

CLINICAL REPORT

Self-reported Skin Diseases, Quality of Life and Medication Use: A Nationwide Pharmaco-epidemiological Survey in Sweden

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The aim of this study was to determine self-reported consumption of dermatological pharmaceuticals and quality of life (QoL), measured with Short Form 36, in relation to eczema, acne, psoriasis and other inflammatory skin conditions in the Swedish population. A questionnaire containing questions on the occurrence of skin diseases, health-related QoL and the use of pharmaceuticals was sent to a cross-sectional sample of the Swedish population, age range 18–84 years ($n=8,000$). The response rate was 61%. The 1-year prevalence of skin diseases was 30–35%, with females reporting a higher prevalence. The prevalence was 11.5% for eczema other than hand eczema, 10.2% for acne, 7.5% for hand eczema, 3.9% for psoriasis and 3.1% for urticaria. QoL was significantly affected and 25% of females and 19% of males had used a dermatological drug. Compared with hand eczema, persons with psoriasis and other eczema reported significantly more use of topical steroids on prescription and more use of dermatological pharmaceuticals in total. Skin conditions are common; they affect QoL and lead to a high consumption of dermatological drugs; which deserves increased awareness in the society. *Key words: skin diseases; quality of life; pharmacoepidemiology; dermatological agents.*

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In a recent study it was shown that approximately 24% of first-time visits to general practitioners in England and Wales were due to skin problems (1). A similar overall prevalence of skin disease, 22–25%, was reported both in London, UK (2), and in a cohort of 90,880 workers in Germany (3). There are few population-based reports on the prevalence of skin diseases. The self-reported prevalence of skin problems in a Swedish adult population was found to be 20% (females 22%; males 17%) in a population-based study from 1995 (4). The occurrence of skin problems in the population is probably higher, as it has been shown that self-reports of 5 common skin

disorders underestimated the prevalence compared with dermatologists' diagnoses (5). This has also been demonstrated for hand eczema (6). It is generally acknowledged that the burden of skin diseases is high (7–11). The expression "burden of" includes a multitude of factors, such as loss of income, increased consumption of pharmaceuticals and medical care, as well as implications for health-related QoL (HRQoL). In a population-based study, Dalgard et al. (12) also found a relationship between socio-economic factors (income, education level, marital status) and self-reported symptoms of common skin disorders. However, knowledge on the consumption of pharmaceuticals used for treatment of skin diseases in the general population is sparse. Bingefors et al. (4) showed that individuals in an adult Swedish population reporting skin problems had an increased consumption of both prescribed and over-the-counter drugs (OTC). The use of dermatological pharmaceuticals was highest among those reporting a decreased QoL (4). In a more recent Swedish cross-sectional population survey it was shown that the use of dermatological pharmaceuticals among persons with hand eczema increased if the eczema was reported to be severe (13). Hald et al. (14) found that 25% of patients with hand eczema used prescription pharmaceuticals.

In this report, we present self-reported data for common inflammatory skin diseases

MATERIALS AND METHODS

The study design has been published in detail (13, 15, 16). The study was a cross-sectional population-based study including a random sample from the Swedish population, age range 18–84 years ($n=8,000$). The response rate was 61.1% (4,875 subjects) after 2 reminders (women 65.2%; men 56.8%) and it increased with the age of the participants, up to a cut-off point among the most elderly participants (80–84 years). Specific socio-demographic information from the national population registers (sex, age, country of birth, income, marital status, education, and type of community) was linked with the research data by the governmental agency Statistics Sweden. We used the weighting technique developed by Statistics Sweden, based on the response rates weighted by the socio-demographic variables, to extrapolate the results from our sample to the country as a whole (16, 17). There were no differences between responders and non-responders regarding age, gender and living areas. The questionnaire comprised questions about self-reported skin diseases during the past 12 months and questions on medication during the past 2 weeks. The Medical Outcomes Study (MOS) Short Form 36 (SF-36) (18–20) was used to measure

self-reported QoL (HRQoL). SF-36 covers 8 domains of health: physical function (PF), role limitations because of physical health (RP), bodily pain (BP), general health (GH), vitality (VT), social functioning (SF), role limitation because of emotional health (RE), and mental health (MH). The postal questionnaire and the production of a database for further statistical analyses were handled by Statistics Sweden. This government agency provided a research data file containing the information obtained. Statistics Sweden linked information from the national population registers to the data file. The variables sex, age, country of birth, income, marital status, education and type of community were added to the research data file (16)

The question on medication use was phrased "Have you during the past 2 weeks used any of the following medicines?" and followed by a list of prescription drugs, over-the-counter (OTC) drugs, and herbal remedies. The respondent was able to add drugs to the list if necessary. In this survey, use of the following drug categories were analysed: topical steroids on prescription; other topical products on prescription; topical steroids OTC; other topical products OTC; and topical natural products.

The question on skin problems were phrased: "Have you during the past 12 months had [psoriasis/acne/urticaria/hand eczema/eczema on other body parts/other skin problems]?" and could be answered "mild", "severe" or "none". A respondent could mark one or several diagnosis. The question "Have you had childhood eczema?" was also added (21).

The statistical analyses used the Statistical Analysis System (SAS) (22). The total number of responses for each skin problem is given in Table SI¹. It can be seen that there are some missing values for the different reported diagnoses. The multivariate logistic regression analyses on use of dermatological pharmaceuticals were restricted to only those reporting psoriasis, acne, hand eczema and/or eczema on other body parts ($n=1,280$). Urticaria had a low reported prevalence and was also missing in some age groups, while the group reporting other skin problems was very heterogeneous. Consequently, these groups were excluded to avoid methodological problems. In the multivariate linear regression analyses on the differences in HRQoL, which were carried out on the whole of the study population ($n=4,875$), the groups with hand eczema, other eczema, psoriasis and acne were compared with the rest of the population. In the logistic regression analyses the LOGIST procedure and in the linear regression analyses the REG procedure were employed. In both sets of multivariate analyses sex and age were controlled for. The study complied with research ethics legislation as approved by the Statistics Sweden Ethics Committee (16).

RESULTS

A total of 4,875 persons (61.1%) responded to the questionnaire. Of these, 11.6% reported eczema other than hand eczema (HE), 10.3% acne, 7.5% HE, 3.9% psoriasis, 3.1% urticaria, and 10% other skin problems. Extrapolating these reported 1-year prevalences to the whole population, it was found that, in total, 2.4 million adult Swedes had had some skin disease or problem (Swedish population 9.5 millions). The figure for childhood eczema was 950,000 individuals. Age and gender distribution of those reporting skin problems

is given in Fig. 1a. It can be noted that the prevalence decreases with age. Reported prevalence for specific diagnosis is given in Table SI¹. Proportions of severe and mild skin problems can be seen in Fig. 1b. Less than 2% of those reporting skin diseases or problems grade their problems as severe. Among those reporting having had childhood eczema, 20.7% reported hand eczema during the past 12 months (females 22.2%; ma-

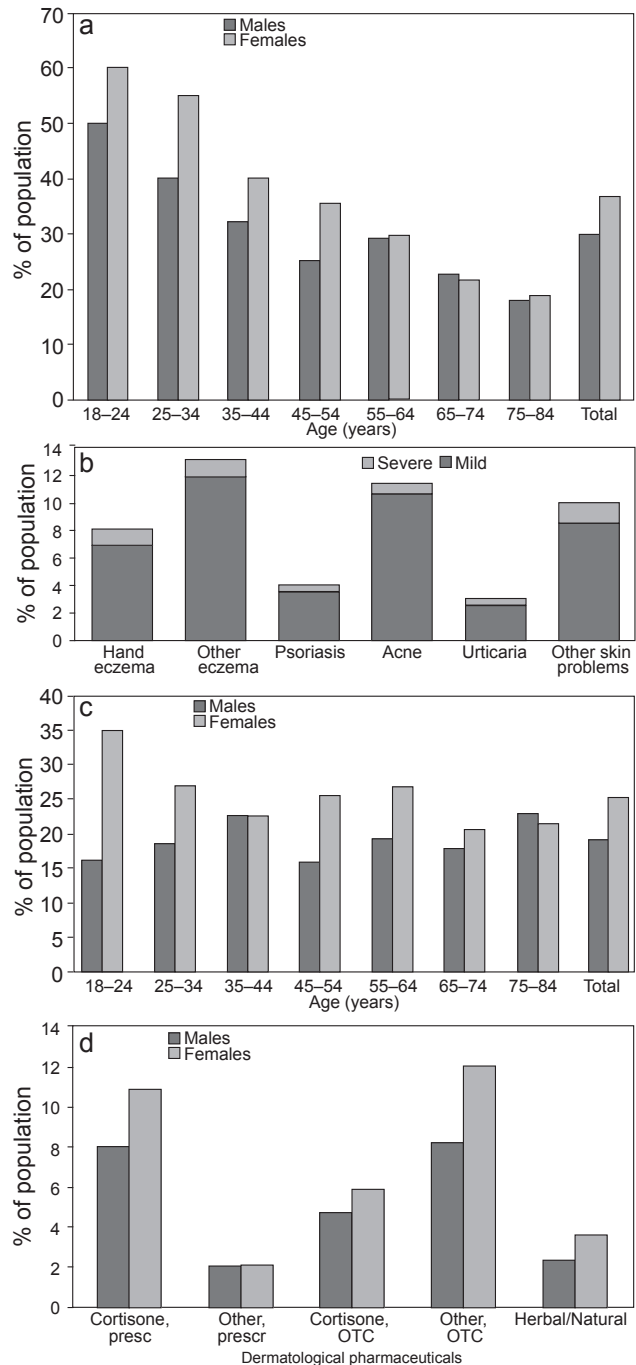


Fig. 1. (a) Self-reported skin problems by age and gender. (b) Self-reported skin diseases and problems graded as mild or severe by the respondents. (c) Self-reported use of dermatological pharmaceuticals by age and gender. (d) Reported use of some pharmaceuticals, as a percentage of the study population.

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les 18.1%), compared with 5.4% (females 6.6%; males 4.1%) among those not reporting childhood eczema.

Reported use of dermatological pharmaceuticals by age and gender is shown in Fig. 1c, and by type of product in Fig. 1d. A higher consumption of medication is reported by females, and it can also be noted that approximately 5% of those with skin conditions report the use of herbal/natural products. In total, 25% of females and 19% of males in the adult population reported the use of some sort of dermatological drug. Reported use of pharmaceuticals in relation to diagnosis is presented in Table SIII¹. For instance, it was found that persons reporting psoriasis and other eczema used significantly ($p < 0.05$) more local steroids on prescription and more dermatological pharmaceuticals in total compared with hand eczema.

The self-reported HRQoL with SF-36 is presented in Tables SIII¹ and SIV¹). All reported skin problems were associated with a decrease in one or several dimensions of SF-36. However, the mental dimensions (VT, SF, MH) and general health (GH) were most affected. There were differences between diagnoses with regard to the affected dimensions of SF-36. Acne had a profound effect on the reported HRQoL, especially the mental and social aspect (SF, MH, GH), whereas psoriasis and eczema had more effect on the physical domains and pain. An interesting finding was that eczema had more profound effects on vitality (VT) and social functioning (SF) than psoriasis when comparing with the whole population. Linear regression analyses also showed that females were more affected than men in all dimensions of SF-36.

DISCUSSION

In this study based on a postal questionnaire on subjectively perceived health, health status and use of drugs, sent to a random sample of the Swedish population, we could confirm that skin problems are very common in the population. Approximately 30–35% of respondents reported some type of skin disease or skin problem, and 20–25% of the adult population used some sort of dermatological drug(s) for local treatment. Importantly, reported skin problems were associated with decreased QoL. To our knowledge, this is the first population-based study performed combining prevalence of skin diseases, pharmaco-epidemiological data and QoL estimations. A possible drawback of the study is that the diagnoses are self-reported covering the past year. Knowing that most non-infectious, inflammatory skin diseases are chronic with a fluctuating progress, it might be that the 1-year prevalence is underestimated. Another possible limitation is that the terms “mild” and “severe” are not defined and represent subjective measures. Finally, our questions on diagnosis are, except for HE and childhood eczema, not validated. To our

knowledge there are no validated questions published for psoriasis and acne that can be used for population-based surveys. However, it has been shown that such a self-reporting of diagnoses tends to underestimate the true prevalence (5). This has earlier been shown for hand eczema (6). We have slightly modified the validated question for hand eczema (6) by letting the respondents choose between 3 alternatives (severe, mild or no) instead of only yes or no. We have also added a validated question for previous childhood eczema (23). The rest of the questions on specific diagnoses have not been validated.

Several studies support the finding that skin diseases and skin symptoms are common in the population (1, 3, 7, 8, 12, 24–26). Population-based prevalence for specific skin diseases is best documented for hand eczema. Our findings are well in accordance with previously published figures on hand eczema (27, 28). For other skin diseases, population-based studies on prevalence are sparser. However, our results are in agreement with prevalence data published for psoriasis (29–33), atopic eczema (23, 27, 34–37) and acne (25, 38–40). Answers to our question on eczema on other locations than hands may include eczemas other than atopic eczema. Seborrhoeic eczema is frequently seen in adults and has been reported to occur in approximately 10% of the population (41). Seborrhoeic eczema is thus probably part of the reported eczema prevalence.

SF-36 has been used for evaluation of HRQoL in several skin diseases, e.g. psoriasis (42–44), hand eczema (14, 33, 45–48), atopic dermatitis (44, 49) and acne (50, 51). SF-36 has also previously been used in postal-based population studies focused on skin problems (4, 52). The findings of the present survey are in accordance with published patient-based clinical studies, demonstrating that skin diseases have a profound effect on HRQoL, especially the mental dimension. We could also show that the most affected domains of SF-36 differed between different self-reported skin diseases.

An interesting methodological aspect was demonstrated in this study. For hand eczema, we have previously published a detailed analysis of HRQoL for this population sample (13). In that report linear regression was used and the model focused on reported hand eczema and the analysis did not include other self-reported skin diseases/problems as possible confounders. However, this was done in the present analysis, in which we included other reported skin diseases and skin problems as separate variables in the model. We thus saw each reported diagnosis separately and the others were regarded as confounders. Examining the HRQoL analysed in this way, we found fewer negative values for almost all dimensions of SF-36 in hand eczema compared with our previous report (13). This implies that, if generic instruments are used for a specific diagnosis, evaluation of other skin diseases/problems as confounders should be discussed.

A large proportion of the population reported the use of dermatological pharmaceuticals, both on prescription and OTC. Looking at different eczemas and psoriasis, it was a little unexpected to find that people with psoriasis and other eczemas used more local steroid preparations on prescription than did those with hand eczema. The same was found for pharmaceuticals in total. This is a little surprising, as hand eczema affects HRQoL as much as psoriasis and other eczemas do. This might imply that problems with hand eczema are underestimated in medical healthcare (“not seen”), and are not provided with the medical care they need.

In conclusion, we could confirm that skin problems are very common in the population; 20–25% of the adult population reported that they used some sort of dermatological drug for local treatment. It is notable that different skin diseases affect the dimension of SF-36 differently, e.g. acne and eczema have more effect on vitality than psoriasis. As skin diseases are also associated with a decreased QoL, it is implied that they have far-reaching implications for individuals and society. Most skin diseases are chronic with a relapsing progress, and there is a need for more quantitative and qualitative studies on prevalence, effects of skin diseases on the individual and society, and the costs and burden of skin diseases.

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REFERENCES

- Schofield JK, Fleming D, Grindlay D, Williams H. Skin conditions are the commonest new reason people present to general practitioners in England and Wales. *Br J Dermatol* 2011; 165: 1044–1050.
- Rea JN, Newhouse ML, Halil T. Skin disease in Lambeth. A community study of prevalence and use of medical care. *Br J Prev Soc Med* 1976; 30: 107–114.
- Augustin M, Herberger K, Hintzen S, Heigel H, Franzke n , Schafer I. Prevalence of skin lesions and need for treatment in a cohort of 90 880 workers. *Br J Dermatol* 2011; 165: 865–873.
- Bingefors K, Lindberg M, Isacson D. Self-reported dermatological problems and use of prescribed topical drugs correlate with decreased quality of life: an epidemiological survey. *Br J Dermatol* 2002; 147: 285–290.
- Jagou M, Bastuji-Garin S, Bourdon-Lanoy E, Penso-Assathiany D, Roujeau JC, Reseau d’Epidemiologie en D. Poor agreement between self-reported and dermatologists’ diagnoses for five common dermatoses. *Br J Dermatol* 2006; 155: 1006–1012.
- Meding B, Barregard L. Validity of self-reports of hand eczema. *Contact Dermatitis* 2001; 45: 99–103.
- Kalia S, Haiducu ML. The burden of skin disease in the United States and Canada. *Dermatol Clin* 2012; 30: 5–18, vii.
- Finlay AY. The burden of skin disease: quality of life, economic aspects and social issues. *Clin Med* 2009; 9: 592–594.
- Basra MK, Shahrukh M. Burden of skin diseases. *Expert Rev Pharmacoecon Outcomes Res* 2009; 9: 271–283.
- Smith JG, Jr. Burden of skin disease. *J Am Acad Dermatol* 2007; 56: 706.
- Chen SC, Bayoumi AM, Soon SL, Aftergut K, Cruz P, Sexton SA, McCall CO, et al. A catalog of dermatology utilities: a measure of the burden of skin diseases. *J Invest Dermatol Symp Proc* 2004; 9: 160–168.
- Dalgard F, Svensson A, Holm JO, Sundby J. Self-reported skin morbidity in Oslo. Associations with sociodemographic factors among adults in a cross-sectional study. *Br J Dermatol* 2004; 151: 452–457.
- Bingefors K, Lindberg M, Isacson D. Quality of life, use of topical medications and socio-economic data in hand eczema: a Swedish nationwide survey. *Acta Derm Venereol* 2011; 91: 452–458.
- Hald M, Agner T, Blands J, Johansen JD. Quality of life in a population of patients with hand eczema: a six-month follow-up study. *Acta Derm Venereol* 2011; 91: 484–486.
- Bingefors K, Svensson A, Isacson D, Lindberg M. Self-reported life-time prevalence of atopic dermatitis and co-morbidity with asthma and eczema in adulthood. A population-based cross-sectional survey. *Acta Derm Venereol* 2013; 93: 438–441.
- Sweden S. [Survey on health, report on a survey conducted November 2004-January 2005]. 2005 (in Swedish).
- Lundström S, Särndal CE. Calibration as a standard method for treatment of nonresponse. *J Official Stat* 1999; 15: 305–327.
- Ware JE, Kosinski M, Sherbourne CA. SF-36 Physical and Mental Health Summary Scales: a user’s manual. Boston, MA: new England Medical Center, 1994.
- Ware JE, Snow KK, Kosinski M, Sherbourne CA. SF-36 Health survey manual and interpretation guide. Boston, MA: new England Medical Center, 1993.
- Ware JE Jr., Sherbourne CD. The MOS 36-item short-form health survey (SF-36). I. Conceptual framework and item selection. *Med Care* 1992; 30: 473–483.
- Stenberg B, Lindberg M, Meding B, Svensson A. Is the question ‘Have you had childhood eczema?’ useful for assessing childhood atopic eczema in adult population surveys? *Contact Dermatitis* 2006; 54: 334–337.
- Inc. SI. The SAS System for Windows, Release 8.02 [1999–2001]. Cary, n C: SAS Institute Inc., 2001.
- Moberg C, Meding B, Stenberg B, Svensson A, Lindberg M. Remembering childhood atopic dermatitis as an adult: factors that influence recollection. *Br J Dermatol* 2006; 155: 557–560.
- Cashman MW, Reutemann PA, Ehrlich A. Contact dermatitis in the United States: epidemiology, economic impact, and workplace prevention. *Dermatol Clin* 2012; 30: 87–98, viii.
- 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.
- Meding B, Liden C, Berglind n . Self-diagnosed dermatitis in adults. Results from a population survey in Stockholm. *Contact Dermatitis* 2001; 45: 341–345.
- Stenberg B, Meding B, Svensson A. Dermatology in public health—a model for surveillance of common skin diseases. *Scand J Public Health* 2010; 38: 368–374.
- Thyssen JP, Johansen JD, Linneberg A, Menne T. The epidemiology of hand eczema in the general population—prevalence and main findings. *Contact Dermatitis* 2010; 62: 75–87.
- Lomholt G. Prevalence of Skin Diseases in a Population; a Census Study from the Faroe Islands. *Dan Med Bull*

- 1964; 11: 1–7.
30. Larsson PA, Liden S. Prevalence of skin diseases among adolescents 12–16 years of age. *Acta Derm Venereol* 1980; 60: 415–423.
 31. Braathen LR, Botten G, Bjerkedal T. Psoriatics in Norway. A questionnaire study on health status, contact with para-medical professions, and alcohol and tobacco consumption. *Acta Derm Venereol Suppl* 1989; 142: 9–12.
 32. Schafer I, Rustenbach SJ, Radtke M, Augustin J, Glaeske G, Augustin M. Epidemiologie der Psoriasis in Deutschland - Auswertung von Sekundärdaten einer gesetzlichen Krankenversicherung. *Gesundheitswesen* 2011; 73: 308–313.
 33. Moberg C, Alderling M, Meding B. Hand eczema and quality of life: a population-based study. *Br J Dermatol* 2009; 161: 397–403.
 34. Shaw TE, Currie GP, Koudelka CW, Simpson EL. Eczema prevalence in the United States: data from the 2003 National Survey of Children's Health. *J Invest Dermatol* 2011; 131: 67–73.
 35. Wolkewitz M, Rothenbacher D, Low M, Stegmaier C, Ziegler H, Radulescu M, Brenner H, et al. Lifetime prevalence of self-reported atopic diseases in a population-based sample of elderly subjects: results of the ESTHER study. *Br J Dermatol* 2007; 156: 693–697.
 36. Harrop J, Chinn S, Verlato G, Olivieri M, Norback D, Wjst M, Janson C, et al. Eczema, atopy and allergen exposure in adults: a population-based study. *Clin Exp Allergy* 2007; 37: 526–535.
 37. Hanifin JM, Reed ML, Eczema P, Impact Working G. A population-based survey of eczema prevalence in the United States. *Dermatitis* 2007; 18: 82–91.
 38. Yentzer BA, Hick J, Reese EL, Uhas A, Feldman SR, Balakrishnan R. Acne vulgaris in the United States: a descriptive epidemiology. *Cutis* 2010; 86: 94–99.
 39. Perkins AC, Cheng CE, Hillebrand GG, Miyamoto K, Kimball AB. Comparison of the epidemiology of acne vulgaris among Caucasian, Asian, Continental Indian and African American women. *J Eur Acad Dermatol Venereol* 2011; 25: 1054–1060.
 40. Halvorsen JA, Vleugels RA, Bjertness E, Lien L. A population-based study of acne and body mass index in adolescents. *Arch Dermatol* 2012; 148: 131–132.
 41. Breunig Jde A, de Almeida HL Jr, Duquia RP, Souza PR, Staub HL. Scalp seborrheic dermatitis: prevalence and associated factors in male adolescents. *Int J Dermatol* 2012; 51: 46–49.
 42. Sampogna F, Tabolli S, Soderfeldt B, Axtelius B, Aparo U, Abeni D, investigators IDIMPRoVE. Measuring quality of life of patients with different clinical types of psoriasis using the SF-36. *Br J Dermatol* 2006; 154: 844–849.
 43. Heydendael VM, de Borgie CA, Spuls PI, Bossuyt PM, Bos JD, de Rie MA. The burden of psoriasis is not determined by disease severity only. *J Invest Dermatol Symp Proc* 2004; 9: 131–135.
 44. Lindberg L, Johannesson M, Silverdahl M, Hermansson C, Lindberg M. Health-related quality of life in patients with psoriasis and atopic dermatitis measured with SF-36, DLQI and a subjective measure of disease activity. *Acta Derm Venereol* 2000; 80: 430–434.
 45. Agner T, Andersen KE, Brandao FM, Bruynzeel DP, Bruze M, Frosch P, Goncalo M, et al. Hand eczema severity and quality of life: a cross-sectional, multicentre study of hand eczema patients. *Contact Dermatitis* 2008; 59: 43–47.
 46. Cvetkovski RS, Zachariae R, Jensen H, Olsen J, Johansen JD, Agner T. Quality of life and depression in a population of occupational hand eczema patients. *Contact Dermatitis* 2006; 54: 106–111.
 47. Meding B, Swanbeck G. Consequences of having hand eczema. *Contact Dermatitis* 1990; 23: 6–14.
 48. Wallenhammar LM, Nyfjall M, Lindberg M, Meding B. Health-related quality of life and hand eczema – a comparison of two instruments, including factor analysis. *J Invest Dermatol* 2004; 122: 1381–1389.
 49. Maksimovic N, Jankovic S, Marinkovic J, Sekulovic LK, Zivkovic Z, Spiric VT. Health-related quality of life in patients with atopic dermatitis. *J Dermatol* 2012; 39: 42–47.
 50. Demircay Z, Seckin D, Senol A, Demir F. Patient's perspective: an important issue not to be overlooked in assessing acne severity. *Eur J Dermatol* 2008; 18: 181–184.
 51. Mallon E, Newton JN, Klassen A, Stewart-Brown SL, Ryan TJ, Finlay AY. The quality of life in acne: a comparison with general medical conditions using generic questionnaires. *Br J Dermatol* 1999; 140: 672–676.
 52. O'Neill P, Kelly P. Postal questionnaire study of disability in the community associated with psoriasis. *BMJ* 1996; 313: 919–921.