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Contributing Factors in Adolescents' Mental Well-Being—The Role of Socioeconomic Status, Social Support, and Health Behavior

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Abstract: Mental disorders are common in adolescents, and for effective interventions we should be aware of their determinants. However, there are only a small number of studies investigating the combined effect of multiple factors. Therefore, our aim is to assess the impact of socioeconomic status, social support, and health behavior on adolescents' mental well-being. A cross-sectional health survey of 1641 children was carried out in accordance with the study protocol of the Hungarian Health Behavior in School-aged Children survey. Multivariate multiple regression was used to analyze the main determinants of mental well-being. The boys' mental well-being was favorable compared to girls; lower subjective family wealth was associated with lower life satisfaction and depressive mood. Life satisfaction was positively related to healthy eating, social support, and physical activity. Unhealthy eating, sedentary lifestyle, and lower social support were associated with higher depression scores. Higher social support reduces psychosomatic symptoms, while unhealthy eating and spending a lot of time in front of the computer increase them. Both social support and healthy lifestyle seem to be protective against mental health problems among adolescents, and thus interventions should focus on these factors regardless of the socioeconomic status of the participants, with special attention given to girls.

Keywords: adolescents; mental well-being; socioeconomic status; social support; health behavior

1. Introduction

Adolescence, the transition from childhood to adulthood, is a crucial period of life. However, the physical, emotional, intellectual, and social changes at this time can increase the risk of mental health problems. Mental and behavioral disorders are frequent among youth, and one fifth of adolescents experience some kind of mental health problem [1]. Almost half of all adult mental disorders begin in the teenage years [2], and the poor mental health of young people is associated with lower educational achievement, substance abuse, suicide, violence, and sexual health problems [3]. More than one tenth of adolescents in the World Health Organization (WHO) European Region have some kind of mental health problem, and this is the leading cause of disability in young people. Depression is the most common condition in children and adolescents, and suicide is one of the leading causes of death in youth [4]. Based on the results of the Global Burden of Disease Study 2010, the highest proportion of disability-adjusted life years (DALYs) for mental disorders occurred in the 10–29 age group, and the burden of depressive disorders (responsible for more than 7000 DALYs in thousands) exceeds the burden from alcohol and drug use [5].

One of the main information sources regarding young people's well-being, behavior, and social context is the Health Behavior in School-aged Children (HBSC) Survey, which has run for nearly 40 years. It is conducted every four years in 50 countries and regions across Europe and North America as a cross-national study [6]. According to the HBSC 2013/14 survey ascertainments, children's life satisfaction declines between the ages of 11 and 15. Fifteen-year-old girls have reported lower life satisfaction and more multiple health complaints than boys [7]. In Hungary, there was no significant change in life satisfaction between grades, but regarding gender differences it can be stated that, in higher grades, the life satisfaction of boys was favorable and they also reported fewer health complaints. In the case of depression, girls scored significantly higher than boys [8].

Therefore, promoting the well-being and healthy lifestyle of adolescents can have far-reaching effects on their present and future mental health [9]. However, for effective interventions, we need reliable data regarding the risk and protective factors that determine the epidemiological properties of mental disorders. These include—among other factors—genetic susceptibility, socioeconomic and demographic factors, lifestyle, somatic diseases, and family and environmental factors [3,10]. Several studies have proved that lower socioeconomic status is associated with unfavorable mental health among adolescents [11–13]. Mental problems are deep-rooted in the social and emotional environment of the person. Safe and supportive families, together with positive and supportive peers, are essential in supporting youth to achieve their best health [14]. Family can be protective in many ways; one of these is parental communication, which promotes prosocial values that help youths cope with stressful situations [15]. Those who are able to communicate easily with their parents are more likely to have higher life satisfaction and fewer health complaints. Higher support from friends can help protect against depression and isolation, and interactions with friends strengthen the ability to deal with stress. Students with higher perceived classmate support have reported fewer subjective health complaints and higher life satisfaction [15,16]. Mental well-being is also influenced by behavior [17]; it is proven that physical activity and raw fruit and vegetable consumption have a positive effect on mental health, as well as reducing anxiety symptoms and depression. However, a low level of physical activity and sedentary behavior are significantly associated with mental health problems [18–20]. All in all, we can assume that there are complex interactions between social and economic factors, behavior, and mental health in adolescence; however, there are relatively few comprehensive studies investigating the combined effect of these. If we search for information related to adolescents in the PubMed database with the search terms "mental health" AND "socioeconomic status" AND "health behavior", we will find only 40 items (filter activated: adolescent: 13–18 years; date of search: 09 July 2020). After checking the titles, it appears that some of the search results are not relevant, and very few focus on the effect of health behavior (i.e., healthy diet and physical activity). Therefore, to fill this gap the aim of our study is to assess the combined impact of sex, socioeconomic status, social support, and health behavior on adolescents' mental health. Then, we evaluated the sex differences across the studied mental well-being variables (Is sex related to all the examined mental well-being indicators? If yes, are there any sex differences across the mental well-being indicators?). The reason for this comprehensive analysis is that this will bring us closer to the real-life situation compared to investigating the associations on a pairwise basis.

2. Materials and Methods

2.1. Study Population

A cross-sectional health survey of a school-aged child population was carried out in the second largest Hungarian town (Debrecen) in accordance with the study protocol of the Hungarian HBSC survey [8]. The study population consisted of 5th, 7th, 9th, and 11th grade students who were enrolled in different schools of the town. Multistage, stratified cluster sampling was performed where the strata included the school maintainer (municipality and church), school type (primary and secondary school),

and grade (the details were published elsewhere: [21]). Finally, the sample consisted of 2208 students from 86 classes of 10 schools. All the students from the selected grades were included in the sample.

2.2. Data Collection

Data collection was carried out during November 2015 with a self-reported, anonymous online questionnaire, which was identical to the questionnaire of the Hungarian Health Behavior in School-aged Children (HBSC) survey [8]. The research was performed with ethical approval; written parental consent was obtained from all participants, but, independent of the given parental consent, the participation of the students was voluntary.

In accordance with the Hungarian HBSC survey [8], three questionnaires were used: a full-length one for 15- and 17-year-olds, a shorter one for 13-year-olds, and the shortest version for 11-year-olds. Only the common domains of the questionnaires analyzed in the present manuscript will be described below. During the evaluation of these scales, national and international protocols were followed [8,22].

This study used 33 questions divided into four main sections: socioeconomic and demographic data, social support, health behavior, and mental well-being.

2.2.1. Socioeconomic and Demographic Data

The following socioeconomic and demographic data were collected: gender, age, place of residence (Debrecen or other surrounding settlements), type of school (primary school, vocational school, vocational high school, and high school), parental educational attainment (university or college, secondary school, vocational certificate, maximum primary school, do not know), subjective perception of family wealth (5-item scale with answers from "very well off" to "not at all well off"; these were collapsed into three categories: not well-off/average/well-off), and family affluence. The last was measured by the Family Affluence Scale (FAS), for which the total score (0–13 points) was calculated based on car, computer, and dishwasher ownership; having a bathroom and one's own bedroom; and the number of family holidays abroad during the last year. Then, three categories were created based on the total points: 0–5 low, 6–7 medium, 8–13 high affluence [8,22].

2.2.2. Social Support

To measure perceived social support from family and friends (peer support), we used the Multidimensional Scale of Perceived Social Support (MSPSS). There were eight items by which to determine the level of family and peer support on a 7-point Likert scale. The students were asked to mark how much they agree (from 1, "very strongly disagree", to 7, "very strongly agree") with the statements about their family and friends. The family support items were the following statements: "my family really tries to help me", "I get emotional help and support I need from my family", "I can talk about problems with my family", and "my family is willing to help me make decisions". The peer support contained the next items: "my friends really try to help me", "I can count on my friends when things go wrong", "I have friends with whom I can share my joys and sorrows", and "I can talk about my problems with my friends". The Cronbach's alpha was 0.89 for the family support scale and 0.92 for the peer support scale. Finally, the summary of the scores was calculated separately for the two parts (total score ranged from 4 to 28), where a higher score means higher support. Besides social support, the quality of family communication was also measured with the short version of the clear communication scale from the Family Dynamics Measure II (FDMII). In this part of the questionnaire, there were four statements, and the students were asked to mark on a five-point scale how much they agree (1, "strongly agree"; 5, "strongly disagree") with the following: "in the family, the important things are talked about", "when she/he speaks, someone listens to what she/he says", "they ask questions when they don't understand each other", "when there is a misunderstanding, they talk it over until it's clear". The Cronbach's alpha for the clear communication scale was 0.84. The summary of the reversed scores was calculated (total score ranged from 4 to 20), where a higher score means better communication [8,22].

2.2.3. Health Behavior

Health behavior was assessed in terms of eating habits and physical activity. Dietary habits, such as the regularity of having breakfast (on how many days during the week), were measured. The frequency of consumption of healthy (fruits, vegetables) and unhealthy food (sweets, sugar-containing soft drinks, energy drinks, salty snacks, and fast foods) was assessed with a seven-item scale from "never" to "more than once a day". Questions about the frequency of having breakfast and the evening meal together with parents were also included. There were also questions regarding active (regularity of moderate-to-vigorous and vigorous physical activity) and passive ways of spending free time. Sedentary behavior was measured with the time spent on three types of screen-based activity a day. Students were asked how many hours a day of their free time they usually spend watching TV, videos, and DVDs; playing games on a computer; or using electronic devices not for playing (e.g., Internet use, chat, e-mailing). Response options referred to a nine-point Likert scale from none at all to seven hours or more [8,22].

2.2.4. Mental Well-Being

The mental well-being of the students was characterized by life satisfaction, measured by the Cantril ladder, where a score of 0 represents the worst possible life and ten represents the best possible life; depression; and the frequency of psychosomatic symptoms. To measure depression, the short version of the Child Depression Inventory (CDI) was used. It contains statements about eight different symptoms of depression and the summarized score ranges from 0 to 16. A higher value means a higher risk of depression, and based on the scores, three categories can be formed: normal mood (0–1 point), disturbed mood (2–3 points), and depressive mood (4 or above) [8,23]. The health complaints index was used for the assessment of the frequency of psychosomatic symptoms (e.g., headache, feeling low/nervous, difficulties in getting to sleep). The index is calculating by summing up the scores of each item; values range from 9 to 45, and higher values indicate more health complaints [8,22]. The Cronbach's alpha was 0.78 for the depression scale and 0.87 for the health complaints index.

2.3. Data Analysis

The data analysis was conducted in several steps. First of all, variables that were not completely filled in were imputed to overcome the constraint of biased or overestimated results that may arise from missing data. Missing values were classified as random, and multiple imputation by fully conditional specification, which is an iterative Markov Chain Monte Carlo (MCMC) method, was used to impute all missing data in the studied database.

Next, the health behavior and social support questions were evaluated with factor analysis in order to generate health behavior and social support patterns. The number of factors with eigenvalues higher than one was determined using principal component analysis and varimax (orthogonal) rotation. The scree plot curve had declinations at seven factors, which also indicated a seven-factor model, similar to the eigenvalue specification. Health behavior questions with factor loadings > 0.50 were used to interpret each pattern. The model significance was tested with Bartlett's test of sphericity ($p < 0.001$) and the goodness of fit was tested with the Kaiser–Meyer–Olkin Measure of Sampling Adequacy (KMO = 0.716), which convinced us that the seven-factor model depicted the latent structure of the original set of questions. The resulting standardized factor scores were introduced into the multivariate models as continuous explanatory variables.

Then, we used descriptive statistics to provide an overview of the respondents' characteristics, and finally multivariate multiple regression was used to analyze the main determinants of mental well-being. The method differs from ordinary multiple regression because several outcome variables (in this case, life satisfaction, depression, psychosomatic symptoms) are jointly regressed on a set of predictors (here, socioeconomic and demographic data, social support, health behavior). To estimate

the overall statistical significance of the models, we calculated Wilks' lambda based on a multivariate analysis of variance (MANOVA) procedure, followed by multivariate multiple regressions. Based on the analyses, firstly we determined the R-squares for each outcome measure. Secondly, we studied the relationship between the adolescents' mental well-being and studied covariates in one model together. Associations were quantified by regression coefficients (β) and the corresponding 95% confidence interval (CI). Post-estimation with hypothesis testing was used to analyze the gender differences across the studied outcomes. To avoid the inflated likelihood of a Type I error due to multiple testing, the significance level of each test was adjusted using Bonferroni correction, which divides the significance level by the number of tests. *p*-values less than 0.008 were considered to be significant (0.05/6 = 0.008). Statistical computation was performed with Intercooled Stata 12.0 for Windows [24].

3. Results

In the present manuscript, data from the 5th grade (n = 253) were excluded from the data analysis because depression was not assessed in that age group. Of the remaining 1955 students, 1641 filled out the questionnaire, so the overall response rate was 83.9%. The adolescents' characteristics are summarized in Table 1. The average age was 15.28 years (standard deviation, SD: 1.70), and the proportion of boys was 60.8%. Approximately 62% of the respondents lived in Debrecen, and 42% of the adolescents studied in high school. Almost one third of the fathers and nearly 40% of the mothers had university or college certificates. Twelve percent of the respondents had a high FAS score, but on the other hand nearly 40% of the adolescents described their family wealth status as well-off. The average score of life satisfaction was 7.42 (SD: 1.94), and the score was 21.17 (SD: 7.77) for psychosomatic symptoms. The mean score of the depression scale was 2.12 (SD: 2.44), and 21.8% of the students belonged to the depressive mood category. The percentages of missing values for the study ranged between 0.24% (residence) and 13.16% (depression scale). Detailed information regarding the socioeconomic and demographic data after multiple imputation can be found in Table A1 (in Appendix A).

Table 1. Characteristics of the respondents before the multiple imputation of missing values.

		N (%)	Mean (±SD)
Age			15.28 (1.70)
Gender of students	Male	997 (60.76%)	
	Female	644 (39.24%)	
Educational attainment of father	Not known	181 (11.62%)	
	Primary school or less	60 (3.85%)	
	Vocational school	434 (27.87%)	
	Secondary school/high school	375 (24.08%)	
	University/college	507 (32.56%)	
Educational attainment of mother	Not known	131 (8.47%)	
	Primary school or less	60 (3.88%)	
	Vocational school	214 (13.84%)	
	Secondary school/high school	515 (33.31%)	
	University/college	626 (40.49%)	
Family affluence	Low	645 (43.58%)	
	Medium	656 (44.32%)	
	High	179 (12.09%)	

Table 1. *Cont.*

		N (%)	Mean (±SD)
Subjective perception of family wealth	Not well-off	63 (3.91%)	
	Average	918 (56.95%)	
	Well-off	631 (39.14%)	
Residence	Debrecen	1012 (61.82%)	
	Other surrounding settlements	625 (38.18%)	
Type of school	Primary school	358 (21.95%)	
	Vocational school	62 (3.80%)	
	Secondary school	516 (31.64%)	
	High school	695 (42.61%)	
Life satisfaction			7.42 (1.94)
Depression scale			2.12 (2.44)
Psychosomatic symptoms			21.17 (7.77)

N: number of cases; SD: standard deviation.

3.1. Result of the Factor Analysis

The seven factors were responsible for 66.12% of the total variance (Table A2). Factor 1 was determined by different types of unhealthy foods (sweets, sugar-containing soft drinks, salty snacks, fast-foods, and energy drinks), and factor 2 was related to the questions on entertainment screen time (computer games and television or video watching). The questions about physical activity formed factor 3 (frequency of vigorous physical activity, weekly hours of vigorous physical activity and moderate-to-vigorous physical activity), while the different questions about social support connected to factor 4 (perceived social support from family, quality of family communication, perceived social support from friends (peer support)). Factor 5 consisted of using electronic devices not for playing. The following questions make up the 6th factor: eating together with parents and breakfast consumption. Factor 7 comprised of questions on healthy food consumption (vegetables and fruits).

After evaluating the contents of factor-building statements, factor 1 to factor 7 were referred to as "unhealthy food consumption", "entertainment screen time", "physical activity", "social support", "using the computer not for playing", "breakfast consumption and family meals", and "healthy food consumption", respectively.

3.2. Determinants of Mental Well-Being

In the multivariable multiple regression analysis (Table 2), Wilks' lambda showed that the model is statistically significant ($p < 0.001$). A full model including all 15 independent variables explained 19%, 24%, and 17% of the variance in the outcome variables life satisfaction, depression, and psychosomatic symptoms, respectively.

Table 2. Multivariate multiple regression analysis of socioeconomic and demographic data and social support, health behavior, and mental well-being indicators among adolescents.

		Life Satisfaction β (95% CI)	**Depression β (95% CI)**	**Psychosomatic Symptoms β (95% CI)**
Gender of students	Male (ref: female)	0.42 (0.21; 0.62) *	−0.90 (−1.14; −0.67) *	−3.05 (−3.88; −2.21) *
Educational attainment of father	Not known (ref: university/college)	0.34 (−0.02; 0.70)	0.31 (−0.11; 0.73)	1.83 (0.33; 3.32) *
	Primary school (ref: university/college)	−0.39 (−0.85; 0.07)	0.23 (−0.30; 0.77)	0.79 (−1.13; 2.70)
	Vocational school (ref: university/college)	−0.18 (−0.42; 0.07)	−0.02 (−0.30; 0.27)	1.04 (0.03; 2.05) *
	Secondary school/high school (ref: university/college)	−0.03 (−0.27; 0.22)	−0.06 (−0.34; 0.23)	−0.26 (−1.27; 0.75)
Educational attainment of mother	Not known (ref: university/college)	−0.72 (−1.12; −0.32) *	−0.37 (−0.84; 0.10)	−1.53 (−3.20; 0.14)
	Primary school (ref: university/college)	0.26 (−0.20; 0.72)	−0.22 (−0.75; 0.31)	−2.15 (−4.05; −0.25) *
	Vocational school (ref: university/college)	−0.05 (−0.33; 0.22)	0.05 (−0.27; 0.37)	−1.20 (−2.35; −0.06) *
	Secondary school/high school (ref: university/college)	0.07 (−0.14; 0.28)	−0.18 (−0.43; 0.06)	−0.09 (−0.96; 0.79)
Subjective perception of family wealth	Not well-off (ref: well-off)	−1.25 (−1.70; −0.80) *	0.80 (0.27; 1.32) *	1.54 (−0.33; 3.41)
	Average (ref: well-off)	−0.48 (−0.66; −0.29) *	−0.04 (−0.25; 0.17)	0.09 (−0.66; 0.84)
Family affluence	Low (ref: high)	−0.22 (−0.51; 0.08)	−0.02 (−0.37; 0.32)	−0.20 (−1.43; 1.03)
	Medium (ref: high)	−0.10 (−0.37; 0.17)	0.05 (−0.26; 0.37)	−0.19 (−1.31; 0.94)
Type of school	Primary school (ref: high school)	0.29 (−0.02; 0.60)	0.02 (−0.34; 0.38)	−1.49 (−2.77; −0.21) *
	Vocational school (ref: high school)	−0.34 (−0.79; 0.12)	−0.06 (−0.59; 0.46)	−0.24 (−2.11; 1.64)
	Secondary school (ref: high school)	−0.18 (−0.39; 0.03)	−0.02 (−0.27; 0.22)	−0.37 (−1.25; 0.51)

Table 2. *Cont.*

		Life Satisfaction β (95% CI)	Depression β (95% CI)	Psychosomatic Symptoms β (95% CI)
Residence	Debrecen (ref: other surrounding settlements)	−0.18 (−0.36; 0.00)	0.03 (−0.18; 0.25)	0.64 (−0.11; 1.39)
Factors	Social support	0.42 (0.34; 0.50) *	−0.75 (−0.84; −0.65) *	−1.13 (−1.47; −0.79) *
	Breakfast consumption and family meals	0.19 (0.11; 0.28) *	−0.46 (−0.56; −0.36) *	−1.52 (−1.88; −1.17) *
	Healthy food consumption	0.20 (0.11; 0.28) *	−0.08 (−0.18; 0.01)	0.16 (−0.18; 0.50)
	Unhealthy food consumption	0.04 (−0.05; 0.12)	0.15 (0.05; 0.24) *	0.84 (0.50; 1.19) *
	Physical activity	0.19 (0.10; 0.27) *	−0.20 (−0.30; −0.10) *	−0.18 (−0.53; 0.17)
	Entertainment screen time	−0.15 (−0.24; −0.06) *	0.17 (0.07; 0.27) *	0.10 (−0.26; 0.46)
	Using the computer not for playing	0.02 (−0.07; 0.10)	0.19 (0.10; 0.29) *	0.86 (0.51; 1.21) *
	Age	0.03 (−0.04; 0.11)	−0.01 (−0.09; 0.08)	0.07 (−0.24; 0.39)

* Significant predictor at 0.05. * Results represent regression coefficients (β) and corresponding 95% confidence intervals (CI).

We found that boys have a higher life satisfaction (β = 0.42; 95% confidence interval, 95%CI = −0.21; 0.62) and they are less affected by depressive (β = −0.90; 95%CI = −1.14; −0.67) and psychosomatic symptoms (β = −3.05; 95%CI = −3.88; −2.21) than girls. The post estimation shows that the coefficients for boys, taking all three outcomes together, are statistically significant ($p < 0.001$). The results support the hypothesis that the three coefficients for male sex across the three equations are statistically significant. We also rejected the null hypothesis ($p < 0.001$) that the three coefficients for the variable male sex in the equation with life satisfaction, depression, and psychosomatic symptoms as the outcome measures are equal and do not differ from each other. This means that male sex is linked with various degrees to life satisfaction, depression, and psychosomatic symptoms. Those who did not know the educational attainment of their father (β = 1.83; 95%CI = 0.33; 3.32) or whose fathers had a vocational certificate (β = 1.04; 95%CI = 0.03; 2.05) had more psychosomatic symptoms than those whose fathers had a university or college certificate. The students who did not know the educational attainment of their mother (β = −0.72; 95%CI = −1.12; −0.32) were less satisfied with their lives, and those students whose mothers had lower educational attainment than secondary school had fewer psychosomatic symptoms (primary school: β = −2.15; 95%CI = −4.05; −0.25) (vocational school: β = −1.20; 95%CI = −2.35; −0.06).

The lower subjective perception of family wealth had a negative effect on life satisfaction (not well-off: β = −1.25; 95%CI = −1.70; −0.80), (average: β = −0.48; 95%CI = −0.66; −0.29) and increased the development of depression (β = 0.80; 95%CI = 0.27; 1.32), while family affluence had no effect on these mental well-being indicators.

Students from primary schools perceived fewer psychosomatic symptoms than high school students (β = −1.49; 95%CI = −2.77; −0.21).

Those who had higher social support (β= 0.42; 95%CI= 0.34; 0.50) had better life satisfaction and had fewer depressive (β= −0.75; 95%CI = −0.84; −0.65) and psychosomatic symptoms (β = −1.13; 95%CI = −1.47; −0.79).

Healthy food consumption was associated with higher life satisfaction (β = 0.20; 95%CI = 0.11; 0.28), and those who consumed unhealthy foods were more likely to have psychosomatic (β = 0.15; 95%CI = 0.05; 0.24) and depressive symptoms (β = 0.84; 95%CI = 0.50; 1.19). Regular breakfast consumption and family meals were positively related to life satisfaction (β = 0.19; 95%CI = 0.11; 0.28), depression (β = −0.46; 95%CI = −0.56; −0.36), and psychosomatic symptoms (β = −1.52; 95%CI = −1.88; −1.17).

Regular physical activity had a positive effect on life satisfaction (β = 0.19; 95%CI = 0.10; 0.27) and depression (β = −0.20; 95%CI = −0.30; −0.10), while higher entertainment screen time was related to lower life satisfaction (β = −0.15; 95%CI = −0.24; −0.06) and a higher risk of depression (β = 0.17; 95%CI = 0.07; 0.27). Computer usage that was not for playing games increased the risk of depression (β = 0.19; 95%CI = 0.10; 0.29) and psychosomatic symptoms (β = 0.86; 95%CI = 0.51; 1.21).

4. Discussion

The mental well-being of adolescents was characterized based on three domains: life satisfaction, the presence of psychosomatic symptoms, and depression. Regarding our results, each well-being domain for boys—similar to the international and national survey [7,8]—was favorable compared to those for girls, but there was no association with age and place of living. The sensitivity analysis also shows that these sex differences simultaneously exist, independent of other factors, across all the studied well-being variables. The differences among adolescents in psychosomatic symptoms, depression, and life satisfaction significantly varied across boys and girls; the effect of gender on well-being domains exists to various degrees. Based on the results of previous studies these differences may be explained partly by the hormonal, physical and psychological changes caused by puberty in girls, which are not necessarily consistent with the ideal self-image or can lead to sexualization. Another cause can be if there is a big contrast between familial, peer and mass media values. Furthermore, the social environment will change in that period, the parents probably will be stricter with girls, and also the

school performance has greater importance for them, which can lead to increased stress. From a sociological point of view, society usually overvalues maleness, which can enhance the development of role conflicts among young women [25–27]. From the socioeconomic determinants, there was no clear relationship either with parental educational attainment or with the material assets of the family; however, lower subjective family wealth was associated with lower life satisfaction and depressive mood.

These results are in line with a previous meta-analysis suggesting that mental well-being is linked to subjective socioeconomic status (SES) and that the effect is independent of objective SES. This can perhaps be explained by the hypothesis that subjective SES reflects the relative status while objective SES is the absolute social position of a person, and the perception of socioeconomic rank can influence mental health outcomes through psychological processes [12].

Life satisfaction was positively related to healthy eating, social support, and physical activity. Unhealthy eating, sedentary lifestyle, and lower social support were associated with higher depression scores. Higher social support and eating together with parents decrease psychosomatic symptoms, while unhealthy eating and spending more time before the computer increase them.

Our results do not differ from those of previous studies where the effect of similar factors (but not all of them together) was investigated. Thus, the same relationships have been found concerning the connection between mental health and healthy eating [18,28,29]. The reason for this association could be the appropriate intake of micronutrients and vitamins which are necessary for proper mental function, and probably because negative mood can lead to the frequent consumption of unhealthier foods as a coping mechanism (to increase the serotonin level). The positive effect of physical activity on mental health has also been proven [28,30,31]; this could be because of the physiological effects of exercise, because of an indirect effect due to increased self-esteem, or be connected with social support. Furthermore, the time spent engaging in screen-based activities has been connected to mental health problems by Brindova et al. [32], Hoare et al. [33], and Iannotti et al. [19]. This may be due to the decreased opportunity to be active, but the effect of the content of videos and games could also influence well-being, or it could be that those who already have mental health problems will choose these activities as compensation. The opportunity to communicate with parents along with support from family and peers are also established as protective factors for mental well-being [15,34] because these can help to improve social skills, raise self-esteem, and enhance one's sense of security and belonging, which can strengthen one's ability to cope with stress.

Strengths and Limitations

The uncertainty of the answers can be high for some variables (e.g., educational attainment of the parents), as the younger children did not all know this information. Because our questionnaire was the same as that used in the Hungarian HBSC survey, which was developed following international protocol, the uncertainty for these items is expected to be no higher than in other countries. Imputation was used to minimize the bias that may arise from missing data. Due to the cross-sectional design, clear conclusions cannot be drawn about the causal effect, but this study does provide a foundation for elucidating the relationship between the factors. Among the strengths of our study, we can mention the relatively large sample size and the fact that the determinants of mental well-being were investigated from a complex point of view using advanced statistical methods.

5. Conclusions

In this study, we aimed to contribute to the literature concerning adolescents' well-being and effective intervention planning by investigating (1) whether socioeconomic status, social support, and health behavior are connected with mental well-being; (2) the potential gender differences between mental well-being domains independent of socioeconomic factors; (3) and, if these differences exist, whether this association differed according to gender.

Both social support and healthy lifestyle are important protective factors against mental health problems among adolescents, so interventions should focus on these factors regardless of the socioeconomic status of the participants, with special attention given to girls. Taking into consideration previous intervention studies [35,36], it can be stated that the development of effective interventions is a challenge; therefore, any kind of study which is able to add one piece to this puzzle can be meaningful.

The importance of our research can be highlighted by the fact that The United Nations Children's Fund (UNICEF) and the WHO advocate putting child and adolescent mental health higher up on the global health agenda, taking into consideration its magnitude (high rates of self-harm, suicide, and mental health problems). Studies similar to ours can help us to understand the leading factors in mental health and can lead to providing better service for adolescents. One example of this could be a school-based mental health screening program [37].

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Appendix A

Table A1. Characteristics of the respondents after the multiple imputation of missing values.

		Before Imputation		After Imputation	
		N (%)	**Mean (±SD)**	**N (%)**	**Mean (±SD)**
Age (missing: 0.91%)			15.28 (1.70)		15.28 (1.70)
Gender of students (missing: 0%)	Male	997 (60.76%)		997 (60.76%)	
	Female	644 (39.24%)		644 (39.24%)	
Educational attainment of father (missing: 5.12%)	Not known	181 (11.62%)		189 (11.52%)	
	Primary school or less	60 (3.85%)		75 (4.57%)	
	Vocational school	434 (27.87%)		459 (27.97%)	
	Secondary school/high school	375 (24.08%)		397 (24.19%)	
	University/college	507 (32.56%)		521 (31.75%)	
Educational attainment of mother (missing: 5.79%)	Not known	131 (8.47%)		132 (8.04%)	
	Primary school or less	60 (3.88%)		74 (4.51%)	
	Vocational school	214 (13.84%)		244 (14.87%)	
	Secondary school/high school	515 (33.31%)		544 (33.15%)	
	University/college	626 (40.49%)		647 (39.43%)	
Family affluence (missing: 1.77%)	Low	645 (43.58%)		715 (43.57%)	
	Medium	656 (44.32%)		725 (44.18%)	
	High	179 (12.09%)		201 (12.25%)	
Subjective perception of family wealth (missing: 1.77%)	Not well-off	63 (3.91%)		63 (3.84%)	
	Average	918 (56.95%)		933 (56.86%)	
	Well-off	631 (39.14%)		645 (39.31%)	

Table A1. *Cont.*

		Before Imputation		After Imputation	
		N (%)	**Mean (±SD)**	**N (%)**	**Mean (±SD)**
Residence (missing: 0.24%)	Debrecen	1012 (61.82%)		1015 (61.85%)	
	Other surrounding settlements	625 (38.18%)		626 (38.15%)	
Type of school (missing: 0.61%)	Primary school	358 (21.95%)		358 (21.82%)	
	Vocational school	62 (3.80%)		66 (4.02%)	
	Secondary school	516 (31.64%)		518 (31.57%)	
	High school	695 (42.61%)		699 (42.60%)	
Life satisfaction (missing: 6.46%)			7.42 (1.94)		7.39 (1.92)
Depression scale (missing: 13.16%)			2.12 (2.44)		2.11 (2.40)
Psychosomatic symptoms (missing: 8.78%)			21.17 (7.77)		21.17 (7.57)

N: number of cases. SD: standard deviation.

Table A2. Factor structure of the variables measuring social support and health behavior.

	Median (Interquartile Range)	**Factors**							**Communalities**
		Unhealthy Food Consumption	**Screen Time**	**Physical Activity**	**Social Support**	**Using the Computer Not for Playing**	**Breakfast Consumption and Family Meals**	**Healthy Food Consumption**	
Frequency of salty snacks consumption	3 (2)	**0.812**	0.122	−0.024	0.012	0.034	0.113	0.005	0.688
Frequency of sugar-containing soft drinks consumption	3 (3)	**0.778**	0.137	−0.063	0.081	0.037	−0.070	−0.092	0.649
Frequency of fast-foods consumption	2 (1)	**0.731**	0.124	0.092	−0.008	0.081	0.007	0.016	0.565
Frequency of sweets consumption	4 (2)	**0.685**	−0.024	−0.065	−0.013	−0.040	0.154	0.129	0.516
Frequency of energy drinks consumption	1 (1)	**0.558**	0.144	0.058	−0.080	0.190	−0.206	−0.048	0.422
Playing on the computer on weekdays	3 (3)	0.167	**0.816**	0.025	−0.033	−0.020	0.051	−0.061	0.703
Playing on the computer on weekends	4 (4)	0.113	**0.811**	−0.005	−0.025	−0.042	0.080	−0.129	0.696

Table A2. *Cont.*

	Median (Interquartile Range)	Factors							Communalities
		Unhealthy Food Consumption	Screen Time	Physical Activity	Social Support	Using the Computer Not for Playing	Breakfast Consumption and Family Meals	Healthy Food Consumption	
Watching TV and videos on weekdays	3 (2)	0.129	**0.676**	−0.088	−0.016	0.290	−0.107	0.074	0.583
Watching TV and videos on weekends	5 (3)	0.081	**0.628**	−0.118	−0.046	0.319	−0.183	0.044	0.555
Frequency of vigorous physical activity	6 (2)	0.023	−0.056	**0.861**	0.070	−0.031	0.025	0.116	0.765
Weekly hours of vigorous physical activity	4 (3)	−0.050	−0.059	**0.839**	0.069	−0.024	0.005	0.040	0.718
Moderate-to-vigorous physical activity	5 (3)	0.023	−0.009	**0.791**	−0.004	0.028	0.139	0.107	0.657
Perceived social support from family	26 (5)	−0.003	0.006	0.010	**0.834**	−0.049	0.222	0.034	0.748
Quality of family communication	17 (3)	−0.050	0.040	0.051	**0.806**	−0.080	0.200	0.069	0.708
Perceived social support from friends (peer support)	26 (5)	0.050	−0.149	0.081	**0.665**	0.139	−0.153	0.079	0.522
Using the computer not for playing on weekdays	4 (3)	0.133	0.159	−0.012	−0.001	**0.881**	−0.064	−0.019	0.824
Using the computer not for playing on weekends	5 (4)	0.069	0.122	0.000	0.016	**0.894**	−0.056	−0.013	0.823
Breakfast with the parents	3 (2)	0.088	−0.035	0.039	0.200	−0.030	**0.794**	0.114	0.695
Breakfast consumption on weekdays	5 (5)	−0.036	−0.024	0.117	−0.120	−0.085	**0.685**	−0.025	0.508
Evening meal with the parents	4 (3)	0.020	−0.013	0.009	0.326	−0.026	**0.658**	0.218	0.588
Frequency of vegetables consumption	4 (2)	−0.038	−0.020	0.098	0.087	0.003	0.092	**0.887**	0.814
Frequency of fruit consumption	4 (2)	0.060	−0.068	0.173	0.093	−0.027	0.129	**0.858**	0.799
Eigenvalue		3.765	3.048	1.967	1.808	1.548	1.330	1.080	
Explained variance (%)		17.114	13.856	8.941	8.218	7.036	6.046	4.909	

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization. Kaiser–Meyer–Olkin Measure of Sampling Adequacy (KMO): 0.716; Bartlett's Test of Sphericity: $p < 0.001$; total variance explained: 66.12%.

The numbers represent the standardized factor loadings for the 7-factor model. Values of factor loading higher than 0.5 are emphasized in bold.

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