

## Student Health Clusters Based on Health-Behaviour and Academic Achievement: The Hungarian Evidence in an International Comparison

*Karolina Eszter Kovács, Beáta Erika Nagy*

### **How to cite**

Kovács, E. K., Nagy, B. E. (2021). Student Health Clusters Based on Health-Behaviour and Academic Achievement: The Hungarian Evidence in an International Comparison. [Italian Sociological Review, 11 (3), 903-926]

Retrieved from [<http://dx.doi.org/10.13136/isr.v11i3.498>]

[DOI: 10.13136/isr.v11i3.498]

### **1. Author information**

*Karolina Eszter Kovács*

Institute of Psychology, University of Debrecen, Debrecen, Hungary

*Beáta Erika Nagy*

Department of Pediatrics, University of Debrecen, Debrecen, Hungary

### **2. Author e-mail address**

*Karolina Eszter Kovács*

E-mail: karolina92.kovacs@gmail.com

*Beáta Erika Nagy*

E-mail: drbeatanagy@gmail.com

### **3. Article accepted for publication**

Date: May 2021

Additional information about  
**Italian Sociological Review**  
can be found at:

[About ISR-Editorial Board-Manuscript submission](#)



*Student Health Clusters Based on Health-Behaviour and Academic Achievement: The Hungarian Evidence in an International Comparison*

Karolina Eszter Kovács\*, Beáta Erika Nagy\*\*

Corresponding author:  
Karolina Eszter Kovács  
E-mail: karolina92.kovacs@gmail.com

Corresponding author:  
Beáta Erika Nagy  
E-mail: drbeatanagy@gmail.com

**Abstract**

The prevalence of health-damaging behaviours is worldwide typical although the growing trend of health-damaging behaviour has a negative influence on academic achievement. Our study aims to measure the connection between health behaviour and academic achievement. We mapped the different student clusters and their characteristics, furthermore, we compared the Hungarian and international trends regarding perceived health based on HBSC 2014 (N=2732). Regarding our results, the 9th and 11th-grade students can be categorized into four groups concerning health-risk behaviour and self-esteem entitled deviant, phlegm, balanced and stressful groups. The educational level of the parents and gender had a significant influence. Significant territorial differences could be found, indicating the better mental health of students learning in West Transdanubia and the lower efficacy of those learning in Central and North Hungary. Concerning the international comparison, the ratio of students with lower self-rated health is higher among Hungarian students. The significant health-behavioural clusters and their territorial distribution highlights the huge differences in the Hungarian and international comparison. The results indicate to improve the health-

---

\* Institute of Psychology, University of Debrecen, Debrecen, Hungary.

\*\* Department of Pediatrics, University of Debrecen, Debrecen, Hungary.

awareness and academic achievement of the students, especially in the disadvantaged regions.

Keywords: health-behaviour, academic achievement, secondary education.

## **1. Introduction**

Adolescence is a critical period where the child has to cope with several factors as an intensive biological, psychological and cognitive development can be experienced in this life period. Additionally, the effect of physical and emotional changes, school and peers has not only a separated but a combined effect. Regarding the frequency of health-damaging behaviours, this is the most endangered period as the ratio of health-risk behaviours is getting higher while the tendency of health-protective behaviour is getting lower (Lohaus et al., 2009). Risky behaviours are considered as typical habits for adults what make these behaviours more attractive for young people.

The different health behaviour elements show their influence not separately but in a part of a lifestyle thus it is important to highlight the complicated interaction between the different behavioural, social and individual factors (Do et al., 2014; Németh, 2007). In the present study, one element of the health behaviour so health-damaging behaviour was stood into the focus, concerning smoking, alcohol consumption and substance use. It is important to emphasize the educational perspective of healthy and risky behaviour as the effect of health behaviour and health-damaging behaviour can be seen in academic achievement as well. For this reason, it is indispensable to measure institutional effects, additionally, the investigation of the factors which are necessary to achieve emotional balance and health and the factors influencing these variables and school well-being too (Gray-Burrows et al., 2019; de Matos et al., 2016). European and American researchers have thoroughly explained the relationship between health behaviour and academic achievement, (e.g. Legleye et al., 2009; Moor et al., 2015; Haught et al., 2016; Sullivan et al., 2017), however, only a few examples can be found in Hungary in this topic (Kovács, Szigeti, 2017).

Based on the constantly worse data concerning health and health-behaviour of the youth population, our study aimed to measure the health behaviour of students in 9th and 11th grade on a Hungarian database of an international study called HBSC 2014 (Health Behaviour in School-aged Children). For this reason, student clusters were created based on health-behaviour and non-academic achievement to make comparisons regarding gender and grade, the educational level of the parents and territorial distribution of Hungary as we hypothesized that different patterns can be detected in the

student groups alongside the main background variables. Furthermore, we aimed to make an international comparison of the self-rated health of the Hungarian students as previous studies (e.g. ESPAD) showed that the health characteristics of the Hungarian population is worse compared to the developed countries.

### **1.1 Smoking**

Smoking can be regarded as one of the biggest sources of risk. Several factors can stand in the background of its try-out and subsistence. The low socioeconomic status is a risk factor (Droomers et al., 2005; Kovács, Szigeti, 2017; de Hoog et al., 2020) as well as childhood traumas or the changes in the family structure, the divorce of the parents (Anda et al., 1999). The patterns which are given by the parents as the smoking of the parents are outstanding (Fagan et al., 2005). Firstly, the smoking habits of the mother have a significant influence on girls and boys as well (Kandel et al., 1994), however, the influence of peers (White et al., 2003) and siblings (Avenevoli et al., 2003) is remarkable on the behaviour and smoking habits of the adolescent.

The frequency of smoking try-out is increasing by age. According to the Hungarian results of the HBSC 2014 survey, 5.6% of the 5th graders, 21.6% of the 7th graders, 45.8% of the 9th graders while 60.8% of the 11th graders have ever tried out smoking. The growing tendency can be detected in every country which took part in the HBSC studies (Inchley et al., 2016). Concerning age, the pattern of the prevalence of regular smoking is similar to the pattern of the try-outs as the prevalence is hugely increasing with age. Otherwise, a higher rate of regular smoking can be seen in Hungary in comparison with the European countries. Based on the results of the HBSC 2014 international survey, the ratio of weekly smoking is higher among girls and boys as well. Regarding girls, the international mean is 11% while the Hungarian mean is 21%, furthermore, the international mean of the boys is 12% while in Hungary it is 20%. On this basis, Hungary can be found in the fifth place among the examined countries (Inchley et al., 2016).

### **1.2 Alcohol consumption**

Alcohol consumption is getting more typical for the young generation; furthermore, the first try-out happens at an earlier age. The age of 13 years can be regarded as the beginning of regular alcohol consumption. Every fifth 14 years old adolescents consume alcohol weekly, and half of the 16-17 years old students consume some kind of drink which contains alcohol monthly. 25.8% of the 5th graders, 48.6% of the 7th graders, 82.6% of the 9th graders and 84% of the 11th graders have ever tried out consuming alcohol (Inchley et al., 2016).

In the background of the alcohol consumption often stand the fulfilling of social and personal needs, the correspondence to the peers and the building of new relationships as a motivational background (Engels et al., 2001). Regarding socioeconomic status (educational level of the parents, financial background), the results concerning alcohol consumption are inconsistent. In case of some papers, the prevalence of alcohol consumption is higher among students with low socioeconomic status (Wardle, Steptoe, 2003) while others showed an inverse tendency, having said that students with high socioeconomic status show a higher rate of alcohol consumption (Ritterman et al., 2009). Peers have a remarkable in this case as well (Pikó et al., 2005; Pikó, 2000; Kovács, Szigeti, 2017).

Following the results of the HBSC surveys, which are similar to the smoking patterns, it seems that the highest increase can be detected between the students learning in the 7th and 9th grades, among boys and girls too. However, the gender ratio is not as balanced as it could be seen regarding smoking. Girls' alcohol consumption is significantly lower in primary school compared to boys, but it is similar in secondary education. However, the rate of those students who have at least twice been drunk is two times bigger among boys. Nevertheless, it is clear that the chance of inebriation is increasing by age; furthermore, it is worrisome that the number of students who have ever been drunk is increasing from survey to survey (Németh, Költő, 2014).

### **1.3 Substance use**

Drug consumption can be regarded as part of the 'adolescent culture' as adolescence is a critical period when the prevalence of illegal substance use is higher than the average in this period (Demetrovics, 2001; Kovács, Szigeti, 2017). This is a huge problem as substance use is usually an item of the problematic behaviour in adolescence which can accompany by psychic problems, depression, anxiety, suicidal thoughts, learning problems or difficulties in integration (Brassai, 2010).

Socioeconomic status has a huge influence on drug use as the prevalence of substance use is significantly higher among students with high socioeconomic status (SES) (Hanson, Chen, 2007). The effect of gender is significant as the ratio of substance users is higher among men (SAMHSA, 2014), although the gender differences seem to disappear regarding smoking and alcohol consumption (Pitel et al., 2010).

The age of the try-out of illegal substances is decreasing like in the case of smoking and alcohol consumption. Regarding the Hungarian results of the HBSC studies, almost one-fifth of the 9th and more than one-fourth of the 11th graders have ever consumed some kind of legal or illegal substance. Cannabis

usage is around the international mean; it is softly higher than the international mean among girls but lower among boys. Concerning weekly cannabis use, the international mean of girls is 13% while it is 14% in Hungary; furthermore, the international mean is 17% among boys while it is 12% in Hungary. This sets Hungary on the 25th place which is a better result in comparison with smoking and alcohol consumption (Inchley et al., 2016).

#### **1.4 The relationship between health behaviour and academic achievement**

Many previous investigations have examined the connection between the different type of health-damaging behaviours and academic achievement. It influences school absence and dropout as well. In case of regular smoking, the likelihood of the school dropout is higher (Fergusson et al., 2003; Cox et al., 2007) regarding boys and girls too (Legleye et al., 2009; Pusztai et al., 2017; Kovács et al., 2019; Kovács, 2020).

The results of the previous studies concerning alcohol consumption are ambivalent. For example, concerning the investigation of Wichstorm et al. (1998), a positive connection can be seen between the two variables as the rate of school dropout is higher among regular smoker adolescents. Contrary, no connection could be shown in other research (Legleye et al., 2009).

Substance use, similar to smoking, is in positive connection with school dropout as daily cannabis usage showed a strong relationship with this. The chance of the school dropout is almost one and a half times (1,37) higher among students who consume cannabis daily. This odd is higher (1,75) among students who habituated to this under becoming 14 years old (Legleye et al., 2009).

In addition, the different kind of health-risk behaviours are in strong connection with depression, low self-esteem and body satisfaction (Nerini et al., 2016; Balluerka et al., 2016) as many examinations showed that the rate of depression is higher among smokers, binge drinkers and substance users which has a negative influence on academic achievement as it can easily lead to dropout (Legleye et al., 2009, Moor et al., 2015).

It is important to mention that this phenomenon cannot be seen in all cases. On the other hand, the aim of the adolescent with health-damaging behaviour may be the reduction of stress and anxiety. These behaviours can have a relaxing effect in short-term thus the aim of the student can be the decrease of the stress caused by the desire for high achievement. From this perspective, health-damaging behaviour can be one source of the psychosocial development which fulfils a health-protective function, including the integrity of peer groups, rebellion against the authority or compensation. Regarding this, the try-out or presence of health-damaging behaviour not necessarily correlates

with the decrease of the academic achievement but it can support the child to maintain its good achievement (Brassai, 2010).

## **2. Method**

### **2.1 Participants**

Our target group contained students learning in secondary education. Regarding HBSC 2014, the data of 9<sup>th</sup>-and 11<sup>th</sup>-grade students are in focus which contains the data of 1510 students in the 9<sup>th</sup> grade and 1230 students in the 11<sup>th</sup> grade thus altogether the results of 2732 students were measured in the present study. Accordingly, the mean age of students learning in the 9<sup>th</sup> grade was 15,3 years in our sample while the mean age in the 11<sup>th</sup> grade was 17,6 years.

### **2.2 Materials and procedure**

In our analysis, we used one part of the Hungarian HBSC 2014 database. This is a school-based international examination which investigates the health behaviour of the school-aged children in 42 countries, measuring health behaviour (nutrition, sleeping, self-esteem, self-rated health etc.), health-damaging behaviour (smoking, alcohol and drug consumption, promiscuity etc.) or academic achievement (perceived pressure, subjective evaluation of the teachers about academic achievement etc.) through self-completion questionnaires administered in the classroom. The international standard questionnaire allows to cross-national comparisons to be made. Following stratified sampling, the proportion of the different school types, settlement types and regions was proper, and the selection of the classes involved in the measurement was random in the selected institutions. In the Hungarian survey, 7468 students took part from 330 classes of 279 schools. To use the database, it must have been claimed from the National Institute for Health Development of Hungary which was submitted on 10 October 2016 and accepted on 27 October 2016.

During the study, the following variables were investigated:

- the frequency of smoking (*'How often do you smoke?'*- daily/ at least once per week but not daily/ rarer than weekly/ never);
- alcohol consumption (*'How often do you consume some kind of alcohol (beer/ wine or coke with wine/ champagne/ spirits or coke with rum or gin tonic or vodka*



*orange/ soft drink with alcohol e.g. Bacardi Breezer, Smash, Smirnoff Ice/ liqueur/  
other soft drinks with alcohol)? – daily/ weekly/ monthly/ rarer/ never<sup>1)</sup>;*

- substance use (*'Have you consumed marijuana or hashish in the last 30 days?' –  
never/ in 1-2- days/ in 3-5 days/ in 6-9 days/ 10-19 days/ 20-29 days/ 30 or  
more days*);
- self-esteem (Rosenberg Self-esteem Scale, Rosenberg, 1965);
- perceived school performance (*'In your opinion, what do your class teacher(s)  
think about your school performance?' – very good/ good/ average/ below the  
average*);
- the pressure by schoolwork (*'How pressured you feel by the schoolwork you have  
to do? – not at all/ a little/ some / a lot*).
- self-rated health (*'How would you rate your health? – excellent/ good/ fair/ poor*)

#### *Analysis*

Based on our database and variables, our research questions were the following:

1. What kind of student clusters can be created based on health behaviour, self-rated health, self-esteem, schoolwork pressure and the evaluation of the teachers?
2. Are there any between-group differences regarding gender, grade, the educational level of the parents and territorial distribution?
3. Are there any differences in self-rated health in the different countries participating in the HBSC 2014 study?

Based on our research questions, the hypotheses were the following:

1. Based on academic and non-academic achievement, more student clusters can be differentiated following the trends of the previous research results (Kovács, 2020).
2. Significant differences can be hypothesized based on gender and grade, the educational level of the parents and territorial distribution of Hungary. We suppose that girls are overrepresented in the stressful cluster, while 11<sup>th</sup>-graders and students whose parents have lower educational levels are overrepresented in the deviant cluster and the best achievement can be found among students learning in the West-Transdanubian region (Kovács, 2018).
3. Regarding self-rated health, significant differences can be detected between Hungary and the other countries participating in HBSC 2014 study, especially compared to the western countries where the self-rated

---

<sup>1</sup> In this case, an index was made according to the different types of alcohol consumption listed above.

health is better (Sullivan et al., 2017; Moor et al., 2015; Németh, Költő, 2014; Székely et al., 2013; Pitel et al., 2010; Legleye et al., 2009).

The analysis was made by SPSS 22 statistics program. During the analysis, the creation of the student groups was made by cluster analysis and the differences in the distributions were measured by Chi-square tests. The maps applied for the explanation of the student clusters and academic achievement results in the regions were made by MapInfo.

Firstly, the data of the 9<sup>th</sup>- (~15-year-old students) and 11<sup>th</sup>-grade (~17-year-old) students were selected in the HBSC 2014 database. In the second step, the variables of smoking, alcohol and drug consumption were standardized to ensure the united scale. Based on the previously mentioned variables, cluster analysis (K-means clustering, iteration: 100) was made to categorize the students concerning their health behaviour (including the frequency of smoking, alcohol consumption and substance use, self-esteem and self-rated health) and attitudes toward their academic achievement (including perceived school performance, pressured by schoolwork). The student clusters were compared regarding the educational level of the parents (*university or college/secondary school/vocation school/primary school/lower than primary school*), gender (*girl/boy*), and class (9<sup>th</sup> grade/11<sup>th</sup> grade).

We also saw the distribution of the student clusters in the different regions. Furthermore, the two data were illustrated in a map where the student achievement was demonstrated by raster while the distribution of the students was demonstrated by pie charts. To make an international comparison, the self-rated health of the 15-year-old students was regionally aggregated based on the HBSC data. The regional differences were represented with maps.

### **2.3 Ethics statement**

This study was reviewed by the university's Institutional Review Board (IRB) and the Hungarian HBSC Group. The study procedures were carried out in accordance with the Declaration of Helsinki.

## **3. Results**

### **3.1 The formation of the student clusters**

Cluster analysis was made based on the students' health behaviour, self-rated health, self-esteem, schoolwork pressure and the evaluation of their teachers. Regarding smoking, alcohol and drug consumption, the lower the value is, the more frequent the usage is. Regarding self-esteem, the higher the value is, the better the self-esteem of the student is. In the case of the other

values, the lower the value is, the more positive the students' result is. Namely, if a negative result can be seen, the evaluation of the teachers on the students' academic achievement is better, the pressure of the students by schoolwork is lower and the self-rated health of the student is higher as well. Concerning this categorization, the best way is to separate four clusters.

In the first cluster (*deviant*) are those students who smoke, consume alcohol and drug frequent. Although they know that this is not healthy, it is typical for them. Their self-esteem is high, however, the evaluation of the teachers is negative regarding their academic achievement but they do not care about this. In the second cluster (*phlegm*) are those students who smoke and drink alcohol but substance use is not typical for them. They think that smoking and alcohol consumption is the part of everyday life thus they perceive their health well. Their self-esteem is positive, however, the evaluation of the teachers is negative about them and they feel a big pressure from school. In the third group (*stressful*) can be found those students who do not use any kind of health-damaging substance but their self-esteem is low, their teachers' have a negative evaluation about their achievement and they also experience a huge schoolwork pressure. Their self-rated health is poor caused by their self-esteem thus in their case, mental diseases can be typical for them thus the self-rated health in the lowest in this group. In the fourth cluster (*balanced*) can be found those students who live healthily, their self-esteem is high, their teachers have a positive evaluation about their performance, their perception about schoolwork pressure is low and their self-rated health is appropriate as well. The results of the cluster analysis are explained in Table 1.

TABLE 1. *The characteristics of the clusters (Source: HBSC 2014, N=2732).*

	Clusters			
	Deviant	Phlegm	Stressful	Balanced
Smoking frequency	-1,291	-0,304	0,268	0,540
Alcohol consumption frequency	-0,833	-0,515	0,376	0,584
Substance use frequency	-2,016	0,348	0,374	0,365
Self-esteem	-0,099	0,396	-0,733	0,530
Perceived school performance	0,363	0,408	0,473	-1,005
Pressured by schoolwork	0,031	-0,261	0,507	-0,382
Self-rated health	0,336	-0,383	0,657	-0,457
Count	420	779	836	697

### 3.2 The educational level of the parents

We investigated the differences between the clusters regarding the educational level of the parents. Firstly, the educational level of the fathers was examined. Regarding the results of the analysis of variance, the distribution of

the clusters is significant ( $p < 0,000$ ). The children of fathers with education lower than primary level can be seen in the *stressful cluster* in the highest ratio (47,8%) as the pressure to get out of their situation is the highest in their case. However, they can be seen also at a high rate in the *deviant cluster* (21,7%) while the prevalence of health-risk behaviour is higher among students with low educational level parents. In case of the children of fathers with primary educational level, the rate of *stressful* (34,1%) and *phlegm* (32,6%) cluster members are in higher ratio caused by similar reasons as it was mentioned in case of the children of fathers with education lower than primary level. Concerning fathers with vocational school level, most of the children take part in the *stressful cluster* (32,6%) while the pressure of getting out their social layer is high but they do not feel the potency to meet the expectations. Regarding fathers with secondary education level, the biggest part of the students can be found in the *stressful cluster* (29,7%) which shows the negative effect of the educational level on self-esteem. Furthermore, the ratio of students in the *phlegm cluster* is high too (28,9%) who do not care about their academic achievement and with the consequences of their health-damaging behaviour. But is also visible that the rate of students in the *balanced cluster* is still higher (%) compared to the other educational level groups. Finally, it can be said that the biggest part of the children of the fathers with tertiary educational level takes part in the *balanced cluster* (34,1%) which shows the protecting and supporting effect of the high educational level. The distribution of the clusters can be seen in Table 2.

TABLE 2. The differences between the clusters regarding the educational level of the father (Source: HBSC 2014, N=2732).

		Father's educational level					Total
		University/ college	Secondary school	Vocation school	Primary school	Lower than primary school	
Deviant	Count	77	81	137	40	5	340
	Column%	15,2%	15,3%	13,4%	18,2%	21,7%	14,8%
Phlegm	Count	136	153	302	71	3	665
	Column%	26,8%	28,9%	29,5%	32,3%	13,0%	28,9%
Stressful	Count	121	157	333	75	11	697
	Column%	23,9%	29,7%	32,6%	34,1%	47,8%	30,3%
Balanced	Count	173	138	250	34	4	599
	Column%	34,1%	26,1%	24,5%	15,5%	17,4%	26,0%
Total	Count	507	529	1022	220	23	2301
	Column%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%

Significant differences could be detected in the case of the educational level of the mothers as well ( $p < 0,000$ ). The distribution of the clusters showed a similar pattern as it could be seen in case of the educational level of the fathers.

The children of the mothers without primary educational level can be found in the *stressful cluster* in the highest rate (38,5%) presenting the low self-esteem and the school pressure. The children of the mother with primary educational level can be seen in the *stressful cluster* in the highest ratio as well (38,0%), however, the rate of the students in *phlegm cluster* is high too (30,0%) presenting the negative effect of the low educational level. Concerning mothers with vocational school level, students take part mostly in *stressful* (32,3%) and *phlegm clusters* (29,4%). The children of mothers having secondary educational level can be found mostly in these two clusters as well (the rate of students in the *stressful cluster* is 30,3% and in the *phlegm cluster* is 28,8%), however, the rate of students in the *balanced cluster* is higher in this case (26,1%). Concerning the mothers having higher educational level (university or college), the predominance of the *balanced cluster* membership is obvious (32,8%) which shows, as it was visible in case of the fathers as well, the positive effect of the parents' high educational level on health-related behaviour, self-esteem and academic achievement too. The distribution of the clusters regarding the educational level of the mothers can be seen in Table 3.

TABLE 3. *The differences between the clusters regarding the educational level of the mother (Source: HBSC 2014, N=2732).*

		Mother's educational level					
		University/ college	Secondary school	Vocation school	Primary school	Lower than primary school	Total
Deviant	Count	95	121	93	51	5	365
	Column%	14,7%	14,8%	15,7%	16,3%	19,2%	15,3%
Phlegm	Count	173	235	174	94	5	681
	Column%	26,8%	<b>28,8%</b>	<b>29,4%</b>	<b>30,0%</b>	19,2%	28,5%
Stressful	Count	166	247	191	119	10	733
	Column%	25,7%	<b>30,3%</b>	<b>32,3%</b>	<b>38,0%</b>	<b>38,5%</b>	30,6%
Balanced	Count	212	213	133	49	6	613
	Column%	<b>32,8%</b>	26,1%	22,5%	15,7%	23,1%	25,6%
Total	Count	646	816	591	313	26	2392
	Column%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%

### 3.3 Gender and grade

We examined the differences regarding gender as well. It can be stated that the distribution of the clusters is significant based on the variance analysis ( $p < 0,000$ ). The biggest part of the boys belongs to the *phlegm cluster* (35,5%) thus they have high self-esteem and self-rated health, however, the traditional health-damaging behaviours are typical for them, additionally, they feel a lower level of schoolwork pressure. The rate of belonging to this cluster is lower among

girls (22,1%). Contrary, the majority of the girls take part in the *stressful cluster* (39,3%) thus these girls have lower self-esteem, which is fundamentally typical for girls, worse self-rated health, even health-damaging behaviours are not typical for them, additionally, the school pressure and perceived anxiety is higher, which is also typically high among girls according to the literature, however, only 21,2% of the boys belong to this cluster. In addition, it is conspicuous that 27,4% of the boys belong to the *balanced cluster* (thus they live healthily, perceive themselves healthy, have positive self-esteem and a positive perception about schoolwork and the evaluation of the teachers), meanwhile only 23,8% of the girls can be categorized in this group. Regarding the *deviant cluster*, no conspicuous difference can be detected. The results of the variance analysis can be regarded in Table 4.

TABLE 4. The distribution of the genders in the clusters (Source: HBSC 2014, N=2732).

		Boy	Girl	Total
Deviant	Count	209	210	419
	Column%	15,9%	14,8%	15,3%
Phlegm	Count	466	313	779
	Column%	35,5%	22,1%	28,5%
Stressful	Count	279	557	836
	Column%	21,2%	39,3%	30,6%
Balanced	Count	360	337	697
	Column%	27,4%	23,8%	25,5%
Total	Count	1314	1417	2731
	Column%	100,0%	100,0%	100,0%

Finally, the differences regarding the *grade* of the students were investigated which is presented in Table 5. Regarding the results of the variance analysis, a significant difference could be detected in the distribution of the clusters ( $p < 0,000$ ). Concerning the distribution of the *phlegm* and *stressful clusters*, the difference of the distribution is not conspicuous as the rates of these clusters are similar in the 9<sup>th</sup> and 11<sup>th</sup> grade as well. However, it is visible that the rates of the *deviant* and *balanced clusters* roughly change place. In the 9<sup>th</sup> grade, only 11,9% of the students take part in the deviant cluster while this rate is 19,6% in the 11<sup>th</sup> grade which shows well that the prevalence of health-damaging behaviours increases with age. Contrary, 28,3% of the students belong to the balanced cluster in the 9<sup>th</sup> grade but this ratio is 22% in the 11<sup>th</sup> grade, demonstrating the increase of the learning burden which has a negative influence on academic achievement, moreover, it correlates negatively with health behaviour as the anxiety and burn-out caused by schoolwork pressure goes together with the try-out and subsistence of health-damaging behaviours. Beside this, students are experiencing what kind of ability they have and which future perspectives can be available for them, in which direction can they

continue their life and further education thus among students, who evaluate negatively their performance and do not care about academic achievement, pressure and the evaluation of the teachers, the prevalence of health-risk behaviour is higher.

TABLE 5. The distribution of the clusters in the 9<sup>th</sup> and 11<sup>th</sup> grades (Source: HBSC 2014, N=2732).

		Deviant	Phlegm	Stressful	Balanced	Total
9th grade	Count	180	425	475	427	1507
	Row%	11,9%	28,2%	31,5%	<b>28,3%</b>	100,0%
11th grade	Count	240	354	361	270	1225
	Row %	<b>19,6%</b>	28,9%	29,5%	22,0%	100,0%
Total	Count	420	779	836	697	2732
	Row %	15,4%	28,5%	30,6%	25,5%	100,0%

### 3.4 The territorial differences between the clusters

The cluster distribution shows a huge difference in the regions which is significant regarding the results of the variance analysis ( $p < 0,000$ ) (Table 6, Figure 7). The most efficient region can be detected in the capital city and its area. In this region, the rate of students in the phlegm and stressful cluster is above the average.

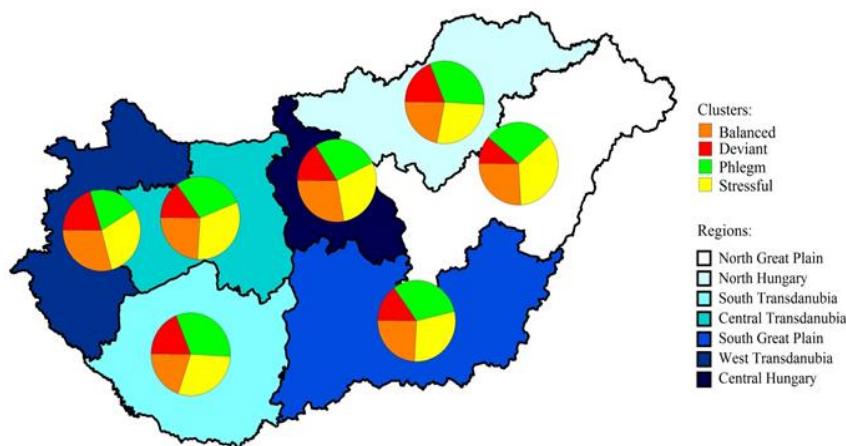
TABLE 6. The distribution of the clusters in the different regions (Source: HBSC 2014, N=2732).

		Deviant	Phlegm	Stressful	Balanced	Total
Central Hungary	Count	129	222	243	232	826
	Row%	15,6%	26,9%	<b>29,4%</b>	28,1%	100,0%
Central Transdanubia	Count	58	116	127	97	398
	Row%	14,6%	29,1%	<b>31,9%</b>	24,4%	100,0%
West Transdanubia	Count	32	35	48	48	163
	Row%	<b>19,6%</b>	21,5%	<b>29,4%</b>	<b>29,4%</b>	100,0%
South Transdanubia	Count	45	74	69	46	234
	Row%	19,2%	<b>31,6%</b>	29,5%	19,7%	100,0%
North Hungary	Count	49	82	68	57	256
	Row%	<b>19,1%</b>	<b>32,0%</b>	26,6%	22,3%	100,0%
North Great Plain	Count	66	166	204	152	588
	Row%	11,2%	28,2%	<b>34,7%</b>	25,9%	100,0%
South Great Plain	Count	41	84	77	65	267
	Row%	15,4%	<b>31,5%</b>	28,8%	24,3%	100,0%
Total	Count	420	779	836	697	2732
	Row%	15,4%	28,5%	30,6%	25,5%	100,0%

In the background can be found in the phenomenon of the capital city as it is the engine of the economy and public life thus the educational level of the parents is much higher here. West Transdanubia owns the second-best result which can be regarded as the region of the extremities as the ratio of the deviant

students is the highest here with the highest ratio of the balanced students. This region is the best situation in the country thanks to its western position as it is the second-best area from the economic point of view, the rate of industrial workers is high and it is the migration target of the graduates. Corresponding to this, the rate of students with a safe parental background (with a stable financial background and high income) is high. As a stable family background is typical here, students can have an available source which they can spend on substance. While the schoolwork pressure is lower, as they do not live in the capital city where students have to achieve well, the ratio of balanced students can be higher too. The academic achievement is similar in Central Transdanubia and South Great Plain and the distribution of the clusters is similar too, however, stressful students are overrepresented in the first while phlegm students are in a higher ratio in the latter. In Central Transdanubia, higher economic achievement, better societal composition and the propinquity of the capital city can contribute to the better achievement while the reasons can be found in the societal traditions in the South Great Plain as parents want to teach their children in secondary grammar schools in this region.

FIGURE 1. The distribution of the students on the basis of the clusters (Source: HBSC 2014, N=732).



The South Transdanubia can be mentioned as one of the lagging areas of the county which can be seen regarding the academic achievement of the students as well. The rate of deviant and phlegm students is above the average while the rate of balanced students is the lowest in this region. North Hungary



and the North Grate Plain owns the lowest academic achievement which can be caused by the low societal composition, the poor economic achievement and the high rate of gipsy students, which is the highest in the county and is one of the biggest challenges of the Hungarian educational system, furthermore, the ratio of disadvantaged students is high as well which aggravates the situation. North Hungary can be regarded as the most health-damaging region as the ratio of deviant and phlegm students is the highest here while the rate of stressful students is higher in the North Grate Plain.

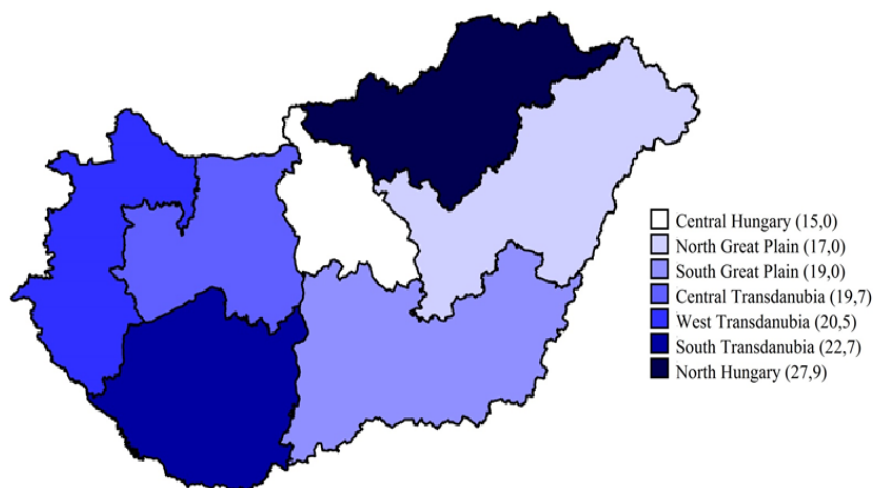
### **3.5 International outlook**

Finally, an international comparison was made regarding self-rated health between girls and boys as the data of this variable are available in each investigated counties in the HBSC 2014 survey. On this basis, the rate of students with poor or fair self-rated health was examined, the Hungarian distribution was explored and it was compared the results of the investigated countries.

Concerning the results of the HBSC 2014 survey, Hungary can be seen in the eighth place regarding the 15-year-old children who perceive their health as poor or fair. 25% of the Hungarian girls rate their health as fair or poor while the international mean is 21% thus the rate of girls with lower self-rated health is higher. Regarding the 15-year-old boys, the international mean is 13% while the Hungarian mean is 18% thus a higher ratio can be seen in the case of boys as well.

Regarding the results of the boys, which can be seen in *Figure 2*, it can be stated that the rate of boys who rate health as fair or poor is the lowest in Central Hungary and the North Grate Plain. In the first, the high socio economic status and the high parental educational level can a causing factor which can provide emotional safety and balance for the children, increasing the subjective well-being and self-esteem. In the latter, low socio economic status is typical; however, the distribution of the clusters showed higher self-esteem and self-rated health. This can be caused by the bigger cities of the region as supporting factors as the prevalence of health-damaging behaviour is lower while academic achievement and self-esteem are better in bigger settlements. Contrary, the rate of students with fair or poor self-rated health is the biggest in the North Grate Plain. In its background can stand the low socio economic status of the region which correlates positively with health-risk behaviours while negatively with self-esteem and self-rated health. It is important to note that the differences between the regions are not significant ( $p=0,363$ ) thus consequences of territorial difference cannot be stated.

FIGURE 2. Self-rated health among boys (15-year-old boys who rate their health as fair or poor, %, Source: HBSC 2014, N=732).

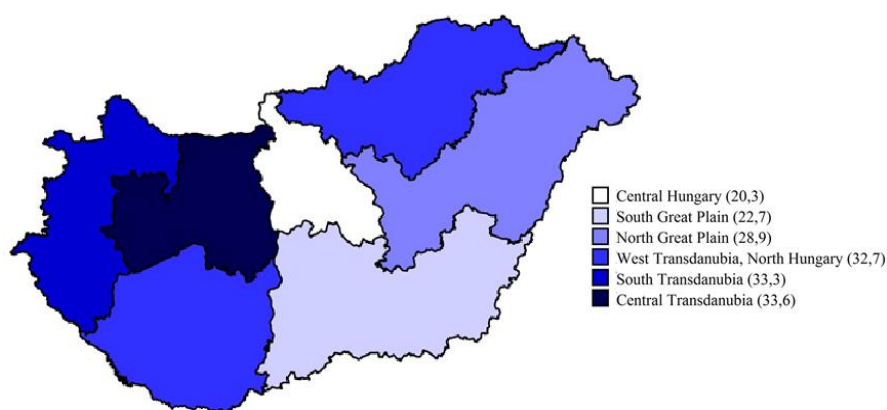


According to the international data of the HBSC survey, it can be stated that the Hungarian mean of the 15-year-old students with fair or poor self-rated health is 15%. The results of Central Hungary, which owns the best results, tend to the German, Dutch, Czech and Slovakian trends. The data of Central Transdanubia and South Grate Plain, where the rates are under 20%, converge to these results as well while the results of the West-and South-Transdanubia are nearer to the Central-European countries (Romania, the Czech Republic and Poland). The results of North Hungary, which owns the worst ratio, outstandingly surpass the international mean.

Regarding the results of the girls (*Figure 3*), it is clear that the rate of students with fair or poor perceived health is much higher compared to the international mean. The differences in the distribution are not significant, however, it can be detected as a tendency ( $p=0,086$ ). Central Hungary owns the best results which can be described as a region with a stable financial position. Positive self-rated health can be directly caused by the high socio economic status of the families and high educational level of the parents which correlates positively with the students' self-esteem and subjective well-being thus with the self-rated health as well. The rate of girls with negatively rated health is outstandingly high is Central Transdanubia, West Transdanubia, South Transdanubia and North Grate Plain. In the case of the latter, low socio economic status can be an explaining factor as lower socio economic status is

typical in this region. In case of the former regions, higher schoolwork pressure can explain the lower self-esteem and because of this the lower self-rated health too.

FIGURE 3. *Self-rated health among girls (15-year-old girls who rate their health as fair or poor, %, Source: HBSC 2014, N=762).*



According to the results of the international HBSC 2014 survey, the Hungarian mean of the 15-year-old girls who evaluated their health as fair or poor is 25%. In our study, the ratios surpassed the international mean in every area except Central Hungary. While the data of Central Hungary tended to the German, Czech and Dutch results as the means of the prevalence are under 20%, the results of the students living in Central, West and South Transdanubia and North Hungary can be matched to the Central-Eastern European countries (Romania, Ukraine and Poland). The data of the North and South Grate Plain go together with the Russian results.

Regarding the results of the study, a visible difference can be detected among boys and girls as the rate of those who rate their health poor or fair is lower among boys in every region in comparison with girls. However, the rate of negatively evaluated health is higher in the case of boys and girls as well compared to the international average.

#### 4. Discussion

In our study, the relationship between students' health behaviour and academic achievement was investigated. According to the frequency of

smoking, alcohol consumption and substance use, self-esteem, self-rated health, perceived schoolwork pressure and teachers' evaluation about academic achievement, four student clusters were separated. Based on the results, it can be said that although many students are aware of the damaging consequences of the health-risk behaviours, they do not take it into account and the knowledge is not a retentive factor, as it could be seen in case of phlegm students in the present study.

The effect of the educational level of the parents was conspicuously detectable as both the father's and mother's educational level has a significant influence on the students' health behaviour and self-esteem. The protective effect of the high parental educational level is outstanding as parental university or college certificate leads more likely to balanced cluster membership while low educational level leads more likely to deviant or phlegm cluster membership.

Gender has a significant effect as well. Reflecting the higher level of the anxiety of the girls, the prevalence of belonging to the stressful cluster is higher which demonstrates the higher level of desire for achievement and meeting the expectations. In case of boys, the rate of balanced students is higher which points out the lower level of the anxiety among them, however, the rate of deviant and phlegm cluster members is higher too, presenting the higher level of risky behaviour and sensation-seeking motivation.

The effect of the school grade is remarkable as a significant difference could be detected between the 9th-and 11th-graders regarding balanced and deviant cluster membership. The former is more likely among the 9th graders while the latter is more likely among 11th graders, demonstrating the continuous increase of the schoolwork pressure and the prevalence of health-damaging behaviour with the age. Because of this, prevention is the most important in this life stage. It is worth to reconsider the possibilities of the prevention from the perspectives of the school and the society as well.

Also, significant differences can be mentioned concerning territorial differences. The ratio of balanced students is the highest in the West Transdanubia which reflects the lower level of schoolwork pressure compared to the capital city and its agglomeration which leads to higher self-esteem and better academic achievement. The reason for the high rate of stressful students in Central Hungary, Central and West Transdanubia can be searched in the high achievement pressure. The rate of the deviant students is the highest in West Transdanubia and North Hungary which can be explained by the good financial status in case of the former while by the family patterns in case of the latter. The prevalence of phlegm students is the highest in the South Transdanubia, North Hungary and South Grate Plain which can be caused by the disadvantaged situation of the students. Furthermore, it is visible that the academic achievement and health behaviour of the students is better in regions

where the economic development is high which correlates to the results of the previous research (Pikó et al., 2005; Kovács, 2018, Kovács, Nagy, 2019).

Results show that health-behaviour and self-rated health should be strongly emphasized in school life. Teachers must have the ability to detect the objective and subjective health status of the child which has a huge influence on academic achievement or on the perceived pressure by school. This is visible, for instance, among disadvantaged children where the pedagogical added value of the teacher and the institution is indisputable. However, it is common that students have too many subjects and contact lessons in secondary education which also leads to overwhelmed students. It would be important to decrease the number of mandatory lessons in this age (9th grade) to provide enough free-time for the students for other healthy leisure-time activities. Also, different health clusters may be characterized with different personality traits and mental health problems (Joyner et al., 2018). Group memberships, creative therapeutic, music and near-natural experiences and their own experiences of the team building can help them in social level, beyond the family social support. Thus, it is worth availing the possibilities and increasing the mental health facilities with the elaboration of appropriate programs. In a wider perspective, the results of the international comparison also urge this need for development and indicate to improve the health-awareness and academic achievement of the students, especially in the disadvantaged regions.

One of the biggest strength of the research is that the data collection followed stratified sampling and is representative for the nations which provide a more precise basis for national and international comparison for us. Furthermore, the measures of health behaviour are validated although the measure of school pressure and academic achievement is based on subjective evaluation which could be better if the objective learning indexes and GPAs would be available. However, we still have to emphasise that it is the best way to make international comparisons based on representative samples involving health awareness and academic achievement too.

In conclusion, based on objective and subjective health characteristics and perceived academic achievement, deviant, phlegm, balanced and stressful clusters can be categorized among the Hungarian 9th-and 11th-graders. The educational level of the parents and gender had a significant influence on cluster distributions. Also, significant territorial differences could be found, indicating the perceived mental health is in West Transdanubia and worse in Central and North Hungary indicating that the health patterns of the students follow the economic and socio-economic inequalities of the country. In an international outlook, the ratio of students with poor self-rated health is higher among Hungarian students both regarding boys and girls, highlighting the disadvantages of Hungary compared to the Western-European countries.

## References

- Allen, J. (2008), The attachment system in adolescence, in Cassidy, J., Shaver P. (eds), *Handbook of Attachment: Theory, research and clinical applications*, New York, The Guilford Press, 419-435.
- Anda, R. F., Croft, J. B., Felitti, V. J., Nordenberg, D., Giles, W. H., Williamson, D. F., Giovino, G. A. (1999), Adverse childhood experiences and smoking during adolescence and adulthood, *JAMA*, vol. 282, n. 17, 1652-1658.
- Avenevoli, S., Merikangas, K. R. (2003). Familial influences on adolescent smoking, *Addiction*, vol. 98, Suppl 1, 1-20.
- Balluerka, N., Gorostiaga, A., Alonso-Arbiol, I., Aritzeta, A. (2016), Peer attachment and class emotional intelligence as predictors of adolescents' psychological well-being: A multilevel approach, *Journal of Adolescence*, 53, 1-9.
- Barabás K., Nagy L. (2012), Health status and health behaviour. [Egészségi állapot, egészségmagatartás.], in Csapó B. (ed.), *School in the balance. [Mérlegen a magyar iskola]*, Budapest, Nemzeti Tankönyvkiadó Zrt., 477-511
- Brassai, L. (2010), *Response for the risky society: the belief into the meaning of the life. [Válasz a kockázati társadalomra: az élet értelmességébe vetett hit.]*, Sepsiszentgyörgy, T3 Publisher.
- Cox, R. G., Zhang, L., Johnson, W. D., Bender, D. R. (2007), Academic performance and substance use: findings from a state survey of public high school students, *Journal of School Health*, vol. 77, n. 3, 109-15.
- de Hoog, N., van Dinther, S., Bakker, E. (2000), Socioeconomic Status and Health-Compromising Behaviour: Is it All About Perception?, *Europe's Journal of Psychology*, vol. 16, n. 3, 498–513.
- Demetrovics Zs. (2001), *Substance use in the pleasure grounds of Hungary. [Droghasználat Magyarországon táncos szórakozóhelyein]*, Budapest, L'Harmattan Publisher.
- Derdikman-Eiron, R., Indredavik, M. S., Bratberg, G. H., Taraldsen, G., Bakken, I. J., Colton, M. (2011), Gender differences in subjective well-being, self-esteem and psychosocial functioning in adolescents symptoms of anxiety and depression: Findings from the Nord-Trøndelag health study, *Scandinavian Journal of Psychology*, vol. 52, n. 3, 261-267. DOI: 10.1111/j.1467-9450.2010.00859.x
- de Matos, M. G., Camacho, I., Reis, M., Costa, D., Galvão, D., Team Aventura Social (2016), Worries, coping strategies and well-being in adolescence: highlights from HBSC study in Portugal, *Vulnerable Children and Youth Studies*, vol. 11, n. 3, 274-280.
- Do, U. P., Edlund, B., Stenhammar, C., Westerling, R. (2014), Vulnerability to unhealthy behaviours across different age groups in Swedish Adolescents: a

- cross-sectional study, *Health Psychology and Behavioral Medicine*, vol. 2, n. 1, 296-313.
- Droomers, M., Schrijvers, C. T., Casswell, S., Mackenbach, J. P. (2005), Farthers' occupational group and daily smoking during adolescence: patterns and predictors, *American Journal of Public Health*, 95(4), 681-8.
- Engels, R. C. M. E., ter Bogt, T. (2001). Influences of risk behaviours on the quality of peer relations in adolescence, *Journal of Youth and Adolescence*, vol. 30, n. 6, 675–95.
- Fagan, P., Brook, J. S., Rubenstone, E., Zhang, C. (2005), Parental occupation, education, and smoking as predictors of offspring tobacco use in adulthood: a longitudinal study, *Addiction Behaviour*, vol. 30, n. 3, 517-29.
- Fergusson, D., Horwood, I., Beautrais, A. (2003), Cannabis and educational achievement, *Addiction*, vol. 98, n.12, 1681-92.
- Gray-Burrows, K., Taylor, N., O'Connor, D., Sutherland, E., Stoet, G., Conner, M. (2019), A systematic review and meta-analysis of the executive function-health behaviour relationship, *Health Psychology and Behavioral Medicine*, vol. 7, n. 1, 253-268.
- Hanson, M. D., Chen, E. (2007), Socioeconomic status and health behaviors in adolescence: a review of the literature, *Journal of Behavioral Medicine*, vol. 30, n. 3, 263–85.
- Haight, H. M., Rose, J. P., Brown J. A. (2016), Social-class indicators differentially predict engagement in prevention vs. detection behaviours, *Psychology & Health*, vol. 31, n. 1, 21-39,
- Inchley, J., Currie, D., Young, T., Samdal, O., Torsheim, T., Augustson, L., Mathison, F., Aleman-Diaz, A., Molcho, M., Weber, M., Barnekow, V. (2016), *Growing up unequal: gender and socioeconomic differences in young people's health and well-being. Health Behaviour In School-Aged Children (Hbsc) Study: International report from the 2013/2014 survey. (Health Policy for Children and Adolescents, No. 7)*, Copenhagen, WHO Regional Office for Europe.
- Joyner, C., Rhodes, R. E., Loprinzi, P. D. (2018), The Prospective Association Between the Five Factor Personality Model With Health Behaviors and Health Behavior Clusters, *Europe's Journal of Psychology*, vol. 14, n. 4, 880–896.
- Kandel, D. B., Wu, P., Davies, M. (1994), Maternal smoking during pregnancy and smoking by adolescent daughters, *American Journal of Public Health*, vol. 84, n. 9, 1407–1413.
- Kovács, K., Ceglédi, T., Csók, C., Demeter-Karászi, Zs., Dusa, Á. R., Fényes, H., Hrabéczy, A., Kocsis, Zs., Kovács, K. E., Markos, V., Máté-Szabó, B., Németh, D. K., Pallay, K., Pusztai, G., Szigeti, F., Tóth, D. A., Váradi, J. (2019), *Lemorzsolódott hallgatók [Dropped-out students]*, Debrecen, DuPress.
- Kovács, K. E. (2018), The characteristics and territorial distribution of health-behavioural clusters among students, in Keresztes, G., Szabó Cs, (eds),

- Tavaszi Szél 2018 = Spring Wind 2018: Tanulmánykötet [Study volume]*, Budapest, Doktoranduszok Országos Szövetsége, 336-348.
- Kovács, K. E., Nagy, B. E. (2019), Territorial Differences In The Health-Awareness Of Students Learning in Sport Schools in Hungary, *Hungarian Educational Research Journal*, vol. 9, n. 2, 349-353.
- Kovács, K. E. (2020), *Health and learning in educational sports schools [Egészség és tanulás a köznevelési típusú sportiskolákban]*, Debrecen, Center for Higher Education Research and Development.
- Kovács, K. E., Szigeti, F. (2017), Review of protective and risk factors influencing the health-behaviour of adolescents [A serdülők egészségmagatartásában szerepet játszó rizikó- és protektív faktorok áttekintése] in Fábíán, G., Szoboszlai, K., Hüse, L. (eds), *The background of the risk behavior of children and youth living in the margin of the society [A társadalmi periférián élő gyermekek és fiatalok rizikómagatartásának háttere]*, Nyíregyháza, Periféria Egyesület, 17-46.
- Kovacsics, L., Sebestyén, E. (2007), The consumption of illegal substances. [Illegális szerek fogyasztása]. In Németh Á. (Ed.) *Health and lifestyle of adolescents. The national report of the study of school-aged children [Serdülőkorú fiatalok egészsége és életmódja. Az iskoláskorú gyermekek felmérésének Nemzeti jelentése]*, Budapest, National Children Health Institute [Országos Gyermekegészségügyi Intézet], 88–98.
- Legleye, S., Obradovic, I., Janssen, E., Spilka, S., Le Nézet, O., Beck, F. (2009), Influence of cannabis use, grade repetition and family background on the school-dropout rate at the age of 17 years in France, *European Journal of Public Health*, vol. 20, n. 2, 157-163.
- Lohaus, A., Vierhaus, M. & Ball, J. (2009), Parenting styles and health-related behaviour in childhood and early adolescence: results of a longitudinal study, *The Journal of Early Adolescence*, vol. 29, 449-475.
- Moor, I., Rathmann, K., Lenzi, M., Pförtner, T-K., Nagelhout, G. E., de Looze, M., Berndsen, P., Willemsen, M., Kannas, L., Kunst, A. E., Richter, M. (2015), Socioeconomic inequalities in adolescent smoking across 35 countries: a multilevel analysis of the role of family, school and peers, *European Journal of Public Health*, vol. 25, n. 3, 457–463.
- Németh Á. (Ed) (2007), *Health and lifestyle of adolescents. The national report of the study of school-aged children. [Serdülőkorú fiatalok egészsége és életmódja. Az iskoláskorú gyermekek felmérésének Nemzeti jelentése.]*, Budapest, National Children Health Institute. [Budapest: Országos Gyermekegészségügyi Intézet].
- Németh Á. Költő A. (eds, 2014), *Health and health behaviour in school-age 2014. [Egészség és egészségmagatartás iskoláskorban 2014. Az Iskoláskorú gyermekek egészségmagatartása elnevezésű, az Egészségügyi Világszervezettel együttműködésben]*



- megvalósuló nemzetközi kutatás 2014. évi felméréséről készült nemzeti jelentés], Budapest, National Health-Developing Institute [Budapest, Nemzeti Egészségfejlesztési Intézet].
- Ritterman, M. L., Fernald, L. C., Ozer, E. J., Adler, N. E., Gutierrez, J. P., Syme, S. L. (2009), Objective and subjective social class gradients for substance use among Mexican adolescents, *Social Science & Medicine*, vol. 68, 1843–1851.
- Nerini, A., Matera, C., Stefanile, C. (2016), Siblings' appearance-related commentary, body dissatisfaction, and risky eating behaviors in young women, *Revue Européenne de Psychologie Appliquée/European Review of Applied Psychology*, vol. 6, n. 6, 269-276.
- Pikó, B. (2000), Health-Related Predictors of Self-Perceived Health in a Student Population: The Importance of Physical Activity, *Journal of Community Health*, vol. 25, n. 2., 125-137.
- Pikó, B., Luszczynska, A., Gibbons, F. X., Teközel, M. (2005), A culture-based study of personal and social influences of adolescent smoking, *European Journal of Public Health*, vol. 15, n. 4, 393-398.
- Pitel, L., Geckova, A. M., van Dijk, J.P., Reijneveld, S. A. (2010), Gender differences in adolescent health-related behaviour diminished between 1998 and 2006, *Public Health*, vol. 124, n. 9, 512-518.
- Pusztai, G., Kovács, K. E., Kovács, K., Nagy, B. E. (2017), The effect of campus environment on students' health behaviour in four Central European countries, *Journal of Social Research and Policy*, vol. 8, n. 1, 125-138.
- Ronen, T., Hamama, L., Rosenbaum, M., Mishely-Yarlap, A. (2014), Subjective well-being in adolescence: The role of self-control, social support, age, gender, and familial crisis, *Journal of Happiness Studies*, vol. 17, n. 1, 1-24.
- Rosenberg, M. (1965), *Society and adolescent self-image*, Princeton, NJ, Princeton University Press.
- Substance Abuse and Mental Health Services Administration (SAMHSA) (2014), *Results from the 2013 National Survey on Drug Use and Health: Summary of National Findings*, Rockville, MD, Substance Abuse and Mental Health Services Administration.
- Sullivan, R. A., Kuzel, A. H., Vaandering, M. E., Chen, W. (2017), The Association of Physical Activity and Academic Behavior: A Systematic Review, *Journal of School Health*, vol. 87, n. 5, 388-398.
- Székely, A., Susánszky, É., Ádám, Sz. (2013), Health-risk behaviour of youth. [Fiatalok kockázati magatartása.] in Székely L. (ed.), *Hungarian Youth 2012. Study volume. [Magyar ifjúság 2012. Tanulmánykötet.]* Budapest, Kutatópont Kft., 179-210.
- Wardle, J., Steptoe, A. (2003), Socioeconomic differences in attitudes and beliefs about healthy lifestyles, *Epidemiology & Community Health*, vol. 57, n. 6, 440-443.

- White, V. M., Hoper, J. L., Wearing, A. J., Hill, D. J. (2003), The role of genes in tobacco smoking during adolescence and young adulthood: a multivariate behaviour genetic investigation. *Addiction*, vol. 98, n. 8, 1087-100.
- Wichstorm, L. (1998), Alcohol intoxication and school dropout, *Drug Alcohol Review*, vol. 17, n. 4, 413-21.
- Wight, D., Williamson, L., Henderson, M. (2006), Parental influences on young people's sexual behaviour: A longitudinal analysis, *Journal of Adolescence*, vol. 29, n. 4, 473-494.