

ORIGINAL PAPER

THE INCIDENCE OF ANXIETY, DEPRESSION, AND QUALITY OF LIFE IN PATIENTS WITH DERMATOLOGICAL DISEASES

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Aim: The study aim was to establish the differences in the levels of anxiety, depression, and quality of life in patients with acne and atopic dermatitis, to examine differences related to gender, and to examine the relationship of levels of anxiety, depression, and quality of life to age and personality traits. *Design:* A cross-sectional study. *Methods:* The Hospital Anxiety and Depression Scale (HADS), the Beck Depression Inventory (BDI), and the Dermatology Life Quality Index (DLQI) were used for data collection, and the Mini International Personality Item Pool (IPIP) was used for identification of five personality factors. *Results:* No statistically significant differences were found between patients with acne and patients with atopic dermatitis regarding levels of anxiety, depression, and quality of life. In terms of age, a difference was found only in the incidence of anxiety in the group of patients with acne; higher anxiety was found in women. There were no statistically significant differences in anxiety, depression, and quality of life related to age in patients with acne and atopic dermatitis. Significant relationships of the variables to personality traits were found in both groups. *Conclusion:* Knowing the factors influencing the incidence of mental health problems in patients with acne and atopic dermatitis helps in early nursing diagnosis of such problems, which can eliminate the negative impact of mental health problems on patients' quality of life.

Keywords: depression, anxiety, quality of life, atopic dermatitis, acne.**Introduction**

Patients with dermatological diseases suffer from mental health problems more often than the general population. In these patients multiple factors cause negative feelings or the onset of mental health problems, such as, reduced self-esteem and self-confidence, shame, avoidance of company, avoidance of direct contact with people, feelings of helplessness, anxiety, and fear (Turčeková, 2012; Rajczyová, 2015). Some studies on the incidence of mental health problems in patients with dermatological diseases focus on whether the presence of mental health problems is only a comorbidity or if they are mutually related clinical conditions (Hůlková et al., 2008). The type of dermatological disease, its extent, the severity of subjective problems it causes, and the areas of skin

affected by it are related factors which influence the incidence of mental health problems in patients with dermatological diseases (Rajczyová, 2015).

The incidence of mental health problems has been recorded in connection with more than 30 dermatological diagnoses (Gupta et al., 2005), including acne and atopic dermatitis (Barankin, DeKoven, 2002; Evers et al., 2005).

Anxiety and depression are described as the most common mental health problems related to dermatological diseases (Magin et al., 2008). Extensive and visible manifestations of diseases on the skin are usually linked with anxiety, depression, and low self-esteem (Rajczyová, 2015). Gurková and Čáp (2009) state that changes in health status result not only in the onset of anxiety in the patient but also in changes to their self-conception (their ideas of self-image/self-worth) which occur as a consequence of the disease. Furthermore, they state that the way an individual copes with stressful situations related to health status, and whether anxiety develops, depends also on the number of concurrently acting stressors. In the case

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of dermatological diseases, the stressor can be the disease itself and also a consequence of the patient's perception of their disease, i.e., decreased self-worth.

Lower quality of life is also described in patients with dermatological diseases (Holm, Esmann, Jemec, 2004). Acne in particular negatively affects quality of life, possibly because it represents social stigma for adults.

The incidence of dermatological diseases is closely related to the emotional experience of an individual and their ability to cope with the experience. As emotional experiences increase in intensity, stress develops which can induce dermatoses or psychodermatoses (itching, burning, and formication). In atopic dermatitis, emotional triggers can cause itching after only a few seconds of stress in 70% of cases; with acne, the incidence of dermatoses occurs within two days after stress in 55% of cases (Balaščík, 2011). There are differences in the emotional experiences of men and women. In particular, women suffer from higher rates of depression (Gupta, Gupta, Schork, 1994). Women experience situations more emotionally than men, which might explain the lower incidence of depression and other mental health problems in men (Picardi et al., 2004). The incidence of depression and anxiety is in significant relationship to age; the higher the age of the patient, the more common the incidence of depression or anxiety (Heretik, 2007). Endogenous factors, e.g., personality, can increase the risk of incidence of anxiety and depression in patients with dermatological diseases. According to Rajczyová (2015), personality traits predispose patients with dermatological diseases to the development of depressive, anxious disorders, or a combination of them. According to Čáp and Holmanová (2008), personality traits also influence how patients cope with their health status.

Based on the theoretical background on the incidence of anxiety, depression, and quality of life in patients with dermatological diseases and their mutual relationship to gender, age, and personality traits, we specified the study aim.

Aim

The study aim was to establish differences in the levels of anxiety, depression, and quality of life in patients with acne and atopic dermatitis; to examine differences related to gender; and to examine the relationship of the levels of anxiety, depression, and quality of life to age and personality traits.

Methods

Design

A cross-sectional study.

Sample

The target group were patients with the dermatological diseases acne and atopic dermatitis dispensarized in a Dermatovenerology Outpatient Department. The average age was 34.65 (SD = 15.3), with an age range from 18 to 68 years.

The sample consisted of 104 respondents including 54 (51.9%) respondents with a diagnosis of acne (27 men; 27 women) and 50 (48.1%) respondents with a diagnosis of atopic dermatitis (26 men; 24 women). The average age of the group of respondents with acne was 24.70 (SD = 7.0), while in the group of respondents with atopic dermatitis it was 45.40 (SD = 14.5).

The selection criteria were: the medical diagnoses acne or atopic dermatitis, dispensarization in the selected dermato-venerology outpatient department, and the informed consent of the respondent.

Data collection

The methods used for data collection were the Hospital Anxiety and Depression Scale (HADS), the Beck Depression Inventory (BDI), and the Dermatology Life Quality Index (DLQI); the Mini International Personality Item Pool (IPIP) was used to identify five personality factors.

The HADS is the gold standard for the determination of the incidence of anxiety and depression in patients (Zigmond, Snaith, 1983). It is a 14-item self-report scale which measures the mental status of a patient over the previous week. Seven of the items relate to anxiety and seven relate to depression. In the study, we used a shortened version of the scale – HADS-A to determine anxiety. Each item is rated on a scale from 0–3 points. The sum of all items creates the total score. A score of 0–7 indicates no anxiety, 8–10 indicates mild anxiety, and 11–21 indicates severe anxiety (McDowell, 2006). In the study, we used a version of the scale translated by the authors. The scale is highly reliable (Bjelland, et al., 2002; McDowell, 2006). The total score for the HADS-A in this study also demonstrated high reliability (Cronbach's $\alpha = 0.75$).

The BDI is the oldest and most widely used scale to indicate depression in patients. The author of the scale is Aaron Beck (Beck et al., 1961). The scale consists of 21 items rated on a four-point scale. The sum of all items creates a total score. A score of 0–11 indicates the norm, 12–19 indicates mild depression, 20–30 indicates moderate depression, and > 30 points

indicates severe depression (Svoboda, 1999). In the study, the Slovak version of the scale commonly available in clinical practice was used. The reliability of the scale has been documented abroad (McDowell, 2006). The total score in this study showed very high reliability (Cronbach's $\alpha = 0.86$).

The DLQI by Finlay and Khan (1994) is a questionnaire to measure quality of life in patients; it expresses their subjective perceptions of a disease. The questionnaire is simple to administer and evaluate; it consists of ten questions. The answers to the questions are rated according to intensity (3 points – very high, 0 points – extremely low). The worst evaluation of quality of life is expressed by a score of 30. In the study, a Slovak version, translated by the authors, was used. The reliability of the questionnaire has been documented by foreign authors (Aghaei et al., 2004; Zhibin et al., 2013). Evaluation of the reliability of data for this study confirms the high reliability of the total DLQI score (Cronbach's $\alpha = 0.82$).

The Mini IPIP is a self-report questionnaire for the evaluation of five personality traits (factors), based on the Big Five Theory (Goldberg et al., 2006). The questionnaire is designed for non-clinical and clinical populations. Extraversion, neuroticism, openness, agreeableness, and conscientiousness as personality factors can be rated by the questionnaire. It includes 20 items; there are four items for each personality factor. The items are rated on a Likert-type scale

from one: “strongly disagree” to five: “strongly agree”. A Slovak version of the scale (Hullová, Duriš, 2016) was used in the study. Again, the reliability of the questionnaire has been documented by foreign authors (Zheng et al., 2008) and in our data (Cronbach's α for all factors > 0.7).

Data analysis

The sample was divided into a group of men and a group of women because of the expected differences in the levels of anxiety, depression, and quality of life in patients with acne and atopic dermatitis according to gender. Non-parametric statistics were used for statistical analysis because the conditions for normal distribution of variables (anxiety, depression, quality of life) were not met. The Mann-Whitney U-test was used to compare the differences of the independent samples, and Spearman's rank correlation coefficient was used to study the relationships between the variables. The software IBM SPSS Statistics 21 was used for data analysis.

Results

We compared two groups of patients with dermatological diseases – acne and atopic dermatitis – on levels of anxiety, depression, and quality of life. The two groups do not differ statistically in any of the studied variables (all $p > 0.05$) (Table 1).

Table 1 Comparison of levels of anxiety, depression, and quality of life in patients with acne and atopic dermatitis

	Acne		Atopic dermatitis		U	p
	n ₁	Mdn ₁	n ₂	Mdn ₂		
HADS-A	54	6.90	50	7.21	1288.5	0.819
BDI	54	8.00	50	8.75	1330.0	0.896
DLQI	54	6.88	50	5.63	1161.0	0.217

HADS-A – anxiety; BDI – depression; DLQI – quality of life; n – number of participants; Mdn – grouped median value; U – testing criterion Mann-Whitney U-test; p – p-value

In the next part we studied the differences in levels of anxiety, depression, and quality of life, in terms of gender, age, and personality traits. We studied these relationships separately in diagnostic subgroups due to the different diagnoses (e.g., the age range of the sample of the two groups is significantly different). A statistically significant difference in the levels of anxiety in men and women was found in the group of patients with acne ($U = 165.5$; $p = 0.001$); higher anxiety was found in women (Mdn = 10.00) than in

men (Mdn = 5.17). No statistically significant differences were found in the incidence of depression and quality of life between genders (all $p > 0.05$) (Table 2).

We discovered that anxiety, depression, and quality of life do not correlate with age in either the group of patients with acne or the group of patients with atopic dermatitis (Table 3).

Table 2 Comparison of levels of anxiety, depression, and quality of life in male and female patients with acne and atopic dermatitis

	Men		Women		U	p
	n ₁	Mdn ₁	n ₂	Mdn ₂		
Acne						
HADS-A	27	5.17	27	10.00	165.5	0.001
BDI	27	7.50	27	9.00	330.5	0.555
DLQI	27	8.00	27	6.00	305.5	0.306
Atopic dermatitis						
HADS-A	26	7.80	24	5.83	258.5	0.415
BDI	26	9.00	24	8.00	302.5	0.853
DLQI	26	5.17	24	6.33	242.5	0.175

HADS-A – anxiety; BDI – depression; DLQI – quality of life, n – number of participants; Mdn – grouped median value; U – testing criterion Mann-Whitney U-test; p – p-value

Table 3 Correlation between anxiety, depression, quality of life and age in patients with acne and atopic dermatitis

Age	HADS-A	BDI	DLQI
Acne (n = 50)	-0.093	-0.122	0.064
Atopic dermatitis (n = 54)	0.238	0.191	-0.221

HADS-A – anxiety; BDI – depression; DLQI – quality of life; n = number of participants; Spearman's rank correlation coefficient was used, all correlations are $p > 0.05$

The relationships of anxiety, depression, and quality of life to five personality factors are shown in Table 4. We found statistically significant relationships between anxiety and neuroticism in both groups ($r_s = 0.507$ and 0.463). Depression relates to neuroticism in the group of patients with acne ($r_s = 0.381$). In the group of patients with atopic dermatitis, depression

relates to all personality variables (neuroticism $r_s = 0.281$; extraversion $r_s = -0.292$; openness $r_s = -0.275$; agreeableness $r_s = -0.371$; and conscientiousness $r_s = -0.286$). Quality of life relates to extraversion ($r_s = -0.286$) in the group of patients with acne, and with agreeableness ($r_s = -0.292$) in the group of patients with atopic dermatitis.

Table 4 Correlations between anxiety, depression, quality of life and personality variables in patients with acne and atopic dermatitis

Personality	Neuroticism	Extraversion	Openness	Agreeableness	Conscientiousness
Acne (n = 50)					
HADS-A	0.507***	-0.227	-0.267	-0.085	0.121
BDI	0.381**	-0.208	-0.019	0.036	-0.095
DLQI	0.103	-0.286*	0.113	-0.254	0.078
Atopic dermatitis (n = 54)					
HADS-A	0.436**	-0.168	-0.171	-0.062	-0.210
BDI	0.281*	-0.292*	-0.275*	-0.371*	-0.286*
DLQI	0.055	0.042	0.054	-0.292*	-0.001

HADS-A – anxiety; BDI – depression; DLQI – quality of life; Spearman's rank correlation coefficient was used; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Discussion

We found a prevalence of anxiety of 55.6% in patients in the studied groups with acne and atopic dermatitis. Mild anxiety was found in 23.3% of the patients, and severe anxiety in 22.3% of the patients. The prevalence of anxiety in the general population is 25% (Ninan, 2001). Prevalence of depression was 37.5% of patients with acne and atopic dermatitis. Mild depression was found in 24% of patients, moderate depression in 11.5% of patients, and severe depression in 1.9% of patients. According to Češková (2001), prevalence of depression in the general public is 17%.

Based on the findings of the prevalence of anxiety and depression in the studied groups, we can confirm that acne and atopic dermatitis are part of the group of dermatological diseases with psychological morbidity (Ginsburg et al., 1993; Turčeková, 2012).

Subjective perception of a disease and its impact on patients' quality of life was evaluated by the DLQI; quality of life was slightly affected by the disease in 26% of patients, significantly in 38.5% of patients, and very significantly in 17.3% of the patients; i.e., 81.7% of the respondents reported that their dermatological disease affected their quality of life. Studies on the incidence of psychological

morbidity in patients with dermatological diseases or their influence on quality of life focus on the severity of dermatological diseases as predictors of these complications. As severity of skin problems is described as being a weak predictor of the incidence of psychological morbidity and quality of life (Wittkowski et al., 2004; Hůlková et al., 2008), we did not investigate this factor.

We expected to find differences in the levels of anxiety, depression, and quality of life due to the different symptomatology of the dermatological diagnoses acne and atopic dermatitis. Depression in patients with atopic dermatitis has been confirmed by research (Gupta, Gupta, 1998). Depression in patients with atopic dermatitis can be caused and intensified not only by worsening skin condition, as, for example, with acne, but also by severe itching. Rajczyová (2015) states that subjective problems in patients with dermatological diseases, such as itching, have negative effects on their quality of life. Patients with atopic dermatitis respond by intensive scratching, resulting in excoriations, a significant indication of the severity of the disease (Masarovičová et al., 2012). Severity of depression and suicidal ideation closely relate to subjective perceptions in dermatological patients (Gupta et al., 1994). Perceptions of skin problems in patients with atopic dermatitis are crucial in prediction of quality of life (Wittkowski et al., 2004). Similarly, Linnet and Jemec (1999) state that the incidence of psychological morbidity relates more to subjective perceptions of severity of disease manifestations than to objectively evaluated severity of skin problems.

From analysis of the literature, which indicates that atopic dermatitis involves numerous factors contributing to the presence of psychological morbidity in patients, we assumed there would be higher anxiety and depression, and lower quality of life in the group of patients with atopic dermatitis than in the group of patients with acne.

According to our findings, there are no statistically significant differences between the levels of anxiety, depression, and quality of life in patients with acne and patients with atopic dermatitis. Even though higher levels of anxiety and depression were found in the group of patients with atopic dermatitis, no statistically significant differences were found. The study results by Ginsburg et al. (1993) show that patients with atopic dermatitis have higher anxiety than patients with another dermatological disease (psoriasis). However, we did not find differences in the incidence of anxiety between the dermatological diseases atopic dermatitis and acne.

Quality of life was worse in the patients with acne than in the patients with atopic dermatitis, although there was no statistically significant difference. According to our findings, both dermatological diseases affect quality of life, which has been confirmed by other studies. The effects on quality of life in patients with acne have been stated in several studies (Do et al., 2009; Tasoula et al., 2012; Yap, 2012; El-Khateeb et al., 2014). Quality of life affected by atopic dermatitis has also been described by several authors (Linnet, Jemec, 1999; Turčeková, 2012). As there are differences between men and women in the experience of emotions, in the next part of the study we studied differences in anxiety, depression, and quality of life between genders in both groups of patients. A statistically significant difference in levels of anxiety was found in the group of patients with acne – higher anxiety was found in women. However, we found no statistically significant differences in anxiety between men and the women in the group of patients with atopic dermatitis. Similarly, Linnet and Jemec (1999) found that there were no differences between genders in the group of patients with atopic dermatitis. An interesting finding is that the incidence of anxiety in women in the group of patients with acne was twice as high as in women in the group of patients with atopic dermatitis. Levels of depression were almost the same in men and women in both groups, which does not confirm findings by other authors (Gupta et al., 1994; Picardi et al., 2004) who found that there was higher depression and other mental health problems in women, since they perceive situations and events more emotionally than men.

Quality of life was evaluated similarly by both the men and the women in both groups of patients with dermatological diseases, with no statistically significant differences found between genders. This finding does not correspond with findings in other studies (Do et al., 2009; El-Khateeb et al., 2014) in which in patients with acne, women reported worse quality of life than men.

According to Heretik (2007), levels of anxiety and depression should relate to the patient's age – the older the patient, the higher the level of mental health problems. In the study, we did not find statistically significant relationships between age and quality of life in the patients in either group. Yap (2012) reported a similar finding, i.e., that quality of life in patients with acne does not relate to age. It is typical for acne to spontaneously disappear in early adulthood; although sometimes it persists in patients up to 30 years of age. We also found that anxiety and depression levels do not relate to age.

In patients with atopic dermatitis, the disease can persist for various lengths of time. According to our findings, however, age does not appear to be a protective factor for the studied variables. Linnet and Jemec (1999) also state that neither quality of life nor anxiety relates to age in patients with atopic dermatitis. This finding was also supported by our results.

Personality traits affect how people respond to stress, which can be a significant factor in the onset of dermatological diseases or as a stressor when a person already has a disease (Rajczyová, 2015). Personality traits are also important in determining how patients cope with their state of health (Čáp, Holmanová, 2008). El-Khateeb et al. (2014) describe anxiety and depression as consequences of acne as it is a disease which can be “seen”. Patients are confronted by their social environment. They must make use of their personality traits to deal with difficult situations. The incidence of emotional lability or anxiety (neuroticism) in patients relates to the incidence of dermatological diseases. Based on background information, we studied the relationship of the levels of anxiety, depression, and quality of life in patients with acne and atopic dermatitis to their personality traits. In the study, we found statistically significant relationships between anxiety and neuroticism in both groups; lower anxiety was found in emotionally more stable individuals. Our findings also support the findings by Linnet and Jemec (1999) that the level of anxiety in patients with atopic dermatitis relates to their personality traits (neuroticism).

In the group of patients with atopic dermatitis, depression relates to all personality variables; higher depression was found in individuals who are neurotic, introvert, reserved, less agreeable, and less conscientious. In the group of patients with acne, depression relates only to neuroticism.

Quality of life in the group of patients with acne relates to extraversion; worse quality of life was found in more introverted individuals. This result is indirectly supported by research by Tasoula et al. (2012), who report that acne causes feelings of inferiority and reduces self-respect, which negatively affects social interaction, and also subsequently affects the psychosocial area of quality of life. Quality of life in the group of patients with atopic dermatitis relates to agreeableness; worse quality of life is reported by individuals who are less agreeable.

In both groups of dermatological diseases, we found significant relationships to personality traits; in some cases, these relationships differ. There is a lack

of research on the relationships between several personality traits in this area. Based on our findings, we can assume that not only obvious factors such as type of dermatological diseases and their extent and severity (Rajczyová, 2015) but also personality traits can be significant factors related to the incidence of mental health problems in patients with dermatological diseases, and levels of quality of life. Our study has provided new findings in this area; we recommend they be used as a basis for further studies.

In patients with dermatological diseases in general, besides depressive and anxious symptomatology, other psychiatric disorders can occur, including schizophrenia, affective disorders, somatoform disorders, personality disorders, or behavioural disorders (Schmitt et al., 2009; Turčeková, 2012). We did not consider comorbidity of mental health or somatic diseases for inclusion of respondents in the study. In addition, we used self-report tools to study all variables, which is one of the limitations of the study. The presence of mental health problems can cause less accurate evaluation of one's own condition. On the other hand, we did not find any evident manifestations of mental health issues in any of the patients. Thus, this limitation should be minimal for the study results and conclusions.

In patients with atopic dermatitis, a number of authors (Ginsburg et al., 1993; Hashiro, Okumura, 1997; Linnet, Jemec, 1999) unequivocally recommend dermatological treatment and the implementation of psychological interventions in care; and likewise with patients with acne (Do et al., 2009). Reduction or elimination of mental health problems as a result of nursing interventions can significantly contribute to improving quality of life in patients with dermatological diseases.

Conclusion

Acne and atopic dermatitis are dermatological diseases with psychological morbidity, particularly as a result of high prevalence of anxiety and depression, which results in worse evaluation of quality of life in patients. Patients with acne and atopic dermatitis do not differ significantly in levels of anxiety, depression and quality of life. The differences in the studied variables (anxiety, depression, and quality of life) in patients with acne and atopic dermatitis can be affected by a number of factors. The effect of (female) gender is significant in the prevalence of anxiety in patients with acne. Age does not indicate significant relationships in the studied variables in either patients with acne or patients with atopic dermatitis. Personality traits are a factor that

predicts higher anxiety and depression, and worse quality of life. The most interesting finding is that the personality trait of neuroticism indicates a relationship to the prevalence of anxiety in both patients with acne and patients with atopic dermatitis.

Screening of mental health problems is important for all members of multidisciplinary teams in the care of patients with dermatological diseases. Knowing the predictive factors of the incidence of mental health problems in patients with acne and atopic dermatitis helps nurses in nursing diagnoses. Nurses contribute to quality care and improving quality of life in patients with dermatological diseases, particularly by early nursing diagnosis of the incidence of anxiety and depression in patients with acne and atopic dermatitis, and subsequently by early interventions in these areas.

Ethical aspects and conflict of interest

The authors declare that they have no conflicts of interest in the research. Before data collection, informed consents from the patients and the agreement of the Dermato-venerology Outpatient Department's founder were obtained.

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Author contribution

Conception and design (AS, GV, TS), data collection (AS, DZ), data analysis and interpretation (TS, AS), manuscript draft (AS, DZ), critical revision of the manuscript (AS, TS, GV), final approval of the manuscript (AS, TS, GV, DZ).

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