PSYCHOSOMATIC SYNDROMES AND SYMPTOM SEVERITY IN CHRONIC PSORIASIS

Annamaria Petito, Angela Piazzoli, Mario Altamura, Antonello Bellomo,
Francesco Bernardini, Laura Scarponi, Piero Porcelli

Abstract

Objective: To investigate whether and the extent to which psychosomatic syndromes and psychopathology are associated to psoriasis severity.

Method: Consecutive 282 outpatients with chronic psoriasis were assessed for psychopathology (with the Mini International Neuropsychiatric Interview), psychosomatic conditions (with the Diagnostic Criteria for Psychosomatic Research, DCPR), severity of psoriatic symptoms (with the Psoriasis Area and Severity Index, PASI), and illness-related quality of life (with the Dermatology Life Quality Index, DLQI).

Results: Psychopathology was diagnosed in 26.6% patients while at least one DCPR syndrome in 67% of them and higher psychosomatic severity (>1 DCPR syndrome) in 29.1%. Higher symptom severity (PASI>20) was significantly more prevalent in patients with greater psychosomatic severity (29.1%) (d=1.25) – particularly, alexithymia (29.4%; d=0.83) – and poorer quality of life (DLQI>10) (d=0.86). Furthermore, after controlling for psychopathology, psychosomatic severity, and alexithymia, together with lower illness-related quality of life, independently predicted severity of symptoms, with large effect size (d=0.78 and d=1.75, respectively).

Conclusions: DCPR clusters can be suggested as a useful tool for identifying psychological distress in psoriasis, significantly linked to both subjective (quality of life) and objective factors (severity of lesions and extension of affected skin areas) of the illness experience.

Key words: alexithymia, diagnostic criteria for psychosomatic research, psoriasis, psychopathology, symptom severity

Annamaria Petito[1], Angela Piazzoli[2], Mario Altamura[1], Antonello Bellomo[1], Francesco Bernardini[3], Laura Scarponi[2], Piero Porcelli[5]

[1] Department of Clinical and Experimental Medicine, Psychiatry Unit, University of Foggia, Italy;
[2] Territorial Mental Health Center USL Umbria 2, Perugia, Italy;
[3] SPDC Pordenone, Department of Mental Health, AsFO Friuli Occidentale, Italian NHS, Pordenone, Italy;
[4] USC Psichiatria 1, Department of Mental Health and Addiction Disorders, ASST Papa Giovanni XXIII, Bergamo, Italy;
[5] Department of Psychological, Health, and Territorial Sciences, University of Chieti, Italy

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Corresponding author
Piero Porcelli, PhD
Department of Psychological, Health, and Territorial Sciences
Via dei Vestini, 31
66100 Chieti, Italy
Phone: +39 0871 3555339
E-mail: piero.porcelli@unich.it

Introduction

Psoriasis is a chronic auto-immune inflammatory disease of the skin characterized by skin lesions, erythematous-squamous plaques, with a complex etiology involving genetic risk factors, abnormal activation of the immune system, and environmental factors, such as sunburns, infections, and stress (Boehncke & Schon, 2015; Harden, Krueger, & Bowcock, 2015; Schadler, Ortel, & Mehlis, 2019). Psoriasis has an incidence of 1-2% in the general population and a reported prevalence ranging from 0.2% to 4.8%, with no gender differences (Danielsen, Olsen, Wilsgaard, & Furberg, 2013; James, Berger, & Elston, 2016). Moreover, skin lesions, erythematous-squamous plaques with variable osteo-articular and nail involvement may be associated with systemic damage, such as ischemic cardiovascular disease, metabolic syndrome, autoimmune disorders, and ocular pathologies (Rehal, Modjtahedi, Morse, Schwab, & Maibach, 2011; Boehncke & Schon, 2015; Harden, Krueger, & Bowcock, 2015). Furthermore, psoriasis is a disease characterized by a waxing-and-waning course of symptoms with a severe psychosocial impact, comparable to diabetes and cancer (Negrei et al., 2015; Batani et al., 2018). Therefore, a careful consideration of psychosocial factors is essential for managing the skin disorders effectively (Hutteman, Nestler, Wagner, Egloff, & Back, 2015; Baudson, Weber, & Freund, 2016). Manifestations of erythema, crusting, thick scaling, and malodor are easily observable by the affected subject and other people, so that patients may suffer from stigmatization, poor self-esteem, negative self-perception, and increasing psychological

distress (Ginsburg & Link, 1993; Gupta, Gupta, & Watteel,1998; Korman, Zhao, Pike, & Roberts, 2016), and fostering avoidant behavior, increased family dysfunction, and social isolation that can be detrimental to patients' interpersonal relationships (Gupta & Gupta, 1997; Eghlileb, Davies, & Finlay, 2007; Pearce et al., 2006).

The overall clinical picture of psoriatic patients is further worsened by the prevalence of psychopathology. Among dermatologic conditions, psoriasis has indeed the highest association with psychiatric illness, including mood, anxiety and personality disorders. Even though over the past few decades the importance of psychiatric comorbidity has been increasingly recognized, the role of psychiatric disorders is not yet fully understood because of several confounding factors. First, the weight of psychopathology in the pathogenesis of psoriasis remains unclear given the correlational nature of most studies and the high psychosocial burden of the disease (Russo, Ilchef, & Cooper, 2004; Ferreira, Abreu, Reis, & Figueiredo, 2016; Cohen, Martires, & Ho, 2016). Second, a large proportion of psoriatic patients may not meet full diagnostic criteria for psychopathology classification and the weight of subthreshold syndromes have not been ascertained (Schmitt & Ford, 2007; Tyring et al., 2006). For example, a recent study highlighted that the majority of psoriatic patients reported depressive and anxiety symptoms which however did not qualify for a full depressive or anxiety disorder (Padma, Nanaware, Yadiyal, & Mathai, 2020). Third, a causal model has not been identified and the likely explanation is that psoriasis has a multifactorial etiology (Boehncke & Schon, 2015). From a clinical viewpoint, however, it is more important to understand the personality and the life context of a patient affected by a chronic medical condition than the etiology of the disease. In fact, psychological factors, including perceived health and perception of stigmatization, were found as stronger determinants of disability in patients with psoriasis than disease severity, location and duration (Fortune et al., 2003). Understanding psychosocial and emotional difficulties encountered by patients with psoriasis that may negatively interfere with illness severity would deserve more attention. Indeed, although the high burden of psoriasis due to the negative physical, psychological, and social consequences, our knowledge of how combined somatic and non-somatic factors may affect patients' quality of life (QoL) directly and indirectly remains mostly unknown. Of interest, there is evidence that poor illness-related QoL is driven by a combination of symptom severity and stigmatization, whereas psychopathology is related mostly to stigmatization alone (Korman et al., 2016).

Psoriasis negatively affects not only health and social life of patients but also their psychological well-being. Neglecting these issues from the usual clinical management may influence patients' adherence to treatment and even contribute to negative treatment outcomes. Gathering information about comorbidity, response to previous treatments, daily psychosocial functioning, life events, and psychosocial well-being is considered an essential asset when planning different treatment choices through the direct involvement of the patient in his or her treatment plan by improving therapeutic alliance (Korman et al., 2016; Tatu & Nwabudike, 2017). The Diagnostic Criteria for Psychosomatic Research (DCPR) clusters have been suggested as a useful tool for identifying psychological distress in several medical conditions, including psoriasis (Fava et al., 1995; Porcelli & Sonino, 2007). DCPR clusters aim to expand the traditional biomedical model of diagnosis by translating psychosocial variables that derive from psychosomatic research into operational tools. They include diagnostic criteria for abnormal illness behavior (disease phobia, thanatophobia, health anxiety, and illness denial), different modalities of somatization (persistent somatization, functional somatic symptoms secondary to a psychiatric disorder, conversion symptoms, and anniversary reaction), and affective factors (irritable mood, type A behavior, demoralization, and alexithymia). They have undergone extensive clinical and psychometric validation, have been used in several medical and psychiatric settings in different countries and cultures, and a recent review of the literature highlighted their clinical utility (Porcelli & Guidi, 2015). Furthermore, DCPR have been suggested as a useful tool for deepening psychosomatic factors, overcoming some critical aspects of the traditional psychiatric nosology, and detecting subthreshold psychopathology (Cosci & Fava, 2016).

Because of the complexity underlying a chronic and disabling condition as psoriasis, the aims of the present study were: (a) to explore the prevalence of psychosomatic clinically relevant conditions and psychiatric disorders in psoriatic patients; and (b) to evaluate the role played by psychosomatic conditions psychiatric and comorbidity in predicting the severity of psoriasis. Based on the few earlier studies, we expected that (a) psychosomatic syndromes assessed with DCPR would be more prevalent than psychiatric disorders because of the closer link of DCPR with the overall health status; and (b) the severity of psoriasis, assessed with standard measure, would be related more to psychosomatic conditions than psychopathology.

Materials and method

Participants

Consecutive adult patients with psoriasis were recruited from newly referrals to the dermatology outpatient services of two Italian university hospitals between 2011 and 2014. Out of 322 recruited patients, 282 (87.6%) (52.1% of whom were women) were enrolled. The mean age of participants was 50.10 years-old (SD=12.64; median age=51; range=18-70), the mean duration of illness was 16.85 years (SD=12.92; median=13 years; range=1-57), and the mean body mass index (BMI) was 27.5 (SD=6.6; median=26; range=17-70). To maximize ecological validity, only patients with pregnancy, mental retardation, and current or past diagnosis of psychotic disorders and substance or alcohol abuse were excluded. Patients were treated as usual and most of them (n=100; 35.6%) had comorbid medical diseases, mainly cardiovascular (11.1%), metabolic (16%), inflammatory (5.3%), and endocrine diseases (3.2%). Written informed consent to participate was obtained from each subject. The study was approved by the local Ethics Committee in accordance with the Declaration of Helsinki.

Measures

Psychopathology was diagnosed with the widely used Mini International Neuropsychiatric Interview (MINI) 5.0.0 version (Sheehan et al., 1998) and psychosomatic syndromes were assessed with the Structured Interview for DCPR (Porcelli & Sonino, 2007), administered by expert and trained interviewers. The interview for DCPR is composed of 58 items scored

in a yes/no response format evaluating the presence of 1 or more of the following 12 psychosomatic syndromes: alexithymia, type A behavior, irritable mood, demoralization, disease phobia, thanatophobia, health anxiety, illness denial, functional somatic symptoms secondary to a psychiatric disorder, persistent somatization, conversion symptoms, and anniversary reaction.

The Psoriasis Area and Severity Index (PASI), the most widely used tool for the measurement of psoriasis severity, was employed (Fredriksson & Pettersson, 1978; Ashcroft, Po, Williams, & Griffiths, 1999). The intensity of erythema, desquamation, and induration was rated in a 5-point scale (0 indicates no involvement whilst 4 indicates severe characteristic). Furthermore, the degree of involvement on the four anatomical regions (BSA, body surface area) was represented in a numerical scale that ranged between 0 and 6 (1=1-9%, 2=10-29%, 3=30-49%, 4=50-69%, 5=70-89%, and 6=90-100%). A cutoff value of PASI≥10 is considered as an index of moderate to severe psoriasis (Mrowietz et al., 2011).

Quality of life (QoL) was assessed with Dermatology Life Quality Index (DLQI) (Finlay & Khan, 1994). The total DLQI score ranges between 0 (no impairment) and 30 (maximum impairment). The DLQI questionnaire consists of 10 questions, subdivided into 6 domains that relate to different aspects of a person's health-related QoL as symptoms and feelings (2 items), daily activities (2 items), leisure (2 items), work/school (1 item), personal relationships (2 items), and treatment (1 item). The impact of the illness on the individual QoL is estimated by DLQI scores of 0-1 (no effect), 2-5 (small effect), 6-10 (moderate effect), 11-20 (very large effect), and 21-30 (extremely large effect) (Basra, Fenech, Gatt, Salek, & Finlay, 2008).

Statistical analysis

Between-group differences were evaluated with two-tailed t and chi-square tests. The ability of DCPR syndromes (independent variables) to predict psoriasis severity (PASI as criterion), controlled for psychopathology (MINI diagnoses) and disease-specific QoL (DLQI), was evaluated by multiple regression analyses. The relation underlying DCPR syndromes, MINI, DLQI, and PASI was evaluated through the effect sizes in homogeneous strata by means of the standardized mean difference, referred to as Cohen's d (Cohen, 1988) or standardized mean difference statistic. Cohen's d is a scale-free measure of the separation between 2 group means that is widely used to express the practical significance of a difference. A standardized effect size of 0-0.2 is considered as trivial, 0.2-0.5 as small, 0.5-0.8 as moderate, and 0.8 or greater as large. All statistical analyses were run under SPSS, version 25.0 for Windows. The level of significance was set at 95%.

Results

Of the 282 patients, 75 (26.6%) were positive to the MINI (prevalently anxiety and mood disorders) and 189 (67.0%) to at least one DCPR diagnosis (or DCPR>0). Alexithymia was the most prevalent DCPR syndrome (n=83, 29.4%) and 82 patients (29.1%) had severe psychosomatic conditions (or DCPR>1). Moderate to severe (DLQI>10) impairment was reported by 67 (23.7%) patients and moderate to severe (PASI>10) psoriasis severity by 138 (48.9%) patients. Socio-demographic and illness-related features of patients with higher psoriasis severity did not differ significantly from those with lower PASI score (**table 1**).

All patients positive to MINI screening had also DCPR>0 while 92 (48.7%) patients with DCPR>0 and 45 (54.9%) with DCPR>1 were positive to MINI. Also, 71 (25.2%) patients had neither DCPR nor MINI diagnoses. DCPR and MINI diagnoses had no direct link with PASI severity while demoralization and irritable mood were associated with poorer QoL (**table 2**).

Significantly higher prevalence of patients with severe levels of PASI (score>20, n=32, 39.0%) and DLQI (score>10, n=26, 31.7%) were found in patients with DCPR>1 (χ^2=17.36, p<.001, standardized deviates=3.10, d=1.25; and χ^2=6.95, p=.03, standardized deviates=1.98, d=0.61, respectively). Significantly higher prevalence of patients with severe PASI>20 (n=23, 33.3%) and DLQI>10 (n=53, 26.6%) were found only in those within the DCPR category of alexithymia (χ^2=10.17, p=.006, standardized deviates=2.29, d=0.83; and χ^2=13.08, p=.001, standardized deviates=2.08, d=0.86, respectively). Finally, no clinical (e.g.,

Table 1. *Socio-demographic and clinical characteristics of the sample*

	Total sample (n = 282)	PASI=0-9 (n = 144)	PASI ≥ 10 (n = 138)	t/χ^2	p	DLQI=0-5 (n = 215)	DLQI ≥ 6 (n = 67)	t/χ^2	p
Age	50.10 ± 12.64	49.59 ± 12.32	48.91 ± 11.91	0.39	.70	50.33 ± 12.60	49.36 ± 12.85	0.55	.58
Sex (M)	142 (50.4%)	79 (54.9%)	63 (45.6%)	2.39	.12	114 (53.0%)	28 (41.8%)	2.58	.11
Education (years)	10.89 ± 4.08	10.82 ± 3.83	10.62 ± 4.20	0.34	.74	10.93 ± 4.07	10.76 ± 4.16	0.26	.77
Marital status									
Single	49 (17.4%)	23 (16.7%)	26 (18.1%)			34 (15.8%)	15 (22.4%)		
Married/Co-dwelling	200 (70.9%)	101 (70.2%)	99 (68.7%)	0.84	.661	157 (73.0%)	43 (64.2%)	2.51	.47
Separated/Widow	33 (11.7%)	14 (10.1%)	19 (13.2%)			24 (11.2%)	9 (13.4%)		
Duration of illness (years)	16.85 ± 12.91	15.40 ± 13.82	16.52 ± 11.55	0.52	.61	16.58 ± 12.68	17.61 ± 13.67	0.48	.63
BMI	27.52 ± 6.58	26.74 ± 5.61	28.34 ± 6.08	1.86	.07	26.85 ± 4.91	29.67 ± 10.02	3.10	.002
PASI	13.64 ± 9.09	6.05 ± 1.97	17.69 ± 8.83	11.11	<.001	12.89 ± 7.72	16.16 ± 12.41	2.23	.03
DLQI	6.92 ± 5.82	6.10 ± 6.04	7.18 ± 5.82	1.27	.20	4.22 ± 2.86	15.60 ± 4.18	25.24	<.001
MINI>0	75 (26.6%)	51 (37.0%)	30 (41.1%)						

Table 2. *Prevalence of DCPR syndromes*

	Total sample (n = 282)	PASI=0-9 (n = 144)	PASI ≥ 10 (n = 138)	t/χ^2	p	DLQI=0-5 (n = 215)	DLQI ≥ 6 (n = 67)	t/χ^2	p
Illness Denial	57 (20.2%)	21 (14.6%)	36 (26.1%)	4.18	.04	46 (21.4%)	11 (16.4%)	0.78	.38
Alexithymia	83 (29.4%)	47 (32.6%)	36 (26.1%)	1.46	.23	69 (32.1%)	14 (20.9%)	3.08	.08
Demoralization	34 (12.1%)	17 (11.8%)	17 (12.3%)	0.02	.89	20 (9.3%)	14 (20.9%)	6.48	.01
Type A Behavior	45 (16.0%)	22 (15.3%)	23 (16.7%)	0.10	.75	33 (15.3%)	12 (17.9%)	0.25	.62
Irritable Mood	25 (8.9%)	18 (12.5%)	7 (5.1%)	4.82	.03	9 (4.2%)	16 (23.9%)	24.52	<.001
Health Anxiety	22 (7.8%)	8 (5.6%)	14 (10.1%)	1.51	.22	17 (7.9%)	5 (7.5%)	0.14	.91
Persistent Somatization	17 (6.0%)	10 (6.9%)	7 (5.1%)	0.71	.40	15 (7.0%)	2 (3.0%)	1.44	.23
Functional Secondary Somatic Symptoms	16 (5.7%)	7 (4.9%)	9 (6.5%)	0.36	.55	13 (6.0%)	3 (4.5%)	0.23	.63
Conversion Disorder	8 (2.8%)	1 (0.7%)	7 (5.1%)		.03	6 (2.8%)	2 (3.0%)	0.01	.93
Anniversary Reaction	7 (2.5%)	2 (1.4%)	6 (4.3%)		.16	7 (3.3%)	0	-	-
Thanatophobia	4 (1.4%)	3 (2.2%)	1 (1.4%)	-	-	1 (0.5%)	4 (4.5%)	-	-
Disease Phobia	1 (0.4%)	0	1 (1.4%)	-	-	0	1 (1.5%)	-	-
DCPR>0	189 (67.0%)	89 (61.8%)	100 (72.5%)	3.62	.06	144 (67.0%)	45 (67.2%)	0.01	.98
DCPR>1	82 (29.1%)	44 (30.6%)	38 (27.5%)	0.31	.57	56 (26.0%)	26 (38.8%)	4.03	.04

psoriasis severity, quality of life, psychiatric disorders, and DCPR syndromes) and socio-demographic factor, except older age at a small effect size (r = 0.26, p<.01), was associated with the duration of illness. Probably because of a ceiling effect due to the long-lasting disease, severity of psoriasis, quality of life, psychopathology, and psychosomatic syndromes were not affected by the duration of psoriasis within this sample (data not shown, available on request to the corresponding author).

The distinct independent role played by DCPR, psychopathology, and QoL in predicting PASI scores as criterion was evaluated with two multiple regression analyses in which psychosomatic severity (DCPR>1) and alexithymia were entered separately in each model. Among DCPR clusters, only alexithymia was considered because it was the only DCPR cluster that most significantly differentiated between patients with and without severe psoriasis severity. PASI was significantly predicted by poorer QoL and DCPR>1 (R^2=0.245, F=5.501, p=.02) in the first model and alexithymia (R^2=0.321, F=15.794, p<.001) in the second model whereas the MINI did not enter the model. After testing the statistical significance of the association between DCPR, MINI, DLQI, and PASI scores in a multivariate analysis, we made a different use of these figures (**table 3**).

Patients were stratified by the presence of DCPR>1 (Table 3, upper part) or alexithymia (lower part), psychopathology (MINI>0), and impaired QoL (DLQI>10) and, in each stratum, we calculated the association with PASI in terms of effect size as the difference in means between participants with and without DCPR>1 (severe psychosomatic condition), MINI>0 (positive psychopathologic screening), and DLQI>10 (impaired illness-related QoL) divided by the pooled standard deviation. In each stratum, DCPR>1 and impaired QoL (d=0.78 and d=0.56, respectively) produced a large association with symptom severity, regardless of the presence of psychopathology (d=0.15 and d=0.22, respectively). The association of symptom severity with alexithymia was particularly large and produced an effect size of 1.75, that was >3-fold larger than the stratum of patients exposed to all 3 variables together (d=0.43).

Discussion

Our main findings are that, in a consecutive sample of newly referred patients affected by psoriasis, DCPR-based psychosomatic syndromes had a higher 3-fold prevalence than MINI-based psychiatric disorders and, unlike psychopathology, independently predicted the severity of illness.

Our first hypothesis that DCPR syndromes would be more prevalent than psychiatric disorders was fully confirmed. As expected, QoL, psychiatric diagnoses, and psychosomatic factors were related with PASI scores in unilinear associations. However, while up to two third of patients met criteria for at least one DCPR syndrome and one third for severe psychosomatic conditions (DCPR>1), only 1/4 of them met criteria for one psychiatric diagnosis, showing a DCPR-to-MINI ratio of 3-to-1. Furthermore, half DCPR-positive patients had also at least one psychiatric diagnosis whereas all patients with psychiatric diagnosis were also diagnosed with a DCPR syndrome. These figures confirmed the ability of the DCPR system to identify psychosocial correlates more strictly related to patients' health condition compared to psychopathology. Also, they are in line with a large body of literature in different medical settings (Porcelli & Rafanelli, 2010; Porcelli & Guidi, 2015) as well as in dermatology (Picardi et al., 2005; Picardi et al., 2007; Offidani, Del Basso, Prignano, & Tomba, 2016) evidencing the clinical utility of psychosomatic assessment. The DCPR syndromes are indeed conceived as a proxy of the trans-diagnostic construct of illness behavior and aim to evaluate the perception of somatic sensations, healthcare use, and the likely origins of symptoms. Additionally, in case of patients sharing the same medical diagnosis, they are sufficiently multifaceted to assess the deceptively similar patients (Sirri & Fava, 2013; Cosci & Fava, 2016). For this reason, the ability of DCPR to identify psychosocial constructs strictly linked to the clinical

Table 3. *PASI score (symptom severity) by DCPR, psychopathology (MINI>0), and severe impairment of quality of life (DLQI>10)*

DCPR>1	MINI>0	DLQI>10	n	PASI score *Mean (SD)*	Cohen's d
N	N	N	86	12.80 (9.83)	--
N	N	Y	20	15.13 (8.10)	--
N	Y	N	37	11.74 (5.40)	--
N	Y	Y	7	8.46 (3.77)	--
Y	N	N	18	14.24 (8.52)	0.15
Y	N	Y	7	22.29 (11.83)	0.78
Y	Y	N	22	14.05 (9.72)	0.22
Y	Y	Y	15	18.27 (7.72)	0.56

DCPR alexithymia	MINI>0	DLQI>10	n	PASI score *Mean (SD)*	Cohen's d
N	N	N	66	11.81 (6.79)	--
N	N	Y	20	11.03 (6.05)	--
N	Y	N	42	12.39 (5.93)	--
N	Y	Y	15	14.04 (8.42)	--
Y	N	N	38	14.20 (9.39)	0.30
Y	N	Y	7	24.00 (10.58)	1.75
Y	Y	N	17	14.14 (9.02)	0.26
Y	Y	Y	7	17.51 (7.40)	0.43

The first 3 columns indicate the presence (Y) or absence (N) of DCPR>1, MINI diagnoses, and severe DLQI>10. The 4th column shows the number of patients meeting criteria in the first 3 columns and the 5th column shows mean (SD) scores of PASI. Effect size for the presence versus the absence of the DCPR>1 condition (Cohen's d) are indicated in the last column

reality of medical patients has been consistently recognized in the literature of the last 25 years showing their prevalence is 2 to 3 times greater than psychiatric syndromes, regardless of the diagnostic systems (DSM. IV, DSM.5, and MINI) (Porcelli & Rafanelli, 2010).

In our second hypothesis, we expected that DCPR would be more able to predict the severity of psoriasis than psychiatric diagnoses. It is known that psychopathology and psychosocial distress increase the burden of illness in medical patients (Wise, Baez-Sierra, & Pradhan, 2011). Less is known however on which extent they may differently contribute to the global burden of disease, including illness-related behaviors, QoL, somatic and psychological symptomatology. In this regard, the DCPR system has been used in different medical settings including oncology, gastroenterology, dermatology, consultation-liaison psychiatry, cardiology, and endocrinology. Consistent findings clearly show that DCPR is more able to significantly and independently predict QoL and psychosocial adjustment to disease than psychiatric diagnosis, thus confirming that the psychological burden of disease is more closely related to psychosomatic factors than psychiatric symptom reporting (Porcelli & Guidi, 2015). Our present results add to the knowledge that only DCPR syndromes, together with poor illness-related QoL, but not psychiatric disorders, independently predicted the standard measure of somatic symptom severity in psoriasis.

In particular, within our sample the most frequent DCPR category was alexithymia (29.4%) that, as a stand-alone cluster, showed a very large association when considered together with impaired QoL (d=1.75). Alexithymia is considered a risk factor for a variety of medical conditions and may increase susceptibility to disease development (Porcelli & Taylor, 2018). It has been found to play a relevant role specifically in dermatology because of its negative consequences on psychosocial adjustment and emotional dysregulation (Sampogna et al., 2017). Also, alexithymia was found to be associated with increased inflammation and altered profiles of circulating cytokines (Kano, Grabe, & Terock, 2018). For example, in the Kuopio Depression Study, Honkalampi et al. (2011) found that alexithymia was associated with high-sensitive C-reactive protein (hsCRP) (a protein generated by the liver in response to IL-6 secretion by macrophages and T cells) as well as with adiponectin (a cytokine expressed in adipose tissue) similarly to the pattern found in individuals with major depression and cardiovascular diseases. Finally, alexithymia may bias the perception of stress and lead to a decoupling between subjective and physiological responses to stress (Panayiotou, Panteli, & Vlemincx, 2018), affecting the psycho-neuroendocrine-immune network which is thought to explain complex illnesses as psoriasis (Jafferany & Franca, 2016).

As integral part of skin disease, psychosocial issues deserve careful attention in everyday clinical practice and highlight the need for a biopsychosocial approach to patients with skin disease. The identification and treatment of clinically relevant psychosomatic conditions may favorably affect the course of skin disease. To this purpose, diagnostic criteria of psychopathology may be profitably complemented by the DCPR that, unlikely psychiatric nosology, may identify psychological and illness-related behaviors more closely linked with factors influencing the burden of disease. Such a comprehensive assessment of psychological distress in patients with skin diseases may foster the effective collaboration between dermatologists and mental health professionals in the framework of a shared biopsychosocial approach, helping to reach the ultimate

goal of improving patient outcomes. Individual factors surely influence the stress process predisposing to the onset and exacerbations of psoriasis via neuroendocrine-immune pathways, from one side, and the perception of illness leading to the different coping strategies and illness behaviors, from the other side. For example, alexithymia may contribute to exacerbation of psoriatic symptoms because of poor coping with emotional issues (Picardi et al., 2007) and psychosocial distress may associate with poor social support in psoriatic patients (Everset al., 2005). The available evidence suggests that psychiatric and psychological morbidity goes often unrecognized among patients with skin disease by their dermatologists. For example, it was found that only one third of dermatologists were able to correctly identify mental health problems and psychosocial issues among their patients (Picardi et al., 2004). Conversely, while medical treatment produced clearance of lesions and a significant reduction in psoriasis-related disability, it did not impact upon emotional distress and coping (Fortune et al., 2004). The use of DCPR in clinical practice is therefore likely to help in improving the clinical management and the evaluation of treatment outcomes.

Limitations

The present study has some limitations that might affect the interpretation of the results. First, the cross-sectional design does not allow for assessment of the stability of psychiatric/psychological diagnoses over time and longitudinal studies are needed to confirm our findings. Second, psoriasis patients were recruited from tertiary care university-based clinics and may therefore represent the most severe end of severity continuum of skin diseases in which a high level of psychological problems may be prevalent. Tertiary care patients have been found to display higher psychological distress, psychiatric comorbidity, and abnormal illness behavior than those in primary care settings (Lamb et al., 2017). Third, there may be additional unknown confounding factors such as employment status, diet, familiar morbidity, seasonal effect, exposure to sunlight, and lifestyle habits that could have affected our results. Recent studies have examined the ways in which the different determinants socioeconomic and sociocultural are associated with psychological distress and quality of life among patients with psoriasis. For example, Kwan et al. (2017) found that determinants sociocultural can influence on psychological complications of psoriasis. This has provided invaluable insight into factors predictive of adverse effects of psoriasis on psychological distress and quality of life in patient population.

Conclusions

Our findings suggest that operationalized criteria for psychosomatic conditions related to somatization, illness behavior, and subthreshold syndromes not included in the traditional psychiatric nosology as the DCPR clusters may be a helpful tool for clinicians in order to achieve effective clinical management and to tailor individual treatment planning in patients with psoriasis suffering from a high burden of disease. According to a comprehensive biopsychosocial approach to illness, assessing how psoriasis affects a patient's life is strongly recommended to integrate with body surface area measurement for delineating psoriasis severity and the burden of disease (Krueger et al., 2000).

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