



FRUIT AND VEGETABLE INTAKE AMONG COLLEGE STUDENTS IN NITRA – COMPARATIVE STUDY

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ABSTRACT

The aim of the study was to collect and analyse the frequency of fruit (fresh, dried, canned and nuts) and vegetable (fresh, tinned, legumes, soya) consumption in the group of 242 respondents aged 19 – 22 years-students of Constantine the Philosopher University in Nitra; to evaluate differences according to field of study and language in which they study (Hungarian or Slovak) by questionnaire method. On the base of collected data it can be concluded that in general the consumption of fresh fruits and vegetables can be considered as very low (only once a day) together with canned and dried fruit (nuts) and tinned vegetable (rarely). Furthermore, the majority of respondents took legumes only 1 – 3 times a week or rarely and soya had never been consumed. The statistically significant differences between college students of PEEH and the rest of assayed group of students had not been confirmed so the higher level of knowledge in health has not been connected with the higher consumption of fruits and vegetables. On the other hand, statistically significant differences have been proved between the following assayed groups of university students: RTH ↔ RTS (χ 7.90, $p < 0.05$), J ↔ RTH (χ 9.99, $p < 0.05$), J ↔ RTS (χ 10.00, $p < 0.05$), J ↔ PEES – SK (χ 9.91, $p < 0.05$). Statistically significant differences were assayed also in consumption of dried fruits or nuts among the following field of study: J ↔ RTS (χ 9.48, $p < 0.01$), RTH ↔ RTS (χ 12.57, $p < 0.05$), RTS ↔ PEES (χ 8.19, $p < 0.01$). Consumption of fresh vegetables was statistically different between the students J ↔ RTS (χ 9.95, $p < 0.05$) and RTS ↔ PEES (χ 8.19, $p < 0.01$).

Keywords: fruit consumption; vegetable consumption; college student; nut; soya; dietary habit

INTRODUCTION

Western countries lifestyle increase the risk for premature development of chronic diseases (cardiovascular, diabetes, metabolic syndrome, osteoporosis, cancer) (Henauw et al., 2007). Poor dietary habits, sedentary leisure time spending and a lack of physical activity are lifestyles that – once installed – have a strong tendency to track from childhood into adulthood and then become extremely resistant to modification (Koplan et al., 2005). This fact has led to increasing interest in studying the dietary habits of pupils, students and most often adolescents (Babinska et al., 2007, 2008 and Bašková, 2011). Unfortunately, the population of college students who present connection between the students and adults has been much less studied in last years than other population groups. College students differ in irregular eating patterns, frequent snacking and frequent skipping of meals, consumption of fast foods (Juríková and Viczayová, 2014), overuse consumption of energetic drinks and caffeine (Balla et al., 2013). According to results of marketing study of Pap et al. (2012) 1/3 of students of secondary schools have changed eating habits towards unhealthy foods at university. The most comprehensive study including 3172 respondents from Slovakia has been provided by Stefanikova et al. (2003). They examined the changes in eating habits of college students of medicines during 1992 – 2002. The result of the study has confirmed the positive increase in

consumption of legumes (including soya) by 32%, on the other hand decrease in consumption of fruit by 25%. Comparative study of Kimáková et al. (2011) of eating habits of college students of medicine and lawyers aged 21-26 years had not proved the statistically significant differences between them and focused on high consumption of fast food resulted in problems with digestion.

The regular intake of fruit and vegetables is given by socio – demographic variables (age, gender and socio – economic status) (Aranceta et al., 2003; Moreno et al., 2008 a,b; Currie et al., 2008), family background (Bere et al., 2008; Friel et al., 2005; Cooke et al., 2004). Knowledge level about health promoting effect of fruit and vegetables is considered to be the most important factor that positively influences the regular consumption of fruit and vegetables (Cooke et al., 2004). Certainly, the school play significant role in formation of positive attitude to regular consumption of fruit and vegetables (Story et al., 2008) by programmes and activities (French and Wechsler, 2004).

Understanding the factor of education and defining population of college students with the least healthy food habits (at greatest risk) has great importance for the development of relevant interventions, programmes and policies.

MATERIAL AND METHODOLOGY

The questionnaire was designed to determine intake frequency of fruits and vegetables among 242 respondents – students of Constantine the Philosopher University in Nitra during 2013 – 2014 years. The university students aged 19 – 22 year had the following distribution according to field of study: Pre-school and elementary education in Hungarian language (PEEH n = 32), Pre-school and elementary education in Slovak language (PEES n = 55), Journalism (J = 38), Regional Tourism in Hungarian language (RTH n = 45) and Regional Tourism in Slovak language (RTS n = 72). Students were asked for the filling the questionnaire in fruit (fresh, dried or canned) and vegetable consumption (fresh, tinned, legumes and potatoes) and chose the frequency: 3 and more times a day, daily, 1 – 3 times a week, rarely or never. Because of the fact that 200 asked students were female gender, statistical evaluation of frequency of fruit, vegetable and nuts consumption was provided only according to field of study and language of study (Hungarian – Slovak) by the method of χ square statistic on the level of probability $p = 0.05$ resp. 0.01 in the statistical programme STATGRAPHIC. Among the assayed groups only the students of PEEH have incorporated the health education into the study programme as subjects: Health education, Nutrition of children, Human and environment, Movement and Health. So we supposed that there would be statistically significant differences between students of PEEH and students of the rest field of study.

RESULTS AND DISCUSSION

Our study was aimed at mapping of consumption of fruits and vegetables of 242 college students on the base of field of study and evaluate if health education had statistically significant importance on the regular consumption of fruits and vegetables.

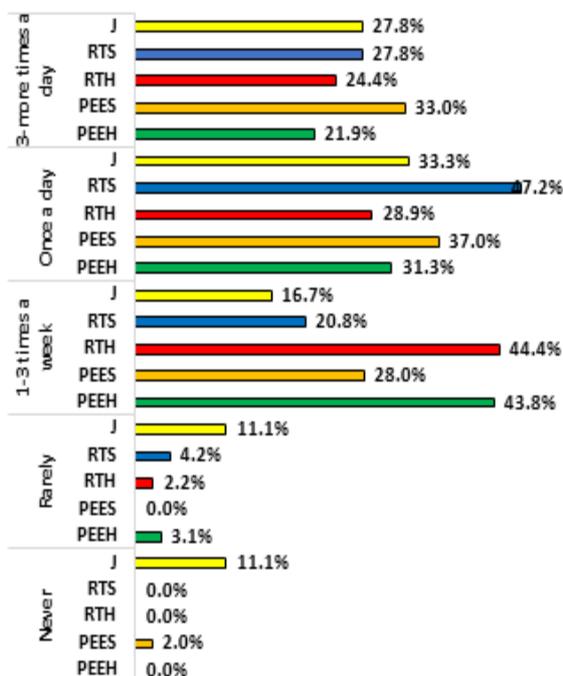


Figure 1 Evaluation of frequency of fresh fruit consumption among college students.

Consumption of fruit (fresh or processed) is 51.9 kg/capita/year that is lower by 53.7% in comparison with recommended value (96.7 kg/capita/year) (Habánová, 2012). The majority of university students indicated to eat fruit in fresh form only once a day (RTH 28.9% – RTS 47.2%) (Figure 1).

This finding is in accord with study of Kimáková et al. (2011) in which the 25.3% medicinal students and 27.2% lawyers and 61% students of Slovak Agriculture University Sramkova (2001) consumed fruit only once a day. More negative trend has been confirmed in study Fatrcova-Šramková et al. (2010) evaluated the eating habits of Slovak population in which 62% of women consumed the fresh fruit only three times a weeks. Similarly, in the study evaluated 145 college students of Slovak Agriculture University 34.6% consumed fresh fruit only 1 – 3 times a week (Kopčeková and Kolesárová, 2009). Moreover, the consumption of canned and dried fruit is lower with prevailing frequency only rarely (RTH 46.7% - PEEH 53.1%; PEES 31% - PEEH 59.4%) (Figure 2 and Figure 3).

Consumption of vegetables (fresh or processed) in Slovakia represents 101.5 kg/capita/year that is lower value by 20.4% than recommended amount (Habánová, 2012). On the basis of analysed dates this trend has been confirmed too, only the students of RTS ate 3- more portion a day (40.3%). The majority of students preferred consumption only once a day (J 22.2% - PEEH 50.0%) (Figure 4).

Results are in accord with study of Kimakova et al. (2011) in which the 24% of medicinal students and 17.5% lawyers consumed the fresh vegetable only once a day. The study of Fatrcova-Šramkova et al. (2010) also confirmed that the adult Slovak population aged 25 – 75 years preferred to consume fresh vegetable only once a

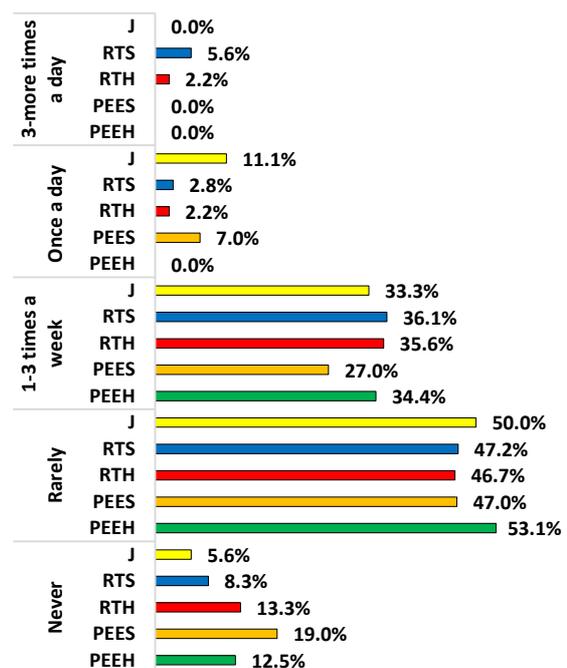


Figure 2 Evaluation of frequency of canned fruit consumption among college students.

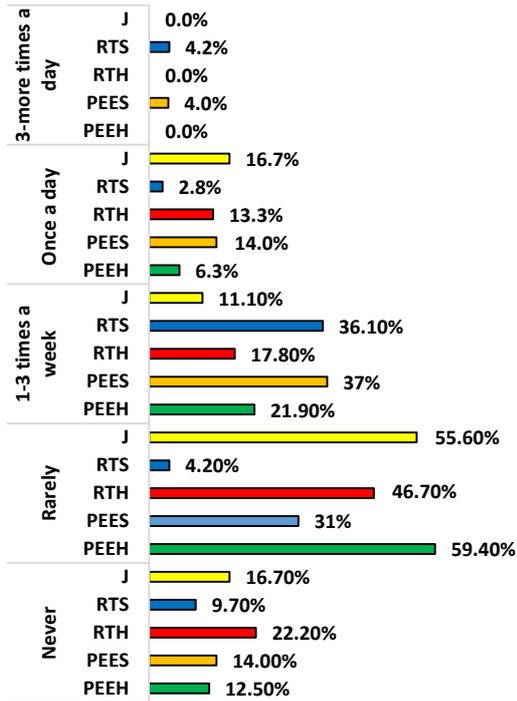


Figure 3 Evaluation of frequency of dried fruit consumption among college students.

week (57.47%). In the study of **Kopčėková and Kolesárová (2009)** examined 145 college students of Slovak Agriculture University and found out that the prevalence of them 36.6% consumed fresh vegetable 1 – 3 times a week that is in accordance with assayed students of

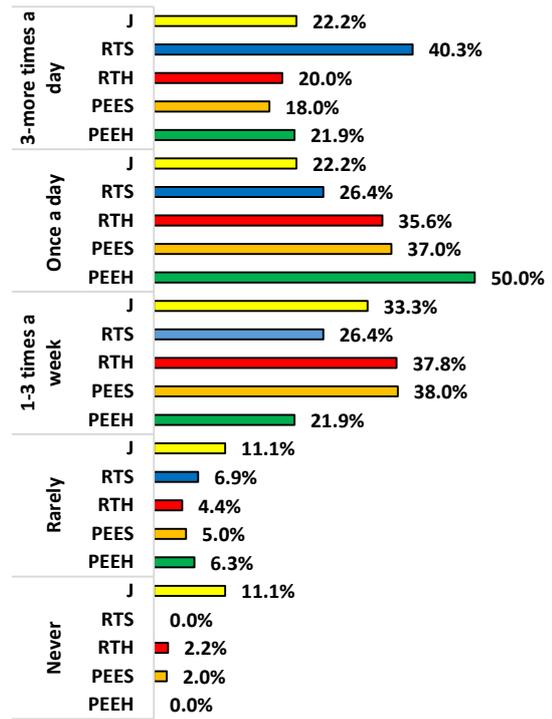


Figure 4 Evaluation of frequency of fresh vegetable consumption among college students.

PEES and PEEH. Tinned vegetable was consumed in lower amount, the majority of students chose answer only rarely (RTS 41.7% – J 61.1%) (Figure 5). Cognizance of healthy food have been associated with positive attitudes towards healthy eating habits but there has not been significant differences between the people

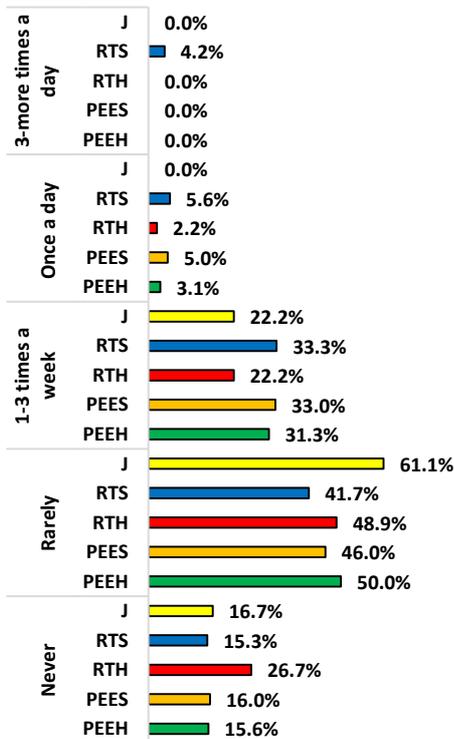


Figure 5 Evaluation of frequency of tinned vegetable consumption among college students.

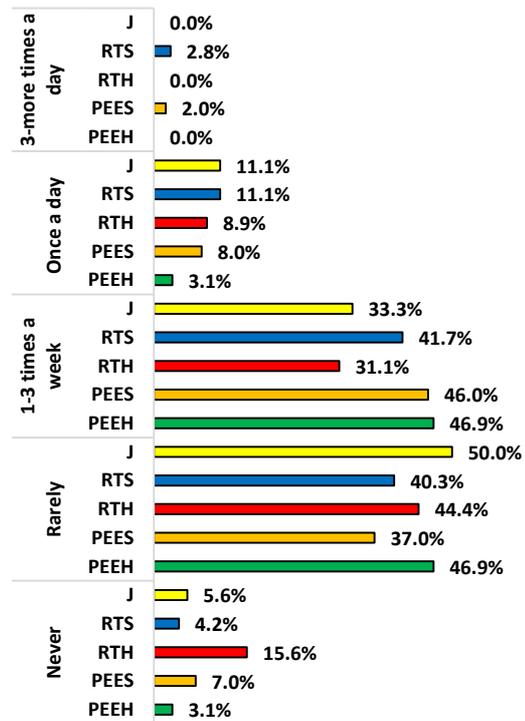


Figure 6 Evaluation of frequency of legumes consumption among college students.

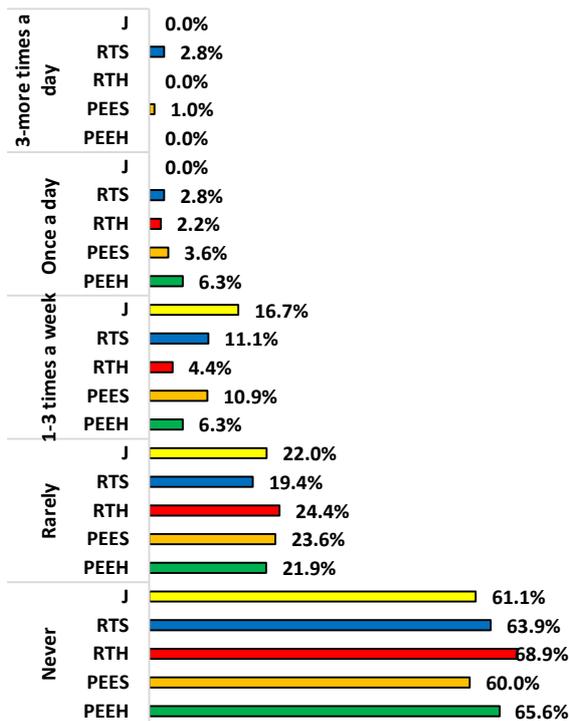


Figure 7 Evaluation of frequency of soy based products consumption among college students.

with higher and lower levels of education (Herath et al., 2008; Urala and Lähteenmäki, 2007; de Jong et al., 2003; Verbeke, 2005). In the same way, the results of statistical evaluation pointed to the fact that there had not been significant differences in fruit consumption (fresh, dried or canned) and nuts, vegetable (fresh, tinned, legumes) among students with field of study PEEH ↔ J, PEEH ↔ RTH, PEEH ↔ PEES and RTH ↔ PEES. So the hypothesis that the students of PEEH (have cognizance of healthy eating) will have consumed higher amount of fruit and vegetable and distinguished from another group of students can be refused. Our results are in accord with study of Barath et al. (2014) who were not noticed significant differences in fruit and vegetable consumption between the students of PEEH and PEES. In the similar way, Kimáková et al. (2011) has not found statistically significant differences in fruit and vegetable consumption between the medical students and lawyers. This fact can be given by trend to choose food according to taste preference. Children have not consumed enough fruit and vegetable despite the fact that they have cognizance of positive effect of consumption of fruit and vegetable as it has been proved by HELENA study. The young people understood the importance of healthy eating and knew they did not always eat as well as they should. To them, the problem with 'healthy' food including fruit and vegetable was that it is boring and does not taste very nice (Gilbert et al., 2007). In another marketing study realised in Hungary by Pap et al. (2012) 75% of respondents (college students) had cognizance of health promoting effect of fruit and vegetable but they preferred to consume sweets or sugared drinks. By contrast, statistically significant differences in fresh fruit and vegetable consumption have been proved between the following assayed groups of university students: RTH ↔ RTS (χ 7.90, $p < 0.05$), J ↔

RTH (χ 9.99, $p < 0.05$), J ↔ RTS (χ 10.00, $p < 0.05$), J ↔ PEES – SK (χ 9.91, $p < 0.05$).

Statistically significant differences were assayed also in consumption of dried fruits or nuts among the following field of study: J ↔ RTS (χ 9.48, $p < 0.01$), RTH ↔ RTS (χ 12.57, $p < 0.05$), RTS ↔ PEES (χ 8.19, $p < 0.01$). Consumption of fresh vegetables was statistically different between the students J ↔ RTS (χ 9.95, $p < 0.05$) and RTS ↔ PEES (χ 8.19, $p < 0.01$).

In comparison with acceptable interval of rational consumption 2.1 – 3.2 kg it is necessary to increase the consumption of leguminous plants at least by 0.5 kg because in Slovakia the consumption of legumes has been very low in the long term (Habánová, 2012). According to achieved dates (Figure 6) the consumption of legumes was not efficient only 1-3 times a week PEEH (46.9%) or rarely (PEES 37% – J 50.0%). Similarly, Fatrcova-Šramková and Gregušová (2009) examined the eating habits of 392 pupils from elementary schools in Nitra found out that 1/4 of girls and 1/5 of boys consumed legumes only twice a week. Our findings are also in accord with study of Fatrcova-Šramkova et al. (2010) in which from 400 adults aged 25 – 75 years only 35% consumed legumes once a week. This negative trend was confirmed by Jurkovičová (2005) within study in Slovakia found out that 1/3 respondents consumed legumes rarely or never. According to study of eating habits of pupils of primary school the biggest problem was recognized in consumption of legume in Czech Republic (Tláškal et al., 2012) that can be given by their indistinctive taste.

On the basis of collected data we can conclude that the frequency of soya consumption is very low (Figure 7). The majority of respondents chose answer that they have never consumed soya (PEES 60% – RTH 68.9%) or rarely (19.4% RTS – 24.4% RTH). Our results are in contrast with study of Stefanikova et al. (2003) examined the increase in legumes and soya consumption among college students during ten years. Čurlej et al. (2015) studied the phytoestrogens dietary intake from Middle – North Slovakia region and found out that no respondents aged 50 – 60 years old utilised soya as important source of phytoestrogens. The statistically significant differences in soya consumption were confirmed between PEEH ↔ RTS (χ 8.82, $p < 0.01$); RTH ↔ RTS – SK (χ 12.56, $p < 0.05$).

CONCLUSION

The frequency of fruits and vegetables was measured by questionnaires completed by college students aged 19 – 22 years old at Constantine the Philosopher University in Nitra. Based on achieved results, fruits and vegetables were the most popular in fresh form but they did not meet the recommended daily requirement of five or more portion. Generally, the majority of participated students consumed only one portion of fresh fruit and one portion of fresh vegetable a day. The legumes and dried fruit with nuts have been consumed only rarely and soy hasn't ever. This trend can be considered as negative in eating habits of college students. There has not been proved statistically significant differences among students of PEEH and the rest of evaluated field of study, so in our study the significance of higher level of knowledge of this group of students has not been confirmed. So we can conclude that incorporation of subjects in healthy lifestyle in the group

of university students is not sufficient enough. The health education must present continual process from childhood with support of family followed by preschool and school education. Unfortunately the health education has not been incorporated into state education programme as obligatory subject in Slovakia. So there has not been adequate space for systematic and regular acquirement of healthy behaviour. Similarly, the significance influence of language in which they studied the programme has not been confirmed expressly. According to statistic evaluation there has been proved statistically significant differences between the following assayed groups of college students: RTH ↔ RTS (χ 7.90, $p < 0.05$), J ↔ RTH (χ 9.99, $p < 0.05$), J ↔ RTS (χ 10.00, $p < 0.05$), J ↔ PEES – SK (9.91, $p < 0.05$).

Statistically significant differences were assayed also in consumption of dried fruits or nuts among the following field of study: J ↔ RTS (χ 9.48, $p < 0.01$), RTH ↔ RTS (χ 12.57, $p < 0.05$), RTS ↔ PEES (χ 8.19, $p < 0.01$). Consumption of fresh vegetable was statistically different between the students J ↔ RTS (χ 9.95, $p < 0.05$) and RTS ↔ PEES (χ 8.19, $p < 0.01$).

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