Research Article

Pamukkale Medical Journal
doi:https://dx.doi.org/10.31362/patd.1532810

Received: 14.08.2024
Accepted: 09.12.2024
Area of Expertise: Family Medicine

Title: Nutrition literacy status of university students, influencing factors, and its relationship with healthy nutrition attitudes.

Short title: Nutrition literacy and its relationship with healthy nutrition attitudes.

Abstract

Purpose: This study aims to evaluate the nutrition literacy status of university students, the factors influencing it, and its relationship with healthy nutrition attitudes.

Materials and methods: This is a descriptive and cross-sectional study. A total of 317 students aged 18-24 studying at Pamukkale University were included in the study. A questionnaire was administered to the students, which included questions about sociodemographic characteristics, the Adolescent Nutrition Literacy Scale (ANLS), and the Attitude Scale for Healthy Nutrition (ASHN) assessing nutrition attitudes.

Results: Of the 317 students who participated in the study, 48.9% (n=155) were female, and 17.4% (n=55) were studying in health-related departments. The mean nutrition literacy score of the students was 70.85±9.69. Nutrition literacy scores were found to be significantly higher in those studying in health-related departments compared to other departments, in those who received nutritional education compared to those who did not, and in those who exercised regularly compared to those who did not (p<0.05). Among the students, 56.8% had a high level, 10.1% had an ideal level, and 32.8% had a moderate level of healthy nutrition attitudes. A significant relationship was found between nutrition literacy and healthy nutrition attitudes (r=404; p<0.05).

Conclusion: The study found that the mean nutrition literacy score of the students was 70.85±9.69, and 56.8% of them had a high level of healthy nutrition attitudes. It was determined that nutrition literacy was higher among students who exercised regularly, received nutritional education/knowledge, and studied in health-related departments. Additionally, an increase in students' nutrition literacy positively influenced their healthy nutrition attitudes.

Keywords: Nutrition literacy, healthy nutrition, attitude, university students.

Makale başlığı: Üniversite öğrencilerinin beslenme okuryazarlığı durumu, etkileyen faktörler ve sağlıklı beslenme tutumu ile ilişkisi.

Kısa başlık: Beslenme okuryazarlığı ve sağlıklı beslenme tutum ilişkisi.

Öz

Amaç: Bu çalışmada; üniversite öğrencilerinin beslenme okuryazarlığı durumlarını, etkileyen faktörleri değerlendirmek ve sağlıklı beslenme tutumu ile ilişkisini belirlemektir.

Gereç ve yöntem: Tanımlayıcı ve kesitsel tipte bir çalışmadır. Çalışmaya Pamukkale Üniversitesinde öğrenim gören 18-24 yaş arası 317 öğrenci dahil edildi. Öğrencilere sosyodemografik özellikler, adolesan beslenme okuryazarlığı ölçeği (ABOÖ) ve beslenme tutumunu değerlendiren sağlıklı beslenmeye ilişkin tutum ölçeği (SBİTÖ)'ni içeren anket uygulandı.

Bulgular: Çalışmaya katılan 317 öğrencinin %48,9'u (n=155) kadın, %17,4'ü (n=55) sağlık ile ilgili bölümlerde öğrenim görmekteydi. Öğrencilerin beslenme okuryazarlığı puan ortalaması 70,85±9,69 idi. Beslenme okuryazarlığı puanının, sağlıkla ilgili bölümlerde okuyanların diğer bölümlere göre, beslenme hakkında eğitim alanların almayanlara göre, düzenli egzersiz yapanların yapmayanlara göre istatistiksel olarak anlamlı yüksek bulundu (p<0,05). Öğrencilerin %56,8'in yüksek düzeyde, %10,1'i ideal düzeyde ve %32,8'i orta düzeyde sağlıklı beslenme tutumuna sahipti. Beslenme okuryazarlığı ile sağlıklı beslenme tutumu arasında istatiksel olarak anlamlı bir ilişki saptandı (r=404; p<0,05).

Sonuç: Çalışmada öğrencilerin beslenme okuryazarlığı puanının ortalaması 70,85±9,69 olduğu ve beslenme tutumunun %56,8'inde yüksek düzeyde olduğu saptandı. Beslenme okuryazarlığının düzenli egzersiz yapan öğrencilerde, beslenme eğitimi/bilgisi alanlarda ve sağlık alanı bölümlerinde okuyanlarda daha yüksek olduğu tespit edildi. Ayrıca öğrencilerin beslenme okuryazarlığının artması sağlıklı beslenme tutumunu olumlu yönde etkilemekteydi.

Anahtar kelimeler: Beslenme okuryazarlığı, sağlıklı beslenme, tutum, üniversite öğrencileri.

Introduction

Beginning from the earliest stages of fetal development to old age, nutrition is fundamental in human life, health, and development [1]. Healthy nutrition is the basis of optimal health and quality of life. Adequate and balanced nutrition both protects the health of individuals and prevents diseases. In a globalizing world, achieving quality of life is only possible by increasing the nutritional awareness of the society and making healthy nutrition a lifestyle. Therefore, improving and developing healthy lifestyles of

individuals is of great importance for public health [2]. Nutrition literacy plays a crucial role in developing behaviors oriented towards healthy nutrition [3]. Zoellner et al. [4] define nutrition literacy as the level at which individuals have the ability to obtain, process, and understand basic information about nutrition. Poor nutrition literacy impedes healthy nutrition [5].

Nutrition literacy (NL) is classified into three dimensions, i.e. functional, interactive, and critical nutrition literacy [6, 7]. Functional nutrition literacy refers to the basic reading and writing skills necessary to access information about nutrition [7, 8]. Interactive nutrition literacy encompasses advanced literacy skills, including cognitive and interpersonal communication abilities, which are required to effectively interact with healthcare professionals regarding nutrition [9].

At a basic level, interactive nutrition literacy includes the ability to translate information into healthy nutrition choices [6, 7]. Critical nutrition literacy can be defined as the ability to critically analyze information and recommendations about nutrition, increase awareness, and strive against barriers to healthy nutrition [9].

Although nutritional problems are prevalent in society, one of the groups with insufficient and unbalanced nutrition is university students. This is because the university period represents a transition to a new phase of life for young individuals. When students move away from home and start living independently for the first time, they reshape their health and eating habits [10, 11].

As students enter a new life-routine, they become more sensitive to external influences and, due to the accelerated pace of life, may experience an increase in inadequate, unbalanced, and unhealthy eating habits. These unhealthy eating habits can negatively affect students' mental and physical health, which in turn can lower their academic performance [10].

Research indicates that many university students avoid healthy food choices due to inadequate nutritional knowledge, negative attitudes, and practices, often skipping meals and generally distancing themselves from a healthy lifestyle [12, 13]. It is crucial to identify and regulate students’ eating habits to prevent the problems that unhealthy nutrition can cause [10]. In this context, the aim of this study is to determine the nutrition literacy status of university students, the factors influencing it, and to evaluate its relationship with healthy nutrition attitudes.

Materials and method

This is a descriptive and cross-sectional study. Approval for the research was obtained from the Pamukkale University Non-Invasive Research Ethics Committee (date: 17.05.2022- number: E-60116787-020-208345).

Population and sample

The study population consisted of 31,417 students enrolled at the central campus of Pamukkale University during the 2022-2023 academic year. The sample size was calculated to represent the population with a 95% confidence level, ±5% margin of error, and using the prevalence rate of a reference study [14], which reported that 76.4% of students had a high level of attitude towards healthy nutrition. Based on these parameters, the required sample size was calculated to be at least 277 students. A total of 317 students were included in the study. Surveys were administered to students who agreed to participate between 01/09/2022 and 31/10/2022.

Data collection and data collection tools

The survey consists of three main sections: a socio-demographic descriptive section, the Adolescent Nutrition Literacy Scale (ANLS), and the Attitude Scale for Healthy Nutrition (ASHN) The first section of the survey is the socio-demographic descriptive section, which inquires about age, gender, department of study, mother's educational level, father's educational level, family's monthly income level, height, weight, smoking status, regular exercise status, frequency and duration of exercise, meal skipping status, skipped meals and reasons for skipping, nutritional education/knowledge level, and sources of nutritional education/knowledge.

Adolescent Nutrition Literacy Scale: Developed by Bari in 2012 [14] and validated in Turkish by Sonay Türkmen et al. [15] in 2017, this scale consists of 22 questions and is in the form of a five-point Likert scale. The scale includes three sub-dimensions: critical, interactive, and functional nutrition literacy. The highest possible score on the scale is 110, and the lowest is 22. A higher scale score indicates a higher level of nutrition literacy.

Attitude Scale for Healthy Nutrition: Created and validated by Tekkurşun Demir et al. [16] in 2019, this scale consists of 21 items in a five-point Likert format. The scale is divided into four factors: Malnutrition (MP), Emotion for Nutrition (EN), Information on Nutrition (IN), and Positive Nutrition (PN). The highest possible score on this scale is 105, and the lowest is 21. When interpreting the scores, 21 points indicate a very low level, 23-42 points indicate a low level, 43-63 points indicate a moderate level, 64-84 points indicate a high level, and 85-110 points indicate an ideal level of healthy nutrition attitude.

Data analysis

The data were analyzed using IBM SPSS Statistics 25 (Armonk, NY: IBM Corp.) software. Descriptive statistics were presented as numbers and percentages for categorical variables, and as arithmetic means and standard deviations for continuous variables. The Kolmogorov-Smirnov and Shapiro-Wilk tests were used to assess the normal distribution. To evaluate the differences between groups, One-Way ANOVA, T test, Kruskal-Wallis Variance Analysis, Mann-Whitney U tests were applied. Additionally, Spearman's correlation analysis was used to assess the relationships between continuous variables. A *p*-value of less than 0.05 was considered statistically significant.

Results

The age range of the 317 students included in the study was 18-24 years, with a mean age of 20.75±1.65 years, and 48.9% (n=155) were female students. Of the students, 17.4% (n=55) were enrolled in health-related departments (such as medicine, dentistry, physiotherapy and rehabilitation, the faculty of health sciences, and the vocational school of health services), while 82.6% (n=262) were studying in other departments. The sociodemographic variables of the students are presented in Table 1.

Among the students, 55.5% (n=176) reported performing regular exercise. Of those who exercised regularly, 52.8% (n=93) exercised 1-2 days a week, and 43.7% (n=76) exercised for 30-60 minutes. It was found that 74.8% (n=237) of the students skipped meals, with lunch being the most frequently skipped meal at 50.2% (n=119). When asked about the reasons for skipping meals, 30.8% (n=73) stated "I don't feel like eating/I have no appetite," and 22.8% (n=54) reported "I don't have time." It was found that 53.3% (n=169) of the students had not received any nutritional education or knowledge. Among those who had received nutritional education or knowledge, 17.7% (n=56) stated they received it as a course at school (Table 2).

The overall Nutrition Literacy (NL) score among the students ranged from 37 to 105, with a mean score of 70.85±9.69. The mean score on the Attitude Scale for Healthy Nutrition (ASHN) was 69.01±11.29 (min:38, max:102), with 10.1% (n=32) of the students having an ideal level and 56.8% (n=180) having a high level of healthy nutrition attitude (Table 3).

Table 4 presents the comparison of overall NL and subscale scores with certain student variables. The overall NL, interactive NL, and functional NL mean scores were found to be significantly higher among students enrolled in health-related departments compared to those in other departments ($p<0.05$).

An examination of the relationship between age and overall NL and its subscales revealed a weak but significant positive correlation with functional NL, while no significant relationship was observed with interactive NL, critical NL, and overall NL (r=.131 p=0.020; r=.040 p=0.477; r=.0011 p=0.840; r=.090 p=0.110, respectively).

There was a statistically significant, moderately positive correlation between the Nutrition Literacy (NL) score and Attitude Scale for Healthy Nutrition (ASHN) scores (r=0.404 p<0.05) (Table 5).

Discussion

The increase in risky eating habits during university years is concerning as it can lead to adverse health-related outcomes, as well as reduced physical and academic performance, both in the present and later stages of life [18, 19]. Nutrition literacy is considered an important indicator of dietary characteristics [20-22]. The present study indicated that 56.8% of the students had a high level of healthy nutrition attitudes and that there was a relationship between nutrition literacy and healthy nutrition attitudes. It was concluded that by increasing nutritional literacy, having basic knowledge about nutrition, accessing the right nutritional information and using them effectively, instead of choosing unhealthy foods, healthy eating attitudes can be increased with positive nutritional behaviors. It was shown that especially students studying in the field of health, who received nutrition education and exercised regularly, had better nutritional literacy and higher healthy eating attitudes. It is important to eliminate the knowledge gap about healthy nutrition, especially in students who study outside the field of health, who have not received nutrition education and who do not have healthy lifestyle behaviors.

Studies have shown that health education is effective in adopting healthy lifestyle behavior, including nutrition [23]. In the present study, it was observed that students enrolled in health-related departments had higher nutrition literacy compared to students in other departments, and they were more competent in possessing basic nutritional knowledge and translating it into healthy eating choices. Another study also reported that students in the faculty of health sciences had higher nutrition literacy compared to students in other departments [24].

One of the primary goals of nutritional education is to increase nutrition literacy [3]. In the study by Hassani et al. [24], it was found that following the nutrition education provided to participants, their nutritional knowledge scores increased, and positive changes occurred in their eating habits. A study conducted with students from a faculty of health sciences reported that the nutrition education provided as part of their curriculum improved their nutritional knowledge scores [26]. In the present study, it was also

observed that students who received nutritional education or knowledge had higher nutrition literacy. Additionally, these students demonstrated higher levels of basic nutritional knowledge, more advanced communication skills with healthcare professionals, family, and friends, and the ability to critically evaluate nutrition advice.

The level of nutrition literacy is influenced by physical activity [27]. Moreover, it has been shown that an increase in physical activity leads to positive developments in eating habits [28]. According to the World Health Organization, at least 150 minutes of moderate-intensity aerobic exercise per week or 75 minutes of high-intensity aerobic exercise per week is recommended for individuals aged 18 to 64 years [29]. The present study found that students who engaged in regular exercise had higher overall NL scores, better comprehension of basic nutritional knowledge, easier communication about nutrition with healthcare professionals and their relatives, and greater ability to critically interpret and evaluate nutrition recommendations. Similar to this study, the research by Koca and Arkan [30] found that young people who engaged in sports had higher critical NL, interactive NL, and overall NL scores compared to those who did not engage in sports. In a study conducted in Norway with university students and staff, it was observed that individuals who were more physically active had higher nutrition literacy [24].

Obesity, considered the pandemic of this age, poses a significant risk for university students who frequently consume low-nutrient, high-calorie foods. One potential cause of this issue is low levels of nutrition literacy [31]. Increasing nutrition literacy is regarded as an effective and preventive measure for achieving an ideal BMI in adolescents and reducing overweight and obesity in adulthood [32]. A study conducted by Mearns et al. [32] with nursing students reported a negative relationship between nutrition literacy and anthropometric measurements such as BMI and body fat percentage, indicating that knowledge about nutrition had positive effects on maintaining a healthy weight.

Although it is hoped that high nutrition literacy would positively impact BMI, this study found no significant difference in BMI levels and overall nutrition literacy scores among students. However, it was observed that overweight and obese students had higher interactive NL scores compared to their thinner counterparts, indicating a greater interest in seeking and applying nutritional knowledge to improve their eating habits. A study conducted with educational faculty students found that students who were underweight had lower overall and interactive NL scores compared to other students [34]. On the other hand, a study conducted by Koca and Arkan [30] with adolescents established no relationship between BMI and nutrition literacy.

While it is generally expected that women would have higher nutrition literacy, given their greater interest in nutrition and concern for body image, this study did not find any

significant impact of gender on NL [35]. In a study conducted in Denizli province, similar to our study, no relationship was found between students' gender and nutrition literacy [36]. Contrary to the present study, research conducted with adolescents in Uganda found that female students had higher levels of interactive and critical nutrition literacy compared to male students [15]. Another study conducted with university students found that female students scored higher than male students in all three sub-dimensions of nutrition literacy [37]. We believe that the difference in the sample groups may have affected the results. In addition, the fact that the students in our study had similar levels of education may be the reason why there was no difference in terms of nutrition literacy in terms of gender.

Michou et al. [37] reported that socioeconomic status affects health and nutrition literacy, with lower income levels being associated with lower nutrition literacy. Similarly, Gibbs et al. [38] found that a family's income level influences the dietary quality of children. However, in this study, it was observed that the nutrition literacy of students was not influenced by their families' monthly income. A similar finding was reported in a study conducted with adolescents, which showed that nutritional knowledge levels were independent of the family's income level [40].

Skipping meals is a common habit among university students [10, 26]. Often living away from their families, students face challenges related to nutrition and may skip meals to suppress hunger rather than maintain a balanced diet [10]. A study with adolescents found that those who skipped meals had significantly lower functional NL compared to those who did not skip meals [30]. Another study conducted with high school students revealed that despite having high food literacy, students commonly engaged in negative eating habits such as skipping meals, increasing the consumption of unhealthy snacks, and reducing fruit intake. The study also found that students were inadequate in translating their nutritional knowledge into positive eating behavior [41]. In the present study, meal skipping was found to be common among students, regardless of their level of nutrition literacy. The most frequent reasons cited for skipping meals included lack of appetite, lack of habit, financial constraints, and lack of time.

The goal of nutrition literacy is to access accurate nutritional knowledge and use it effectively to develop healthy eating habits [42]. A study conducted by Al Tell et al. [42] found that nutrition literacy is linked to eating habits. Another study conducted among university students identified that eating habits influence nutrition literacy [37]. This study also demonstrated that nutrition literacy positively supports healthy nutrition attitudes. Possessing basic knowledge about nutrition, obtaining useful information from various sources, gaining the ability to critically evaluate such information, and increasing the

willingness to participate actively in healthy nutrition studies can enhance healthy nutrition attitudes by encouraging positive dietary habits instead of preferring unhealthy foods due to emotional and hedonic wants.

In conclusion, nutrition literacy was found to be higher among students who had nutritional education/knowledge, were studying in health-related fields, and engaged in regular physical exercise. Additionally, an increase in students' nutrition literacy positively influenced their healthy nutrition attitudes. In order to sustain healthy nutrition, it is necessary to increase the nutritional literacy levels of individuals and societies. For this purpose, it is important to develop health policies that include university students. Furthermore, it would be beneficial to include nutrition-related courses in the curriculum of all university students, regardless of the department of study, and to organize periodic seminars and conferences by health professionals to reduce information pollution on healthy eating and nutrition. It is also recommended to offer healthy food options in areas such as cafeterias and canteens on campus and to create favorable conditions to increase students' physical activity.

The limitations of the study are that the results obtained cannot be generalized due to the small sample size, the fact that it was conducted in only one university and that it was conducted on a voluntary basis. Further research with different sample groups and other factors affecting nutrition will contribute more to the literature.

Funding: None.

Authors contributions: A.C. and N.E. constructed the main idea and hypothesis of the study. A.C. and N.E. developed the theory and arranged/edited the material and method section. A.C. has/have done the evaluation of the data in the Results section. Discussion section of the article written by A.C. and N.E. reviewed, corrected and approved. In addition, all authors discussed the entire study and approved the final version.

Conflict of interest: No conflict of interest was declared by the authors.

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Table 1. The sociodemographic features of the students

	n	%
Gender		
Female	155	48.9
Male	162	51.1
Department		
Health-related departments	55	17.4
Others	262	82.6
Mother's level of education		
Primary school graduate and below	132	41.6
Secondary school graduate	65	20.5
High school graduate	82	25.9
University graduate	38	12.0
Father's level of education		
Primary school graduate and below	104	32.8
Secondary school graduate	50	15.8
High school graduate	107	33.7
University graduate	56	17.7
Family Income		
Income is less than expenditure	88	27.8
Income is equal to expenditure	155	48.9
Income is more than expenditure	74	23.3
Body mass index		
Underweight	33	10.4
Normal weight	213	67.2
Overweight and obesity	71	22.4
Smoking status		
Yes	143	45.1
No	174	54.9
Total	317	100

Table 2. Students' exercise status, eating habits, nutritional education/information status and source

	n	%
Regular exercise status		
Yes	176	55.5
No	141	44.5
Frequency of exercise (n=176)		
1-2 day	93	52.8
3-4 day	47	26.7
5-6 day	24	13.6
Every day	12	6.8
Daily exercise duration (n=176)		
<30 minute	37	21.3
30-60 minute	75	42.6
1-2 hours	48	27.6
>2 hours	13	7.5
No time specified	3	1.7
Meal skipping status		
Yes	237	74.8
No	80	25.2
Skipped meals		
Breakfast meal	104	43.9
Luch meal	119	50.2
Dinner meal	14	5.9
Reasons for skipping meal		
I don't feel like eating/I have no appetite	73	30.8
I can't wake up in the morning	24	10.1
I don't have time	54	22.8
I'm on a diet	8	3.4
I do not have a habit	24	10.1
No one prepares it	23	9.7
My economic opportinities are insufficient	27	11.4
Others (living in a dormitory)	4	1.7
Nutrition education/information status		
Yes	148	46.7
No	169	53.3
Source*		
School lessons	56	17.7
Physician/Healthcare provider	43	13.6
Books/Newspapers/Magazines	20	6.3
Media (Tv/internet)	53	16.7
Family/Friends	18	5.7
Other (Sports trainer)	2	0.6

* More than one option has been marked

Table 3. Students' nutritional literacy total and sub-dimension, attitude scale for healthy nutrition total score and level distribution

	Min-Max	**Mean±SD**
Total NL scores	37-105	70.85±9.69
Functional NL	8-35	24.53±5.09
İnteractive NL	6-30	18.07±4.95
Critical NL	16-41	28.25±4.10
ASHN score	38-102	69.01±11.29
ASHN level	**n**	**%**
Mild	1	0.3
Moderate	104	32.8
High	180	56.8
İdeal	32	10.1

NL: Nutrition Literacy, ASHN: Attitude Scale for Healthy Nutrition

Table 4. Comparison of some independent variables with total NL and sub-dimension scores

	Functional NL	İnteractive NL	Critical NL	Total NL
	Mean±SD	Mean±SD	Mean±SD	Mean±SD
Gender				
Female (n=155)	24.65±4.92	18.54±4.95	27.91±4.27	71.10±9.47
Male (n=162)	24.42±5.26	17.62±4.91	28.58±3.93	70.62±9.92
Test value	Z=-0.395	Z=-1.781	Z=-1.045	Z=-0.321
p value	0.693	0.075	0.296	0.748
Department				
Health-related departments (n=55)	26.36±4.69	19.64±4.77	29.31±3.57	75.31±10.25
Others (n=262)	24.15±5.09	17.74±4.93	28.03±4.18	69.92±9.32
Test value	Z=-2.531	Z=-2.423	Z=-1.825	Z=-3.434
p value	**0.011***	**0.015***	0.068	**0.001***
Body mass index				
Underweight (n=33) (a)	24.24±4.34	16.33±4.57	28.00±3.61	68.58±8.22
Normal weight (n=213) (b)	24.48±4.9	17.96±4.86	28.32±4.27	70.76±9.44
Overweight and obesity (n=71) (c)	24.82±5.93	19.21±5.14	28.17±3.85	72.20±10.91
Test value	F =0.174	Kwh=8.338	Kwh=0.150	Kwh =4.005
p value	0.841	**0.015* (a-c)**	0.928	0.135
Mother's level of education				
Primary school graduate and below (n=132)	24.05±4.80	17.76±4.97	28.46±4.46	70.27±9.37
Secondary school graduate (n=65)	24.00±5.59	18.45±5.15	28.11±3.70	70.55±11.05
High school graduate (n=82)	25.40±5.05	18.54±4.59	28.33±3.81	72.27±9.31
University graduate (n=38)	25.24±5.10	17.50±5.30	27.61±4.19	70.34±9.17
Test value	Kwh=3.893	F=0.711	F=0.464	Kwh=2.406
p value	0.273	0.546	0.708	0.493
Father's level of education				
Primary school graduate and below (n=104)	23.68±4.51	17.48±4.50	28.21±4.58	69.38±8.48
Secondary school graduate (n=50)	24.88±5.68	18.98±5.41	28.56±4.38	72.42±11.91
High school graduate (n=107)	24.79±5.32	18.38±5.13	28.06±3.44	71.23±9.34
University graduate (n=56)	25.30±5.01	17.75±4.90	28.43±4.18	71.48±10.16
Test value	F=1.578	F=1.281	Kwh=2.399	F=1.381
p value	0.195	0.281	0.494	0.248
Family Income				
Income is less than expenditure (n=88)	24.50±4.98	17.82±4.98	28.48±3.88	70.80±9.31
Income is equal to expenditure (n=155)	24.88±5.07	18.47±4.88	28.45±4.15	71.80±9.51
Income is more than expenditure (n=74)	23.84±5.25	17.53±5.03	27.58±4.25	68.95±10.33
Test value	Kwh=1.389	Kwh=2.223	Kwh=3.195	Kwh=3.822
p value	0.499	0.329	0.202	0.148

Smoking status				
Yes (n=143)	24.34±5.19	17.73±4.96	28.01±4.50	70.08±10.32
No (n=174)	24.69±5.01	18.35±4.93	28.45±3.75	71.49±9.12
Test value	Z=-0.194	T=-1.117	Z=-0.814	Z=-1.370
p value	0.846	0.265	0.416	0.171
Regular exercise status				
Yes (n=176)	25.28±5.19	18.86±5.01	28.66±4.20	72.81±9.98
No (n=141)	23.60±4.81	17.09±4.7	27.74±3.94	68.42±8.75
Test value	Z=-2.763	Z=-3.002	Z=-1.987	Z=-3.963
p value	**0.006***	**0.003***	**0.047***	**<0.05***
Meal skipping status				
Yes (n=237)	24.44±5.06	17.84±5.04	28.15±4.14	70.43±9.46
No (n=80)	24.81±5.17	18.76±4.61	28.55±4.01	72.13±10.31
Test value	Z=-0.470	Z=-1.547	Z=-0.901	Z=-1.541
p value	0.638	0.122	0.368	0.123
Nutrition education/information status				
Yes (n=148)	26.09±4.48	19.39±4.96	29.13±3.99	74.61±9.85
No (n=169)	23.17±5.21	16.91±4.65	27.49±4.06	67.56±8.27
Test value	Z=-5.305	Z=-4.237	Z=-3.470	T=6.851
p value	**<0.05***	**<0.05***	**0.001***	**<0.05***

Mann Whitney U (Z), Kruskal Wallis (Kwh), One-Way Anova (F), T test (T), *p<0.05

Table 5. The relationship between students' total NL and sub-dimension scores and their ASHN scores

		Functional NL	İnteractive NL	Critical NL	Total NL	ASHN
Functional NL	r	1.000	.256**	.098	.680**	.276**
	p		.000	.081	.000	.000
İnteractive NL	r		1.000	.248**	.730**	.267**
	p			.000	.000	.000
Critical NL	r			1.000	.582**	.299**
	p				.000	.000
Total NL	r				1.000	.404**
	p					.000
ASHN	r					1.000
	p					

*p<0.05, **p<0.01, NL: Nutrition Literacy, ASHN: Attitude Scale for Healthy Nutrition

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