

Quality of life of dogs with skin disease and of their owners. Part 2: administration of a questionnaire in various skin diseases and correlation to efficacy of therapy

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Abstract

A previously validated 15-item questionnaire on dogs' life quality (QoL1) and that of their owners (QoL2) was applied in a multicentre study to owners of 200 dogs with different dermatological conditions, together with a question on the owner-perceived disease severity (S). Factor analysis was applied to the whole questionnaire. The correlation of S with QoL1 and QoL2 scores was evaluated using Spearman's rank correlation tests. Owner sex, age, educational level and willingness to pay for a potential definitive cure of the disease were recorded, and compared with quality of life (QoL) scores. In 23 atopic dogs, CADESI-03, pruritus Visual Analogue Scale and QoL scores were obtained before and after therapy, and their correlation was evaluated with linear regression. Factor analysis revealed that three factors (S, QoL1 and QoL2) explained 75% of the variance. Owner-perceived severity correlated significantly with QoL1 and QoL2 ($P = 0.002$ and $P = 0.015$, respectively). The five diseases with the worst QoL scores were scabies, pododermatitis, complicated atopic dermatitis, pemphigus foliaceus and endocrine alopecia. Pruritic diseases did not give significantly higher QoL1 or QoL2 scores compared with nonpruritic diseases ($P = 0.19$, Kruskal–Wallis test). Owner sex, age or educational level did not influence QoL

scores. Female sex, a younger age and a higher educational level were significantly associated with more willingness to pay. In atopic dogs, all the scores decreased after therapy, but post-treatment CADESI-03 and Visual Analogue Scale scores did not correlate with QoL1 and QoL2. Questions related to the burden of maintenance therapy showed the lowest improvements in score.

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Introduction

The multifaceted impact of dermatological diseases on the life of the affected dog and that of its owners has been, until very recently, neglected. Health-related, including dermatology-specific, quality of life (QoL) measures have been developed in human medicine in order to provide standardized quantitative data, and together with objective measures of severity, they help provide a broad approach to management.

We have developed and validated a questionnaire tailored to assess the QoL of dogs with skin disease and that of their owners,¹ and have tested its repeatability and its correlation to clinical signs in atopic dogs. Another recently published questionnaire limited the assessment of the QoL of dogs and of their owners to patients affected with atopic dermatitis (AD).² Information on the QoL of dogs affected with other dermatological conditions and that of their owners is lacking, and would be of great importance, as the veterinarian's perception of the severity of a disease can be very different from that of the owner. For example, a mild alopecia, such as pattern baldness, may be considered benign and physiological by the veterinarian, but a source of frustration and embarrassment for the owner. The first aim of this study was to administer the questionnaire to a large number of owners of dogs with different skin diseases and further validate the test by means of factor analysis and correlation to owner-perceived disease severity. In addition, we wanted to obtain a list of the diseases with the highest and lowest QoL scores, to guide dermatologists to the likely opinion of the owner. In a previous study, we found that QoL scores correlated well with pruritus.¹ In order to confirm the hypothesis that the QoL would greatly depend on the presence of pruritus, we wanted to group and compare data generated from nonpruritic and pruritic diseases.

Experience from the human field indicates that numerous factors, including age, sex, education, social class and the respondent's psychological status, affect QoL assessments. For example, women affected by skin disease report a lower QoL in relation to severity than men,³ while no difference was seen between sexes in the evaluation of the impact of having a family member with skin disease.⁴ Likewise, age and/or the educational level of the owner could also influence the results of the assessment. One further aim of our study was to assess whether the demographic characteristics of owners might influence the results.

As well as decreasing QoL of dogs and owners, skin disease may also have financial implications for the owners. Utility measures are used in human medicine to assess value placed by the patients on their health. One of these methods, called the contingent valuation method, evaluates this value in terms of money, and a simple approach is to ask patients how much they would pay for the definitive cure of their disease.⁵ This is usually combined with information about disposable income. A further aim of this study was to determine the financial value given by owners to their dogs' diseases and its dependence on age, sex and educational level of the owners.

In human medicine, validated life quality tests have been used as a further measurement tool for the assessment of the therapeutic success of medical interventions,^{6–8} as clinical improvement may not correlate with increasing life quality. In veterinary medicine, a few tools to evaluate dogs' QoL, including those with skin disease, have been developed.^{2,9–13} Changes after therapeutic intervention, however, have not been described. The final aim of this study was to evaluate any change following treatment and improvement of clinical signs.

Materials and methods

Study sample

Study participants were the owners of dogs with different skin diseases. Only one owner completed the questionnaire for each animal. The test was not given to owners whose dogs had systemic or severe illnesses, other than the dermatological problem, which could have impaired QoL. In animals with AD, clinical scores were assessed by CADESI-03¹⁴ and pruritus was evaluated by the owners by means of a descriptive Visual Analogue Scale (VAS).¹⁵

Questionnaire

A previously validated¹ questionnaire (Appendix 1) was used. This was composed of 15 questions, each with four possible answers: not at all (score 0), a little (score 1), quite a bit (score 2) and very much (score 3). The 15 questions were subdivided as follows: one question on the general severity of the disease (S, range 0–3); seven questions on the quality of life of the dog (QoL1, total score range 0–21); and seven questions on the quality of life of the owner (QoL2, total score range 0–21). One further question on the financial implication of the skin condition was added at the end: how much would you be willing to spend in order to cure definitively the skin disease of your dog? There were four possible answers, as follows: less than 1 monthly salary, 1 monthly salary, 2 months' salary, or more than 2 months' salary. Owners were free to not answer this question if they did not wish to do so.

Data analysis 1: diseases

Mean QoL1 and QoL2 and total QoL1 + QoL2 scores were determined for each disease. Scores of pruritic diseases were compared with those of nonpruritic diseases using the Kruskal–Wallis test.

Data analysis 2: demographic analysis

Sex, age and educational level of the owners completing the questionnaires were recorded anonymously, and QoL1 and QoL2 scores were stratified following demographic data. Owners were free not to give information about their age and educational level if they did not wish to do so.

Data analysis 3: financial value

Answers to the question on the financial value of the disease were compared with the medians of disease severity, QoL1, QoL2, CADESI-03 and pruritus VAS. The relation of the financial value given to the disease with sex, age and educational level was evaluated by Pearson's Chi-square test.

Further validation of the questionnaire

Factor analysis was applied to the whole questionnaire. Correlation of QoL1 and QoL2 with the owner-assessed severity score (S) was done with a nonparametric Spearman's rank correlation test.

Evaluation of responsiveness to therapy

The questionnaire was given to owners of dogs with AD before and after therapeutic intervention. The diagnosis of AD was made using currently accepted criteria and by exclusion of other pruritic diseases.¹⁶ Clinical signs and pruritus were assessed by CADESI-03¹⁴ and a descriptive Visual Analogue Scale¹⁵ before and after therapy. It was decided to repeat the test only if the dog was judged to have improved. The time between completion of the pretreatment and the post-treatment questionnaire depended on the time needed to achieve a clinical improvement and ranged from 2 to 8 months, with an average of 3.5 months. The same owner was asked to repeat the questionnaire, and the same investigator performed all the clinical examinations.

Improvements in median severity score (S), QoL1 and QoL2 were determined by Wilcoxon test. Improvement of mean CADESI-03 and VAS pruritus scores were determined by Student's paired t-test.

The correlation of the expected improvement of CADESI-03 and the VAS pruritus scores after therapy with the dogs' quality of life (QoL1) and the owners' quality of life (QoL2) were evaluated by linear regression.

Results

Study sample

The questionnaire was given to 200 owners of dogs with skin diseases. Data from 73 had already been included in a previous study dealing with the validation of the questionnaire.¹ Primary diagnoses and their prevalence are summarized in Table 1, together with mean severity scores (S), QoL1, QoL2 and total scores (QoL1 + QoL2).

Data analysis 1: skin diseases

When taking into account the diseases diagnosed in five or more animals, the diagnoses with higher total scores (i.e. worse QoL), in decreasing order, were as follows: sarcoptic mange, pododermatitis, complicated AD (AD with pyoderma and/or *Malassezia* dermatitis and/or otitis and/or flea allergy), pemphigus foliaceus, endocrine alopecia (hyperadrenocorticism, hypothyroidism or testicular tumour), otitis, uncomplicated AD, flea allergic dermatitis (FAD), demodicosis, pyoderma and cutaneous adverse food reactions (Table 2 and Figure 1).

Table 1. Results of a quality of life questionnaire administered to the owners of 200 dogs with skin disease

Diagnosis	n = 200	Mean score severity (S) (range 0–3)	Mean score QoL1 (range 0–21)	Mean score QoL2 (range 0–21)	Total score QoL1 + QoL2 (range 0–42)
Uncomplicated AD	49	1.9	6.4	8.8	15.2
Pyoderma	28	1.6	6.1	6.7	12.8
Complicated AD	20	2.1	8.3	8.8	17.1
Demodicosis	18	1.6	5.2	8.4	13.6
Otitis	12	1.9	6.8	8.9	15.7
Pododermatitis	10	1.8	7.3	10	17.3
Endocrine alopecia	7	2.1	6.9	9	15.9
Food allergy	6	1.5	4.2	6.8	11
Sarcoptic mange	6	2.2	9.7	9.5	19.2
Flea allergy	5	1.8	7.4	7.4	14.8
Pemphigus foliaceus	5	1.8	7.2	9.4	16.6
Cutaneous lupus	4	1.8	5.3	7.5	12.8
Lick granuloma	4	1	4.5	6.5	11
Sebaceous adenitis	3	2.3	5	9.7	14.7
Colour dilution alopecia	3	2	4.7	10.3	15
Leishmaniosis	3	2.3	9	8.3	17.3
Vitiligo	3	0.7	1.7	1	2.7
Pattern baldness alopecia	2	1	0	3.5	3.5
Scrotal dermatitis	2	1	5.5	10	15.5
Seborrhoea oleosa	2	1.5	6	12.5	18.5
Alopecia X	1	2	1	5	6
Dermatophytosis	1	2	15	13	28
Perianal fistulae	1	1	2	3	5
Mucinosi	1	2	7	9	16
Toxic epidermal necrosis	1	2	16	14	30
Lupoid onychodystrophy	1	2	18	11	29
Syringohydrumyelia	1	2	11	10	21
Vasculitis	1	0	1	5	6

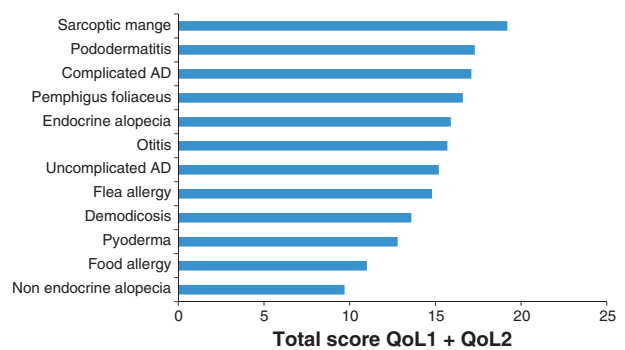
Abbreviations: AD, atopic dermatitis; QoL1, dog's quality of life; QoL2, owner's quality of life; S, severity.

Table 2. Results of the questionnaire in the most prevalent skin diseases, ordered in decreasing severity of total QoL1 + QoL2 scores

Diagnosis	n	Mean score severity (range 0–3)	Mean score QoL1 (range 0–21)	Mean score QoL2 (range 0–21)	Total score QoL1 + QoL2 (range 0–42)
Sarcoptic mange	6	2.2	9.7	9.5	19.2
Pododermatitis	10	1.8	7.3	10.0	17.3
Complicated AD	20	2.1	8.3	8.8	17.1
Pemphigus foliaceus	5	1.8	7.2	9.4	16.6
Endocrine alopecia	7	2.1	6.9	9.0	15.9
Otitis	12	1.9	6.8	8.9	15.7
Uncomplicated AD	49	1.9	6.4	8.8	15.2
Flea allergy	5	1.8	7.4	7.4	14.8
Demodicosis	18	1.6	5.2	8.4	13.6
Pyoderma	28	1.6	6.1	6.7	12.8
Food allergy	6	1.5	4.2	6.8	11.0
Nonendocrine alopecia*	6	1.7	2.5	7.2	9.7

Abbreviations: AD, atopic dermatitis. *Colour dilution alopecia + pattern baldness alopecia + alopecia X.

The group of pruritic diseases included AD, FAD, cutaneous adverse food reactions, sarcoptic mange and all forms of otitis. Nonpruritic diseases included all forms of noninflammatory alopecia, all endocrine diseases, mucinosi, cutaneous lupus and vasculitis.

**Figure 1.** Data from Table 2 in a histogram. The x-axis represents the total QoL1 + QoL2 scores (range 0–42). AD, atopic dermatitis.

Pruritic diseases did not give significantly higher QoL1 or QoL2 results compared with nonpruritic diseases ($P = 0.19$).

Data analysis 2: demographic analysis

Demographic characteristics of owners completing the questionnaires are summarized in Table 3. Sex, age and educational level of the owner did not seem to influence QoL1 or QoL2.

Data analysis 3: financial value

Median scores for each financial value assigned are summarized in Table 4 and Figure 2. No differences in disease severity, QoL1, QoL2, CADESI-03 and pruritus VAS were observed between different groups. Data on the financial value given to the disease stratified by sex, age and educational level are reported in Table 5 and Figure 3. Willing-

Table 3. Demographic data of 200 owners of dogs with skin disease answering the questionnaire on the quality of life

	Number	Median QoL1	Median QoL2
Sex			
Female	122	6	7.5
Male	65	6	8
Sex not reported	13		
Age			
<45 years	92	6	8
45–65 years	66	7	7
>65 years	13	5	9
Age not reported	29		
Education			
Primary	39	5	7
High school	92	6.5	8
University	38	6.5	7
Education not reported	31		

Table 4. Evaluation of the financial value given by the owner to their dog's disease: medians of scores of disease severity (S), QoL1, QoL2, CADESI-03 and pruritus VAS for each class of responders

Financial value	S (n = 165)	QoL1 (n = 165)	QoL2 (n = 165)	CADESI-03 (n = 33)	VAS pruritus (n = 33)
<1 monthly salary	2	7	8	52	7.5
1 monthly salary	2	6	9	129.5	6.25
2 monthly salaries	2	7	8	161.5	5.25
>2 monthly salaries	2	6	7	98	7.5

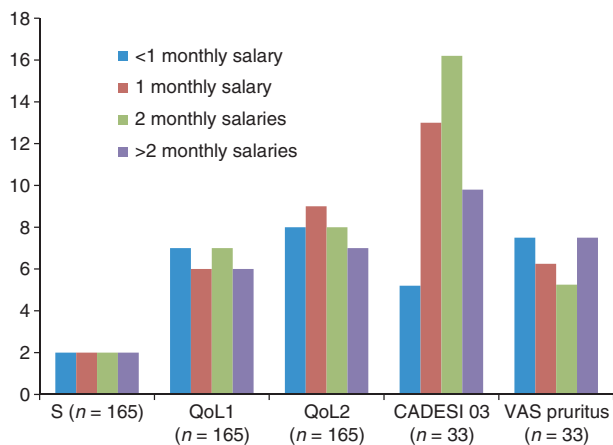


Figure 2. The same data as in Table 5 represented as a histogram. Standardized CADESI-03 ($0.1 \times \text{CADESI-03}$) has been used for the purposes of illustration.

ness to spend money in order to cure the disease increased significantly with increasing educational level, was significantly greater in women than in men, and decreased significantly with increasing age ($P < 0.0001$ for all demographical variables analysed).

Further validation of the questionnaire

Factor analysis revealed that three factors (S, QoL1 and QoL2) explained 75% of the variance. Owner-perceived severity (S) correlated significantly with QoL1 and QoL2 scores ($P = 0.002$ and $P = 0.015$, respectively).

Evaluation of responsiveness to therapy

Owner-assessed severity (S), QoL-1, QoL-2, CADESI-03 and pruritus VAS were determined before and after therapy in 23 atopic dogs (Table 6a). CADESI-03 pretherapy scores (score range 0–1240) ranged from 15 to 794 (mean 118.1, SD 134.4), while post-therapy scores ranged from 0 to 181 (mean 45.1, SD 45.9). Pruritus VAS pretherapy scores (range 0–10) ranged from 4 to 10 (mean 7.4, SD 1.6), while post-therapy scores ranged from 0 to 8 (mean 3, SD 2.2).

All the scores decreased significantly after therapy (Table 6b). The percentage mean improvement was 43.5% for severity (S), 59.5% for QoL1, 28% for QoL2, 61.8% for CADESI-03 and 60% for pruritus VAS (Figure 4). However, post-treatment QoL1 and QoL2 scores were not influenced by improvement of CADESI-03 and pruritus VAS scores (CADESI-03 $P = 0.84$ and $P = 0.27$ for QoL1 and QoL2, respectively; and pruritus VAS $P = 0.11$ and $P = 0.12$ for QoL1 and QoL2, respectively).



Figure 3. The same data as in Table 6a represented as a histogram. Data are given as percentages.

When the answers to the single questions were compared before and after treatment, all questions showed a decrease in scores, albeit of differing magnitude (Table 7 and Figure 5). For the QoL of dogs (QoL1), all aspects of the animal's life improved consistently with therapy, with exception of the disturbance associated with administering treatment (question 8). For the QoL of owners (QoL2) areas directly dependent on the animals' treatment (time loss, physical exhaustion and expenditure) improved less than items related to the family activities, relationship and physical uneasiness due to the dog's skin condition. A similar trend is apparent when percentages of positive answers (scores 1–3) are considered (Table 7 and Figure 6).

Discussion

This article describes the further use, on a larger number of patients, of the previously validated questionnaire on the QoL of dogs affected with skin disease and that of their owners. Factor analysis and the strong correlation between owner-perceived severity of their pet's disease and QoL scores confirm the validity of this questionnaire. In human dermatology, the patient/caregiver's perception of clinical severity of the skin disease is the most important predictor of impact of eczema on the family,⁸ and our study suggests that this may be true for animals too.

As expected, diseases with the highest mean scores (i.e. worst QoL) were those associated with more pruritus and discomfort: sarcoptic mange, pododermatitis and AD. Interestingly, similar results were obtained in human

Table 5. Financial value given to the disease stratified for sex, age and educational level

Monthly salary (n = 200)	Sex		Age (in years)			Educational level		
	M	F	<45	45–65	>65	Primary	High school	University
<1	9 (16.1)	14 (14.6)	12 (15.2)	6 (11.3)	2 (20)	7 (23.3)	11 (14.5)	1 (3.1)
1	17 (30.4)	10 (10.4)	16 (20.3)	13 (24.5)	4 (40)	7 (23.3)	16 (21.1)	9 (28.1)
2	8 (14.3)	16 (16.7)	4 (5.1)	11 (20.8)	1 (10)	4 (13.4)	9 (11.8)	3 (9.4)
>2	22 (39.2)	56 (58.3)	47 (55.4)	23 (43.4)	3 (30)	12 (40)	40 (52.6)	19 (59.4)
Total	56 (100)	96 (100)	79 (100)	53 (100)	10 (100)	30 (100)	76 (100)	32 (100)

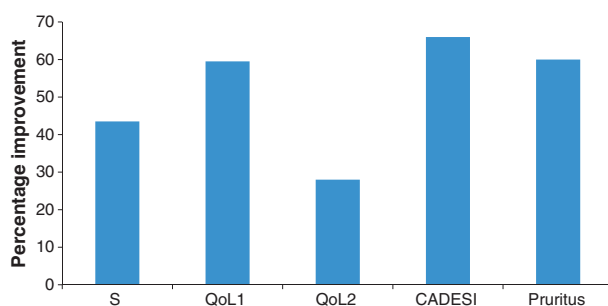
The figures in parentheses represent percentages.

Table 6a. Owner-assessed severity (S), quality of life of dogs (QoL1) and life of owners (QoL2), CADESI-03 and pruritus VAS results before (pre) and after (post) therapy in 23 dogs with atopic dermatitis

n	S pre	S post	QoL1 pre	QoL1 post	QoL2 pre	QoL2 post	CADESI-03 pre	CADESI-03 post	Pruritus pre	Pruritus post
1	2	1	0	1	2	3	15	0	6	0
2	2	2	5	8	7	6	24	28	6	2
3	1	1	3	5	8	7	29	28	7.5	2
4	2	2	7	4	8	8	29	33	6	6
5	3	1	14	4	16	13	31	9	7.5	3
6	2	2	10	6	8	7	42	8	6	0
7	3	0	9	0	2	2	46	0	7.5	0
8	2	1	0	1	7	4	50	28	7.5	0
9	3	1	13	3	9	8	52	21	10	4
10	2	1	4	4	5	6	69	24	7	4.5
11	2	2	11	8	13	11	75	44	9.5	8
12	2	1	7	2	14	11	98	17	7.5	2
13	2	2	10	4	10	8	98	20	7.5	6
14	3	1	13	2	15	0	104	15	9.5	4
15	2	1	13	2	10	4	108	38	8	5
16	2	0	16	1	7	4	109	42	9.5	0
17	2	2	2	3	5	2	114	55	4	1.5
18	3	1	13	5	12	10	143	55	10	4.5
19	2	1	7	0	2	5	166	60	6	4
20	2	1	3	1	8	6	228	64	6.5	2.5
21	3	1	14	1	17	5	234	134	8.6	2
22	2	2	7	2	7	8	371	135	5.5	4
23	3	1	10	5	15	13	794	181	8	4
Median	2	1	6	3	8	6	88	28	7.5	3
Mean							118.1	45.1	7.4	3
SD							134.4	45.9	1.6	2.2

Table 6b. Comparison of pre- and post-treatment means of owner-assessed severity (S), quality of life of dogs (QoL1) and life of owners (QoL2), CADESI-03 and pruritus VAS in 24 dogs with atopic dermatitis

	Data analysed	Before	After	Test used	P-value
S	Median	2	1	Wilcoxon test	0.000
QoL1	Median	6	3	Wilcoxon test	0.000
QoL2	Median	8	6	Wilcoxon test	0.001
CADESI-03	Mean $\pm$ SD	118.1 $\pm$ 134.4	45.1 $\pm$ 45.9	Student's paired t-test	0.002
VAS pruritus	Mean $\pm$ SD	7.5 $\pm$ 1.6	3.0 $\pm$ 2.2	Student's paired t-test	0.000

**Figure 4.** Percentage improvement of mean scores after therapy for owner-assessed severity (S), QoL1, QoL2, CADESI-03 and pruritus.

medicine, where a study¹⁷ also ranked scabies first, followed by atopic dermatitis/eczema and acne. It is also worth noting that our test was able correctly to differentiate between complicated (by pyoderma, *Malassezia* infection and/or otitis) and uncomplicated AD. Nonendocrine alopecia was ranked last, but it was somewhat surprising to see endocrine alopecia ranked fifth. This may be because of systemic involvement, and the burden of maintenance therapy and regular monitoring.

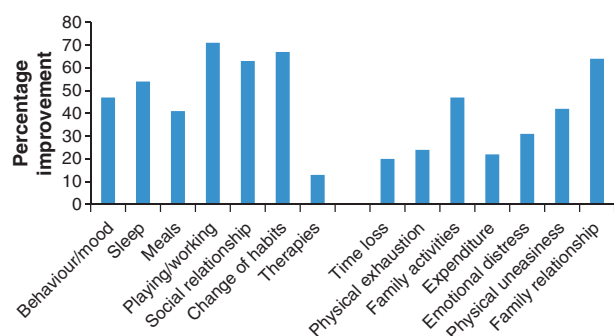
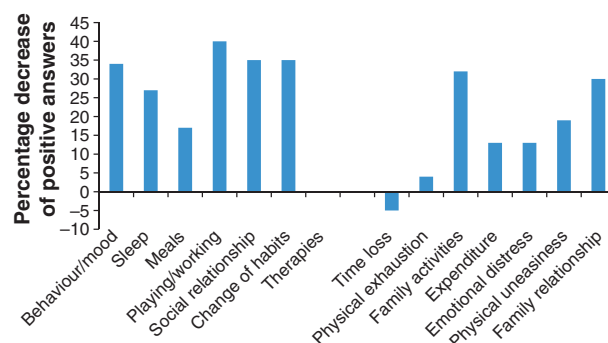
It was surprising to observe that some diseases that are usually considered trivial by veterinarians may be of more concern to owners. Colour dilution alopecia, for example, had QoL2 scores higher than those of scabies and AD, although only three cases were enrolled in the study. Nevertheless, this observation suggests that dermatologists should consider the owner's physical and psychological distress and the social dimension of their dog's condition, as well as the physical lesions. Our previous study demonstrated that QoL scores strongly correlate with pruritus scores. In this study, however, pruritic diseases did not have significantly higher scores than nonpruritic diseases, suggesting that other factors influenced QoL.

Sex of the owner, age or educational level did not influence the QoL assessments. Likewise, in a study on the QoL in dogs with pain secondary to cancer, sex, age and educational level of the owner were not significantly associated with the life quality scores.¹⁰ While Favrot *et al.* found no difference between male and female owners, older owners reported a worse QoL than younger ones.² One reason could be the age classes considered in that study (<30, 30–60 and >60 years), which were dif-

Table 7. Mean scores and percentage of positive answers for each question before and after treatment and their percentage of improvement in 23 dogs with atopic dermatitis

Question no.	QoL1	Mean score			Percentage of positive answers		
		Before	After	Percentage improvement	Before	After	Percentage decrease positive answers
2	Behaviour/mood	1.48	0.78	47	83	48	34
3	Sleep	1.3	0.61	54	70	43	27
4	Meals	0.74	0.43	41	52	35	17
5	Playing/working	1.65	0.48	71	83	43	40
6	Social relationship	0.82	0.3	63	57	22	35
7	Change of habits	0.78	0.26	67	57	22	35
8	Therapies	1.35	1.17	13	78	78	0

	QoL2	Mean score			Percentage of positive answers		
		Before	After	Percentage improvement	Before	After	Percentage decrease positive answers
9	Time loss	1.78	1.43	20	91	96	-5
10	Physical exhaustion	1.43	1.09	24	78	74	4
11	Family activities	0.83	0.43	47	74	42	32
12	Expenditure	2	1.57	22	96	83	13
13	Emotional distress	1.57	1.09	31	78	65	13
14	Physical uneasiness	1.04	0.61	42	61	42	19
15	Family relationship	0.61	0.22	64	43	13	30

**Figure 5.** Percentage score improvement for each question after therapy in dogs with atopic dermatitis.**Figure 6.** Percentage decrease of positive answer for each question after therapy in dogs with atopic dermatitis.

ferent from those in our study, or different lifestyles between the two study populations.

To the authors' knowledge, there are no veterinary studies of contingent evaluation in relationship to quality of life. Studies in human dermatology usually show a good correlation between willingness to pay and life quality scores.¹⁸ Surprisingly, in our study neither disease severity nor lesional scores, pruritus or impact on QoL seemed to influence the financial value given to the dog's disease. On the contrary, female sex, a younger age and a higher educational level were significantly associated with a higher propensity to expenditure. While a higher educational level may be associated with a wealthier financial status, the influence of age and sex is more difficult to explain. It is possible that older owners may have less disposable income, but this is not always true.

This study is the first evaluation of a QoL questionnaire in veterinary dermatology in response to therapy. Sensitivity to clinical change of life quality evaluations in children with AD make these useful for clinical studies.¹⁹ In our study, all scores were significantly improved after

therapy, suggesting that both QoL of dogs (QoL1) and their owners (QoL2) reflect changes in clinical disease severity. However, there was no strong correlation between improvements in CADESI-03 or pruritus VAS and QoL, possibly due to the small number of animals considered. Likewise, a human study reported a strong association between disease severity and higher family impact of AD on the first visit, but the significance of the association decreased in the postbaseline period.⁸ This observation suggests that other factors apart from the improvement of the clinical disease severity may influence QoL. In our study, QoL1 scores improved by nearly 60%, but QoL2 scores decreased by only 28%. The examination of the answers to the single questions can shed light on this finding. When considering the dogs' quality of life, all aspects were improved, with the exception of the disturbance caused by the therapy administration. The burden of maintenance therapy is therefore probably responsible for the smaller improvement in QoL2 (Figure 4). In fact, questions related to time loss, physical exhaustion and expenditure (most probably

related to the maintenance therapy) showed the least improvement. Similar observations were made in a human study, where at follow-up visit, efforts related to caring for the child and financial concerns about treatment were most important.⁸ It would be interesting to evaluate pre- and post-treatment life quality scores in curable diseases, such as sarcoptic mange, as it is possible that QoL1 and QoL2 scores would improve more equally.

In conclusion, veterinarians should be aware that their evaluation of the clinical severity of a disease does not necessarily reflect the life quality of their patient and its owner. We believe that QoL measures are able to provide extra useful information about the disease status and that these should also be used in clinical practice, research and clinical trials.¹⁹

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Résumé Un questionnaire précédemment validé de 15 thèmes sur la qualité de vie des chiens (QoL1) et celle de leurs maîtres (QoL2) a été appliqué à une étude multicentrique sur les propriétaires de 200 chiens atteints de dermatoses différentes, associé à un questionnaire sur la perception de la sévérité de la maladie (S) par les maîtres. Une analyse factorielle a été appliquée sur l'ensemble du questionnaire. La corrélation de S avec les scores de QoL1 et de QoL2 a été évaluée à l'aide de tests de corrélation de rang de Spearman. Le sexe, l'âge, le niveau d'éducation et les capacités de paiement pour une guérison définitive potentielle de la maladie ont été enregistrés et comparés aux scores de qualité de vie évaluée (QoL). Pour 23 chiens atopiques, les scores de CADESI-03, d'échelle visuelle analogue de prurit (VAS), et de QoL ont été obtenus avant et après traitement et leur corrélation a été évaluée par régression linéaire. L'analyse factorielle a révélé que trois facteurs (S, QoL1 et QoL2) expliquaient 75% de la variance. La perception de la sévérité par les propriétaires corrélait significativement avec QoL1 et QoL2 ($p = 0.002$ and $p = 0.015$). Les cinq maladies ayant les scores de QoL les plus mauvais étaient la gale, la pododermatite, la dermatite atopique avec complications, le pemphigus foliacé et l'alopecie endocrine. Les maladies prurigineuses n'avaient pas de scores de QoL1 ou QoL2 significativement plus élevés que les dermatoses non-prurigineuses ($p = 0.19$, Kruskal-Wallis test). Le sexe, l'âge ou le niveau d'éducation n'ont pas influencé les scores de QoL. Être une femme, jeune et d'un niveau d'étude élevé étaient significativement associés avec une plus grande bonne volonté de paiement. Chez les chiens atopiques, tous les scores diminuent après le traitement mais seuls les scores de prétraitement CADESI-03 et VAS ont corrélés avec QoL1 et QoL2. Les questions relatives à la charge du traitement d'entretien ont montré les plus faibles améliorations des scores.

Resumen Se aplicó un cuestionario de quince preguntas acerca de la calidad de vida de perros (QoL1) y la de sus propietarios (QoL2) previamente validado en un estudio multicéntrico a propietarios de 200 perros con diferentes condiciones dermatológicas, junto con una pregunta acerca de la severidad de la enfermedad en percepción del dueño (S). Se aplicó un análisis de factores al cuestionario completo. La correlación de S con los valores de QoL1 y QoL2 se evaluó utilizando pruebas de correlación de rango de Spearman. Se recopilaban datos del género del propietario, la edad, el nivel de educación y la voluntad de pagar por una cura potencialmente definitiva, y se compararon con los valores de QoL. En 23 perros atópicos se obtuvieron valores de CADESI-03, escala análoga visual de prurito (VAS), y QoL antes y después del tratamiento, y se evaluó la correlación con regresión lineal. El análisis de factores reveló que tres factores (S, QoL1 and QoL2) explicaban el 75% de la varianza. La severidad en percepción del propietario se correlacionó significativamente con QoL1 and QoL2 ($p = 0.002$ y $p = 0.015$). Las cinco enfermedades con los peores valores de QoL fueron la sarna, pododermatitis, dermatitis atópica complicada, pénfigo foliaceo y alopecia endocrina. Las enfermedades pruriginosas no dieron valores significativamente mayores de QoL1 y QoL2 comparados con enfermedades no pruriginosas ($p = 0.19$, prueba de Kruskal-Wallis). El género del propietario, la edad y el nivel de educación no influyeron los valores de QoL. Mujeres, propietarios mas jóvenes y un nivel de educación mayor se asociaron significativamente con mayor voluntad de pagar. En perros atópicos los valores decrecieron tras el tratamiento, pero solo los valores pretratamiento de CADESI-03 y valores de VAS se correlacionaron con QoL1 y QoL2. Las preguntas relacionadas con la carga que suponía el tratamiento de mantenimiento mostraron las menores mejoras en sus valores.

Zusammenfassung Ein zu einem früheren Zeitpunkt validierter 15-teiliger Fragebogen über die Lebensqualität (QoL1) von Hunden und deren BesitzerInnen (QoL2) wurde in einer Multizenterstudie für BesitzerInnen von 200 Hunden mit verschiedenen dermatologischen Problemen, gemeinsam mit der Frage bezüglich der von den BesitzerInnen wahrgenommenen Schwere der Erkrankung (S), angewendet. Eine Faktorenanalyse wurde für den gesamten Fragebogen verwendet. Die Korrelation von S mit QoL1 und QoL2 Werten wurde mittels Spearman Rang Korrelationstest evaluiert. Das Geschlecht, Alter, Ausbildungsgrad und die Bereitschaft der BesitzerInnen für eine mögliche Heilung zu bezahlen wurden festgehalten und mit den Werten bezüglich der Lebensqualität (QoL) verglichen. Bei 23 atopischen Hunden wurden CADESI-03, eine Visuelle Analogskala (VAS) des Juckreizes und QoL Werte vor und nach der Therapie erhoben und ihre Korrelation mittels linearer Regression bewertet. Die Faktorenanalyse zeigte drei Faktoren (S, QoL1 und QoL2), die 75% der Varianz ausmachten. Das von den BesitzerInnen wahrgenommene Ausmaß der Erkrankung korrelierte signifikant mit QoL1 und QoL2 ($p = 0.002$ und $p = 0.015$). Die fünf Erkrankungen mit den schlimmsten QoL Werten waren Sarkoptesräude, Pododermatitis, welche kompliziert war durch atopische Dermatitis, Pemphigus foliaceus und endokrine Alopezie. Die juckenden Hauterkrankungen ergaben keine signifikant höheren QoL1 und QoL2 Werte im Vergleich zu nicht-juckenden Erkrankungen ($p = 0.19$; Kruskal-Wallis Test). Weder das Geschlecht, das Alter, noch der Ausbildungsgrad der BesitzerInnen beeinflussten die QoL Werte. Weibliches Geschlecht, jüngeres Lebensalter und ein höherer Ausbildungsgrad konnten mit der höheren Bereitschaft zu bezahlen in einen signifikanten Zusammenhang gebracht werden. Bei den atopischen Hunden nahmen alle Werte nach der Therapie ab, aber nur CADESI-03 vor der Behandlung und VAS Werte korrelierten signifikant mit QoL1 und QoL2. Fragen, die sich auf die Bürde der Erhaltungstherapie bezogen, zeigten die geringste Verbesserung der Werte.

要約 過去に検証したイヌの生活の質(QoL1)とその飼い主の生活の質(QoL2)に対する15個の質問を飼い主の認識する重症度(S)の質問とともに様々な皮膚状態の200頭のイヌの飼い主に多施設研究として行った。全ての質問に要因分析を適用した。QoL1とQoL2スコアの相関をスピアマンの順位相関係数によって評価した。飼い主の性別、年齢、教育のレベル、可能性のある疾患の確実な治療を行う意思を記録し、QoLスコアと比較した。23頭のアトピー犬で、治療前後にCADESI-03、視覚的なそう痒アナログスコア(VAS)とQoLスコアを評価し、線形回帰を用いてそれらの相関を評価した。要因分析は3つの要因(S, QoL1, QoL2)が75%の相違を示すことを明らかにした。飼い主の認識する重症度はQoL1とQoL2で有意に相関していた($P = 0.002$ と $P = 0.015$)。最もQoLスコアが悪かった5つの疾患は疥癬、足皮膚炎、複雑性アトピー性皮膚炎、落葉状天疱瘡、内分泌性脱毛であった。そう痒性疾患はQoL1とQoL2のいずれのスコアも非そう痒性疾患と比較して有意に高くはなかった($P = 0.19$, Kruskal-Wallis test 検定)。飼い主の性別、年齢、教育のレベルはQoLスコアに影響しなかった。女性、若さ、高い教育レベルと治療の積極性は有意に相関していた。アトピー犬において、すべてのスコアは治療後に低下していたが、治療前CADESI-03とVASスコアのみがQoL1、QoL2と相関していた。スコアの中で維持療法の負担に関する質問が最も改善していなかった。

Appendix 1 – Questionnaire on the quality of life of dogs with skin disease and their owners. The questionnaire deals with the impact of your dog's disease on its quality of life and on that of the owners and the hosting family in the last week. Please read the questions carefully and tick one answer only.

1. How severe and disturbing has your dog's disease been?			
☐ not at all	☐ a little	☐ quite a bit	☐ very much
2. What was the impact of your dog's disease on its behaviour and/or mood? (more lazy, more nervous, more aggressive, etc.)			
☐ not at all	☐ a little	☐ quite a bit	☐ very much
3. How much was your dog's sleep disturbed by the disease?			
☐ not at all	☐ a little	☐ quite a bit	☐ very much
4. How much were your dog's meals disturbed by the disease? (it has no appetite, it scratches during meals, it does not like special food, etc.)			
☐ not at all	☐ a little	☐ quite a bit	☐ very much
5. How much were your dog's playing or working activities disturbed by the disease? (it is more lazy, nervous, itchy, etc.)			
☐ not at all	☐ a little	☐ quite a bit	☐ very much
6. What was the impact of your dog's disease on its relationship with you, the other family members or other dogs? (due to mood changes, presence of skin lesions, etc.)			
☐ not at all	☐ a little	☐ quite a bit	☐ very much
7. How much has your dog's disease changed its usual habits? (change in place where he is allowed to sleep, live, eat, way it which it is walked, etc.)			
☐ not at all	☐ a little	☐ quite a bit	☐ very much
8. How much was the dog disturbed by the administration of therapies (shampoos, sprays, tablets, injections, ear cleaning and drops, etc.)			
☐ not at all	☐ a little	☐ quite a bit	☐ very much
9. How much time did you lose for your dog's disease? (administration of therapies, shampooing, home cleaning, cooking, veterinary consultations, etc.)			
☐ not at all	☐ a little	☐ quite a bit	☐ very much
10. How much effect had your dog's disease on your tiredness? (extra cleaning, cooking, shampooing, etc.)			
☐ not at all	☐ a little	☐ quite a bit	☐ very much
11. How much were your usual activities and/or those of your family disturbed by your dog's disease? (leisure, vacation, walks, work, hunting, etc.)			
☐ not at all	☐ a little	☐ quite a bit	☐ very much
12. How much impact did your dog's disease have on your expenditure? (cost of treatment, veterinarian, etc.)			
☐ not at all	☐ a little	☐ quite a bit	☐ very much
13. How much effect did your dog's disease have on causing emotional distress (feeling of guilt, powerlessness, sorrow, regret, anxiety, nuisance, disgust, anger, frustration, etc.)			
☐ not at all	☐ a little	☐ quite a bit	☐ very much
14. How much physical uneasiness/discomfort did you experience due to your dog's disease? (offending odour, feeling of dirtiness at home, cosmetic nuisance, etc.)			
☐ not at all	☐ a little	☐ quite a bit	☐ very much
15. How much impact did your dog's disease have on the relationship between family members? (between spouses, between parents and sons, with relatives and friends, etc.)			
☐ not at all	☐ a little	☐ quite a bit	☐ very much
16. How much would you be willing to spend in order to cure definitively the skin disease of your dog?			
☐ <1 monthly salary	☐ 1 salary	☐ 2 salaries	☐ >2 salaries
