

# Perception of Disease and Coping Attitudes in Patients with Celiac Disease

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**Abstract** The study was conducted to investigate the factors affecting the perception of disease and coping attitudes in patients with celiac disease. The study was conducted with 100 celiac patients in Istanbul. The data were collected by applying “Introductory Information Form”, “Illness Perception Questionnaire”, and “Coping Inventory”. In the statistical analysis, t-test, Tukey and Pearson Correlation Analysis were used. It was observed that 63% of the patients were female, 52% were single, 21% were overweight. It was determined that there was a significant difference in terms of gender, marital status and income level, diet list, difficulty in dietary compliance in coping inventory ( $p < 0.05$ ). It was observed that the patients were emotionally affected by their diseases and exhibited problem-focused coping behaviors from coping attitudes. It was determined that there was a negative correlation between the patients’ age and illness coherence and emotional representations and between diagnosis time and emotional representation, personal attribution, lifestyle and chance factor ( $p < 0.01$ ). It was determined that there was a negative correlation between the dieting duration and emotional representations, personal attribution, lifestyle and chance factor ( $p < 0.01$ ). It was seen that there was a positive correlation between the age and problem-focused coping method and a negative correlation between the age and the dysfunctional subscale ( $p < 0.01$ ). It was seen that there was a positive correlation between the timeline (acute/chronic) and emotional-focused coping subscales, between personal control and problem focused and emotional focused coping subscales and between the treatment control and emotional focused coping subscale ( $p < 0.05$ ). It was also observed that 88% of the patients experienced symptoms like constipation and diarrhea, perceived their diseases as chronic, and the disease affected their physical, social and psychological functions. It may be recommended to comprehensively examine especially the factors obstructing their dietary compliance and influencing perception of disease.

**Keywords:** perception of disease, coping attitudes, celiac

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## 1. Introduction

Celiac disease is an autoimmune intestinal disorder caused by the ingestion of foods containing gluten in people with genetic predisposition. Gluten is a protein found in wheat and other cereals (barley, rye, oats). Symptoms of the disease can occur at any age with the introduction of gluten into the diet. Symptoms and signs of celiac disease is based on a wide range. Some patients can be asymptomatic and also celiac crisis can be seen in some other patients with chronic diarrhea as a result of hyponatremia, hypokalemia, hypoalbuminemia, and metabolic acidosis [1]. With this disease, the absorption of many nutrients that are beneficial to the body such as vitamins and minerals reduces. Thus, nutritional deficiency occurs [2].

Treatment of the disease is a lifelong gluten-free diet. Gluten-free diet is the inability to eat any desired food in

anyplace. It refers to knowing the content of the foods to be eaten and to controlling whether or not they contain gluten. These will constraint the patients both materially and morally. Although the symptoms are eliminated with a suitable diet, the special diet that a person has to follow throughout his/her life leads a psychological difficulty [3]. The health team monitoring the patient with celiac disease should evaluate the patient's psychosocial status, moods, and attitudes and should guide the patient and his/her family to get psychiatric support when necessary [4]. Chronic diseases affect the balance and adaptation of the patient depending on the disease, how he/she perceives the disease and the difficulties caused by the disease. Although many people have a disease in their lives, the experience of the disease is different in every person. The patients try to explain their diseases in the light of their personal experiences, knowledge, values, beliefs and needs. Perception of disease is the cognitive appearance of the disease status. People constitute cognitive models to explain and predict events in the outside world. Patients

develop similar models about the symptoms of a temporary or long-term disease [5].

Coping is defined as the cognitive and behavioral efforts that individuals develop to overcome the demands of their environments and produced by themselves when they encounter difficult situations. The coping attitudes used by the person against these conditions can vary depending on various factors such as age, gender, culture and disease and have characteristics specific to individual [6]. Assessment of the perception of disease and determination of coping attitudes can help the patients with chronic diseases to gain problem solving skills for self-management, coping with the emotional state of the disease, and overcoming the daily stress associated with the disease. Celiac is a disease requiring lifelong treatment. Therefore, determining the factors affecting the perception of disease is very important in coping with the disease. Several studies have been conducted abroad to investigate the perception of disease in celiac patients. However, we did not find any study conducted with celiac patients in Turkey. This study was conducted to investigate the effect of socio-demographic and disease-related characteristics of celiac patients on their perception of disease and coping attitudes.

## 2. Material and Method

This descriptive study was conducted with 100 volunteer adult patients who were diagnosed with celiac disease in nine state hospitals and associations related to celiac disease in Istanbul province after getting necessary permissions from Halic University Non-Invasive Clinical Trials Ethics Committee and were selected by random sampling method. The data of the study were collected with three forms: "Introductory Information Form", "Illness Perception Questionnaire", and "Coping Inventory".

### 2.1. Introductory Information Form

Introductory Information Form includes questions about the socio-demographic (age, gender, body mass index, marital status, income status) and disease-related characteristics (dieting duration, diagnosis time, presence of a diet list, difficulty in dietary compliance) of celiac patients. The Body Mass Index is obtained by dividing the body weight measured in kilograms to the square of height measured in centimeters and the Body Mass Index of 30 or more is considered as overweight.

### 2.2. Illness Perception Questionnaire

Validity and reliability studies of the Illness Perception Questionnaire, which was developed first by Weinman et al., in 1996, for Turkish society were conducted by Armay et al., (2007) [7]. The Illness Perception Questionnaire structurally consists of 3 parts: symptoms (identity), perception and causes.

Symptoms (Identity Subscale): A section consisting of two subscales including Identity A and Identity B. While Identity A includes experiencing symptoms related to the disease, Identity B included seeing symptoms as a part of

the disease for the patients. Both subscales are scored as "yes" (1) – "no" (0) and each subscale includes 14 symptoms.

Perception is a section that contains 38 items with 5-point Likert type scored between "I strongly disagree" (1) – "I strongly agree" (5). This part consists of 7 subscales. These subscales are: Timeline (Acute/Chronic), Timeline (Cyclic), Consequences, Personal Control, Treatment Control, Illness coherence and Emotional Representations. Subscale contents are as follows; Timeline (Acute/Chronic) subscale evaluates people's perception of diseases as acute or chronic; Timeline (Cyclic) subscale evaluates people's perceiving the diseases sometimes as in an acute cyclical course and sometimes in a chronic cyclical course; Consequences subscale assesses the effect of disease on physical, social and psychological functions of individuals; Personal Control subscale evaluates the internal control perceptions of individuals on the duration and treatment of the disease; Treatment Control subscale evaluates the people's beliefs that the disease will pass and their diseases can be kept under control and about the effectiveness of the treatment; Illness coherence subscale evaluates the status of comprehending the diseases for the individuals; Emotional Representations subscale assesses the emotional impact status of individuals' diseases on them.

The third section, the Causes section, consists of Eighteen items which are rated in 5-point Likert type ranging between "I strongly disagree" 1 and "I strongly agree" 5. This part contains 5 subscales. These subscales are Personal Attributions, External Attributions, Lifestyle Attributions, Uncontrolled Body Attributions, and Chance. The content of the subscales is as follows: The Personal Attributions subscale refers to the level of attributing the cause of the disease to factors such as stress or anxiety, their own attitudes, personal characteristics, emotional state, family problems, reduced body resistance, and their own behaviors; The External Attributions subscale refers to the level of attributing the cause of disease to factors such as previous poor medical care, environmental pollution, accident or injury, overwork, and so forth; The Lifestyle Attributions subscale refers to the level of attributing the cause of the disease to factors like smoking, alcohol, diet, and eating habits; The Uncontrolled Body Attributions subscale measures the level of attributing the cause of the disease to factors such as a germ or virus, heritability and aging; The chance subscale shows the level of attributing the cause of the disease to factors such as chance or bad luck.

### 2.3. Coping Inventory

Coping Inventory (COPE): A 60-item likert-type scale test with 15 sub-scales, was developed by Carver et al. (1989) and scored between 1-4. COPE problem-focused coping strategies include use of instrumental social support, active coping, restraint coping, suppression of competing activities and planning. Emotional-focused coping strategies include positive reinterpretation and growth, turning to religion, humor, use of emotional social support, acceptance. Dysfunctional coping strategies include mental disengagement, focus on and venting of

emotions, denial, behavioral disengagement, and alcohol-drug disengagement subscales [9]. Turkish validation study of the inventory was conducted by Agargun et al., [10].

## 2.5. Statistical Analysis

The data were evaluated with SPSS Computer Statistical Packaged Software (ver. 17.0) at confidence interval of 95% and significance level of  $p < 0.05$ . In addition to descriptive statistical methods (number, percentage), t-test, one-way analysis of variance (ANOVA) and Tukey and Pearson correlation analysis were used to analyze the data.

## 3. Results

It was observed that while the mean age of the patients was  $33.06 \pm 10.81$ , the diagnosis time and duration of dieting were  $5.78 \pm 5.44$ . 63% of the celiac patients were female, 52% were single, 57% had an associate or higher degree, 64% had an income equal to their expenses, 65% had no diet list, and 44% sometimes had difficulties in following the diet (Table 1). It was observed that 88% of the patients experienced diarrhea/constipation symptoms and 89% considered that these symptoms were related to the disease (Table 2). Table 3 shows the mean scores of the patients from the subscales of the coping inventory and illness perception questionnaire. No statistically significant difference was seen between the gender variable and subscale scores of the illness perception questionnaire scores of the patients ( $p > 0.05$ ). The single patients were seen to have higher scores in timeline (acute/chronic), illness coherence, emotional representations, and chance factor subscales of illness perception questionnaire compared to married ones ( $p < 0.05$ ). It was observed that overweight patients had lower scores in illness coherence subscale than the normal weight and weak patients ( $p < 0.05$ ). According to educational status, high school graduates had high scores in emotional representations subscale ( $p < 0.05$ ). The personal control subscale score of the patients with income less than expenses was higher than those with income higher than expenses ( $p < 0.05$ ). Those who had no diet list under the supervision of a dietician had higher timeline (cyclic) scores than those who had ( $p < 0.05$ ). It was seen that the patients who had mostly difficulties and were overwhelmed in their diet had higher scores in Identity A subscale than the patients who sometimes had difficulty and those who were overwhelmed in their diet had higher scores in illness coherence subscale than those who had no difficulty and those who sometimes had difficulty in their diet ( $p < 0.05$ ). It was seen that the patients who mostly had difficulty and were overwhelmed in their diet had higher scores in emotional representations subscale than the patients who never and sometimes had difficulties in their diet ( $p < 0.05$ ). Score of chance factor was higher in those who were overwhelmed in their diet than those who never had difficulty in their diet and in those who had mostly difficulty in their diet than those who sometimes had difficulty in their diet ( $p < 0.05$ ) (Table 4).

**Table 1. Descriptive Characteristics of the Patients (N=100)**

Variable	Group	Number (n)	Percentage (%)
Gender	Female	63	63
	Male	37	37
Marital status	Married	48	48
	Single	52	52
Educational Status	High School	43	43
	Associate Degree and higher	57	57
Income Status	Income less than Expenses	15	15
	Income equal to Expenses	64	64
	Income higher than Expenses	21	21
Body mass index	Weak	6	6
	Normal	73	73
	Overweight	21	21
Diet list	No	65	65
	Yes	35	35
Difficulty in Dietary Compliance	Never	28	28
	Sometimes	44	44
	Mostly	17	17
	A lot	11	11

**Table 2. Results of the Patients about the Disease Symptoms Subscale of Illness Perception Questionnaire**

Symptoms	Identity A	Identity B
Diarrhea / Constipation	88.0	89.0
Bloating / gas	80.0	81.0
Fatigue	80.0	66.0
Tension	75.0	63.0
Weight loss	70.0	71.0
Power loss	62.0	60.0
Joint pain	57.0	46.0
Difficulty in gaining weight	52.0	65.0
Sleep difficulty	51.0	37.0
Drowsiness	50.0	45.0
Skin rash	28.0	28.0
Numbness in hands	26.0	26.0
Growth delay	16.0	16.0
Moniliasis	16.0	16.0

**Table 3. The mean scores of the patients from the subscales of the scales**

Scales	Mean±SD
<b>Subscales of the Coping Inventory</b>	
Problem Focused	56.05±8.13
Emotional Focused	55.84±8.49
Dysfunctional	41.13±8.88
<b>Subscale of Illness Perception Questionnaire</b>	
Identity A	7.52±2.55
Identity B	7.46±3.02
Timeline (Acute/ Chronic)	18.22±1.70
Consequences	21.28±3.84
Personal Control	19.50±3.42
Treatment Control	16.69±5.14
Illness coherence	14.33±3.83
Timeline (Cyclic)	13.03±3.62
Emotional Representations	19.04±5.37
Personal Attributions	16.21±6.27
External Attributions	6.85±3.03
Lifestyle	5.19±1.70
Uncontrolled Body Attributions	7.08±1.79
Chance Factor	2.59±1.63

Standard Deviation: SD.

Table 4. Results of Descriptive Variables of the Patients from the the Subscales of the Illness Perception Questionnaire (N=100)

Variables	Identity A	Identity B	Timeline (acute/chronic)	Consequences	Personal Control	Treatment Control	Illness coherence
<b>Gender</b>							
Female	7.61±2.57	7.55±2.99	18.17±1.79	20.79±3.96	19.26±3.08	16.68±0.03	14.0±3.83
Male	7.35±2.54	7.29±3.11	18.29±1.57	22.10±3.54	19.89±3.94	16.70±3.19	14.89±3.82
<b>Marital Status</b>							
Married	7.77±2.30	7.75±3.17	17.85±1.62	20.79±3.91	19.54±3.69	16.89±6.71	13.29±3.75
Single	7.28±2.76	7.19±2.89	18.55±1.73*	21.73±3.76	19.46±3.18	16.50±3.13	15.28±3.68*
<b>Education</b>							
High School	7.90±2.21	7.46±3.01	18.02±1.76	21.44±3.52	19.74±3.89	17.00±7.14	15.13±3.69
Associate and higher degree	7.22±2.76	7.45±3.06	18.36±1.66	21.15±4.10	19.31±3.03	16.45±2.90	13.71±3.85
<b>Income Status</b>							
Income less than Expenses	6.80±2.80	7.33±2.94	18.66±1.49	21.80±3.25	20.6±4.06*	16.26±3.61	14.60±3.85
Income Equal to Expenses	7.76±2.53	7.73±3.07	18.10±1.69	21.26±3.92	19.64±3.38	16.54±3.32	14.28±3.70
Income higher than Expenses	7.24±2.43	6.71±2.93	18.23±1.92	20.95±4.11	18.28±2.79	17.42±9.29	14.28±4.37
<b>Body mass index</b>							
Weak	6.83±4.26	6.33±4.32	18.50±1.76	21.00±3.34	18.33±3.93	15.83±4.40	15.33±6.05
Normal	7.75±2.48	7.58±2.94	18.20±1.70	21.26±3.86	19.69±3.55	16.89±5.68	14.90±3.55
Overweight	6.90±2.16	7.33±9.98	18.19±1.77	21.42±4.08	19.14±2.79	16.23±3.04	12.04±3.33*
<b>Diet list</b>							
No	7.70±2.59	7.70±2.96	18.20±1.60	21.47±3.88	19.93±3.50	16.44±3.33	14.53±3.96
Yes	7.17±2.47	7.00±3.12	18.25±1.91	20.91±3.81	16.68±3.15	17.14±7.47	13.94±3.61
<b>Difficulty in Dietary Compliance</b>							
Never	7.35±2.87	7.96±3.58	18.42±2.08	21.50±4.30	19.85±3.95	16.53±2.80	13.10±4.15
Sometimes	6.95±2.56	7.00±2.64	18.20±1.77	20.47±3.63	19.68±3.05	16.86±6.87	14.09±3.81
Mostly	8.47±1.90*	7.17±2.42	18.00±1.22	22.29±3.85	17.70±3.8*	16.35±4.47	15.05±3.07
Overwhelmed	8.72±1.90*	8.45±3.69	18.09±1.04	22.36±3.17	20.63±1.50	16.90±2.34	17.27±2.53*
<b>Variables</b>	<b>Timeline (Cyclic)</b>	<b>Emotional representations</b>	<b>Personal Attributions</b>	<b>External Attributions</b>	<b>Lifestyle Attributions</b>	<b>Uncontrolled Body</b>	<b>Chance Factor</b>
<b>Gender</b>							
Female	12.96±3.54	18.49±5.82	17.03±6.78	7.14±3.2	5.06±1.78	7.15±1.86	2.41±1.63
Male	13.13±3.80	19.97±4.43	14.81±5.08	6.55±2.5	5.40±1.57	6.94±1.68	2.89±1.61
<b>Marital Status</b>							
Married	12.41±3.92	17.25±5.04	16.54±6.54	7.04±2.6	4.79±1.80	6.87±1.68	2.02±1.40
Single	13.59±3.26	20.69±5.17*	15.90±6.06	6.67±3.3	5.55±1.53	7.26±1.89	3.11±1.66*
<b>Education</b>							
High School	13.30±3.21	20.25±3.94*	16.67±5.92	7.02±2.5	5.23±1.75	7.25±1.76	2.83±1.66
Associate and higher degree	12.82±3.92	18.12±6.11	15.85±6.55	6.71±3.3	5.15±1.82	6.94±1.82	2.40±1.60
<b>Income Status</b>							
Income less than Expenses	13.00±2.85	20.26±5.41	17.80±6.53	7.33±2.8	5.53±1.59	7.33±1.29	2.66±1.79
Income Equal to Expenses	13.15±3.52	19.28±5.32	15.81±6.31	6.54±3.0	5.09±1.77	7.21±1.79	2.62±1.64
Income higher than Expenses	12.66±4.47	17.42±5.38	16.28±6.08	7.42±3.2	5.23±1.60	6.47±2.04	2.42±1.53
<b>Body mass index</b>							
Weak	14.83±2.31	19.50±4.76	15.83±8.28	6.66±2.6	6.16±1.47	7.00±2.09	3.00±2.19
Normal	12.95±3.51	19.30±5.47	16.69±6.06	6.94±3.1	5.09±1.78	7.02±1.82	2.58±1.59
Overweight	12.76±4.25	18.00±5.27	14.61±6.4	6.57±2.7	5.23±1.44	7.28±1.67	2.47±1.66
<b>Diet list</b>							
No	13.89±3.4*	19.47±5.47	15.92±6.18	6.41±2.9	5.27±1.74	7.01±1.59	2.78±1.75
Yes	11.42±3.39	18.22±5.16	16.74±6.49	7.65±3.1	5.02±1.65	7.20±2.13	2.22±1.33
<b>Difficulty in Dietary Compliance</b>							
Never	12.57±4.16	17.03±4.94	16.32±7.00	7.42±2.8	4.82±1.72	6.92±1.74	1.96±1.34
Sometimes	12.50±3.66	17.61±5.43	15.84±6.05	6.63±3.0	5.02±1.77	7.02±1.69	2.47±1.54
Mostly	14.11±2.39	22.94±2.92*	16.29±6.29	7.05±3.4	5.76±1.43	7.29±2.36	3.35±1.83*
Overwhelmed	14.63±3.10	23.81±2.85*	17.27±5.88	5.90±2.7	5.90±1.57	7.36±1.50	3.45±1.69*

(p&lt;0.05\*, t-test).

It was observed that female patients were found to score higher in problem-focused coping attitudes subscale than male patients (p<0.05). According to the education and body mass index variables of the patients, no statistically significant difference was determined between the coping inventory subscale scores (p>0.05). Single

patients were seen to have higher scores than married patients in dysfunctional coping strategies subscale (p<0.05). The patients who had income equal to their expenses had higher scores in problem focused coping strategies than the patients who had an income higher than the expenses (p<0.05). Problem focused subscale

scores of those with diet list were higher than those with a diet list ( $p<0.05$ ). The patients who had no difficulty in dietary compliance and sometimes had difficulty in dietary compliance had higher scores in emotional focused subscale than those who mostly had difficulty in dietary compliance and the dysfunctional subscale score of those who were overwhelmed in dietary compliance was higher than those who never, sometimes and mostly had difficulties in dietary compliance ( $p<0.05$ ) (Table 5).

A negative weak correlation between the age and illness coherence and emotional representations and a positive weak correlation between the age and the chance factor were determined. A negative weak correlation was determined between the diagnosis time and dieting duration and emotional representations, personal attributions, lifestyle, and chance factor. A positive weak correlation between the age and problem focused subscale and a negative weak relationship between the age and dysfunctional subscale were found ( $p<0.05$ ) (Table 6).

**Table 5. Results of the Descriptive Variables of the Patients from the Subscales of Coping Inventory**

Variables	Variable Categories	Subscales	Mean±SD	Test Value	Within-Group Comparison
Gender	Female	Problem Focused <sup>1</sup> Emotional Focused <sup>2</sup> Dysfunctional <sup>3</sup>	57.57±8.10 56.61±8.34 41.61±8.09	<u>Problem</u> t=2.50 <u>Emotional</u> t=1.19	p=0.014*
	Male	Problem Focused <sup>1</sup> Emotional Focused <sup>2</sup> Dysfunctional <sup>3</sup>	53.45±7.60 54.51±8.70 40.29±8.90	<u>Dysfunctional</u> t=0.71	p=0.23 p=0.47
Marital Status	Married	Problem Focused <sup>1</sup> Emotional Focused <sup>2</sup> Dysfunctional <sup>3</sup>	58.08±7.64 56.31±7.94 39.27±7.99	<u>Problem</u> t=2.46 <u>Emotional</u> t=0.53	p=0.16 p=0.59
	Single	Problem Focused <sup>1</sup> Emotional Focused <sup>2</sup> Dysfunctional <sup>3</sup>	54.17±8.19 55.40±9.02 42.84±9.38	<u>Dysfunctional</u> t=2.04	p=0.044*
Educational Status	High school	Problem Focused <sup>1</sup> Emotional Focused <sup>2</sup> Dysfunctional <sup>3</sup>	56.25±7.97 55.67±7.51 42.74±8.79	<u>Problem</u> t=0.21 <u>Emotional</u> t=0.16	p=0.82 p=0.86
	Associate Degree and Higher	Problem Focused <sup>1</sup> Emotional Focused <sup>2</sup> Dysfunctional <sup>3</sup>	55.89±8.31 55.96±9.22 39.91±8.83	<u>Dysfunctional</u> t=1.59	p=0.11
Income Status	Income less than Expenses	Problem Focused <sup>1</sup> Emotional Focused <sup>2</sup> Dysfunctional <sup>3</sup>	54.26±7.76 56.93±6.51 40.60±7.73	<u>Problem</u> F=2.77 P=0.06 <u>Emotional</u> F=0.90 P=0.40	1-2;p=0.17 1-3;p=0.66 2-3;p=0.033*
	Income Equal to Expenses	Problem Focused <sup>1</sup> Emotional Focused <sup>2</sup> Dysfunctional <sup>3</sup>	57.43±7.37 56.29±7.58 42.15±8.73	<u>Dysfunctional</u> F=1.47 P=0.23	1-2;p=0.79 1-3;p=0.25 2-3;p=0.22
	Income higher than Expenses	Problem Focused <sup>1</sup> Emotional Focused <sup>2</sup> Dysfunctional <sup>3</sup>	53.09±9.80 53.66±11.82 38.38±9.85		1-2;p=0.54 1-3;p=0.46 2-3;p=0.093
Body mass index	Slim	Problem Focused <sup>1</sup> Emotional Focused <sup>2</sup> Dysfunctional <sup>3</sup>	51.50±11.82 54.66±7.65 39.16±4.30	<u>Problem</u> F=2.69 P=0.73 <u>Emotional</u> F=0.14 P=0.86	1-2; p=0.23 1-3;p=0.42 2-3; p=0.72
	Normal	Problem Focused <sup>1</sup> Emotional Focused <sup>2</sup> Dysfunctional <sup>3</sup>	55.53±7.59 56.10±8.46 42.20±9.06	<u>Dysfunctional</u> F=2.06 P=0.13	1-2; p=0.69 1-3; p=0.88 2-3; p=0.68
	Overweight	Problem Focused <sup>1</sup> Emotional Focused <sup>2</sup> Dysfunctional <sup>3</sup>	59.14±8.21 55.23±9.13 37.95±8.59		1-2;p=0.41 1-3;p=0.76 2-3;p=0.54
Diet list	No	Problem Focused <sup>1</sup> Emotional Focused <sup>2</sup> Dysfunctional <sup>3</sup>	57.18±7.96 56.49±7.46 40.93±8.62	<u>Problem</u> t=1.92 <u>Emotional</u> t=1.04	p=0.047*
	Yes	Problem Focused <sup>1</sup> Emotional Focused <sup>2</sup> Dysfunctional <sup>3</sup>	53.94±8.13 54.62±10.14 41.48±9.47	<u>Dysfunctional</u> t=0.29	p=0.29 p=0.77
Status of having difficulty in Dietary Compliance	Never	Problem Focused <sup>1</sup> Emotional Focused <sup>2</sup> Dysfunctional <sup>3</sup>	58.57±6.60 58.50±6.16 40.42±8.35	<u>Problem</u> F=1.36 P=0.25 <u>Emotional</u> F=3.38 P=0.02	1-2; p=0.06 1-3;p=0.11 1-4;p=0.42 2-3;p=0.87 2-4;p=0.63 3-4;p=0.59
	Sometimes	Problem Focused <sup>1</sup> Emotional Focused <sup>2</sup> Dysfunctional <sup>3</sup>	54.95±8.08 56.20±7.89 40.56±7.79	<u>Dysfunctional</u> F=1.62 P=0.19	1-2; p=0.25 1-3;p=0.002** 1-4;p=0.36 2-3;p=0.017* 2-4;p=0.88 3-4;p=0.09
	Mostly	Problem Focused <sup>1</sup> Emotional Focused <sup>2</sup> Dysfunctional <sup>3</sup>	54.58±9.48 50.52±10.19 40.17±9.90		1-2; p=0.94 1-3;p=0.92 1-4;p=0.04* 2-3;p=0.87 2-4;p=0.04* 3-4;p=0.04*
	Overwhelmed	Problem Focused <sup>1</sup> Emotional Focused <sup>2</sup> Dysfunctional <sup>3</sup>	56.27±9.26 55.81±10.43 46.63±11.69		

SD: Standard deviation,  $p<0.05$ , \* $p<0.01$ \*\*, t=t-test value, F=ANOVA test value.

Table 6. Correlation Analysis Between the Patients' Age, Diagnosis Time, Dieting Duration, and Subscales of the scales

	Age		Diagnosis Time		Dieting Duration	
	r	p	r	p	r	p
<b>Illness Perception Questionnaire Subscales</b>						
Identity A	0.17	0.09	-0.05	0.5	-0.05	0.5
Identity B	0.15	0.13	-0.67	0.5	-0.67	0.5
Timeline (Acute / Chronic)	0.03	0.75	0.06	0.5	0.06	0.5
Consequences	0.03	0.75	0.07	0.47	0.07	0.47
Personal Control	0.03	0.73	-0.003	0.9	-0.003	0.9
Treatment Control	0.02	0.8	-0.02	0.84	-0.02	0.84
Illness coherence	-0.29	0.003**	-0.16	0.10	-0.16	0.10
Timeline (Cyclic)	-0.05	0.56	0.003	0.9	0.003	0.9
Emotional Representations	-0.32	0.001**	0.32	0.001**	-0.32	0.001**
Personal Attributions	0.008	0.93	-0.27	0.006**	-0.27	0.006**
External Attributions	0.017	0.86	-0.12	0.22	-0.12	0.22
Lifestyle	-0.06	0.51	-0.27	0.006**	-0.27	0.006**
Uncontrolled Body Attributions	-0.013	0.9	0.02	0.8	0.02	0.8
Chance Factor	0.21	0.032*	-0.21	0.032*	-0.21	0.032*
<b>Subscales of Coping Inventory</b>						
Problem Focused	0.275	0.006**	0.12	0.236	0.12	0.23
Emotional Focused	0.06	0.4	0.08	0.4	0.08	0.4
Dysfunctional	-0.294	0.003**	-0.07	0.47	0.07	0.47

p < 0.05 \*, p < 0.01 \*\*, r = Pearson correlation analysis.

Table 7. Results of the Patients on the Correlation Analysis between the Illness Perception Questionnaire and Coping Inventory

Subscales of the Scales	Problem Focused		Emotional Focused		Dysfunctional	
	r	p	r	p	r	p
Identity A	-0.056	0.578	-0.196	0.051	0.070	0.486
Identity B	0.033	0.744	-0.020	0.844	0.151	0.134
Timeline (Acute / Chronic)	0.049	0.626	0.220	0.028*	-0.058	0.563
Consequences	-0.002	0.981	-0.015	0.880	-0.141	0.162
Personal Control	0.201	0.045*	0.317	0.001**	0.067	0.510
Treatment Control	0.115	0.255	0.211	0.035*	-0.013	0.901
Illness coherence	-0.060	0.522	0.186	0.064	0.233	0.166
Timeline (Cyclic)	0.127	0.208	0.118	0.224	-0.007	0.945
Emotional Representations	-0.133	0.187	-0.141	0.160	0.299	0.282
Personal Attributions	0.052	0.606	0.248	0.235	0.234	0.144
External Attributions	-0.084	0.407	0.084	0.407	0.248	0.360
Lifestyle	0.025	0.807	0.034	0.736	0.070	0.492
Uncontrolled Body References	-0.088	0.383	-0.018	0.861	0.022	0.831
Chance Factor	0.042	0.680	0.032	0.749	0.129	0.201

p < 0.05 \*, p < 0.01 \*\*, r = Pearson correlation analysis.

It was observed that there was a positive weak correlation between the timeline (acute/chronic) and emotional focused subscale, between personal control and problem and emotional focused subscales, between treatment control and emotional focused subscale (p < 0.05) (Table 7).

## 4. Discussion

Celiac is a chronic disease and shows itself with symptoms such as diarrhea, constipation, bloating, weight loss, joint pain, fatigue. It has no available treatment but minimizing these symptoms is possible by maintaining a gluten-free diet for life [11]. The results of the present study revealed that 88% of the patients experienced symptoms of digestive system such as constipation and diarrhea, they perceived their disease as chronic in terms

of timeline and displayed problem focused coping behaviors among coping strategies.

In the study, no significant difference was seen between all subscales in the celiac disease perception of male and female patients. In the studies conducted on other types of disease, La Greca et al., obtained results indicating that women attributed their problems with their disease more than men and they were more negative than men [12]. In this study, it was observed that although there was no difference in celiac disease perception of female and male patients, female patients used problem-focused coping method including the attitudes like active coping, planning and using beneficial social support. The dietary compliance is important in reducing disease symptoms in celiac disease. Women are more careful about their diet than men. In contrast to the study, in a study conducted with cancer patients, female patients were shown to use

emotional focused coping methods [13]. This study may suggest that women are structurally more likely to have a dietary compliance, which leads them to prefer problem focused coping method.

According to the body mass index of the patients, overweight patients had a lower score in the illness coherence subscale of the illness perception questionnaire compared to the normal weight and slim patients. It is known that difficulty in weight gain and weight loss symptoms are seen in clinical findings of Celiac disease [14]. However, in this study, it was observed that the patients had no difficulty in gaining weight and most of them had a normal weight.

It was observed that the single patients had higher scores in timeline (acute/chronic), illness coherence, emotional references and chance factor subscales of the illness perception questionnaire compared to the married patients. When coping strategies were examined, single patients were seen to have a higher score in dysfunctional strategies compared to the married patients. When considering that married patients live a more regular life, it can be asserted that single patients use negative coping methods such as behavioral disengagement and denial since they cannot provide such a regular life. It is stated that being married is of great importance in terms of social support as well as sharing of home-related responsibilities [15]. The social support of spouses in married individuals can help to explain this situation. Since the approaches of the partners can be regarded as a support in coping attitudes, displaying positive approaches is usual.

According to the educational status of the patients, no significant difference was observed in perception of disease and coping attitudes. It was thought that there was no difference between the subscales because the educational level in the sample group was similar to each other. Personal controls on the disease of the patients with low income were higher than the patients who had an income higher than their expenses. Income status has an important place in individuals with celiac disease. Economic situation, eating habits, emotional state, climate, cultural structure, various diseases and appetite affect the intake of nutrients. The fact that the gluten-free diet is in the basis of the disease and this diet is costly makes the income situation important [16]. In this study, it was observed that the patients who had income equal to their expenses used the attitudes such as behavioral and mental disengagement and denial more than those who had incomes higher than the expenses. Relying on financial opportunities in coping with the disease may force the patients to use dysfunctional methods.

According to the status of having a diet list under the control of a dietician, it was determined that those who had no diet list had higher scores in problem focused subscale than the patients who had a diet list. The gluten-free diet requires special research, planning and care. The person who prepared the foods containing a small amount of gluten should be careful to avoid risky conditions such as cross contamination. It is also important to provide the foods that the body needs in these individuals and prepare different menus [17]. For this reason, since the planning skill of an individual who do research and deals with his/her own diet list and apply that

list could be more powerful and developed, these people can use coping strategies such as active coping and planning.

When examining the dietary compliance variables, we see that the patients who mostly had difficulty and were overwhelmed in their diet experienced the disease symptoms more and realized emotional focused coping attitudes more compared to those who had sometimes difficulty in their diet. It was again seen that those who mostly had difficulty and were overwhelmed in their diet had higher scores in emotional representations subscale compared to the patients who had never and sometimes had difficulties. Patients who had difficulty in dietary compliance realize the attitudes such as making fun or accepting their disease by preferring emotional coping method with their disease. Individuals who prefer emotional methods as the coping method may have difficulty in dietary compliance. As a result of this situation, it can be asserted that they experienced more symptoms due to the occasional cheating on the diet. It was found that the patients who were overwhelmed in their diet score high in illness coherence and dysfunctional subscales compared to the patients who had no difficulty and sometimes had difficulty. The fact that the people who comprehended their diseases and had enough information about their disease and the gluten-free diet, were very careful about their diet, they were aware of that the external factors such as cross contamination may negatively affect their health may show that the person had difficulty in the dietary compliance and felt unsafe in continuing his/her diet outside [18]. It was seen that the patients who had mostly difficulty and were overwhelmed in dietary compliance had higher score than the patients who had no difficulty and the patients who were overwhelmed in dietary compliance had higher score in timeline cyclic subscale than those who had sometimes difficulty. Diet stability of individuals who had difficulty in compliance can be interrupted which may cause them to experience acute progress of the disease more. Additionally, it was seen that the patients who were overwhelmed and had mostly difficulty in dietary compliance had higher scores in the chance factor subscale than the patients who had never and sometimes had difficulty. Individuals attributing the cause of the disease to bad luck may have difficulty in dietary compliance regularly since they do not use the attitudes such as active coping and planning for their diseases.

According to the result of the study, a negative correlation was observed between the age factor and illness coherence and emotional representations subscale. The fact that the people are emotionally affected from their diseases less as their age increased can be associated with that the adults who reach certain maturity level with age approach to their diseases in a more planned way. Another effect of age factor was the increase of the level of attributing the disease to the factors such as chance or bad luck. It was found that there was a positive correlation between the increase in age and the problem focused subscale. Another result obtained in parallel with this was that dysfunctional coping attitudes decreased as age increased. Along with the maturity and life experience acquired as the age increases, people start to use more positive coping strategies.

A negative correlation was found between the increased diagnosis time and the emotional representations subscale. It is a possible result that individuals who have been diagnosed long ago would be less likely to be emotionally affected by their disease. A negative correlation was seen between the dieting duration and emotional representations, personal attributions, and chance factor. Attributing the cause of the disease to the factors like stress, concern, personal attitude, body resistance, family problems and luck was inversely proportional to the dieting duration [19]. It was observed that people who have been continuing their diet for a long time did not attribute their disease to personal reasons and luck factors.

When the disease perception and coping attitudes of the patients were compared, a positive correlation was determined between the timeline (acute/chronic) and emotional focused subscales. As the chronic perception of the disease increased, presenting coping attitudes where the emotionality is in the foreground such as religiously coping, using emotional social support also increases. According to this result, in order to cope with the idea that the existing disease would last a lifetime, it can be asserted that people first try to cope with their diseases in their inner worlds.

A positive correlation was seen in the comparison of the personal control subscale and problem and emotional focused subscale. As the internal control of the patient over the duration and treatment of the disease increased, they exhibit more emotional coping attitudes such as positive interpretation, acceptance and religiously coping. The individuals apply emotional focused methods coming after the acceptance feeling occurring when they comprehend that the only treatment of celiac disease is a lifelong diet [17].

People with chronic illnesses need to make serious lifestyle changes to control the disease course. Life experience, disease perception and personal competence of the individuals are important for the management of chronic disease [20]. Ruined diet can significantly affect the health of celiac patients and it is important to inform patients about their diet. Taking the necessary precautions for cases where the perception of disease is a problem may increase the success of the treatment.

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