

The Impact of Oral Health Education Difficulties in Disadvantaged Primary Schools

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Abstract

The inadequate social integration of young people from disadvantaged regions is compounded by poor health and lifestyle, which manifests itself as mechanisms of educational disadvantage. Pupils have less access to the resources they need to develop their skills in their home environment, which should be adapted to their specific educational needs with specialized teachers. In this segment of the population, the time spent on health was inadequate even before online education was introduced due to the pandemic. The segregation has worsened their situation, and the lack of digital tools has not reduced the gap. We aimed to explore the lifestyles of primary school pupils in disadvantaged regions to extend the research to pupils with special educational needs and to understand their health behavior through dental status and time spent on oral health, which determines their life chances. The study was conducted in three primary schools in disadvantaged regions in the Abaúj region, Hungary, and 318 pupils (mean age: 10.5±2.5 years) underwent dental screening and survey examinations. The questionnaire focused on nutrition, physical activity, family microenvironment, health behavior, and educational processes during the pandemic. The majority of the students live in large families.

Most students visit the dentist only when they have a toothache; 21.6% do not exercise outside school; 19.1% have already consumed alcohol. Their DMFT average is 5.6 ± 3.5 . Also, 32.7% of the students had a device for online education. A firm increase in the level of preventive activities in minority schools, with the involvement of special education teachers, is crucial for social inclusion and health.

Keywords: prevention, oral health, online lifestyle, disadvantage, special educational needs

Introduction

Health and its preservation have long been of concern to humanity. The World Health Organization has defined the concept of health, and over time it has become increasingly sophisticated, taking into account more and more factors. Nowadays, it includes not only objective measures but also the impact of physical and mental balance on our perception of health and our ability to work. It has come to the point where health behavior patterns are considered when defining the health of a society. We include the lifestyle habits of the given socio-culture, which are best observed in the micro-environment of family, school, and workplace.

Simon (2006) states that the development of good health behavior habits is a pedagogical task, which is significantly influenced by the context and the family, sometimes making the work of the teachers difficult or even impossible. It has been made more difficult by the pandemic situation of recent years; thus, the separation of families and the already little time devoted to developing correct health behavior decreased even more. This state of affairs is particularly valid in disadvantaged regions, families, and schools, where the inaccessibility of the online world has worsened the situation (Kende & Messing, 2020). Thus, indirectly, the study of the disadvantages of online education in these regions can be strongly linked to the deficiencies in oral health education.

Preventive services are underutilized in dental practice in Hungary, both in adult and pediatric dentistry (Pinke et al., 2011), and this has not improved in the last decade. The data of the international research called *Health Behavior of School-aged Children*, carried out every four years with the participation of 45 countries, provides information on the physical health, health-affecting habits (including brushing habits), mental well-being and social relationships of more than two hundred thousand 11, 13 and 15-year-old schoolchildren. According to the latest HBSC research data for Hungary, regarding eating and brushing habits, 24% of boys and 27% of girls eat sweets daily, only 41% eat fruits and vegetables daily, and only 60% of adolescents brush their teeth twice a day (Inchley et al., 2020).

On the utilization of preventive care, Bershell's (2017) study also reports on deficiencies in the US, particularly in low-income, vulnerable populations. Interdisciplinary collaboration, access to dental care, the development of dental education, and the cooperation of dental hygienists are considered essential. Access to dental services and treatments has become even more limited during the pandemic.

Dental caries and periodontal disease are major dental health problems due to their high prevalence and incidence in the world, including Indonesia, and the high cost of treatment also creates a heavy burden on individuals and society (WHO 2003, Nuratni et al., 2010).

Research has shown that children with poor oral health are twelve times more likely to be missing school than those with good oral health (Haque et al., 2010; Kwan et al., 2005). This can be prevented through good oral hygiene education. Prevention is the most significant factor in improving oral health among children with special educational needs, children from low-income families, as well as people with disabilities. Early preventive intervention is paramount for lifelong healthy oral hygiene for children with special educational needs (Shenkin, 2001). Appropriate intervention requires clear, well-developed professional training.

It would be important to include inpatient care and the professional support of children with various mental disorders by specially trained psychopedagogist or special-education teachers. In their case, a preventive, psychosomatic approach is of crucial importance, which can be part of the work of special education, increasing the interdisciplinary nature of preventive and curative work. Time spent on proper health behavior is also valued in these populations through the preventive activities of appropriately trained special educators.

The number of children, adolescents, and young adults with behavioral and performance disorders due to psychological damage to their neuro-emotional and personality development caused by various biological, environmental, social, and psychological impairments is gradually increasing. The numbers were only exacerbated by isolation and confinement during the pandemic.

Health education is any combination of teaching and learning activities that aims to promote the development of positive behaviors and habits to maintain health. In other words, it is essentially behavioral shaping (WHO, 2003). Health education covers several disciplines: medicine, pedagogy, psychology, education, and sociology.

The scope (content) of health education thus expands significantly: it takes into account a person's biological condition (physical health) as well as their mental (mental, emotional,

aspirational) characteristics and social status resulting from social coexistence (socio-economic situation, family harmony, social integration disorders) and it judges what needs to be done in their combined system of impact. (Gritz, 2007, p. 4)¹

In Hungary, there is a serious shortage of health education, especially in schools and health services in disadvantaged communities. Instead of a holistic understanding of health in health education programs in schools, most schools focus only on the physical dimension and not include other dimensions of health, such as social, psychological, hygienic, mental, or emotional areas (Deutsch, 2011). Cintia Horváth (2021) research of school programs revealed that all included an objective focusing on physical activity and avoiding harmful addictions. However, only a few activities focused on mental hygiene, other hygiene, and social relationships, but none mentioned oral hygiene (Horváth, 2021).

The concept of disadvantage includes individuals—and the groups and communities they form—who differ from the average and do not integrate into the given society to various extents. The reasons are multifold, not only low income and poor education or inadequate housing conditions but also the resulting disadvantage in the biological–somatic and mental–spiritual development. These include, for example, educational disadvantages, health reasons, lack of access to health services, inadequate family structure, and functioning.

Currently, the definition of disadvantaged status is based on Article 45 of Amendment 23 of 2013. The criteria for assessing disadvantage include unemployment and poor (inadequate) housing conditions. The cumulative disadvantage situation has changed in the following way:

Seriously disadvantaged (a) a child entitled to regular child protection and a child who has reached the age of majority and for whom at least two of the circumstances set out in paragraph 1(a) to (c) apply, (b) a child in care, c) a young adult in receipt of aftercare who have either a student or pupil status (Child Protection Act, Chapter VIII, § 67(2) a),b),c).² (2013/23 törvény, 67/A § (2))

¹ „Az egészségnevelés feladatköre (tartalma) így lényegesen kitágul: figyelembe veszi az ember biológiai állapotát (testi, szervezeti egészségét) csakúgy, mint a lelki (szellemi, 5 érzelmi, törekvéses) tulajdonságait és a társadalmi együttélésből adódó szociális státuszát (anyagi–gazdasági helyzetét, családi harmóniáját, társadalmi beilleszkedési zavarait) és ezek együttes hatás-rendszerében ítéli meg tennivalóit” (Gritz, 2007, p. 4).

² Halmozottan hátrányos helyzetű a) az a rendszeres gyermekvédelmi kedvezményre jogosult gyermek és nagykorúvá vált gyermek, aki esetében az (1) bekezdés a)-c) pontjaiban meghatározott körülmények közül legalább kettő fennáll, b) a nevelésbe vett gyermek, c) az utógondozói ellátásban részesülő és tanuló vagy hallgatói jogviszonyban álló fiatal felnőtt.

The situation of the Roma population is even more difficult, as they also have to deal with the problems of being a minority and living in extreme poverty. According to the European Union's Roma strategy, Roma and poverty are part of the same set of issues, i.e. the problems of Roma listed in the preamble are in fact problems of poverty³ (Forray, 2011, p. 62).

In Hungary, Roma children are over-represented among disadvantaged pupils, and there is a clear overlap between the spatial location of the Roma population and areas with high proportions of disadvantaged pupils. Two-thirds of the disadvantaged population are registered as vulnerable by child welfare services, with the highest proportions in Borsod-Abaúj-Zemplén and Hajdú-Bihar counties in terms of geographical distribution (Híves, 2015).

In the present study, we investigated the health status, health behavior, and access to health services, including preventive care, of almost 100% of Roma children in primary schools in three little settlements in the underdeveloped region of northeastern Hungary. The data of the KSH in 2016 indicates that the unemployment rate in the settlements covered by the study is far above the national average. The proportion of the child population is 24.8% of the total population, almost twice the national average (Kőrösi & Kiss-Tóth, 2020). In light of these, we may derive that the people living in the region under study are disadvantaged in several respects and that improving their health and preventing their illnesses is a priority socio-public health task.

Objective

In the challenging period of the last two years, curtailing health inequalities has become even more essential, and special education teachers can play a decisive role in this. In the present research, we draw attention to a new way of solving a widespread public health problem, such as access to good oral hygiene. The latter is crucial because social inequalities are also manifested in the oral cavity. Oral health education is recommended for all social groups, and it bears weight in the case of disadvantaged people (Taani, 2002).

A public health approach is necessarily a preventive approach that involves identifying risk factors for various diseases in a social context; therefore, our research is of great importance from a public health perspective. We are determined to raise awareness of the deficiencies in this area among public health professionals. In the research,

³ „A programban a cigányság és a szegénység egyazon kérdéscsoportban jelenik meg, azaz a cigányságnak a preambulumban felsorolt problémái valójában a szegénység problémái” (Forray, 2011, p. 62).

we aim to draw attention to the poor oral health indicators of the most deprived groups by identifying the causes and suggesting possible solutions. As a solution, the possibility of specialized further training courses for teachers, special education teachers, and psychoeducation specialists in preventive oral hygiene is considered. In addition to these, the research also aimed to explore the disadvantages of online education and the digital world for this population, as this may exacerbate health inequalities in health education.

Material and Method

We started the health survey and the screening program by contacting the leaders of the concerned municipalities, health professionals, and educational institutions after obtaining the approval of the ethics committee to do the research (IG-102-298/2018). A declaration of parental consent preceded the examinations. In three disadvantaged settlements in Abaúj county in Hungary, we examined 318 pupils (mean age: 10.5 ± 2.5); the ratio of gender was 47.6/52.4 (female/male) at the elementary school (Szemere, Karsznokvajda, Baktakék) in 2019, 2021. Then a full dental screening of pupils was carried out, complemented by a survey. In the case of smaller age groups, a focus group interview was also completed. After registering their DMFT⁴ and dmft⁵ data (WHO, 1997) and gingival status, the pupils filled in a questionnaire on their oral hygiene, nutritional habits, lifestyle, and online education.

Throughout our observations, we identified the number of decayed (D), missing (M), and filled (F) teeth, and, using this information, we calculated the DMFT index. All participants were examined by the same dental examiner (dr. Ildikó Faragó), and the dental screening examinations were performed in good lighting conditions, with disposable instruments in protective equipment. The clinical diagnostic criteria for dental caries were visually apparent cavitation, discoloration showing through enamel, or visual evidence of recurrent caries. Radiographs were not used in this study.

After data collection, data were recorded and analyzed using SPSS statistical software. In addition to the descriptive statistical analysis (mean, standard deviation, frequency distribution (frequencies), we used T-test, correlation test, and chi-square test.

⁴ The value calculated from the sum of the number of Decayed and Missing and Filled Teeth in permanent teeth in the studied population

⁵ The value calculated from the sum of the number of decayed, missing, filled teeth in primary teeth in the studied population

Results

Socio-economic Background

In our study, 37.04% of the students' families had no piped water in the household (Figure 1), and 73.11% of the participants lived in large families with three or more siblings (Figure 2). The living conditions of children living in large families are modest, often with no running water in the household.

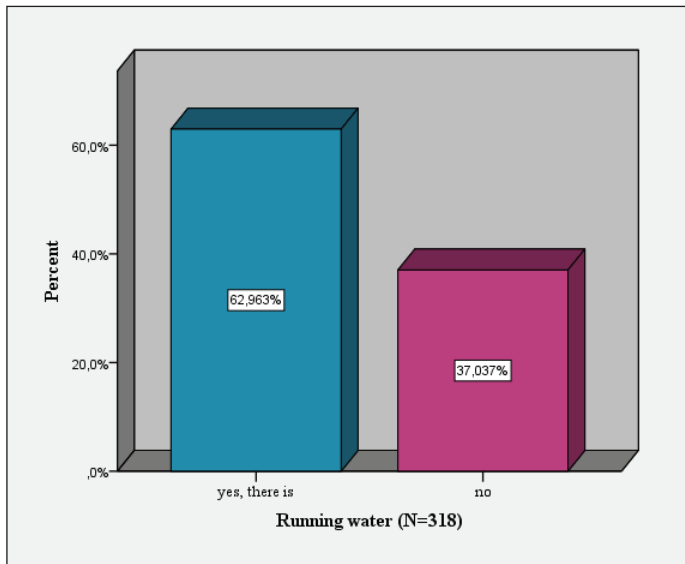


Figure 1

Presence of Piped Water in Pupils' Family (%)

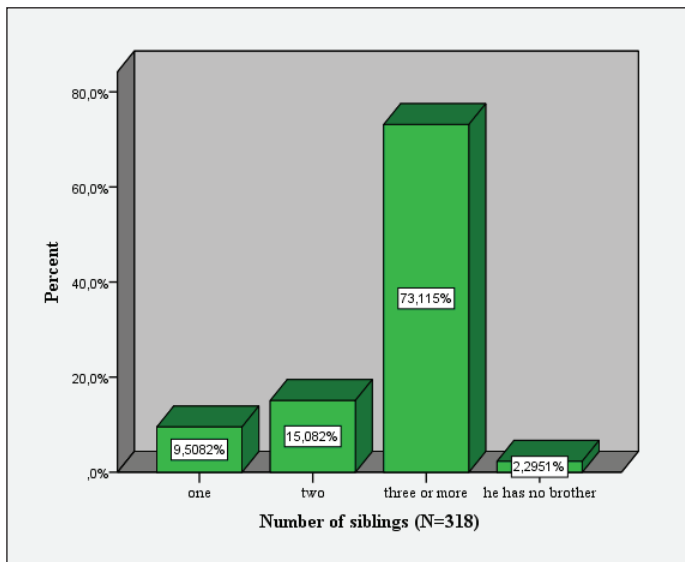


Figure 2

Number of Siblings Among the Pupils

Health Behavior Habits

In terms of habits affecting health, a high percentage of school children do not participate in sports outside school (30.68%), but a high rate of school children drinks alcohol (19.32%) (Kopkáné et al., 2020). The parents of the pupils—neither the mothers nor the fathers—do not typically play sports, so there is no positive role model for the children.

We also looked into their eating habits. About 10% of pupils report having breakfast at home, and 86.5% have a hot meal at home every day. 4.3% of students eat hot meals at home only on weekends, and 9.1% rarely eat hot meals at home.

In terms of alcohol consumption and smoking habits, the numbers are high. In the studied population, 8.5% of pupils smoke, and the average amount is 3.1 cigarettes per day. When asked about alcohol consumption in the study population of Baktakék, 10% of the students answered that they consumed alcohol daily, 11.43% regularly, and 32.86% every time the family got together.

Oral Hygiene and Dentist Visiting Habits

In the total population studied, 48.14% of the students clean their teeth in the morning and evening, while 16.7% only every morning and 10.1% only every evening. However, 13.13% of students clean their teeth occasionally, and 7.07% brush their teeth only when they remember to do that (Figure 3).

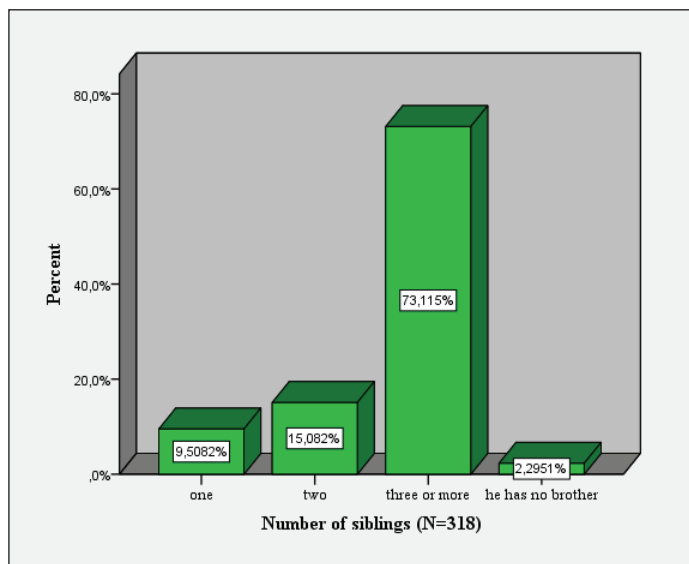


Figure 3
Brushing Habits Among Studied Pupils (%)

When we asked about owning a toothbrush, 83.6% of the pupils answered they had their own toothbrush, and 6.9% claimed that they did not use it at home alone but shared it with other family members. 9.4% of students do not have a toothbrush (Figure 6). Furthermore, 37.8% of students buy a new toothbrush more than once a school year, 34.6% when their hair starts to fall out, and 20.2% when financially dependent. Toothbrush usage by age is shown in Figure 4. According to our data, 18.4% of pupils have never seen their parents brush their teeth (Figure 5).

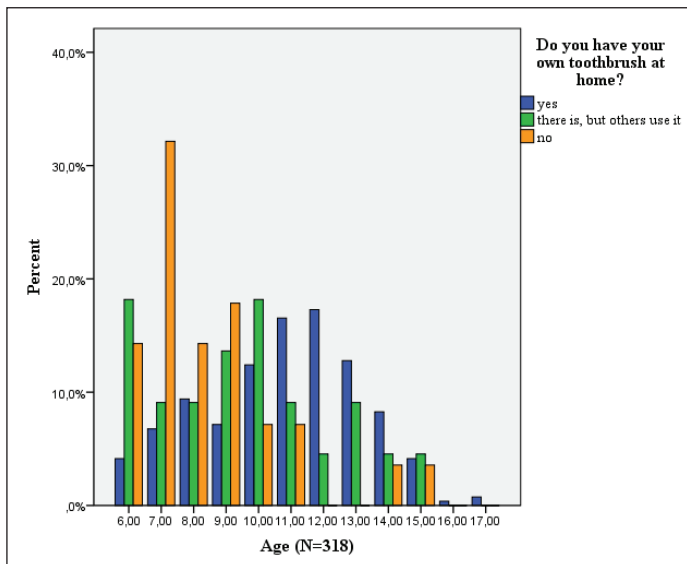


Figure 4
*Toothbrush Use by Age
in the Studied Population*

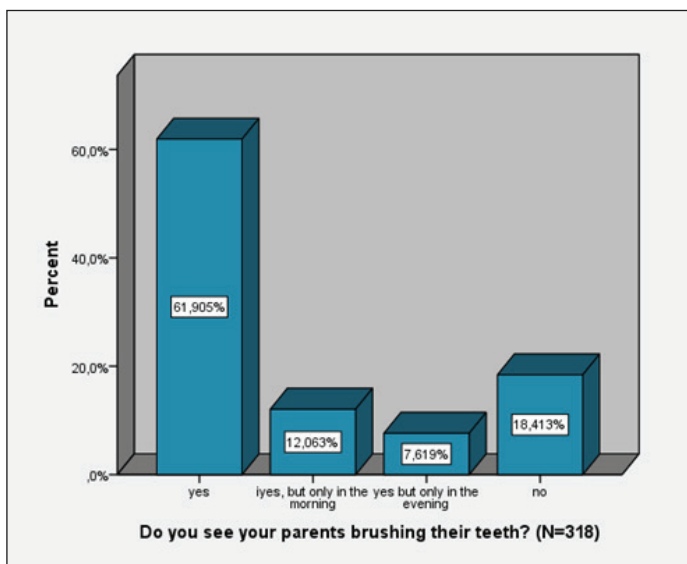


Figure 5
*Whether Pupils Have
Seen Their Parents
Brushing Their Teeth (%)*

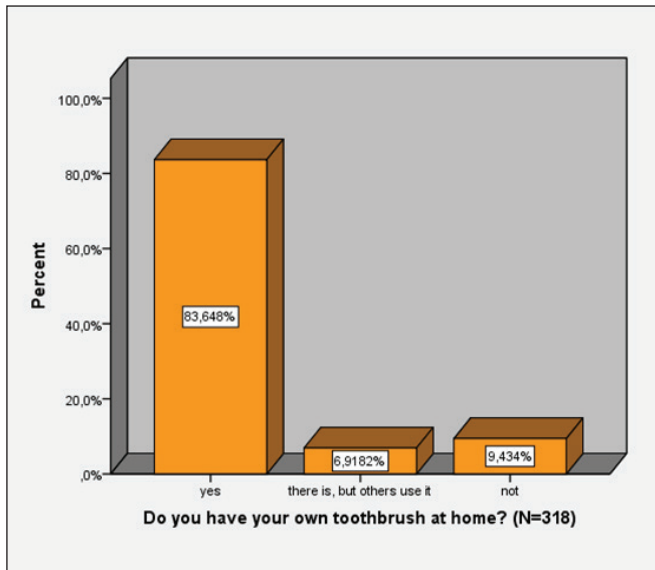
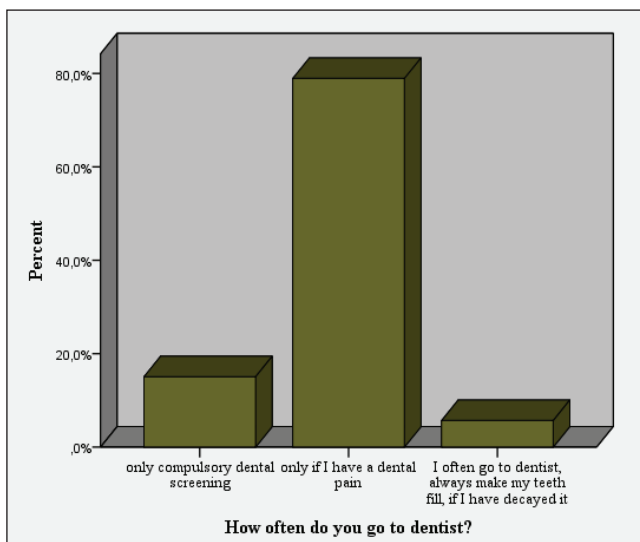


Figure 6
*Toothbrush Ownership
Among Pupils (%)*

There is a weak correlation between the lack of toothbrushes and age ($r = 0.3$), with younger children (6–10 years) being more likely to lack their own toothbrush and sharing toothbrushes being more common in this age group. Children who do not have their personal toothbrushes also tend not to see their parents brushing their teeth ($r = 0.24$; $p < 0.0003$), and they also tend not to have running water in their homes ($r = 0.24$). Regarding their habits of going to the dentist, the highest percentage (78.9%) use the dental service only when they have a toothache, regardless of whether there is a dental clinic in the municipality.



Parents do not take their children back for fillings at all, and only 15.1% of them went to screenings (Figure 7).

Figure 7
*Frequency of Visits to the
Dentist Among Pupils (%)*

Importantly for oral health and prevention, only one of the three settlements in the study has a dental service establishment.

33.1% of students often and 41.8% sometimes eat or drink various candied soft drinks and snacks after brushing their teeth in the evening. Only 25% of students do not consume anything after brushing their teeth in the evening. A significant relationship ($p = 0.05$) was observed between dental health (DMFT) and eating after brushing, which explains the high prevalence of caries in the students (Figure 8).

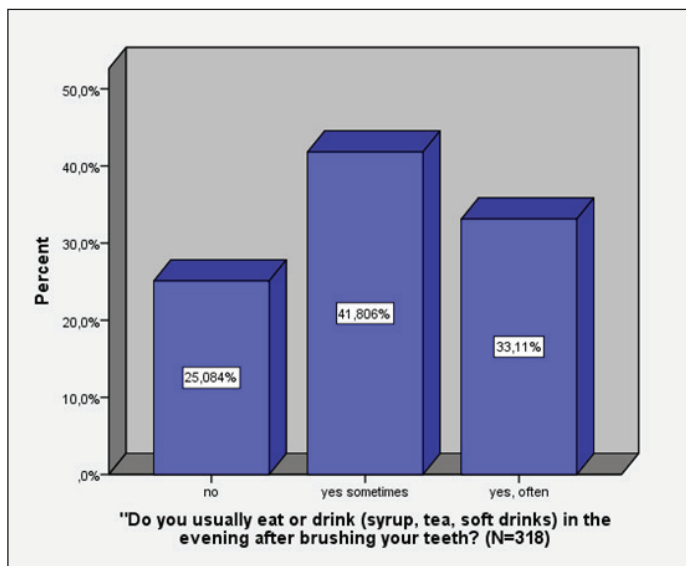


Figure 8

*Frequency of Sugary
Drinks and Food
Consumption
After the Evening
Brushing Procedure (%)*

Dental Health, DMFT/dmft Values

Given that the study population is of primary school age (6–14 years), we examined the condition of permanent and primary dentition separately. The majority of the pupils in the study (192 respondents) still have primary teeth. The mean dmft of primary teeth is 4.07 ± 3.1 (mean \pm S.D.). The minimum index is 1, and the maximum is 13. Several young people reported that all their primary teeth were carious. This data also implies that the oral cavity of these children is already present in preschool-age cariogenic bacterial flora, which also determines the fate of the permanent teeth that will later erupt into this milieu. No filled primary teeth were found in the age group studied. A weak correlation was found between the dmft index and gender ($r = 0.206$), with boys having worse teeth than girls. 61.9% of students had seen their parents brush their teeth, but students with a high dmft index had not seen their parents brush their teeth ($r = 0.472$).

The mean DMFT of permanent teeth was 5.65 ± 3.5 (mean \pm S.D.), with a minimum index of 0 and a maximum of 16. Many students were reported to have a majority of caries in their teeth. A total of 4 filled teeth were found in the study population.

A weak correlation between the DMFT index and gender can be detected ($r = 0.206$), with boys having worse teeth than girls. 61.9% of students saw their parents brushing their teeth regularly (Figure 5), but students with a high DMFT index did not see their parents brushing their teeth ($p < 0.05$). 63.3% of students have acute gingivitis and 36.3% have chronic gingivitis.⁶

Online Education

67% of students did not have digital tools for online education (Figure 9). During the pandemic period, students mainly used pencils, erasers, and books. In connection with how they received the assignments they declared “I was given assignments at lunch on Monday, and had to return them at lunch on Friday,” “we prepared assignments on assignment sheets,” “assignments were sent out, and had to return them every Friday.”

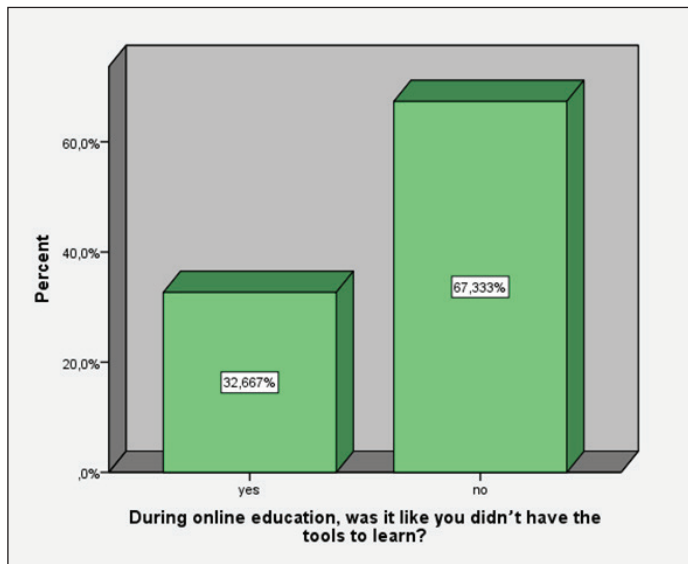


Figure 9

Did Students Have a Digital Tool for Online Education? (%) (yes/no)

⁶ Acute gingivitis: acute, reversible inflammation of the gums without resorption of the underlying alveolar bone, which usually develops as a result of improper brushing.

Chronic gingivitis: prolonged, persistent inflammation of the gums, in which the epithelium of the gum is irreversibly damaged, and the rest of the periodontium becomes diseased.

Students preferred face-to-face teaching to digital (Figure 10), and they rated online education worse than personal teaching (Figure 11).

Figure 10

Rating of Online Education by Students (%)

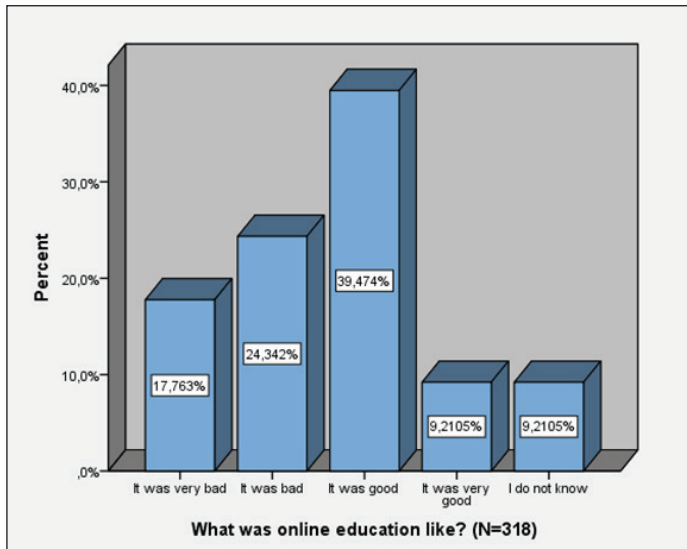
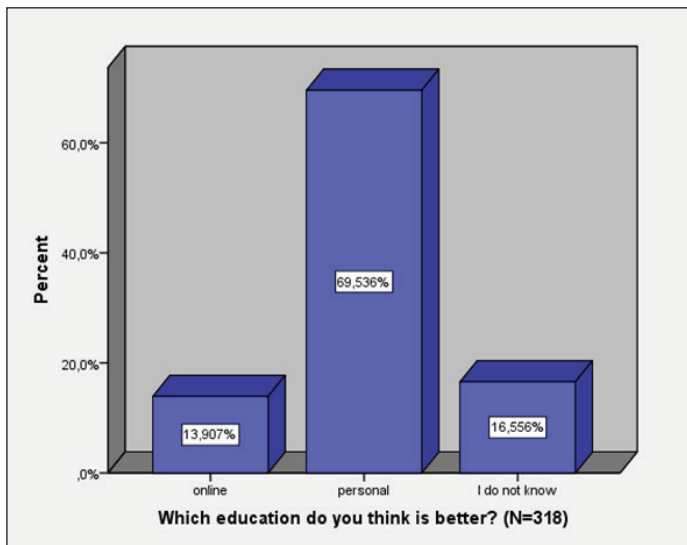


Figure 11

Preference for Types of Education (%)



Discussion

The results clearly show that, in disadvantaged settlements, digital education has widened the gap, expanding the already existing ones. In the area of health education, the lack of digital tools has reduced opportunities to below the minimum due to a further decline in student availability.

The Rosa Parks Foundation, the Motivation Association, and the Partners Hungary Foundation, as part of their joint research in 2020, also concluded that the higher the proportion of disadvantaged and Roma students, the lower the proportion of digital education participants (Kende & Messing, 2020). In a short period, the pandemic's online education imperative has "produced" a high percentage of students who have dropped out of education and health education in these populations. Based on the social situation of the family, there is a very clear gap in the transition to digital education: half of the pupils are "lost" in disadvantaged and Roma classes (Kende & Messing, 2020).

The data mentioned above is in line with our present research, in which 32.7% of pupils had the tools to learn online, and more than 40% had problems and were left behind. This gap is even more striking for health education, especially oral health.

The pathological processes in the oral cavity can take several years to develop into a manifest problem felt by the patient, such as caries with cavities or chronic gingivitis. In school age, the time factor is even more pronounced: the dentin layer of the tooth is thinner, the carious cavity that develops reaches the dental pulp⁷ sooner, and pulpitis develops, which—if left untreated—can lead to tooth loss. In addition, nutritional anomalies are also manifested in the oral cavity, as the initial stage of the alimentary canal. Internal stress and anxiety also cause visible changes in the oral cavity (Faragó, 2013). Therefore, it would be extremely important to increase the level of dental education in these lower-educated families in order to reduce the disadvantages of the rising generation.

Northridge et al. (2020) found in their study that low-income, ethnic minority, immigrant, and rural families in the United States also have suboptimal access to good quality dental care, including preventive care. Disparities in dental health care reflect unequal chances for health, which further marginalizes disadvantaged groups. "As a result, poor oral health serves as the national symbol of social inequality," emphasize the authors (Northridge et al., 2020, p. 513). In addition, they carry common risk factors (e.g., smoking, excessive sugar consumption) and can be the cause of the development of consequential diseases (diabetes, obesity).

⁷ The gelatinous mass that fills the canal located in the innermost part of the tooth; it contains blood vessels, nerves, and connective tissue elements.

Based on our research, we had similar findings (DMFT values in the study population are almost double the national value, high sugar consumption). Teachers (special education teachers) often witness unsolved dental problems in these schools. The pandemic has made these disparities even more pronounced, as in this period, oral health problems have worsened, and the gap has widened. With digital education, the chances of disadvantaged children have further deteriorated, and health education has been pushed into the background. However, health behavior needs to be drastically improved (considering the high proportion of children who smoke and drink alcohol).

The results are strongly influenced by faulty eating habits, snacking after brushing teeth in the evening, not brushing teeth in the evening, and inadequate dental education of pupils.

There may be many pupils in this population who would be special educational needs (SNI), although we did not investigate this. However, we had the opportunity to talk to teachers when filling in the questionnaires, who all agreed that the majority are difficult to manage, maladjusted, with a lot of aggression and behavioral problems, anxiety. Apart from inadequate parenting patterns, this is another possible reason they do not go to the dentist. Special educators and psychoeducation specialists could help a lot by being present in the education of children with SNI. Therefore, our research has been extended to include the study of emotional, intellectual, adjustment, or behavioral developmental disorders (SNI) in child populations, the results of which are currently being processed.

Furthermore, it would be worth comparing the fitness and oral health and “fitness” of children with special educational needs and children with different disabilities. According to Kalbli’s study, these populations have poorer test scores for fitness in children (Kalbli, 2019).

Conclusion

The main factors contributing to the negative results are lack of dental care (total absence of filled teeth), disadvantaged socio-economic status of parents, lack of parental role models, and total lack of motivation of children. Health education professionals and a complex program are needed to improve the current situation to raise the current dental indicators, which are well below the European average, and to rectify harmful health behavior. Furthermore, a major increase in the level of prevention and time spent on prevention is also crucial for social inclusion and health, which can be bridged by the cooperation of specially trained educators with the health care system and families. Raising the level of digital background could also increase the opportunities for online dental education for these groups. Considering the lack of oral health data in disadvantaged

populations in Hungary, the processing, documentation, and publication of the data collected in this study becomes an important and inevitable task for public health professionals, and thus its solution at the national level.

Acknowledgment

This current study was performed in the frames of the Thematic Excellence Program 2021–National Research sub-program, as part of the Creative Region III. project under the ID of TKP2021-NKTA-22, with the support of the National Research, Development and Innovation Office (Hungarian acronym: NKFIH).

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