boys for the first two age groups, while for university students, an opposite situation was encountered.

Table II
Co-occurrence of unhealthy alimentary behaviors.

Number of unhealthy alimentary behaviors	Total %	Junior high school %	Senior high school %	University %
<i>Total</i>				
0	4.7	8.8 ^{a,b}	3.3 ^c	0.5
1	17.3	22.7 ^b	18.0 ^c	8.6
2	29.4	33.0 ^b	30.9 ^c	22.6
3	29.4	23.1 ^b	27.1 ^c	41.6
4	19.2	12.4 ^{a,b}	20.7 ^c	26.7
<i>Girls</i>				
0	4.6	8.8 ^{a,b}	3.2 ^c	0.5
1	18.9	24.8 ^b	18.1 ^c	11.6 ^d
2	30.2	29.2	30.7	31.1 ^d
3	25.4	19.7 ^b	23.2 ^{c,d}	36.8 ^d
4	20.8	17.5 ^{a,d}	24.8 ^d	20.0 ^d
<i>Boys</i>				
0	4.7	8.8 ^{a,b}	3.5 ^c	0.5
1	15.7	20.6 ^b	17.8 ^c	5.7
2	28.7	36.8 ^b	31.0 ^c	14.1
3	33.4	26.5 ^b	31.0 ^c	46.4
4	17.5	7.3 ^{a,b}	16.7 ^c	33.3

a) statistically significant differences using the χ^2 test ($p < 0.05$) between junior and senior high school students; b) statistically significant differences using the χ^2 test ($p < 0.05$) between junior high school students and university students; c) statistically significant differences using the χ^2 test ($p < 0.05$) between senior high school students and university students; d) statistically significant differences using the χ^2 test ($p < 0.05$) between girls and boys from the same age group.

Discussions

This study presents data on health-risk alimentary behaviors among Romanian young people. This study has three main strengths. First, the sample of the study comprises junior high school students, senior high school

students, as well as university students, thus allowing a broad overview and comparison of different adolescent groups. Secondly, the study covers several alimentary habits. Thirdly, to the best of our knowledge, this is the first Romanian study assessing the accumulation of health-risk alimentary behaviors among Romanian young people. What are the main findings?

First, all the four unhealthy alimentary habits had quite a high prevalence in the study sample. The inadequate use of vegetables and fruits had the highest prevalence, which could be related to an inadequate consumption of fibers, vitamins, minerals and antioxidants, leading to an increased risk for long-term health problems such as cancer and cardiovascular diseases (Mette et al., 2006; Caton et al., 2012; Granner et al., 2012).

Skipping breakfast was also found among many subjects. This influences the quality and quantity of a person's daily dietary intake, as well as cognition and learning, and consequently affects the adolescents' capacity to take advantage of learning opportunities provided by schools and families (Currie et al., 2008; ***, 2002; ***, 2010; Hoertel et al., 2014).

The inadequate use of dairy products was less frequent. Nevertheless, one out of two students did not use these type of products on a daily basis, which could influence daily calcium intake, with negative consequences on the development and maintenance of healthy bones and an increased risk of osteoporosis (***, 2002; ***, 2010).

Secondly, many health-risk behaviors were found to be interrelated rather than being a collection of independent activities. A percentage of around 80% of the subjects were involved in more than one unhealthy alimentary habit, with variations from 70% among junior high school students to 90% among university students. This shows that engagement in multiple unhealthy eating behaviors starts in junior high school and increases with age. This co-occurrence increases the risk of nutritional and health problems, also suggesting that people that are involved in one risk behavior such as skipping breakfast could be involved in other unhealthy eating behaviors, too.

Thirdly, several gender differences were found, some unhealthy alimentary habits being more frequent among girls (such as skipping breakfast), others among boys (e.g. inappropriate consumption of fruits); some of the gender differences found also varied between the three age groups. The co-occurrence of unhealthy alimentary habits was noticed in both girls and boys, the main gender difference being the fact that the presence of all four investigated unhealthy eating habits was more frequent among girls in the case of younger junior and senior high school adolescents, while a reverse situation was encountered among university students.

This study is subject to limitations. Due to funding and logistical restrictions, the study did not include a national representative sample, it involved only school youths and did not include out-of-school adolescents. This inevitably limits the generalization of the findings of the present study beyond its sample. Hence, future studies should use national representative samples and try to include out-of-school young people as well. Another common limitation of most studies on this topic is reliance on the adolescents'

self-reports. Although some respondents may not have reported truthfully, the likelihood of honest responses was maximized in this survey by conducting it anonymously. Future studies should also focus on factors that influence the food choice of different age and gender groups and identify what actions and messages could be appropriate in order to promote healthy nutrition for different categories of adolescents.

Conclusions

1. The results of the study show that many Romanian junior and senior high school students as well as university students engage in unhealthy alimentary behaviors that place them at risk for health and physical development problems, and that a co-occurrence of several unhealthy behaviors is observed.

2. These data call for actions aimed at helping Romanian young people to adopt healthy eating behaviors.

3. The co-occurrence of several unhealthy alimentary habits underlines that comprehensive programs, addressing several components of healthy nutrition, are required for Romanian young people.

4. The findings related to gender differences identified by our study emphasize the necessity of studying in more details the gender differences with respect to the alimentary habits of different age categories of Romanian young people, as well as several factors (socio-economic status, knowledge of and attitudes regarding healthy nutrition, body image and weight management, etc.), which could influence these behaviors; this information is needed in order to develop educational programs that are age and gender sensitive.

Conflicts of interests

The authors have no conflict of interest to declare.

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