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Healthy Lifestyle Behaviors of Primary School-Aged Children and Affecting Predictors: A Cross-Sectional Study

İlkokul Çağındaki Çocukların Sağlıklı Yaşam Biçimi Davranışları ve Etkileyen Yordayıcılar: Kesitsel Çalışma

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ABSTRACT Objective: To develop effective interventions to improve children's health outcomes, it is of great importance to determine the health-related lifestyles of primary school-aged children and the factors that influence these lifestyles. The aim of this research was to identify the elements that influence primary school children's healthy lifestyle behaviors. **Material and Methods:** This is a cross-sectional study. The research 1,240 primary school-aged children who met the inclusion criteria formed the sample of the study. Descriptive characteristics form and Healthy Lifestyle Behaviors in Children Scale (HLBCS) were used. Data collection was carried out in the school-aged children's own classrooms using face-to-face data collection technique. Analysis of variance, t-test, and multiple linear regression analysis was used. **Results:** Female school-aged children, school-aged children's whose parents are living, school-aged children whose mother has a university education, whose father has a high school or university education, who has a good economic situation and who does not have an overweight family member, have significantly higher mean HLBCS scores. **Conclusion:** It was shown that primary school-aged children had a good level of lifestyle behaviors. The most important predictors affecting lifestyle behaviors were gender, mother's education level, income level and class level. To improve school-aged children's lifestyle behaviors, it is important to provide education on physical activity, nutrition, hygiene and sleep by the school nurse.

Keywords: Healthy lifestyle; health behavior; child health; school health; school health nursing

ÖZET Amaç: Çocukların sağlık sonuçlarını iyileştirmeye yönelik etkili müdahaleler geliştirmek için, ilkokul çağındaki çocukların sağlıkla ilgili yaşam biçimlerini ve bu yaşam biçimlerini etkileyen faktörleri belirlemek büyük önem taşımaktadır. Bu araştırmanın amacı, ilkokul çağındaki çocukların sağlıklı yaşam biçimi davranışlarını etkileyen faktörlerin belirlenmesidir. **Gereç ve Yöntemler:** Bu araştırma kesitseldir. Araştırmanın örneklemini 1.240 ilkokul çağındaki çocuk oluşturmaktadır. Tanımlayıcı Özellikler Formu ve Çocuklarda Sağlıklı Yaşam Biçimi Davranışları Ölçeği kullanılmıştır. Veri toplama, okul çağı çocuklarının kendi sınıflarında yüz yüze veri toplama tekniği kullanılarak gerçekleştirilmiştir. Varyans analizi, t-testi ve çoklu doğrusal regresyon analizi kullanılmıştır. **Bulgular:** Kız öğrencilerin, anne ve babası hayatta olan öğrencilerin, annesi üniversite eğitimi almış olan öğrencilerin, babası lise veya üniversite eğitimi almış olan öğrencilerin, ekonomik durumu iyi olan öğrencilerin ve ailesinde aşırı kilolu birey olmayan öğrencilerin Çocuklarda Sağlıklı Yaşam Biçimi Davranışları Ölçeği puan ortalamaları anlamlı düzeyde daha yüksektir. **Sonuç:** İlkokul çağı çocuklarının iyi düzeyde yaşam biçimi davranışlarına sahip olduğu gösterilmiştir. Yaşam biçimi davranışlarını etkileyen en önemli yordayıcılar cinsiyet, anne eğitim düzeyi, gelir düzeyi ve sınıf düzeyidir. Çocukların yaşam biçimi davranışlarını geliştirmek için okul hemşiresi tarafından fiziksel aktivite, beslenme, hijyen ve uyku konularında eğitim verilmesi önemlidir.

Anahtar Kelimeler: Sağlıklı yaşam biçimi; sağlık davranışı; çocuk sağlığı; okul sağlığı; okul sağlığı hemşireliği

Healthy lifestyle behaviors are characterized as all behaviors describe that have an impact on a person's health and can be controlled against factors that have a significant impact on their health.[1] In other words, it refers to the entirety of the actions and beliefs a person adopts to maintain their health and ward off illness.[2] When trying to enhance health, one public health policy that should be taken into considera-

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tion is the promotion of a healthy lifestyle.[3] Healthy lifestyle behaviors are summarized as having adequate and balanced nutritional habits, managing stress, doing regular physical activity, engaging in spiritual activities, keeping interpersonal relationships alive and taking responsibility in these matters.[4] The acquisition of good lifestyle habits from childhood is crucial for the long-term maintenance of those behaviors .[1]

It is especially important to promote healthy behaviors early on since childhood habits carry over into adulthood. Lifestyle choices during this period can result in a number of health issues in adulthood. Increased harmful habits including childhood smoking, physical inactivity, and malnutrition are contributing to the rise in lifestyle-related health issues like diabetes, heart disease, and obesity.[5] Children who are still going through a period of physical, mental, and emotional development are therefore especially susceptible to these consequences.[6] This highlights even more how critical it is to establish healthy habits early in infancy to promote appropriate growth and development.

Instilling positive health behaviors in children at an early age is extremely important for public health as it ensures health and well-being in adulthood and improves physical health and academic performance.[7] Adopting healthy habits can also help children feel better about themselves and have less mental health issues.[8] There is great potential in using school environments to improve health habits and positively affect academic success.[9] The child has to adopt a healthy lifestyle in all areas, such as diet, exercise, behavioral development, and entertainment, in order to grow up to be a healthy adult.[10]

In a systematic review examining lifestyle behaviors in children, it was determined that unhealthy nutrition, high levels of inactivity and sedentary lifestyle were observed in children.[11] In a research study with comprehensive data collected by World Health Organization from 25 countries, information on physical activity behavior, screen time and sleep time of 150,651 children was analyzed. The data of this study showed that 79.4% of children actively play digital games for more than 1 hour every day, 53.9% are not members of a sports or dance club, and 39.8% spend more than 2 hours in front of the screen a day.[12] In their research, Lekše et al. found an important theme that children need education about health promotion and health behaviors.[13] These comprehensive data show that primary school-aged children's healthy lifestyle behaviors are below the ideal level and that they require more instruction in this area.

While reviewing the literature, it became evident that many studies on healthy lifestyle behaviors focused on adolescents, but studies on the subject in primary school-aged children were insufficient.[1,3,14] There is no research in the literature that examines all aspects of healthy lifestyle behaviors in primary school-aged children.[15] But early implementation of treatments aiming at fostering better lives may be more effective in preventing harmful choices from being ingrained in an individual's lifestyle.[16] To improve children's health outcomes, it is essential to identify the health-related lifestyles of elementary school-aged children and the factors that impact these lifestyles. The school health nurse plays a very important role in developing healthy lifestyle behaviors in primary school-aged children's. This role is critical for children to acquire healthy habits and adopt a long-term healthy lifestyle.[17]

Thus, the purpose of this study was to identify the characteristics that influence primary school-aged children's adoption of healthy lifestyles. It is expected that the study results will guide future studies on the subject and contribute to the literature.

Research Questions

What are the healthy lifestyle behavior scores of primary school-aged children's?

Is there a difference in healthy lifestyle behavior scores of primary school-aged children's according to their sociodemographic characteristics?

What are the factors that affect primary school-aged children's healthy lifestyle behaviors?

MATERIAL AND METHODS

DESIGN

This research is cross-sectional.

STUDY SETTING AND SAMPLE

This study was conducted between January and May 2023 in the city center of a province located in the west of Türkiye. The population of the research consisted of 3rd and 4th grade school-aged children's studying in 7 primary schools located in the city center affiliated with the Provincial Directorate of National Education. These schools were determined by simple random sampling method among 47 primary schools in the city center. Criteria for inclusion in the sample were being a 3rd or 4th grade primary school-aged children and parental consent. Exclusion criteria are having a mental or physical disability, being a foreign school-aged children and not knowing Turkish. In the sample calculation of this study, the average score of healthy lifestyle behaviors of primary school-aged children's was taken as reference in the study conducted by Öcal and Önsüz.[18] The average score of school-aged children's healthy lifestyle behaviors is 141.39±16.21. It was assumed that the average score of healthy lifestyle behaviors of the sample in our study was 139.80. Accordingly, effect size=0.098. In the calculation, the sample size was calculated as at least 1,127 by taking the type 1 error margin (α) as 0.05 and the power (1-β) as 0.95. Considering the possibility of data loss in the research, 1,240 primary school-aged children's who met the inclusion criteria formed the sample of the study.

INSTRUMENTS

Descriptive characteristics form and Healthy Lifestyle Behaviors Scale in Children were utilized as data research collection instruments in the study.

DESCRIPTIVE CHARACTERISTICS FORM

The form with the descriptive characteristics was created considering the literature.[1,3,18] The form includes questions for school-aged children's including their age, grade, gender, and number of siblings. In addition, there are questions regarding the demographic information of the parents, including the living situation, cohabitation status, education level and profession of the mother and father. In addition, the family was asked about their family type, economic status and whether there were any overweight individuals.

HEALTHY LIFESTYLE BEHAVIORS IN CHILDREN SCALE

This scale was developed by Öcal and Önsüz to measure the healthy lifestyle behaviors of primary school-aged children's in Türkiye.[18] Healthy Lifestyle Behaviors in Children Scale (HLBCS) consists of 53 items and 7 sub-dimensions. These sub-dimensions and Cronbach alpha values are as follows: nutrition sub-dimension, physical activity sub-dimension, hygiene sub-dimension, sleep sub-dimension, environmental cleanliness dimension, health responsibility dimension and addiction dimension. Goodness of fit indexes of the scale are $\chi^2/df=2.55$, Root Mean Square Error of Approximation=0.055, Comparative Fit Index=0.802, Goodness of Fit Index=0.790. The options of the items are scored as "I agree 3, I am undecided 2 and I disagree 1". In each question, children are asked to mark only one of the 3 options that is most appropriate for them. The minimum score that can be obtained from the scale is 53, while the maximum score is 159. As the score obtained from the scale increases, the level of school-aged children's 'healthy lifestyle behaviors also increases. In this study, the Cronbach's Alpha value of the scale was found to be 0.89.

PROCEDURE

School-aged children's who achieved the criteria for participation were given information on the aim and details of the research. Before the data collection process, school administrators and teachers of the relevant classes were contacted, and the school-aged children's parents were contacted, and their informed consent was obtained. Data collection was carried out in the school-aged children's own classrooms using face-to-face data collection technique. Since the survey form was based on self-report, surveys were distributed to school-aged children's, and they were given until the end of the course (40 minutes) to fill them out. During this period, the researchers were in the relevant classroom and answered the school-aged children's questions.

STATISTICAL ANALYSIS

The data were evaluated in the IBM SPSS v29.0 (IBM Corp., Armonk, NY, USA) statistical program.

Count, proportion, average, standard deviation, and lowest-and-maximum values were employed in the descriptive variable analysis. Normal distribution was tested with Skewness=1.02 and Kurtosis=1.49 values and it was determined that the data was normally distributed.[19] Independent sample t-test was used to determine whether there was a difference between the healthy lifestyle behaviors scale mean score between 2 groups in terms of sociodemographic characteristics, and one-way analysis of variance was used to determine the difference in mean score between 3 or more groups. Variables with variations across groups were included in multiple linear regression analysis to identify the predictors influencing healthy lifestyle behaviors. A p value of less than 0.05 was accepted as statistically significant in every analysis.

ETHICAL PRINCIPLES AND APPROVAL

This study was performed in line with the principles of the Declaration of Helsinki. Approval was granted by the Non-Interventional Clinical Research Ethics Committee (Date: December 07, 2022/No: E-60116787-020-301347). Explanations were made to the students to be included in the research and their parents about the purpose of the research and the content of the forms, and informed parental consent was obtained for their participation. Written permissions were obtained from the ministries and institutions to which the data will be collected. Permission was also obtained from the researchers developing the scales used via e-mail.

RESULTS

PARTICIPANT CHARACTERISTICS

Primary school-aged children's of 50.2% are boys and 49.8% are girls. The school-aged children's of 51.0% are in the 3rd grade and 49.0% are in the 4th grade. When the body mass index (BMI) of the school-aged children's was calculated, it was determined that 72.1% were normal weight, 10.6% were overweight, 8.7% were underweight and 8.6% were obese (Table 1). In the BMI classification, the values determined by Neyzi et al. for Turkish children were taken as reference.[20]

TABLE 1: Demographic characteristics of the students

	n	%
Gender		
Female	617	49.8
Male	623	50.2
Age		
8	220	17.7
9	550	44.4
10	470	37.9
Grade		
3rd	633	51.0
4th	607	49.0
Number of siblings		
None	199	16.0
1	495	39.9
2	319	25.7
3 and above	227	18.3
Living situation of mother and father		
Both are alive	1,214	97.9
Only the mother lives	20	1.6
Only the father lives	5	0.4
Both passed away	1	0.1
Living situation of mother and father		
Living together	1,112	89.7
Living apart-death	128	8.6
Mother's educational status		
Illiterate	93	7.5
Primary school	209	16.9
Middle school	229	18.5
High school	290	23.4
University	419	33.8
Father's educational status		
Illiterate	74	6.0
Primary school	156	12.6
Middle school	235	19.0
High school	336	27.1
University	439	35.4
Mother's profession		
Housewife	605	48.8
Officer	261	21.0
Employee	333	26.9
Other occupations and death	41	3.3
Father's profession		
Not working	69	5.6
Officer	349	28.1
Employee	748	60.3
Other occupations and death	74	6.0
Economic level of the family		
Income is less than expenses	781	63.0
Income is equal to expenses	430	34.7
Income is more than expenses	29	2.30
Family type		
Nuclear family	913	73.6
Extended family	327	26.4
BMI Percentile Value Classification (kg/m^2)		
<5	108	8.70
5-15	208	16.80
15-25	134	10.80
25-50	258	20.80
50-75	201	16.20
75-85	93	7.50
85-95	131	10.6
95>	107	8.60
Overweight level according to BMI		
<5 (Low weight)	108	8.70
5-85 (Normal weight)	894	72.10
85-95 (Overweight)	131	10.60
95> (Obese)	107	8.60
Is there an overweight member in the family?		
Yes	550	44.4
No	690	55.6

BMI: Body mass index

THE MEAN SCORES ON THE HEALTHY LIFESTYLE BEHAVIORS SCALE

The mean score of the primary school-aged children's on the HLBCS was 140.96±12.23. The mean scores of the HLBCS subscales are between 4.93 and 48.26 (Table 2).

THE COMPARISON OF THE MEAN SCORES ON THE HEALTHY LIFESTYLE BEHAVIOURS SCALE BETWEEN SOCIODEMOGRAPHIC CHARACTERISTICS

Table 3 illustrates the statistically significant variations that were discovered between gender, health status of the parents, education level of the mother and father, economic status, and the status of being an overweight member in the family and the average score of healthy lifestyle behaviors ($p<0.05$). Female school-aged children, school-aged children's whose parents are living, school-aged children's whose mother has a university education, whose father has a high school or university education, who has a good economic situation and who does not have an overweight family member, have significantly higher mean HLBCS scores ($p<0.05$) (Table 3).

PREDICTORS AFFECTING HEALTHY LIFESTYLE BEHAVIORS IN PRIMARY SCHOOL-AGED CHILDREN'S

Predictors affecting healthy lifestyle behaviors in primary school-aged children's are gender, grade, maternal education level and economic status. Being a female gender (β=0.155), being a 3rd grade school-aged children's (β=0.123), having a mother's education level of university or higher (β=0.143), and having a good economic level (β=0.135) positively affect healthy lifestyle behaviors ($p<0.05$) (Table 4).

TABLE 2: Mean scores on the healthy lifestyle behaviors scale

Sub-Dimensions	$\bar{X}$	SD	Minimum	Maximum
Nutrition	48.26	5.61	19.00	57.00
Physical activity	10.06	1.84	4.00	12.00
Hygiene	22.71	1.78	8.00	24.00
Sleep	4.93	1.04	2.00	6.00
Environment	16.81	1.71	6.00	18.00
Health responsibility	24.76	2.65	9.00	27.00
Dependence	13.39	1.82	5.00	15.00
HLBCS total score	140.96	12.23	53.00	159.00

SD: Standard deviation; HLBCS: Healthy Lifestyle Behaviors in Children Scale

DISCUSSION

Primary school age is a very important period for the development of healthy behaviors that will affect one's health and well-being in the later stages of life. For this reason, this study primarily examined the level of healthy lifestyle behaviors of primary school-aged children's and the factors affecting these behaviors.

The mean score of the primary school-aged children's included in this study was 140.96±12.23. Accordingly, our result shows that the school-aged children's participating in the study have high healthy lifestyle behaviors score. In the literature, primary school-aged children's and adolescents have similar problems with risky behaviors such as malnutrition habits, inadequate physical activity, unhealthy leisure time activities, alcohol and tobacco use that can lead to health problems and have low healthy lifestyle behaviors.[6,12,13,15,21-23] Contrary to the literature, our research finding showed that the lifestyle behaviors of the primary school-aged children's included in the sample were at a positive level. While this result is considered positive, it suggests that the reason for this may be related to family, environment, school environment and role modeling.

The fact that the majority of the parents of the children included in the sample were university graduates may have had a positive effect on the result. Parents' lifestyle behaviors are one of the main factors affecting children's behaviors. As stated by Lekše et al. the most basic need of primary school children is education on health promotion and healthy behaviors.[13] Schools' healthy nutrition policies, programs encouraging physical activity and health-oriented activities can support school-aged children's healthy lifestyle behaviors. The fact that the schools where this study was conducted were located in the city center and had facilities and that planned trainings were given by teachers and nursing school-aged children's on these issues may have positively affected the result.

In this study, the predictors affecting lifestyle behaviors were also examined. According to the results

TABLE 3: Relationship between HLBCS and sociodemographic characteristics

	Nutrition	Physical activity	Hygiene	Sleep	Environmental cleanliness	Health responsibility	Addiction	Total
Gender								
Female	48.72±5.60	9.76±1.89	23.07±1.45	5.05±1.00	17.08±1.47	25.03±2.29	13.64±1.69	142.38±11.50
Male	47.81±5.58	10.36±1.74	22.36±2.00	4.82±1.08	16.54±1.87	24.49±2.95	13.13±1.91	139.55±12.77
t-test/p value	2.880/p=0.004	-5.805/p=0.000	7.121/p=0.000	3.799/p=0.000	5.652/p=0.000	3.573/p=0.000	4.935 p=0.000	**4.106 p=0.000**
Age								
8	49.42±5.20	10.09±1.88	22.75±1.78	5.08±0.95	16.95±1.49	24.83±2.60	13.57±1.84	142.70±11.05
9	48.31±5.83	10.05±1.84	22.74±1.84	4.97±1.04	16.86±1.64	24.88±2.61	13.50±1.75	141.33±12.62
10	47.67±5.44	10.07±1.83	22.67±1.72	4.82±1.08	16.68±1.86	24.58±2.73	**13.18±1.88**	139.70±12.18
Anova/p value	**7.398 p=0.001**	0.029/p=0.971	0.190/p=0.827	**5.161/p=0.006**	2.282/p=0.102	1.678/p=0.187	**5.212 p=0.006**	**5.014 p=0.007**
	8 vs 10<0.05			8 vs 10<0.05			8vs10<0.05	**8vs10<0.05**
	8 vs 9<0.05						9vs10<0.05	
Grade								
3rd	48.95±5.56	10.26±1.77	22.79±1.77	5.08±0.97	16.97±1.49	24.96±2.51	13.56±1.76	142.60±11.47
4th	47.55±5.57	9.86±1.89	22.63±1.79	4.78±1.10	16.63±1.89	24.55±2.78	13.21±1.87	139.24±12.76
t-test/p value	4.410/p=0.000	3.857/p=0.000	1.530/p=0.126	5.170/p=0.000	3.484/p=0.000	2.738/p=0.006	3.401 p=0.001	**4.872 p=0.000**
Family type								
Nuclear family	48.39±5.53	10.04±1.85	22.76±1.73	4.97±1.04	16.87±1.59	24.85±2.58	13.43±1.82	141.34±11.99
Extended family	47.92±5.80	10.13±1.80	22.60±1.94	4.83±1.05	16.62±1.99	24.50±2.85	13.25±1.83	139.88±12.84
t test/p value	1.293/p=0.196	-0.719/p=0.473	1.368/p=0.172	2.026/p=0.043	2.093/p=0.037	1.932/p=0.054	1.523 p=0.128	1.851 p=0.064
Number of siblings								
None	47.74±5.80	9.73±2.14	22.64±1.90	4.90±1.07	16.63±1.99	24.80±2.77	13.24±1.97	139.71±13.87
1	48.79±5.72	10.16±1.84	22.74±1.81	5.00±1.03	16.88±1.65	24.78±2.57	13.45±1.83	141.84±12.22
2	48.36±5.45	10.11±1.71	22.73±1.67	4.91±1.06	16.84±1.63	24.79±2.55	13.50±1.69	141.29±11.54
3 and above	47.43±5.30	10.08±1.71	22.70±.178	4.85±1.04	16.76±1.65	24.61±2.89	13.22±1.84	139.66±11.52
Anova/p value	**3.779/p=0.010**	**2.727/p=0.043**	0.173/p=0.915	1.328/p=0.264	1.048/p=0.370	0.299/p=0.826	1.757 p=0.154	2.479 p=0.060
	1 vs 3<0.05	0 vs 1<0.05						
Living situation of mother and father								
Both are alive	48.26±5.59	10.07±1.83	22.72±1.76	4.93±1.04	16.83±1.67	24.78±2.64	13.40±1.82	141.02±12.09
Only the mother lives	49.50±4.33	9.80±2.14	23.05±1.98	5.30±0.86	16.50±1.87	24.40±2.70	13.00±1.80	141.55±11.45
Only the father lives	44.40±12.34	9.00±3.00	20.40±4.03	4.60±1.51	14.60±4.92	23.20±3.89	12.00±2.34	128.20±30.55
Both passed away	42.00±0.00	7.00±0.00	18.00±0.00	3.00±0.00	12.00±0.00	18.00±0.00	11.00±0.00	111.00±0.00
Anova/p value	1.531/p=0.205	1.639/p=0.179	**5.410/p=0.001**	2.109/p=0.97	**5.759/p=0.001**	**2.888/p=0.035**	1.874 p=0.132	**3.867 p=0.009**
Living situation of mother and father								
Living together	48.26±5.58	10.08±1.82	22.71±1.76	4.93±1.04	16.83±1.70	24.79±2.62	13.42±1.80	141.03±12.16
Living apart-death	48.29±5.98	9.96±2.07	22.82±1.90	4.99±1.07	16.71±1.73	24.65±2.93	13.14±1.98	140.59±12.72
Anova/p value	0.017/p=0.983	0.507/p=0.602	0.378/p=0.686	0.186/p=0.831	1.626/p=0.197	1.647/p=0.193	1.359 p=0.257	0.407 p=0.666
Mother's educational status								
Illiterate	47.68±5.92	9.68±1.96	22.40±2.21	4.66±1.11	16.67±1.83	24.09±2.88	13.33±1.79	138.55±13.17
Primary school	47.43±5.51	9.99±1.92	22.59±1.92	4.91±1.04	16.45±1.91	24.29±2.88	13.15±1.98	138.84±12.44
Middle school	48.11±5.49	9.92±1.90	22.88±1.54	4.96±1.03	16.92±1.58	24.86±2.49	13.52±1.68	141.19±11.17
High school	48.17±5.69	10.14±1.83	22.75±1.68	4.91±1.06	16.81±1.74	24.96±2.48	13.34±1.83	141.11±12.10
University	48.96±5.53	10.21±1.74	22.73±1.80	5.00±1.02	16.95±1.59	24.94±2.64	13.48±1.82	142.31±12.39
Anova/p value	**3.084/p=0.015**	2.236/p=0.063	1.474/p=0.208	2.113/p=0.077	**3.404/p=0.009**	**4.171/p=0.002**	1.515 p=0.195	**3.809 p=0.004**
	2 vs 5<0.05				2 vs 3<0.05	1 vs 5<0.05		2vs5<0.05
					2 vs 5<0.05	2 vs 4<0.05		
						2 vs 5<0.05		

TABLE 3: Relationship between HLBCS and sociodemographic characteristics *(contunied)*.

	Nutrition	Physical activity	Hygiene	Sleep	Environmental cleanliness	Health responsibility	Addiction	Total
Father's educational status								
Illiterate	47.52±6.03	9.62±1.92	22.41±2.10	4.90±1.13	16.75±1.80	24.37±2.99	13.09±2.00	138.70±12.96
Primary school	47.44±5.85	9.83±1.85	22.62±1.94	4.85±1.02	16.48±2.11	24.46±2.93	13.20±1.89	138.91±12.70
Middle school	47.50±5.57	9.94±1.86	22.71±1.76	4.91±1.05	16.72±1.85	24.79±2.56	13.38±1.80	139.98±12.24
High school	48.79±5.49	10.25±1.76	22.93±1.62	4.97±1.04	16.91±1.43	24.92±2.35	13.41±1.73	142.20±11.09
University	48.69±5.49	10.15±1.85	22.63±1.80	4.95±1.05	16.90±1.63	24.79±2.75	13.49±1.85	141.63±12.62
Anova/p value	**3.640/p=0.006**	**3.101/p=0.015**	2.135/p=0.074	0.395/p=0.812	2.224/p=0.064	1.193/p=0.312	1.272 p=0.279	**3.321 p=0.010**
Mother's profession								
Housewife	48.20±5.54	10.07±1.82	22.76±1.72	4.94±1.04	16.80±1.73	24.75±2.58	13.45±1.73	141.00±11.77
Officer	48.67±6.04	10.08±1.91	22.64±1.93	4.89±1.11	16.91±1.64	24.68±2.85	13.32±2.00	141.22±13.83
Employee	48.16±5.53	10.02±1.84	22.70±1.79	4.95±1.02	16.80±1.67	24.90±2.64	13.41±1.81	140.98±11.98
Other occupations and death	47.39±4.25	10.14±1.71	22.53±1.73	4.95±0.94	16.31±2.04	24.26±2.53	12.70±2.01	138.31±9.99
Anova/p value	0.859/p=0462	0.105/p=0.957	0.454/p=0.714	0.219/p=0.883	1.446/p=0.228	0.876/p=0.453	2.269 p=0.079	0.683 p=0.562
Father's profession								
Not working	47.72±5.70	9.63±2.06	22.44±2.77	4.94±1.05	16.65±2.20	24.07±3.36	13.17±1.83	138.65±14.65
Officer	48.65±5.88	10.06±1.87	22.64±1.84	4.90±1.10	16.85±1.74	24.71±2.79	13.41±1.96	141.25±13.50
Employee	48.16±5.55	10.07±1.81	22.77±1.66	4.95±1.03	16.86±1.60	24.85±2.53	13.43±1.76	141.12±11.51
Other occupations and death	47.95±4.73	10.44±1.74	22.77±1.53	4.93±0.95	16.22±1.98	24.64±2.40	13.01±1.76	140.00±10.34
Anova/p value	0.927/p=0.427	2.292/p=0.077	0.942/p=0.420	0.205/p=0.893	**3.390 p=0.017**	1.966/p=0.117	1.569 p=0.195	1.087 p=0.353
					2 vs 4<0.05			
					3 vs 4<0.05			
Economic level of the family								
Income is less than expenses	48.87±5.42	10.16±1.85	22.85±1.72	4.95±1.06	16.90±1.65	24.95±2.62	13.51±1.76	142.23±12.00
Income is equal to expenses	47.26±5.78	9.88±1.81	22.50±1.83	4.90±1.03	16.63±1.75	24.46±2.61	13.16±1.91	138.83±12.25
Income is more than expenses	46.75±5.57	10.20±2.02	22.24±2.41	4.89±0.97	16.96±2.32	23.82±3.56	13.27±1.77	138.17±13.53
Anova/p value	**12.78/p=0.000**	**3.320/p=0.036**	**6.178/p=0.002**	0.348/p=0.706	**3.754/p=0.024**	**6.590/p=0.001**	**5.148 p=0.006**	**11.698 p=0.000**
	1 vs 2<0.05	1 vs 2<0.05	1 vs 2<0.05		1 vs 2<0.05	1 vs 2<0.05	1vs2<0.05	1vs2<0.05
Overweight level according to BMI								
<5 (Low weight)	48.35±5.48	9.95±1.90	22.72±1.87	5.00±0.93	16.87±1.41	24.91±2.31	13.62±1.52	141.45±11.31
5-85 (Normal weight)	48.35±5.71	10.12±1.84	22.74±1.73	4.95±1.04	16.82±1.68	24.83±2.54	13.39±1.84	141.23±12.22
85-95 (Overweight)	48.61±5.32	10.11±1.70	22.74±1.77	4.95±1.16	16.72±2.01	24.60±2.90	13.43±1.90	141.19±12.32
95> (Obese)	47.03±5.12	9.66±1.92	22.46±2.14	4.74±1.05	16.71±1.77	24.24±3.44	13.03±1.83	137.91±12.85
Anova/p value	1.961/p=0.118	2.160/p=0.091	0.775/p=0.508	1.362/p=0.253	0.297/p=0.827	1.835/p=0.139	1.987 p=0.114	2.438 p=0.063
Is there an overweight member in the family?								
Yes	47.56±5.53	9.98±1.87	22.57±1.86	4.78±1.07	16.66±1.87	24.46±2.80	13.28±1.82	139.34±12.21
No	48.82±5.61	10.1±1.82	22.83±1.72	5.05±1.01	16.92±1.56	24.99±2.51	13.47±1.82	142.25±12.10
t-test/p value	-3.936/p=0.000	-1.447/p=0.148	-2.450/p=0.014	-4.540/p=0.000	-2.615/p=0.009	-3.469/p=0.001	-1.771 p=0.077	**-4.187 p=0.000**

Anova: Analysis of variance; BMI: Body mass index

TABLE 4: Predictors affecting healthy lifestyle behaviors in primary school students

Independent variables	B	SE	Beta (β)	t value	p value	F	Model (p)	R^2	Durbin Watson
Constant	135.235	1.233	-	109.710	0.000*	9.217	0.000*	0.078	1.813
Gender (female)	3.791	0.858	0.155	4.416	0.000*				
Age (8 age)	-0.368	1.021	-0.014	-0.361	0.719				
Grade (3rd)	3.405	1.047	0.123	3.253	0.001*				
Is there an overweight member in the family? (no)	-1.684	0.862	-0.068	-1.954	0.051				
Mother education (university and above)	3.669	1.152	0.143	3.187	0.001*				
Father education (university and above)	1.556	1.141	0.061	1.364	0.173				
Economic status (Income is more than expenses)	3.416	0.887	0.135	3.849	0.000*				

*p<0.05. SE: standard error of coefficient; β: standardized regression coefficient; R^2: proportion of variation in dependent variable explained by regression model; p: the level of statistical significance.

of the regression analysis, gender was determined as an important variable affecting healthy lifestyle behaviors (β=0.155). It was determined that girls had higher lifestyle behaviors than boys. Xiang et al. also found that girls were more sensitive to healthy lifestyle factors than boys.[24] Temircan found that the healthy lifestyle behavior of female school-aged children's was higher than that of male school-aged children's.[25] Our research finding and the findings of previous studies show that girls have more positive lifestyle behaviors than boys.

In this study, mother's education level (β=0.143) was the other important variable affecting healthy lifestyle behaviors. While the father's education level was found to be associated with healthy lifestyle behaviors in univariate analysis, it was not found to be a predictor in multiple linear regression analysis. Children with higher educational level of their parents had higher healthy lifestyle behaviors. In the study of Musić Milanović et al. low parental education level was found to be a risk factor for not exercising.[15] Previous studies on the subject in adolescents show that parental education level is an important predictor of children's healthy lifestyle behaviors.[26,27] Our research finding is similar to previous research findings and supports the literature. Higher educated parents are typically more aware of and knowledgeable about health-related issues. These parents can provide more information and guidance to their children on topics such as healthy eating, regular exercise, hygiene and avoiding harmful habits. Parents are often important role models for their children. When parents with higher levels of education demonstrate their own healthy lifestyle behaviors, they can set a positive example for their children. Educated parents can also allocate more resources to healthy lifestyle behaviors. For example, factors such as access to healthy foods, sports and physical activity opportunities, and access to health services can support children's healthy lifestyle behaviors.[28,29]

The other important variable affecting healthy lifestyle behaviors in our study was the income status of children (β=0.135). The perception of the child's income level revealed that children with good income status had higher healthy lifestyle behaviors. In the study of Xiang et al. it was determined that children from low-medium family wealth had lower levels of physical activity than children from high family wealth.[24] Although not in primary school-aged children's, it shows that low-income perception is an important predictor affecting healthy lifestyle behaviors in adolescents.[27,30] Our research finding and previous research findings suggest that income status is an important predictor of healthy lifestyle behaviors. Families with better income generally have access to healthier foods and can provide their children with a balanced diet from a variety of food groups. They may also invest more in physical activity opportunities, such as gym memberships and opportunities to join sports teams. This can encourage children to engage in regular physical activity.[12,15]

In our study, another important factor affecting the healthy lifestyle behaviors of primary school-aged children's was the grade level of the school-aged children's. Younger school-aged children's in the 3rd

grade (β=0.123) had more positive lifestyle behaviors than 4th graders. Depboylu and Kaner reported that the nutritional compliance of primary school children with healthy lifestyle behaviors was significantly higher than that of middle school children.[31] In the literature, younger age is associated with more dietary compliance, regular exercise, less screen time, and enough sleep length.[21,31,32] There are studies showing that unhealthy dietary practices, inadequate physical activity, tobacco use, alcohol consumption and disturbances in sleep patterns increase with age.[21,33] Considering that healthy lifestyle behaviors become negative and risky behaviors increase with increasing age, it is of great importance to gain healthy lifestyle behaviors in early childhood.

The school health nurse plays a crucial role in promoting healthy lifestyle behaviors in primary school-aged children's. This role is critical for children to acquire healthy habits and adopt long-term healthy lifestyles. School health nurses can create health education programs and provide trainings on topics such as healthy nutrition, sleep, exercise and hygiene. They can also help school-aged children's and their families achieve their personal health goals by providing individual counselling on healthy lifestyles. School health nurses can provide early diagnosis and treatment by conducting health screenings such as eye, dental and hearing screenings. They can encourage children to lead an active lifestyle by organizing sports activities and games. They can help school-aged children's cope with stress, anxiety and other emotional problems and ensure that they receive professional help when necessary. They ensure that the school environment is clean and hygienic and educate school-aged children's about personal hygiene. In this way, the school health nurse protects both the physical and psychological health of school-aged children's, supports their general well-being and helps them adopt healthy lifestyle behaviors.[17,34,35]

STRENGTHS AND LIMITATIONS

The healthy lifestyle behaviors of primary school children and the sociodemographic factors influencing these practices were both thoroughly examined in our study. A further advantage of the research is that it was performed with a large sample (n=1,240). Our study also has limitations. In the study, healthy lifestyle behaviors were associated with sociodemographic variables, but the relationship with environmental and cultural variables within the scope of social determinants of health was not evaluated. In future studies, addressing the social determinants of health in detail may yield stronger results.

CONCLUSION

It was shown in this study that school-aged children's in primary schools exhibited a good level of healthy lifestyle behaviors. The mother's degree of education, income level, class level, and gender were the most significant determinants of healthy lifestyle behaviors. In line with these results, it is recommended to develop policies to improve sociodemographic determinants that affect healthy lifestyle behaviors. These may include increasing the education level of parents and providing social assistance to low-income families. According to these findings, it is recommended to create and support programs such as nutrition and physical activity in schools for healthy lifestyle behaviors among primary school-aged children's who are disadvantaged in terms of sociodemographic variables. In addition, the content of the programs to be planned should be organized according to demographic differences such as grade level and gender. School health nurses should plan and implement interventions for healthy lifestyle behaviors in line with the results of this study.

IMPLICATIONS FOR PRACTICE

Although the development of healthy lifestyle behaviors during childhood is important for the permanence of these behaviors, there is little evidence on children's healthy lifestyle behaviors. Starting from primary school, school health nurses should assess children's healthy lifestyle behaviors and the predictors affecting them. In line with these assessments, they should help children develop healthy lifestyle behaviors by taking individual differences into consideration.

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Conflict of Interest

No conflicts of interest between the authors and / or family members of the scientific and medical committee members or members of the potential conflicts of interest, counseling, expertise, working conditions, share holding and similar situations in any firm.

Authorship Contributions

Idea/Concept: *Asiye Kartal, Eda Kılınç İşleyen, Edanur Özkaya;* ***Design:*** *Asiye Kartal, Eda Kılınç İşleyen, Edanur Özkaya;* ***Control/Supervision:*** *Asiye Kartal;* ***Data Collection and/or Processing:*** *Eda Kılınç İşleyen, Edanur Özkaya;* ***Analysis and/or Interpretation:*** *Eda Kılınç İşleyen, Edanur Özkaya;* ***Literature Review:*** *Asiye Kartal, Eda Kılınç İşleyen, Edanur Özkaya;* ***Writing the Article:*** *Edanur Özkaya, Eda Kılınç İşleyen;* ***Critical Review:*** *Asiye Kartal.*

REFERENCES

1. Marques A, Bordado J, Tesler R, Demetriou Y, Sturm DJ, de Matos MG. A composite measure of healthy lifestyle: a study from 38 countries and regions from Europe and North America, from the Health Behavior in School-Aged Children survey. Am J Hum Biol. 2020;32(6):e23419. PMID: 32277794.
2. WHO [Internet]. A healthy lifestyle-WHO recommendations. © 2025 WHO [Cited: January, 2024] Available from: https://www.who.int/europe/news-room/fact-sheets/item/a-healthy-lifestyle---who-recommendations
3. Marques A, Loureiro N, Avelar-Rosa B, Naia A, Matos MG. Adolescents' healthy lifestyle. J Pediatr (Rio J). 2020;96(2):217-24. PMID: 30393010; PMCID: PMC9432147.
4. Owen KB, Parker PD, Astell-Burt T, Lonsdale C. Regular physical activity and educational outcomes in youth: a longitudinal study. J Adolesc Health. 2018;62(3):334-40. PMID: 29229462.
5. Ng R, Sutradhar R, Yao Z, Wodchis WP, Rosella LC. Smoking, drinking, diet and physical activity-modifiable lifestyle risk factors and their associations with age to first chronic disease. Int J Epidemiol. 2020;49(1):113-30. PMID: 31329872; PMCID: PMC7124486.
6. Scaglioni S, De Cosmi V, Ciappolino V, Parazzini F, Brambilla P, Agostoni C. Factors Influencing Children's Eating Behaviours. Nutrients. 2018;10(6):706. PMID: 29857549; PMCID: PMC6024598.
7. Stevenson D. Settings for Health Promotion. In: Snelling A, ed. Introduction to Health Promotion. 2nd ed. New Jersey: John Wiley&Sons. 2024. p.253-77.
8. Pagerols M, Prat R, Rivas C, Español-Martín G, Puigbó J, Pagespetit È, et al. The impact of psychopathology on academic performance in school-age children and adolescents. Sci Rep. 2022;12(1):4291. PMID: 35277563; PMCID: PMC8917234.
9. UNESCO. Ready to learn and thrive: school health and nutrition around the world. [Cited:December, 2023]. https://unesdoc.unesco.org/ark:/48223/pf0000384421.
10. Puia A, Leucuta DC. Children's lifestyle behaviors in relation to anthropometric indices: a family practice study. Clujul Med. 2017;90(4):385-91. PMID: 29151785; PMCID: PMC5683826.
11. D'Souza NJ, Kuswara K, Zheng M, Leech R, Downing KL, Lioret S, et al. A systematic review of lifestyle patterns and their association with adiposity in children aged 5-12 years. Obes Rev. 2020;21(8):e13029. PMID: 32297464.
12. Whiting S, Buoncristiano M, Gelius P, Abu-Omar K, Pattison M, Hyska J, et al. Physical activity, screen time, and sleep duration of children aged 6-9 years in 25 countries: an analysis within the WHO European childhood obesity surveillance initiative (COSI) 2015-2017. Obes Facts. 2021;14(1):32-44. PMID: 33352575; PMCID: PMC7983588.
13. Lekše R, Godec D, Prosen M. Determining the impact of lifestyle on the health of primary school children in slovenia through mixed membership focus groups. J Community Health. 2023;48(5):857-69. PMID: 37160527; PMCID: PMC10169174.
14. Mulitauopele C, Israel W, Rosenberg S, Brooks-Russell A, Ma M, Dinger MK. The association of school learning environment with adolescent health behaviors. J Sch Health. 2023;93(8):649-58. PMID: 36815238.
15. Musić Milanović S, Buoncristiano M, Križan H, Rathmes G, Williams J, Hyska J, et al. Socioeconomic disparities in physical activity, sedentary behavior and sleep patterns among 6- to 9-year-old children from 24 countries in the WHO European region. Obes Rev. 2021;22 Suppl 6:e13209. PMID: 34235843.
16. Rawal T, van Schayck OCP, Willeboordse M, Arora M, Bhaumik S, Bhagra A, et al. How to promote a healthy lifestyle among schoolchildren: development of an intervention module (i-PROMISe). Public Health Pract (Oxf). 2022;3:100262. PMID: 36101760; PMCID: PMC9461553.
17. Kostenius C. School nurses' experiences with health dialogues: a Swedish case. J Sch Nurs. 2023;39(5):345-56. PMID: 34155940; PMCID: PMC10486162.
18. Öcal EE, Önsüz MF. Reliability and validity of healthy lifestyle behaviours scale in children. European Journal of Public Health. 2020;30(Supplement_5). https://doi.org/10.1093/eurpub/ckaa166.392
19. George D, Mallery M. SPSS for Windows Step by Step: A Simple Guide and Reference, 17.0 update. 10th ed. Boston: Pearson; 2010.
20. Neyzi O, Günöz H, Furman A, Bundak R, Gökçay G, Darendeliler F, et al. Türk çocuklarında vücut ağırlığı, boy uzunluğu, baş çevresi ve vücut kitle indeksi referans değerleri. Çocuk Sağlığı ve Hastalıkları Dergisi. 2008;51(1):1-14. http://www.forgottendiseases.org/assets/Turkey/papers/Turkey_Growth_Neyzi_2008.pdf
21. Hormenu T. Dietary intake and its associated factors among in-school adolescents in Ghana. PLoS One. 2022;17(5):e0268319. PMID: 35552563; PMCID: PMC9097987.
22. López-Bueno R, López-Sánchez GF, Casajús JA, Calatayud J, Tully MA, Smith L. Potential health-related behaviors for pre-school and school-aged children during COVID-19 lockdown: a narrative review. Prev Med. 2021;143:106349. PMID: 33271236; PMCID: PMC7701882.
23. Day RE, Sahota P, Christian MS. Effective implementation of primary school-based healthy lifestyle programmes: a qualitative study of views of school staff. BMC Public Health. 2019;19(1):1239. PMID: 31500603; PMCID: PMC6734437.
24. Xiang H, Feng X, Lin L, Luo S, Liu X, Chen D, et al. Association between healthy lifestyle factors and health-related quality of adolescents: the moderating role of gender. Health Qual Life Outcomes. 2023;21(1):119. PMID: 37904152; PMCID: PMC10617140.

25. Temircan Z. Ergenlerin sağlıklı yaşam biçimi davranışları ile okul aidiyeti arasındaki ilişkinin incelenmesi [Investigation of the relationship between adolescents' healthy lifestyle behaviors and school belonging]. Journal of Mehmet Akif Ersoy University Institute of Educational Sciences. 2022;10(13):71-87. https://dergipark.org.tr/en/download/article-file/2490422

26. Ardic A, Esin MN. Factors associated with healthy lifestyle behaviors in a sample of Turkish adolescents: a school-based study. J Transcult Nurs. 2016;27(6):583-92. PMID: 26002620.

27. Daşıkan Z. Healthy lifestyle behaviors and related factors in high school adolescents: a cross-sectional study (Izmir/Turkey). Vulnerable Children and Youth Studies. 2023;18(2):156-68. https://doi.org/10.1080/17450128.2022.2100952

28. Chen L, Hong J, Xiong D, Zhang L, Li Y, Huang S, et al. Are parents' education levels associated with either their oral health knowledge or their children's oral health behaviors? A survey of 8446 families in Wuhan. BMC Oral Health. 2020;20(1):203. PMID: 32652985; PMCID: PMC7353758.

29. de Buhr E, Tannen A. Parental health literacy and health knowledge, behaviours and outcomes in children: a cross-sectional survey. BMC Public Health. 2020;20(1):1096. PMID: 32660459; PMCID: PMC7359277.

30. Gur K, Kılınc E, Yayikci E, Değer K, Tekin E. Examination of predictive factors healthy lifestyle behaviours and compare coping styles with stress of adolescents with and without hearing loss: a comparative study. Clinical and Experimental Health Sciences. 2022;12(4):875-84. https://dergipark.org.tr/en/download/article-file/1775235

31. Depboylu GY, Kaner G. Younger age, higher father education level, and healthy lifestyle behaviors are associated with higher adherence to the Mediterranean diet in school-aged children. Nutrition. 2023;114:112166. PMID: 37597470.

32. Lioret S, Campbell KJ, McNaughton SA, Cameron AJ, Salmon J, Abbott G, et al. Lifestyle patterns begin in early childhood, persist and are socioeconomically patterned, confirming the importance of early life interventions. Nutrients. 2020;12(3):724. PMID: 32182889; PMCID: PMC7146362.

33. Jonsson KR, Corell M, Löfstedt P, Adjei NK. The clustering of multiple health and lifestyle behaviors among Swedish adolescents: a person-oriented analysis. Front Public Health. 2023;11:1178353. PMID: 37538263; PMCID: PMC10394625.

34. Silva AA, Gubert FDA, Barbosa Filho VC, Freitas RWJF, Vieira-Meyer APGF, Pinheiro MTM, et al. Health promotion actions in the School Health Program in Ceará: nursing contributions. Rev Bras Enferm. 2021;74(1):e20190769. English, Portuguese. PMID: 33787775.

35. Dolgun E, Yavuz van Giersbergen M, Durmaz Akyol A. Healthy life style behaviors changes of the nursing students: 2004-2014. International Journal of Caring Sciences. 2020;13(2):1155-61. https://www.internationaljournalofcaringsciences.org/docs/39_1_dogun_original_13_2.pdf