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Evaluation of Nutrition Knowledge and Sustainable Healthy Eating Behaviors in Adults

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Abstract

Objective

This study aimed to determine the explanatory role of nutrition knowledge and food preference on sustainable and healthy eating behaviors in adults, and to examine differences according to sociodemographic variables.

Methods

This cross-sectional and descriptive study was conducted with 231 adults aged 18–65 years who applied to a university hospital wellness center. Data were collected using a sociodemographic questionnaire, the Adult Nutrition Knowledge and Attitude Assessment Scale and the Sustainable Healthy Eating Behaviors Scale. Chi-square test, independent samples t-test, Mann-Whitney U test, Spearman correlation analysis, and hierarchical linear regression analysis were used for statistical analyses.

Results

Of the participants, 53.7% were female with a mean age of 26.70 ± 7.14 years. SHEBS scores increased significantly as nutrition knowledge levels improved ($p = 0.002$). Hierarchical regression analysis showed that adding food preference to the model increased its explanatory power (Adjusted $R^2=0.129$, $p < 0.001$). Women scored significantly higher than men in food preference ($p = 0.001$), seasonal food consumption ($p = 0.011$), and reduced meat consumption ($p = 0.030$) subscales. The local/organic food subscale showed a positive effect on nutrition knowledge ($\beta = 0.245$), while the local food subscale showed a negative effect on both nutrition knowledge ($\beta=-0.182$) and food preference ($\beta=-0.160$).

Conclusion

Nutrition knowledge and food preference were significantly associated with sustainable and healthy eating behaviors. These findings suggest that intervention programs promoting sustainable nutrition may benefit from incorporating attitude- and value-based approaches alongside knowledge transfer.

INTRODUCTION

Nutrition is one of the fundamental modifiable factors affecting individual health [1]. Today, nutrition has become a multidimensional concept that should be addressed not only from an individual perspective but also in terms of environmental sustainability, food security, and ecological balance [2]. Population growth, changes in dietary patterns, and the climate crisis have raised concerns regarding the sustainability of food systems worldwide. In this context, the Food and Agriculture Organization (FAO) defines sustainable nutrition as a dietary approach that prioritizes foods with high nutritional value, low environmental impact, economic accessibility, and cultural acceptability [3]. Therefore, sustainable and healthy eating behaviors have become one of the major focal areas of public health policies and nutrition research [4, 5].

Individual eating behavior is shaped by nutrition knowledge, beliefs, and environmental factors [6]. Nutrition knowledge is considered an important factor associated with healthy and sustainable eating behaviors. The level of nutrition knowledge is considered an important determinant enabling individuals to make healthy food choices, interpret food labels, and maintain appropriate dietary behaviors. However, nutrition knowledge alone is insufficient to improve eating behavior [7]. Several studies have reported that individuals with high levels of nutrition knowledge do not always exhibit healthy eating behaviors [8–10]. This phenomenon is defined as the inconsistency between knowledge and behavior and has led researchers to investigate food preferences and sociodemographic variables in addition to nutrition knowledge [11].

Adults represent the demographic group that independently purchases, prepares, and consumes food and therefore exerts the greatest influence on the food system. Although studies examining the relationship between nutrition knowledge, food preferences, and sustainable eating behaviors among adults are available, comprehensive research evaluating this relationship together with variables such as sex, body mass index (BMI), and educational level remains limited [12, 13]. When evaluated together with sociodemographic factors and health knowledge, it is considered that sustainable and healthy eating behaviors may increase as adults' levels of nutrition knowledge improve. In Türkiye, the gradual replacement of the traditional Mediterranean dietary culture with processed food consumption makes the investigation of sustainable and healthy eating behaviors both timely and necessary [14].

Based on this hypothesis, the present study utilized the Adult Nutrition Knowledge and Attitude Assessment Scale (ANKAAS) together with the Sustainable Healthy Eating Behaviors Scale (SHEBS). Through these instruments, the explanatory roles of nutrition knowledge and food preferences on sustainable eating behaviors were tested within the framework of regression models, while differences according to sex and other sociodemographic variables were examined in detail.

METHODS

Study Design and Participants

This cross-sectional and descriptive study was conducted with adults aged 18–65 years who applied to the wellness center of a university hospital. Individuals who voluntarily agreed to participate in the study were included, whereas those who were pregnant or breastfeeding, had difficulties in

communication, or had incomplete data were excluded from the study. The sample size was calculated based on the correlation coefficient between sustainable healthy eating behaviors and nutrition knowledge scores reported in the study entitled "Evaluation of the Relationship Between Sustainable Healthy Eating Behaviors, e-Healthy Nutrition Literacy, and Nutrition Knowledge Level in Adults." According to the power analysis performed with an alpha level of 0.05 and a statistical power of 0.80, the minimum required sample size was determined as 113 individuals [15]. The study was completed with a total of 231 adults, exceeding the minimum required sample size.

Data Collection Instruments

Study data were collected by the researchers through face-to-face interviews. A structured questionnaire evaluating sociodemographic characteristics, lifestyle habits, and nutritional behaviors was administered to the participants. The questionnaire included variables such as age, sex, educational level, smoking status, alcohol consumption, exercise habits, dietary supplement use, and awareness of the concept of sustainable nutrition.

The Adult Nutrition Knowledge and Attitude Assessment Scale was used to evaluate participants' nutrition knowledge levels and food preferences [16]. The scale consists of the "nutrition knowledge" and "food preference" subdimensions. Higher scores indicate better nutrition knowledge and more positive food preferences.

The Sustainable Healthy Eating Behaviors Scale was administered to evaluate sustainable and healthy eating behaviors [17]. The scale consists of the following subdimensions: quality labels (traditional and organic foods), seasonal foods and avoidance of food waste, animal welfare, reduction of meat consumption, healthy and balanced nutrition, local food, and low-fat consumption. Higher scores obtained from the scale indicate more positive sustainable and healthy eating behaviors.

Anthropometric Measurement

Participants' body weight and height were measured by the researchers. Body mass index (BMI) was calculated by dividing body weight (kg) by the square of height in meters (m^2). According to the World Health Organization classification, BMI values were categorized as underweight (< 18.5 kg/m^2), normal weight (18.5–24.9 kg/m^2), overweight (25.0–29.9 kg/m^2), and obese (≥ 30.0 kg/m^2).

Ethical Considerations

Ethical approval for the study was obtained from the Non-Interventional Research Ethics Committee of SANKO University (Approval No: 2024/12). Written informed consent was obtained from all participants, and the study was conducted in accordance with the principles of the Declaration of Helsinki.

Statistical Analysis

Statistical analyses were performed using SPSS version 25.0 (Statistical Package for the Social Sciences, IBM Corporation, Chicago, United States). The normality of continuous variables was evaluated using visual (histograms and probability plots) and analytical methods. Descriptive data were presented as mean ± standard deviation ($\bar{X}$±SD), number (n), and percentage (%).

The Chi-square test was used for comparisons of categorical variables. Independent samples t-test was applied for normally distributed variables, whereas the Mann–Whitney U test was used for variables that did not show normal distribution. Relationships between scale scores were evaluated using Spearman correlation analysis.

Hierarchical linear regression analysis was performed to determine the factors affecting sustainable and healthy eating behaviors. In addition, multiple linear regression analysis was conducted to evaluate the effects of sustainable eating subdimensions on ANKAAS nutrition knowledge and food preference scores. Internal consistency of the scales used in the study was evaluated using Cronbach's alpha coefficients. Statistical significance was accepted as $p < 0.05$.

RESULTS

The study was conducted with a total of 231 adult individuals. 53.7% of the participants were female (n = 124), and 46.3% were male (n = 107), with an average age of 26.70 ± 7.14 years. The average BMI of the participants was 24.26 ± 4.91 kg/m^2. The average number of main meals per day was 2.35 ± 0.72, and the average number of snacks was 1.51 ± 0.92. Regarding educational attainment, it was found that 76.6% of the participants were university graduates, 17.7% were high school graduates, 4.3% were postgraduate graduates, and 1.3% were primary school graduates. Table 1 shows a comparison of the participants' nutritional habits, lifestyle characteristics and The Adult Nutrition Knowledge and Attitude Assessment Scale (ANKAAS) and Sustainable Healthy Eating Behaviors Scale (SHEBS) scores by gender. While male participants were found to be overweight at a higher rate than female participants, the normal BMI rate was higher among women ($p = 0.001$). It was found that men had significantly higher rates of exercise, smoking, alcohol consumption, and nutritional supplement use compared to women (all $p < 0.05$). However, women were significantly more aware of the concept of sustainable nutrition than men ($p < 0.001$).

When the ANKAAS sub-dimensions were examined, it was determined that there was no significant difference in nutrition knowledge levels according to gender ($p = 0.138$). However, it was found that women had higher scores than men in the food preference sub-dimension ($p = 0.001$).

When the sub-dimensions of the Sustainable Nutrition Consumption Scale were evaluated, it was determined that women scored significantly higher than men in the sub-dimensions of "seasonal foods and avoiding food waste" and "reducing meat consumption" ($p = 0.011$ and $p = 0.030$, respectively). No significant difference was found between genders in terms of other sub-dimensions and the total SBS score ($p > 0.05$).

Table 1
Comparison of Dietary Habits, Lifestyle Characteristics, ANKAAS and SHEBS Scores According to Sex

Variables	Male (n:107) n(%)	Female (n:124) n(%)	Total (n:231) n(%)	Test Statistic	p
BMI Classification					
Underweight	1 (0.9)	9(7.3)	10 (4.3)	x^2=15.68	**0.001**
Normal	61 (57.0)	86 (69.4)	147 (63.6)		
Overweight	36 (33.6)	18 (14.5)	54 (23.4)		
Obese	9 (8.4)	11 (8.9)	20 (8.7)		
Exercise Status					
Exercising	68 (63.6)	44 (35.5)	112 (48.5)	x^2=18.11	**< 0.001**
Not exercising	39 (36.4)	80 (64.5)	119 (51.5)		
Smoking Status					
Yes	55 (51.4)	26 (21.0)	81 (35.1)	x^2=23.36	**< 0.001**
No	52 (48.6)	98 (79.0)	150 (64.9)		
Alcohol Consumption Status					
Yes	25 (23.4)	15 (12.1)	40 (17.3)	x^2=5.09	**0.024**
No	82 (76.6)	109 (87.9)	191 (82.7)		
Dietary Supplement Use					
Using	47 (43.9)	19 (15.3)	66 (28.6)	x^2=23.02	**< 0.001**
Not Using	60 (56.1)	105 (84.7)	165 (71.4)		
Awareness of Sustainable Nutrition					
Heard of it	26 (24.3)	58 (46.8)	84 (36.4)	x^2=12.53	**< 0.001**
Never heard of it	81 (75.7)	66 (53.2)	147 (63.6)		
ANKAAS–Nutrition Knowledge					
Poor	31 (29.0)	21 (16.9)	52 (22.5)	x^2=5.51	0.138
Moderate	49 (45.8)	71 (57.3)	120 (51.9)		
Good	22 (20.6)	24 (19.4)	46 (19.9)		
Very good	5 (4.7)	8 (6.5)	13 (5.6)		
ANKAAS–Food Preference					
Poor	23 (21.5)	14 (11.3)	37 (16.0)	x^2=15.75	**0.001**
Moderate	53 (49.5)	43 (34.7)	96 (41.6)		
Good	20 (18.7)	38 (30.6)	58 (25.1)		
Very good	11 (10.3)	29 (23.4)	40 (17.3)		
SHEBS Subdimensions	**Male (n = 107) Mean ± SD**	**Female (n = 124) Mean ± SD**	**Total (n = 231) Mean ± SD**	**Test Statistic**	**p**
Quality labels (traditional and organic)	3.80 ± 1.10	4.07 ± 1.13	3.95 ± 1.12	**t=**-1.796	0.074
Seasonal foods and avoidance of food waste	4.30 ± 1.21	4.63 ± 1.34	4.48 ± 1.29	**U =** 5344.0	**0.011**
Animal welfare	3.65 ± 1.38	3.82 ± 1.35	3.75 ± 1.36	**t=**-0.947	0.345
Reduction of meat consumption	2.97 ± 1.24	3.33 ± 1.25	3.16 ± 1.25	**t=**-2.189	**0.030**
Healthy and balanced nutrition	4.55 ± 1.35	4.74 ± 1.20	4.65 ± 1.27	**t=**-1.138	0.256
Local food	2.87 ± 1.14	2.80 ± 1.11	2.83 ± 1.12	**t =** 0.497	0.620

Variables	Male (n:107) n(%)	Female (n:124) n(%)	Total (n:231) n(%)	Test Statistic	p
BMI Classification					
Low-fat consumption	4.55 ± 1.48	4.83 ± 1.30	4.70 ± 1.39	**t=**-1.524	0.129
Total	18.12 ± 4.31	18.57 ± 4.55	18.36 ± 4.44	**t=**-1.08	0.060

χ^2: Chi-square test, t: Independent samples t-test, U: Mann–Whitney U test.

Figure 1 presents the distribution of SHEBS scores according to ANKAAS nutrition knowledge and nutrition attitude levels. SHEBS scores increased significantly as nutrition knowledge levels improved ($p = 0.002$). Similarly, a significant increase in SHEBS scores was observed with increasing nutrition attitude levels ($p < 0.001$). In particular, participants classified as having “good” and “very good” levels demonstrated higher sustainable and healthy eating behavior scores. These findings indicate that increases in nutrition knowledge and attitude levels are positively associated with sustainable and healthy eating behaviors.

Table 2 presents the results of the correlation analysis between sustainable eating subdimensions and ANKAAS nutrition knowledge and food preference scores. Overall, positive and moderate-to-high significant correlations were observed among the SHEBS subdimensions (all $p < 0.001$). The strongest correlations with the sustainable eating mean score were identified for quality labels ($r = 0.865$), healthy and balanced nutrition ($r = 0.864$), and seasonal foods and avoidance of food waste ($r = 0.821$).

Significant positive correlations were found between ANKAAS nutrition knowledge scores and quality labels ($r = 0.278$, $p < 0.001$), seasonal foods and avoidance of food waste ($r = 0.266$, $p < 0.001$), healthy and balanced nutrition ($r = 0.220$, $p = 0.001$), low-fat consumption ($r = 0.201$, $p = 0.002$), and the sustainable eating mean score ($r = 0.259$, $p < 0.001$). In contrast, no significant relationship was observed between the local food subdimension and nutrition knowledge scores ($r=-0.015$, $p = 0.818$).

Similarly, ANKAAS food preference scores were positively correlated with quality labels ($r = 0.215$, $p = 0.001$), seasonal foods and avoidance of food waste ($r = 0.264$, $p < 0.001$), animal welfare ($r = 0.189$, $p = 0.004$), reduction of meat consumption ($r = 0.141$, $p = 0.033$), healthy and balanced nutrition ($r = 0.267$, $p < 0.001$), low-fat consumption ($r = 0.212$, $p = 0.001$), and the sustainable eating mean score ($r = 0.262$, $p < 0.001$). However, no significant association was found between the local food subdimension and food preference scores ($r = 0.010$, $p = 0.886$).

Table 2
Correlations Between Sustainable Eating Subdimensions and Nutrition Knowledge and Attitude Scores

Quality Labels (Traditional and Organic)	Quality Labels (Traditional and Organic)	Seasonal Foods and Avoidance of Food Waste	Animal Welfare	Reduction of Meat Consumption	Healthy and Balanced Nutrition	Local Food	Low-Fat Consumption	Sustainable Mean Score	ANKAAS–Nutrition Knowledge	ANKAAS–Food Preference
Seasonal Foods and Avoidance of Food Waste	r: 0.660 p: 0.000									
Animal Welfare	r:0.564 p:0.000	r:0.477 p:0.000								
Reduction of Meat Consumption	r:0.418 p:0.000	r:0.382 p:0.000	r:0.520 p:0.000							
Healthy and Balanced Nutrition	r:0.707 p:0.000	r:0.668 p:0.000	r:0.623 p:0.000	r:0.394 p:0.000						
Local Food	r:0.433 p:0.000	r:0.239 p:0.000	r:0.487 p:0.000	r:0.472 p:0.000	r:0.415 p:0.000					
Low-Fat Consumption	r:0.547 p:0.000	r:0.570 p:0.000	r:0.655 p:0.000	r:0.303 p:0.000	r:0.757 p:0.000	r:0.293 p:0.000				
Sustainable Mean Score	r:0.865 p:0.000	r:0.821 p:0.000	r:0.781 p:0.000	r:0.599 p:0.000	r:0.864 p:0.000	r:0.552 p:0.000	r:0.764 p:0.000			
ANKAAS–Nutrition Knowledge	r:0.278 p:0.000	r:0.266 p:0.000	r:0.136 p:0.039	r:0.139 p:0.035	r:0.220 p:0.001	r:-0.015 p:0.818	r:0.201 p:0.002	r:0.259 p:0.000		
ANKAAS–Food Preference	r:0.215 p:0.001	r:0.264 p:0.000	r:0.189 p:0.004	r:0.141 p:0.033	r:0.267 p:0.000	r:0.010 p:0.886	r:0.212 p:0.001	r:0.262 p:0.000	r:0.606 p:0.000	

r: Spearman correlation coefficient

Table 3 presents the results of the hierarchical linear regression analysis regarding factors affecting sustainable and healthy eating behaviors. In Model 1, age, sex, and educational status were found to have significant effects on sustainable and healthy eating behaviors (Adjusted R^2=0.043, p = 0.004). The inclusion of BMI in Model 2 did not produce a meaningful change in the explanatory power of the model (R^2 Change = 0.000, p = 0.011).

In Model 3, the addition of ANKAAS nutrition knowledge scores increased the explanatory power of the model (Adjusted R^2=0.093, R^2 Change = 0.056, p < 0.001). In Model 4, the inclusion of ANKAAS food preference scores further improved the explanatory power of the model, explaining 12.9% of the variance in sustainable and healthy eating behaviors (Adjusted R^2=0.129, R^2 Change = 0.040, p < 0.001).

These findings indicate that nutrition knowledge and particularly food preference levels are significant associated factors of sustainable and healthy eating behaviors.

Table 3
Hierarchical Linear Regression Analysis of Factors Affecting Sustainable and Healthy Eating Behaviors

	Sustainable and Healthy Eating Behavior			p*
	Adjusted R^2	R^2 Change	F	
Model 1	0.043	0.043	4.478	0.004
Model 2	0.039	0.000	3.353	0.011
Model 3	0.093	0.056	5.699	0.000
Model 4	0.129	0.040	6.693	0.000

Adjusted R^2: Adjusted coefficient of determination; R^2 Change: Change in explanatory power after adding variables to the model; F: Overall model significance test.

Multicollinearity diagnostics indicated acceptable VIF and tolerance values for all variables included in the regression models.

Dependent Variable: Sustainable and Healthy Eating Behavior

Model 1: Demographic variables (age, sex, educational status)

Model 2: Model 1 + BMI values

Model 3: Model 2 + ANKAAS Nutrition Knowledge

Model 4: Model 3 + ANKAAS Nutrition Attitude

Table 4 presents the results of the multiple linear regression analyses examining the effects of sustainable and healthy eating subdimensions on ANKAAS nutrition knowledge and food preference scores. The model established for ANKAAS nutrition knowledge was found to be significant (R^2=0.117, Adjusted R^2=0.089, $p < 0.001$). The analysis demonstrated that the "traditional/organic food" subdimension was positively associated with nutrition knowledge (β = 0.245, p = 0.015). In contrast, the "local food" subdimension had a significant negative effect on nutrition knowledge (β=-0.182, p = 0.021). No significant effects were observed for the remaining subdimensions on nutrition knowledge ($p > 0.05$).

The model established for ANKAAS food preference was also found to be significant (R^2=0.102, Adjusted R^2=0.073, p = 0.001). According to the regression analysis results, only the "local food" subdimension showed a significant negative association on food preference (β=-0.160, p = 0.046). No significant effects of the other sustainable eating subdimensions on food preference were identified ($p > 0.05$).

These findings suggest that sustainable nutrition, particularly the traditional/organic food approach, is associated with nutrition knowledge, whereas the local food dimension demonstrates an inverse relationship with both nutrition knowledge and food preference.

Table 4
Multiple Linear Regression Analysis of the Effects of Sustainable and Healthy Eating Subdimensions on ANKAAS Nutrition Knowledge and Food Preference Scores

Variables	**B**	**Std. Error**	**β (Beta)**	**p**
Dependent Variable: ANKAAS–Nutrition Knowledge				
R = 0,342 R^2 = 0,117	Adj. R^2 = 0,089		p < 0,001	
Traditional/Organic Food	1,829	0,744	0,245	**0,015**
Food Waste	0,625	0,609	0,096	0,305
Animal Welfare	-0,350	0,603	-0,057	0,562
Meat Reduction	0,619	0,529	0,093	0,243
Healthy Eating	0,013	0,787	0,002	0,986
Local Food	-1,359	0,587	-0,182	**0,021**
Low-Fat Consumption	0,443	0,641	0,073	0,490
Dependent Variable: ANKAAS–Food Preference				
R = 0,319 R^2 = 0,102	Adj. R^2 = 0,073		p = 0,001	
Traditional/Organic Food	0,134	0,652	0,021	0,837
Food Waste	0,683	0,533	0,121	0,202
Animal Welfare	0,346	0,530	0,065	0,514
Meat Reduction	0,348	0,464	0,060	0,454
Healthy Eating	1,129	0,690	0,197	0,103
Local Food	-1,033	0,514	-0,160	**0,046**
Low-Fat Consumption	-0,161	0,561	-0,031	0,775

DISCUSSION

In this study, the explanatory roles of nutrition knowledge and food preference on sustainable and healthy eating behaviors among adults were examined within the framework of regression models, while differences according to sex and other sociodemographic variables were also evaluated in detail. The findings obtained were largely consistent with the existing literature, although several important differences were also identified.

The fact that the majority of the participants were university graduates (76.6%) and belonged to the young adult age group ($\bar{X}$=26.70 ± 7.14 years) provided a specific framework in terms of both nutrition knowledge and sustainable eating behaviors. Individuals with higher educational attainment may possess greater nutrition literacy because they can access accurate nutrition-related information more easily and may follow scientific content more frequently [18]. However, the high proportion of participants who had never heard of the concept of sustainable nutrition (63.6%) suggests that even when adults have

moderate or high levels of nutrition knowledge, limited exposure to sustainability concepts may restrict the translation of this knowledge into practical behavior. A large-scale study conducted in Türkiye reported that awareness of sustainable nutrition was positively associated with food choice motivations [19].

In the present study, sustainable and healthy eating behavior scores increased significantly as nutrition knowledge levels improved ($p = 0.002$). This finding is consistent with a recent study conducted with 1,712 participants. That study reported that individuals with higher levels of nutrition knowledge demonstrated significantly greater adherence to sustainable eating behaviors and to the Mediterranean diet, which is considered a healthy dietary model [20].

In another study conducted with 1,600 adults, participants' age, sex, and BMI values were reported to be significantly associated with nutrition knowledge and nutrition literacy. Similarly, in the present study, sex and BMI were found to be significantly associated with nutrition knowledge and food preference [18].

In a study conducted by Kaner et al. among adults, individuals with knowledge about sustainable nutrition were reported to exhibit more positive sustainable and healthy eating behaviors [12].

Several studies have demonstrated that nutrition knowledge is largely an independent construct from healthy eating behavior and have emphasized that motivation, self-efficacy, and contextual support should also be incorporated into interventions in order for knowledge to be translated into behavior [21].

In this context, the present study supports the notion that although nutrition knowledge alone is not a sole determinant, it remains an important contributor to sustainable eating behavior.

When evaluated according to sex, women in the present study had significantly higher scores than men in the food preference subdimension ($p = 0.001$) and reported greater awareness of the concept of sustainable nutrition ($p < 0.001$). In particular, women scored significantly higher than men in the "seasonal foods and avoidance of food waste" and "reduction of meat consumption" subdimensions, and this finding was consistent with the literature. A multinational study reported that women generally demonstrate greater engagement in sustainable eating behaviors compared with men [22]. A study conducted in Türkiye examining sustainable eating behaviors among young adults reported that women had higher scores than men [23]. Women's higher scores in the reduction of meat consumption subdimension may be explained by the greater prominence of external dietary motivations, such as health and ecological concerns, as well as the stronger emphasis placed on ethical values in food choices among women [24]. On the other hand, the absence of a significant sex difference in the nutrition knowledge subdimension ($p = 0.138$) is consistent with similar findings reported in the literature, suggesting that while knowledge levels develop independently of sex, attitude and behavioral dimensions may differ significantly according to sex [21].

In the correlation analysis, a significant positive relationship was identified between nutrition knowledge and the sustainable eating mean score ($r = 0.259$, $p < 0.001$). The strongest correlations were observed for the quality labels (traditional and organic foods) ($r = 0.278$) and seasonal foods/avoidance of food waste ($r = 0.266$) subdimensions. These findings suggest that nutrition knowledge is particularly associated with behaviors related to quality and sustainability and are consistent with the existing literature. For example, a study conducted among adults in Spain reported that individuals with higher educational levels paid greater attention to sustainability criteria when consuming local products [25]. Similarly, the positive effect of knowledge regarding organic foods on consumption tendencies is consistent with findings reported in a study conducted in Romania [26].

In the hierarchical regression analysis, the inclusion of the food preference subdimension in Model 4 increased the explanatory power of the model (Adjusted $R^2=0.129$). This finding suggests that attitude- and value-based food choices may be more strongly associated with sustainable eating behavior beyond knowledge level alone. Ferreira et al. reported that adherence to sustainable healthy diets among Portuguese adults was associated not only with knowledge but also with environmental attitudes and food choice motivations [13]. Similarly, Guy et al. demonstrated that sustainable eating behaviors were associated with awareness and perceived importance [27]. A systematic review also emphasized that attitudes, values, and contextual factors play roles as influential as knowledge itself [11]. The consistency of the present findings with previous studies suggests that although food preference is associated with higher levels of nutrition knowledge, it may influence sustainable behavior through different mechanisms. This interpretation is further supported by the correlation identified between nutrition knowledge and food preference ($r = 0.606$, $p < 0.001$).

In the multiple regression analysis, the "local food" subdimension demonstrated a negative effect on both nutrition knowledge ($\beta=-0.182$, $p = 0.021$) and food preference ($\beta=-0.160$, $p = 0.046$). This finding may be explained by the different perception of the concept of "local food" in Türkiye. The majority of the participants in the present study were university-educated young adults, a group that may define "local food" primarily as fresh, convenient, or locally available food rather than from a sustainability perspective. A study conducted in the United States showed that local food purchasing behaviors were shaped more by health and safety motivations than by environmental attitudes [28]. This may suggest that the insufficient evaluation of local food within the context of sustainability could explain why it was not associated with higher nutrition knowledge and food preference scores. A study conducted in Türkiye also reported that increased ecological awareness influenced preferences for organic and plant-based foods, highlighting that the concepts of "local food" and "ecological food" are not necessarily used interchangeably [29]. Similarly, the literature suggests that local food consumption may be shaped more by economic accessibility and cultural habits than by knowledge level [11]. In the present study, it was considered that individuals may not yet fully perceive local food consumption as a knowledge-based sustainable behavior.

In the multiple regression model, the "traditional/organic food" subdimension demonstrated a positive effect on nutrition knowledge ($\beta = 0.245$, $p = 0.015$). This finding suggests that positive attitudes toward organic and traditional products may be associated with greater nutrition knowledge. A study conducted in Spain reported that sustainability awareness was more prominent among women and middle-aged individuals, and that participants with higher educational levels exhibited greater consumption of local products [25]. Similarly, the Nutrinet-Santé cohort study conducted in France reported that organic food consumers had higher overall levels of nutrition knowledge [30]. Taken together, these findings suggest that the influence of nutrition knowledge on sustainable eating behavior may be reflected more strongly in quality labels and preferences for organic/traditional foods.

Strengths and Limitations

This study has several strengths. First, validated and reliable measurement tools were used to assess nutrition knowledge, food preference, and sustainable healthy eating behaviors. Second, the study evaluated not only nutrition knowledge but also food preference as an independent determinant of sustainable eating behaviors, providing a broader behavioral perspective. Third, the use of hierarchical regression analysis enabled the incremental contributions of sociodemographic variables, BMI, nutrition knowledge, and food preference to be examined separately. In addition, the inclusion of recent and multidimensional sustainable nutrition concepts contributes to the current literature.

However, several limitations should also be considered when interpreting the findings. First, the cross-sectional design precludes causal inferences regarding the relationships between nutrition knowledge, food preference, and sustainable eating behaviors. Second, the study was conducted in a single center with a relatively homogeneous sample consisting predominantly of young and highly educated participants, which may have introduced selection bias and limited the generalizability of the findings. Third, all data were collected through self-report instruments, which may have introduced recall and social desirability bias. Finally, sustainable eating behaviors are influenced by multiple psychological, cultural, environmental, and economic factors; therefore, the relatively low explanatory power of the regression models suggests that additional determinants should be explored in future studies.

CONCLUSION

In this study, nutrition knowledge and food preference were found to have significant effects on sustainable and healthy eating behaviors among adults. The finding that food preference was independently associated with sustainable eating behaviors suggests that interventions promoting sustainable nutrition may benefit from incorporating not only knowledge transfer but also attitude- and value-based approaches.The more positive tendency of women toward sustainable eating behaviors compared with men, together with the fact that the majority of participants had never previously heard of the concept of sustainable nutrition, highlights the need for public awareness initiatives. The findings further suggest that longitudinal and multicenter studies would be beneficial for a more comprehensive evaluation of sustainable eating behaviors.

Declarations

Clinical Trial Number

Not applicable.

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Author Contribution

Author Contributions: DM: planned the study, DM, MÖP: collected and evaluated the data, MÖP: prepared the article, DM, MÖP: reviewed the article and gave final approval

Data Availability

Surveys supporting the findings of this study are available from the corresponding author. Data will be shared with editors and reviewers upon request.

References

1. Organization WH. Sustainable healthy diets: guiding principles. Food & Agriculture Org.; 2019.
2. Willett W, Rockström J, Loken B, Springmann M, Lang T, Vermeulen S, et al. Food in the Anthropocene: the EAT Lancet Commission on healthy diets from sustainable food systems. Lancet. 2019;393(10170):447–92.
3. Lang T. Sustainable diets and biodiversity: The challenge for policy, evidence and behaviour change. Rome: Food and Agriculture Organization of the UN; 2012.
4. Macheka L, Kanter R, Lawrence M, Dernini S, Naja F, Oenema S. Sustainable diets: where from and where to? J Nutr Sci. 2025;14:e78.
5. Leydon CL, Leonard UM, McCarthy SN, Harrington JM. Aligning Environmental Sustainability, Health Outcomes, and Affordability in Diet Quality: A Systematic Review. Adv Nutr. 2023;14(6):1270–96.
6. Contento IR. Nutrition education: linking research, theory, and practice. Asia Pac J Clin Nutr. 2008;17(Suppl 1):176–9.
7. Silva P. Food and nutrition literacy: exploring the divide between research and practice. Foods. 2023;12(14):2751.
8. Alghamdi SA, Alqarni AA, Alghamdi AF, Alghamdi TK, Hasosah NM, Aga SS, et al. Knowledge, attitude, and practices regarding dietary habits among medical and non-medical university students. J Family Med Prim Care. 2021;10(9):3436–43.
9. O'Leary M, Mooney E, McCloat A. The Relationship Between Nutrition Knowledge and Dietary Intake of University Students: A Scoping Review. Dietetics. 2025;4(2):16.

10. Ekeagwu OA. Why nutrition knowledge may not influence dietary behaviour. Eur J Nutr Food Saf. 2017;7(2):101–8.
11. Principato L, Pice G, Pezzi A. Understanding food choices in sustainable healthy diets – A systematic literature review on behavioral drivers and barriers. Environ Sci Policy. 2025;163:103975.
12. Kaner G, Kurklu NS, Depboylu GY, İnsel TH. Knowledge and opinions about sustainable nutrition and the factors associated with sustainable and healthy eating behaviors in adults. Galician Med J. 2024;31(3).
13. Ferreira AF, Abreu S, Liz Martins M. Determinants of adherence to sustainable healthy diets among Portuguese adults. NFS J. 2024;37:100200.
14. Erdoğan Gövez N, Akpınar Şentüre Ş, Ayten Ş, Köksal E. Evaluation of the Turkey Nutrition and Health Surveys according to the mediterranean adequacy index and sustainability through water footprints. Public Health Nutr. 2023;26(12):2927–35.
15. Yeşildemir Ö. Yetişkin Bireylerde Sürdürülebilir ve Sağlıklı Yeme Davranışları ile E-Sağlıklı Beslenme Okuryazarlığı ve Beslenme Bilgi Düzeyi Arasındaki İlişkinin Değerlendirilmesi. Celal Bayar Üniversitesi Sağlık Bilimleri Enstitüsü Dergisi. 2023;10(3):250–60.
16. Batmaz H, Diyetetik B. Yetişkinler İçin Beslenme Bilgi Düzeyi Ölçeği Geliştirilmesi Ve Geçerlik-Güvenirlik Çalişmasi.
17. Köksal E, Bilici S, Çitar Daziroğlu ME. Erdoğan Gövez N. Validity and Reliability of the Turkish Version of the Sustainable and Healthy Eating Behaviors Scale. Br J Nutr. 2022:1–20.
18. Sanlier N, Kocaay F, Kocabas S, Ayyildiz P. The Effect of Sociodemographic and Anthropometric Variables on Nutrition Knowledge and Nutrition Literacy. Foods. 2024;13(2):346.
19. Irgat S, Bakırhan H, Bakırhan YE, Sonkaya Z. Determining food choice motivations in Turkish adults: sustainable and healthy eating behavior, ecological footprint awareness, and food insecurity perspective. BMC Public Health. 2024;24(1):3547.
20. Öngün Yilmaz H, Arslan S, Tari Selçuk K, Bayram HM, Ozturkcan A. From knowledge to action: How nutrition knowledge shapes sustainable eating and Mediterranean diet adherence. Front Nutr. 2025;12:1684438.
21. Orhan BE, Alkasasbeh WJ, Karaçam A, Canlı U, Adıgüzel NS, Amawi AT. Nutrition knowledge and healthy-eating attitudes: the role of physical activity and lifestyle factors in adults. Front Nutr. 2026;Volume 13–2026.
22. Chard E, Bergstad CJ, Steentjes K, Poortinga W, Demski C. Gender and cross-country differences in the determinants of sustainable diet intentions: a multigroup analysis of the UK, China, Sweden, and Brazil. Front Psychol. 2024;15:1355969.
23. Helvacı G, Tayhan F, Özbey Yücel Ü. Gender and healthy eating attitude strongly predict sustainable food literacy among Turkish young adults, while Mediterranean diet adherence shows only weak correlation. Front Public Health. 2025;Volume 13–2025.
24. Wollmar M, Post A, Sjöberg A. Food choice, activity level, and carbon footprint: exploring potential for sustainable food consumption practices in young adults. Front Nutr. 2024;Volume 11–2024.
25. Sandri E, Broccolo A, Piredda M. Analysis of the Importance of Food Sustainability and the Consumption of Organic and Local Products in the Spanish Population. Sustainability. 2025;17(3):991.
26. Moroșan E, Popovici V, Popescu IA, Daraban A, Karampelas O, Matac LM, et al. Perception, Trust, and Motivation in Consumer Behavior for Organic Food Acquisition: An Exploratory Study. Foods. 2025;14(2):293.
27. Guy DJ, Bray J, Appleton KM. Knowledge, Perceived Importance, Current Uptake, and Willingness to Adopt Healthy Sustainable Dietary Actions: A Cross-Sectional Study of UK Adults. Nutrients. 2026;18(3):534.
28. Tran L, Su Y. Consumers' Health and Environmental Attitudes and Local Food Purchases. Int J Environ Res Public Health. 2025;22(2):298.
29. Bayram HM, Ozturkcan A. The role of polyphenol intake and ecological awareness in shaping sustainable nutrition. Front Nutr. 2025;Volume 12–2025.
30. Kesse-Guyot E, Péneau S, Méjean C, Szabo de Edelenyi F, Galan P, Hercberg S, et al. Profiles of organic food consumers in a large sample of French adults: results from the Nutrinet-Santé cohort study. PLoS ONE. 2013;8(10):e76998.

Figures

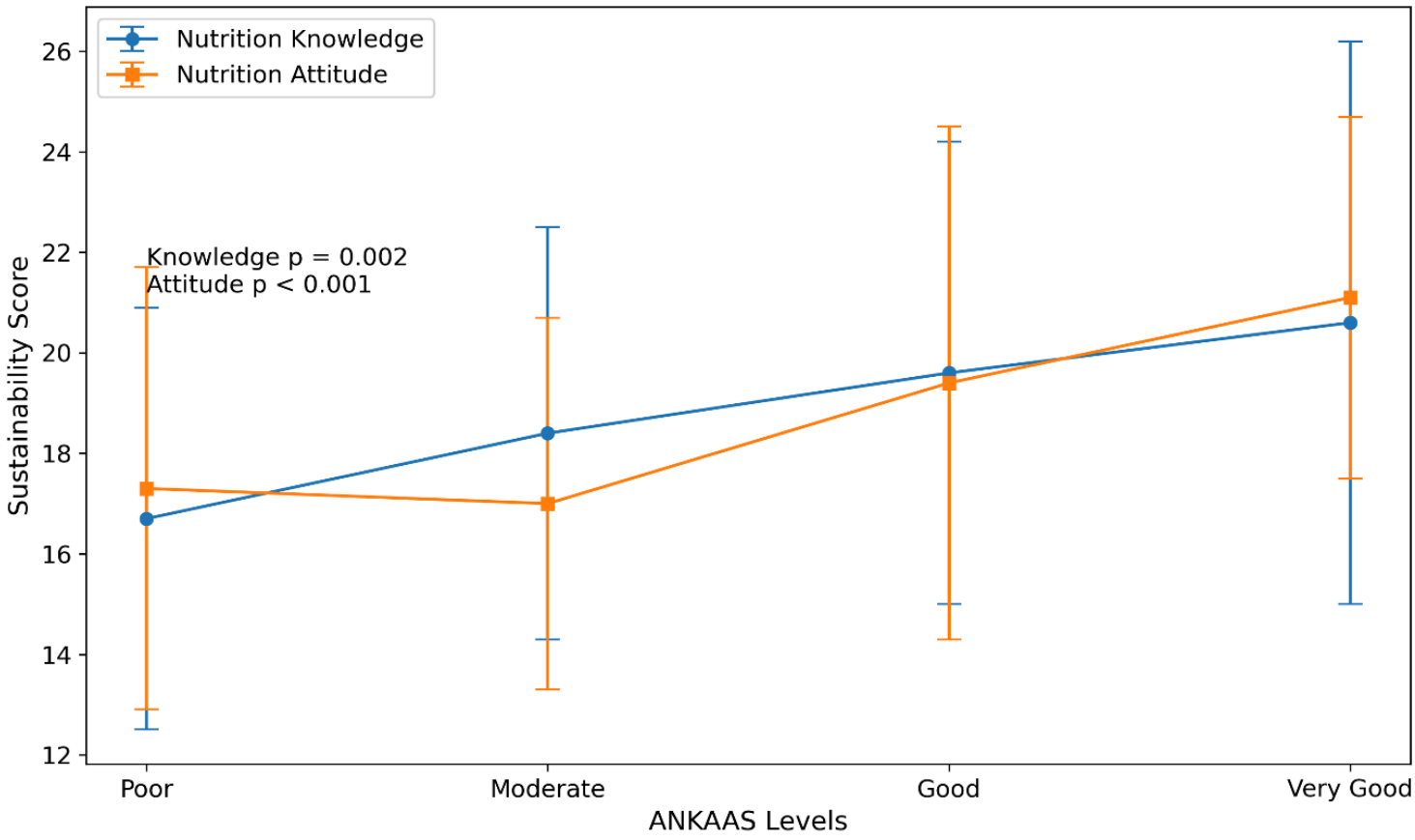


Figure 1

Distribution of SHEBS Scores According to ANKAAS Nutrition Knowledge and Nutrition Attitude Levels