Eating Attitudes From a Cardiometabolic Risk Perspective: Psoriasis Sample

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ABSTRACT

Objective: In this study, we aimed to compare psoriasis patients with healthy controls in terms of impaired eating attitudes and to investigate the relationship of eating attitudes with cardiometabolic and clinical parameters, anxiety, depression, and quality of life.

Methods: 45 psoriasis patients and 45 healthy controls were included in the study. Personal and clinical information form, eating attitude test (EAT-40), body mass index (BMI) and MetS criteria were used for all participants. Psoriasis patients were evaluated with clinical information form, hospital anxiety and depression scale (HADS), dermatological quality of life index (DQLI), psoriasis area and severity index (PASI).

Results: The data of the patient and control groups differed in terms of doing sports, impaired EAT, BMI groups, and metabolic syndrome (MetS). Abnormal eating attitudes such as negative body image, inability to control oneself in eating, overeating, and some restrictive attitudes were significantly higher in the psoriasis group. Overeating, overeating or stress-induced emotional eating, presence of MetS, weight dissatisfaction, frequent dieting to lose weight, some compensatory behaviours, and loss of self-control were significantly higher in patients with BMI>25. EAT points; showed a positive moderate correlation with BMI and HAD-Anxiety. DQLI results; showed a moderate positive correlation with HAD-Anxiety and PASI scores.

Conclusion: Our study is the first to reveal what kind of disordered eating attitudes are at risk for cardiometabolic diseases in psoriasis patients. In psoriasis patients, the rate of not being able to control their eating behaviour is high. Our results primarily highlight the relationship that can be explained by autonomic reactivity between anxiety and difficulty resisting food cravings. Professional support including psychoeducation, cognitive behavioural therapy, and acceptance-based therapies should be provided to reduce maladaptive reactions and anxiety by improving self-regulation skills.

Keywords: anxiety, eating attitude, psoriasis, metabolic syndrome, obesity

1. INTRODUCTION

Psoriasis is a disease with systemic manifestations, typically characterized by erythema, plaque formation, and scaling on the skin, mediated by chronic autoinflammatory changes that are thought to develop with the interaction of endogenous and environmental factors on a genetic basis (1). Systemic changes in inflammatory modulators such as keratinocyte proliferation in the skin increased levels of inflammatory cytokines and adipokines such as TNF-α, IL-23, IL-17, hypothalamic-pituitary-adrenal axis, and autonomic dysregulation are described chronically in the severity of psoriasis (2). These systemic proinflammatory changes; It is a key factor for a number of comorbidities including psoriatic arthritis, inflammatory bowel disease, increased hyperlipidemia, hypertension, atherosclerosis, cardiovascular risk, type 2 diabetes mellitus, obesity, metabolic syndrome (MetS), skin cancer, lymphoma, and depression (2,3). MetS is multiple components of risk factors such as hypertension, impaired glucose regulation, abdominal obesity, and dyslipidemia and is seen as a common precursor to the development of diabetes mellitus and cardiovascular disease (4). The prevalence of MetS in patients with psoriasis varies between 20% and 50%, and the risk of developing MetS in psoriatic patients is at least two times higher than in healthy controls (5). Emerging evidence suggests that the genetic background and pathogenic links shared by psoriasis and MetS can be accelerated by multiple factors, such as unhealthy lifestyles, and eating attitudes (6).

Eating attitude; consists of people's feelings, thoughts, and behaviours about eating and nutrition, and impaired attitudes pave the way for the formation of eating disorders. Eating behaviour; appetite and food intake are regulated by the control of many peripheral hormones, including adipokines (7). When the psychological aspects of eating habits are followed; Emotional eating is defined as the shaping of binge eating behaviour to alleviate the emotional tension caused by anger, boredom, depression, anxiety, or feelings of rejection (8). Some of the pathophysiological changes that are common today have revealed that obesity should be interpreted as food addiction. Therefore, it is reported that information about the neurobehavioral connections of reward processes associated with food stimuli is of strategic importance for a better understanding and proper management of obesity (9). A recent cohort study showed a positive and strong bidirectional relationship between psoriasis and any eating disorder, especially in women (10). This study investigates eating attitudes in psoriasis patients. Secondly, it aimed to investigate the relationship between impaired eating attitudes and demographic characteristics, clinical parameters such as psoriasis severity, quality of life, depression, and anxiety, and cardiometabolic parameters such as obesity and metabolic syndrome. As far as we know, there is no study in the literature that deals with all these variables collectively.

2. METHODS

2.1. Sample

The study was designed as a cross-sectional, randomized, and controlled study. Approval for the study was obtained from the ethics committee of Atatürk University Faculty of Medicine (approval document dated 09.06.2017 and numbered B.30.2.ATA.0.01.00/154). Forty-five patients, aged between 18-65 years, who applied to the dermatology outpatient clinic and were diagnosed with psoriasis, were included in the study. A control group was formed with 45 healthy participants with similar sociodemographic characteristics as the study group. Patients with uncontrolled DM, HT, presence of systemic disease, multimorbid conditions with morbid obesity, illiterate, advanced hearing, vision, and speech problems were not included in the study.

2.2. Process

All participants were asked to fill out a questionnaire including sociodemographic and health-related behaviours, after obtaining written and verbal consent. Body mass index (BMI), waist circumference, triglyceride level, HDL cholesterol level, blood pressure, and fasting blood sugar were recorded with the Eating Attitude Test (EAT-40). Dermatological examinations of psoriasis patients were performed by the same physician; The psoriasis area and severity index (PASI) was scored and evaluated with the clinical information form, the Dermatological Quality of Life Index (DQLI), and the Hospital Anxiety and Depression Scale (HADS).

2.3. Data collection tools

Socio-demographic and clinical data of the participants including age, weight, height, BMI, gender, education, economis status, profession, smoke-alcohol consumption, weight satisfaction, effort to maintain weight, dieting to maintain weight, the effect of stress on nutrition, psychogenic eating habits, restrictive eating, emotional eating, state of doing sports were evaluated.

Eating Attitude Test (EAT-40) was used in order to identify the eating disorders of the participants. It is a six-point Likert-form self-report scale with 40 questions used all over the world to screen for problematic eating behaviours. The cut-off point for impaired eating behaviour is accepted as 30 points (11).

Hospital Anxiety and Depression Scale (HADS) was used in order to determine the risk in terms of anxiety and depression in the patient. It is a four-point Likert-type scale to measure the level and change in severity, and is preferred because it does not contain items related to somatic symptoms. The cut-off points of the Turkish version of the HAD scale were determined as 10 for the anxiety subscale and 7 for the depression subscale (12).

Dermatological Quality of Life Index (DQLI) was used to evaluate the quality of life of psoriasis patients. It is a dermatology-specific, simple, short, understandable, patient-oriented questionnaire and can be used in daily routine clinical studies. If DQLI Scores > 10, it was considered severe(13,14).

Psoriasis Area and Severity Index (PASI) was used to rate the severity of psoriasis. The index evaluates disease severity from 0 to 72 by assessing the percentage of skin/body parts and the three target symptoms, erythema, induration, and desquamation; PASI>10 indicates severe psoriasis (14).

Patient Body mass index (BMI) (kg/m2); calculated as weight(kg) / height(m2) ratio according to World Health Organization(WHO) 2008; overweight is considered as BMI ≥25 kg/m2, and obesity as BMI ≥30 kg/m2 (15).

MetS Diagnosis; based on the presence of ≥3 criteria from the modified National Cholesterol Education Program (NCEP) Adult Treatment Panel-III; waist circumference>102cm in men or >88cm in women, hypertriglyceridemia≥150mg/dL, HDL cholesterol men<40mg/dL or women<50mg/dL, blood pressure≥130/85mmHg, and fasting plasma glucose≥100mg/dL (16).

2.4. Statistical Analysis

Participants' data were presented as mean±standard deviation, median, minimum, maximum for numerical variables, percentage, and number for categorical variables. Data were visually assessed for normality using Kolmogorov Smirnov test, histograms and Q-Q plots. Additionally, data were checked for the presence of skewness, kurtosis and outliers before proceeding with the inferential analysis.

Statistical inference is based on 95% confidence intervals (CIs), and the significance level was set at 0.05. The data of the study were analyzed using the independent sample t-test, Mann-Whitney U-test, Chi-square test, Fisher's exact test, and Pearson correlation tests in the SPSS20 program.

3. RESULTS

3.1. Comparison of sociodemographic and lifestyle variables of psoriasis and control groups

Gender, marital status, cigarette consumption, alcohol consumption, weight satisfaction, weight maintenance effort, dieting to maintain weight, effect of stress on nutrition, psychogenic eating habits, restrictive diet, and emotional eating were similar in psoriasis and control groups. There was a significant difference between the groups in terms of occupation, education, and doing sports (Table 1).

3.2. Clinical features of psoriasis patients

The most common vulgar involvement was in the psoriasis group, the rate of use of systemic agents in the treatment was high, and 87% of the patients had moderate or severe psoriasis. (Table2).

Table 1. Comparison of sociodemographic and lifestyle variables of groups

		Psoriasis group		Healthy controls		t	df	p^a
		n:45	%100	n:45	%100			
Gender	Male	28	62.2	24	53.3	0.729	1	.393
	Female	17	37.8	21	46.7			
Marital Status	Single	18	40.0	26	57.8	2.846	1	.092
	Married	27	60.0	19	42.2			
Profession	Working	31	68.9	40	88.9	5.404	1	**.020***
	Not Working	14	31.3	5	11.1			
Education	Primary	19	42.2	7	15.6	7.805	2	**.020***
	Middle	16	35.6	24	53.3			
	High	10	22.2	14	31.1			
Smoke consumption	Smokers	23	51.1	15	33.3	2.232	1	.135
	Not Smokers	22	48.9	30	66.7			
Alcohol consumption	Drinkers	3	6.7	1	2.2			.616
	Not drinkers	42	93.7	44	97.8			
Weight satisfaction	Pleased	23	51.1	18	40.0	1.120	1	.296
	Not glad	22	48.9	27	60.0			
Effort to maintain weight	Yes	22	48.9	18	40.0	0.720	1	.396
	No	23	51.1	27	60.0			
Dieting to maintain weight	Often	10	22.2	4	8.9	0.741	1	.389
	Sometimes	6	11.0	16	35.6			
	Rarely-never	29	64.4	25	55.6			
The effect of stress on nutrition	Effects	34	75.6	30	66.7	0.865	1	.352
	Does not affect	11	24.4	15	33.3			
Psychogenic eating habits	Yes	33	73.3	34	75.6	0.058	1	.809
	No	12	26.7	11	24.4			
Restrictive eating	Decreased or absent appetite	13	39.4	16	47.1	0.458	1	.499
	No	32	71.1	29	52.9			
Emotional eating	Binge eating too much or more than usual	20	44.6	18	40.0	0.182	1	.670
	No	25	55.6	27	60.0			
State of doing sports	Yes	8	17.8	11	24.4	16.312	2	**<.001***
	No	36	80.0	20	44.4			
	Done left	1	2.2	14	31.1			

*Chi-square test, significant p values were bolded in the table*p<.05,**p<.01,***p<.001*

Table 2. Clinical features of psoriasis patients

Age		Min-Max 18-53 year	Mean ± SD (34.36± 10.773)
Psoriasis onset age		Min-Max 1-52 year	Mean ± SD (20.04±12.46)
Disease duration		Min-Max 2-47 year	Mean ± SD (14.46±10.35)
Psoriasis type	Vulgaris	32(n)	71.11(%)
	Guttate	3(n)	6.6(%)
	Pustular	2(n)	4.4(%)
	Erythrodermic	1(n)	2.2(%)
	Nail involvement	8(n)	17.6(%)
	Joint involvement	1(n)	2.2(%)
Treatment	Local	18(n)	40.0(%)
	Systemic	27(n)	60.0(%)
Stress factor	Yes	18(n)	40.0(%)
	No	27(n)	60.0(%)
PASI group	Mild	6(n)	13.3(%)
	Middle	18(n)	40.0(%)
	Severe	21(n)	46.7(%)
DQLI	> = 11	24(n)	53.3(%)
	<11	21(n)	46.7(%)
HADS risk	Yes	24(n)	53.3(%)
	No	21(n)	46.7(%)
Mental disorder before psoriasis	Yes	2(n)	4.4(%)
	No	43(n)	95.6(%)
Mental disorder after psoriasis	Yes	9(n)	20.0(%)
	No	36(n)	80.0(%)

Hospital Anxiety and Depression Scale=HADS, Dermatological Quality of Life Index=DQLI, Psoriasis Area and Severity Index=PASI

3.3. EAT variables

From the expressions of eating attitude; trying not to eat when hungry, cutting food into small pieces, post-meal nausea, only thought is to become thinner, liking to eat meat, getting up early in the morning, like to eat at a restaurant, self-control about food, feeling pressure from others about eating, sugar-oily in the reports of liking to try foods, it was seen that the psoriasis group differed statistically from the control group. The difference was in the psoriasis group; it was due to high rates of binge eating, overeating, and restrictive eating behaviours shaped by negative body image, effort to lose weight, and loss of self-control. (Table 3)

3.4. Chi Square Test Results of Groups

When psoriasis patients and healthy controls were examined with the chi-square test; it was found that there were differences in terms of impaired eating attitude, BMI groups, and MetS. (p values: .030, .042, .004, respectively) (Table 4).

3.5. Comparison of means of metabolic variables in psoriasis and control groups;

While the mean age, BMI, glucose, HDL, Tg, cholesterol, and LDL values were similar between groups, the waist circumference and EAT scores were significantly higher in the psoriasis group (Table 5).

EAT score of 30 and above

Eight patients (17.8%) and 1 (2.2%) control were identified who exhibited impaired eating behaviours, including efforts to maintain weight, binge eating, binge eating, emotional eating, and restrictive eating changes. In those with impaired eating attitude; the rate of smoker was low (p=.022), but the rate of doing sports was high (p=.039). When the relationship between the clinical and demographic data of 8 patients with eating attitude disorder was examined by chi-square test, 8 patients had a disease duration longer than 3 years (p=.568), 6 had severe psoriasis clinic (p=.699), 4 had a history of systemic treatment (p=.694) reported. In these patients, increased BMI, MetS diagnosis, stress factor positivity, increased risk of anxiety depression, and poor quality of life were found that did not reach statistical significance (p>.05 for each).

Table 3. EAT variables of psoriasis and control groups

		Psoriasis group		Healthy controls		t	df	pᵃ
		n	%	n	%			
I try not to eat when I'm hungry	Always – very often-often	15	33.3	5	11.1	6.852	2	**.033***
	Rarely	8	17.8	8	17.8			
	Never	22	48.9	32	71.1			
I like to eat meat	Sometimes-rarely	22	48.9	36	80.0	13.887	2	**.001***
	Never	10	22.2	8	17.8			
	Always-very often-often	13	28.9	1	2.2			
I like to eat at the restaurant	Always-very often-often	18	40.0	32	71.1	12.206	5	**.007****
	Sometimes	9	20.0	5	11.1			
	Rarely	6	13.3	6	13.3			
	Never	12	15.6	2	4.4			
I can control myself about food	Always	4	8.9	9	20.0	19.113	2	**<.001***
	Very often-often	4	8.9	19	42.2			
	Sometimes-rarely	37	82.2	17	37.8			
Sugary. I like to try fatty foods	Never	8	17.8	24	53.3	16.648	3	**.001***
	Always-very often-often	11	24.4	11	24.4			
	Sometimes	9	20.0	6	13.3			
	Rarely	17	37,8	4	8.9			

*Significant p values of the chi-squared test were bolded in the table *p<0.05,**p<0.01,***p<0.001*

Tablo 4. Chi square test results of groups

		Psoriasis group		Healthy controls		t	df	pᵃ
		n:45	100%	n:45	100%			
EAT	30 and above	8	17.8	1	2.2			**.030***
	29 and below	37	82.2	44	97.8			
BMI group	<25	21	46.7	27	60.0	6.750	2	**.034***
	>25<30	18	40.0	18	40.0			
	>30	6	13.3	0	0.0			
Glucose	<100	36	80.0	44	97.8	7.200	1	**.007****
	>100	9	20.0	1	2.2			
Waist circumference	Normal	27	60.0	44	97.8	19.281	1	**<.001***
	Male >102 Female>88	18	40.0	1	2.2			
HDL	Normal	21	46.7	28	62.2	2.195	1	.138
	Male<40 Female<50	24	53.3	17	37.8			
Tg	<150	26	57.8	36	80.0	5.184	1	**.023***
	>150	19	42.2	9	20.0			
MetS >3 criterion	Yes	10	22.2	1	2.2	8.389	1	**.004****
	No	35	77.8	44	97.8			
Presence of metabolic risk	Yes	19	42.2	7	16.3	7.110	1	**.008****
	No	26	57.7	36	83.7			

*BMI=body mass index, Eating Attitude Test=EAT, High density lipoprotein=HDL, Metabolic syndrome=MetS, Triglyceride=Tg, a Significant p values of the chi-squared test were bolded in the table, *p<.05,**p<.01,***p<.001*

Table 5. Comparison of means of metabolic variables in psoriasis and control groups

	Psoriasis group	Healthy controls	t	pª	Means	Standard error
	(Mean ± SD)	(Mean± SD)				
Age	34.36± 10.77	30.87± 10.74	-1.538	.128	-3.49	2.268
BMI	25.47± 4.53	24.32± 3.22	-1.393	.167	-1.15	.82801
Waist circumference	93.64± 14.92	79.80± 10.53	-5.084	**<.001*****	-13.84	2.72303
Glucose	88.39±17.02	84.62± 6.86	-1.375	.173	-3.77	2.73905
HDL	44.978±10.84	46.93± 8.22	.957	.341	1.95	2.04493
Tg	142.49±80.99	112.62±52.64	-1.958	.054	-29.87	15.25599
Cholesterol	175.20±40.72	167.58±35.58	-.916	.362	-7.63	8.32395
LDL	116.56±30.75	107.89±27.32	-1.342	.184	-8.67	6.46036
EAT score	20.24± 8.80	13.18± 6.47	-4.339	**<.001*****	-7.07	1.62880

*An Independent sample t test was used to compare between groups, significant p values were bolded in the table*p<.05,**p<.01,***p<.001*

In patients with BMI>25;

19 were married(p=.005), 17 were male(p=.203), 17 showed severe psoriasis (p=.526), 17 had increased waist circumference(p<.0001), 14 had triglyceride value was over 150(p=.019), and 12 of them had MetS(p<.0001). Weight dissatisfaction, frequent dieting to lose weight, binge eating, overeating, and stress-induced emotional eating were significantly higher: Emotional eating changes triggered by stress and binge eating were found in 15 of them(p=.009), and 15 of them were dissatisfied with their weight(p=.051). 13 reported that they frequently dieted to lose weight(p=.005) and 13 reported that they smoked(p=.661). 5 of them had an impaired eating attitude(p=.705); Dividing food into small pieces from eating attitudes showed a significant increase in the BMI>25 groups(p=.003), and trying not to eat when hungry showed a significant increase in the BMI<25 groups(p.011).

3.6. In Pearson correlation analysis;

EAT scores; Positive moderate correlation between waist circumference (r=.311*,p=.04) and HAD anxiety (r=.352*,p=.019), and DQLI results and HAD anxiety (r=.311*,p=.040) and PASI scores (r=.442**,p=.002) was found to have a positive, moderate correlation.

4. DISCUSSION

In our study investigating the relationship between cardiometabolic risks and impaired eating attitudes in psoriasis patients, obesity rates in psoriasis patients were higher than in healthy controls. Obesity, one of the most important components in MetS, has been detected in psoriasis patients at higher rates than in the general population. Meta-analyses of cross-sectional and case-control studies have shown, similar to our results, that patients with psoriasis are 50% more likely to be obese compared to the general population (17,18). Although there is great variation between countries and ethnic groups, the prevalence of metabolic syndrome

increases as body mass index(BMI) increases. In our study, a significant difference was found between the patient and control groups in terms of MetS frequency, high fasting blood glucose, high triglyceride, and high waist circumference. The recent systematic review reported that the odds ratio (OR) for MetS and psoriasis ranged from 1.39 to 4.49 (19).

In our study, binge eating, overeating, and restrictive eating behaviours shaped by negative body image, effort to lose weight, and loss of self-control were found to be high in the psoriasis group. It has been reported in the literature that eating disorders can be considered as a psychogenic cofactor contributing to the development of obesity and MetS in psoriatic patients (6). Studies in overweight and obese people have shown that negative body image with increased body dissatisfaction and shape and weight concerns leads to weight gain over time compared to those who are not overweight (20). In the study of Crosta et al.; in the psoriasis group, especially in the obese patients, higher scores were found in the eating disorder subscales of 'body dissatisfaction' and 'interpersonal distrust' compared to patients without psoriasis (21). In our study, in patients with BMI>25; although EAT scores do not differ; MetS, weight dissatisfaction, frequent dieting to lose weight, and some compensatory behaviours, binge eating too much or more than normal, and emotional eating triggered by stress were found to be significantly higher. In our study, it is consistent with the literature that emotional eating behaviours, among the eating attitudes reported in patients with weight gain, have a stronger relationship between higher BMI and MetS (22,9).

Diet is an effective factor in the etiopathogenesis of psoriasis. In our study, attitudes such as 'eating meat', 'eating out', 'trying sugary and fatty foods' were found to be high in the psoriasis group. The high avoidance states we identified are; may be associated with worsening of the psoriasis clinic if the foods mentioned by the patients are consumed (23). Meat is a food source of arachidonic acid, one of the n-6 polyunsaturated fatty acids. Eicosanoids derived from arachidonic acid have been implicated in psoriatic skin lesions by exacerbating

inflammatory processes by increasing IL-1 production and tissue sensitivity to cytokines (24). Schwarz et al. It has been reported that healthy foods such as vegetables positively affect psoriasis, and processed foods, sweets, and alcohol have negative effects on the psoriasis clinic (18). Although there are not enough randomized controlled studies in the literature to confirm the benefit of diet regulation, the patients' own experiences have been instructive in this regard. On the other hand, patients' expression "I feel bloated after meals" may also be associated with inflammatory bowel disease symptoms, which are 4 times more common in psoriasis than in the general population (25). However, while all of these attitudes are expected to be protective for obesity, obesity and metabolic risk increased in the psoriasis group in our study. The significant increase in the expression 'not being able to control oneself about food' in the psoriasis group may explain this situation. According to our results, despite the understanding of psoriasis triggering foods and/or obesity risk, insufficient self-control of eating behaviour seems to increase the risk of obesity.

It is thought that autonomic reactivity plays a role in the pathophysiology, primarily due to psychological reasons, including anxiety, about the difficulty of resisting urges to eat (26). In addition, the difference in appetite characteristics may also be effective. There is increasing evidence that an increase in appetite due to changes in neurohormones, particularly an increase in leptin levels and/or a decrease in regulatory adipokines, is associated with the occurrence of obesity in psoriasis (7). These neuroendocrine changes may also be effective by promoting hunger and the urge to eat and increasing activity in the reward cycle. In our study, the significant increase in the parameter of trying not to eat when hungry in the psoriasis group with BMI>25 may again be an indicator of increased appetite and hunger. In individuals with obesity, lack of satiety response or motivation to eat with hypersensitivity to reward, impulsivity and food-seeking appetite characteristics such as eating faster and more, and poor self-regulation are considered to be risks for excessive calorie consumption and weight gain (20). The increase in activities such as binge eating and emotional eating as pleasurable activities with changes in reward sensitivity in the psoriasis group with BMI>25 is also consistent with the literature.Impulsive eating behaviour, another disordered eating attitude, can explain emotional eating, as it is followed as fast, unplanned reactions regardless of the negative consequences of the behaviour. However, in impulsive eating, excessive compensatory behaviours are expected, which are added to the table together with the feelings of regret experienced later. Only in the psoriasis group with BMI>25, the behaviour of 'I break my food into small pieces' is scored as unhealthy or excessive weight control compensatory behaviour on the scale, but it seems to be an intervention to provide diet and weight control with awareness. At the same time, the significantly lower rate of "I like to eat at the restaurant" compared to the controls can be interpreted as avoidance behaviours associated with psychological symptoms such as social anxiety when combined with the

statement "I feel that others pressure me about food". The positive correlation of EAT scores with HADS-A justifies this interpretation. A systematic review of recent observational studies and clinical trials found that prevalence of anxiety disorders and anxiety symptoms among adult patients with psoriasis using the HADS-A limits, 20-50% of participants had significant anxiety levels and 7-16% were diagnosed with clinical anxiety (27). The psychosocial burden of somatic and anxiety symptoms in psoriasis patients and the relationship between BMI and quality of life have been demonstrated (28,29). In the literature, it has been reported that individuals with high depression and anxiety levels have an increased risk of obesity-associated with their eating attitudes. At the same time, a higher cardiovascular risk is reported in common mental disorders such as depressive disorder and anxiety disorder due to inflammatory changes and autonomic dysfunction, as well as life changes such as smoking, alcohol use, inactivity, and unhealthy diet (30).

This study has many strengths. its prospective nature and the existence of a control group. The severity of psoriasis was accurately assessed using a validated clinical index, cardiometabolic risks were reported with objective criteria, not only the EAT scale scores but also the questions were evaluated and how it was affected was also evaluated. The limitations of this study are the relatively small number of participants, single-centre, and cross-sectional design. Moreover, not excluding patients treated with systemic drugs harbors the possibility of drug influence on the outlook of MetS in psoriasis.

5. CONCLUSION

It is important to raise awareness about impaired eating attitudes in psoriasis patients who are at high risk for cardiometabolic diseases. Our results primarily highlight the relationship that can be explained by autonomic reactivity between anxiety and difficulty resisting food cravings. Professional support including psychoeducation, cognitive behavioural therapy, and acceptance-based therapies should be provided to reduce maladaptive reactions and anxiety by improving self-regulation skills. The severity of psoriasis is associated with deterioration in diet and exercise. Weight loss of psoriasis patients will play an important role in both targeted treatment of psoriasis and reducing their metabolic risks. Supportive interventions for healthy lifestyle changes such as exercise and dietary changes in psoriasis patients; are seen as an unmet medical need. Prospective studies examining the role of lifestyle changes and psychological interventions in patient groups are needed.

6. Ethical considerations

This study was performed in accordance with the Declaration of Helsinki. We have obtained written consent from the patient and approval from the ethics committee of Atatürk University Faculty of Medicine (document dated 09.06.2017 and numbered B.30.2.ATA.0.01.00/154).

7. Conflict of interest

The authors have no conflict of interest to declare.

8. Funding

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