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CLINICAL REPORT

Quality of Life, Use of Topical Medications and Socio-economic Data in Hand Eczema: A Swedish Nationwide Survey

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Hand eczema is common and has an adverse impact on the lives of patients. There is a need for population-based surveys on the pharmacoepidemiological aspects, quality of life and impact of socioeconomic factors in hand eczema. The aim of this cross-sectional study was to investigate these factors. A questionnaire-based nationwide survey of health was performed, including questions on hand eczema, use of pharmaceuticals and socioeconomic factors. Quality of life was estimated with the generic instrument Short Form 36 (SF-36). The questionnaire was sent to 7,985 persons (age range 18–84 years), response rate 61.1% (*n*=4,875). The 1-year prevalence of hand eczema in the study population was 7.5%. In this group, quality of life was lower. All dimensions of SF-36 were affected, most markedly general health and those dimensions reporting on mental health. In the group with self-reported hand eczema, 51% reported using topical pharmaceuticals. Hand eczema was more common among women (9.1%, *n*=2,630) than among men (5.6%, *n*=2,245) and in the age group below 65 years (8.5%, *n*=3,274) compared with those aged 65 years and over (4.3%, *n*=1,151). This survey clearly demonstrates the impact of hand eczema on several dimensions of life and also highlights age, gender and socioeconomic differences. *Key words: hand eczema; prevalence; quality of life; pharmacoepidemiological; population-based; cross-sectional; epidemiology.*

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Hand eczema (HE) is a common, chronic disease with a variable and relapsing course. In Sweden, the 1-year prevalence of HE is approximately 10% (1–4). In a comprehensive review on HE prevalence data published between 1964 and 2007, the median prevalence was found to be 9.7% (females 11.4%; males 5.4%) (5). Variations in prevalence with geographical area (north, middle and south of Sweden) have been reported (1). HE has been reported to be more common among women (4–6) and in younger age groups (1, 3, 4). The long-term prognosis for HE is poor (7, 8) and it has been reported that, in 5% of cases, HE had far-reaching consequences for the individual (7). HE can be considered a public health problem (1, 2) and is the most common occupational skin disease (9–11). It is well known that socioeconomic factors (e.g. marital status and income) have a significant impact on skin diseases in general (12). Considering the occupational risks for the development of HE, the possible association between socioeconomic status and HE in the general population has also been discussed (11).

During recent years there has been increased interest in the burden of skin diseases in general (13, 14) and the impact on quality of life (QoL) specifically. HE has also been shown to have a pronounced impact on QoL. It is reported to have an influence on psychosocial functions, e.g. sleep disturbances, hampered leisure activities and psychosocial impairment (7). Using the Dermatology Life Quality Index (DLQI) and Short Form 36 (SF-36) (15) and EQ-5D (2) it was confirmed that HE had a more pronounced effect on the mental dimensions of QoL. Some gender differences (e.g. females more afflicted) were found using the generic instruments SF-36 and EQ-5D. A cross-sectional multicentre study using DLQI showed that HE negatively affected QoL and that this effect was significantly correlated with disease severity (16).

Another area of interest is the treatment of HE and the consumption of healthcare by persons with HE. It has been suggested that many people with HE do not consult a general practitioner or a dermatologist (17, 18). Hald and co-workers (17) found that prescribed medication was used by 25% of patients with HE during the past 12 months. A gender difference in the use of topical treatment among persons with allergic contact dermatitis has been reported (19). However, pharmacoepidemiological studies on the use of different types of topical drugs among persons with HE are scarce.

Most epidemiological studies on HE have some limitations. They have focused on occupational HE and been restricted to geographical areas or to certain age groups, as most occupational and epidemiological studies exclude elderly persons. Few studies have examined pharmacoepidemiological or socioeconomic data. Thus, there is a need for epidemiological studies that include

the different aspects mentioned above, especially differences in disease severity, use of pharmaceuticals and consumption of healthcare resources.

The aim of this nationwide study was to analyse the use of topical drugs and QoL among persons with HE. Of special interest was investigation of the self-reported severity of the disease. Furthermore, gender, age and socioeconomic differences were considered.

MATERIALS AND METHODS

This study is based on a postal questionnaire on subjectively perceived health, health status and use of drugs sent to a random sample of the Swedish population ($n = 7{,}985$), aged 18–84 years, in October 2004 to January 2005. Sweden keeps population registers based on unique personal numbers for all persons legally living in the country. A governmental agency, Statistics Sweden, uses these registers to facilitate national statistics. This agency also managed our survey and a random sample was drawn. The respondents returned the questionnaires to Statistics Sweden, who, after two reminders, deleted the personal numbers in order to secure confidentiality. The agency then 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 (20). We used the weighting technique developed by Statistics Sweden to handle non-responders and, based on these sociodemographic variables, to extrapolate the results from our sample to the country as a whole (20, 21).

The questionnaire was answered by 4,875 subjects (61.1%). An analysis showed that the response rate was higher among women (65.2%) than among men (56.8%). The response rate increased with the age of the participant, up to a cut-off point among the most elderly participants (18–40 years: 51.9%, 41–79 years: 66.6%, 80–84 years: 60.7%) and with higher income (low: 52.6%, high: 66.9%). Furthermore, those born in Sweden had a higher response rate (63.6%) than those born in other countries (45.1%).

The Swedish Survey of Living Conditions was used to determine the questions on drug use, healthcare utilization, diseases and medical complaints, recall periods, and sociodemographic variables. This is a validated survey that allows comparison between studies (22–24). The question on HE was phrased "Have you, during the last 12 months experienced problems with HE". This is a validated question considered to slightly underestimate the 1-year prevalence of HE (25). We expanded the original question by giving three alternatives for the answer: yes, severe; yes, mild; and no. This addition on self-reported severity of HE has not been validated. The question on medication use was phrased: "Have you during the past two weeks used any of the following medicines?", 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 questions used for skin diseases and the use of pharmaceuticals is given in English translation in Table SI (available from http://www.medicaljournals.se/acta/content/?doi=10.2340/00015555-1111).

Marital status was categorized into three groups: married/cohabiting; single; and divorced/widow/widower. The variable education was grouped according to the highest education of the participants: 9 years of school or less; 11–12 years; and university education. Income was divided into a monthly income, pension, etc. of: less than 10,000 Swedish Crowns (SEK); 10,000–14,999 SEK; 15,000–19,999 SEK; 20,000–24,999 SEK; and 25,000 SEK or more. The variable community size was divided into: less than 40,000 inhabitants; 40,000–79,999 inhabitants; 80,000–119,999 inhabitants; and 120,000 inhabitants or more.

The Medical Outcomes Study (MOS) Short Form 36 (SF-36) (26–28) was used to measure QoL. SF-36 covers eight 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 statistical analyses used the Statistical Analysis System (SAS) (29). χ^2 tests were used for comparing categorical variables between groups of individuals. Logistic regression analysis was used for analysing differences in prevalence (the LOGIST procedure) and linear regression analysis (the REG procedure) was employed for the analysis on differences in health status (29). The study complied with research ethics legislation as approved by the Statistics Sweden Ethics Committee (20).

RESULTS

A total of 4,875 persons (61%) answered the questionnaire. Of these, 7.5% (corresponding to 534,600 persons in the Swedish population) reported that they had experienced HE during the 12-month period (6.4% reported mild problems and 1.1% reported severe problems (Table I)). The prevalence was highest in the younger age

Table I. *Number in the study sample and percentages reporting mild and severe problems with hand eczema in Sweden 2004/2005. Mild and severe problems are the self-reported scorings by the responders. The result of the statistical analysis (a logistic regression model) relating hand eczema to age and sex is shown in Table II*

	Men			Women			All		
		With problems			With problems			With problems	
	Total	*n* (%)	*n* (%)	Total	*n* (%)	*n* (%)	Total	*n* (%)	*n* (%)
Age (years)	*n*	Mild	Severe	*n*	Mild	Severe	*n*	Mild	Severe
18–24	160	12 (7.5)	1 (0.6)	231	23 (10.0)	5 (2.2)	391	35 (9.0)	6 (1.5)
25–34	302	23 (7.6)	3 (1.0)	387	34 (8.8)	9 (2.3)	689	57 (8.3)	12 (1.7)
35–44	370	22 (5.9)	2 (0.5)	475	46 (9.7)	11 (2.3)	845	68 (8.0)	13 (1.5)
45–54	396	13 (3.3)	2 (0.5)	450	40 (8.9)	6 (1.3)	846	53 (6.3)	8 (0.9)
55–64	471	31 (6.6)	3 (0.6)	482	22 (4.6)	8 (1.7)	953	53 (5.6)	11 (1.2)
65–74	342	8 (2.3)	1 (0.3)	367	23 (6.3)	2 (0.5)	709	31 (4.4)	3 (0.4)
75–84	204	5 (2.5)	0 (0.0)	238	9 (3.8)	2 (0.8)	442	14 (3.2)	2 (0.5)
Total	2,245	114 (5.1)	12 (0.5)	2,630	197 (7.5)	43 (1.6)	4,875	312 (6.4)	54 (1.1)

Table II. *Logistic regression analysis relating sex, age, income and size of community to hand eczema in Sweden 2004/2005. Odds ratios (OR), confidence intervals (CI) and* p*-values are given. (*n *= 4,858, the number of persons giving complete answers)*

	Parameter estimate	OR (95% CI)	*p*-value
Intercept	–2.332		
Sex (men[a])			
Women	0.836	1.47 (1.17–1.86)	0.0012
Age, years (18–25 years[a])			
25–34	0.082	1.09 (0.70–1.68)	0.7122
35–44	0.111	1.12 (0.72–1.75)	0.6252
45–54	–0.162	0.85 (0.53–1.36)	0.5013
55–64	–0.224	0.80 (0.51–1.27)	0.3395
65–74	–0.714	0.49 (0.30–0.81)	0.0052
75–84	–1.060	0.35 (0.19–0.64)	0.0007
Income per month, Swedish Crowns (SEK) (less than 10,000[a])			
10,000–14,999	0.090	1.09 (0.79–1.52)	0.5934
15,000–19,999	–0.057	0.94 (0.68–1.31)	0.7325
20,000–24,999	–0.298	0.74 (0.50–1.10)	0.1397
>25,000	–0.576	0.56 (0.37–0.86)	0.0071
Size of community (>40,000 inhabitants[a])			
<40,000 inhabitants	–0.227	0.80 (0.64–1.00)	0.0400

[a]Used as reference group.

groups. Among those with HE, 142 persons (38.8%) also reported eczema on other body locations and 28 (7.6%) reported psoriasis during the past 12 months.

The results from the logistic regression analysis relating to sex, age and socioeconomic variables to the prevalence of HE are shown in Table II. Tables I and II show that HE was more common among women and that the disease was more common among those aged 18–64 years of age than among those 65 years of age and older. Among the socioeconomic variables, education and marital status were not found to be associated with HE. However, those with the highest income were found to report less problems with HE than those with lower income. Furthermore, a weak relationship was found with respect to community size. Those living in the smallest communities reported problems with HE to a lesser extent.

Use of topical medications

Table III shows the use of topical medications during the 2 weeks prior to answering the questionnaire among person reporting with HE. No differences were found between women and men. However, in the age group 35–44 years both men and women used less steroid products on prescription ($p = 0.018$ and $p = 0.006$, respectively) than other males and females with HE. Furthermore, it was more common among men in the same age group to use other OTC products than steroids ($p = 0.001$) compared with younger and older men.

Analyses by severity of disease showed that it was more common among those with severe problems to use drugs than those reporting mild problems with respect to topical steroids on prescription (49.1% vs. 26.0%, $p < 0.001$) other topical drugs on prescription (12.7% vs. 2.9%, $p = 0.001$) and natural products (12.7% vs. 5.1%, $p = 0.033$), while there were no differences with respect to topical steroids OTC (16.4% vs. 15.1%) and other drugs OTC (29.1% vs. 22.8%). Of those with severe problems, 65.5% had used any of the drugs studied, while the corresponding figure for those with mild problems was 49.2% ($p = 0.026$).

Health-related quality of life

Descriptive statistics on the eight dimensions of QoL (SF-36) are shown in Table IV. In the same table the results of the linear regression analyses relating severity of the disease, sex and age to the dimensions are displayed. As shown, HE was found to be associated with lower scores of QoL in all of the eight dimensions. This was evident, in particular, with respect to the severity of the disease. For instance, strong relationships between severe HE and low scores were found in the dimensions SF, RE and MH, while no statistically significant differences was found between mild problems and QoL in these dimensions. Strong relationships for both those with mild and severe problems were found in the dimensions GH, while weaker relationships were found in the other three dimensions. Overall, with the exception of GH, the four dimensions of SF-36 that describe mental health were more affected than the dimensions that describe physical health among those with severe problems.

The multivariate analyses on those with HE revealed that women scored lower than men in the dimensions PF (–5.4, $p = 0.0070$) and BP (–7.1, $p = 0.0202$).

Table III. *Use of drugs for the treatment of skin problems among persons (*n *= 366) reporting problems with hand eczema (HE). Data is pooled, as there was no difference between females and males*

Age (years)	Persons with HE *n*	Local steroids on prescription *n* (%)	Other drugs on prescription *n* (%)	Local steroids OTC *n* (%)	Other drugs OTC *n* (%)	Natural products *n* (%)	Any topical drug *n* (%)
18–34	110	35 (31.8)	5 (4.5)	21 (19.1)	28 (25.5)	7 (6.4)	61 (55.5)
35–44	81	11 (13.6)	1 (1.2)	11 (13.6)	26 (32.1)	4 (4.9)	37 (45.7)
45–64	125	38 (30.4)	6 (4.8)	16 (12.8)	22 (17.6)	5 (4.0)	60 (48.0)
65–84	50	24 (48.0)	4 (8.0)	8 (16.0)	11 (22.0)	7 (14.0)	31 (62.0)
Total	366	108 (29.5)	16 (4.4)	56 (15.3)	87 (23.8)	123 (6.3)	189 (51.6)

OTC: over-the-counter.

Table IV. *Self-reported quality of life evaluated with Short Form 36 (SF-36) and self-reported hand eczema (HE) (mild and severe problems). The table presents the result of the linear regression analyses. (A) Descriptive statistics (mean scores) for problems with HE in relation to the eight dimensions of SF-36. (B) Result of the linear regression analyses relating mild and severe problems with HE, respectively, sex and age the eight dimensions of SF-36 (*n = *4,875)*

SF-36 dimensions	PF	RP	BP	GH	VT	SF	RE	MH
A. *Descriptive statistics* (mean scores)								
No HE[a]	86.6	80.4	72.1	70.8	62.0	85.4	83.7	77.1
HE-mild problems	85.4	79.0	69.2	66.0***	56.8***	83.3	81.5	73.8**
HE-severe problems	83.4	70.5***	63.2*	55.5***	47.9***	73.1***	66.7***	64.6***
B. *Linear regression analyses*								
Intercept	98.5	89.0	82.9	75.9	61.0	86.7	80.8	72.7
HE (No HE[a])								
HE-mild problems	–3.0**	–2.3	–3.7*	–5.8***	–3.7**	–1.5	–1.6	–2.1
HE-severe problems	–5.1*	–10.4*	–9.3*	–16.2***	–11.1***	–11.0***	–15.7***	–10.3***
Sex (Men[a])								
Women	–4.4***	–4.4***	–5.6***	–2.4***	–5.8***	–4.3***	–4.0***	–3.8***
Age (18–24[a] years)								
25–34	–1.3	–2.3	–2.0	1.0	–0.4	0.8	3.0	3.2**
35–44	–3.6**	–3.4	–4.5**	–0.4	1.0	–0.3	4.8*	4.2***
45–54	–6.7***	–4.4*	–9.4***	–2.8*	1.9	–0.3	6.4**	5.9***
55–64	–2.1***	–6.1**	–10.4	–5.8	7.6	2.8*	8.6***	9.5***
65–74	–7.1***	–8.9***	–11.3	–7.2	12.1	4.0**	7.1***	11.2***
75–84	–2.2***	–7.6***	–15.7	–14.0	4.1	–2.8	–2.5	8.5***

[a]Comparison group: *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$.

PF: physical functioning; RP: role limitation because of physical health; BP: bodily pain; GH: general health perceptions; VT: vitality; SF: social functioning; RE: role limitation because of emotional health problem; MH: mental health.

DISCUSSION

This cross-sectional epidemiological study confirms that HE is more common among females and in lower age groups. It is also demonstrated that there is a gender difference in the effect of HE on QoL, with more pronounced effects for women. HE has the most pronounced effects in the mental health dimensions of QoL. Among persons with HE 51.6% had used any topical drug 2 weeks prior to the study. Dichotomized (severe – mild) reporting of HE severity reveals that those with severe HE have more pronounced changes in QoL and a higher consumption of topical drugs. Persons living in smaller communities and those with higher incomes reported a lower prevalence of HE.

To determine the prevalence of HE we used a validated question (25). The question has been used in several population-based studies and it is suggested to be used for epidemiological surveillance (1). Hand eczema is a complex disease considering variations with age, sex, diagnosis (type of eczema), severity, risk factors, relation to occupation and effects on the individual (c.f. review by Thyssen et al. (5)).To further evaluate the correlation between HE and such factors the design of the study must include questions or clinical evaluations to address these specific problems. For example, contact allergy and specific allergens as risk factors for HE have been studied in clinical settings (30), and disease severity and QoL was described in a cross-sectional clinical multicentre study (16). In a population-based investigation, HE disease severity was determined with a two-step study design, first using a questionnaire with the same validated question on HE as in the present study to identify persons with HE, followed by a second questionnaire including a guide for the responder to grade the severity of the HE (17). Difficulties in grading and classification of HE extent and severity have been discussed in a multicentre study (31) and in comprehensive review (32). The present study is a part of a larger survey on health, QoL, use of pharmaceuticals and socio-economic data. It does not cover all the above-mentioned aspects of the complexity of HE, which might be seen as a limitation. However, the result is based on a validated question and includes a self-reported dichotomized question for grading of HE severity (mild–severe). The classification was performed by the responders themselves without any guidance from the questionnaire as to how to perform it. This severity scoring has not been validated, but it is interesting to see that there was a significant correlation with the self-reported changes in QoL as measured with SF-36 (Table IV).

There are several strengths of this study. There was a response rate of 61%, which is an acceptable rate as there has been a decrease in response rates in epidemiological studies during the last decade. The public health survey in Stockholm (2) had a response rate of 58% and a population-based study in Uppsala 15 years ago had a response rate of 68% (33). The survey provides estimates of the prevalence of HE in the general population as a whole in Sweden. It also provides national baseline estimates on the QoL dimensions of SF-36. The baseline estimates are important for national and international comparisons and can be used to assess results from clinical trials using SF-36. Furthermore, in this study the use of topical medical products was studied.

The 1-year prevalence of HE was 7.5% for the total study population. This is somewhat lower than has been reported in other Scandinavian studies. Excluding the age group 65–84 years gives a prevalence of 8.5%, which is closer to the result of recent Swedish studies from Gothenburg (3) (prevalence 9.7%) and Stockholm (2) (prevalence 9.7%) and the mean prevalence of 9.7% presented in the review by Thyssens et al. (5). The low prevalence found can be explained by the fact that the survey covered the whole of Sweden. It has been shown that the HE prevalence is lowest in the northern part of Sweden and highest in the southern part (1). Another possible explanation is highlighted in the present study; smaller communities reported a lower prevalence of HE compared with larger communities. Several earlier studies have been carried out in major cities, e.g. Stockholm and Gothenburg. A third possible explanation could be that the previously validated question on HE (25) was combined with a self-reported estimate of the severity of the disease in the present study. This combination has not been validated. We found that 1.1% of the population, or 14.7% of those who reported HE, rated their problems as severe, while in a Danish study it was reported that 23% of those with HE had a moderate to severe disease (17). In the present study the severity of the disease was self-evaluated with a single question, while the Danish study used a specific questionnaire and a photographic guide.

Most studies have found a higher prevalence of HE among women than men. This was confirmed in this study. Few epidemiological studies have been carried out on HE among older people. We found that the prevalence among those aged 65 years and older was considerably lower than among those younger than 65 years; results that are in accordance with previous reports (1, 4). This, of course, could be a result of no longer being exposed to harmful stimuli to the same extent as previously in life, improving symptoms and perhaps prognosis.

Considering occupational exposure and the development of HE, the relationship between socioeconomic factors and HE has been discussed (11, 12). In this study we found a weak association between community size and HE, those in the population with the highest income reported HE to a lesser extent than others, while no association was found by education and marital status. With the sample size of the survey it was not possible to study further any association between different occupations and HE.

Use of topical medication

Topical drugs are the main treatment used for HE, both as prescribed by doctors or as self-treatment with OTC drugs or other topical products. Despite all available treatment options Diepgen et al. (34) concluded that disease management in patients with severe HE is often inadequate. In discussions on treatment of HE, access to doctors and dermatologists has been mentioned as a limiting factor. It has been argued that people with milder forms of HE do not consult a doctor (7, 17). This is supported by the findings of a positive association between severity of HE and medical consultations (17, 18, 35). Epidemiological studies on the use of topical medications among persons with HE are scarce, especially when mild to severe HE and the whole range of prescription drugs, OTC drugs and natural products are to be considered. Therefore, we lack comparative data. In this study we found that among both men and women with HE those aged 35–44 years used topical steroids prescribed by a doctor to a lesser extent than those in other age groups. This might be an indication that persons with HE in this age group do not receive the same treatment as others. Furthermore, it is interesting to note that men in this age group use more topical non-steroids purchased OTC than do other men. The use of topical drugs among those reporting HE during the past 12 months was found to be related to the self-reported severity of HE. HE is often chronic with a relapsing course (7) and the question about the use of drugs covered only the past 2 weeks. With this design it is thus possible to underestimate the treatment needed for HE and, at the same time, it cannot be excluded that some of the reported drug use is for other skin conditions. Among those reporting HE, 38.8% also reported eczema on other body locations and 7.6% reported psoriasis. However, the correlation with self-reported HE severity indicates that it represents topical drug use due to HE. This result demonstrates that this group of persons has a high consumption of pharmaceuticals; a finding that must be evaluated further.

Health-related quality of life

During recent years interest has focused on the relationships between dermatological diseases and QoL. It has been demonstrated that skin diseases have a considerable impact on QoL and several different instruments (generic, disease- and diagnosis-specific) have been used (13, 36–40). Most studies have demonstrated an impact on the mental dimensions of QoL, e.g. in population-based surveys in Sweden (33) and Norway (12). The present survey strongly supports other studies that HE has an impact on QoL (2, 7, 15, 16, 18, 41, 42). Mental dimensions are affected more than physical ones. We found a gender difference for some of the dimensions in SF-36, which have been reported previously for SF-36 (15) and for EQ-5D (2), but not for DLQI (15). Furthermore, it has been suggested that patients with contact dermatitis may experience depression to a greater extent than do healthy controls (43, 44), but this was not seen in a large study on Danish

patients (41). In particular, those with severe problems are affected. Furthermore, like the studies focused on depression and psychosocial impairment (7, 43, 44), this study shows that beside GH it is the mental health dimensions VT, SF, RE and MH that are most strongly affected by HE.

The comparison between males and females reporting HE showed that women had lower scores in the dimensions PF and BP. One explanation for this is that women in the general population to a higher extent experience headache and musculoskeletal pain and that they also experience a higher severity of pain than men (45). These differences will also be evident in a patient group of men and women with HE.

In summary, this study once again demonstrates that HE is a common disease in the general population. It shows that HE is more frequent among women than men and that it is more common among those under the age of 65 years. The study also shows that the use of prescription topical medications is not evenly distributed among persons with HE. Use of topical medications is less common in the age group 35-44 years. We have reasons to believe that this age group has fewer physician consultations. The study also demonstrates that HE has an impact on QoL, especially those experiencing severe problems, and that it is GH and the mental health dimensions that are affected most. In many surveys of public health, locally, nationally, or internationally, dermatological problems are lumped together in a single group. Considering the prevalence of HE and other dermatological diseases and their impact on QoL and public health, it is important that future surveys study different skin diseases (diagnoses) separately.

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