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Research paper

Predicting the effect of healthy lifestyle belief on attitude toward nutrition, exercise, physical activity, and weight-related self-efficacy in Turkish adolescents

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ABSTRACT

Objectives: This study was conducted to examine the effect of healthy lifestyle beliefs on their attitudes toward physical activity, nutrition, exercise, and weight-related self-efficacy lifestyles in Turkish adolescents.
Methods: This study used a methodological and descriptive design. The study was conducted with 445 adolescents aged 13–18 years. The data were collected using a Descriptive Information Form, the Healthy Lifestyle Beliefs Scale for Adolescents, the Nutrition Exercise Attitudes Scale, and the Attitudes Toward Physical Activity Scale. Mean and percentage values, *t*-test, ANOVA test, and linear regression analysis were used in the analysis of the research data.
Results: A statistically significant difference was found between adolescents' obesity status, paternal educational level, maternal educational level, income status, and the mean scores obtained for healthy lifestyle beliefs, nutrition and exercise attitudes, physical activity attitudes, and weight-related self-efficacy, as well as between sex and mean scores for attitudes toward nutrition, exercise, and physical activity. In the model created with regression analysis, it was found that the adolescents' healthy lifestyle beliefs and sociodemographic variables explained 96.3% of their attitudes toward nutrition and exercise, 93.6% of physical activity attitudes, and 96.5% of weight-related self-efficacy levels, with statistical significance.
Conclusion: According to the results of the study, healthy lifestyle beliefs are an important predictor of adolescents' attitudes toward nutrition, exercise, and physical activity as well as their weight-related self-efficacy. We recommend that school nurses consider healthy lifestyle beliefs when creating intervention programs for adolescents .

1. Introduction

Adolescence is an important period of life in which health-related behaviors and attitudes develop [1]. One of the most important factors in the protection and improvement of health is the development of the individual's health awareness and beliefs. For this reason, it is important to help individuals take responsibility for their own health and make decisions when necessary. Although it is not possible to change the genetic makeup of individuals, healthy behaviors can be developed by changing nutrition behaviors, physical activity levels, and other environmental factors positively [2].

Since adolescence is a period when nutrition behaviors change and the basis of adult behaviors is formed, it should be approached carefully. The acquisition of healthy eating behaviors in childhood and adolescence increases the possibility of individuals continuing these behaviors in later life [3]. The attitudes of adolescents toward nutrition play a very important role in childhood obesity and affect their eating habits in adulthood [3]. According to the literature, only 39.2% of adolescents know about the food pyramid, and a mere 15.2% exhibit healthy eating habits although they are educated about healthy nutrition at school [4]. It is observed that adolescents with high levels of healthy living beliefs have positive healthy eating attitudes. It is important to determine nutritional attitudes and self-efficacy so as to clearly identify healthy-living beliefs that are affected by various factors [5].

One of the most widely used models both to explain the change and maintenance of health-related beliefs and behaviors in individuals and to highlight a framework for health behavior interventions is the health belief model. This model focuses on helping people understand and change their own beliefs [6]. There are two basic propositions for the success of the model: the first is that the individual should see their current health behavior as a threat and the other is that they should think that a certain change will lead to positive

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outcomes with reasonable cost and time [7]. The model includes a few basic concepts that make it easier to predict how individuals will take action to prevent or control their disease status. These concepts are (a) sensitivity, seriousness, and benefits of and barriers to a behavior, (b) action-stimulating cues, and (c) self-efficacy [7]. It is emphasized that the model is effective in increasing healthy lifestyle beliefs in adolescents and in developing a series of behavioral changes, such as improving nutrition, reducing school injuries, increasing physical activity, and using screening programs [8–10].

Self-efficacy, which is an effective variable in determining health protection behaviors, is an individual's belief in their own abilities in developing and implementing the strategy that they need to manage the situations they may encounter. Some studies in the literature have shown that adolescents with high levels of weight self-efficacy eat a more balanced diet, consume more vegetables and fruits, have healthier eating attitudes, and are more physically active [11]. In addition, individuals with higher levels of weight-related self-efficacy are more successful in losing weight [11], because weight control self-efficacy helps to achieve the behavioral changes required to maintain or reach an ideal weight [12]. It is important to examine the effects of all these variables on each other in order to identify healthy-living behaviors optimally [5,12].

One of the other factors affecting healthy-living beliefs is physical activity. Adolescents make independent decisions about healthy lifestyle behaviors such as physical activity [13]. It has been reported that positive changes in adolescents' beliefs and self-management strategies improve healthy lifestyle behaviors by increasing physical activity [14]. Students with a high belief in healthy living are more likely to participate in physical activity [15]. Therefore, determining the attitudes of adolescents toward physical activity will shed light on their healthy-living beliefs.

In studies involving multicomponent behavioral change interventions including education, nutrition, and physical activity in adolescents, many factors have been associated with healthy lifestyle beliefs and have resulted in short-term positive results; however, interventions in adolescents have not achieved long-term sustainable effects [16]. Therefore, it is important to continue to identify healthy lifestyle beliefs and key variables that affect them. Determining the effect of attitudes toward physical activity, nutrition, and exercise as well as weight-related self-efficacy, which are among these key variables, on healthy lifestyle beliefs is important for the development of healthy lifestyle behaviors in adolescents. Increased belief in a healthy lifestyle indicates that adolescents can successfully gain and practice healthy lifestyle behaviors [16]. School health nurses have an important role in teaching healthy-living behaviors to adolescents. Nurses working in schools should conduct research on nursing plans and their effectiveness to encourage healthy eating and physical activity and to develop healthy lifestyle beliefs and behaviors. In particular, the determination of variables, such as physical activity and nutrition, which affect the level of healthy lifestyle beliefs in adolescents will shed light on the intervention studies to be carried out in this area. Interventions to increase the beliefs of adolescents will be effective in developing healthy lifestyle behaviors [16]. In the study by Trigueros et al., it was emphasized that there was a positive correlation between physical activity and healthy-living behaviors and it was determined that physically active adolescents were also determined to maintain healthy-living behaviors [13]. In their study, Chung et al. found a similar correlation between attitude toward nutrition and healthy lifestyle behaviors [17]. In addition, many studies emphasized that there is a relationship between sociodemographic characteristics and physical activity, nutrition, and healthy lifestyle beliefs, but all variables have not been reported to affect each other [18,19]. According to the literature, some studies have examined each variable separately [5,20–22], but there are no studies examining the effects of all variables on each other. Therefore, studies are needed that examine the effect of healthy lifestyle beliefs of adolescents on attitudes toward physical activity, nutrition, and exercise as well as on weight-related self-efficacy.

This study aimed to determine the predictive effect of Turkish adolescents' healthy lifestyle beliefs on their attitudes toward physical activity, nutrition, and exercise attitudes as well as on weight-related self-efficacy. Accordingly, the following research questions were raised:

1. What are the mean scores of adolescents regarding healthy lifestyle beliefs, attitudes toward physical activity, nutrition, and exercise, as well as weight-related self-efficacy?
2. Do healthy lifestyle beliefs, attitudes toward physical activity, nutrition, and exercise as well as weight-related self-efficacy vary according to sociodemographic characteristics of adolescents?
3. What is the extent to which healthy lifestyle beliefs and sociodemographic variables of adolescents predict their attitudes toward physical activity, nutrition, and exercise as well as weight-related self-efficacy?

2. Methods

2.1. Study design and setting

This study used a methodological and descriptive design and examined the effect of Turkish adolescents' healthy lifestyle beliefs on their attitudes toward physical activity, nutrition, and exercise as well as weight-related self-efficacy. It was conducted between November 2020 and February 2021 with adolescents at three high schools in the western region of Turkey.

2.2. Study sample

The study group comprised 445 high school students randomly selected from three high schools in a provincial center in western Turkey. Participants included adolescents (a) who were 9th-, 10th-, 11th-, and 12th-grade students, (b) who were aged 13–18 years, and (c) who volunteered to participate in the study. Adolescents without parents were not included in the study. The minimum sample size required for the study was calculated using the G*POWER 3.1.0 statistical analysis software based on a significance level of 0.05, 80% power, and medium effect size (f^2 = 0.15). Accordingly, the sample size required for multidimensional linear regression analysis was determined to be 107 adolescents. Ultimately, the study recruited 445 adolescents (206 females and 239 males) to examine the relationship between the variables. Data collection tools were administered to adolescents who voluntarily accepted to participate in the study from the schools where the study would be conducted and who provided written parental consent. The questionnaires could not be distributed in print due to the COVID-19 pandemic. Instead, a questionnaire form was created on Google Forms and the link to the form was shared with the participants. The participants first responded to a question at the beginning of the form asking whether they and their parents would consent to participate in the study. The questionnaire was administered to adolescents who accepted to participate in the study (Fig. 1).

2.3. Data collection tools

The descriptive information form

This form, created by researchers based on the literature, consists of eight questions that are used to obtain descriptive data such as age, sex, declared weight, declared height, economic level, and education and employment status of parents [5,16,21].

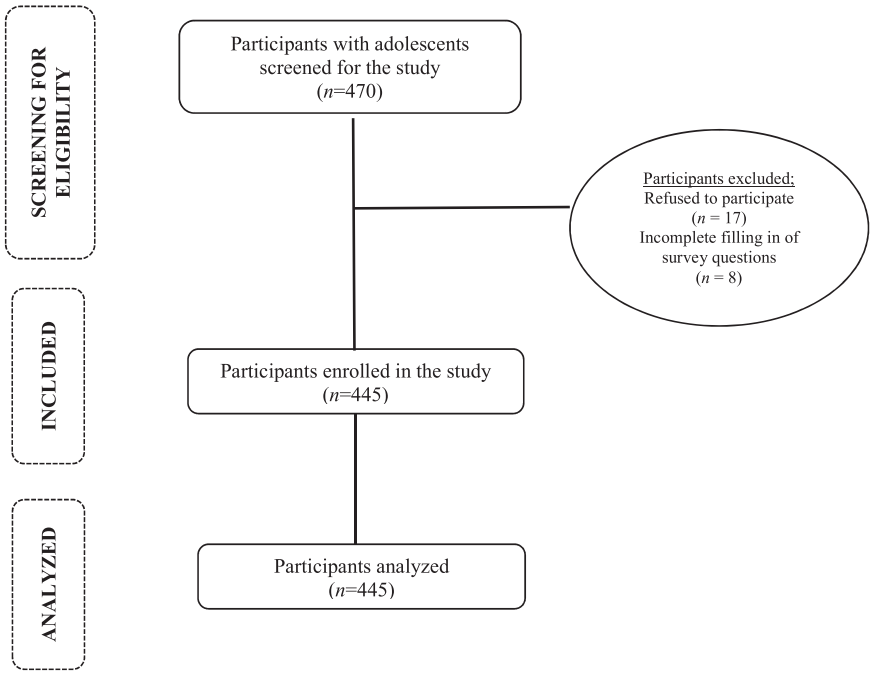

Fig. 1. Study participants flow diagram.

The healthy lifestyle beliefs scale for adolescents (HLBS)

The Healthy Lifestyle Beliefs Scale for Adolescents was developed by Kelly et al. (2011), and its Turkish validity and reliability study was conducted by Kudubeş and Bektaş (2020). It highlights beliefs about various aspects of maintaining a healthy lifestyle. It consists of a total of 16 items and three sub-dimensions, namely, health belief (items 4, 5, 6, 11, 12, 13, and 16), physical activity (items 2, 7, 9, 14, and 15), and nutrition (items 1, 3, 8, and 10). The scale has a five-point Likert-type evaluation system with options ranging between 1="strongly disagree" and 5="strongly agree." A minimum of 16 and a maximum of 80 points can be obtained from the overall scale. Increased scores from the scale indicate increased healthy lifestyle beliefs of the adolescent. Cronbach's alpha coefficient of the scale is 0.90. The factor loads of the items vary between 0.49 and 0.86 [23,24].

2.4. The nutrition–exercise attitudes scale (NEAS)

The NEAS is a five-point Likert-type scale consisting of 13 items developed by Yurt et al. in 2016 to evaluate attitudes toward nutrition. The respondent chooses among the 1="never," 2="rarely," 3="sometimes," 4=" most often," and 5="always" to evaluate the attitudes. The scores given to each question on the scale are taken as a basis. A minimum of 13 and a maximum of 65 points can be obtained from the scale. High overall scores obtained from the scale indicate that there is a positive attitude toward nutrition and exercise, and a low scores indicate that the attitudes toward nutrition and exercise are negative. Cronbach's alpha coefficient of the scale is 0.74 [25].

2.5. The attitudes toward physical activity scale (APAS)

The Turkish validity and reliability study of the scale, which was developed by Mok et al. (2015), was conducted by Dinç et al. (2019). It consists of 38 items and has a 4-point Likert-type scale with options such as 1="strongly disagree," 2="disagree," 3="agree," and 4="strongly agree." The scale has seven sub-dimensions, namely, entertainment (items 1–7), learning (items 8–15), utility (items 16–22), sports (items 23–30), self-efficacy (items 31–33), and personal record (items 34–38). Cronbach's alpha coefficient of the scale is 0.94, and the alpha values of the sub-dimensions range between 0.82 and 0.91. Increased scores indicate increased attitudes toward physical activity [26,27].

2.6. The weight-efficacy lifestyle questionnaire short form (WEL-SF) for adolescents

This questionnaire was developed by Ames et al. in 2012, and its Turkish validity and reliability study was conducted by Altan and Bektaş. It helps to measure weight-related self-efficacy, which has an important role in the prevention of childhood obesity, and the self-efficacy of avoiding inappropriate eating attitudes that cause the intake of much more calories than the body needs. It consists of eight questions aimed at understanding how binge eating attitudes change according to the current situation. It is a 10-point Likert-type scale (0="I do not trust myself in this matter at all," 5="I trust myself," 10="I trust myself in this matter"). Cronbach's alpha coefficient of the scale is 0.848. The factor loadings of the scale items vary between 0.52 and 0.80. The scores that can be obtained from the scale vary between 0 and 80. As the score increases, the level of self-efficacy in preventing binge-eating behavior in certain situations also increases [28,29].

2.7. Ethical considerations

At the outset, the permission of the owners of the scales used in the study was obtained via e-mail. The approval of the Ministry of National Education and the Non-Interventional Clinical Research Ethics Committee of a university was also obtained (Decision No: 5479-GOA, 2020/13–03). The researcher in charge explained the purpose of the study to all participants via the online form and obtained their informed consent. Participants were informed that they could quit the study at any time without giving any reason.

2.8. Data analysis

The data were analyzed using the SPSS version 23.0 (IBM Corp) software package. The Shapiro–Wilk W test, histograms, and normal Q–Q plots were used for tests of normality. Frequency and percentage values were calculated for categorical variables. Mean and standard deviation values were calculated for normally distributed

properties. The presence of obesity, part of the descriptive characteristics, was determined according to the body mass index (BMI). In the evaluation of BMI, BMI values were converted into percentile values according to age tables [30] prepared by the World Health Organization in 2007 for boys and girls aged 5–19. Accordingly, the percentile values were evaluated as follows: ≤ 15=underweight; 16–84=normal weight; 85–95=overweight, and ≥96=obese [30]. A *t*-test and ANOVA test were used to compare the scale scores for the descriptive characteristics. The Bonferroni-corrected Mann–Whitney U test was used to identify which of the variables of obesity status, father's educational level, mother's educational level, and income status were associated with the measurement difference. In order to determine the new level of significance in the binary comparison analysis, the accepted level of significance ($p = 0.05$) should be divided into 15, 3, 10, and 6, respectively, since there were: age, 15 pairs; declared obesity status, 3 pairs; maternal and paternal education status, 10 pairs; economic level, 6 pairs. Thus, the new significance level is 0.003, 0.016, 0.005, and 0.008, respectively. Linear regression analysis was employed to examine the extent to which adolescents' healthy lifestyle beliefs predicted their nutrition and exercise attitudes, attitudes toward physical activity, and weight-related self-efficacy lifestyle. VIF and tolerance analysis was used to examine whether there was multicollinearity between adolescents' healthy lifestyle beliefs and their nutrition and exercise attitudes, attitudes toward physical activity, and weight-related self-efficacy lifestyle. A VIF value of <10, a tolerance value of <0.2, and a condition index value of <15, which are independent variables, were included in the regression analysis [31]. Results were evaluated with a 95% confidence interval, and $p < 0.05$ was accepted as the level of significance.

3. Results

Of the adolescents participating in the study, 2.5% were 13 years old ($n = 11$), 14.8% were 14 years old ($n = 66$), 26.5% were 15 years old ($n = 118$), 12.6% were 16 years old ($n = 56$), 24.3% were 17 years old ($n = 108$), and 19.3% were 18 years old ($n = 86$). The mean age of the adolescents participating in the study was 16.04±1.39 years, 53.7% of them were female, 64.9% were normal weight, the fathers of 33.3% and the mothers of 42.7% were high school graduates. The mean declared weight of the adolescents was 63.29±6.77 kg and the mean declared height was 166.80±5.43 cm. Overall, 82.5% of the mothers and 10.2% of the fathers were not working and 61.8% had a low economic status. It was determined that the income of 10.5% of the families of the adolescents participating in the study was below 2825 Turkish lira, which was accepted as the minimum wage in Turkey in 2021, and the income of 56.5% was between 5000 and 7500 Turkish lira. In this study, adolescents were found to be homogeneous in terms of descriptive variables ($p > 0.05$).

The mean scores of the adolescents according to the study scales were as follows: the HLBS, 51.30±18.24 (minimum = 23.00, maximum = 76.00); the NEAS, 40.12 ± 14.98 (minimum = 20.00, maximum = 60.00); the APAS, 105.99 ± 36.14 (minimum = 64.00, maximum = 170.00); the WEL-SF, 42.43±22.12 (minimum=14.00, maximum=73.00).

While there was a statistically significant difference between adolescents' age, obesity status, father's education level, mother's education level, and income level and their mean scores from the HLBS, NEAS, APAS, and WEL-SF ($p < 0.05$); gender was statistically significantly correlated only with the mean NEAS and APAS scores at a high level ($p < 0.05$, Table 1). The Bonferroni-corrected Mann–Whitney U test was used to identify which of the variables of obesity status, father's education level, mother's education level, and income status were associated with the differences in measurements. The results of the test showed that the differences were related to the following characteristics: underweight(<15th percentile); fathers with high school and undergraduate degree; mothers with high school and undergraduate degree; low economic status.

As seen in the regression analysis, healthy lifestyle beliefs and sociodemographic variables were significant predictors of nutrition and exercise attitudes, physical activity attitudes, and weight-related self-efficacy ($p < 0.001$). Healthy lifestyle beliefs and sociodemographic variables explained 96.3% of adolescents' nutrition and exercise attitudes, 93.6% of physical activity attitudes, and 96.5% of weight-related self-efficacy levels ($p < 0.001$, Table 2).

4. Discussion

The implementation of healthy lifestyle behaviors requires a complex interaction of various determining factors. Healthy lifestyle beliefs have an important place in the formation of healthy lifestyle behaviors. It is emphasized that multicomponent behavioral changes, such as physical activity, healthy diet, weight-related self-efficacy, protection from diseases, and living a healthy life, are affected by healthy lifestyle beliefs [16]. According to the current literature, healthy lifestyle beliefs and nutrition and exercise behaviors, attitudes toward physical activity, and weight-related self-efficacy have been investigated as separate variables in adolescents [5,15,20,32,33], but to the best of our knowledge, this study is the first to examine the three variables together.

Healthy lifestyle beliefs and sociodemographic variables explained 96.3% of adolescents' nutrition and exercise attitudes, 93.6% of physical activity attitudes, and 96.5% of weight-related self-efficacy levels. Also, healthy lifestyle beliefs explained 85.4% of the adolescents' nutrition and exercise attitudes, 77.9% of physical activity attitudes, and 89.9% of weight-related self-efficacy levels. When sociodemographic variables were excluded from the model, a small variance was observed in the explained variance. The effects of sociodemographic variables on nutrition and exercise attitudes, attitudes toward physical activity, and weight-related self-efficacy have been examined separately in studies, and different results have been obtained. Some studies have shown that sociodemographic variables are associated with nutrition and exercise behaviors, attitudes toward physical activity, and weight-related self-efficacy [33–36]. In the literature, female adolescents are reported to be a vulnerable group for the development of overweight. Therefore, it should be taken into consideration that gender may be a risk factor for some metabolic disorders such as obesity and unhealthy lifestyle behaviors [37]. Another study emphasized that obese children have lower levels of healthy lifestyle behaviors [38]. In addition, it is emphasized in different studies that socioeconomic determinants such as income level have an effect on nutrition and activity attitudes [39,40]. The results of this study were found to be consistent with the literature.

When the findings were examined with the models in our study, Model 1 showed that the increase in healthy lifestyle beliefs positively increased the nutrition and exercise attitudes of adolescents ($p < 0.05$, Table 2). Nutrition behaviors are one of the important determinants of healthy lifestyle beliefs and have an important place in the lives of adolescents. Healthy eating is very important for a person to feel active throughout the day, to consume the nutrients needed for growth and development, and to lead a healthy life [41]. Many studies have shown a positive relationship between the formation of healthy eating behaviors and an individual's attitudes and beliefs [3,5]. Adolescents with a high belief in leading a healthy life are more successful in demonstrating healthy lifestyle behaviors. One of the most important components of healthy lifestyle behaviors is nutrition. Some studies have reported that adolescents who make an effort to maintain a healthy life develop positive attitudes toward healthy and balanced nutrition and pay attention to nutrition-related behaviors [33,34]. The literature supports the findings from Model 1.

Model 2 indicated that the increase in healthy lifestyle beliefs increased the physical activity attitudes of adolescents positively

Table 1
The effects of sociodemographic characteristics of adolescents on mean HLBS, NEBS, APAS, and WEL-SF scores.

		n	%	HLBS Mean ± SD	NEAS Mean ± SD	APAS Mean ± SD	WEL-SF Mean ± SD
Age	13	11	2.5	47.54 ± 12.72	36.45 ± 10.86	106.00 ± 28.78	35.72 ± 16.26
	14	66	14.8	35.12 ± 12.59	29.21 ± 9.56	99.66 ± 27.69	28.21 ± 9.56
	15	118	26.5	33.10 ± 6.02	23.50 ± 5.50	90.46 ± 24.49	16.94 ± 3.01
	16	56	12.6	55.69 ± 8.95	30.68 ± 8.68	89.68 ± 22.69	39.44 ± 5.50
	17	108	24.3	65.57 ± 9.72	51.61 ± 9.41	121.87 ± 20.63	61.44 ± 14.39
	18	86	19.3	73.43 ± 1.50	58.09 ± 2.00	155.68 ± 15.07	67.24 ± 5.52
	Test value			*F* = 401.884	*F* = 427.332	*F* = 326.346	*F* = 466.497
	[b]p			*p* = 0.000	*p* = 0.000	*p* = 0.000	*p* = 0.000
Gender	Girls	206	46.3	52.08 ± 19.19	42.65 ± 15.20	115.71 ± 39.66	44.10 ± 19.44
	Boys	239	53.7	50.63 ± 17.39	37.95 ± 14.47	97.61 ± 30.50	40.99 ± 24.14
	Test value			*t* = 0.837	*t* = 3.322	*t* = 5.332	*t* = 1.479
	[b]p			*p* = 0.403	*p* = 0.001	*p* = 0.000	*p* = 0.140
Declared Obesity Status	Weak	36	8.1	69.02 ± 18.30	57.20 ± 15.15	137.60 ± 33.06	72.03 ± 19.08
	Normal weight	289	64.9	56.62 ± 17.14	44.92 ± 13.12	119.57 ± 31.21	49.35 ± 17.94
	Overweight	120	27.0	33.20 ± 6.02	23.51 ± 8.50	64.00 ± 15.10	16.90 ± 3.01
	Test value			*F* = 146.039	*F* = 222.581	*F* = 235.815	*F* = 290.949
	[a]p			*p* = 0.000	*p* = 0.000	*p* = 0.000	*p* = 0.000
Father's educational level	Literate	58	13.0	27.10 ± 8.50	23.12 ± 3.60	64.21 ± 10.22	20.00 ± 10.62
	Primary school	35	7.9	23.62 ± 7.32	20.08 ± 2.41	73.03 ± 13.18	19.06 ± 9.57
	Middle school	133	29.9	45.30 ± 6.19	32.12 ± 7.51	80.24 ± 15.24	28.24 ± 13.40
	High school	148	33.3	62.77 ± 12.64	50.09 ± 9.57	138.52 ± 25.57	55.33 ± 14.70
	University and higher	71	16.0	72.45 ± 3.52	58.47 ± 1.51	137.02 ± 24.26	72.00 ± 19.82
	Test value			*F* = 442.366	*F* = 409.962	*F* = 393.285	*F* = 320.651
	[a]p			*p* = 0.000	*p* = 0.000	*p* = 0.000	*p* = 0.000
Mother's educational level	Literate	58	13.0	27.18 ± 8.50	23.32 ± 3.60	64.11 ± 10.22	20.06 ± 10.62
	Primary school	35	7.9	23.02 ± 7.30	20.02 ± 2.41	73.00 ± 13.24	19.00 ± 9.57
	Middle school	127	28.5	45.18 ± 6.30	31.67 ± 7.52	79.55 ± 15.25	27.93 ± 13.68
	High school	190	42.7	63.48 ± 11.75	51.05 ± 9.13	136.85 ± 23.79	57.84 ± 15.08
	University and higher	35		76.00 ± 3.63	60.00 ± 1.97	137.02 ± 24.32	72.00 ± 19.60
	Test value			*F* = 412.314	*F* = 368.772	*F* = 358.020	*F* = 249.156
	[a]p			*p* = 0.000	*p* = 0.000	*p* = 0.000	*p* = 0.000
Economic level	High	58	13.0	27.02 ± 1.96	23.03 ± 8.90	64. 00 ± 10.69	20.06 ± 1.96
	Middle	77	17.3	50.59 ± 2.51	39.06 ± 10.69	110.33 ± 17.09	40.07 ± 2.01
	Low	275	61.8	53.49 ± 18.15	41.52 ± 15.77	109.69 ± 39.03	44.06 ± 23.87
	Very low	35	7.9	76.00 ± 20.23	60.00 ± 16.10	137.00 ± 39.69	72.00 ± 24.62
	Test value			*F* = 92.244	*F* = 67.851	*F* = 47.257	*F* = 57.264
	[a]p			*p* = 0.000	*p* = 0.000	*p* = 0.000	*p* = 0.000

SD: standard deviation; HLBS: Healthy Lifestyle Beliefs Scale; NEAS: Nutrition Exercise Attitude Scale; APAS: Attitudes Toward Physical Activity Scale; WEL-SF: Weight Efficacy Lifestyle Questionnaire Short-Form.
[a] ANOVA test
[b] t-test.

Table 2
Association of adolescents' healthy lifestyle beliefs and sociodemographic variables with nutrition exercise behaviors, attitudes toward physical activity, and weight-related self-efficacy lifestyles.

	Model 1				Model 2				Model 3			
Variable	NEAS				APAS				WELL-SF			
	B	SE	β	p	B	SE	β	p	B	SE	β	p
HLBS	0.726	0.012	0.884	0.000	1.152	0.055	0.581	0.000	0.895	0.035	0.721	0.000
Age[a]	1.881	0.103	0.521	0.000	1.050	0.753	0.042	0.164	5.916	0.339	0.079	0.000
Gender[b]	4.459	0.289	0.149	0.000	2.336	1.321	0.170	0.000	0.327	0.840	0.017	0.007
Declared obesity status[c]	4.980	0.418	0.091	0.000	3.608	1.910	0.027	0.040	3.700	1.215	0.132	0.000
Father's educational level[d]	3.444	0.335	0.115	0.000	4.868	1.527	0.344	0.000	5.264	0.971	0.119	0.000
Mother's educational level[d]	0.724	0.441	0.024	0.010	3.398	2.014	0.144	0.000	4.180	1.281	0.095	0.001
Economical level[e]	−1.561	0.432	−0.028	0.000	−4.004	1.970	−0.179	0.000	−4.249	1.253	0.052	0.001
R	0.986				0.967				0.983			
R^2	0.963				0.936				0.965			
F	889.265				909.923				969.568			
p	0.000				0.000				0.000			
Durbin–Watson 1.610 (1.5–2.5)					1.520				1.730			

B: unstandardized beta; SE: standard error; β: standardized beta; R: correlation; R^2: correlation coefficient (explained variance ratio); F: model statistics. HLBS: Healthy Lifestyle Beliefs Scale; NEAS: Nutrition Exercise Attitude Scale; APAS: Attitudes Toward Physical Activity Scale; WEL-SF: Weight Efficacy Lifestyle Questionnaire Short-Form.
[a] Participants aged 16, 17, and 18 years were coded as 1 and those aged 13, 14, and 15 years were coded as 0. [b]Girls were coded as 1 and boys were coded as 0. [c]Weak status (<15th percentile) was coded as 1 and the others were coded as 0. [d]High school and university degree were coded as 1 and the other degrees were coded as 0. [e]Very low income level was coded as 1 and the other levels were coded as 0.a.

($p < 0.05$, Table 2). Physical activity in adolescence is very important for a healthy life. Children and adolescents who are physically more active can have stronger cardiovascular systems and muscles and experience fewer psychosocial problems throughout their lives [42]. Therefore, attitudes toward physical activity have an important place in creating a healthy lifestyle. It is emphasized in the literature that there is a positive relationship between healthy lifestyle beliefs and physical activity attitudes and that people who feel competent in maintaining a healthy life develop positive attitudes toward physical activity [43]. Many studies also emphasize that in addition to health lifestyle beliefs, some sociodemographic variables such as age, gender, and the economic status of adolescents and their families affect attitudes toward physical activity [39,40]. Therefore, the literature supports the findings from Model 2.

Model 3 of our study showed that the increase in healthy lifestyle beliefs increased the self-efficacy of adolescents in preventing binge-eating behaviors ($p < 0.05$, Table 2). Adolescence is a complex developmental period that covers the transition from childhood to adulthood, and during this period, many physical, psychological, and social changes are observed in the adolescent [44]. During this period, the adolescent develops a healthy or unhealthy set of life behaviors. Various problems such as eating disorders are frequently seen in adolescents who are likely to develop unhealthy living behaviors [45]. For this reason, forming healthy lifestyle beliefs in a positive way is important in preventing many problems that can be seen in this period. Self-efficacy plays an important role in the development of healthy/unhealthy behaviors in adolescence. Self-efficacy is defined as the perception of the capacity of the person to carry out and organize the necessary action to overcome difficulties [46]. The better the levels of self-efficacy, the better their positive thinking and coping skills. There is a linear relationship between self-efficacy and being willing to control weight and paying attention to nutritional principles [47]. Studies highlight the findings that people with strong beliefs in a healthy lifestyle pay attention to nutrition behaviors and the foods they consume, attach importance to weight control, and have high self-efficacy [3,4]. The findings presented in Model 3 are similar to those in the literature. In addition, with the implementation of social isolation norms due to the COVID-19 pandemic, adolescents were forced to stay indoors and this situation caused great stress and uncertainty in their lives. This may have led adolescents to overeat and made them more vulnerable to a sedentary lifestyle. As a result, it is thought that willpower decreases and weight control self-efficacy levels are affected in adolescents.

4.1. Limitations

Despite the many strengths of this study, it has some limitations due to the use of convenience sampling, which may affect the generalizability of the results. The second limitation is that data were collected from the participants during the COVID-19 pandemic process. Another limitation is that the study was conducted in high schools located in Turkey, which limits the generalizability of the findings to different populations. Although this study found that adolescents' healthy lifestyle beliefs had a significant effect on their attitudes toward physical activity, on nutrition and exercise attitudes, and on weight-related self-efficacy, it should be kept in mind that these variables are as influential as familial, environmental, cultural, and social factors. A further limitation is that all the responses are declarative, and the health beliefs and the declared physical behavior are likely to be associated.

5. Conclusion

This study is one of the few works examining the effects of healthy lifestyle beliefs of adolescents in Turkey on their attitudes toward physical activity, on nutrition and exercise attitudes, and on weight-related self-efficacy. The results of the study show that healthy lifestyle beliefs are an important predictor of adolescents' nutrition and exercise attitudes, of physical activity attitudes, and of weight-related self-efficacy.

School nurses are healthcare professionals who play an important role in developing and maintaining healthy lifestyle behaviors of adolescents. They should be aware of the possible effects of healthy lifestyle beliefs on nutrition attitudes, physical activity attitudes, and weight-related self-efficacy by considering the outcomes of this study. In addition, teaching adolescents about the relationship between these variables is clearly an important initiative in developing and maintaining healthy lifestyle behaviors. Therefore, these variables should be addressed in nursing care planning. We recommend that school nurses should conduct screening programs with valid and reliable tools to determine the healthy lifestyle beliefs and the nutrition and physical activity attitudes of adolescents, to design programs to improve these variables, and to determine the effectiveness of the programs.

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Declaration of Competing Interest

None.

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.arcped.2021.11.001.

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