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RESEARCH

Alexithymia Levels and Facial Emotion Recognition Skills in Psoriasis Patients

Psöriazis Hastalarında Aleksitimi Düzeyleri ve Yüzden Duygu İfadesi Tanıma Becerileri

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Abstract

The purpose of this study was to examine alexithymia levels and abilities to recognize facial emotions among psoriasis patients and compare with healthy controls. Sixty psoriasis patients diagnosed in dermatology clinics, and 65 age, sex and educationally matched healthy controls were assessed for this randomized controlled trial. Psoriasis Area Severity Index (PASI) was applied to patients in dermatology clinics, Structured Clinical Interview for DSM-IV Axis-1 Disorders, 20-item Toronto Alexithymia Scale (TAS-20), Facial Emotion Recognition Test (FERT) were applied to patients and controls in psychiatry clinics. Patients' mean TAS-20 total scores were higher, while their ability to recognize negative facial emotions were lower than the control group Patients might have underestimated especially negative emotions over time, for a possible defense mechanism against depression and anxiety. Alexithymia levels were significantly related with psoriasis disease severity. Thus, alexithymia might be a predictor for severity of psoriasis.

Keywords*:* Psoriasis, alexithymia, facial emotion recognition.

Öz

Bu çalışmanın amacı, psöriazis tanısı alan hastalarda aleksitimi düzeylerini ve yüzden duyguları tanıma becerilerini sağlıklı kontrollerle karşılaştırmak ve bu belirtilerin klinik önemini araştırmaktır. Dermatoloji polikliniğinde psöriazis tanısı konan 60 hastaya, yaş, eğitim ve cinsiyet olarak eşleştirilmiş 65 sağlıklı kontrole Psöriazis Alan Şiddet İndeksi (PAŞİ), psikiyatri servisinde DSM-IV eksen-1 için yapılandırılmış klinik görüşme formu, Toronto Aleksitimi Ölçeği (TAÖ), Yüzden Duygu İfadesi Tanıma Testi uygulandı. Psöriazis hastalarının TAÖ toplam ve altölçek puanlarında anlamlı bir yükseklik saptanırken, yüz ifadelerinin büyük kısmını tanıma becerilerinin kontrol grubuna göre daha düşük bulundu. Depresyon ve anksiyete skorlarının da iki grupta benzer olmasından hareketle, hastaların muhtemelen depresyondan ve anksiyeteden korunmak amacıyla zaman içinde özellikle olumsuz duygulara yönelik bir kayıtsızlık geliştirmiş olabilecekleri değerlendirildi. Psöriazis hastalarının aleksitimi seviyeleri ile hastalık şiddeti arasında da anlamlı ilişki olduğu saptandı. Aleksitiminin psoriasis şiddetinin belirleyicilerinden biri olabileceği düşünüldü.

Anahtar sözcükler: Psöriazis, aleksitimi, yüzden duygu ifadesi tanıma.

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PSORIASIS is a chronic inflammatory disease characterized with white squams on erythematous plaques and papules. Its overall rate in general population is 1 to 3% roughly. It has a typical double peak, the former in early and the latter in late adulthood (Atakan and Dogan 2012). It causes remarkable medical and psychiatric morbidity (Russo et al. 2004; Choon et al. 2014).

Various dermatologic conditions are linked to psychiatric disorders and on the contrary, psychological distress can induce or exacerbate dermatologic diseases (Jafferany 2007; Chung et al. 2010; Yaghmaie et al. 2013). These are especially well documented for psoriasis. Patients with psoriasis are reported to suffer from more psychiatric disorders, especially depression and anxiety, than healthy volunteers (Kimball et al. 2012). The importance of psychiatric comorbidities in psoriasis patients has gained more attention in last decade, however, pathogenesis is not clear yet.

Sifneos was the first lecturer who put forward the word alexithymia. Alexithymic individuals have difficulty in perceiving their emotions, expressing them and manifesting them by linking emotions and thoughts (Sifneos 1973). Alexithymic characteristics may also be seen in general population. Literature reported the prevalence of alexithymia to be 12 to 18%, besides, no consensus about gender differences was met thus far (Salminen et al. 1999). It has been suggested that, alexithymic individuals have difficulty in discriminating between their emotions and their physical feelings arising from physiological stimulation (Meza-Concha et al. 2017). Thus, it might make sense that they are sensitive to psychosomatic diseases. The further understanding of the relationship between alexithymia and physical symptoms has led to its inclusion in psychosomatic medicine and it reached to a wider scope over time (Khosravani et al. 2016). Researches concluding alexithymia in the field of dermatology suggest important implications for the treatment of a number of dermatological disorders, and dermatologists were advised to be aware of alexithymia and its possible association with underlying dermatologic diseases (Willemsen et al. 2008).

Certain configurations of facial features resulting from specific patterns of facial muscle movements are accepted to correspond to the particular basic emotions throughout the world (Ekman 1994). Correctly recognizing facial emotions is a crucial ability to construct functional cognitions about self and other people, which then probably may have a strengthening effect on interpersonal relationships and a tendency to become less anxious and depressive. Yet, despite the fact that certain dermatologic diseases including psoriasis are strongly related to psychiatric problems, facial emotion recognition is not broadly researched among those patients.

While higher levels of alexithymia and impairment of facial emotion recognition are already known in medical illnesses related with psychiatric conditions, and while both alexithymia and impairments of facial emotion recognition are related to poorer outcome in treatments of such conditions (Lumley et al. 2007; Pedrosa Gil et al. 2009). With this findings in mind, in this study we aimed to search for both of these features among psoriasis patients, compare these with healthy control subjects and make proper interpretations about the outcomes.

Method

Sample

Current study was performed in Bezmialem Foundation University Hospital. The study protocole was approved by the local ethics committee for non-interventional studies (approval date: 10.07.2018, approval number: 15/182). We performed a power analysis to determine the sample size. The minimum number of subjects was found to be 54 at 90% confidence and 95% power levels. Then, 66 patients diagnosed with psoriasis in dermatology clinics were evaluated, among them, 60 patients (18 males, 42 females) were included in the study. 68 healthy volunteers were selected from employees of Bezmialem Foundation University Hospital and 65 out of them (21 males, 44 females) were added. Individuals working in the psychiatry department have neither been selected for the patient group, nor for the control group, in order to avoid ethics violation.

All subjects were between 18 and 65 years old. Patients and controls with serious psychiatric disorders like alcohol and substance use disorders, severe major depressive disorder, bipolar disorder and schizophrenia were excluded. Besides, individuals who have conditions interfering with communication, like blindness, deafness, mental retardation, and autism spectrum disorders, were not included either. For those reasons, 6 patients and 3 controls were excluded at the beginning. Among excluded patients, 3 had severe major depressive disorder, 1 had schizophrenia, 1 had substance use disorder and 1 had intellectual disability (mental retardation). Among excluded controls, 1 had severe major depressive disorder, 1 had bipolar disorder and 1 had deafness. Written informed consent forms were signed by all individuals who agreed to participate.

Measures

Prior to psychiatric examination and tests, Psoriasis Area Severity Index (PASI) was applied to patients in dermatology outpatient clinics by dermatologists who were in the author team. Among the included patients, 21 was sent by one dermatologist, while the resting 39 was sent by the other dermatologist to psychiatry clinics for the study. Patients and controls were examined by a psychiatrist, then directed to psychiatry residents for performing tests.

Structured Clinical Interview for DSM-IV Axis-1 disorders (SCID-1), sociodemographic data form prepared for the study, 20-item Toronto Alexithymia Scale (TAS-20), Facial Emotion Recognition Test (FERT), Hamilton Anxiety Rating Scale (HAMA) and Hamilton Depression Rating Scale (HAMD) were applied in psychiatry clinics to patients and controls. Sociodemographic data form, SCID-1, TAS-20, FERT, HAMA, and HAMD were performed by two psychiatry residents. Among included individuals, each resident performed tests with 30 patients. One resident performed tests with 31 controls, while the other with 34 controls. Times for performing tests were not counted. The psychiatrist who made the first psychiatric examination and the above mentioned two psychiatry residents set daily meetings for the final decision about inclusion of patients and controls. Individuals who met the inclusion criteria were then included by consensus.

Sociodemographic Data Form

It contained questions to enlighten individual characteristics as follows: age, gender,

marital status, education, level of income, presence of chronic diseases (like diabetes mellitus, hypertension etc.), previous psychiatric disorders, previous psychiatric medication, childhood family status (intact, divorced/broken), current use of tobacco, alcohol and substance, age and duration of psoriasis diagnosis.

Psoriasis Area Severity Index (PASI)

It is used by dermatologists to determine the severity of psoriasis. It was firstly developed by Fredriksson and Peterson (1978). Since then, it was widely used for determining the disease severity and response to treatment. It is a quantitative method for evaluating psoriatic plaques. Three typical signs of plaques, erythema, infiltration, and desquamation are measured and classified according to severity ranges from 0 to 4. Besides, affected areas of head, upper extremities, body and lower extremities and their involvement percentages are also graded (Ramsay and Lawrance 1991, Finlay et al. 1990). The maximum score of the index is 72 (Bonifati and Berardesca 2007). PASI is generally accepted to be the gold standard for measuring the disease severity (Puzenat et al. 2010). Validation and reliability analysis of the Turkish form of the index has not been not performed yet.

Structured Clinical Interview for DSM-IV Axis-1 Disorders (SCID-I)

It is an interview form for DSM-IV Axis-1 disorders prepared by First et al. (1997). Adaptation and reliability study for Turkish form was performed by Özkürkçügil et al. (1999) and its clinical version was written by Çorapçıoğlu et al. (1999).

Twenty Item Toronto Alexithymia Scale (TAS-20)

It is a likert type self-report scale. Each item is scored between 1 and 5. Some items are scored in reverse order. There are three subscales as follows: Difficulty in Identifying Feelings (TAS-1), Difficulty in Describing Feelings (TAS-2) and Externally Oriented Thinking (TAS-3). Higher levels of test scores indicate higher levels of alexithymia. The scale was developed by Bagby et al (1994). Turkish adaptation study was performed by Güleç et al. (2009). The Turkish TAS-20 showed a three-factor model. The Cronbach alpha for the total TAS-20 scale was 0.78, and for the three subscales (factors 1–3); 0.80, 0.57, and 0.63 respectively. All items (except 18 and 20) correlated significantly with the total score, the values ranged from 0.22 to 0.48, which demonstrated that, it had adequate internal consistency. Thus, the TAS-20 scale was found to be a valid construct within Turkish culture. Scale total scores are categorized according to the cutoff points such that, a total score of ≥61 points stands for alexithymia and ≤51 points for no alexithymia.

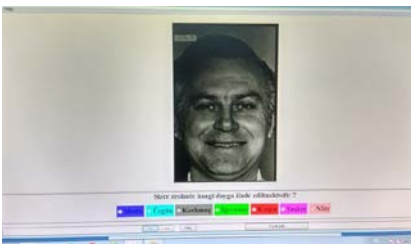

Figure 1. Application of Facial Emotion Recognition Test

Figure 2. Application of Facial Emotion Recognition Test

Facial Emotion Recognition Test (FERT)

It was composed via bringing together a total of 56 black and white photographs selected from Ekman and Friesen's catalogs, representing happy, surprised, fearful, sad, angry, disgusted and neutral facial emotions of four men and four women (Ekman 1999). Those widespread known photographs of faces were initially taken, developed and used by Ekman and Friesen to test the existence of emotions as cross-cultural universals (1976). Photo images of these faces were digitized on a computer presentation via a Structured Query Language (SQL) data application in a Visual Basic NET software program (2.4 GHz and 3 MB processor, 3 GB main memory, 15.6-inch LCD screen with 1,366×768 pixel resolution). All participants performed the test in a silent, properly illuminated and ventilated room. Participants seated 45 to 60 cm apart from the computer scene. There was an array of colours under each facial expression scene (Figure 1). Each expression matched with a separate certain colour on the array and a certain button on the keyboard. We sticked self-adhesive notepapers on each of these buttons, coloured identical with their counterparts on the computer scene (Figure 2). At the beginning, in order to accommodate participants to the test, seven separate facial expressions on the first seven certain photographs were told by the residents who applied the test to the participants. The rest 49 photographs were automatically shown to subjects in a mixed order. When the subject chose one emotion and pressed the related key, the subsequent photograph was automatically displayed on the scene. But, participants were not told about the correct total number of any expressions and received no feedback, not to cause a tendency for any expressed emotion. Immediately after the test finished, the programme automatically produced an excel file that has the records of answers. Data contained in each patient's file were then examined and number of correctly detected emotions and average answering time for each emotion was recorded to the SPSS file.

Table 1. Demographic data of psoriasis patients and controls.

Variable	Psoriasis (n=60)	Controls (n=65)	p
Age (years)	44.42±13.47	44.71±10.60	t=-0.13, p=0.89
Sex (M/F)	18/42	21/44	X^2=0.077, p=0.781
Marital Status (married %)	76.7 (n=46)	76.9 (n=50)	X^2=0.001, p=0.97
Education (high school and over %)	50.0 (n=30)	64.6 (n=42)	X^2=2.73, p=0.099
Tobacco smokers (%)	36.7 (n=22)	44.6 (n=29)	X^2=0.82, p=0.37
Alcohol intakers (%)	16.7 (n=10)	29.2 (n=19)	X^2=2.76, p=0.096

M, Male; F, Female; n, number of subjects; t: t score; X2, chi-square test score; p, probability value

FERT is a computer task and this form was not standardized or validated for Turkish population. However, researchers from Turkey used two different combinations of photographs from Ekman and Friesen's catalogs in the form of consecutive slides on the computer. They named those tests as Facial Emotion Identification Test and Facial Emotion Discrimination Test. Results of the study demonstated that both tests were valid and reliable for the Turkish population (Erol et al. 2009). Besides, in a previous study, photographs of 17 faces from Ekman and Friesen's catalogs displaying the six universal emotions were used to test the reliability. The results indicated that the instrument was relatively successful at distinguishing among individuals who were better or worse at facial recognition (Morand 2001).

Hamilton Anxiety Rating Scale (HAMA)

Developed originally by Hamilton (1959), it is used for determining the level, distribution of symptoms and severity of anxiety. It is a Likert type scale consisting of fourteen questions. Each item is scored between 0 and 4. The optimal HAMA score ranges were determined as follows: mild anxiety = 8–14; moderate = 15–23; severe ≥ 24. Scores ≤ 7 were considered to represent no/minimal anxiety (Matza et al. 2010). The validity and interrater reliability study of Turkish form was performed by Yazıcı et al (1998). In that study, joint-interview method with a structured interview guide (Hamilton Anxiety Rating Scale-Interview guide) was used in a group of 20 patients to assess the interrater reliability of the scale. Criterion validity was also assessed by comparing the HAMA scores with State-Trait Anxiety Inventory scores. The findings of this study demonstrated that the interview guide is a reliable instrument and that HAMA meets the standards of validity assessment.

Table 2. Alexithymia and Hamilton test scores of patients and controls

Scale	Psoriasis (n=60)	Controls (n=65)	p
TAS-1	13.40±5.32	10.05±2.34	z=3.75, p<0.001
TAS-2	13.18±4.42	10.63±3.30	z=3.48, p<0.001
TAS-3	22.25±3.55	17.03±4.15	t=7.53, p<0.001
TAS total	49.23±10.11	37.54±6.85	z=6.73, p<0.001
HAMA psychic	3.57±3.81	4.23±3.65	z=1.43, p=0.15
HAMA somatic	5.30±5.84	2.62±2.69	z=2.60, p=0.009
HAMA total	8.88±8.99	6.88±5.93	z=0.86, p=0.39
HAMD total	6.38±7.12	6.46±5.12	z=1.14, p=0.26

TAS-1: Difficulty in Identifying Feelings subscale; TAS-2: Difficulty in Describing Feelings subscale; TAS-3: Externally Oriented Thinking subscale; HAMA: Hamilton Anxiety Rating Scale scores; HAMD: Hamilton Depression Rating Scale scores; n, number of subjects; t: t-test score; z, Mann-Whitney U test score; p, probability value.

Hamilton Depression Rating Scale (HAMD)

Developed originally by Hamilton for the measurement of severity of depressive symptoms (1960) , the structured form was developed by Williams (1988) . The following severity ranges were recommended: no depression (0–7); mild depression (8–16); moderate depression (17–23); and severe depression (≥24) (Zimmerman et al. 2013). The validity and reliability study of Turkish form was carried out by Akdemir et al (2001). In that study, the severity of depression was assessed with the HAMD, Beck Depression Inventory (BDI), and Clinical Global Impression score (CGI).

The test-retest reliability coefficient of the HDRS based on a 5-day interval was 0.85, with a Cronbach alpha coefficient of 0.75 and a split-half reliability coefficient of 0.76. Interrater reliability coefficients based on the independent ratings of four assessors were between 0.87 and 0.98. The correlation between the HAMD and BDI scores was 0.48, and between the HAMD and CGI, it was 0.56. Principal Components Analysis yielded six factors. The correlation (-0.13) between the control and patient groups indicated that the Turkish form of HAMD assessed depression very well.

Statistical Analysis

SPSS 24.0 packaged software was used for all analyses in this cross-sectional trial. All numerical variables were demonstrated as means±standard deviations while categorical variables were demonstrated with frequency and probability tables. For normally distributed samples, independent samples t-test (Student t-test) was used for comparison of

numerical variables and Chi-Square test for categorical variables. For samples which were not normally distributed, Mann-Whitney U test was used for comparison of numerical variables. Pearson Correlation test was used for assessing correlations between numerical variables. P<0.05 was accepted to be the significance level for all statistical analyses.

Table 3. Facial Emotion Recognition Test scores of patients and controls.

Emotion	Psoriasis (n=60)	Controls (n=65)	p
Happy	6.67±1.12	6.88±0.45	z=1.03, p=0.30
Sad	4.33±2.01	5.92±1.28	z=4.70, p<0.001
Fearful	2.47±1.61	5.06±1.32	z=7.47, p<0.001
Disgusted	4.42±1.68	5.57±1.12	z=3.99, p<0.001
Angry	4.90±1.69	6.26±0.91	z=5.03, p<0.001
Surprised	5.63±1.77	5.78±1.22	z=0.34, p=0.73
Neutral	4.82±2.47	6.09±1.26	z=2.67, p=0.008

n: number of subjects; z: Mann-Whitney U test score; p: probability value

Table 4. Correlations between PASI, TAS-20 and FERT scores of psoriasis patients

Variable	PASI	TAS-1	TAS-2	TAS-3	TAS-total
PASI		p<0.001, r=0.485	p<0.001, r=0.458	p=0.018, r=0.306	p<0.001 r=0.662
TAS-1	p<0.001 r=0.485		p<0.001 r=0.396	p=0.03 r=0.267	p<0.001 r=0.613
TAS-2	p<0.001 r=0.458	p<0.001 r=0.396		p<0.001 r=0.350	p<0.001 r=0.720
TAS-3	p=0.018 r=0.306	p=0.03 r=0.267	p<0.001 r=0.350		p<0.001 r=0.709
TAS-20 total	p<0.001 r=0.662	p<0.001 r=0.613	p<0.001 r=0.720	p<0.001 r=0.709	
Happy	p=0.701 r=0.051	p=0.497 r=-0.061	p=0.513 r=0.059	p=0.853 r=-0.017	p=0.569 r=-0.051
Sad	p=0.308 r=-0.135	p<0.001* r=-0.361	p=0.025* r=-0.201	p<0.001* r=-0.312	p<0.001* r=-0.390
Fearful	p=0.172 r= 0.180	p=0.002* r=-0.275	p=0.006* r=-0.245	p<0.001* r=-0.396	p<0.001* r=-0.465
Disgusted	p=0.276 r=-0.144	p=0.018* r=-0.211	p=0.099 r=-0.148	p=0.001* r=-0.300	p<0.001* r=-0.308
Angry	p=0.824 r=-0.030	p=0.001* r=-0.290	p=0.274 r=-0.099	p=0.035* r=-0.189	p=0.001* r=-0.300
Surprised	p=0.745 r=0.043	p=0.412 r=-0.074	p=0.274 r=-0.099	p=0.481 r=0.064	p=0.662 r=-0.039
Neutral	p=0.331 r=-0.129	p=0.001* r=-0.296	p<0.001* r=-0.342	p=0.176 r= 0.122	p<0.001* r=-0.380

PASI: Psoriasis Area Severity Index; FERT: Facial Emotion Recognition Test; TAS-1: Difficulty in Identifying Feelings subscale; TAS-2: Difficulty in describing Feelings subscale; TAS-3: Externally Oriented Thinking subscale; p: probability value; r: correlation coefficient.

Results

Mean ages, gender, marital status and educations of patient and control group did not differ significantly (Table 1). Tobacco and alcohol using profiles did not differ either (Table 1). Mean TAS-20 total and all subscale scores of patients were significantly higher than controls (Table 2). There were no significant differences between mean

HAMD and HAMA total scores of groups. An expected difference was demonstrated in somatic subscore of HAMA. That is, somatic anxiety scores of patients were higher than the controls (Table 2).

We also analyzed the relationship of TAS-20 total and subscale mean scores with certain sociodemographic variables among the patient group. Independent samples t-test demonstrated that male and female patients had comparable scores of TAS-20 total and subscales (p values were 0.172 for TAS-20 total and 0.213, 0.199 and 0.640 for TAS-1, 2 and 3 respectively). As 9 patients were bachelors and 5 were divorced/separated, we decided to unite these, thus, adopted two groups regarding marital status, married and non-married. Independent samples t-test showed no significant difference between these two groups for TAS-20 total and subscale mean scores (p values were 0.870 for TAS-20 total and 0.449, 0.750 and 0.788 for TAS-1, 2 and 3 respectively).

Likewise, we composed two patient groups as high school and higher graduates and primary education and lower graduates. These two groups did not have significant differences regarding TAS-20 total and subscale scores (p values found in t-test were 0.186 for TAS-20 total and 0.361, 0.931 and 0.971 for TAS-1, 2 and 3 respectively). Additionally, TAS-20 scores did not show a significant difference according to presence of chronic medical ilness, history of psychiatric disorders, family status in childhood, and usage of tobacco, alcohol and substance. Correlation analyses showed no significant correlations between TAS-20 scores and age and duration of psoriasis.

FERT outcomes were compared between groups and interestingly, significant differences regarding the number of correctly identified emotions were found particularly in negative emotions. Patients' mean number of correctly identified sad, fearful, disgusted, angry and neutral emotions were significantly lower than controls. Happy and surprised emotions showed no significant difference between groups (Table 3).

We analyzed whether there was a relationship between PASI, TAS-20 and FERT scores among patients (Table 4). Significant positive correlations were found between PASI and TAS-20 total and subscale scores. No significant correlations were found between PASI and FERT scores.

Discussion

One of the first published articles concerning psychiatric issues in dermatologic diseases was the work of MacKenna, in which the author considered that chronic psoriasis is often linked with deeply repressed emotional conflicts (MacKenna 1944). Later on, a huge volume of studies about psychiatric problems among psoriasis patients have been published. A pilot study reported that stressful life situations involving the mobilisation of severe anxiety and unexpressed resentment occured in relation to the onset of psoriasis in eight cases and in association with exacerbations in fourteen cases out of a total of twenty patients (Susskind and McGuire 1959). A case-control study recently reported that the overall prevalence of psychological distress in psoriasis patients was significantly more than healthy controls and dermatologists and family members should be educated to recognize the symptoms early and encouraged to seek the help of a psychiatrist (Goyal et al. 2017).

However, contrary to the findings of previous studies, we did not find any significant differences between depression and anxiety scores of patients and controls. This

finding may partly be related to the patient profile. Patients in this trial were mostly the ones who applied for dermatologic examination regularly. Besides, they all were outpatients and none of them had the most severe forms of the disease, like erythrodermic psoriasis (Raychaudhuri et al. 2014). Thus, most of the patients might have had good control of the disease. This situation may also explain the patients' comparable levels of anxiety and depression with healthy controls. An exception was the mean somatic anxiety score of patients, which might predominantly be the result of aesthetic preoccupation because of the marks of psoriatic plaques on the skin.

According to the psychosomatic theory, it is suggested that due to the lack of emotional awareness originating from alexithymia, emotions are expressed through physical symptoms, especially psoriasis (Conrad et al. 2008). Prevalence of alexithymia in a large sample of psoriasis patients was found to be 24.8%, which is significantly higher than the general population (Sampogna et al. 2017). Likely, we found that psoriasis patients were more alexithymic than healthy controls. A recent study aimed to assess the frequency of alexithymia and its relationship with self-management and illness perception in psoriasis and showed that, alexithymia indicates inferior self-management and causes worse illness perception (Larsen et al. 2017). We did not look for disease perception or a causal relationship between psoriasis severity and alexithymia, however, we found that disease severity and alexithymia levels had positive correlation. In another recent study with 108 psoriasis patients, psychopathology was evaluated with the Symptom Checklist-90-Revised (SCL-90-R) and alexithymia with TAS-20. Disease severity was clinically assessed using PASI. In that study, patients with alexithymia presented with statistically significant higher somatization, interpersonal sensitivity, anxiety and phobic anxiety than non-alexithymic patients. In addition, alexithymia also contributed to the prediction of these conditions. However, no statistically significant differences were found between PASI scores and alexithymia levels (Korkoliaou et al. 2017). We did not search for a wide spectrum of clinical signs and the predictive role of alexithymia among psoriasis patients. However, our findings about levels of depression and anxiety among psoriasis patients were clearly distinct from previous studies.

Unlike depression and anxiety, alexithymia is accepted to be a personality construct rather than a disorder, which poses risk for several psychiatric issues, particularly for psychosomatic disorders (Taylor et al. 1991). Thus, alexithymia might be an important factor for both diagnosis and treatment of psoriasis and might be one of the predictors of psoriasis severity.

Facial emotion recognition is crucial for interpersonal relationships and constitution of useful and flexible cognitions. In one of the rare studies concluding facial emotion recognition in psoriasis patients, researchers reported that, patients were less able than controls to identify all intensities of disgust and this result was attributed to a coping mechanism to protect them from stressful emotional responses by blocking the processing of disgusted facial expressions (Kleyn et al. 2009). In this remarkable study, the authors suggested a biologically plausible basis for observed psychological associations of psoriasis and previously unreported insights into the brain-skin axis. Our findings demonstrated somewhat distinct results. All emotions, except happy and surprised, were recognized poorer by patients than controls. Patients, as mentioned above (Kleyn et al. 2009), might be using a self-protective strategy against negative emotions. Taking together with higher alexithymia levels, psoriasis patients may display poorer responses

to all kinds of negative emotions over time. This strategy might also have protected them to be depressed or anxious apparently. However, also considering the significant relationship found between alexithymia levels and disease severity in the current study, we assert that the price of this strategy might be the ongoing unconscious conflicts which may take part in proceeding and exacerbation of the disease. Thus, the mechanism needs to be searched via follow-up studies and more sophisticated methods to detect emotion recognition in the future.

Another remarkable finding of the current study is that mean scores of sad, fearful, disgusted, angry and neutral emotions showed negative correlations with TAS-20 mean score. This finding is in concordance with the interpretation that psoriasis patients might have underestimated the importance of negative emotions over time.

In a cross-sectional study, temperament and character properties of psoriasis patients were investigated. In this study, among the temperament properties, novelty seeking, harm avoidance, reward dependence and among the character properties, self-transcendence scores were found to be higher in psoriasis patients than in healthy controls (Ak et al. 2011). However, only male patients ranging from 20 to 30 years old were included in the study, which was pointed out to be an important limitation. Besides, since that work had a cross-sectional design, the authors discussed that they cannot talk about causal relationships between psoriasis and temperament and character dimensions. Yet, those dimensions might have a remarkable role in clinical course of psoriasis. Our sample had a wider range regarding ages, yet, we did not search for temperament and character properties.

The current study has several limitations. At the onset, the sample size was relatively small. Another limitation is our model to detect facial expressions. Photographic films only were used for the process, but motion videos, analyses of facial muscle movements and functional magnetic resonance imaging (fMRI) could have been more descriptive. We did not limit the time for FERT. Despite the fact that those photographs are accepted to be cross-cultural universals, we could have searched for possible individual differences in discriminative abilities by limiting the exposure time of each photograph to a short time period. Validity and reliability of the Turkish forms of PASI and our computer based FERT were not performed. We did not determine temperament and character properties of patients and controls. Besides, in view of the fact that individuals who had TAS-20 scores of ≥61 points are accepted to be alexithymics, very limited numbers of individuals in our sample were fulfilling this criterion. Thus, instead of separating the sample as alexithymics or non-alexithymics, we decided to compare the groups according to the mean scores of TAS-20 total and subscales. This may also be considered as a limitation.

The main outcomes of the current trial are that psoriasis patients were shown to be more alexithymic and to have lower ability to recognize most of the facial emotions, particularly negative emotions, than the healthy control group. The severity of the disease was shown to be related to alexithymia levels among psoriasis patients. However, facial emotion recognition and psoriasis severity were not related. Thus, alexithymia might be a predictor for psoriasis severity. In conclusion, we suggest that the relationship between psoriasis, alexithymia, and impairments of facial emotion recognition needs to be searched with follow-up studies and neuroimaging and facial muscle movements should be included in the future. We also suggest that, the derma-

tologic care of the psoriasis patients might be improved by simultaneous psychiatric examinations focused on not only depression and anxiety, but also alexithymia and impairments of facial emotion recognition.

References

Ak M, Hacıömeroğlu B, Turan Y, Lapsekili N, Doruk A, Bozkurt A et al. (2012) Temperament and character properties of male psoriasis patients. J Health Psychol, 17:774-781.

Akdemir A, Türkçapar M, Örsel S, Demirergi N, Dağ I, Özbay M (2001) Reliability and validity of the Turkish version of the Hamilton Depression Rating Scale. Compr Psychiatry, 42:161–165.

Atakan N, Doğan S (2012) Psöriazis sistemik bir hastalık mıdır? Turk J Dermatol, 6:119-122.

Bagby RM, Parker JD, Taylor GJ (1994) The twenty-item Toronto Alexithymia Scale—I. Item selection and cross-validation of the factor structure. J Psychosom Res, 38:23-32.

Bonifati C, Berardesca E (2007) Clinical outcome measures of psoriasis. Reumatismo 59 (Suppl 1):64-67.

Çorapçıoğlu A, Aydemir Ö, Yıldız M (1999) DSM-IV Eksen I Bozuklukları (SCID-I) İçin Yapılandırılmış Klinik Görüşme, Klinik Versiyon. Ankara, Hekimler Yayın Birliği.

Choon SE, Lai NM, Mohammad NA, Nanu NM, Tey KE, Chew SF (2014) Clinical profile, morbidity, and outcome of adult - onset generalized pustular psoriasis: analysis of 102 cases seen in a tertiary hospital in Johor, Malaysia. Int J Dermatol, 53: 676-684.

Chung MC, Symons C, Gilliam J, Kaminski ER (2010) Stress, psychiatric co-morbidity and coping in patients with chronic idiopathic urticaria. Psychol Health, 25:477–490.

Conrad R, Geiser F, Haidl G, Hutmacher M, Liedtke R, Wermter F (2008) Relationship between anger and pruritus perception in patients with chronic idiopathic urticaria and psoriasis. J Eur Acad Dermatol Venereol, 22:1062-1069.

Ekman P (1999) Facial expressions. In: Handbook of Cognition and Emotion (Eds T DaIgleish, M Power):301–320. USA; Wiley.

Ekman P (1994) Strong evidence for universals in facial expressions: A reply to Russell's mistaken critique. Psychol Bull, 115:268–287.

Ekman P, Friesen WV (1976) Pictures of Facial Affect. Palo Alto CA, Consulting Psychologists Press.

Erol A, Ünal EK, Gülpek D, Mete L (2009) Yüzde dışavuran duyguların tanınması ve ayırt edilmesi testlerinin türk toplumunda güvenilirlik ve geçerlilik çalışması. Anadolu Psikiyatri Derg, 10:116-123.

Finlay AY, Khan GK, Luscome DK, Salak MS (1990) Validation of sickness impact profile and disability index in psoriasis. Br J Dermatol, 123:751-756.

First MB, Spitzer R, Gibbon M, Williams J (1997) Structured Clinical Interview for DSM IV Clinical Version (SCID-1/CV). Washington DC, American Psychiatric Press.

Fredriksson T, Pettersson U (1978) Severe psoriasis-oral therapy with a new retinoid. Dermatologica, 157:238-241.

Goyal S, Pisharody RR, Nath S (2017) Psychiatric morbidity in psoriasis: A case-control study. Journal of Marine Medical Society, 19:18-23.

Güleç H, Köse S, Güleç MY, Çitak S, Evren C, Borckardt J et al. (2009) Reliability and factorial validity of the Turkish version of the 20-item Toronto Alexithymia Scale (TAS-20). Klin Psikofarmakol Bulteni, 19:214-220.

Hamilton M (1960) A rating scale for depression. J Neurol Neurosurg Psychiatry, 23:56–62

Hamilton M (1959) The assessment of anxiety states by rating. Br J Med Psychol, 32:50–55.

Jafferany M (2007) Psychodermatology: a guide to understanding common psychocutaneous disorders. Prim Care Companion J Clin Psychiatry, 9: 203–213

Khosravani V, Alvani A, Sharifi Bastan F, Jamaati Ardakani R, Akbari H (2016) The alexithymia, cognitive emotion regulation, and physical symptoms in Iranian asthmatic patients. Pers Individ Dif, 101:214–219

Kimball AB, Wu EQ, Guérin A, Yu AP, Tsaneva M, Gupta SR et al. (2012) Risks of developing psychiatric disorders in pediatric patients with psoriasis. J Am Acad Dermatol, 67:651-657.

Kleyn CE, McKie S, Ross AR, Montaldi D, Gregory LJ, Elliott R et al. (2009) Diminished neural and cognitive responses to facial expressions of disgust in patients with psoriasis: a functional magnetic resonance imaging study. J Invest Dermatol, 129:2613-2619.

Korkoliakou P, Efstathiou V, Giannopoulou I, Christodoulou C, Kouris A, Rigopoulos D et al. (2017) Psychopathology and alexithymia in patients with psoriasis. An Bras Dermatol, 92:510-515.

Larsen MH, Krogstad AL, Wahl AK (2017) Alexithymia, illness perception and self-management competency in psoriasis. Acta Derm Venereol, 97:934-940.

Lumley MA, Neely LC, Burger AJ (2007) The assessment of alexithymia in medical settings: implications for understanding and treating health problems. J Pers Assess, 89:230-246.

Mac Kenna RMB (1944) Psychosomatic factors in cutaneous disease. Lancet, 2:679-681.

Matza LS, Morlock R, Sexton C, Malley K, Feltner D (2010) Identifying HAM - A cut offs for mild, moderate, and severe generalized anxiety disorder. Int J Methods Psychiatr Res, 19:223-232.

Meza-Concha N, Arancibia M, Salas F, Behar R, Salas G, Escobar R (2017) Towards a neurobiological understanding of alexithymia. Medwave, 17:e6960.

Morand DA (2001) The emotional ıntelligence of managers: assessing the construct validity of a nonverbal measure of "people skills". J Bus Psychol, 16:21-33.

Özkürkçügil A, Aydemir Ö, Yılmaz M, Esen Danacı A, Köroğlu E (1999) DSM-IV Eksen I bozuklukları için yapılandırılmış klinik görüşmenin Türkçeye uyarlanması ve güvenilirlik çalışması. İlaç ve Tedavi Dergisi, 12:233–236.

Pedrosa Gil F, Ridout N, Kessler H, Neuffer M, Schoechlin C, Traue HC et al. (2009) Facial emotion recognition and alexithymia in adults with somatoform disorders. Depress Anxiety, 26:E26-E33.

Puzenat E, Bronsard V, Prey S, Gourraud PA, Aractingi S, Bagot M et al. (2010) What are the best outcome measures for assessing plaque psoriasis severity? A systematic review of the literature. J Eur Acad Dermatol Venereol, 24(Suppl 2):10-16.

Ramsay B, Lawrence CH (1991) Measurement of involved surface area in patients with psoriasis. Br J Dermatol, 124:565-570.

Raychaudhuri SK, Maverakis E, Raychaudhuri SP (2014) Diagnosis and classification of psoriasis. Autoimmun Rev, 13:490-495.

Russo PA, Ilchef R, Cooper AJ (2004) Psychiatric morbidity in psoriasis: a review. Australas J Dermatol, 45:155-161.

Salminen JK, Saarijärvi S, Äärelä E, Toikka T, Kauhanen J (1999) Prevalence of alexithymia and its association with sociodemographic variables in the general population of Finland. J Psychosom Res, 46:75-82.

Sampogna F, Puig L, Spuls P, Girolomoni G, Radtke MA, Kirby B et al. (2017) Prevalence of alexithymia in patients with psoriasis and its association with disease burden: a multicentre observational study. Br J Dermatol, 176:1195-1203.

Sifneos PE (1973) The prevalence of alexithymic characteristics in psychosomatic patients. Psychother Psychosom, 22:255-262.

Susskind W, McGuire RJ (1959) The emotional factor in psoriasis. Scott Med J, 4:503-507.

Taylor GJ, Bagby RM, Parker JD (1991) The alexithymia construct: a potential paradigm for psychosomatic medicine. Psychosomatics, 32: 153-164.

Willemsen R, Roseeuw D, Vanderlinden J (2008) Alexithymia and dermatology: the state of the art. Int J Dermatol, 47: 903-910.

Williams JBW (1988) A structured interview guide for the Hamilton depression rating scale. Arch Gen Psychiatry, 45: 742-747.

Yaghmaie P, Koudelka CW, Simpson EL. Mental health comorbidity in patients with atopic dermatitis. J Allergy Clin Immunol, 2013; 131: 428–433

Yazıcı M, Demir B, Tanrıverdi N, Karaağaoğlu E, Yolaç P (1998) Validity and inter-rater reliability of Hamilton Anxiety Rating Scale. Turk Psikiyatri Derg, 9:114–117.

Zimmerman M, Martinez JH, Young D, Chelminski I, Dalrymple K (2013) Severity classification on the Hamilton depression rating scale. J Affect Disord; 150:384–388.

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