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Evaluation of the relationship between the Mediterranean diet adherence and sleep quality in adults

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Abstract

Purpose To investigate the association between Mediterranean diet adherence (MDA) and sleep quality in adults.

Methods This cross-sectional research was conducted among adults aged 19–64 years in Ankara, Türkiye. Data on demographics, education, lifestyle, and physical activity habits were collected. Mediterranean diet adherence was assessed with the Mediterranean Diet Adherence Screener (MEDAS). Healthy eating attitudes were evaluated with the Attitude Scale for Healthy Nutrition (ASHN). Sleep quality was measured with the Pittsburgh Sleep Quality Index (PSQI). Data were gathered using an online format.

Results Among 1031 participants enrolled (74% women), mean age was 28.6 ± 8.3 years. Median age increased with MDA ($p = 0.001$). As individuals' MDA increased, ASHN total and subgroup scores also increased significantly ($p < 0.001$). The total sleep duration of the participants with low MDA was significantly lower than the other groups ($p = 0.003$). Pittsburgh Sleep Quality Index score and MEDAS ($\beta = -0.222$, $p < 0.001$), ASHN ($\beta = -0.043$, $p < 0.001$) and ASHN subgroups ($\beta = (-0.086) - (-0.031)$) were found to have a weakly signficant negative relation.

Conclusions The findings suggest that healthy eating attitudes and nutritional behavior in accordance with the Mediterranean diet are associated with sleep quality.

Keywords Healthy eating · Mediterranean diet · Sleep quality · Sustainable diet

Introduction

Sleep, which is a complex combination of physiological and behavioral processes, is a state of physical and mental rest in which bodily functions slow down and which can be easily reversed with awakening [1, 2]. Sleep quality includes quantitative components of sleep such as sleep latency, duration, and the number of awakenings per night, and also includes subjective aspects, like sleep depth and restfulness [3]. Many factors such as smoking, alcohol, medication, environmental factors, economic situation, hormonal changes, chronic diseases, and psychological factors affect sleep quality [4]. Another factor affecting sleep quality is nutrition behavior [5]. Notably, there is a significant relationship between good sleep quality and a healthy diet that encourages the consumption of plant-based foods and seafood, and limited consumption of processed and sugar-containing foods [6]. The Mediterranean diet, which is rich in plant-based foods such as whole grains, vegetables, and fruits, is limited in the consumption of red and processed meat, sugar, and sugared foods. Olive oil serves as the main source of fat [7, 8]. The Mediterranean diet has been the subject of many studies and has proven to have positive health effects in the prevention/management of chronic diseases such as metabolic and cardiovascular diseases [9, 10]. Also, a study showed a relation between the Mediterranean diet and adequate sleep time and fewer insomnia symptoms [11]. Mediterranean diet adherence (MDA) in older adults (≥ 60 years) contributes to better sleep quality and less risk of changes in sleep duration. [12]. The aim of this study was to evaluate the relationship between sleep quality and MDA in adults.

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Materials and methods

Participants

Data for this cross-sectional study were gathered from a convenience sample of adults in Ankara. The G-Power tool (3.0 version) was used to determine the sample size for the research, using a significance level of 0.05 and a power of 0.95, according to a similar study [13], and it was determined that a sample of at least 132 people would be adequate for this study.

The research tool for gathering data was an online questionnaire. Social media (Facebook, Twitter, Instagram) was used to distribute the online survey in May 2021.

The participants were adults (between the ages of 19 and 64). The following requirements were required to participate in this research: free from illnesses that might affect diet, not pregnant or lactating, and without a history of obstructive sleep apnea, anxiety, depression, or other psychiatric disorders. The Declaration of Helsinki's recommendations were followed in the conduct of this study. The local ethics committee of Ankara University (No.56786525–050.04.04/111936) approved this research.

Questionnaires

Data was gathered via a self-administered online questionnaire. The questionnaire involved demographic (i.e., age, gender, educational and occupational level) and lifestyle characteristics (i.e., physical activity, smoking, and alcohol habits); MDA assessment—Mediterranean Diet Adherence Screener (MEDAS); evaluation of healthy eating attitudes—Attitude Scale for Healthy Nutrition (ASHN); and sleep assessment—Pittsburgh Sleep Quality Index (PSQI). The final questionnaire, which took 10 min to complete, evaluated these four constructs using the previously validated questionnaires.

Demographic and lifestyle information

Individuals were asked to provide their age, gender, smoking status, alcohol intake, educational and occupational level, and physical activity habits. Disease status was also evaluated. Participants who declared diseases that could affect their dietary habits, such as diabetes, hypertension, and kidney diseases, were excluded from the study.

Mediterranean diet adherence assessment

MEDAS was used to assess Mediterranean diet habits. The MEDAS consists of 14 items. [14]. The score given for each item is 0 or 1 giving a scoring range of 0–14 points [14]. The Turkish validity-reliability research of the MEDAS yielded a Cronbach alpha coefficient of 0.829, which demonstrates adequate reliability. The interpretation of the total MEDAS score is: <7 low MDA, ≥ 7 moderate MDA, ≥ 9 high MDA [15].

Healthy nutrition attitude assessment

A valid and accurate measurement tool for assessing attitudes toward healthy eating, the Attitude Scale for Healthy Nutrition (ASHN) has 21 items and four components. These elements are categorized as information on nutrition (IN), emotion for nutrition (EN), positive nutrition (PN), and malnutrition (MP). The IN sub-factor is by knowing the content of foods and their health status; the EN sub-factor is with sugary foods and fast food consumption; the PN sub-factor was associated with not skipping meals and regular consumption of vegetables and fruits; the MN sub-factor is associated with consuming junk food and skipping the main meal. The scale's positive statements receive the following ratings: "Strongly Disagree," "Disagree," "Neutral," "Agree," and "Strongly Agree." Negative attitude items ($n=11$; 6, 7, 8, 9, 10, 11, 17, 18, 19, 20, and 21 items) were scored as 5, 4, 3, 2, and 1; positive attitude items ($n=10$; 1, 2, 3, 4, 5, 12, 13, 14, 15, and 16 items) were scored as 1, 2, 3, 4, and 5. The ASHN yields a score from 21 to 105, with higher scores indicating higher healthy eating attitudes. The ASHN's overall rating is as follows: 21 being extremely low, 22 being low, 43 being moderate, 64 being high, and 85 being extremely high [16].

Sleep quality assessment

The Pittsburgh Sleep Quality Index (PSQI), a subjective assessment of sleep quality and disruptions of the patients during a 1-month time period, was used to assess quality of sleep. The 19-item self-reported questionnaire is broken down into seven score components: subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disruptions, usage of sleeping pills, and daytime dysfunction. The PSQI questions are scored from 0 to 3. The scores for each component are summed to provide a global sleep quality index. The PSQI is scored between 0 and 21 with higher scores indicating poorer sleep quality. Those with a PSQI score of >5 are classified with poor sleep quality, and those with a PSQI score of ≤ 5 as good sleep quality. The index was validated for use in Türkiye. [17].

Statistical analysis

The analysis of the data obtained from the research was performed using the Statistical Package for the Social Sciences (SPSS) version 25 for Windows (SPSS Inc., Chicago, IL). Data distribution evaluation was done with

Kolmogorov–Smirnov test. Descriptive statistics with normal distribution are shown as mean ± standard deviation, non-normal variables as median and interquartile range, and nominal variables as number of cases and percentage (%). The chi-square test was used to determine the significance of differences in the frequency distribution. The Kruskal–Wallis *H* test was used to determine the significance of the differences between the MEDAS groups. Differences between MEDAS groups for total sleep time, PSQI score, ASHN total, and subgroup scores were analyzed using the one-way ANOVA test followed by the Tukey or Tamhane's post hoc test. Linear regression analysis models were performed to determine the relationship between the PSQI score and MEDAS score, ASHN total, and subgroup scores. All statistical tests were evaluated at $p < 0.05$ significance level.

Results

Four weeks after opening the online invitation, 1426 adults had provided their information. Of these 1426, 363 met exclusion criteria and 32 provided incomplete data, leaving 1021 participants in the study sample. The median age of 1031 participants, Mean age of the study sample was 28.6 ± 8.3, and as the median age increased, the MEDAS score increased ($p = 0.001$). Individuals in MDA groups were generally in the 19–25 age group ($p = 0.032$).. Most participants were students (73.8–75.6%) who had university education. Almost half of the participants did not do physical activity. Simultaneously, as the MEDAS score increased, the proportion of individuals engaged in physical activity increased ($p < 0.001$) (Table 1).

Table 2 shows the MEDAS scores of individuals with low, moderate, and high MDA respectively ($p < 0.001$). As individuals' MEDAS score increased, ASHN total and subgroup scores also increased significantly. Additionally, more than half of the individuals (59.7%) were in the group with a high ASHN score (Table 2).

According to Table 3, the total sleep duration of the participants with low MDA was significantly lower than the other groups, and this difference was due to the group with low adherence. Additionally, most individuals with low MDA slept after 23:00 and 28.5% woke up after 10:00. The sleep quality scores are shown in Table 3.

Associations of MEDAS items with sleep quality are shown in Table 4.

According to the linear regression analysis given in Table 5, Pittsburgh Sleep Quality İndex score and MEDAS ($\beta = -0.222$, $p < 0.001$), ASHN ($\beta = -0.043$, $p < 0.001$), and ASHN subgroups ($\beta = (-0.086) - (-0.031)$) were found to have a weakly significant negative relationship (Table 5).

Discussion

There is a bidirectional relationship between sleep and nutrition [18]. While changes in sleep duration and quality affect the type and amount of food consumed [6], the food consumed also affects sleep duration and quality. Adequate sleep time, high-sleep efficiency, and shorter sleep latency are among the indicators of good sleep quality and are associated with indicators of good diet quality [19]. The effect of dietary patterns on sleep parameters has highlighted the role of nutrition in sleep health [18]. In this study, the findings suggested that MEDAS and ASHN were associated with PSQI ($p < 0.001$) (Table 3 and 5).

The MEDAS and ASHN are two scales that evaluate the nutritional status of individuals with similar criteria, and it was determined that as the IN scores of the individuals participating in this study increased, their MDA increased (Table 2). In a similar study, MDA increased with the increase in the level of nutrition knowledge [20]. However, the PN, EN, and MN sub-factor scores of the individuals in the study increased significantly with the increase in their MDA (Table 2). The specified nutritional habits are factors that affect sleep quality [6]. Individuals who skip meals [21, 22], delay the mealtime and/or change the places of main meals and snacks [21], consume more sugar [23] and sugary drinks [22] have worse sleep quality. On the other hand, consumption of vegetables and fruits has positive effects on sleep quality and duration [24]. In this study, the data suggested that a one-unit increase in the PSQI score created a decrease of 0.031 points in the IN sub-factor of ASHN ($p < 0.05$), 0.045 points in the EN sub-factor ($p < 0.05$), 0.078 points in the PN sub-factor ($p < 0.001$), and 0.086 points in the MN sub-factor ($p < 0.001$).

The Mediterranean diet contains melatonin, tryptophan, serotonin, and many nutritional components that affect sleep quality [25]. Low MDA has been associated with inadequate sleep duration and quality [11, 12]. Individuals with short sleep duration are more likely to eat food with processed and high-simple sugar content; consume less fruits, seafood, and whole grain products; and have a low quality diet quality [6]. Several studies have also shown that poor sleep quality is associated with low-quality diets that include higher energy intake and less fruit and vegetable consumption [19, 26, 2827]. More than 50% of individuals consuming carbonated soft drinks ≥ 3 times a day stated that they had a sleep disorder more than once a day. In addition, men who consumed fast food ≥ 4 days a week had 55% more sleep disorders than those who consumed ≤ 1 day [29]. In addition to all these, low consumption of fruits, vegetables, and legumes was determined to be associated with short sleep duration [24, 28, 30]. Women who increased their vegetable and fruit consumption by 3 servings improved their insomnia symptoms, increased sleep quality, and shortened sleep latency

Table 1 Demographic characteristics of the participants

Characteristics	Mediterranean Diet Adherence Screener (MEDAS)			*p*
	Low adherence ($n=267$)	Moderate adherence ($n=354$)	High adherence ($n=410$)	
Age (years)[a] (median, 25–75th)	24.0 (21.0–32.0)	26.0 (22.0–34.0)	28.0 (22.0–35.0)	0.001*
Age groups, *n* (%)				
19–25 years	144 (53.9)	166 (46.9)	169 (41.2)	0.032*
26–35 years	84 (31.5)	115 (32.5)	146 (35.6)	
36–45 years	33 (12.4)	55 (15.5)	72 (17.6)	
> 45 years	6 (2.2)	18 (5.1)	23 (5.6)	
Gender, *n* (%)				
Male	102 (38.2)	88 (24.9)	77 (18.8)	< 0.001**
Female	165 (61.8)	266 (75.1)	333 (81.2)	
Marital status, *n* (%)				
Married	89 (33.3)	154 (43.5)	212 (51.7)	< 0.001**
Single	178 (66.7)	200 (56.5)	198 (48.3)	
Education level, *n* (%)				
Primary/secondary school	9 (3.4)	12 (3.4)	13 (3.1)	0.018*
High school	44 (16.5)	52 (14.7)	38 (9.3)	
University	197 (73.8)	265 (74.9)	310 (75.6)	
Postgraduate	17 (6.3)	25 (7.0)	49 (12.0)	
Profession, *n* (%)				
Student	103 (38.7)	114 (32.3)	117 (28.5)	< 0.001**
Worker	43 (16.1)	35 (9.9)	25 (6.2)	
Officer (except for healthcare workers)	54 (20.2)	70 (19.8)	114 (27.8)	
Self-employment	23 (8.6)	42 (11.8)	53 (12.9)	
Dietitian	2 (0.7)	13 (3.7)	17 (4.1)	
Homemaker	23 (8.6)	45 (12.6)	47 (11.5)	
Healthcare workers	16 (6.0)	32 (9.0)	26 (6.3)	
Unemployed	3 (1.1)	2 (0.6)	5 (1.2)	
Retired	-	1 (0.3)	6 (1.5)	
Smoking status, *n* (%)				
Never smoker	175 (65.5)	263 (74.3)	325 (79.3)	< 0.001**
Current smoker	92 (34.5)	91 (25.7)	85 (20.7)	
Alcohol consumption, *n* (%)				
Non-drinker	208 (77.9)	290 (81.9)	330 (80.5)	0.457
Yes	59 (22.1)	64 (18.1)	80 (19.5)	
Regular physical activity level, *n* (%)				
None	182 (68.2)	219 (61.8)	199 (48.5)	< 0.001**
Low	47 (17.6)	59 (16.7)	107 (26.1)	
Moderate	30 (11.2)	64 (18.1)	88 (21.5)	
High	8 (3.0)	12 (3.4)	16 (3.9)	

[a]Data are presented as median (25 and 75th quartile) values; *p* values were derived by Kruskal–Wallis *H* test; nominal variables are shown as percentage (frequency); *p* values were derived by Pearson's chi-squared

*$p < 0.05$; **$p < 0.001$

compared to women who did not change or reduce their consumption [24]. An increase in fruit and vegetable consumption was associated with a lower PSQI score, higher sleep efficiency, and less sleep disturbance, while an increase in legume consumption was associated with better sleep efficiency [31]. Additionally, individuals with high consumption of red meat have a higher risk of having apnea and insomnia symptoms and have more insomnia and daytime

Table 2 Nutrition-related parameters of the participants

Nutrition-related parameters	Mediterranean Diet Adherence Screener (MEDAS)			95% CI	*p*
	Low adherence (*n* = 267)	Moderate adherence (*n* = 354)	High adherence (*n* = 410)		
MEDAS	5.0 ± 1.1[a]	7.5 ± 0.5[b]	9.9 ± 1.0[c]	7.7–8.0	< 0.001**
ASHN	68.2 ± 10.5[a]	75.0 ± 10.7[b]	80.3 ± 10.9[c]	74.7–76.1	< 0.001**
Subgroups of ASHN					
Information on nutrition (IN)	18.5 ± 5.3[a]	19.8 ± 4.9[b]	20.6 ± 5.0[c]	19.5–20.1	< 0.001**
Emotion for nutrition (EN)	16.3 ± 5.4[a]	17.8 ± 5.2[b]	19.2 ± 4.9[c]	17.7–18.3	< 0.001**
Positive nutrition (PN)	16.0 ± 4.9[a]	17.8 ± 4.8[b]	19.6 ± 4.8[c]	17.8–18.5	< 0.001**
Malnutrition (MN)	17.2 ± 5.0[a]	19.4 ± 4.4[b]	20.7 ± 4.0[c]	19.1–19.7	< 0.001**
ASHN groups	Low adherence (*n* = 267)	Moderate Adherence (*n* = 354)	High adherence (*n* = 410)	Total (*n* = 1031)	*p*
	n(%)				
Low	1 (0.4)	1 (0.3)	-	2 (0.2)	< 0.001**
Moderate	91 (34.1)	51 (14.4)	31 (7.6)	173 (16.8)	
High	160 (59.9)	230 (65.0)	225 (54.8)	615 (59.7)	
Very high	15 (5.6)	72 (20.3)	154 (37.6)	241 (23.4)	

Numeric variables are presented as mean ± standard deviation. Nominal variables are shown as percentage (frequency); *p* values were derived by one-way ANOVA and Pearsons chi-squared, respectively. One-way ANOVA: [a,b,c]Tukey or Tamhane's post hoc test: means with the same letter indicate no significant difference

MEDAS Mediterranean Diet Adherence Screener, *ASHN* Attitude Scale for Healthy Nutrition, *CI* confidence interval

**$p < 0.001$

Table 3 Sleep habits according to the MEDAS category

Sleep habits	Mediterranean Diet Adherence Screener (MEDAS)			*p*
	Low adherence (*n* = 267)	Moderate adherence (*n* = 354)	High adherence (*n* = 410)	
Total sleep time, h	7.5 ± 1.5[a]	8.3 ± 1.4[b]	8.2 ± 1.3[b]	0.003***
Bedtimes, *n* (%)				
< 22:00	1 (0.4)	4 (1.2)	3 (0.7)	0.211
22:00–23:00	34 (12.7)	67 (18.9)	63 (15.4)	
> 23:00	232 (86.9)	283 (79.9)	344 (83.9)	
Wake times, *n* (%)				
< 09:00	108 (40.4)	168 (47.5)	218 (53.2)	0.022*
09:00–10:00	83 (31.1)	106 (29.9)	104 (25.3)	
> 10:00	76 (28.5)	80 (22.6)	88 (21.5)	
PSQI	6.1 ± 2.8[a]	5.1 ± 2.5[b]	4.7 ± 2.3[b]	< 0.001**
Sleep quality groups, *n* (%)				
Good sleep quality	83 (31.1)	160 (45.2)	211 (51.5)	< 0.001**
Poor sleep quality	184 (68.9)	194 (54.8)	199 (48.5)	

Numeric variables are presented as mean ± standard deviation. Nominal variables are shown as percentage (frequency); *p* values were derived by one-way ANOVA and Pearsons chi-squared, respectively. One-way ANOVA: [a,b] Tukey or Tamhane's post hoc test: means with the same letter indicate no significant difference

PSQI Pittsburgh Sleep Quality Index, *h* hours

*$p < 0.05$; **$p < 0.001$; ***$p < 0.0001$

sleepiness problems compared to individuals with low consumption [32], while individuals with high fish consumption have higher sleep quality [33]. In this study, there were more individuals with good sleep quality among individuals who consumed ≥ 2 servings/day of vegetables and ≥ 3 portions/week of legumes and there were more individuals with low

Table 4 Percentages of MEDAS items by sleep quality groups

Items	Good sleep quality ($n=454$)		Poor sleep quality ($n=577$)	
	Yes	No	Yes	No
	n (%)		*n* (%)	
Extra virgin olive oil as main culinary fat	363 (80.0)	91 (20.0)	448 (77.6)	129 (22.4)
Extra virgin olive oil > 4 tbsp	282 (62.1)	172 (37.9)	341 (59.1)	236 (40.9)
Vegetables ≥ 2 servings/day	294 (64.8)	160 (35.2)	340 (58.9)	237 (41.1)
Fruits ≥ 3 servings/day	219 (48.2)	235 (51.8)	269 (46.6)	308 (53.4)
Red meat < 1/day	116 (25.6)	338 (74.4)	151 (26.2)	426 (73.8)
Butter < 1/day	142 (31.3)	312 (68.7)	214 (37.1)	363 (62.9)
Sweet drinks < 1/day	101 (22.2)	353 (77.8)	215 (37.3)	362 (62.7)
Wine ≥ 7/week	4 (0.9)	450 (99.1)	6 (1.0)	571 (99.0)
Legumes ≥ 3/week	330 (72.7)	124 (27.3)	418 (72.4)	159 (27.6)
Fish ≥ 3/week	92 (20.3)	362 (79.7)	108 (18.7)	469 (81.3)
Desserts ≤ 3/week	181 (39.9)	273 (60.1)	272 (47.1)	305 (52.9)
Nuts ≥ 3/week	289 (63.7)	165 (36.3)	332 (57.5)	245 (42.5)
White meat preference (yes)	193 (42.5)	261 (57.5)	219 (38.0)	358 (62.0)
Sofrito ≥ 2/week	369 (81.3)	85 (18.7)	444 (76.9)	133 (23.1)

Nominal variables are shown as percentages (frequency)

Table 5 Linear regression analysis models with PSQI as the dependent variables were used to estimate the predictive value of MEDAS score and ASHN total and subgroup score

Parameters	Linear regression analysis						
Model	R^2	β	*SE*	*t*	*p*	95% *CI*	
MEDAS score	0.034	−0.222	−0.185	−6.051	< 0.001**	6.395	7.565
ASHN score	0.038	−0.043	0.007	−6.334	< 0.001**	−0.056	−0.029
Information on nutrition (IN)	0.004	−0.031	0.016	−1.984	< 0.05*	−0.062	0.000
Emotion for nutrition (EN)	0.008	−0.045	0.015	−2.940	< 0.05*	−0.075	−0.015
Positive nutrition (PN)	0.023	−0.078	0.016	−4.944	< 0.001**	−0.109	−0.047
Malnutrition (MN)	0.024	−0.086	0.017	−5.019	< 0.001**	−0.120	−0.053

p value calculated from linear regression analysis

PSQI Pittsburgh Sleep Quality Index, *MEDAS* Mediterranean Diet Adherence Screener, *ASHN* Attitude Scale for Healthy Nutrition, R^2 *R* squared, β beta coefficient, *SE* standard error, *CI* confidence interval

*$p < 0.05$; **$p < 0.001$

sleep quality among individuals who consumed < 3 portions/day of fruit, ≥ 1 portion/day of red meat, < 3 portions/week of fish, sweets more than 3 times per week, and ≥ 1 sugary drink per day (Table 4). Additionally, individuals who slept less than 7 h, had a lower Mediterranean diet score compared to those who slept 7 h. Varying sleep duration on weekdays and weekends was also associated with a lower Mediterranean diet score [30]. In another study [12], a one-unit increase in the Mediterranean diet score would increase sleep quality by 10%, while the MEDAS score and the PSQI score showed a negative relationship [34]. Similarly, an increase in sleep quality was observed with increasing MDA [35]. In this study, it was defined that more than half of the individuals with low and moderate MDA had poor sleep quality, and individuals with high adherence had high sleep quality ($p < 0.001$) (Table 3). Additionally, the findings suggested that a one-unit increase in the PSQI score was associated with a 0.22 point decrease in the MEDAS score ($p < 0.001$) (Table 5). However, individuals with low MDA sleep later, while those with high levels wake up earlier (Table 3). Studies have also supported the results of this research and have shown that individuals with morningness chronotype who go to bed early at night and wake up early in the morning have higher MDA [13, 36].

Limitations

Although this research showed that MDA and higher healthy eating attitude are associated with good sleep quality, the research has some limitations. Because of the cross-sectional study design, causality cannot be inferred.

This research was conducted online because of the COVID-19 pandemic. It is not appropriate to generalize these results from healthy adult individuals who voluntarily participated in the online survey research to all populations. The findings of this study are based on self-report data, which carries the risk of bias. This study excluded conditions such as psychiatric disorders, which are related to eating and sleep disorders. Another limitation of this study is that a significant proportion of the sample consisted of university students whose sleep times cannot be generalized to the entire adult population in Turkiye. One of the reasons we based our bedtime at 22:00–23:00 was that the lowest cardiovascular event rate in a cardiovascular disease study [37] was seen in those who slept between 22:00 and 23:00, and in our research, we evaluated MDA which is recommended for the prevention of cardiovascular disease.

Conclusion

The findings of this study suggest that healthy eating attitudes and nutritional behavior in accordance with the Mediterranean diet are associated with good.

Supplementary Information The online version contains supplementary material available at https://doi.org/10.1007/s11325-023-02890-5.

Author contribution Conceptualization: Gülsüm Şahin-Bodur, Sümeyye Kemaneci, Esra Tunçer, Alev Keser; Methodology: Gülsüm Şahin-Bodur, Sümeyye Kemaneci, Esra Tunçer, Alev Keser; Formal analysis and investigation: Gülsüm Şahin-Bodur, Sümeyye Kemaneci, Esra Tunçer; Writing — original draft preparation: Gülsüm Şahin-Bodur, Sümeyye Kemaneci, Esra Tunçer; Writing — review and editing: Gülsüm Şahin-Bodur, Sümeyye Kemaneci, Esra Tunçer, Alev Keser.

Data availability The datasets generated during and/or analysed during the current study are available from the corresponding author on reasonable request.

Declarations

Ethical approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Ethical committee permission Research, involving human participants, was conducted according to the guidelines laid down in the Declaration of Helsinki and was approved by the local ethics committee of Ankara University (No. 56786525–050.04.04/111936).

Informed consent Informed consent was obtained before beginning the online survey.

Conflict of interest The authors declare no competing interests.

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