

PAINFUL AND ITCHY DERMATOSES CARRY THE HIGHEST PSYCHOLOGICAL BURDEN FOR DERMATOVENEREOLOGICAL PATIENTS

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SUMMARY

Background: Most dermatovenerological diseases are not life-threatening but nevertheless are highly prevalent disorders. Psychosocial aspects of skin diseases and physical symptoms strongly influence patient's quality of life (QoL) which results in the development of different coping mechanisms in patient's behaviour. Development of psychiatric comorbidity in patients with skin diseases is well known. On the other hand, little is known about psychological comorbidity associated with dermatovenerological diseases. Aims of this study were to investigate QoL and psychological burden among dermatovenerological patients.

Subjects and methods: Two hundred and ninety patients suffering from different dermatological and venereological diseases participated in the study, divided into three study groups: itchy/painful dermatoses, non-itchy/non-painful dermatoses and venereological diseases. Participants completed standardized psychological questionnaires: Dermatology Specific Quality of Life (DSQL), Beck Depression Inventory (BDI) and State and Trait Anxiety Inventory (STAI). Intensity of the disease and localisation of the lesions were also assessed.

Results: Physical aspect of QoL was mostly influenced by itchy/painful dermatoses but psychological aspect and everyday activities and choices were mostly affected by patients with non-itchy/non-painful dermatoses and venereological diseases. 4.1% of participants had serious depressive symptoms, 11.5% had high and very high anxiety symptoms as state and 15.6% as trait. However, participants with severe skin conditions were more depressed, while participants with always and sometimes exposed lesions were more anxious.

Conclusion: It is essential to recognise subgroups of dermatovenerological patients whose treatment approach should be interdisciplinary. Further studies are needed to detect psychosocial needs of patients with venereological diseases.

Key words: quality of life - anxiety - depression - skin diseases - venereological diseases

List of Abbreviations: QoL – quality of life; DSQL - Dermatology Specific Quality of life; BDI - Beck Depression Inventory; STAI - State and Trait Anxiety Inventory; DSM-IV - Diagnostic and Statistical Manual of Mental Disorders, 4th Edition; ANOVA - Analysis of Variance; P - Probability value; χ^2 - chi-squared test

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INTRODUCTION

Most dermatovenerological diseases are not life-threatening and are generally considered as diseases that cause only cosmetic nuisance with short duration and no consequences on patient's life. Awareness of skin diseases in general population is weak which results in poor education about skin diseases. However, skin diseases are disorders of high prevalence (Schafer et al. 2008). Hay et al. demonstrated, in the Global Burden of Diseases Study (2014), that skin diseases are on the fourth position as non-fatal disease burden, but it is not illuminated which aspects of life are burdened and what the consequences are. It would be of great importance for Health authorities worldwide to assess burden of skin diseases because of its prevention and treatment. The skin is an organ of communication. The most aggravating fact for the patients is that skin diseases often cannot be hidden (Papadopoulos & Waler 2003). Face and hands inclu-

ding nails are predilecting location of many skin diseases and this is what people notice first when they meet someone. Indeed, social aspect of skin diseases is what influences patient's life the most (Papadopoulos & Bor 1999, Pearl et al. 2019, Khalid et al. 2020). In a study of stigmatization in dermatology the localisation of the lesions was an important factor responsible for lowered patient's self-esteem, with visible locations being the major contributors (Matusiak & Szepietowski 2011). Social aspects of skin diseases strongly influence patient's quality of life (QoL) which results in the development of different coping mechanisms in patient's behaviour (Thompson 2005). QoL is also influenced by physical symptoms of the skin diseases, like itching (Warlich et al. 2015) and pain (Situm et al. 2016). Itch on the skin is equivalent to pain in other organs. Severity of the disease does not always correlate with the influence of the disease on the patient's life like in patients with acne (Aktan et al. 2000, Yazici et al. 2004).

Development of psychiatric comorbidity in patients with skin diseases is already well known. For many dermatological conditions like psoriasis, atopic dermatitis, hand eczema, acne, hidradenitis suppurativa increased risk of depression and other psychiatric disorders is reported (Vallerand et al. 2019, Dalgard et al. 2015, Picardi et al. 2000). On the other hand, little is known about psychological comorbidity between common skin diseases and venereological diseases. There are only a few studies that addressed the psychological status of patients with common venereological diseases. Also the differences between quality of life in patients with common skin diseases and venereological diseases are yet to be established. Aims of this study were to investigate quality of life and psychological burden among dermatovenereological patients.

SUBJECTS AND METHODS

Subjects

This study was approved by the Ethics Committee of the Medical School University of Zagreb and Ethics Committee of the University Hospital Center «Sestre milosrdnice» in Zagreb where it was conducted, with regards to the Helsinki declaration. Two hundred and ninety female and male inpatients and outpatients suffering from different dermatological and venereological diseases participated in the study. All participants were invited to take part in the study by a member of a medical staff while attending a regular follow-up or during hospitalization at the Department of Dermatovenereology. Exclusion criteria for the participants were the diagnosis of previous psychiatric disorder or other chronic illness (including malignant tumours) and taking medications that could provoke skin itching. Age of the participants ranged from 25 to 65 years. Participants were divided in three study groups with 90 participants in each group. The first group included participants with itchy/painful dermatoses, the second group participants with non-itchy/non-painful dermatoses and the third group included participants with venereological diseases. The first group with itchy/painful dermatoses included 30 patients with psoriasis, 30 with atopic dermatitis and 30 with venous ulcer while the second group with non-itchy/non-painful dermatoses included 30 patients with vitiligo, 30 patients with acne and 30 patients with alopecia. The third group with venereological diseases included 30 patients with anogenital warts, 30 patients with genital *Herpes simplex* infection and 30 patients with balanopostitis/vulvovaginitis.

Methods

All participants gave informed consent and completed the general information, information about the disease and standardized psychological questionnaires: Dermatology Specific Quality of life (DSQL), Beck

Depression Inventory (BDI) and State and Trait Anxiety Inventory (STAI).

DSQL is inventory that measures influence of the disease and its treatment on the patient's physical, psychological and social functioning and patient's perception (Anderson & Rajagopalan 1997). State of the skin, everyday activities, work and school, social aspect and psychological aspect are dimensions of DSQL. Answers are presented on Likert's scale from 0, which means never, to 4, which means always or almost always.

BDI is an inventory that measures level of depressive symptoms. This inventory was created by A.T. Beck in 1961, and in 1996 BDI was reviewed (Beck et al. 1961, Beck et al. 1996). It is often used tool in clinical trials to detect depressive symptoms and it is adjusted to Diagnostic and Statistical Manual of Mental Disorders, 4th edition (DSM-IV) classification. It consists of 21 questions regarding depressive mood and depressive symptoms behaviour. Answers range from 0 to 4, with a sum of 0-63 points. Minimal depressive symptoms are considered from 0 to 13, mild depressive symptoms from 14 to 19, average depressive symptoms from 14 to 19 and serious depressive symptoms from 29 to 63 points.

STAI is an inventory that measures anxiety symptoms as state and trait in adults. It was designed in 1987 by Spielberg (2000) and consists of two scales: S - which measures momentary state anxiety symptoms like anxiety, frustration and tension which are varying; and O - which measures trait anxiety symptoms that are stable in time and do not change in specific situation. Every scale has 20 questions with four possible answers from 0 to 4. Sum of all points indicates the level of anxiety symptoms compared to general population.

General information included gender, age of the participant, diagnosis, intensity of the disease (mild, average, severe) and localisation of the lesions – always exposed areas (head, face, neck, hands), sometimes exposed areas (trunk, arms, legs) and never exposed areas.

Statistical analysis

MedCalc version 13 was used to analyse the data. Parametric tests, K-S Lilliefors test for normality distribution and Leven test for variance equality, were assessed for results. Results were calculated by t-test (confidence interval 95%), multifactorial ANOVA and Scheffé post-hoc test. Pearson's or Spearman's coefficient of correlation were applied for correlations between results and regression analysis was used for influence of independent variables.

RESULTS

Descriptive data

A total of 270 participants were included in the study, 145 (53.7%) women and 125 (43.6%) men. They were divided into three groups (n=90 in each group). Mean age

of participants was 41.5 years with 51 years in group with itchy/painful disorders, 35 years in group with non-itchy/non-painful disorders and 29 years in group with venereological diseases. Statistical differences was shown between age of the study groups ($P < 0.001$). Patients with itchy/painful dermatoses had higher severity of the disease whereas patients with venereological diseases had lower severity of the disease. There was a statistically significant difference between the severity of the disease in the study groups ($\chi^2 = 20.293$; $P < 0.001$). Participants with non-itchy/non-painful disorders had lesions mostly on the visible areas of the skin (94.6%). *Post hoc* analysis showed significant difference between localisations of the lesions in the study groups ($\chi^2 = 325.174$; $P < 0.001$).

Quality of life

Results for different dimensions of quality of life in study groups are shown in the Table 1.

Itchy/painful dermatoses have the highest influence on patient's QoL in aspect of *state of the skin* (1.71 on

the scale from 0 to 4), *everyday activities and choices* and *psychological dimension* (1.40 on the scale from 0 to 4). *Psychological dimension* (1.40 on the scale from 0 to 4) and *everyday activities and choices* (1.20 on the scale from 0 to 4) were influenced the most in the patients with non-itchy/non-painful dermatoses. Venereological diseases showed the strongest influence on the *psychological dimension* of QoL in this study (1.20 on the scale from 0 to 4). Statistically significant differences between all the dimensions of QoL in study groups except *psychological dimension* ($P < 0.308$) were registered.

Depressive and anxiety symptoms

In all study groups, depressive and anxiety symptoms were recorded, however in mild form (Table 2). There was no statistically significant difference between depressive symptoms in all study groups ($P < 0.05$). Significant differences in anxiety symptoms as state and trait were registered between patients with venereological disease and other two study groups.

Table 1. Different dimensions of QoL in study groups

Dimensions of QoL	Study group	C	25. P.	75. P.	H	P	Mann-Whitney, P
State of the skin	Itchy/painful dermatoses (A)	1.71	1.14	2.28			
	Non-itchy/non-painful dermatoses (B)	0.86	0.42	1.71	37.042	<0.001	A:B <0.001 A:C <0.001 B:C =0.804
	Venereological diseases (C)	1.00	0.43	1.57			
Everyday activities and choices	Itchy/painful dermatoses (A)	1.40	0.80	2.00			
	Non-itchy/non-painful dermatoses (B)	1.20	0.60	1.80	18.397	<0.001	A:B =0.143 A:C <0.001 B:C =0.008
	Venereological diseases (C)	0.80	0.40	1.00			
Social aspect	Itchy/painful dermatoses (A)	1.30	0.40	2.10			
	Non-itchy/non-painful dermatoses (B)	0.75	0.10	1.40	8.794	0.012	A:B =0.007 A:C =0.057 B:C =0.108
	Venereological diseases (C)	1.00	0.60	1.30			
Work and school	Itchy/painful dermatoses (A)	0.35	0.00	1.00			
	Non-itchy/non-painful dermatoses (B)	0.28	0.00	1.28	6.649	0.036	A:B =0.911 A:C =0.016 B:C =0.043
	Venereological diseases (C)	1.00	0.14	1.71			
Psychological aspect	Itchy/painful dermatoses (A)	1.40	0.80	2.00			
	Non-itchy/non-painful dermatoses (B)	1.40	0.40	2.00	2.353	0.308	A:B =0.568 A:C =0.115 B:C =0.394
	Venereological diseases (C)	1.20	0.60	2.00			

Table 2. Results of the Beck Depressive Inventory Scale (BDI) and State and Trait Anxiety Inventory (STAI)

		C	25. P.	75. P.	H	P	Mann-Whitney, P
BDI	Itchy/painful dermatoses (A)	8	3	12			
	Non-Itchy/non-painful dermatoses (B)	7	4	11	1.781	0.411	
	Venereological diseases (C)	9	5	13			
STAI - State	Itchy/painful dermatoses (A)	37	30	47			
	Non-Itchy/non-painful dermatoses (B)	36	29	45	15.216	<0.001	A:B =0.390 A:C <0.001 B:C =0.003
	Venereological diseases (C)	31	27	37			
STAI - Trait	Itchy/painful dermatoses (A)	41	34	49			
	Non-Itchy/non-painful dermatoses (B)	39	33	47	11.075	0.004	A:B =0.209 A:C =0.001 B:C =0.036
	Venereological diseases (C)	35	30	44			

Minimal depressive symptoms were registered in 78.7% of the participants. Serious depressive symptoms were recorded in 4.1% of patients, mostly in those with itchy/painful dermatoses. Post hoc analysis did not show significant differences between level of depressive symptoms in study groups (Pearsons $\chi^2=12.512$; $P=0.051$). According to gender distribution, women were more prone to mild, average or serious depressive symptoms, whereas male patients exhibited minimal depressive symptoms. Statistically significant differences were not recorded in the level of depressive symptoms between female and male patients (Pearsons $\chi^2=2.815$; $P=0.421$).

Thirty-one patients (11.5%) had high and very high state anxiety symptoms. High and very high anxiety symptoms as trait were recorded in 41 patients (15.6%). Very high symptoms of state anxiety were registered in 19 female participants as well as in 7 male participants. There were no significant differences between level of state anxiety symptoms in women and men ($\chi^2=4.975$ $P=0.174$). Also, more women than men had high and very high trait anxiety symptoms. There was a significant difference between the level of trait anxiety symptoms in women and men ($\chi^2=8.836$, $P=0.032$).

Age, intensity and localisation of the diseases in connection with quality of life, depressive and anxiety symptoms

Patients with the most severe skin conditions had the highest influence of the disease on different dimensions

of QoL: *state of the skin* (1.57 on the scale from 0 to 4), *everyday activities and choices* (1.60 on the scale from 0 to 4), *social aspect* (1.30 on the scale from 0 to 4) and *psychological aspect* (1.60 on the scale from 0 to 4) (Table 3).

Patients with severe skin conditions exhibited more depressive symptoms on the BDI scale (Table 3). Statistically significant differences were proven between severity of the skin lesions and different dimensions of QoL ($P<0.05$), except the *psychological* dimension ($P<0.056$).

Participants with severe skin conditions were more depressed than the two other study groups ($P<0.026$) but there were no significant differences between severity of the skin lesions and anxiety symptoms as state and trait ($P=0.238$ and $P=0.276$). For patients with always exposed skin lesions the greatest influence of the disease was found in the *psychological dimension* of QoL (1.40 on the scale from 0 to 4), while for patients with never exposed skin lesions the greatest influence was on the *work and school aspect* (1 on the scale from 0 to 4) (Table 4). Additionally, patients with never exposed skin lesions suffered from the most severe depressive symptoms (Table 4). State anxiety symptoms were higher in patients with always exposed skin lesions on the skin but trait anxiety symptoms were higher in patients with sometimes exposed lesions (Table 4).

Table 3. Influence of the intensity of the skin lesions on different dimensions of QoL, depressive symptoms on BDI scale and state and trait anxiety symptoms on STAI scale

	Intensity of the skin lesions	C	25. P.	75. P.	H	Statistics	
						P	Mann-Whitney, P
DSQL – state of the skin	Mild (A)	1.14	0.43	1.71	15.242	<0.001	A:B =0.393
	Average (B)	1.14	0.57	1.71			A:C =0.001
	Severe (C)	1.57	0.85	2.14			B:C =0.001
DSQL –everyday activities and choices	Mild (A)	1.00	0.40	1.40	20.408	<0.001	A:B =0.476
	Average (B)	0.80	0.40	1.40			A:C =0.003
	Severe (C)	1.60	0.80	2.20			B:C <0.001
DSQL – social aspect	Mild (A)	1.00	0.40	1.30	23.215	<0.001	A:B =0.080
	Average (B)	0.80	0.00	1.30			A:C =0.016
	Severe (C)	1.30	0.60	2.30			B:C <0.001
DSQL – work and school	Mild (A)	0.85	0.14	1.71	8.120	0.017	A:B =0.026
	Average (B)	0.28	0.00	1.00			A:C =0.981
	Severe (C)	0.71	0.00	1.42			B:C =0.013
DSQL – psychological aspect	Mild (A)	1.00	0.60	2.00	5.769	0.056	
	Average (B)	1.20	0.60	2.00			
	Severe (C)	1.60	0.80	2.20			
BDI	Mild (A)	8	4	12	7.266	0.026	A:B =0.623
	Average (B)	7	3	11			A:C =0.072
	Severe (C)	10	4	15			B:C =0.010
STAI – state	Mild (A)	33	27	43	2.873	0.238	
	Average (B)	35	29	43			
	Severe (C)	35	29	45			
STAI – trait	Mild (A)	35	30	45	2.575	0.276	
	Average (B)	39	32	47			
	Severe (C)	38	33	48			

Table 4. Influence of the localisation of skin lesions on different dimensions of QoL, depressive symptoms on BDI scale and anxiety symptoms (state and trait)

	Localisation of skin lesions	Median	25. P.	75. P.	Z	P	Mann-Whitney, P
DSQL – State of the skin	Always exposed areas (A)	1.28	0.64	2.00	12.540	0.002	A : B = 0.254
	Sometimes exposed areas (B)	1.71	0.71	2.28			A : C = 0.009
	Never exposed area (C)	1.00	0.43	1.57			B : C = 0.001
DSQL –everyday activities and choices	Always exposed areas (A)	1.20	0.60	2.00	16.597	< 0.001	A : B = 0.587
	Sometimes exposed areas (B)	1.40	0.60	1.60			A : C < 0.001
	Never exposed area (C)	0.80	0.40	1.00			B : C = 0.007
DSQL – social aspect	Always exposed areas (A)	0.90	0.20	1.90	1.257	0.533	A : B = 0.328
	Sometimes exposed areas (B)	1.20	0.40	2.30			A : C = 0.834
	Never exposed area (C)	1.00	0.60	1.30			B : C = 0.271.
DSQL – work and school	Always exposed areas (A)	0.42	0.00	1.28	14.619	0.001	A : B = 0.004
	Sometimes exposed areas (B)	0.00	0.00	0.57			A : C = 0.147
	Never exposed area (C)	1.00	0.14	1.71			B : C < 0.001
DSQL – psychological aspect	Always exposed areas (A)	1.40	0.60	2.60	3.686	0.158	A : B = 0.194
	Sometimes exposed areas (B)	1.30	0.60	2.00			A : C = 0.080
	Never exposed area (C)	1.20	0.60	2.00			B : C = 0.805
BDI	Always exposed areas (A)	7	3	12	1.522	0.467	A : B = 0.504
	Sometimes exposed areas (B)	8	4	12			A : C = 0.231
	Never exposed area (C)	9	5	13			B : C = 0.799
STAI – state	Always exposed areas (A)	37	30	46	14.913	0.001	A : B = 0.837
	Sometimes exposed areas (B)	36	31	46			A : C < 0.001
	Never exposed area (C)	31	27	37			B : C = 0.008
STAI – trait	Always exposed areas (A)	39	33	47	10.025	0.007	A : B = 0.492
	Sometimes exposed areas (B)	42	34	51			A : C = 0.007
	Never exposed area (C)	35	30	44			B : C = 0.008

As shown in Table 4, significant differences between different dimensions of QoL and localisation on the skin, except *social* and *psychological* aspects of QoL were recorded. Participants with venereological diseases were less anxious as state and trait than two other study groups.

Correlations

There were no significant correlations between ages of the participants, QoL, symptoms of depression and anxiety symptoms as state and trait ($r_s < \pm 0.25$). Participants with severe skin lesions were not more depressed or anxious and did not have lower quality of life than those with less severe disease. There were statistical significant correlations between all dimensions of quality of life and symptoms of depression. Participants with lower quality of life were more depressed ($r_s < \pm 0.25-0.4$; $P < 0.001$ and $r_s = \pm 0.4-0.6$, $P < 0.001$) and anxious as state ($P < 0.108$) and trait anxiety symptoms ($r_s < \pm 0.25$, $P < 0.001$).

DISCUSSION

Quality of life and psychiatric comorbidities in dermatovenereological patients, with skin diseases like psoriasis, atopic dermatitis, hidradenitis suppurativa, etc. have already been demonstrated, but quality of life and psychological burden between itchy/painful and non-

itchy/non-painful skin diseases and venereological diseases are yet to be perused.

Quality of life of participants in this study was mildly influenced by the diseases with influence being the most pronounced in state of the skin and psychological aspect of QoL. Participants with itchy/painful dermatoses had expressed problems with physical aspects of their skin, everyday choices and activities and also psychological dimension. Jayaprakasam et al. also reported the biggest influence of the disease on state of the skin in psoriasis patients (2002). Patients with psoriasis were troubled mostly with pruritus and shedding scales (Ramsay & O'Reagan 1988). In other studies of patients with atopic dermatitis pruritus was also stressed as main factor influencing QoL (Chernyshov 2016). Wachholz et al. did not find great influence of having venous ulcer on patient's QoL but with the most influence on feelings and work and education as aspects of QoL which is in correlation with results of our study (2014). *Psychological dimension* of QoL was greatly affected in patients with non-itchy/non-painful and venereological diseases. Indeed, the *psychological dimension* was the only dimension of QoL from this study equally influenced by the diseases in all study groups. Other possible variables like patient's personality traits, perception of the disease and coping strategies may influence patient's *psychological dimension* but these factors were not assessed in this study. Other studies

including patients with acne, vitiligo and alopecia showed influence of the diseases on different dimensions of QoL including *psychological* dimension (Tanghetti et al. 2014, Kostopoulou et al. 2009, Hunt 2005).

Participants from this study showed depressive and anxiety symptoms in mild form, but 4.1% of participants had serious depressive symptoms, 11.5% had high and very high anxiety symptoms as state and 15.6% as trait. A multicentric study from 13 European countries among patients with common skin diseases emphasized significantly higher prevalence of depression (10.1% vs. 4.3%) and anxiety disorders (17.2% vs. 11.1%) compared to controls (Dalgard et al. 2015). Moreover patients with venous ulcers were the most depressed and patients with psoriasis and hand eczema were the most anxious (Dalgard et al. 2015). In our study patients with itchy/painful dermatoses also had the highest depressive and anxiety symptoms. In a study conducted by Noh et al. comparison of patients with atopic dermatitis and vitiligo was done and authors pointed that patients with atopic dermatitis are more anxious (Noh et al. 2013). Picardi et al. found prevalence of psychiatric comorbidity to be as high as 25.2% among outpatients, mostly with acne, alopecia, urticaria and pruritus (Picardi et al. 2000). In another study, Picardi et al. presented women as more depressed than men among patients with skin diseases, especially those who had skin lesions on their hands and face (2001). Female participants from our study were more depressed and anxious than men but without statistical difference, except women being more anxious in general as personality trait. Participants in all study groups were equally depressed but participants with venereological diseases were less anxious than two other study groups. There are only sporadic studies which analysed psychiatric comorbidities among patients with venereological diseases in the literature (Lvov 2011, Dediol et al. 2009, Drolet et al. 2011, Shi et al. 2012). A study which included patients with recurrent genital herpes simplex demonstrated 44% prevalence of psychiatric comorbidities, mostly hypochondriac and depressive symptoms (Lvov 2011). Drolet et al. recorded greatest negative impact of the disease on usual activities, pain/discomfort, and anxiety/depression, and on self-image, sexual activity, and partner issues and possible transmission among patients with anogenital warts (Drolet et al. 2011). In another study psychiatric comorbidity represented in 54.6% patients with anogenital warts, which was explained by China's conservative culture, so patients with anogenital warts feel shame and humiliation (Shi et al. 2012).

Participants in our study had the same influence on QoL and development of depressive as well as anxiety symptoms regardless of their age. It was demonstrated that dermatovenereological diseases, especially those chronic and recurrent ones, have greater influence on QoL in younger patients. One explanation is that the

older patients possess good coping mechanisms and adaptation abilities. In study of Shah et al. QoL in older patients with different dermatoses and malignant skin tumours, there was no influence on patient's QoL but the intensity of the skin lesions had the impact on patient's QoL, which is similar to results of our study (Shah & Coates 2006). Noh et al. in their study of psychological status in patients with atopic dermatitis and vitiligo did not find difference in influence of the diseases on QoL according to age, as well as the influence of the disease on expression of depression and anxiety symptoms (Noh et al. 2013). However, the older patients were less anxious in making social contacts (Noh et al. 2013).

In our patients with severe skin lesions, all dimensions of QoL, except *psychological* dimension, were significantly influenced. Participants in our study represent dermatovenereological patients whose severity of the disease does not influence their psychological status. Several studies showed similar results (Zacharie et al. 2002, Wahl et al. 2000, Gelfand et al. 2004, Kanikowska et al. 2009). However, few studies have shown opposite results (Fortune et al. 1997, Yang et al. 2005). In patients with acne severity of the disease is not proportional with the influence on patient's life in whom even minimal sign of acne diverse patient's QoL which make them change their make-up, clothes, choice of food and sexual behaviours (Hassan et al. 2009). In this study the subjective perception of patient's severity of the disease has not taken into account which has been shown as important fact, more than objective severity of the disease (Kostopoulou et al. 2009).

Results of this study showed influence of intensity of the diseases on patient's development of depressive symptoms, with no influence on development of anxiety symptoms. In literature patients with severe psoriasis and atopic dermatitis are more depressed (Dieris-Hirche 2009, Gupta et al. 1998) but patients with mild acne can also be depressed (Gupta & Gupta 1998, Gupta & Gupta 1998). Baldwin studied psychiatric comorbidities in patients with adult acne who had symptoms of average depression (Baldwin 2002). As well as results of this study other studies pointed atopic dermatitis as disease in which development of anxiety symptoms is not in relationship with severity of the disease (Dieris-Hirshe et al. 2009, Gupta & Gupta 2003). Additionally part of the studies confirm that for vitiligo patients (Sampogna et al. 2008).

Participants of this study with skin lesions on always exposed areas had the most influence on *psychological dimension* on QoL. Visibility of skin lesion is a strong shot to patients with skin diseases. Perception of other people and their reactions to patients implicate patient's perception and self-image about themselves. Especially today in modern world, when appearance and body layout is emphasised, wrong picture of perfect face/body is obtruded. In study by Krueger et al. QoL in

patients with psoriatic lesions on hands was influenced the most (Krueger et al. 2000). Peuvrel et al. measured QoL in patients with lesions of acne, rosacea and scars on face, before and after the education of how to use corrective cosmetics, anyway they recorded better QoL after the education, even if the QoL was not so poor (Peuvrel 2012). As mentioned before, results on patients with vitiligo are controversial (Ongenaes et al. 2005; Schmid-Ott et al. 2007; Tanioka et al. 2010; Linthorst Homan et al. 2009). *State of the skin* as aspect of QoL was mostly influenced by participants with sometimes exposed areas. We can assume participants with sometimes exposed areas do not have already developed coping mechanisms as participants with always exposed lesions, therefore when they expose their lesions, they feel embarrassed. Patients with venereological diseases from this study had the biggest influence on *work and school* as aspect of QoL which can be explained by absence from work/school because of long treatment or recurrences of the disease.

Patients with venereological diseases were also most depressed, patients with always exposed skin lesions were the most anxious as state and patients with sometimes exposed skin lesions were anxious as trait. Authors Brajac et al. confirmed more anxiety symptoms as trait in patients with alopecia comparing to controls, with the biggest anxiety in patients with a recurrent disease (2003). In this study patients with poor QoL were more depressed and more anxious as state and trait. Such findings are in correlation with other studies (Gupta et al. 1998, Devrimci-Ozguven et al. 2000; Dowlatshahi et al. 2014). In study on 2136 patients with dermatological diseases poor QoL in correlation with psychiatric comorbidities, no matter how severe skin lesions were, was presented (Sampogna et al. 2004). Group of authors presented study involving 4010 dermatological patients from all over Europe, in which they emphasised influence on functional aspect of QoL in patients with itchy/painful skin diseases like chronic venous ulcer, hidradenitis suppurativa and autoimmune bulous diseases. Furthermore symptoms of depression and anxiety were experienced by participants with non-itchy/non-painful skin diseases like acne, alopecia and urticaria (Balieva et al. 2017). Results from this study show similar deduction. Poor QoL and highest symptoms of depression were recognised in participants with the most severe skin diseases moreover the most anxious one were participants with always exposed skin lesions.

Limitations

We have to take into consideration that participants in this study groups were not randomized thereby the age distribution, intensity and localisations of the skin lesions varied in every study group, which influenced results of the study. Most participants with severe skin

lesions were in study group with itchy/painful dermatoses and participants with always exposed lesions were common in study group with non-itchy/non-painful dermatoses.

CONCLUSIONS

Poor quality of life and psychological burden in patients with dermatovenereological diseases represents a disability of these patients. It is essential to recognise subgroups of dermatovenereological patients whose treatment approach should be interdisciplinary. Our study pointed to patients with itchy/painful dermatoses with poor QoL and depressive symptoms as well as patients with non-itchy/non-painful dermatoses with symptoms of anxiety. Further studies are needed to detect psychosocial needs of patients with venereological diseases.

Acknowledgements:

We would like to thank Maja Vurnek Zivkovic, PhD, psychologist, who contributed in creating ideas for this study and participated in building our knowledge in use of psychological questionnaires.

Conflict of interest: None to declare.

Contribution of individual authors:

Iva Dediol, Mirna Situm, Vedrana Bulat, Tomo Stugnetic, Josip Juras & Marija Buljan equally contributed to designing the study, literature searches, collecting data, statistical analyses, interpretation of data and manuscript writing.

Dean Tomljenovic contributed to literature searches, interpretation of data and manuscript writing.

References

1. Aktan S, Ozmen E, Sanli B: Anxiety, depression, and nature of acne vulgaris in adolescents. *Int J Dermatol* 2000; 39:354-357
2. Anderson RT, Rajagopalan R: Development and validation of a quality of life instrument for cutaneous diseases. *J Am Acad Dermatol* 1997; 37:41-50
3. Baldwin HE: The interaction between acne vulgaris and the psyche. *Cutis* 2002; 70:133-139
4. Balieva F, Kupfer J, Lien L, et al.: The burden of common skin diseases assessed with the EQ5D™: a European multicentre study in 13 countries. *Br J Dermatol* 2017; 176:1170-1178
5. Beck A, Steer, RA, Brown GK: Beck Depression Inventory-second edition manual. San Antonio (TX): The Psychological Corporation, 1996
6. Beck AT, Ward CH, Mendelson M, Mock J, Erbaugh J: An inventory for measuring depression. *Arch Gen Psychiatry* 1961; 4:561-71
7. Brajac I, Tkalcic M, Dragojevic DM, Gruber F: Roles of stress, stress perception and trait-anxiety in the onset and course of alopecia areata. *J Dermatol* 2003; 30:871-878

8. Chernyshov PV: Health related quality of life in adult atopic dermatitis and psoriatic patients matched by disease severity. *G Ital Dermatol Venereol* 2016; 1581:37-43
9. Coping and Adaptation. In: *Psychological Approaches to Dermatology* (Papadopoulos L, Bor R, eds), 1st edn. Leicester: BPS Books, 1999; 23-30
10. Dalgard FJ, Gieler U, Tomas-Aragones L, et al. The psychological burden of skin diseases: A cross – sectional multicentric study among dermatological Out-patients in 13 European countries. *J Investig Dermatol* 2015; 135: 984-991
11. Dediol I, Buljan M, Vurnek-Zivkovic M, Bulat V, Situm M, Cubrilovic Z. Psychological burden of anogenital warts. *J Eur Acad Dermatol Venereol* 2009; 23: 1035-1038
12. Devrimci-Ozguven H, Kundakci TN, Kumbasar H, Boyvat A. The depression, anxiety, life satisfaction and affective expression levels in psoriasis patients. *J Eur Acad Dermatol Venereol* 2000; 14:267-271
13. Dieris-Hirche J, Gieler U, Kupfer JP, Milch WE. Suicidal ideation, anxiety and depression in adult patients with atopic dermatitis. *Hautarzt* 2009; 60:641-646
14. Dowlatshahi EA, Wakkee M, Arends LR, Nijsten T. The prevalence and odds of depressive symptoms and clinical depression in psoriasis patients: a systematic review and meta-analysis. *J Invest Dermatol* 2014; 134:1542-1551
15. Drolet M, Brisson M, Maunsell E, et al. The impact of anogenital warts on health-related quality of life: a 6-month prospective study. *Sex Transm Dis* 2011; 38:949-956
16. Facts about skin disease: causes and prevalence. In: *Understanding Skin Problems* (Papadopoulos L, Waler C, eds), 1st edn. Chichester: John Wiley & Sons, 2003; 19-26
17. Fortune DG, Main CJ, O'Sullivan TM, Griffiths CE. Quality of life in patients with psoriasis: the contribution of clinical variables and psoriasis-specific stress. *Br J Dermatol* 1997; 137:755-760
18. Gelfand JM, Feldman SR, Stern RS, Thomas J, Rolstad T, Margolis DJ. Determinants of quality of life in patients with psoriasis: a study from the US population. *J Am Acad Dermatol* 2004; 51:704-708
19. Gupta MA, Gupta AK, Watteel GN: Perceived deprivation of social touch in psoriasis is associated with greater psychologic morbidity: an index of the stigma experience in dermatologic disorders *Cutis* 1998; 61: 339-342
20. Gupta MA & Gupta AK: Depression and suicidal ideation in dermatology patients with acne, alopecia areata, atopic dermatitis and psoriasis. *Br J Dermatol* 1998; 139:846-850
21. Gupta MA & Gupta AK: Psychiatric and psychological co-morbidity in patients with dermatologic disorders: epidemiology and management. *Am J Clin Dermatol* 2003; 4: 833-842
22. Gupta MA & Gupta AK: The psychological comorbidity in acne. *Clin Dermatol* 2001; 19:360-363
23. Hassan J, Grogan S, Clark-Carter D, Richards H, Yates VM. The individual health burden of acne: appearance-related distress in male and female adolescents and adults with back, chest and facial acne. *J Health Psychol* 2009; 14: 1105-1118
24. Hay RJ, Johns NE, Williams HC et al. The global burden of skin disease in 2010: an analysis of the prevalence and impact of skin conditions. *J Invest Dermatol* 2014; 134: 1527-1534
25. Hunt N, McHale S. The psychological impact of alopecia. *BMJ* 2005; 331: 951-953
26. Jayaprakasam A, Darvay A, Osborne G, McGibbon D: Comparison of assessments of severity and quality of life in cutaneous disease. *Clin Exp Dermatol* 2002; 27:306-308
27. Kanikowska A, Kramer L, Pawlaczyk M: Quality of life in Polish patients with psoriasis. *J Eur Acad Dermatol Venereol* 2009; 23: 92-93
28. Khalid J, Malik J, Musharraf S. Role of family support in body image satisfaction and psychological distress among patients with dermatology issues. *Primary Health Care*; doi: 10.7748/phc.2018.e1351
29. Kostopoulou P, Jouary T, Quintard B, et al. Objective vs. subjective factors in the psychological impact of vitiligo: the experience from a French referral centre. *Br J Dermatol* 2009; 161: 128-133
30. Kostopoulou P, Jouary T, Quintard B, Ezzedine K, Marques S, Boutchmei S, et al. Objective vs. subjective factors in the psychological impact of vitiligo: the experience from a French referral centre. *Br J Dermatol* 2009; 161: 128-133
31. Krueger GG, Feldman SR, Camisa C, et al.: Two considerations for patients with psoriasis and their clinicians: what defines mild, moderate, and severe psoriasis? What constitutes a clinically significant improvement when treating psoriasis? *J Am Acad Dermatol* 2000; 43:281-285
32. Linthorst Homan MW, Spuls PI, de Korte J, Bos JD, Sprangers MA, van der Veen JP. The burden of vitiligo: patient characteristics associated with quality of life. *J Am Acad Dermatol* 2009; 61: 411-420
33. Lvov AN. Psychosomatic aspects of herpes recidivus genitalis. *Acta Dermato-Venerol* 2011; 91: 230-231
34. Matusiak L, Szepletowski J: Stigmatization in Dermatology. *Acta Dermato-Venerologica* 2011; 91:222
35. Noh S, Kim M, Park CO, Hann SK, Oh SH: Comparison of the psychological impacts of asymptomatic and symptomatic cutaneous diseases: vitiligo and atopic dermatitis. *Ann Dermatol* 2013; 25:454-461
36. Ongenae K, Dierckxsens L, Brochez L, van Geel N, Naeyaert JM. Quality of life and stigmatization profile in a cohort of vitiligo patients and effect of the use of camouflage. *Dermatology* 2005; 210: 279-285
37. Pearl RL, Wan MT, Takeshita J, et al.: Stigmatizing attitudes toward persons with psoriasis among laypersons and medical students. *J Am Acad Dermatol* 2019; 80:1556-1563
38. Peuvrel L, Quereux G, Brocard A, et al. Evaluation of quality of life after a medical corrective make-up lesson in patients with various dermatoses. *Dermatology* 2012; 224: 374-380
39. Picardi A, Abeni D, Melchi CF, Puddu P, Pasquini P. Psychiatric morbidity in dermatological outpatients: an issue to be recognized. *Br J Dermatol* 2000; 143: 983-991
40. Picardi A, Abeni D, Melchi CF, Puddu P, Pasquini P: Psychiatric morbidity in dermatological outpatients: an issue to be recognized. *Br J Dermatol* 2000; 143:983-991
41. Picardi A, Abeni D, Renzi C, Braga M, Puddu P, Pasquini P. Increased psychiatric morbidity in female outpatients with skin lesions on visible parts of the body. *Acta Derm Venereol* 2001; 81: 410-414
42. Ramsay B, O'Reagan M. A survey of the social and psychological effects of psoriasis. *Br J Dermatol* 1988; 118: 195-201
43. Sampogna F, Raskovic D, Guerra L, et al. Identification of categories at risk for high quality of life impairment in patients with vitiligo. *Br J Dermatol* 2008; 159: 351-9

44. Sampogna F, Picardi A, Chren MM, et al. Association between poorer quality of life and psychiatric morbidity in patients with different dermatological conditions. *Psychosom Med* 2004; 66: 620-624
45. Schaefer I, Rustenbach SJ, Zimmer L, Augustin M: Prevalence of Skin Diseases in a Cohort of 48,665 Employees in Germany. *Dermatology* 2008; 217: 169-172
46. Schmid-Ott G, Kunsebeck HW, Jecht E, et al.: Stigmatization experience, coping and sense of coherence in vitiligo patients. *J Eur Acad Dermatol Venereol* 2007; 21: 456-461
47. Shah M, Coates M. An assessment of the quality of life in older patients with skin disease. *Br J Dermatol* 2006; 154: 150-153
48. Shi JF, Kang DJ, Qi SZ, et al. Impact of genital warts on health related quality of life in men and women in mainland China: a multicenter hospital-based cross-sectional study. *BMC Public Health* 2012; 12: 153
49. Situm M, Kolic M, Spoljar S. Quality of life and psychological aspects in patients with chronic leg ulcer. *Acta Med Croatica*. 2016; 70: 61-63
50. Spielberger C. Priručnik za Upitnik anksioznosti kao stanja i kao osobine ličnosti. Zagreb: Naklada Slap, 2000
51. Tangheiti EA, Kawata AK, Daniels SR, Yeomans K, Burk CT, Callender VD. Understanding the burden of adult female acne. *J Clin Aesthet Dermatol* 2014; 7: 22-30
52. Tanioka M, Yamamoto Y, Kato M, Miyachi Y. Camouflage for patients with vitiligo vulgaris improved their quality of life. *J Cosmet Dermatol* 2010; 9: 72-75
53. Thompson A. Coping with Chronic Skin Condition: factors important in explaining individual variation in adjustment. In: *Psychodermatology The psychological impact of Skin Disorders* (Walker C, Papadopoulos L, eds). 1st edn. Cambridge: Cambridge University Press, 2005; 57-71
54. Vallerand IA, Lewinson RT, Parsons L et al.: Assessment of a Bidirectional Association Between Major Depressive Disorder and Alopecia Areata. *JAMA Dermatol*; 155:475-476
55. Wachholz PA, Masuda PY, Nascimento DC, Taira CM, Cleto NG. Quality of life profile and correlated factors in chronic leg ulcer patients in the mid-west of Sao Paulo State, Brazil. *An Bras Dermatol* 2014; 89: 73-81
56. Wahl A, Loge JH, Wiklund I, Hanestad BR. The burden of psoriasis: a study concerning health-related quality of life among Norwegian adult patients with psoriasis compared with general population norms. *J Am Acad Dermatol* 2000; 43: 803-808
57. Warlich B, Fritz F, Osada N, et al. Health-Related Quality of Life in Chronic Pruritus: An Analysis Related to Disease Etiology, Clinical Skin Conditions and Itch Intensity. *Dermatology* 2015; 231: 253-259
58. Yang Y, Koh D, Khoo L, Nyunt SZ, Ng V, Goh CL. The psoriasis disability index in Chinese patients: contribution of clinical and psychological variables. *Int J Dermatol* 2005; 44:925-929
59. Yazici K, Baz K, Yazici AE, et al. Disease-specific quality of life is associated with anxiety and depression in patients with acne. *J Eur Acad Dermatol Venereol* 2004; 18:435-439
60. Zachariae R, Zachariae H, Blomqvist K, et al.: Quality of life in 6497 Nordic patients with psoriasis. *Br J Dermatol* 2002; 146:1006-1016

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