



# The effect of orthorexia nervosa on food label reading habits among university students

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## Abstract

**Purpose** This observational cross-sectional study aimed to evaluate university students' food label reading habits with and without orthorexia nervosa (ON) tendency.

**Methods** Data were collected online with a questionnaire. The questionnaire form included sociodemographic variables, the ORTO-11 scale, the reading frequency of some components on the food label, and the evaluation of some opinions about the food label. The obtained data were evaluated with SPSS 25.0 statistical package program and GraphPad Prism program.

**Results** A total of 674 university students (mean age:  $21.03 \pm 2.43$  years), 537 women (79.7%) and 137 men (20.3%) were included in the study. It was determined that individuals with ON tendency read some nutrients, content information, serving size, health information, instructions for use, additives and brand more frequently compared to individuals without ON tendency ( $p < 0.05$ ). At the same time, it was determined that individuals with ON tendency were more likely to agree with the idea that reading food labels is important for a healthy diet, compared to individuals with normal eating behavior ( $p < 0.001$ ).

**Conclusion** The study findings show that individuals with ON tendency have a higher habits of reading food labels compared to individuals with normal eating behavior. To reach a decision on this issue and to determine the diagnostic criteria for ON, future studies should be conducted on different groups and samples with higher participation, as well as studies using different screening tools to determine the tendency for ON.

**Level of evidence** V, Cross-sectional descriptive study.

**Keywords** Orthorexia nervosa · Food · Food labeling · Eating behavior

## Introduction

Orthorexia nervosa (ON) is defined as excessive preoccupation with healthy foods characterized by diet quality and health concerns [1]. ON is not separately defined in the Diagnostic and Statistical Manual of Mental Disorders (DSM-V) but researchers previously hypothesized that it could be a subcategory of anorexia nervosa (AN) [1]. However, as studies on ON increased, it began to be considered as a separate eating disorder rather than a subcategory of AN [2, 3].

The current diagnostic criteria for ON are controversial as they are not officially recognized in the DSM guidelines published by the American Psychiatric Association. Therefore, there are no internationally reported diagnostic criteria [3]. First, Bratman and Knight published criteria for the diagnosis of ON in 2000. These criteria include items such as: spending more than three hours a day thinking about and preparing healthy food, the strict follow-up of a specific nutritional program implemented by the individuals themselves and the tendency to compensatory restrictions in case of any nutritional imbalance, the nutritional value of food is more important than eating food [2, 4]. Later, as a result of the studies conducted by Moroze et al. in 2015 [5], the diagnostic criteria of ON were proposed. These criteria also include similar items. These diagnostic criteria are particularly important in that they include specific and distinctive statements such as: avoiding eating unnatural or unhealthy foods; worrying about the impact of food quality and composition on physical, emotional health, or both;

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strict avoidance of foods believed to be “*unhealthy*” by the individual; spending a lot of time buying and preparing food (> 3 h a day) [5]. It is typical for individuals with ON to avoid foods that have been processed with chemicals, artificial ingredients, or significant amounts of fat, salt, sugar, or other undesirable ingredients. An extreme focus on food preparation techniques and materials used in preparation, especially the research of methods used in food production, and extreme meticulousness in the data specified on the food label are the unique features of ON [5].

Food labels are considered an important component of healthy diets and obesity-fighting strategies [6]. Although different food labeling methods are used in various countries, its main purpose is to inform consumers and enable them to make healthier food choices [7]. In the literature, it is reported that reading food labels will be associated with healthier eating habits. However, the sample numbers of the existing studies are low [6, 8–10]. A meta-analysis of intervention studies reported that nutritional labeling significantly reduced consumers' total energy and trans fatty acid intake [11]. Similarly, in another meta-analysis study, a significant relationship was found between the habit of reading food labels and healthy eating habits [6].

Some studies have reported that individuals with ON tendency may differ from those without ON tendency in food selection and may spend a long time choosing healthy food [5, 12, 13]. In a study conducted in Lebanon, individuals with a tendency to ON reported that they looked at the product's ingredients and that the product content affected their choice of food [13]. In another study of fitness participants, individuals with a tendency to ON reported spending too much time preparing meals [12]. A study evaluating the relationship between food choice motives and ON, revealed that food content and price are the main food choice motives [14]. In this case, it was suggested that the nutritional label reading habits of individuals with ON tendency might differ from those with no tendency.

When the relationship between reading food labels and making healthy food choices is known, it was thought that evaluating individuals' food labeling habits would help determine the diagnostic criteria for ON. In this sense, in the cross-sectional observational study, which is the first study in the literature to the best of our knowledge, it is aimed to evaluate the differences between food label reading habits in university students with and without ON tendency.

## Materials and methods

### Study design

This study, which was planned as an observational cross-sectional type, was conducted online with 674 students (537

women:79.7%; 137 men:20.3%) studying at Karabuk University between January and November 2020. The online questionnaire was sent to 1000 students, and 67.4% of the students volunteered to participate in the study and were included.

The study was conducted in accordance with the Principles of the Declaration of Helsinki. The study was initiated after the approval (Decision No:2019/20) by the Ethics Committee of Non-Interventional Clinical Researches of Karabuk University. At the same time, an informed consent form was obtained from the participants.

### Data collection tool

In the general information section of the online questionnaire, there are questions about the age, gender, smoking/alcohol use status of individuals, and diagnosed disease status. In addition, information about the main meal and snack patterns of the individuals was also obtained.

Body weights and heights of individuals were taken by self-report. Body Mass Index (BMI) [body weight (kg)/(height (m)<sup>2</sup>] of the individuals were calculated. The BMI values of the participants were classified into four categories according to WHO classification: underweight (< 18.5 kg/m<sup>2</sup>), normal weight (18.5–24.9 kg/m<sup>2</sup>), overweight (25.0–29.9 kg/m<sup>2</sup>), and obese (≥ 30.0 kg/m<sup>2</sup>) [15].

Following the review of the relevant literature by the researchers, the following three-likert-type questions were developed in the questionnaire about food label reading habits: “Which of the food label information do you read and how often do you read it?” (1 = I never read; 2 = I sometimes read; 3 = I always read) (Figs. 1, 2) and “What is your opinion on the food label?” (1 = disagree; 2 = undecided; 3 = agree) (Table 3). These questions were then scored and analyzed.

### The ORTO-11 Scale

The ORTO test, which was prepared by Donini et al. in 2005, was used to determine the tendency for ON [16]. There are 15 items in the original version of the scale (ORTO-15), but Arusoğlu et al. conducted a Turkish validity and reliability analysis in 2008 and the number of items was reduced to 11. The items include the behavior of individuals in choosing, purchasing, preparing and consuming foods that they consider healthy. The items were developed with the aim of evaluating people both emotionally and rationally. In the scale, individuals are asked to indicate how often they feel as described in the statements. Answers that are thought to be distinctive for orthorexia are given 1 points, and answers that show normal eating behavior tendency are given 4 points. In this direction, low scores indicate ON tendency. In the study, 25 points determined by Arusoğlu et al., who conducted the Turkish validity and reliability studies of the ORTO-11 scale, was used as the cut-off point [17].

## Statistical analysis

Research data were evaluated using SPSS 25.0 statistical package program and GraphPad Prism program. Categorical data are given as numbers ( $n$ ) and percent (%), while quantitative data are given as mean ( $\bar{X}$ ), standard deviation (SD) values. The normality test of the research data was evaluated using the Kolmogorov Smirnov normality test. Depending on whether or not the individuals have ON tendencies, some

general characteristics were evaluated using the Chi-square test for categorical variables and the Mann–Whitney  $U$  test for quantitative variables. Likert-type scoring for the evaluation of the participants' reading status of some values on the food label (1 = I never read; 2 = I sometimes read; 3 = I always read) and the evaluation of their opinions about the food label (1 = disagree; 2 = undecided; 3 = agree). The results were evaluated using Student  $t$  test and Mann–Whitney  $U$  test according to the normality of the data. The results were evaluated within a 95% confidence interval and at the  $p < 0.05$  significance levels.

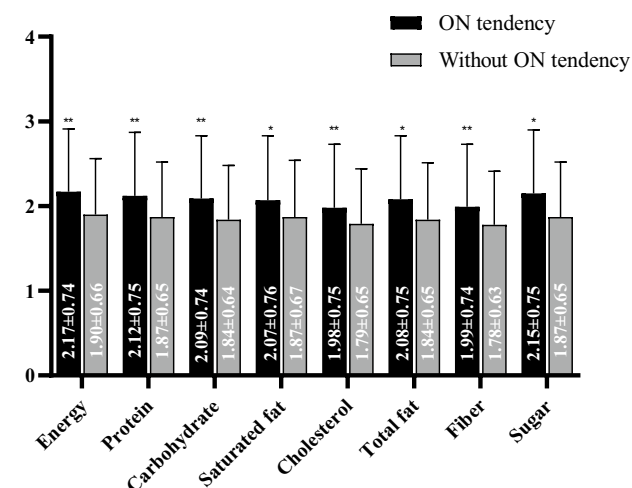


**Fig. 1** Evaluation of participants' reading status of nutritional components on a food label on a 1–3-point scale (1 = I never read; 2 = I sometimes read; 3 = I always read). The (\*) sign indicates the statistical difference ( $*p < 0.05$ ;  $**p < 0.001$ ) in the reading status of each component between ON tendency and without ON tendency participants

## Results

The distribution of some general characteristics of the participants and their evaluation according to their ON tendency are given in Table 1. Accordingly Table 1, 79.7% of the students participating in the study were female and 20.3% were male, with a mean age of  $21.03 \pm 2.43$  years. The average score of the students according to the ORTO-11 test is  $26.69 \pm 3.86$  points. The prevalence of ON tendency, calculated according to the cut-off point of 25, is 27.6%. In addition, 17.2% of individuals with ON tendency and 10.0% of individuals without ON tendency had a diagnosed disease ( $p < 0.05$ ). While smoking and alcohol consumption rates of individuals with ON tendency are 14.0% and 9.1%, respectively, 13.5% of those without ON tendency smoke and 9.8% consume alcohol ( $p > 0.05$ ).

According to BMI grouping, 71.5% of the students are normal weight, while 4.5% are obese. While the mean BMI values of individuals with ON tendency are  $22.29 \pm 3.44$  kg/

**Fig. 2** Evaluation of participants' reading status of certain ingredients on the food label on a 1–3-point scale (1 = I never read; 2 = I sometimes read; 3 = I always read). The (\*) sign indicates the statistical difference ( $*p < 0.05$ ;  $**p < 0.001$ ;  $***p < 0.0001$ ) in the reading status of each component between ON tendency and without ON tendency participants

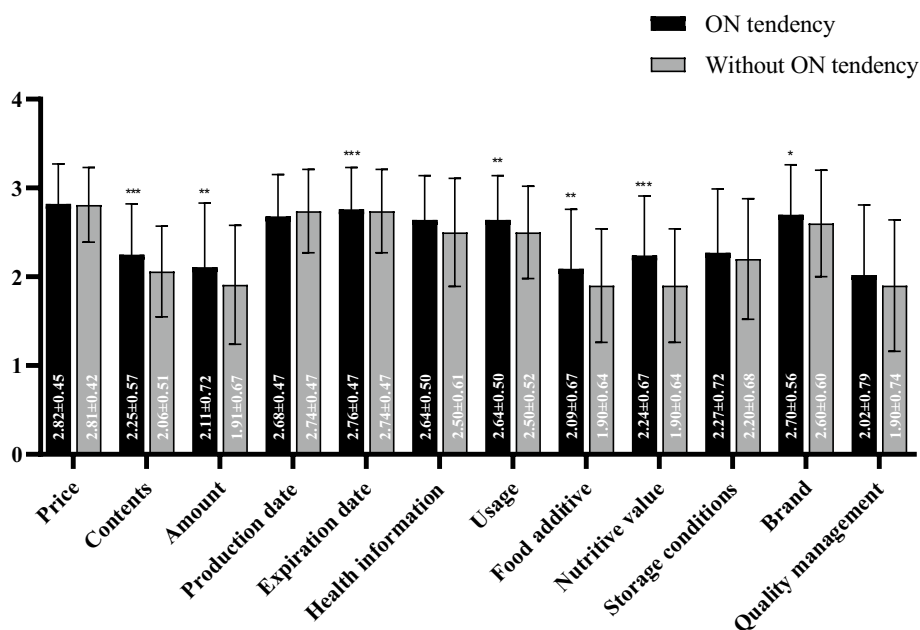


**Table 1** Some general characteristics of the participants

| Characteristics               | ON tendency (n = 186) |      | Without ON tendency (n = 488) |      | Total sample (n = 674) |      | p      |
|-------------------------------|-----------------------|------|-------------------------------|------|------------------------|------|--------|
|                               | n                     | %    | n                             | %    | n                      | %    |        |
| Gender <sup>a</sup>           |                       |      |                               |      |                        |      |        |
| Women                         | 153                   | 82.3 | 384                           | 78.7 | 537                    | 79.7 | 0.344  |
| Men                           | 33                    | 17.7 | 104                           | 21.3 | 137                    | 20.3 |        |
| Age group (year) <sup>a</sup> |                       |      |                               |      |                        |      |        |
| 18–19                         | 50                    | 26.9 | 122                           | 25.0 | 172                    | 11.6 | 0.800  |
| 20–22                         | 101                   | 54.3 | 278                           | 57.0 | 379                    | 56.2 |        |
| > 22–31                       | 35                    | 18.8 | 88                            | 18.0 | 123                    | 18.2 |        |
| Age (year) <sup>b</sup>       |                       |      |                               |      |                        |      |        |
| $\bar{X} \pm SD$              | 21.02 ± 2.31          |      | 21.03 ± 2.48                  |      | 21.03 ± 2.43           |      | 0.699  |
| Chronic disease <sup>a</sup>  |                       |      |                               |      |                        |      |        |
| Yes                           | 32                    | 17.2 | 49                            | 10.0 | 81                     | 12.0 | 0.011* |
| No                            | 154                   | 82.8 | 439                           | 90.0 | 593                    | 88.0 |        |
| Smoking <sup>a</sup>          |                       |      |                               |      |                        |      |        |
| Smoker                        | 26                    | 14.0 | 66                            | 13.5 | 92                     | 13.6 | 0.890  |
| Non-smoker                    | 16                    | 86.0 | 422                           | 86.5 | 582                    | 86.4 |        |
| Alcohol <sup>a</sup>          |                       |      |                               |      |                        |      |        |
| Yes                           | 17                    | 9.1  | 48                            | 9.8  | 65                     | 9.6  | 0.775  |
| No                            | 169                   | 90.9 | 440                           | 90.2 | 609                    | 90.4 |        |

\* $p < 0.05$ <sup>a</sup>Chi-square test<sup>b</sup>Mann–Whitney *U* test were used for numerical data and categorical data between ON tendency and without ON tendency participants, respectively

m<sup>2</sup>, it is  $22.08 \pm 3.73$  kg/m<sup>2</sup> for individuals without ON tendency ( $p = 0.076$ ). When the situation of wanting a change in their body weight was evaluated, it was determined that 79.6% and 71.1% of the individuals with and without ON tendency wanted a change in weight, and this difference was statistically significant ( $p = 0.032$ ). However, there was no significant difference between the two groups in terms of weight change direction ( $p = 0.076$ ) (Table 2).

The evaluation of the participants' reading habits of some nutritional components that can be found on the food label is given in Fig. 1. Accordingly, the habits of reading energy, protein, carbohydrate, saturated fat, cholesterol, total fat, fiber and sugar content on the food label of individuals with ON tendency are statistically significant compared to individuals without ON tendency ( $p < 0.05$  and  $p < 0.001$ ).

The reading habits of some components that can be found on the food label of individuals with and without ON tendencies are given in Fig. 2. It has been observed that individuals with ON tendency have higher reading habits of nutritional content information, amount, health claim, usage pattern, food additives, nutritional values and brand information compared to without ON tendency individuals.

In Table 3, some opinions of the participants about food labels are given. It was determined that individuals with ON tendencies were more likely to agree with all of the other

statements, except for the statement "It is necessary to spend a long time to read food labels", and this difference was statistically significant ( $p < 0.01$  and  $p < 0.001$ ). In addition, the mean total score calculated from the answers given to all of these statements is  $26.34 \pm 3.00$  points in individuals with ON tendency, while it is  $24.43 \pm 3.82$  points in individuals without a tendency, and this difference is statistically significant ( $p < 0.001$ ).

## Discussion

In recent years, many scientific disciplines report an increasing interest in health and healthy eating habits [6]. A healthy diet is important for health, but an obsessive approach to a healthy diet can lead to adverse conditions such as orthorexia [18, 19]. In the study, it was aimed to evaluate the nutritional label reading habits of individuals with and without ON tendency. As a result of this study, it was seen that the frequency of reading some information on the food label and some views on reading the food label were different between those with and without ON tendency.

The relationship between ON and some sociodemographic variables remains unclear. In our study, no significant relationship was found between gender and age and

**Table 2** Some characteristics of the participants

| Characteristics                                    | ON tendency ( <i>n</i> = 186) |      | Without ON tendency ( <i>n</i> = 488) |      | Total sample ( <i>n</i> = 674) |      | <i>p</i> |
|----------------------------------------------------|-------------------------------|------|---------------------------------------|------|--------------------------------|------|----------|
|                                                    | <i>n</i>                      | %    | <i>n</i>                              | %    | <i>n</i>                       | %    |          |
| BMI (kg/m <sup>2</sup> ) <sup>a</sup>              |                               |      |                                       |      |                                |      |          |
| Underweight                                        | 17                            | 9.1  | 56                                    | 11.5 | 73                             | 10.8 | 0.320    |
| Normal                                             | 136                           | 73.1 | 346                                   | 70.9 | 482                            | 71.5 |          |
| Overweight                                         | 28                            | 15.1 | 61                                    | 12.5 | 89                             | 13.2 |          |
| Obese                                              | 5                             | 2.7  | 25                                    | 5.1  | 30                             | 4.5  |          |
| BMI (kg/m <sup>2</sup> ) <sup>b</sup>              |                               |      |                                       |      |                                |      |          |
| $\bar{X} \pm SD$                                   | 22.29 ± 3.44                  |      | 22.08 ± 3.73                          |      | 22.14 ± 3.65                   |      | 0.076    |
| Feeling healthy <sup>a</sup>                       |                               |      |                                       |      |                                |      |          |
| Yes                                                | 147                           | 79.0 | 396                                   | 81.1 | 543                            | 80.6 | 0.548    |
| No                                                 | 39                            | 21.0 | 92                                    | 18.9 | 131                            | 19.4 |          |
| Request a weight change <sup>a</sup>               |                               |      |                                       |      |                                |      |          |
| Yes                                                | 149                           | 80.1 | 348                                   | 71.3 | 497                            | 73.7 | 0.032*   |
| No                                                 | 37                            | 19.9 | 140                                   | 28.7 | 177                            | 26.3 |          |
| Direction of requesting weight change <sup>a</sup> |                               |      |                                       |      |                                |      |          |
| Increase                                           | 31                            | 20.8 | 99                                    | 28.4 | 130                            | 26.2 | 0.076    |
| Decrease                                           | 118                           | 79.2 | 249                                   | 71.6 | 367                            | 73.8 |          |
| Number of main meals <sup>a</sup>                  |                               |      |                                       |      |                                |      |          |
| One                                                | 1                             | 0.5  | 1                                     | 0.2  | 2                              | 0.3  | 0.238    |
| Two                                                | 101                           | 54.3 | 291                                   | 59.6 | 392                            | 58.2 |          |
| Three                                              | 84                            | 45.2 | 196                                   | 40.2 | 280                            | 41.5 |          |
| Snack consumption <sup>a</sup>                     |                               |      |                                       |      |                                |      |          |
| Yes                                                | 90                            | 48.4 | 205                                   | 42.0 | 295                            | 43.8 | 0.219    |
| Sometimes                                          | 82                            | 44.1 | 251                                   | 51.4 | 333                            | 49.4 |          |
| No                                                 | 14                            | 7.5  | 33                                    | 6.6  | 46                             | 6.8  |          |

\**p* < 0.05<sup>a</sup>Chi-square test<sup>b</sup>Mann–Whitney *U* test were used for numerical data and categorical data between ON tendency and without ON tendency participants, respectively

the tendency to ON. There are conflicting data in the literature on gender and age. In this case, it can be thought that more clinical studies are needed for ON, a case for which no formal diagnosis and treatment criteria have been determined. At the same time, it was observed that there was no relationship between the students' smoking and alcohol use and their tendency to orthorexia nervosa. There is no consensus in the literature on this issue yet. While some studies did not find a relationship between smoking/alcohol use and orthorexia nervosa tendency, some emphasized a relationship [12, 20, 21]. These results suggest that ON should be considered more holistically regarding health-related behaviors. In addition, a history of chronic diseases was more common in students with ON tendency. It is reported in the literature that people with chronic diseases may be more concerned about their health, body weight, and diet practices than healthy people [22]. Focusing on the relationship between diet and chronic diseases may cause individuals' inappropriate or disordered eating

behavior is thought [23]. Our study result confirms this information, but more studies are needed to establish a cause–effect relationship.

There are many publications trying to define ON and to determine diagnosis and treatment strategies, but there are still some uncertainties [1, 3, 5]. In general, individuals with ON are reported to remove preservatives, additives, food flavoring, pesticides, excess fat, sugar, salt or genetically modified foods from their diets, and spend more than three hours a day on healthy eating [24, 25]. Our study observed that individuals with ON tendency paid more attention to energy, macronutrient, fiber, and sugar information on food labels. In line with this information, it was thought that the obsessive thoughts of ON tendency individuals on healthy nutrition would make a difference in their interest in food labels compared to individuals with normal eating behavior.

Food labels are tools that contain many different information such as food content, usage pattern, brand, price, quantity, quality standard indicators, etc., and are

**Table 3** Statements of the participants about the food label

| Statements                                                                                                        | ON tendency ( <i>n</i> = 186) | Without ON tendency ( <i>n</i> = 488) | <i>P</i>              |
|-------------------------------------------------------------------------------------------------------------------|-------------------------------|---------------------------------------|-----------------------|
|                                                                                                                   | $\bar{X} \pm \text{SD}$       | $\bar{X} \pm \text{SD}$               |                       |
| The nutritional information on food labels is very helpful to me <sup>a</sup>                                     | 2.71 ± 0.56                   | 2.51 ± 0.60                           | < 0.001 <sup>**</sup> |
| It's important to know how to use food labels to choose a healthy diet <sup>b</sup>                               | 2.88 ± 0.39                   | 2.76 ± 0.49                           | 0.001 <sup>*</sup>    |
| It takes a long time to read food labels <sup>a</sup>                                                             | 1.96 ± 0.78                   | 1.93 ± 0.73                           | 0.719                 |
| I wish I knew more about how to use food labels to follow a healthy diet <sup>a</sup>                             | 2.73 ± 0.52                   | 2.50 ± 0.67                           | < 0.001 <sup>**</sup> |
| I sometimes try new foods by reading the information on food labels <sup>a</sup>                                  | 2.42 ± 0.73                   | 2.19 ± 0.75                           | < 0.001 <sup>**</sup> |
| I make better food choices when I use food labels <sup>a</sup>                                                    | 2.58 ± 0.61                   | 2.30 ± 0.72                           | < 0.001 <sup>**</sup> |
| It is important to understand what is written in the content of food labels to avoid health problems <sup>b</sup> | 2.81 ± 0.43                   | 2.66 ± 0.57                           | 0.002 <sup>*</sup>    |
| To address health concerns, the food label should be read <sup>b</sup>                                            | 2.83 ± 0.43                   | 2.66 ± 0.57                           | < 0.001 <sup>**</sup> |
| Consuming foods with food labels helps me control my weight <sup>a</sup>                                          | 2.71 ± 0.56                   | 2.49 ± 0.64                           | < 0.001 <sup>**</sup> |
| Consuming foods with nutritional labels makes us feel better spiritually <sup>a</sup>                             | 2.66 ± 0.61                   | 2.38 ± 0.70                           | < 0.001 <sup>**</sup> |
| Total score <sup>b</sup>                                                                                          | 26.34 ± 3.00                  | 24.43 ± 3.82                          | < 0.001 <sup>**</sup> |

\**p* < 0.01; \*\**p* < 0.001

<sup>a</sup>Student *t* test

<sup>b</sup>Mann–Whitney *U* test

designed to give the consumer extensive information about the product they want to buy. It is aimed to facilitate and increase healthy food selection through food labels [26]. There are links between reading food labels and good diet quality, reduced energy intake, higher fruit and vegetable consumption, improved health outcomes, and other beneficial behaviors, according to the literature [11, 27, 28]. In some studies, for example, 658 African and American adults have shown that as the habit of reading food labels increases, fruit and vegetable consumption increases and fat intake decreases [29]. Similarly, in another study, it was found that there was a positive correlation between the habit of reading food labels and diet quality and eating behavior characteristics, and this relationship was stronger in men than in women [30]. In the study of Bonanni et al., a significant and positive correlation was found between the habit of reading food labels and adherence to the Mediterranean diet [31]. Similarly, in a study conducted in Vietnam, it was reported that nutritional labeling is an effective policy that can reduce individuals' consumption of foods and beverages with added sugar [32]. As seen in these studies, the habit of reading food labels, as predicted in the literature, is a useful tool in healthy food selection. However, when the studies are examined, it is remarkable that there are no questions about obsessing about the evaluations of food label reading. Because such actions taken in the name of healthy nutrition may deviate from their purpose over time.

Although it is thought that reading the food label is effective in making healthy food choices, in the case of ON, which is also defined as an anxiety disorder about healthy

food consumption, the situation of choosing healthy food can become pathological [3]. As can be seen from the results of our study, it was determined that individuals with ON tendency had a statistically significant tendency to read the information on the food label more and longer. This situation should be taken into account in terms of the fact that the choice of food can be healthy, as well as, perhaps, it can lead to the formation of obsessions about the access of individuals to healthy food. In addition, we think that it will be important to understand whether the habit of reading food labels differs from those of normal individuals to make healthy food selection in individuals with ON tendency or diagnosed according to existing criteria, for whom the diagnostic criteria have not yet been clarified.

### Limitations and strengths

There are some limitations in the interpretation of the study results. First of all, the study is an observational cross-sectional study. For this reason, that is not suitable for establishing a cause-effect relationship. In the study, gender homogeneity was not achieved and the participants were not questioned about which faculty/department they were. In this case, care should be taken in interpreting the results. Survey questions were developed by the researchers and no validation analysis was performed. The data were obtained from individuals' self-reports through the online survey method. It may not be an objective measurement tool. Factors that may affect the nutritional label reading habits of individuals (such as vegetarianism, food allergy) have not been taken into account. In addition, the ORTO-11

scale (original version ORTO-15), which is the scale used to determine the ON tendency, is a methodologically criticized scale in the literature recently and there are doubts about its reliability [33, 34]. However, the study has some very strong points. This study examined the relationship between label reading and ON tendency, which has not been examined in the literature before. In future studies, it may be possible to interpret the results accurately and reliably by using different sample groups and different risk detection tools.

## Conclusions

Although there is no clear consensus on the diagnostic criteria of ON in the literature, it is thought that the two most basic criteria are the unhealthy obsession with healthy nutrition (inflexible dietary rules, excessive time spent on healthy eating, etc.) and the presence of clinically detectable pathological conditions (medical or psychological complications, etc.). It has been reported that excessive interest in healthy nutrition may also have features such as excessive attention to reading food labels and excessive time spent. However, it is not possible to say anything clearly about whether the food label reading habits of individuals with ON are different compared to individuals with normal eating behavior. Our study findings show that individuals with ON tendency may be related to the habit of reading labels and excessive interest in healthy eating and excessive time spent, as predicted in the literature. It was determined that individuals with ON tendency read components such as content and additives on the food label more often than individuals without ON tendency, and were more aware of the importance of reading the food label.

## What is already known on this subject?

There has been an increasing number of studies on ON in recent years. In the studies, it is thought that individuals with ON tendency spend a long time on healthy nutrition.

## What this study adds?

In addition to the data obtained from existing studies, it has been determined that individuals with ON tendency have more label reading habits than normal individuals, and they read the nutrient and additive contents on the food label more frequently.

**Availability of data and materials** The datasets generated during and/or analyzed during the current study are available from the corresponding author on reasonable request.

## Declarations

**Conflict of interest** The authors declare that they have no conflict of interest.

**Ethical approval** The research proposal was approved by the Ethics Committee of the University of Karabuk. All procedures performed 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.

**Informed consent** Informed consent was obtained from all participants included in the study.

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