journal homepage: http://kont.zsf.jcu.cz
DOI: 10.32725/kont.2024.006

KONTAKT / Journal of nursing and social sciences related to health and illness

Original research article

The impact of isolation on the health of adolescents with low socioeconomic status: A longitudinal study during the Covid-19 pandemic

Martina Derzsi-Horváth [1] *, Henrietta Bánfai-Csonka [1, 2], Andrea Masa [1], Bálint Bánfai [2], Zsuzsanna Kívés [3], Attila Szabó [4], Krisztina Deutsch [2]

[1] *University of Pécs, Faculty of Health Sciences, Doctoral School of Health Sciences, Pécs, Hungary*
[2] *University of Pécs, Faculty of Health Sciences, Institute of Emergency Care and Pedagogy of Health, Pécs, Hungary*
[3] *University of Pécs, Faculty of Health Sciences, Institute for Health Insurance, Pécs, Hungary*
[4] *High School and Technical School, Elementary School, Cserepka János Hungarian-English Bilingual Baptist Sports School, Pécs, Hungary*

Abstract
Introduction: The main objective of our research was to measure the impact on health of isolation and online education due to the Covid-19 pandemic, and particularly risk behaviours and mental health in adolescents with low socioeconomic status.
Methods: We used an online questionnaire before (Q1) and after (Q2) the introduction of digital education, which was completed by a total of 212 Hungarian secondary school students. We measured the prevalence of risk behaviours and psychosomatic symptoms: subjective well-being, life satisfaction, self-esteem, sense of coherence, and changes in coping mechanisms among the students.
Results: Stable smoking (p = 0.316), alcohol consumption habits (p = 0.573), and cannabis use (p = 0.607) did not change significantly between the two data sets. Psychosomatic symptoms (p = 0.111), life satisfaction (p = 0.727), self-esteem (p = 0.053) and sense of coherence (p = 0.602) also showed no significant change. However, there was an increase in the level of subjective well-being (p = 0.017) and in the proportion of those who used cognitive restructuring (p = 0.035) or problem-focused coping (p = 0.012) as coping mechanisms.
Conclusion: Digital education had no negative impact on the health indicators of the students with low socioeconomic status. There were no significant changes in risk behaviours between the two surveys, while the students' mental health changed in a positive direction in several aspects.

Keywords: Adolescent; Covid-19; Digital education; Mental health; Risk behaviour

Introduction

Due to the breakout of the coronavirus pandemic in 2019, a number of measures were taken in Hungary after March 2020 to prevent the spread of the virus. One such necessary and drastic step was to close educational institutions. To ensure the learning process was not compromised, online education using technology was introduced. This and the opportunities and difficulties of mixed learning have already been highlighted in the past. With technological resources (computer, internet, user skills, *etc.*), e-learning offers the possibility for anyone to access the information they need, without being tied to a specific location (Dziuban et al., 2018; Pitomber, 2021). In addition to the possibilities of non-traditional education, the unexpected situation also brought with it difficulties such as the lack of teaching skills related to online education, the conversion of educational materials into e-learning materials, the problem of teaching and learning from home, and inadequate material resources (Ali, 2020; Bao, 2020; Zhang et al., 2020).

School is not only a place for education, but also an opportunity to monitor the physical and mental health of young people of school age, to build social relationships and to support their socialisation – which was pushed into the background with the outbreak of the pandemic. This changed the lives of not only the students but also their parents, challenging their psychological resources and affecting their daily activities and interactions. As far as online education was concerned, the pupils were given the task – among other things – of learning the online curriculum, while parents took over the socialisation role of the school, providing the only live, 'present' contact for their children during lockdown. The pandemic brought some families together, as parents could spend some time together with their children.Yet for families that were already dysfunctional, the accumulation of daily interactions became a new source of stress (Singh et al., 2020). Clearly, adaptation to a change in situation varies from one individual to another. Some research suggests that the pandemic increased the amount of time young people spend in front of the screen, while reducing leisure activities and meaningful time with

* **Corresponding author:** Martina Derzsi-Horváth, University of Pécs, Faculty of Health Sciences, Doctoral School of Health Sciences, Vörösmarty M. str 4, 7621, Pécs, Hungary; e-mail: derzsi-horvath.martina@pte.hu
http://doi.org/10.32725/kont.2024.006
Submitted: 2023-08-10 • Accepted: 2024-01-29 • Prepublished online: 2024-02-07
KONTAKT 26/1: 25–31 • EISSN 1804-7122 • ISSN 1212-4117

friends, which are important factors for well-being (Chu et al., 2010; Dunton et al., 2020; Eales et al., 2021; Ilari et al., 2022; Nagata et al., 2020; 2021). Many studies have highlighted the presence of increased anxiety and depression in young people as a result of Covid-19 (Lee, 2020; Zhou, 2020), but others have highlighted the positive effects of online education on mental health, such as reduced somatic symptoms, lower perceived stress, and increased satisfaction with learning (Bolatov et al., 2020; Simon et al., 2022).

Previous research has shown that restrictions due to health-related causes have unintended negative consequences for young people's health (Lancet Child and Adolescent Health, 2019). The psychological damage caused by the pandemic, such as increased distress, mood swings, irritability, insomnia and depression, is now recognised as a fact (Brooks et al, 2020; Rubin and Wessely, 2020; Salari et al., 2020; Wang et al., 2011). However, the extent of this effect is influenced by several factors, such as educational status, financial circumstances, and the presence of mental illness (Santomauro et al., 2021; Singh et al., 2020).

Materials and methods

The main objective of our research was to assess the health impact of the isolation and online education (caused by the Covid-19 pandemic) on Hungarian adolescents of low socioeconomic status. Socioeconomic status can be interpreted in a complex way, giving a picture of the individual's socioeconomic status and family background. To achieve our aim, we examined and compared the risk behaviours and mental health of the chosen vocational school students and their correlations, before and after almost a full academic year of digital education.

Participants

The sampling procedure was non-random selection of classes. The target group of our research were 9–10th grade students at a vocational secondary school in Pécs. They were enrolled in technical, vocational training, and vocational school education. We worked with the same groups (classes) one school year apart in both studies.

Recording the data

The first survey was carried out in September 2020 (Q1) and the second in September 2021 (Q2). A total of 212 students completed the online questionnaires under controlled conditions in school. Of these, 114 students participated in the first survey and 98 students in the second, due to lagging progress. The directors of the institution and the parents also gave their consent to the survey. Participation in the research was voluntary and anonymous. Our research was approved by the Regional Research Ethics Committee (8212-PTE 2020; 8212-PTE 2021).

Measuring instruments

In addition to questions on sociodemographic data (class, gender, age, place of residence, family structure, parents' educational level, family financial situation), the self-administered questionnaire also asked about risk-seeking behaviour (smoking, alcohol, and drug use), using relevant questions from the Health Behaviour in School-aged Children (Németh and Várnai, 2019) study. We wanted to know how often the students smoked, on how many days in the last 30 days they had consumed alcohol, how many times in the last 30 days they had been drunk, and if they had ever used cannabis. Two categories of smoking were created: a stable smoker was defined as a daily smoker, and a regular smoker as someone who smokes at least once a week or more. For the questions on alcohol consumption, we have separated the categories into never drunk alcohol and consumed alcohol/got drunk at least once in the last 30 days. For drug use, we measured the lifetime prevalence of cannabis use. Respondents could indicate the frequency of consumption for 1–30 days, from which two categories were created: those who had never consumed and those who had consumed at least once in their lifetime.

In addition, we measured the prevalence of psychosomatic symptoms among the students in the past 6 months, and we used questionnaires validated in Hungarian to assess mental health indicators such as general well-being, life satisfaction, self-esteem, sense of coherence, and conflict resolution. The characteristics of the latter questionnaires and their internal reliability are presented in Table 1.

Statistical analysis

In the analysis, frequencies were reported for categorical variables and means, standard deviations and medians for continuous variables. The χ^2 test was used to compare the prevalence of risk behaviour between the two data sets, while the Mann–Whitney test was used to test the correlation between different mental indicators and risky behaviour. The results were evaluated using the SPSS 25.00 statistical program (IBM Corp., Armonk, NY, USA), with 95% probability level.

Results

Sociodemographic data

The average age of the participants in the first survey was 16 years and in the second survey 17 years. As the institution is a vocational school, a high proportion of boys participated in the study. Almost half of the students live in a village or small municipality, on average with three other people in the same household. In the first survey, more than half of the sample did not live in a two-parent family, a proportion that fell slightly by the second survey period. More than a quarter of the sample lived in a single-parent family in the first survey and nearly a fifth in the second survey. The resulting decrease, however, showed up as a surplus in the two-parent family and in other categories, indicating a rapid change in family cohabitation patterns. The parents' educational attainment was only below secondary level in 60–70% of both surveys. The sample is largely self-reported to be living in below average financial conditions, which did not show significant variation due to isolation and its effects. Sociodemographic data for the two surveys are presented in Table 2.

Risk behaviour

The number of stable smokers (daily smoking) accounted for more than a third of the sample in the first survey, with a slight decrease in the post-online education survey. The proportion of regular smokers (at least once a week and once a day) was also close to half of the sample, with a similar decline after returning from online education. The trend is the opposite for alcohol consumption compared to smoking. More than half of the sample had consumed alcohol in the month before the first survey, with a minimal increase in the second survey. There was also an increase in getting drunk, and this rate is also close to half the sample. Looking at the prevalence of cannabis use in the sample, there is a minimal increase in the post-online

education period compared to the first survey. Stable smoking (p = 0.316), regular smoking (p = 0.292), alcohol consumption habits (p = 0.573), frequency of getting drunk (0.590) and cannabis use (p = 0.607) were not significantly influenced by online education. The data and results on risk behaviours are presented in Table 3.

Table 1. Characteristics of question sets on mental health

	Statements	Values of the scale	Score	Cronbach alpha value	
				Q1 (n = 114)	Q2 (n = 114)
Psychosomatic symptom scale, Németh and Várnai (2019)	9	1 = seldom or never, 5 = almost daily	9–45	0.837	0.799
WHO Well-being questionnaire (WBI-5-H), Susánszky et al. (2006)	5	0 = not at all characteristic, 3 = totally characteristic	0–15	0.762	0.816
Satisfaction with life scale (SWLS-H), Martos et al. (2014)	5	1 = strongly disagree, 7 = strongly agree	5–35	0.839	0.862
Rosenberg self-esteem scale (RSES-H), Sallay et al. (2014)	10 (5 with reverse scoring)	1 = strongly disagree, 4 = strongly agree	10–40	0.866	0.855
The Sense of coherence scale (SOC-13), Balajti et al. (2007)	13 (5 with reverse scoring)	scale from 1 to 7, with variable endpoints	13–91	0.828	0.705
Ways of coping questionnaire, Rózsa et al. (2017)	16	0 = not typical, 3 = very typical		0.770	0.840
• Cognitive restructuring	7		0–21		
• Stress reduction	3		0–9		
• Problem-focused coping	4		0–12		
• Passive coping	2		0–6		

Table 2. Sociodemographic data in the examined samples

	Q1 (n = 114)	Q2 (n = 114)
Age	16.00 years (1.896)	16.91 years (1.985)
Gender		
boy	92.1%	92.9%
girl	7.9%	7.1%
Residence		
county seat/town	52.6%	52.0%
village/small municipality	47.4%	48.0%
Number of persons living in the household	4.18 persons (1.314)	4.31 persons (1.335)
Family structure (23)		
two-parent family (two biological parents)	48.2%	55.1%
single-parent family (one biological parent)	26.3%	17.4%
restructured family (one biological parent and their new partner)	22.8%	21.4%
other	2.7%	6.1%
Financial situation		
below average	2.6%	5.1%
average	75.4%	72.4%
above average	21.9%	22.4%
Mother's educational level	n = 101	n = 92
below secondary level	58.4%	65.2%
secondary level	27.7%	20.7%
tertiary	13.9%	14.1%
Father's educational level	n = 98	n = 88
below secondary level	68.4%	70.5%
secondary level	28.6%	23.9%
tertiary	3.1%	5.7%

Table 3. Prevalence of risk behaviours in the samples tested

	Q1 (n = 114)	Q2 (n = 114)
Stable smoker		
yes	40.4%	33.7%
no	59.6%	66.3%
Regular smoker		
yes	43.9%	36.7%
no	56.1%	63.3%
Consumed alcohol in the last 30 days		
never	39.5%	35.7%
at least once	60.5%	64.3%
Being drunk in the last 30 days		
never	58.8%	55.1%
at least once	41.2%	44.9%
Cannabis use		
never	83.3%	80.6%
at least once	16.7%	19.4%

Mental health indicators

In general, there was an improvement in the second data collection compared to the situation before one academic year of online education for most mental indicators, but not all indicators showed significant changes. Although the prevalence of psychosomatic symptoms increased, there was no significant difference before and after online education (p = 0.111). Students' overall well-being increased significantly after online education ended (0.017), while their life satisfaction did not decrease significantly (0.727). The students' self-esteem and sense of coherence also increased, but no significant improvement was found for these indicators (p = 0.053; p = 0.602). In terms of the students' ability to resolve conflicts, there was a significant increase in the proportion of students using cognitive restructuring (p = 0.035) and problem-focused approaches (p = 0.012). There is no significant change between the two data sets for those using stress reduction (p = 0.499) and passive coping (p = 0.839) as a coping strategy. Detailed results on mental indicators are presented in Table 4.

Table 4. Characteristics of mental health indicators in the sample

	Q1		Q2	
	Average, st dev.	Median	Average, st dev.	Median
Psychosomatic symptom scale	16.4 ± 7.55	15.1	17.4 ± 6.65	17.0
WBI-5	8.4 ± 3.02	8.0	9.5 ± 3.68	9.0
SWLS-H	24.9 ± 7.23	26.0	24.4 ± 7.64	25.5
RSES-H	28.5 ± 6.03	29.0	30.1 ± 6.94	30.5
SOC-13	56.4 ± 13.29	54.0	57.1 ± 11.20	57.0
Ways of coping questionnaire				
• Cognitive restructuring	11.6 ± 4.38	12.0	13.0 ± 4.55	13.0
• Stress reduction	2.8 ± 2.52	3.0	3.0 ± 2.52	3.0
• Problem-focused coping	6.1 ± 2.85	6.0	6.9 ± 2.85	7.0
• Passive coping	1.4 ± 1.42	1.0	1.5 ± 1.65	1.0

The correlation between mental health and risk behaviour

To measure the relationship between mental health and risk behaviours, we present our results by highlighting one element from each of the groups of health risk behaviours.

Before online education

In the period before the introduction of online education, our results suggest that students who reported a higher proportion of psychosomatic symptoms tended to have a higher proportion of daily smoking (p = 0.025). These students also have higher rates of cannabis use (p < 0.001). Adolescents with low wellbeing were more likely to be stable smokers (p = 0.028) and use cannabis (p < 0.001). Students reporting less satisfaction with life had a higher proportion of daily smoking (p = 0.018) and cannabis derivative use (p = 0.020). The level of coherence was lower in those who were stable smokers (p < 0.001) and had used cannabis derivatives (p = 0.004). Since stress reduction as coping also essentially includes elements that fall within the listed health risk behaviours, a significant correlation was found for each of these elements. Thus, those who preferred this coping method in the first survey period tended to have higher rates of daily smoking (p < 0.001), alcohol consumption in the month prior to the survey (p = 0.003), and cannabis use (p < 0.001).

Returning from online education

Upon returning from online education, students who reported higher rates of psychosomatic symptoms tended to have consumed alcohol more often (p = 0.016) in the past 30 days. Higher rates of cannabis use (p = 0.050) were found for students with a negative life satisfaction, which was also found for students with a lower sense of coherence (p = 0.009). Students who preferred tension reduction in the second data collection period had higher rates of daily smoking (p < 0.001) and cannabis derivative use (p = 0.018). In our study, more people who used problem-focused coping were cannabis users (p = 0.044). Adolescents who use passive coping tend to have higher rates of daily smoking (p = 0.006).

Detailed results on the association between mental health and risk behaviour are presented in Table 5.

Table 5. Correlations between mental health and risk behaviour in the two surveys

Mental indicators	Q1 (n = 114) Q2 (n = 98)	Stable smoking		P-value	Alcohol in the last 30 days		P-value	Cannabisuse		P-value
		Yes	No		Yes	No		Yes	No	
Psychosomatic symptom scale	*Q1*	18.3 ± 8.12	15.0 ± 6.78	0.025	17.2 ± 7.84	15.29 ± 7.01	0.143	22.2 ± 8.31	15.3 ± 6.87	0.001
	Q2	18.3 ± 7.79	17.0 ± 5.91	0.557	18.6 ± 6.63	15.34 ± 6.23	0.016	20.3 ± 8.67	16.8 ± 5.93	0.124
WHO Well-being scale	*Q1*	7.8 ± 3.27	8.9 ± 2.73	0.028	8.17 ± 3.13	8.9 ± 2.79	0.075	6.1 ± 3.07	8.9 ± 2.79	0.001
	Q2	9.8 ± 3.59	9.4 ± 3.76	0.697	9.2 ± 3.32	10.2 ± 4.22	0.141	8.3 ± 4.15	9.8 ± 3.52	0.128
Rosenberg's self-esteem scale	*Q1*	27.7 ± 6.00	29.2 ± 6.02	0.214	28.4 ± 5.99	28.7 ± 6.14	0.687	26.8 ± 6.78	28.9 ± 5.85	0.222
	Q2	28.8 ± 7.04	30.9 ± 6.83	0.105	29.5 ± 7.13	31.1 ± 6.57	0.302	27.5 ± 7.35	30.7 ± 6.75	0.070
Life satisfaction	*Q1*	22.9 ± 7.65	26.4 ± 6.53	0.018	24.0 ± 7.42	26.2 ± 6.80	0.130	21.0 ± 8.57	25.6 ± 6.71	0.020
	Q2	22.6 ± 7.71	25.4 ± 7.47	0.056	24.4 ± 7.00	24.5 ± 8.79	0.613	21.26 ± 8.40	25.2 ± 7.30	0.050
Sense of coherence questionnaire	*Q1*	52.2 ± 12.56	59.7 ± 12.98	0.001	56.3 ± 12.97	56.6 ± 13.91	0.463	48.8 ± 12.01	58.0 ± 13.06	0.004
	Q2	55.3 ± 10.80	58.1 ± 11.39	0.114	55.9 ± 9.89	59.2 ± 13.12	0.267	51.5 ± 7.32	58.4 ± 11.58	0.009
Conflict solving questionnaire										
Cognitive restructuring	*Q1*	11.3± 4.75	11.9 ± 4.09	0.438	11.7 ± 4.27	11.5 ± 4.58	0.940	10.6 ± 5.15	11.9 ± 4.21	0.455
	Q2	14.2± 4.05	12.4 ± 4.71	0.088	13.1 ± 4.21	12.9 ± 5.17	0.932	13.8 ± 5.54	12.9 ± 4.30	0.407
Stress reduction	*Q1*	4.0 ± 2.24	1.8 ± 1.98	0.001	3.3 ± 2.38	2.0 ± 2.05	0.003	4.3 ± 2.19	2.5 ± 2.26	0.001
	Q2	4.5 ± 2.29	2.2 ± 2.28	0.001	3.3 ± 2.48	2.6 ± 2.57	0.165	4.4 ± 2.81	2.7 ± 2.34	0.018
Problem-focused coping	*Q1*	6.3 ± 2.75	5.9 ± 2.30	0.353	6.2 ± 2.56	5.8 ± 2.42	0.371	5.4 ± 3.38	6.2 ± 2.29	0.397
	Q2	7.5 ± 2.76	6.6 ± 2.86	0.105	7.0 ± 2.93	6.8 ± 2.73	0.584	8.0 ± 3.10	6.7 ± 2.75	0.044
Passive coping	*Q1*	2.7 ± 1.78	1.3 ± 1.28	0.418	1.55 ± 1.49	1.2 ± 1.32	0.361	1.9 ± 1.43	1.3 ± 1.41	0.078
	Q2	1.6 ± 1.59	1.1 ± 1.48	0.006	1.59 ± 1.71	1.4 ± 1.57	0.857	2.2 ± 1.87	1.3 ± 1.57	0.060

Discussion

Compared to the European average reported in the HBSC study (Vaičiūnas et al., 2022), our adolescent sample has a high proportion of daily and regular smokers, as well as a high proportion of alcohol drinkers and those who got drunk in the month prior to the survey. During our research, the prevalence of each type of health risk behaviour changed, although not significantly. Like many other studies, the change does not show a consistent picture, as the use of risk behaviours has a multidimensional background, and their emergence and change are influenced by several other mental and social factors. In our study, the proportion of adolescents who smoked shows a minimal decrease during Covid, which is in line with other research on adolescents (Gaiha et al., 2020). Social distancing has had a minimal effect on alcohol consumption, getting drunk, and cannabis use among young people in the study. Research on alcohol consumption patterns has shown mixed results, but in several cases the upward trend we have mentioned is apparent (Chodkiewicz et al, 2020; Dumas et al., 2020; Kapetanovic et al., 2021; Shapiro et al., 2022). The prevalence of illegal substance use in the examined population during the Covid period has been demonstrated by other research (Shrof et al., 2022).

The students in the study had significantly higher subjective well-being ratings in the second data collection, and the positive change in self-esteem was also close to significant. This somewhat contradicts the previous research results, although experts have emphasised in several cases that, for example, adolescents' sleep quality improved, contributing to positive changes in their well-being and quality of life (Dragun et al., 2020; Kerekes et al., 2021). The proportion of those who predominantly used cognitive restructuring and problem-focused coping as coping strategies was also significantly higher after the online education ended. Another example of how to circumvent and avoid problems is the research of Pigaiani et al. (2020) and Türk et al. (2021), in which, for example, adolescents have adapted their daily routines to the changed situation and have adapted their schedules to the online education generated by the pandemic.

In the study of Pigaiani et al. (2020), the researchers also emphasise the positive finding that a large proportion of adolescents made their feelings known to their parents and reassessed their parent-child and sibling relationships, while Türk et al. (2021) linked adolescents' active coping to their physical health.

There is now evidence of a link between poor mental health and risk behaviours (Kaess et al., 2014). Our research showed that, before the year of online education, students with poorer mental health had been more likely to engage in all health risk behaviours. In contrast to previous research (Cao et al., 2020; Kenney et al., 2018), the adolescents we studied did not show as much variation in smoking, alcohol consumption, and cannabis use by mental status after the end of online education.

Limitations of the research

The Covid-19 pandemic was present prior to the one academic year of digital education, and this may have affected the baseline data. We did not examine individual characteristics, school support, or family relationships, which may also have had an impact on the indicators we examined. In our study, the low number of items in each sub-sample is due to the specificity of the target group, which limits the conclusions that can be drawn. Our sample is non-representative, which makes the conclusions drawn primarily applicable to the study group.

Conclusion

The aim of our study was to assess the mental health of Hungarian secondary school students with low socioeconomic status before and after the long-term school closure. In addition, both data sets examined adolescents' health risk behaviours and their changes and association with their subjective well-being, life satisfaction, self-esteem, sense of coherence and coping mechanisms.

Overall, school closures have affected the students' mental health and risk behaviours to varying degrees and in different ways. There was no significant change in any of the risk behaviours examined between the two surveys, but there was a significant increase in the students' subjective well-being and in the proportion of students who preferred cognitive restructuring and problem-focused coping as coping strategies. In addition, their self-esteem and sense of coherence increased, although not significantly. The mental health of the students we studied was strongly associated with the prevalence of risky behaviours. Overall, poorer mental health is more often associated with high rates of smoking, alcohol consumption, getting drunk and drug use, but the periods before and after closing the schools vary greatly. In the period before online education, poorer mental health was associated with stronger risk behaviour, and the same was observed for a smaller proportion of mental indicators in the period after returning from online education.

Examining the two data sets, we can state that the mental health and attitudes towards health-harming behaviours of the Hungarian adolescents with low socioeconomic status were not negatively affected by one school year of school closure. There may be several reasons for this. With the introduction of online education, the desire to conform to school peers has been eliminated through less interaction. At the same time, less contact has also reduced the incidence of bullying in school. With its permissive attitude, online education minimised the learning burden and changed the ways and means of assessment. The home environment, although not socio-economically advantageous, is a safe environment for students, in which, if there is a good parent-child relationship, a relative lack of stress can be experienced. For more than 50% of the students who commuted, the burden of getting to school and managing their lives (*e.g.*, meals) was lifted, while the "constant control" at home helped them to reduce smoking, for example, and the social distance gave them time to reframe their problems and solve them effectively. Taking all this into account, their subjective well-being, an important factor for quality of life, did not decrease when the institutions opened.

Although the Covid-19 pandemic periodically fades out, it is now a part of our lives, and its long-term consequences are not yet known. Even though our target group is not in an advantageous situation from a socioeconomic perspective, our research showed that the closure of schools only negatively affected a few aspects of mental health among the studied Hungarian students, and in the absence of direct experience of school stress, resulted in more positive changes.

Acknowledgments

The authors are grateful to the school directors and the students who participated in this study.

Ethical aspects and conflict of interest

The authors have no conflict of interest to declare.

References

1. Ali W (2020). Online and remote learning in higher education institutes. A necessity in light of Covid-19 pandemic. High Educ Stud 10(3): 16–25. DOI: 10.5539/hes.v10n3p16.
2. Balajti I, Vokó Z, Ádány R, Kósa K (2007). Validation of the hungarian versions of the abbreviated sense of coherence (SOC) Scale and the general health questionnaire (GHQ-12). Mental Health Psychosom 2: 147–161. DOI: 10.1556/Ment·l.8.2007.2.4.
3. Bao W (2020). Covid-19 and online teaching in higher education: A case study of Peking University. Hum Behav Emerg Technol 2(2): 113–115. DOI: 10.1002/hbe2.191.
4. Bolatov AK, Seisembekov TZ, Askarova AZ, Baikanova RK, Smailova DS, Fabbro E (2020). Online learning dure to COVID-19 improved mental health among medical students. Med Sci Educ 31 (1): 183–192. DOI: 10.1007/s40670-020-01165-y.
5. Brooks SK, Webster RK, Smith LE, Woodland L, Wessely S, Greenberg N, Rubin GJ (2020). The psychological impact of quarantine and how to reduce it: rapid review of the evidence. Lancet 395 (10227): 912–920. DOI: 10.1016/S0140-6736(20)30460-8.
6. Cao W, Fang Z, Hou G, Han M, Xu X, Dong J, Zheng J (2020). The psychological impact of the COVID-19 epidemic on college students in China. Psychiatry Res 287: 112934. DOI: 10.1016/j.psychres.2020.112934.
7. Chodkiewicz J, Talarowska M, Miniszewska J, Nawrocka N, Bilinski P (2020). Alcohol consumption reported during the COVID-19 pandemic. The initial stage. Int J Environ Res Public Health 17(13): 4677. DOI: 10.3390/ijerph17134677.
8. Chu PS, Saucier DA, Hafner E (2010). Meta-analysis of the relationships between social support and well-being in children and adolescents. J Soc Clin Psychol 29(6): 624–645. DOI: 10.1521/jscp.2010.29.6.624.
9. Dragun R, Veček NN, Marendić M, Pribisalić A, Divić G, Cena H, et al. (2020). Have lifestyle habits and psychological well-being changed among adolescents and medial students due to Covid-19 lockdown in Croatia? Nutrients 13(1): 97. DOI: 10.3390/nu13010097.
10. Dumas TM, Ellis W, Litt DM (2020). What does adolescent substance use look life during the COVID-19 pandemic? Examining changes in frequency, social contects, and pandemic-related predictros. J Adolesc Health 67(3): 354–361. DOI: 10.1016/j.jadohealth.2020.06.018.
11. Dunton GF, Do B, Wang SD (2020). Early effects of the COVID-19 pandemic on physical activity and sedentary behaviour in children living in the U.S. BMC Public Health 20(1): 1351. DOI: 10.1186/s12889-020-09429-3.
12. Dziuban C, Graham CR, Moskal PD (2018). Blended learning: The new normal and emerging technologies. Int J Educ Technol High Educ 15(1): 3. DOI: 10.1186/s41239-017-0087-5.
13. Eales L, Gillespie S, Alstat RA, Ferguson GM, Carlson SM (2021). Children's screen and problematic media use int he United States before and during the COVID-19 pandemic. Child Dev 92(5): e866–e882. DOI: 10.1111/cdev.13652.
14. Gaiha SM, Cheng J, Halpern-Felscher B (2020). Association between youth smoking, electronic cigarette use, and

COVID-19. J Adolesc Health 67(4): 519–523. DOI: 10.1016/j.jadohealth.2020.07.002.
15. Ilari B, Cho E, Li J, Bautista A (2022). Perceptions of parenting, parent-child activities and children's extracurricular activities in times of COVID-19. Child Fam Stud 31(2): 409–420. DOI: 10.1007/s10826-021-02171-3.
16. Kaess M, Brunner R, Parzer P, Carli V, Apter A, Balazs JA, et al. (2014). Risk-behaviour screening for identifying adolescents with mental health problems in Europe. Eur Child Adolesc Psychiatry 23(7): 611–620. DOI: 10.1007/s00787-013-0490-y.
17. Kapetanovic S, Gurdal S, Ander B, Sorbing E (2021). Reportes Changes in adolescent psychosocial functioning during the COVID-19 outbreak. Adolescents 1(1): 10–20. DOI: 10.3390/adolescents1010002.
18. Kenney SR, DiGuiseppi GT, Meisel MK, Balestrieri SG, Barnett NP (2018). Poor mental health, peer drinking norms, and alcohol risk in a social network of first-year college students. Addict Behav 84: 151–159. DOI: 10.1016/j.addbeh.2018.04.012.
19. Kerekes N, Bador K, Sfendla A, Belaatar M, Mzadi AE, Jovic V, et al. (2021). Changes in adolescents' psychosocial functioning and well-being as a consequence of long-term COVID-19 restrictions. Int J Environ Res Public Health 18(16): 8755. DOI: 10.3390/ijerph18168755.
20. Lancet Child & Adolescent Health (2019). Children's needs in an Ebola virus disease outbreak. Lancet Child Adolesc Health 3(2): 55. DOI: 10.1016/S2352-4642(18)30409-7.
21. Lee J (2020). Mental health effects of school closures during COVID-19. Lancet Child Adolesc Health 4: 421. DOI: 10.1016/S2352-4642(20)30109-7.
22. Martos T, Sallay V, Désfalvi J, Szabó T, Ittzés A (2014). Psychometric characteristics of the Hungarian version of the Satisfaction with Life Scale (SWLS-H). Mental Health Psychosom 15(3): 289–303. DOI: 10.1556/Mental.15.2014.3.9.
23. Nagata JM, Abdel Magid HS, Pettee Gabriel K (2020). Screen time for children and adolescents during the coronavirus disease 2019 pandemic. Obesity 28(9): 1582–1583. DOI: 10.1002/oby.22917.
24. Nagata JM, Cortez CA, Dooley EE, Iyer P, Ganson KT, Pettee Gabriel K (2021). Moderate to vigorous intensity physical activity among adolescents int he USA during the covid-19 pandemic. Prev Med Rep 25: 101685. DOI: 10.1016/j.pmedr.2021.101685.
25. Németh Á, Várnai D (2019). Adolescent lifestyle in Hungary. Budapest: L'Harmattan. ELTE PPK.
26. Pigaiani Y, Zoccante L, Zocca A, Arzenton A, Menegolli M, Fadel S, et al. (2020). Adolescent Lifestyle Behaviors, coping strategies and subjective wellbeing during the COVID-19 pandemic: an online student survey. Healthcare (Basel) 8(4): 472. DOI: 10.3390/healthcare8040472.
27. Pitomber P (2021). Online education: benefits, changes and strategies during and after Covid-19 in higher education. Int J Stud Educ 3(2): 70–85. DOI: 10.46328/ijonse.32.
28. Rózsa S, Purebl Gy, Susánszky É, Kő N, Szádóczky E, Réthelyi J, et al. (2017). Dimensions of coping: Hungarian adaptation of the ways of coping questionnaire. Mental Health Psychosom 3: 217–241. DOI: 10.1556/Mentál.9.2008.3.3.
29. Rubin GJ, Wessely S (2020). The psychological effects of quarantining a city. BMJ 368: m313. DOI: 10.1136/bmj.m313.
30. Salari N, Hosseinian-Far A, Jalali R, Vaisi-Raygani A, Rasoulpoor S, Mohammadi M, et al. (2020). Prevalence of stress, anxiety, depression among the general population during the COVID-19 pandemic: A systematic review and meta-analysis. Global Health 16(1): 57. DOI: 10.1186/s12992-020-00589-w.
31. Sallay V, Martos T, Földvári M, Szabó T, Ittzés A (2014). Hungarian version of the Rosenberg Self-esteem Scale (RSES-H): An alternative translation, structural in variance, and validity. Mental Health Psychosom 15: 259–275. DOI: 10.1556/Mental.15.2014.3.7.
32. Santomauro DF, Mantilla Herrera AM, Shadid J, Zheng P, Ashbaugh C, Pigott MD, et al. (2021). Global prevalence and burden of depressive and anxiety disorders in 204 countries and territories in 2020 due to the COVID-19 pandemic. Lancet 398(10312): 1700–1712. DOI: 10.1016/S0140-6736(21)02143-7.
33. Shapiro I, Gannot RN, Green G, Zigdon A, Zwilling M, Giladi A (2022). Risk behaviors, family support, and emotional health among adolescents during the COVID-19 pandemic in Israel. Int J Environ Res Public Health 19(7): 3850. DOI: 10.3390/ijerph19073850.
34. Shrof A, Fassler J, Fox KR, Schleider JL (2022). The impact of COVID-19 onU.S. adolescents: loss of basic needs and engagement in health risk behaviors. Curr Psychol 22: 1–11. DOI: 10.1007/s12144-021-02411-1.
35. Simon N, Kiss-Tóth E, Fodor B (2022). Positive effect of COVID pandemic ont he depression, stress and insomnia among first-year university students. J Furth Higher Educ 4: 528–539. DOI: 10.1080/0309877x.2022.2143258.
36. Singh S, Roy D, Sinha K, Parveen S, Sharma G, Joshi G (2020). Impact of COVID-19 and lockdown on mental health of children and adolescents: a narrative review with recommendations. Psychiatry Res 293: 113429. DOI: 10.1016/j.psychres.2020.113429.
37. Susánszky É, Konkoly TB, Stauder A, Kopp M (2006). Validation of the short (5-item) version of the WHO Well-being Scale, based on a Hungarian representative health survey (Hungarostudy 2002). Mental Health Psychosom 7: 247–255. DOI: 10.1556/Mental.7.2006.3.8.
38. Türk F, Kul A, Kilinç E (2021). Depression-anxiety and coping strategies of adolescents during the COVID-19 pandemic. Turk J Educ 10(2): 58–75. DOI: 10.19128/turje.814621.
39. Vaičiūnas T, Žemaitaityté M, Lange S, Štelemèkas M, Oja L, Petkevičienė J, et al. (2022). Trends in adolescent substance use: analysis of HBSC data for four eastern european countries, 1994-2018. Int J Environ Res Public Health 19(23): 15457. DOI: 10.3390/ijerph192315457.
40. Wang Y, Xu B, Zhao G, Cao R, He X, Fu S (2011): Is quarantine related to immediate negative psychological consequences during the 2009 H1N1 epidemic? Gen Hosp Psychiatry 33(1): 75–77. DOI: 10.1016/j.genhosppsych.2010.11.001.
41. Zhang W, Wang Y, Yang L, Wang C (2020). Suspending classes without stopping learning: China's education emergency managment policy int he Covid-19 outbreak. J Risk Financial Manag 13(3): 55. DOI: 10.3390/jrfm13030055.
42. Zhou X (2020). Managing psychological distress in children and adolescents following the COVID-19 epidemic: A cooperative approach. Psychol Trauma 12(S1): S76–S78. DOI: 10.1037/tra0000754.