



Health literacy and nutritional attitudes of students in public and private schools in Türkiye: A cross-sectional study

Türkiye'deki devlet okulları ve özel okullardaki öğrencilerin sağlık okuryazarlığı ve beslenme tutumları:
Kesitsel bir çalışma

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ABSTRACT

Objective: The aim of our study is to evaluate and compare the health literacy and nutritional attitudes of children aged 9-11 in two different types of schools.

Method: This study is comparative and cross-sectional. 280 schoolchildren participated in the study. The "Schoolchildren Sociodemographic Data Form," the "Health Literacy Scale for Children Aged 9-11" and the "Nutritional Attitudes Scale" questionnaires were administered. Data were analyzed using SPSS 22.0 at a 95% confidence level.

Results: When the distribution of the children participating in the study was examined according to their descriptive characteristics, a significant difference was found in relation to the age variable ($p < 0.001$). According to the results of the independent groups t-test conducted to determine whether children's health literacy and nutrition attitude scores differed according to school type, there was no significant difference between public and private school groups in terms of total health literacy scores ($p = 0.260$). However, when examined at the subscale level, only the Critical Health Literacy scores show a significant difference ($p = 0.003$). In this sub-dimension, private school students scored higher than public school students.

Conclusion: The findings of this study reveal that some dimensions of health literacy differ according to school type, particularly showing that private schools have an advantage in the area of critical health literacy.

Anahtar Kelimeler: Health literacy; private school; public school; school child

ÖZ

Amaç: Çalışmamızın amacı, iki farklı okul türünde 9-11 yaş arası çocukların sağlık okuryazarlığını ve beslenme tutumlarını değerlendirmek ve karşılaştırmaktır.

Yöntem: Araştırma karşılaştırmalı ve kesitsel tiptedir. Çalışmaya 280 okul çocuğu katılmıştır. "Okul Çocukları Sosyodemografik Veri Formu", "9-11 Yaş Arası Çocuklar için Sağlık Okuryazarlığı Ölçeği" ve "Beslenme Tutumu Ölçeği" anketleri uygulanmıştır. Veriler, %95 güven düzeyinde SPSS 22.0 kullanılarak analiz edildi.

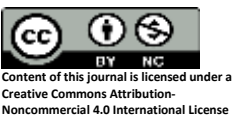
Bulgular: Çalışmaya katılan çocukların dağılımı betimsel özelliklerine göre incelendiğinde, yaş değişkeni ile ilgili olarak anlamlı bir fark bulunmuştur ($p < 0.001$). Çocukların sağlık okuryazarlığı ve beslenme tutumu puanlarının okul türüne göre farklılık gösterip göstermediğini belirlemek için yapılan bağımsız gruplar t-testi sonuçlarına göre, toplam sağlık okuryazarlığı puanları açısından devlet okulu ve özel okul grupları arasında anlamlı bir fark bulunmamıştır ($p = 0.260$). Ancak, alt ölçek düzeyinde incelendiğinde, yalnızca Eleştirel Sağlık Okuryazarlığı puanlarında anlamlı bir fark görülmüştür ($p = 0.003$). Bu alt boyutta, özel okul öğrencileri devlet okulu öğrencilerinden daha yüksek puan almıştır.

Sonuç: Bu çalışmanın bulguları, sağlık okuryazarlığının bazı boyutlarının okul türüne göre farklılık gösterdiğini, özellikle de özel okulların kritik sağlık okuryazarlığı alanında avantajlı olduğunu ortaya koymaktadır.

Keywords: Sağlık okuryazarlığı; özel okul; devlet okulu; okul çocuğu

Introduction

Health literacy was defined in the late 1980s as part of health promotion. The World Health Organization (WHO) defines health literacy not merely as the basic skills required to read and understand health-related information, but rather as the cognitive and social skills necessary for individuals to access, understand, and use health-related information to improve their health and maintain good health (Sørensen et al., 2015). Health literacy is also defined as the capacity to obtain, interpret, and understand the basic health information and



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services necessary for individuals to make informed health decisions (Kutner, Greenberg, Jin & Paulsen, 2003).

Healthy growth, development, and the maintenance of psychophysical competence are directly related to nutritional status. Childhood nutrition plays a crucial role in preventing chronic nutrition-related problems (obesity and malnutrition) (Gardašević, Anđelić, Joksimović & Ahmedov, 2020). Nutritional preferences in school-aged children develop as a result of biological and demographic characteristics, as well as environmental stimuli. In this process, the family, through its attitudes, knowledge, and practices, acts as the architect of the child's initial relationship with food.

The school age period covers the stages of growth and development from 6 to 12 years of age for primary school and 12 to 18 years of age for middle school and high school (adolescence). The school-age period is a time when children undergo continuous physical, emotional, mental, and social growth and development. This period is also known as an active learning period when socialization increases (Sørensen et al., 2015; Kutner et al., 2003). Children acquire behaviors, habits, basic knowledge, and skills that influence their lifestyles in adulthood during the school-age period (Jacobs, Lou, Ownby & Caballero, 2016).

The literature shows that health literacy among school-age children is not at the desired level. In a study conducted by Jang and Kim with fifth and sixth grade students, it was determined that the percentage of those with limited linguistic literacy (47.1%) and functional health literacy (56.8%) was high (Jang & Kim, 2015). In a study conducted by Ran et al. with middle school students, it was determined that 25.5% of students had low health literacy levels (Ran et al., 2018). In a study conducted by Sukys et al. with students in grades 7, 8, 9, and 10, it was determined that 12.1% of students had low health literacy, 70.5% had moderate health literacy, and 17.4% had high health literacy (Sukys, Trinkuniene & Tilindiene, 2019). Although studies assessing the health literacy of school-age children and adolescents in our country are limited, there are differences in their levels of health literacy. In a study conducted by Ozturk and Ayaz-Alkaya with middle school students, it was determined that 64% of students had a moderate level of health literacy, 18.4% had a low level, and 17.7% had a high level (Ozturk & Ayaz Alkaya, 2020). In a study conducted by Haney, it was found that 41.2% of middle school students had a high level of health literacy (Ozturk Haney, 2020). In another study conducted with middle school students, it was determined that 21% of students had a low level of health literacy, 63.8% had an intermediate level, and 15.2% had a high level (Ozturk Haney, 2018).

Within the scope of school health, it is important to determine children's health literacy levels and raise awareness on this issue. Studies in the literature have measured children's health literacy levels and have been conducted in different populations (Denktaş, 2019). According to this, no study has been found in the literature that shows the health literacy level of children aged 9-11. Furthermore, there is no study that includes students from two different types of schools, public and private, and compares their health literacy levels. The aim of our study is to assess and comparing the health literacy of children aged 9-11 in two different types of schools.

Research Questions

- What is the health literacy level of students at school?
- Is there a difference in literacy levels between students attending public and private schools?
- What are the nutritional attitudes of students at school?
- Is there a difference in nutritional attitudes between students attending public and private schools?

Methods

Study design and sampling

This comparative and cross-sectional study was carried out from February to June 2025 with students aged 9-11 in a public and a private school in Aydın, Türkiye. The sample size was determined to be 246 individuals with a confidence level of 95% and a margin of error of 5%. With an additional 10% of error, the target sample

size reached to 280 school children. One public and one private elementary and middle school were selected by lottery from the lists of names obtained from the relevant Provincial Directorate of National Education. The lists of students at the selected schools were obtained from the school administration, and the students to be included in the study were selected using simple random sampling.

A total of 280 school children aged 9-11 presented to the a public school and a private school were included in the study. Of them, 164 were in the public school, and 116 were in private school.

Inclusion criteria: Being between 9-11 years old, being a student in a public or private school, volunteering to participate in the research. **Exclusion criteria:** Refusing to participate in the research, not completing or incompletely completing the survey forms.

Data Collection Tools

Sociodemographic Questionnaire

Following a comprehensive review of the literature, researchers developed a questionnaire encompassing various demographic and health-related factors pertinent to school children. These factors included age, gender, education level, mother's educational status, father's educational status, mother's occupation, father's occupation, family socioeconomic status, presence of chronic disease, regular medication usage, presence of chronic disease in the family, regular medication use in the family.

Health Literacy Scale for Children Aged 9-11

Health Literacy Scale for Children Aged 9-11 developed by Güler (2023), the Health Literacy Scale for Children Aged 9-11 consists of 15 items (Güler, 2023). Child Health Literacy Scale subdimensions Functional Health Literacy (min: 5, max: 15), Communicative/Interactive Health Literacy dimension (min: 4, max: 12), Critical Health Literacy dimension (min: 2, max: 6) Value Assessment/Evaluation dimension (min: 3, max: 9), and a minimum of 14 and a maximum of 42 points can be obtained from the overall Child Health Literacy Scale. In the original study of the Child Health Literacy Scale, the Cronbach alpha value was found to be 0.81. This value indicates that the scale is a generally reliable measurement tool. The internal consistency coefficients of the scale's subscales are also at a similar adequate level. The Cronbach's Alpha coefficient for the Functional Health Literacy sub-dimension was 0.78, for the Communicative Health Literacy sub-dimension 0.76, for the Critical Health Literacy sub-dimension 0.74, and for the Value Assessment/Evaluation sub-dimension 0.80.

Nutrition Attitude Scale

The Child Heart Health Promotion Attitude Scale, developed by Arvidson and Denton (1990) to assess children's attitudes toward improving heart health, consists of 16 items. It was adapted to the Turkish population by Öztürk Haney and Bahar . The scale consists of four sub-dimensions: exercise, nutrition, smoking, and stress control. In this study, the nutrition subscale, consisting of 4 items, was used. The internal consistency reliability coefficient of the scale is 0.75, and the internal consistency reliability coefficient of the nutrition subscale is 0.67. The nutrition subscale measures the child's attitude toward activities that reduce fat intake, increase healthy food consumption, and a diet that improves heart health. The scale items are scored between 1-4 points (1-strongly disagree, 4-strongly agree), and the total score is between 4-16. A high total score on the scale indicates a positive attitude (Öztürk Haney & Bahar, 2014).

Data Analysis

Data were analyzed by using SPSS 22.0 with a confidence level of 95%. In the relevant literature, results for skewness and kurtosis values of variables between +1.5 and -1.5 and +2.0 and -2.0 are considered to be normally distributed (George & Mallery, 2010). It has been determined that the variables exhibit a normal distribution. Parametric methods were used in the analysis of the data. Frequency and percentage analyses

were used to determine the descriptive characteristics of the children participating in the study, while mean and standard deviation statistics were used to examine the scale. Differences in the proportions of categorical variables between independent groups were analyzed using the Chi-square and Fisher exact tests. The independent groups t-test was used to examine differences in scale levels according to the type of school attended by the children

Ethics

This study was approved by the Aydın Adnan Menderes University Faculty of Nursing Ethics Committee [code number:2025/427]. The study followed the latest version of the Helsinki Declaration. Permission to carry out the study was obtained from Provincial Directorate of National Education and school administration before the data collection.

Permission was obtained from the scale authors. After obtaining written consent to children and their parents, the study's purpose and its benefits for health literacy for children were briefly explained. Childrens included in the study were visited in their schools and all the participants filled out the forms by their own in approximately 20 min.

Results

The participants in the study consisted of school-age children aged 9-11, 59% (n=164) of whom attended public schools and 41% (n=116) of whom attended private schools. When the distribution of the children participating in the study was examined according to their descriptive characteristics, a significant difference was found in relation to the age variable ($p < 0.001$). The majority of children attending public schools (72.0%) were 11 years old, while the majority of the private school group (63.8%) were in the 9-year-old age group. 52.4% (n=86) of those attending public schools were male, while 50% (n=58) of those attending private schools were male students. There was no significant difference between the groups in terms of gender distribution ($p > 0.05$). In terms of sibling presence, the percentage of children without siblings was higher in the private school group (34.5%) than in the public school group (21.3%), and this difference was statistically significant ($p = 0.011$). In terms of the number of siblings, the percentage of children with one sibling in the private school group (89.5%) is quite high, and this difference between the groups was found to be statistically significant ($p < 0.001$) (Table 1).

When examining the educational levels of mothers and fathers, it is seen that the vast majority of parents of children attending private schools have a university degree or higher (mothers: 90.5%, fathers: 87.1%); this rate is significantly higher than that of parents of children attending public schools (mother: 50.6%, father: 54.9%), and the difference is significant for both variables ($p < 0.001$). In terms of maternal employment status, 83.6% of mothers in the private school group are employed, which is significantly higher than the 51.2% rate in the public school group ($p < 0.001$). There is no significant difference in paternal employment status between the two groups ($p > 0.05$) (Table 1).

When examining the health-related characteristics of children, no significant differences were observed in terms of variables such as chronic illness, regular medication use, or the presence of chronic illness or regular medication use in the family ($p > 0.05$). However, data on the use of technological devices showed significant differences. The rates of computer and tablet use were 75.0% and 77.6%, respectively, in the private school group, while these rates were 42.1% and 55.5% in the public school group ($p < 0.001$). Additionally, the mobile phone usage rate was 75.0% in public schools, while it was 44.8% in private schools, and the difference between them was statistically significant ($p < 0.001$) (Table 1).

According to the results of the independent groups t-test conducted to determine whether children's health literacy and nutrition attitude scores differed according to school type, there was no significant difference between public and private school groups in terms of total health literacy scores ($t(278) = -1.129$, $p = 0.260$) (Table 2).

Table 1. Sociodemographic characteristics of the participating children in private and public schools

	Public		Private		Total		p
	n	%	n	%	n	%	
Age							
9	0	%0.0	74	%63.8	74	%26.4	X ² =180.964 p=0.000
10	46	%28.0	39	%33.6	85	%30.4	
11	118	%72.0	3	%2.6	121	%43.2	
Gender							
Girl	78	%47.6	58	%50.0	136	%48.6	X ² =0.162 p=0.389
Boy	86	%52.4	58	%50.0	144	%51.4	
Sibling presence							
No	35	%21.3	40	%34.5	75	%26.8	X ² =5.983 p=0.011
Yes	129	%78.7	76	%65.5	205	%73.2	
Number of siblings							
1	74	%57.4	68	%89.5	142	%69.3	X ² =23.229 p=0.000
2	38	%29.5	5	%6.6	43	%21.0	
3 and above	17	%13.2	3	%3.9	20	%9.8	
Parental Education Status (mother)							
Primary and Middle School	38	%23.2	4	%3.4	42	%15.0	X ² =49.237 p=0.000
High School	43	%26.2	7	%6.0	50	%17.9	
University	83	%50.6	105	%90.5	188	%67.1	
Parental Education Status (father)							
Primary and Middle School	26	%15.9	2	%1.7	28	%10.0	X ² =34.059 p=0.000
High School	48	%29.3	13	%11.2	61	%21.8	
University	90	%54.9	101	%87.1	191	%68.2	
Mother's employment status							
Working	84	%51.2	97	%83.6	181	%64.6	X ² =31.208 p=0.000
Not working	80	%48.8	19	%16.4	99	%35.4	
Father's employment status							
Working	159	%97.0	114	%98.3	273	%97.5	X ² =0.489 p=0.387
Not working	5	%3.0	2	%1.7	7	%2.5	
Presence of chronic disease							
Yes	21	%12.8	12	%10.3	33	%11.8	X ² =0.395 p=0.332
No	143	%87.2	104	%89.7	247	%88.2	
Regular medication presence							
Yes	18	%11.0	16	%13.8	34	%12.1	X ² =0.506 p=0.298
No	146	%89.0	100	%86.2	246	%87.9	
Presence of chronic disease in the family							
Yes	48	%29.3	26	%22.4	74	%26.4	X ² =1.642 p=0.126
No	116	%70.7	90	%77.6	206	%73.6	
Presence of a family member who uses drugs							
Yes	65	%39.6	42	%36.2	107	%38.2	X ² =0.338 p=0.325
No	99	%60.4	74	%63.8	173	%61.8	
Do you have a computer?							
Yes	69	%42.1	87	%75.0	156	%55.7	X ² =29.855 p=0.000
No	95	%57.9	29	%25.0	124	%44.3	
Do you have mobile phone?							
Yes	123	%75.0	52	%44.8	175	%62.5	X ² =26.391 p=0.000
No	41	%25.0	64	%55.2	105	%37.5	
Do you have a tablet?							
Yes	91	%55.5	90	%77.6	181	%64.6	X ² =14.517 p=0.000
No	73	%44.5	26	%22.4	99	%35.4	

However, when examined at the subscale level, only the Critical Health Literacy scores show a significant difference ($t(278) = -3.122$, $p = 0.003$). In this sub-dimension, private school students (Mean = 3.207, SD = 1.034) scored higher than public school students (Mean = 2.848, SD = 0.883). Cohen's d value ($d = 0.379$) indicates a moderate effect size. No statistically significant differences were found between the groups in terms of the other subscales: Functional Health Literacy ($p = 0.067$), Communicative Health Literacy ($p = 0.090$), and Valuation/Evaluation ($p = 0.309$) (Table 2).

Table 2. Differences in children's health literacy and nutrition attitude scores according to school type

Groups	Public (n=164)		Private (n=116)		t	sd	p	d
	Mean	SD	Mean	SD				
Child Health Literacy Total	18.500	3.772	19.052	4.370	-1.129	278	0.260	0.137
Functional Health Literacy	3.598	0.863	3.810	1.071	-1.838	278	0.067	0.223
Communicative Health Literacy	3.829	1.013	4.060	1.253	-1.703	278	0.090	0.207
Critical Health Literacy	2.848	0.883	3.207	1.034	-3.122	278	0.003	0.379
Valuation/Assessment	8.226	2.094	7.974	1.945	1.019	278	0.309	0.124
Nutrition Attitude	6.640	1.947	6.379	1.845	1.129	278	0.260	0.137

Independent Groups T-Test; t, p: Significance, df: Degrees of Freedom; Cohen (d): Effect Size

Nutrition Attitude scores did not differ significantly between public (Mean = 6.640, SD = 1.947) and private school (Mean = 6.379, SD = 1.845) groups ($t(278) = 1.129$, $p = 0.260$). When examining the effect size values, it is observed that in all statistically insignificant comparisons, Cohen's d values remained below 0.20, indicating that these differences represent small effects (Table 2).

Discussion

There is no statistically significant difference in general health literacy scores between public school students (mean = 18.50) and private school students (mean = 19.05) ($p = 0.260$). This suggests that general health knowledge may be shaped by a common curriculum and conveyed independently of school type. This result is consistent with the findings of Nash and colleagues (2021) in their international review, which indicated that school-based health literacy programs yield similar outcomes across different countries and school structures (Nash, Patterson, Flittner, Elmer & Osborne, 2021). No research has been found that specifically examines the difference between public and private schools. However, it is thought that the learning environment, teacher quality, and family support may affect children's health literacy.

However, a statistically significant difference in favor of private school students was found in the critical health literacy dimension ($p = 0.003$, $d = 0.379$). This finding indicates that private school students are more competent in evaluating, questioning, and analyzing information. Jenkins, Sykes, and Wills (2023) stated that the development of critical health literacy in children is closely related to teaching approaches and school climate, and that structured learning environments support this development (Jenkins, Sykes & Wills, 2023). Therefore, project-based, critical thinking-based education programs, which are more intensively implemented in private schools, may explain this result.

Private school students were also observed to have higher averages in the functional and communicative health literacy sub-dimensions, but these differences remained at the statistical significance threshold ($p = 0.067$ and $p = 0.090$). Silva (2023) states that children's functional and communicative health skills are closely related to their social environment, parental education, and media literacy (Silva, 2023). In this context, the fact that private school students have more advantageous socioeconomic conditions may also have contributed to these results.

In terms of nutritional attitudes, no significant difference was found between school types in the “Valuing-Evaluating” dimension ($p = 0.309$). This result shows that children's eating habits are similar regardless of school type. However, Chrissini and Panagiotakos (2021) emphasize that nutrition attitudes play a critical role in childhood obesity and that health literacy shapes these attitudes (Chrissini & Panagiotakos, 2021). In this regard, it can be argued that nutrition-focused health education programs for children should be strengthened in all school types.

As Smith and colleagues (2021) point out, the long-term effects of health awareness programs in disadvantaged groups may be limited, and therefore interventions need to be supported by sustainability and school policies (Smith, Goss, Issartel & Belton, 2021). Additionally, Rostamzadeh and colleagues (2023) demonstrated in their study that direct health literacy education has positive effects on children's eating behaviors (Rostamzadeh, Raeisoon & Mohammadi, 2023). These findings support the idea that intervention-based approaches can both reduce school type differences and improve health outcomes.

Limitations

The results of this study only cover children from private and public schools included in this study. They cannot be generalized. Since the data is based on self-reporting, another limitation is the possibility of forgetting or misremembering.

Conclusion

The higher Critical Health Literacy scores among private school students may be related to both the learning environment and family and socioeconomic support. Similarities in other sub-dimensions may indicate equivalence between school types in terms of functional and communicative literacy or the inadequacy of educational interventions. In this context, mixed qualitative and quantitative studies are recommended in the future to better understand the role of the educational environment and family dynamics on health literacy.

In conclusion, the findings of this study reveal that some dimensions of health literacy differ according to school type, particularly showing that private schools have an advantage in the area of critical health literacy. However, the limited differences in areas such as general health knowledge and nutrition attitudes indicate a need for comprehensive and universal education strategies in these areas. Future studies should conduct more comprehensive analyses, taking into account factors such as teacher quality, school curriculum, and parental involvement.

With the expansion of school nursing in Türkiye, the impact of these school nurses can be examined by organizing educational programs on health literacy for children in both public and private schools.

Ethics Committee Approval: Ethics Committee Approval was obtained from the Ethics Committee for Non-Interventional Clinical Research at the Faculty of Nursing, Aydın Adnan Menderes University, under approval number 2025/427, dated February 10, 2025.

Informed Consent: Written informed consent was obtained from the participants in the study.

CRedit Author Statement: **N.B** Conceptualization, Methodology, Data curation, Formal analysis, Investigation, Writing – original draft, Writing – review & editing, Supervision **B.Ş** Data curation, Formal analysis, Investigation, Writing – review & editing

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