Illness Perception and Quality of Life in Patients with Environmental Dermatoses: A Cross-sectional Study

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ABSTRACT

Introduction: The skin conditions or disorders that develop due to various environmental or climatic factors are included under environmental dermatoses. A few studies have shown that different environmental factors can cause skin disorders but have not commented on the Quality of Life (QoL) and perception of the illness due to environmental dermatoses.

Aim: To assess Illness Perception (IP) and QoL in patients with environmental dermatoses and to evaluate the extent to which IP is associated with the QoL in patients with environmental dermatoses.

Materials and Methods: A cross-sectional study was conducted on 117 patients with environmental dermatoses who had visited the Outpatient Clinic of Dermatology, Venereology and Leprosy, Kolar, Karnataka, India, between February 2021-May 2021. All patients were assessed with the help of Dermatological QoL and Brief Illness Perception questionnaires. Data was analysed using Statistical Package for the Social Sciences (SPSS) 21.0 version. Analysis of Variance (ANOVA) was used to see the variances between more than two quantitative variables. Correlations were performed with Spearman correlation coefficient. The p-value <0.05 was considered as statistically significant.

Results: Out of 117 patients, 54.7% patients were males and 45.3% were females with the mean age of 35.13 years. Infections and infestations (47%) were most commonly encountered which was followed by photodermatoses (25.6%), contact dermatitis (20.5%) and dry skin (6.8%). Dermatological Quality of Life (DQOL) mean score for infections and infestations was 12.63±7.15, contact dermatitis was 10.71±6.81, photodermatoses 9.13±3.94, and dry skin 8.26±4.06. The QoL of overall patients were moderately affected (mean DQOL score of 11). Patients with infections and infestations had more treatment expectations (8.58±1.13), concern (8.40±1.43), strong identity (5.53±3.32), more emotional (7.29±1.80) as compared with other dermatoses which were statistically significant (p<0.05). There were statistically significant positive correlation of QoL with consequences (r_s=0.679), timeline (r_s=0.196), concern (r_s=0.602), and emotional impact (r_s=0.583).

Conclusion: Present study shows that the patients' QoL with environmental dermatoses is largely affected. Patients' perspective towards the illness directly influences their QoL, so clinicians should be aware of this. Also, if necessary, it is suggested to integrate psychological intervention in the patient management by the clinicians, which will potentially affect the treatment outcome.

INTRODUCTION

Intrinsic skin quality can be altered by any changes in climate or environmental factors facilitating and/or conditioning the outbreak of various infections [1]. In low humid conditions, there is low transepidermal water loss which thickens the epidermis [2] and stimulate the release of inflammatory cytokines [3]. These changes can be seen in chronic inflammatory dermatoses where itching is more in winter season [1]. Increase in epidermal Langerhans cells and increased allergen penetration are observed with low humidity regulating immune reaction [4]. Low temperature and low humidity increase transepidermal water loss, decrease lipid content and natural moisturising factors leading to dryness of skin, which is prone to be more severe in elderly people [5], and also it aggravates itching of other skin conditions like psoriasis and atopic dermatitis [6]. Majority of acne vulgaris patients experience exacerbation of symptoms during summer season due to increased humidity and sweating [7]. Ultraviolet radiation causes various short-term and long-term sequelae like sunburn reaction, photo-immunosuppresive, photoaging and skin cancers [8] through the production of reactive oxygen species and damage of Deoxyribonucleic Acid (DNA) of epidermal cells [9]. All these skin conditions or disorders that develop due to various environmental or climatic factors are included under environmental dermatoses [10].

In spite of the fact that mortality due to skin diseases are low, it has huge impact on QoL leading to low self-esteem and embarrassment in interacting with society [11]. Social and physical activities of the patient may be severely affected in order to hide their skin disease [12,13].

The IP is the emotional representation and belief about patient's illness or health threat concerning symptoms of illness, chronicity, control of the illness, emotional status and treatment outcome [14,15]. People have little knowledge about environmental exposure as a risk factor of skin diseases. So, it is important to know how the QoL of patients with environmental dermatoses are affected due to their illnesses and their understanding level about their diseases, hence this study was undertaken.

MATERIALS AND METHODS

The present study was a cross-sectional study in which 117 patients with 11 different environmental dermatoses who had visited the outpatient clinic of Dermatology, Venereology and Leprosy, Kolar, Karnataka, India, between February 2021 to May 2021 were included in this study. Informed consent were taken from all the patients before initiating the questionnaire. This study was approved by Institutional Ethics Committee (IEC) (No. DMC/KLR/IEC/448/2021-22).

Inclusion criteria: All patients with environmental dermatoses with the age above 18 years were included in the study.

Exclusion criteria: Unwilling patients were excluded from the study.

Study Procedure

Convenience sampling was followed. All patients were explained about the study, assured that it would not affect their treatment

and their identity would be anonymous. Questionnaires of both English and Kannada languages were distributed to the patients according to their preference. The dermatoses were grouped under four conditions- infections and infestation, contact dermatitis, photodermatoses, and dry skin. QoL was assessed using Dermatological life quality index which had 10 questions. The scores were from 0 (not relevant/not at all) to 3 (very much). It consisted of components like symptoms, feelings, daily activities, leisure activities, work or school, personal relationships and treatment [12].

The IP was evaluated with the brief illness perception questionnaire which contained nine items. In this study, only the first eight items were included and 9th item was removed since it was opened ended. The tool assessed impact on day to day life, longevity of the disease, personal control, treatment expectation, symptoms severity, consciousness, comprehensiveness, emotional impact. One question was added to assess relationship between environmental factors and disease. Each of the question had response from 0-10 [14].

STATISTICAL ANALYSIS

Data was analysed using SPSS 21.0 version. Categorical data was represented in the form of frequencies and proportions. Continuous data was represented as mean and standard deviation. ANOVA was used to see the variances between more than two quantitative variables. Correlations were performed with Spearman correlation coefficient. The p-value <0.05 and <0.01 was considered as statistically significant.

RESULTS

Out of 117 patients, 64 (54.7%) were males and 53 (45.3%) were females. Majority of the participants belonged to the age group of 19-29 years. Of the participants, 36.8% were students followed by housewife (23%) [Table/Fig-1]. Among all environmental dermatoses, infections and infestations (47%) were most commonly encountered [Table/Fig-2].

Socio-demographic variables	N (%)
Sex	
Female	53 (45.3)
Male	64 (54.7)
Age (years, mean±SD)	35.13±11.8
Occupation	
Students	43 (36.8)
Housewife	27 (23)
Skilled workers	21 (18)
Agriculturists	17 (14.5)
Labourer	9 (7.7)

[Table/Fig-1]: Socio-demographic data.

Environmental dermatoses	Subgroup of environmental dermatoses	Distribution N (%)
Infections and infestations	Fungal infection	20 (17.1)
	Bacterial infection	10 (8.5)
	Viral wart	11 (9.4)
	Scabies	14 (12)
Contact dermatitis	Allergic contact dermatitis	9 (7.7)
	Irritant contact dermatitis	15 (12.8)
Photodermatoses	Actinic cheilitis	5 (4.3)
	Chronic actinic dermatitis	4 (3.4)
	Freckles	8 (6.8)
	Polymorphic light eruption	13 (11.1)
Dry skin		8 (6.8)

[Table/Fig-2]: Frequency distribution of various environmental dermatoses (N=117).

Mean score for symptoms and feelings, leisure, work and school and personal relationship were highest in patients with infections and infestations when compared with other dermatoses. The difference was statistically significant among symptoms and feelings, leisure, work and school, and personal relationship with various dermatoses. Also, overall highest DQOL mean score was seen in infections and infestations patients followed by contact dermatitis, photodermatoses and lowest in patients with dry skin. There was statistically significant difference found between DQOL and various dermatoses [Table/Fig-3].

Domains	Infections and infestations Mean±SD	Contact dermatitis Mean±SD	Photodermatoses Mean±SD	Dry skin Mean±SD	p-value*
Symptoms and feelings	3.04±1.74	2.54±1.02	2.07±0.74	2.00±0.76	**0.01**
Daily activities	1.07±1.09	1.00±1.82	1.17±1.05	0.88±1.73	0.938
Leisure	1.38±1.10	1.08±1.35	0.73±0.58	0.50±0.76	**0.017**
Work and school	1.95±1.03	1.71±1.00	1.13±0.43	1.00±0.00	**<0.01**
Personal relationship	3.44±1.54	2.67±0.87	2.53±0.63	2.13±0.35	**<0.01**
Treatment	1.75±0.65	1.71±0.75	1.50±0.51	1.75±0.46	0.364
DQOL*	12.63±7.15	10.71±6.81	9.13±3.94	8.26±4.06	**0.021**

[Table/Fig-3]: Comparison of dermatological Quality of Life (QoL) according to various environmental dermatoses.
*ANOVA test; *The overall mean DQOL score, calculated from the total scores obtained in all the domains by all the participants was 11, suggesting that patients' QoL was moderately affected

Patients with contact dermatitis had the highest mean score for personal control when compared with other dermatoses. There was statistically significant difference found between personal control and various dermatoses, p-value <0.01. Patients with photodermatoses believed that their disease will continue longer than any other conditions (6.33±2.44). Contact dermatitis patients had more understanding about their illnesses whereas infections and infestations patients had more treatment expectations, concern, strong identity, more emotional as compared with other dermatoses. All findings were statistically significant different among the various dermatoses [Table/Fig-4].

Domains	Infections and infestations Mean±SD	Contact dermatitis Mean±SD	Photodermatoses Mean±SD	Dry skin Mean±SD	p-value*
Consequences	6.73±1.77	6.33±1.27	6.17±1.82	5.88±1.13	0.327
Timeline	4.87±1.56	5.33±1.83	6.33±2.44	5.13±0.84	**<0.01**
Personal control	4.65±1.23	6.75±1.51	4.67±1.74	5.25±1.28	**<0.01**
Treatment expectation	8.58±1.13	8.17±1.05	7.53±1.66	8.38±0.74	**<0.01**
Identity	5.53±3.32	4.83±2.30	3.88±1.24	3.88±1.25	**<0.01**
Concern	8.40±1.43	7.50±1.21	7.40±0.86	6.75±1.28	**<0.01**
Understanding	7.11±1.80	7.67±1.20	6.23±1.40	5.88±0.99	**<0.01**
Emotional impact	7.29±1.80	6.13±2.03	6.70±1.18	5.00±0.76	**<0.01**
Environmental impact	7.50±1.63	8.33±1.05	7.20±1.06	6.63±1.41	**<0.01**

[Table/Fig-4]: Comparison of illness perception according to various environmental dermatoses.
*ANOVA test

Using Spearman correlation coefficient, the correlation between QoL and IP domains were tested. Low DQOL was significantly co-related with severe consequences, more timeline, strong identity, more concern, understanding, emotional impact and environmental impact [Table/Fig-5].

Domains		DQOL	Symptoms and feeling	Daily activities	Leisure	Work and school	Personal relationship
Consequences	r_s*	0.679	0.657	0.342	0.504	0.622	0.602
	p-value	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Timeline	r_s*	0.196	0.054	0.222	0.065	0.116	0.103
	p-value	0.034	0.560	0.016	0.488	0.214	0.269
Personal control	r_s*	-0.025	-0.022	-0.085	0.004	0.036	-0.118
	p-value	0.789	0.814	0.365	0.963	0.700	0.204
Treatment expectation	r_s*	0.059	0.139	-0.111	0.099	0.108	0.090
	p-value	0.524	0.135	0.234	0.288	0.245	0.335
Identity	r_s*	0.762	0.812	0.213	0.569	0.769	0.671
	p-value	<0.01	<0.01	0.021	<0.01	<0.01	<0.01
Concern	r_s*	0.602	0.593	0.360	0.519	0.581	0.467
	p-value	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Understanding	r_s*	0.193	0.226	0.132	0.228	0.140	0.054
	p-value	0.037	0.014	0.157	0.013	0.132	0.564
Emotional impact	r_s*	0.583	0.551	0.393	0.451	0.520	0.569
	p-value	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Environmental impact	r_s**	0.197	0.210	0.027	0.194	0.243	0.121
	p-value	0.033	0.023	0.770	0.036	<0.01	0.194

[Table/Fig-5]: Correlation of Quality of Life (QoL) with illness perception in study subjects.
*Spearman correlation

DISCUSSION

Any change in skin colour, texture, or appearance influence the negative attitude of the society and negative emotions of the patients, which are very critical in the evolution of psychological morbidity [16]. Environmental dermatoses affect patients' QoL in various ways such as disturbing symptoms as well as the undesirable appearance of the skin, leads to avoidance of public places, low self-esteem, and embarrassment, unable to concentrate in study or work, interfere in interpersonal relationships [12,16]. Subjective perception of illness determined health outcome and QoL [17,18]. For example, negative illness perception can worsen the symptom severity modification of such cynical thoughts can improve QoL [18].

In this study, DQOL especially the personal relationship domain, was most impaired in the infections and infestations group. However, in a study conducted in Malaysia, participants with infections and infestations were mainly affected by uncomfortable physical symptoms like itching, soreness, pain, and stinging [19]. In a large-scale study by Jong CT et al., conducted in Cardiff, United Kingdom, out of 790 patients with photodermatoses, 39% had a median DQoL score of more than 10 [20], which was comparable to the present study with the DQoL mean score of 9.13±2.24. So, both studies showed a moderate to large impact on patients with photodermatoses.

A cross-sectional study conducted in Rawalpindi found that patients with endogenous eczema had low QoL than those with exogenous eczema [21]. In the present study, the mean DQoL in contact dermatitis (endogenous eczema) was more (10.71±6.81) than dry skin (exogenous eczema) (8.26±4.06), which means contact dermatitis patients had more negative impact on QoL than those with dry skin.

Dry skin, infections and infestations are caused by low humidity, high temperature, and excessive sweating, whereas excessive sun exposure and exposure to chemicals lead to photodermatoses and contact dermatitis [1,8]. Avoidance of these factors, usage of light cotton loose clothing, application of moisturising lotion especially in elderly people, sun protection by using sunscreen, broad brimmed hat and protective clothing would reduce symptoms and severity of the illness thereby improve their perspectives as well as QoL.

In the present study, contact dermatitis patients perceived more understanding about their conditions and also had more subjective feelings of personal control over the diseases, which was in contrast to a study from Israel [22]. Most contact dermatitis participants in the current study were follow-up cases, so dermatologists would have explained the condition, which could be the probable reason for the different results.

The present study found that low DQoL significantly co-related with severe consequences, more timeline, and strong identity (negative illness perception). These findings were supported by a survey by Vollmann M et al., in which patients having favourable illness perception had a better QoL than patients with negative illness perception [23].

Negative illness perception affects the QoL, which is an important factor for the development of psychiatric co-morbidities [24,25]. Patients with such negative illness perception feel depressed, embarrassed, and have low self-esteem [26]. On the other hand, this psychological stress may aggravate or precipitate certain skin conditions leading to the chronicity of the conditions [27]. Psychotherapy has a role as an adjuvant treatment in dermatological conditions to improve morbidity, treatment adherence and prevent any psychiatric complications [28].

The integration of counselling regarding the communication of the patient's subjective perception of illness together with medical treatment will improve the overall outcome, the doctor-patient relationship, as well as patient compliance [29].

Limitation(s)

This study was limited by a small population. It was a self-assessment study. Another drawback was that this study could not include all different types of environmental dermatoses.

CONCLUSION(S)

This study reveals that QoL is moderately affected and has unfavourable illness perceptions in patients with environmental dermatoses. Moreover, it was observed that patients' perception of the illness impacts their QoL. Therefore, it is appealed to the clinicians to acknowledge the patient's perspectives about the illness and integrate psychological intervention, if necessary, along with medical treatment to decrease disease burden, improving their QoL. Future studies should include a large sample size and all different types of environmental dermatoses and awareness about the importance of environmental factors in the causation of environmental dermatoses.

REFERENCES

[1] Balato N, Megna M, Ayala F, Balato A, Napolitano M, Patruno C. Effects of climate changes on skin diseases. Expert Rev Anti Infect Ther. 2014;12:171-81.

[2] Denda M, Sato J, Masuda Y, Tsuchiya T, Koyama J, Kuramoto M, et al. Exposure to a dry environment enhances epidermal permeability barrier function. J Invest Dermatol. 1998;111:858-63.

[3] Ashida Y, Ogo M, Denda M. Epidermal interleukin-1 alpha generation is amplified at low humidity: Implications for the pathogenesis of inflammatory dermatoses. Br J Dermatol. 2001;144:238-43.

[4] Hosoi J, Hariya T, Denda M, Tsuchiya T. Regulation of the cutaneous allergic reaction by humidity. Contact Dermat. 2000;42:81-84.

[5] Sunwoo Y, Chou C, Takeshita J, Murakami M, Tochihara Y. Physiological and subjective responses to low relative humidity in young and elderly men. J Physiol Anthropol. 2006;25:229-38.

[6] Mac-Mary S, Sainthillier JM, Humbert P. Dry skin and the environment. Exog Dermatol. 2004;3:72-80.

[7] Sardana K, Sharma RC, Sarkar R. Seasonal variation in acne vulgaris: Myth or reality. J Dermatol. 2002;29:484-88.

[8] Marionnet C, Tricaud C, Bernerd F. Exposure to non-extreme solar UV daylight: Spectral characterization, effects on skin and photoprotection. Int J Mol Sci. 2014;16:68-90.

[9] Tewari A, Sarkany RP, Young AR. UVA1 induces cyclobutane pyrimidine dimers but not 6-4 photoproducts in human skin in vivo. J Investig Dermatol. 2012;132:394-400.

[10] Singh G, Chatterjee M, Grewal R, Verma R. Incidence and care of environmental dermatoses in the high-altitude region of ladakh, India. Indian J Dermatol. 2013;58(2):107-12.

[11] Rani Z, Khan MS, Aman S, Nadeem M, Hameed A, Kazmi AH. Quality of life issues and new benchmarks in the assessment of skin diseases. J Pak Assoc Dermatol. 2005;15:339-44.

[12] Finlay AY. Quality of life indices. Indian J Dermatol Venerol Leprol. 2004;70:143-48.

[13] Deshpande H, Shivakumar, Kavita MB, Tripathy TB, Chaturvedi A. Assessment of quality of life in patients with skin disorders undergoing ayurvedic Panchakarma (Biopurification) as management. J Evid Based Complementary Altern Med. 2016;21:215-20.

[14] Broadbent E, Petrie KJ, Main J, Weinman J. The brief illness perception questionnaire. J Psychosom Res. 2006;60:631-37.

[15] Nagpal N, Gordon-Elliott J, Lipner S. Comparison of quality of life and illness perception among patients with acne, eczema, and psoriasis. Dermatol Online J. 2019;25:3.

[16] Chaturvedi SK, Singh G, Gupta N. Stigma experience in skin disorders: An Indian perspective. Dermatol Clin. 2005;23(4):635-42.

[17] Yaraghchi A, RezaeiO, Mandegar MH, Bagherian R. The relationship between illness perception and quality of life in Iranian patients with coronary artery bypass graft. Procedia Soc Behav Sci. 2012;46:3329-34.

[18] Clarke D, Goosen T. The mediating effects of coping strategies in the relationship between automatic negative thoughts and depression in a clinical sample of diabetes patients. Personality and Individual Differences. 2009;46:460-64.

[19] Ramamuthie G, Verma RK, Appalasamy J, Barua A. Awareness of risk factors for skin infections and its impact on quality of life among adults in a Malaysian city: A cross-sectional study. Trop J Pharm Res. 2015;14:1913-17.

[20] Jong CT, Finlay AY, Pearse AD, Kerr AC, Ferguson J, Benton EC, et al. The quality of life of 790 patients with photodermatoses. Br J Dermatol. 2008;159:192-97.

[21] Ahmed N, Chaudhary A, Tahir M, Toor S, Ghaffar M, Ali U, et al. A comparative study on effect of endogenous and exogenous eczema on quality of life. Pak Armed Forces Med J. 2019;69:1330-34.

[22] Benyamini Y, Goner-Shilo D, Lazarov A. Illness perception and quality of life in patients with contact dermatitis. Contact Derm. 2012;67:193-99.

[23] Vollmann M, Matsuda A, Kroep JR, Kobayashi K, Kubota K, Inoue K, et al. Illness perceptions and quality of life in patients with non-small-cell lung cancer: A 3-month follow-up pilot study. Patient Relat Outcome Meas. 2020;11:67-71.

[24] Picardi A, Abeni D, Melchi CF, Puddu P, Pasquini P. Psychiatric morbidity in dermatological outpatients: An issue to be recognized. Br J Dermatol. 2000;143:983-91.

[25] Gupta MA, Gupta AK. Psychiatric and psychological co-morbidity in patients with dermatologic disorders: Epidemiology and management. Am J Clin Dermatol. 2003;4:833-42.

[26] Panconesi E. Psychosomatic dermatology: Past and future. Int J Dermatol. 2000;39:732-34.

[27] 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;6:411-20.

[28] Poot F, Sampogna F, Onnis L. Basic knowledge in psychodermatology. J Eur Acad Dermatol Venereol. 2007;21(2):227-34.

[29] De Ridder DTD, Theunissen NCM, Van Dulmen SM. Does training general practitioners to elicit patients' illness representations and action plans influence their communication as a whole? Patient Educ Couns. 2007;66:327-36.

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