



## Research Article

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# ASSESSMENT OF THE ASSOCIATION BETWEEN INTERNET ADDICTION, E-HEALTHY DIET LITERACY, AND BODY MASS INDEX AMONG ADULTS AGED 18-65 YEARS ATTENDING A UNIVERSITY HOSPITAL FAMILY MEDICINE OUTPATIENT CLINIC

 **Sümevra Yazar** <sup>1</sup>,  **Pınar Döner Güner** <sup>2</sup>

<sup>1</sup>Esenler District Health Directorate, Family Health Center No. 8, İstanbul, Türkiye

<sup>2</sup>Department of Family Medicine, Hatay Mustafa Kemal University, Hatay, Türkiye

### Correspondence:

Sümevra Yazar (e-mail: [sumeyrayzr01@gmail.com](mailto:sumeyrayzr01@gmail.com))

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## Abstract

**Objectives:** This study aimed to examine the association between internet addiction, e-healthy diet literacy (e-HDL), and body mass index (BMI) in adults aged 18–65 years.

**Materials and Methods:** A cross-sectional study was conducted with 378 patients attending a university hospital Family Medicine Outpatient Clinic. Data were collected using a sociodemographic questionnaire, the Internet Addiction Scale (IAS), and the e-Healthy Diet Literacy Questionnaire (e-HDLQ). Statistical analyses were performed using IBM SPSS 22.0.

**Results:** Participants were 52.9% female and 47.1% male, with a mean age of  $35.4 \pm 12.2$  years. BMI was positively correlated with age ( $r=0.410$ ;  $p<0.001$ ). No significant association was found between IAS scores and BMI ( $p=0.180$ ). e-HDLQ scores were significantly higher in overweight individuals than in obese individuals ( $p=0.004$ ). Participants who consumed snacks and main meals while using technological devices had significantly higher IAS scores ( $p<0.001$ ). Snack consumption during device use was most frequent in the overweight group ( $p=0.001$ ).

**Conclusion:** Internet addiction was not directly associated with BMI; however, digital behaviours were linked to eating patterns and screen-based meal consumption. Enhancing e-healthy diet literacy and promoting balanced digital habits may support healthier weight management.

**Keywords:** Internet, internet addiction, healthy nutrition, nutrition literacy, body mass index.

## Introduction

The internet facilitates communication and accelerates access to information; however, uncontrolled use has been associated with physical and psychosocial problems.<sup>1</sup> Prolonged use may result in sedentary behaviour, unbalanced diets, and impaired attention, thereby increasing the risk of obesity, particularly among young people.<sup>2,3</sup>

Internet addiction is defined as increased online activity, restlessness in the absence of access, and disruption of daily functioning.<sup>3</sup> In Türkiye, more than 70% of the population actively uses the internet and social media, while the prevalence of internet addiction has been reported as 6–14%.<sup>4,5</sup>

Nutrition literacy refers to the ability to obtain, evaluate, and apply information about healthy nutrition.<sup>6</sup> The high likelihood of encountering misleading content in digital environments has introduced the concept of “e-nutrition literacy”.<sup>7</sup> Insufficient literacy has been associated with unhealthy dietary patterns and obesity.<sup>8</sup>

Obesity, a preventable yet increasing global public health issue, is most commonly assessed by body mass index (BMI).<sup>9</sup> According to the World Health Organisation, 1.9 billion people are overweight, and 650 million are obese.<sup>10</sup> In Türkiye, obesity prevalence is also rising, with major contributors including technological dependence, physical inactivity, and unhealthy diets.<sup>11</sup>

Despite extensive research, studies simultaneously examining internet addiction, nutrition literacy, and obesity are limited. This study aimed to evaluate the relationship between internet addiction, e-nutrition literacy, and BMI among adults aged 18–65 years.

## Materials and Methods

### Study Design and Ethical Approval

This descriptive cross-sectional study was conducted among adults aged 18–65 years attending the Family Medicine Outpatient Clinic of Hatay Mustafa Kemal University Hospital to evaluate the relationship between internet addiction, e-nutrition literacy, and BMI. Ethical approval was obtained from the Non-Interventional Research Ethics Committee of Hatay Mustafa Kemal University (decision no: 12/36, 20.11.2024).

### Sample and Participants

The study population included residents of Antakya and Defne districts (Hatay) aged 18–65 years. According to 2022 data from the Turkish Statistical Institute, this group comprised 383,087 individuals. Assuming 20%

prevalence of internet addiction and 95% confidence level, the required sample size was calculated as 246. With an additional 10% margin for attrition, the target was 271. Data were collected from a total of 378 participants who met the inclusion criteria.

Inclusion criteria: age 18–65, literacy, voluntary participation, and ability to read and understand the questionnaire.

Exclusion criteria: <18 or >65 years of age, illiteracy, or incomplete questionnaires.

### **Data Collection**

Survey data were collected face-to-face and online (via QR code) at the Family Medicine Outpatient Clinic of Hatay Mustafa Kemal University Hospital. All measurements were conducted in person: height with a wall-mounted tape and weight with a digital scale, with participants barefoot and upright.

Instruments: a 29-item sociodemographic questionnaire, the Internet Addiction Scale (IAS), and the e-Healthy Diet Literacy Questionnaire (e-HDLQ). Participants were verbally informed and provided written consent.

Internet Addiction Scale (IAS): Developed by Hahn and Jerusalem and adapted into Turkish by Şahin and Korkmaz. The 19-item Likert-type scale yields a total score of 19–95; higher scores indicate greater addiction. It includes three subscales: loss of control, desire to remain online, and impairment of social relations. Cronbach's alpha = 0.858.<sup>12</sup>

e-Healthy Diet Literacy Questionnaire (e-HDLQ): Developed by Van Duong et al. (2020) and adapted into Turkish by Onbaşı and Türker. The 15-item scale includes five subdimensions: access, understanding, evaluation, application, and digital competence. The maximum score is 71, with higher scores indicating greater literacy. Cronbach's alpha = 0.77.<sup>13</sup>

### **Statistical Analysis**

Data were analysed using IBM SPSS Statistics 25.0. Descriptive statistics included mean, standard deviation, median (Q1–Q3), frequency, and percentage. Continuous variables were compared using t-test, Mann-Whitney U, ANOVA, or Kruskal-Wallis tests, with Tamhane or Bonferroni-corrected post-hoc tests as appropriate. Relationships between continuous variables were assessed with Pearson correlation, and categorical variables with chi-square tests. Statistical significance was set at  $p < 0.05$ .

## Results

A total of 378 participants were included, of whom 52.9% (n=200) were female, and 47.1% (n=178) were male. Their ages ranged from 18 to 65 years, with a mean of  $35.4 \pm 12.2$ .

Sociodemographic characteristics showed that 52.4% (n=198) were single, 69.8% (n=264) were university graduates, 63.0% (n=238) were employed, and 47.6% (n=180) reported income exceeding expenses. Chronic disease was present in 22.2% (n=84).

Regarding lifestyle, 41.5% (n=157) were smokers and 35.7% (n=135) consumed alcohol. More than half (50.3%, n=190) reported no physical activity. In addition, 71.7% (n=271) stated that they usually slept at night and woke up in the morning, indicating a regular sleep routine.

According to BMI categories, 47.4% (n=179) were normal weight, 38.6% (n=146) overweight, and 14.0% (n=53) obese (Table 1).

Dietary habits showed that 57.9% (n=219) reported having a balanced diet, and 66.1% (n=250) considered their nutrition knowledge sufficient. Eating behaviours in front of technological devices revealed that 45.0% (n=170) consumed only snacks, while 29.9% (n=113) consumed both snacks and main meals. Trusted nutrition information sources were identified as physicians/dietitians (37.6%), social media/internet/television (35.4%), and family/friends (27.0%).

Social media use was reported by 91.8% (n=347). Daily internet use was reported by 49.2% (n=186), and 9.3% (n=35) used it  $\geq 8$  hours. Nearly half (44.4%, n=168) searched specifically for nutrition-related content, and 66.1% (n=250) were interested in such posts (Table 2).

Across BMI groups, significant differences were observed for age, sex, education, chronic disease, physical activity, trusted nutrition sources, eating behaviours in front of devices, and e-HDLQ scores. Overweight and obese participants were older ( $p < 0.001$ ), more often male ( $p < 0.001$ ), and more frequently primary/secondary school graduates ( $p = 0.007$ ). Chronic disease was more prevalent in overweight and obese groups compared with normal weight, and most common in the obese group ( $p < 0.001$ ). Participants engaging in  $\geq 5$  days of weekly physical activity were more common among overweight and obese individuals ( $p = 0.008$ ).

**Table 1.** Sociodemographic characteristics of the participants

Variables	n=378
Age (years), Mean $\pm$ SD	35.4 $\pm$ 12.2
Gender, n (%)	
Male	178 (47.1)
Female	200 (52.9)
Marital Status, n (%)	
Married	180 (47.6)
Single	198 (52.4)
Educational Status, n (%)	
Primary/Secondary Education	114 (30.2)
University	264 (69.8)
Employment Status, n (%)	
Employed	238 (63.0)
Unemployed	140 (37.0)
Income Status, n (%)	
Income is less than expenses	122 (32.3)
Income equal to expenses	76 (20.1)
Income greater than expenses	180 (47.6)
BMI, n (%)	
Normal	179 (47.4)
Overweight	146 (38.6)
Obese	53 (14.0)
Chronic Disease Status, n (%)	
Yes	84 (22.2)
No	294 (77.8)
Smoking, n (%)	
Yes	157 (41.5)
No	221 (58.5)
Alcohol Use, n (%)	
Yes	135 (35.7)
No	243 (64.3)
Frequency of Physical Activity, n (%)	
None	190 (50.3)
A few days per week	93 (24.6)
$\geq$ 5 days per week	95 (25.1)
Sleep Pattern, n (%)	
Spending time on games/TV at night and going to bed late.	107 (28.3)
Sleeping at night and waking up in the morning	271 (71.7)

n: number, BMI: Body Mass Index

**Table 2.** Distribution of participants' nutrition knowledge and digital media use habits

<b>Variables</b>	<b>n (%)</b>
<b>Do you think you follow an adequate and balanced diet?</b>	
Yes	219 (57.9)
No	159 (42.1)
<b>Do you think your level of nutrition knowledge is sufficient?</b>	
Yes	250 (66.1)
No	128 (33.9)
<b>Eating habits in front of technological devices (computer, tablet, phone, etc.)</b>	
I do not eat in front of such devices	95 (25.1)
I only consume snacks in front of such devices	170 (45.0)
I consume all my meals, including main meals, in front of such devices	113 (29.9)
<b>Trusted sources of nutrition information</b>	
Social media / Internet / Television	134 (35.4)
Friends / Family / Acquaintances	102 (27.0)
Doctor / Dietitian	142 (37.6)
<b>Use of social media, n (%)</b>	
Yes	347 (91.8)
No	31 (8.2)
<b>Daily internet usage time, n (%)</b>	
Not every day	186 (49.2)
1-3 hours	116 (30.7)
4-5 hours	26 (6.9)
6-8 hours	15 (4.0)
≥8 hours	35 (9.3)
<b>Do you specifically search for nutrition-related posts while browsing the internet? , n (%)</b>	
Yes	168 (44.4)
No	210 (55.6)
<b>Do nutrition-related posts you encounter on the internet and/or social media attract your attention? , n (%)</b>	
Yes	250 (66.1)
No	128 (33.9)

n = Number

Trusted sources of nutrition information differed significantly ( $p=0.014$ ). Post-hoc analysis showed that fewer obese participants relied on social media/internet/television compared with the other groups. Eating behaviours also differed ( $p=0.001$ ): snack consumption in front of devices was highest in the overweight group, while the obese group showed higher rates than normal-weight individuals.

e-HDLQ scores were significantly higher among overweight participants compared with obese ( $p=0.004$ ), whereas IAS scores did not differ across BMI categories ( $p=0.180$ ) (Table 3).

By sociodemographic factors, only eating behaviour in front of devices was associated with IAS. Post-hoc analysis indicated that participants consuming only snacks or both snacks and main meals had higher IAS scores than those who did not eat while online ( $p<0.001$ ). No significant differences were observed in e-HDLQ scores across these groups (Table 4).

Correlation analyses showed a positive relationship between BMI and age ( $r=0.410$ ,  $p<0.001$ ). Weak, non-significant correlations were found between BMI and IAS ( $r=0.049$ ,  $p=0.346$ ) and between BMI and e-HDLQ ( $r=-0.011$ ,  $p=0.826$ ) (Table 5).

Physical activity levels varied significantly by age, marital status, parenthood, education, income, chronic disease, dietary perception, nutrition knowledge, and internet use. Participants active  $\geq 5$  days/week were older ( $p=0.046$ ) and more often single, while those active a few days/week were more often married ( $p=0.002$ ). Having children was associated with higher rates of  $\geq 5$  days of activity ( $p=0.009$ ).

Higher rates of  $\geq 5$  days/week activity were also reported among those with lower education ( $p=0.002$ ), lower income ( $p=0.009$ ), and chronic disease ( $p=0.006$ ). Participants active a few days/week more frequently reported balanced diets ( $p<0.001$ ) and sufficient nutrition knowledge ( $p=0.025$ ). Daily internet use  $\geq 8$  hours was significantly more frequent among those active  $\geq 5$  days/week ( $p=0.002$ ) (Table 6).

IAS scores were significantly higher in participants with children compared with those without ( $p=0.002$ ), whereas no significant differences were observed in e-HDLQ scores by parental status ( $p=0.591$ ).

**Table 3.** Comparison of participants' basic variables according to BMI groups

Variables	BMI			p-value
	Normal	Overweight	Obese	
Age, Median (Q1-Q3)	26 (24 - 36)	38 (28 - 52)	39 (30 - 48)	<0.001 <sup>a,b</sup>
Sex, n (%)	n (%)	n (%)	n (%)	
Male	66 (36.9)	83 (56.8)	29 (54.7)	<0.001 <sup>a,b</sup>
Female	113 (63.1)	63 (43.2)	24 (45.3)	
<b>Education</b>				
Primary/Secondary	40 (22.3)	55 (37.7)	19 (35.8)	0.007 <sup>a,b</sup>
University	139 (77.7)	91 (62.3)	34 (64.2)	
<b>Employment Status</b>				
Employed	116 (64.8)	92 (63.0)	30 (56.6)	0.554
Unemployed	63 (35.2)	54 (37.0)	23 (43.4)	
<b>Chronic Disease</b>				
Yes	23 (12.8)	41 (28.1)	20 (37.7)	<0.001 <sup>a,b,c</sup>
No	156 (87.2)	105 (71.9)	33 (62.3)	
<b>Physical Activity Frequency</b>				
None	91 (50.8)	72 (49.3)	27 (50.9)	0.008 <sup>a,b</sup>
A few days per week	56 (31.3)	29 (19.9)	8 (15.1)	
≥5 days per week	32 (17.9)	45 (30.8)	18 (34.0)	
<b>Sleep Pattern</b>				
Spending time on games/TV at night and going to bed late	47 (26.3)	42 (28.8)	18 (34.0)	0.543
Sleeping at night, waking up in the morning	132 (73.7)	104 (71.2)	35 (66.0)	
<b>Trusted Sources of Nutrition Information</b>				
Social media / Internet / Television	75 (41.9)	50 (34.2)	9 (17.0)	0.014 <sup>b,c</sup>
Friends / Family / Acquaintances	44 (24.6)	37 (25.3)	21 (39.6)	
Doctor / Dietitian	60 (33.5)	59 (40.4)	23 (43.4)	
<b>Social Media Use</b>				
Yes	170 (95.0)	131 (89.7)	46 (86.8)	0.082
No	9 (5.0)	15 (10.3)	7 (13.2)	
<b>Eating habits in front of technological devices (computer, tablet, phone, etc.)</b>				
I do not eat in front of such devices	51 (28.5)	29 (19.9)	15 (28.3)	
I only consume snacks in front of such devices	63 (35.2)	85 (58.2)	22 (41.5)	0.001 <sup>a,b,c</sup>
I consume all my meals, including main meals, in front of such devices	65 (36.3)	32 (21.9)	16 (30.2)	
IAS total score, Median (Q1-Q3)	70 (55 - 76)	73 (59 - 76)	69 (55 - 76)	0.180
e-HDLQ total score, Mean ± SD	44.3 ± 7.2	45.7 ± 6.3	42.0 ± 8.2	0.004 <sup>c</sup>

n = Number, SD = Standard Deviation, BMI = Body Mass Index, e-HDLQ = e-Healthy Diet Literacy Questionnaire.

<sup>a</sup>: Normal vs Overweight, <sup>b</sup>: Normal vs Obese, <sup>c</sup>: Overweight vs Obese. p-values were obtained using chi-square or Kruskal-Wallis tests (post-hoc: Tamhane or Bonferroni-corrected Mann-Whitney U). IAS scores ranged from 19 to 94, with a mean of 66.5 ± 15.4. e-HDLQ scores ranged from 23 to 62, with a mean of 44.5 ± 7.1.

**Table 4.** Comparison of IAS and e-HDLQ scores by sociodemographic characteristics

Variables	IAS Median	Mean±SD (Q1-Q3)	p-value	e-HDLQ Median (Q1-Q3)	p-value
<b>Sex</b>					
Male	65.4 ± 16.0		0.199	45.1 ± 6.9	0.117
Female	67.4 ± 14.8			44.0 ± 7.2	
<b>Employment status</b>					
Employed	66.8 ± 15.9		0.537	44.5 ± 7.0	0.979
Unemployed	65.8 ± 14.5			44.5 ± 7.4	
<b>Physical Activity Frequency</b>					
None	65.9 ± 15.5		0.365	44.5 ± 7.3	0.951
A few days per week	65.6 ± 17.2			44.7 ± 6.7	
≥5 days per week	68.4 ± 13.1			44.4 ± 7.2	
<b>Smoking</b>					
Yes	65.7 ± 15.3		0.404	44.6 ± 6.8	0.807
No	67.0 ± 15.5			44.4 ± 7.3	
<b>Alcohol use</b>					
Yes	65.7 ± 16.1		0.452	44.2 ± 7.0	0.596
No	66.9 ± 15.0			44.7 ± 7.2	
<b>Sleep Pattern</b>					
Spending time on games/TV at night and going to bed late	63.9 ± 17.2		0.061	44.2 ± 7.8	0.552
Sleeping at night, waking up in the morning	67.5 ± 14.5			44.6 ± 6.8	
<b>Education</b>					
Primary/Secondary	72.5 (59.0 - 75.0)		0.996	44.4 ± 7.0	0.892
University	70.0 (55.5 - 77.0)			44.5 ± 7.2	
<b>Chronic Disease</b>					
Yes	73.0 (63.5 - 75.0)		0.376	44.3 ± 7.0	0.788
No	70.0 (56.0 - 76.0)			44.6 ± 7.2	
<b>Trusted Sources of Nutrition Information</b>					
Social media / Internet / Television	65.4 ± 16.3		0.611	44.7 ± 6.9	0.156
Friends / Family / Acquaintances	66.8 ± 15.4			44.4 ± 7.3	
Doctor / Dietitian	67.2 ± 14.6			44.4 ± 7.2	
<b>Social Media Use</b>					
Yes	70.0 (56.0 - 76.0)		0.748	44.7 ± 7.2	0.142
No	75.0 (60.0 - 75.0)			42.7 ± 6.2	
<b>Eating habits in front of technological devices (computer, tablet, phone, etc.)</b>					
I do not eat in front of such devices	62.0 (50.0 - 72.0)		<0.001	43.4 ± 6.8	0.228
I only consume snacks in front of such devices	75.0 (65.0 - 77.0)		*.y	44.9 ± 6.9	
I consume all my meals, including main meals, in front of such devices	69.0 (54.0 - 76.0)			44.8 ± 7.6	

p-values were obtained using the Kruskal-Wallis test. For significant variables, pairwise comparisons were performed with the Mann-Whitney U test with Bonferroni correction. \*: Significant difference between those who never ate in front of devices and those who consumed only snacks. †: Significant difference between those who never ate in front of devices and those who consumed all meals, including main meals.

**Table 5.** Evaluation of the relationship between BMI and age, IAS, and e-HDLQ total scores

	Age	IAS Total Score	e-HDLQ Total Score
BMI	r	0.410**	0.049
	p	<0.001	0.826

\*\* r: Correlation coefficient. p-values were obtained using the Pearson correlation test. p < 0.001 indicates statistical significance.

**Table 6.** Comparison of demographic characteristics, dietary habits, and internet use by physical activity level

Variables	Physical Activity			p-value
	None	A few days per week	≥5 days per week	
Age, Median (Q1-Q3)	32 (25 - 43)	29 (24 - 42)	36 (25 -52)	<b>0.046</b>
Sex	<b>n (%)</b>	<b>n (%)</b>	<b>n (%)</b>	
Male	88 (46.3)	46 (49.5)	44 (46.3)	0.870
Female	102 (53.7)	47 (50.5)	51 (53.7)	
Marital status				
Married	93 (48.9)	55 (59.1)	32 (33.7)	<b>0.002</b>
Single	97 (51.1)	38 (40.9)	63 (66.3)	
Having children				
Yes	82 (43.2)	37 (39.8)	57 (60.0)	<b>0.009</b>
No	108 (56.8)	56 (60.2)	38 (40.0)	
Education				
Primary/Secondary	50 (26.3)	22 (23.7)	42 (44.2)	<b>0.002</b>
University	140 (73.7)	71 (76.3)	53 (55.8)	
Employment status				
Employed	125 (65.8)	60 (64.5)	53 (55.8)	0.241
Unemployed	65 (34.2)	33 (35.5)	42 (44.2)	
Income Status				
Income is less than expenses	51 (26.8)	26 (28.0)	45 (47.4)	<b>0.009</b>
Income equal to expenses	39 (20.5)	21 (22.6)	16 (16.8)	
Income greater than expenses	100 (52.6)	46 (49.5)	34 (35.8)	
Chronic Disease				
Yes	46 (24.2)	10 (10.8)	28 (29.5)	<b>0.006</b>
No	144 (75.8)	83 (89.2)	67 (70.5)	
Smoking				
Yes	86 (45.3)	33 (35.5)	38 (40.0)	0.275
No	104 (54.7)	60 (64.5)	57 (60.0)	
Alcohol use				
Yes	78 (41.1)	31 (33.3)	26 (27.4)	0.065
No	112 (58.9)	62 (66.7)	69 (72.6)	
Sleep Pattern				
Spending time on games/TV at night and going to bed late	64 (33.7)	20 (21.5)	23 (24.2)	0.060
Sleeping at night, waking up in the morning	126 (66.3)	73 (78.5)	72 (75.8)	
Do you think you follow an adequate and balanced diet?				
Yes	110 (57.9)	67 (72.0)	42 (44.2)	<b>&lt;0.001</b>
No	80 (42.1)	26 (28.0)	53 (55.8)	
Do you think your level of nutrition knowledge is sufficient?				
Yes	128 (67.4)	69 (74.2)	53 (55.8)	<b>0.025</b>
No	62 (32.6)	24 (25.8)	42 (44.2)	
Dietary habits				
I do not skip meals; I have three meals a day.	52 (27.4)	27 (29.0)	34 (35.8)	0.058
I only have two meals a day.	21 (11.1)	7 (7.5)	17 (17.9)	
I have only one main meal and replace the others with snacks.	117 (61.6)	59 (63.4)	44 (46.3)	
Eating habits in front of technological devices (computer, tablet, phone, etc.)				
I do not eat in front of such devices	49 (25.8)	27 (29.0)	19 (20.0)	0.095
I only consume snacks in front of such devices	77 (40.5)	39 (41.9)	54 (56.8)	

<b>I consume all my meals, including main meals, in front of such devices</b>	64 (33.7)	27 (29.0)	22 (23.2)	
<b>Trusted Sources of Nutrition Information</b>				
<b>Social media / Internet / Television</b>	74 (38.9)	37 (39.8)	23 (24.2)	0,118
<b>Friends / Family / Acquaintances</b>	47 (24.7)	23 (24.7)	32 (33.7)	
<b>Doctor / Dietitian</b>	69 (36.3)	33 (35.5)	40 (42.1)	
<b>Social Media Use</b>				
<b>Yes</b>	177 (93.2)	88 (94.6)	82 (86.3)	0.073
<b>No</b>	13 (6.8)	5 (5.4)	13 (13.7)	
<b>Daily internet usage time</b>				
<b>Not every day</b>	95 (50.0)	44 (47.3)	47 (49.5)	<b>0.002</b>
<b>1-3 hours</b>	60 (31.6)	36 (38.7)	20 (21.1)	
<b>4-5 hours</b>	19 (10.0)	3 (3.2)	4 (4.2)	
<b>6-8 hours</b>	4 (2.1)	4 (4.3)	7 (7.4)	
<b>≥8 hours</b>	12 (6.3)	6 (6.5)	17 (17.9)	

p-values were calculated using Chi-square or Kruskal-Wallis test, with post-hoc analysis performed where appropriate.

## Discussion

This study examined the associations between internet addiction (IAS) and e-healthy diet literacy (e-HDL) scores and BMI, lifestyle factors, dietary habits, and sociodemographic characteristics in adults. To our knowledge, studies evaluating these three variables simultaneously are limited, suggesting that this research may contribute to the existing literature.

With the rapid shift of social interactions toward digital environments in the 21st century, digital platforms have assumed a prominent role in shaping dietary norms. A substantial proportion of food-related content shared on social media consists of unhealthy foods, indicating that repeated exposure to energy-dense products may influence eating behaviours.<sup>14</sup>

The literature suggests that longer social media use is associated with increased unhealthy dietary behaviours. Given the high duration of internet and social media use in Türkiye, this exposure appears widespread at the population level.<sup>4,15</sup> In the present study, the high proportion of active social media users and participants interested in nutrition-related content supports the potential influence of digital environments on nutrition literacy and dietary behaviours. These findings are consistent with previous research.

Previous studies have reported a positive association between age and BMI. Kiadaliri et al. demonstrated that obesity prevalence is lower among younger individuals and increases with advancing age in both men and women.<sup>9</sup> Similarly, in this study, overweight and obese individuals had higher mean ages than normal-weight individuals, and BMI increased with age. The higher prevalence of overweight in middle age may be related

to age-related metabolic decline, reduced physical activity, and lifestyle changes, supporting age as an important risk factor for weight gain.

Gender-based differences in the relationship between e-HDL and BMI have been reported, with men more frequently classified as overweight or pre-obese and women more commonly within the normal BMI range.<sup>4,16</sup> Consistent with these findings, women in our study were predominantly of normal weight, whereas men were more often overweight or obese. Higher body-weight awareness and stronger motivation for weight control among women may partially explain this pattern, whereas more irregular dietary habits and comparatively lower weight-related awareness among men may contribute. These findings highlight gender as a potentially important determinant of dietary behaviours and weight status.

Regarding educational level, overweight and obesity were more prevalent among individuals with primary and secondary education, whereas university graduates were more frequently within the healthy weight range. This finding is consistent with studies indicating that obesity prevalence decreases as educational level increases.<sup>17</sup> Higher education may facilitate access to accurate information on nutrition and physical activity and enhance the ability to translate knowledge into behaviour, thereby supporting healthy weight control.<sup>18</sup>

Although physical activity is generally reported to decline and obesity risk to increase with age<sup>18</sup>, some studies indicate that activity levels may rise again in later life.<sup>19</sup> In this study, individuals engaging in physical activity on  $\geq 5$  days per week had a higher mean age, possibly reflecting increased health awareness and a greater tendency toward lifestyle modification in later years. The relatively high educational level of participants may have further contributed to increased awareness of physical activity and healthy living.

Single individuals were more physically active than married individuals, possibly due to greater flexibility in allocating time to physical activity. In contrast, increased work and family responsibilities among married individuals may contribute to a more sedentary lifestyle.

Interestingly, individuals with children reported higher rates of engaging in physical activity on  $\geq 5$  days per week, differing from studies suggesting that parenthood reduces activity levels.<sup>20</sup> This discrepancy may reflect sociocultural characteristics of the sample and the perception of physical activity as daily-life movement rather than structured exercise. Activities performed with children may also increase overall movement levels among parents.

The relationship between education and physical activity showed partial divergence from the literature.<sup>18</sup> Individuals with lower educational attainment had higher rates of engaging in frequent physical activity, possibly due to employment in physically demanding occupations or the perception of activity as routine

daily movement rather than planned exercise. In addition, the lack of a detailed assessment of activity type and reliance on self-reported data may have limited the accurate reflection of actual activity levels.

Physically active individuals were more frequently concentrated in the lower-income group. Previous studies have reported inconsistent findings regarding the relationship between income, obesity, and physical activity, with some identifying no association between income and BMI.<sup>21</sup> In this study, higher activity levels among lower-income individuals may be explained by occupational physical demands and daily movement patterns rather than structured exercise. Studies evaluating only planned exercise may underestimate total physical activity levels.

Physically active participants were more likely to perceive their diet as adequate and balanced and reported higher perceived nutrition knowledge. This aligns with literature demonstrating a positive association between physical activity and healthy dietary behaviours.<sup>22</sup> Greater health motivation and awareness among active individuals may support both healthier eating behaviours and higher nutrition knowledge.

Chronic disease was identified in 22.2% of participants and was more prevalent among overweight and obese individuals, particularly in the obese group, consistent with the established association between obesity and conditions such as type 2 diabetes and hypertension.<sup>11</sup> However, individuals with chronic disease reported higher rates of frequent physical activity, which may reflect increased health awareness and lifestyle modifications following diagnosis. Medication-related effects on metabolism, appetite, and activity levels may also contribute to this relationship.

The higher prevalence of frequent physical activity among overweight and obese individuals compared with normal-weight individuals is noteworthy. Although increased physical activity is generally expected to reduce BMI, this finding may indicate that individuals with higher BMI have recently increased their activity levels as part of weight control efforts. Previous research has suggested that post-overeating discomfort or increased awareness may motivate greater physical activity.<sup>17</sup>

Health professionals and mass media were the most trusted sources of nutrition information. Obese individuals were less likely to regard social media and the internet as reliable sources, possibly reflecting greater caution toward online nutrition content. The relatively high educational and socioeconomic status of participants may have contributed to greater awareness of misinformation and preference for expert guidance.

From a behavioural perspective, eating in front of technological devices was common and more pronounced among overweight and obese groups. Prolonged screen exposure has been associated with unhealthy food

choices and adverse lifestyle patterns.<sup>3</sup> Eating while using screens may contribute to weight gain through mechanisms such as distraction, impaired portion control, and unintentional increases in energy intake.

No significant association was found between BMI and IAS scores. The literature reports mixed findings, with some studies suggesting that intensive internet use increases the likelihood of overweight or obesity, while others report no association.<sup>23,24</sup> The absence of a relationship in this study suggests that the impact of internet use on weight status may depend on duration, content type, and accompanying lifestyle behaviours.

IAS scores were not significantly associated with gender, employment status, lifestyle factors, education, or chronic disease. Similarly, no association was found between IAS scores and physical activity. However, individuals engaging in physical activity on  $\geq 5$  days per week reported higher rates of  $\geq 8$  hours of daily internet use, indicating that physical activity alone may not limit screen exposure. This finding suggests that internet use behaviour may be influenced by factors beyond physical activity.<sup>23</sup>

While Saldıran reported no effect of physical activity on internet addiction in Türkiye <sup>25</sup>, Khan et al. observed decreased activity with increasing addiction.<sup>26</sup> This inconsistency may reflect conceptual differences between internet use and internet addiction or the possibility that individuals can remain physically active while consuming digital content intensively. Given that most participants were university graduates, internet use may have been primarily education- or work-related. Therefore, physical activity and digital addiction do not necessarily demonstrate an inverse relationship.

Although some studies suggest that smokers may be more prone to internet addiction<sup>2</sup>, others report no association.<sup>27</sup> Similarly, no relationship was found between smoking and IAS scores in this study. While higher internet addiction has been reported among individuals with alcohol or substance dependence <sup>2</sup>, no association was identified here. The lack of a detailed assessment of alcohol dependency may explain this finding.

Participants who consumed both snacks and main meals in front of screens had higher IAS scores, suggesting that an online-oriented lifestyle may reinforce screen-based eating behaviours. Visually oriented platforms have been shown to influence dietary habits, and prolonged screen time has been associated with eating disorders and obesity.<sup>14,28</sup>

Nutrition literacy plays a central role in adopting healthy eating behaviours by enabling access to accurate information and its translation into practice. In this study, e-HDL scores were not significantly associated with gender, employment status, lifestyle factors, or chronic disease. Although some variation in e-HDL scores across BMI groups was observed, differences were not statistically significant, indicating the need for further evaluation using larger samples and diverse measurement approaches. Previous studies have reported

heterogeneous findings, with some identifying a negative correlation between BMI and food literacy<sup>29</sup>, others reporting higher literacy among underweight individuals<sup>8</sup>, and some indicating increased risk among both underweight and overweight adolescents.<sup>30</sup> Such heterogeneity may be attributed to differences in measurement tools, age groups, and cultural contexts. Our findings suggest that beyond knowledge itself, barriers influencing the translation of knowledge into behaviour—such as habits, environmental exposure, and resource constraints—may play a critical role.

### *Limitations*

This study has limitations. It was conducted in a single tertiary hospital in Hatay, restricting generalizability to the wider Turkish population. Furthermore, exercise type and frequency were not assessed in detail, and reliance on self-reported measures may have introduced bias. Future multicenter studies with larger and more diverse samples are warranted to confirm and expand these findings.

In conclusion, this study investigated the relationship between internet addiction, e-HDLQ, and BMI among individuals aged 18–65 years. Internet addiction scores were higher among participants who reported eating in front of devices, particularly those who consumed snacks, a behaviour more common in overweight and obese groups.

A significant relationship was observed between e-HDLQ and BMI, with overweight participants having higher scores than obese participants, suggesting that body weight may be a significant predictor of e-nutrition literacy. The findings indicate that digital habits influence dietary behaviours.

Given the ease of access to both accurate and misleading information in digital environments, health risks may arise. Therefore, monitoring and regulating online health-related content by public health authorities is of great importance. Preventive strategies should focus on evaluating screen time and usage patterns at the individual level, controlling duration of use, and enhancing nutrition literacy.

It is further recommended to implement age- and occupation-specific awareness programs and to provide regular nutrition literacy training in community and family health centres to promote healthier dietary practices.

**Ethical Considerations:** This descriptive cross-sectional study was conducted among adults aged 18–65 years attending the Family Medicine Outpatient Clinic of Hatay Mustafa Kemal University Hospital to evaluate the relationship between internet addiction, e-nutrition literacy, and BMI. Ethical approval was obtained from the Non-Interventional Research Ethics Committee of Hatay Mustafa Kemal University (decision no: 12/36, 20.11.2024).

**Conflict of Interest:** The authors declare no conflict of interest.

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