# Caregiver burden, treatment complexity, and the veterinarian–client relationship in owners of dog with skin disease

**Mary Beth Spitznagel\*** (iD)**, Karlee Patrick\*, Andrew Hillier†, Margaret Gober† and Mark D. Carlson‡**

\*Department of Psychological Sciences, Kent State University, Kent, OH, USA
†Parsippany, NJ, USA
‡Kent, OH, USA

Correspondence: Mary Beth Spitznagel, Department of Psychological Sciences, Kent State University, 800 E. Summit Street, Kent, OH 44242, USA. Email: mspitzna@kent.edu

**Background –** Increasing complexity of treatment plans is associated with higher levels of caregiver burden in owners of dogs with skin disease. It is possible that elevated caregiver burden resulting from treatment complexity could, in turn, affect the veterinarian–client relationship.

**Hypotheses/Objectives –** We expected that treatment complexity, caregiver burden, and the client's perception of the veterinarian–client relationship would be related to each other. We also expected an indirect effect of caregiver burden on the cross-sectional association between treatment complexity and the veterinarian–client relationship, and that this effect would be robust to adjustment for the dog's skin disease course and severity.

**Participants –** Participants were 349 owners of dogs with skin disease recruited through online consumer panels.

**Materials and methods –** Cross-sectional online assessments were completed for caregiver burden, treatment plan complexity, veterinarian–client relationship, and skin disease course and severity. Demographic information also was collected.

**Results –** The indirect effect of caregiver burden on the relationship between treatment complexity and veterinarian–client relationship was statistically significant, accounting for 42.76% of the variance in the model. After controlling for disease severity and course, that effect remained statistically significant, accounting for 37.76% of the variance.

**Conclusions and clinical importance –** Findings support the notion that greater treatment complexity is related to the owner's perception of the veterinarian–client relationship via caregiver burden. Efforts to reduce caregiver burden by using the simplest effective treatment may benefit the veterinarian–client relationship.

## Introduction

Chronic disease in a companion animal is associated with caregiver burden, or strain from the challenges of providing care, for the owner.[1,2] This burden is linked with negative owner outcomes such as depressive symptoms and lower quality of life,[1,2] and predicts owner decisions about the animal, including consideration of euthanasia.[3] Beyond impact to the owner and the animal, burden also may affect the relationship between the veterinarian and owner. Caregiver burden in the owner has been posited to underlie stressful encounters with the veterinary provider through a "burden transfer,"[4,5] which could undermine the veterinarian–client relationship. Numerous studies have demonstrated the value of good rapport between the veterinarian and client, such as adherence[6]

and satisfaction,[7,8] making this a crucial issue to consider in successful veterinary practice.

Owners of dogs with skin disease show elevated caregiver burden compared to owners of healthy control dogs,[9] and that burden is significantly related to the complexity of the treatment plan.[10] Although differences in burden between owners of dogs with skin disease and healthy controls are reduced when disease severity is decreased,[9] controlling for severity does not eliminate the significance of the relationship between burden and treatment complexity.[10] The more complicated the treatment regimen, the greater burden the owner feels, even after accounting for severity of the dog's problems. Simplicity and effectiveness of treatment thus both appear to be key influencers of caregiver burden. This is of critical concern in treating skin disease, where treatments range in complexity from periodic injection[11] to multimodal treatment involving combinations of oral, injectable and topical medications.[12]

In order to effectively partner with an owner toward sustainable management of skin disease, associations between caregiver burden, treatment complexity and the

veterinarian–client relationship are important to understand. Do complicated or difficult treatments lead to feelings of caregiver burden, in turn affecting how the client feels about the veterinarian? The goal of the current study was to explore these relationships in a sample of owners of dogs with skin disease through a cross-sectional mediation model. We hypothesised that significant relationships would be detected among three primary variables: treatment complexity, caregiver burden and the client's perception of the veterinarian–client relationship. Furthermore, we expected that the link between treatment complexity and the client's perception of their relationship with the veterinarian would be cross-sectionally mediated by caregiver burden.

## Materials and methods

### Ethics
This study was approved by the local Institutional Review Board (Kent State University IRB #21-177). Informed consent was obtained electronically from all participants before completion of study activities.

### Procedure
This study was undertaken using STROBE[13] criteria for cross-sectional studies. Data were collected between 23 April and 13 June 2021 through Qualtrics consumer panels targeting pet owners. Following informed consent, the protocol opened. Participants were reimbursed in accordance with an agreed-upon amount and pay-out option from Qualtrics (e.g. airline miles, gift card for a retail outlet). No identifying information was obtained from the dog owners, ensuring participant confidentiality.

### Participants
Participants were required to be English-speaking, 18 years of age or older, and reporting on a dog that is routinely monitored for health by a veterinarian and which currently is experiencing "excessive itching (i.e. scratching, licking, chewing, or biting at self)." Participants also were required to provide complete data that passed attention checks including expected completion speed (>231 s) and response consistency. From the initial reach (n = 6537), a total of 526 met these criteria. Due to the focus of the study on treatment complexity and the veterinarian–client relationship, several further exclusion criteria then were applied. Participants who reported a diagnosis that did not fit the study's chronic dermatological disease focus (e.g. "anxiety," "ear infection;" n = 4), who reported that their dog was not currently receiving treatment specifically for itch (n = 64), or that, although their dog's health is overseen by a veterinarian, any treatment for itch in particular was not being overseen by a veterinarian (n = 52) were removed from the sample. To ensure data quality, a veterinarian on the research team (MDC) then reviewed treatment descriptions for participants listing treatment that appeared improbable or inappropriate for the stated condition, removing an additional 57 participants. The final analytic sample was 349.

### Measures

#### Caregiver burden
The 18 item, previously validated Zarit Burden Interview (ZBI),[14] adapted for companion animal use[1] measured caregiver burden. Questions on this measure reflect emotional (e.g. feelings of guilt, anger, frustration) and instrumental (e.g. physical health, social life, financial impact) burden from caregiving. Likert-type responses (0, never to 4, nearly always) are summed for a total score. Higher values indicate a greater degree of burden, with a total score of ≥18 indicating meaningful caregiver burden.[1,15] The sample internal consistency was α = 0.91.

#### Treatment complexity
Subjective and objective treatment plan complexity were measured as described previously[10] using treatment plan-related items from the Pet Owner Adherence Scale (POAS)[16] and total number of individual treatments used to manage their dog's skin condition each week. Specifically, subjective treatment complexity was assessed using the POAS, which is a measure of owner perception of a companion animal's disease and treatment. Although designed to examine adherence, this scale addresses several issues relevant to treatment needs. Items related to the treatment plan (e.g. how difficult it is to follow, how well it has been explained; n = 7) were utilised. A Likert-type response format was used (1, strongly disagree to 5, strongly agree), with reverse scoring as indicated. Items then were summed for the subjective treatment complexity score. The internal consistency reliability was α = 0.67 in the current sample. Objective treatment complexity was assessed by asking participants to indicate weekly frequency of individual treatments used to manage their dog's skin condition. Frequency for various treatment modalities was asked about in a manner facilitating owner response (i.e. oral medications per day, quick topical treatments per day, time-intensive topical treatments per week, injections per year). Weekly treatment frequency for each variable then was calculated (e.g. oral medications per day multiplied by seven, injections per year divided by 52) and these numbers were summed for a total objective treatment complexity score. To create a single variable reflecting both subjective and objective aspects of treatment complexity, these scores were normalised into t-scores, a standardized score calculated in order to consider both measures of treatment complexity in the analyses [mean 50, standard deviation (SD) 10] and added together for an "Overall treatment complexity" variable.

#### Veterinarian–client relationship
The previously validated Context and Relationship subscale of the revised Patient Perception of Patient-Centeredness (PPPC-R) questionnaire[17] was used to assess the client's perception of their relationship with the veterinarian. This scale was chosen as a result of its focus on perception that a provider is caring, trusted, compassionate, and considerate of the rater's thoughts and feelings. As suggested by measure creators, the specific provider type (in this case "veterinarian") was used in place of the general term "provider." Because the PPPC-R was developed for use in human medicine, an item specifically related to caring about the companion animal was added ("How much would you say this person cares about your dog?"), using the same Likert-type response format (1, very much/completely to 4, not at all). Item scores were summed for a total subscale score, with a higher number indicating poorer client perception of the veterinarian–client relationship. The sample internal consistency with this added item was α = 0.87 in the current sample.

#### Skin disease severity
Skin disease severity was rated by owners using a measure validated previously.[18] Responses to the single item disease severity question, "How severe and disturbing has your dog's skin disease been?" ranged from 0, not at all to 3, very much.

#### Skin disease course
Skin disease course was rated by owners using a single item question with multiple choice format, "Since your dog's symptoms started, they have overall: Improved, Declined, Been stable – No improvement, but no decline." For the purpose of the current study, responses were condensed into either "Improved" or "Not improved" (i.e. declined or stable) in order to create a binary variable.

#### Demographic information
Participants reported their age (continuous, with free text response format), gender (multiple choice response format: Male, Female, Other), education level [multiple choice response format: Less than high school, High school graduate, Associate's degree or equivalent, Bachelor's degree or equivalent, Advanced degree (e.g. Master's degree, Doctorate)], race/ethnicity (multiple choice response format:

African-American or Black, Asian American or Asian, Caucasian or White, Latin American or Hispanic, Native American or Indigenous, Other), annual income (multiple choice response format: <US$25,000 per year, US$25,000–$74,999 per year, US$74,999–$125,000 per year, >$125,000 per year). A "Prefer not to say" option was provided for all multiple choice response formats.

Participants also provided information regarding their dog and its disease, including age (continuous, with free text response format), sex (multiple choice response format: Male/neutered/ Male/intact, Female/spayed, Female/intact), diagnosis (multiple choice response format with the option to endorse more than one diagnosis: Allergic dermatitis – undetermined/unknown, Atopic dermatitis – environmental allergies, Flea allergy, Food allergy, Contact allergy, No formal diagnosis, Other), duration of disease (continuous, with free text response format), and type of provider overseeing the dog's treatment for itch [General (practitioner) or Dermatologist (referral)].

### Statistical analyses

Descriptive statistics first were conducted for demographic and primary variables; primary variables were deemed acceptable for parametric analyses. To examine the hypothesis that significant relationships would exist across the three primary variables (caregiver burden, treatment complexity and the veterinarian–client relationship), Pearson's correlations were conducted. Disease course and severity[10] were considered to be potential confounding factors that might influence primary variables of interest; correlations of these with primary variables also were thus examined so that further analyses could be adjusted in the event of significant relationships.

In order to examine the hypothesis that owner caregiver burden would mediate the cross-sectional relationship between treatment plan complexity and owner perception of the veterinarian–client relationship, the Hayes PROCESS macro[19] was employed. Two models were run: first, the three primary variables were included in the model with treatment plan complexity entered as the independent variable, the veterinarian–client relationship entered as the dependent variable, and caregiver burden entered as the mediating variable. Given the significance of the associations among disease course and severity with primary variables, a second model adjusting for these potential confounders also was run. All analyses were conducted in Spss 27.

## Results

See Table 1 for sample characteristics and Table 2 for descriptive statistics of primary variables. Average ZBI scores ($M$ = 11.96) did not reach the threshold for clinically meaningful caregiver burden in this sample. Mean subjective treatment complexity (total POAS raw score) was 13.08 (SD = 3.59), while average objective treatment complexity (total weekly skin disease treatments) was 9.06 (SD = 5.85). Most dogs were described as having skin disease that was "not at all" (42.1%) or "a little" (47.3%) severe or disturbing, while smaller proportions were described as having skin disease that was "quite a bit" (9.2%) or "very much" (1.4%) severe or disturbing.

Correlations among the three primary variables (treatment complexity, caregiver burden, and the client's perception of the veterinarian–client relationship) and two potential confounding variables (disease course and disease severity) are shown in Table 3. Significant relationships were observed among all three primary variables ($P < 0.001$ for all). Several significant relationships also emerged with potential confounding factors of disease course and severity, suggesting that adjusting for these variables would be of benefit in understanding results of the subsequent mediation analysis.

Cross-sectional mediation analysis demonstrated that the indirect effect of caregiver burden on the relationship

**Table 1.** Sample demographic characteristics

|  | Total sample n = 349 |
|---|---|
| *Owner variables* |  |
| Gender (n, %female) | 192 (55.0) |
| Age (M/SD) | 47.25/16.59 |
| Education (n, %) |  |
| <High school | 5 (1.4) |
| High school | 119 (34.1) |
| College | 180 (51.6) |
| Advanced degree | 44 (12.6) |
| Declined to answer | 1 (0.3) |
| Race/ethnicity (n, %) |  |
| Caucasian or White | 278 (79.7) |
| African American or Black | 23 (6.6) |
| Asian American or Asian | 13 (3.7) |
| Latin American or Hispanic | 21 (6.0) |
| Native American or Indigenous | 7 (2.0) |
| Other | 3 (0.9) |
| Declined to answer | 4 (1.1) |
| Annual Income (n, %) |  |
| <US$25,000 | 40 (11.5) |
| US$25–74,999 | 190 (54.4) |
| >US$75,000 | 110 (31.5) |
| Declined to answer | 9 (2.6) |
| *Animal and disease variables* |  |
| Sex (n, %) |  |
| Female, spayed | 145 (41.5) |
| Female, intact | 40 (11.5) |
| Male, neutered | 150 (43.0) |
| Male, intact | 12 (3.5) |
| Age (M/SD) | 6.83/3.73 |
| Diagnosis (n, %) |  |
| Allergic dermatitis (undetermined/unknown) | 117 (33.5) |
| Atopic dermatitis (environmental allergies) | 19 (22.1) |
| Flea allergy | 87 (24.9) |
| Food allergy | 44 (12.6) |
| Contact allergy | 23 (6.6) |
| Other | 6 (1.7) |
| No formal diagnosis | 67 (19.2) |
| Types of treatment used (n, %) |  |
| Topical | 208 (59.6) |
| Oral | 197 (56.4) |
| Injection | 30 (8.6) |
| Ear cleaner | 66 (18.9) |
| Other | 8 (2.3) |
| Duration of disease – years (M/SD) | 2.35/2.48 |
| Veterinarian type overseeing treatment (n, %) |  |
| General practitioner | 318 (91.1) |
| Dermatological specialist | 31 (8.9) |

Diagnosis category adds to >100% owing to the option to endorse more than one diagnosis as appropriate.

between treatment complexity and the client-veterinarian relationship was statistically significant [$B$ = 0.03, BC 95%CI(0.01, 0.05)], accounting for 42.76% of the variance in the model (see Table 4 and Figure 1). After controlling for disease severity and course, the indirect effect remained statistically significant [$B$ = 0.03, BC 95%CI (0.01, 0.04)], accounting for 37.76% of the variance in the model (see Table 4 and Figure 2).

## Discussion

This study explored relationships among caregiver burden, treatment complexity, and the veterinarian–client relationship in a sample of owners of dogs with skin

**Table 2.** Descriptive statistics for primary measures

| | Total sample n = 349 |
|---|---|
| Caregiver burden (M/SD; min–max) | |
| Zarit Burden Interview, adapted | 11.96/9.87; 0–53 |
| Veterinarian–client relationship (M/SD; min–max) | |
| Patient Perception of Patient-Centeredness, revised (PPPC-r): Context and relationship subscale | 15.77/4.68; 9–32 |
| Treatment complexity (M/SD; min–max) | |
| Subjective plus objective treatment complexity | 101.04/14.58; 70.89–153.20 |
| Disease severity (M/SD; min–max) | |
| Noli skin disease severity | 0.70/0.69; 0–3 |
| Disease course (n, %) | |
| Improved | 183 (52.4) |
| Not improved (i.e. stable or declined) | 166 (47.6) |

M, mean; SD, standard deviation; min–max, minimum to maximum.

**Table 3.** Correlations among primary and potentially confounding variables

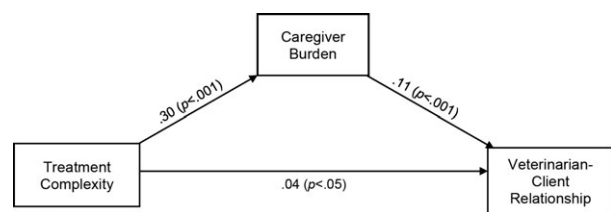| | r | | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| 1. Caregiver burden | __ | | | |
| 2. Veterinarian–client relationship | 0.29** | __ | | |
| 3. Treatment complexity | 0.44** | 0.24** | __ | |
| 4. Disease severity | 0.40** | 0.09 | 0.23** | __ |
| 5. Disease course | 0.23** | 0.18** | 0.16* | 0.15* |

*, p < 0.01, ** indicates p < 0.001.

disease. Highly significant relationships among all three variables were demonstrated. Moreover, the association between complexity of the treatment plan and veterinarian–client relationship was mediated by caregiver burden in the owner, even after adjusting for disease course and severity in this sample. Several aspects of the findings warrant further discussion.

The associations observed in this study support the idea that more complicated treatment is related to poorer perception of the veterinarian–client relationship by way of caregiver burden. Although the study design does not definitively address causality, it is likely that caregiver burden is amplified by greater treatment complexity, which in turn reduces the client's perception of their rapport with the veterinarian. The importance of current findings



**Figure 1.** Coefficients for the indirect effect of caregiver burden on the association between treatment complexity and client perception of the veterinarian–client relationship (Model 1).



**Figure 2.** Coefficients for the indirect effect of caregiver burden on the association between treatment complexity and client perception of the veterinarian–client relationship, adjusted for disease course and severity (Model 2).

is underscored by a recent focus on client-centred approaches in veterinary medicine, which include efforts to develop rapport and build an authentic partnership with the client.[20,21]

Of note, sustained statistical significance after controlling for the course and severity of skin disease in these relationships shows that these links are present independent of the level of the dog's problems or any potential client dissatisfaction with outcomes. Both course and severity of skin disease did contribute to the relationships observed; however, their contributions were relatively small. This is useful knowledge for the veterinarian: it suggests that for most clients, a complicated treatment plan could do more to damage trust in the veterinarian than having an imperfect outcome. When treatment is difficult and caregiver burden ensues, rapport with the veterinarian is affected.

Findings thus highlight the importance of treatment that is simple. Dermatological presentations will sometimes necessitate complicated treatment planning, and starting with the simplest possible treatment and increasing complexity only as necessary may help keep owner
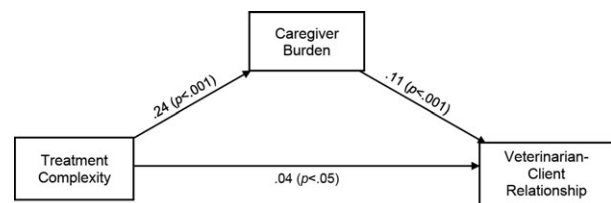
**Table 4.** Analysis of the indirect effect of caregiver burden on the relationship between treatment complexity and client perception of the veterinarian–client relationship

| | Model 1 Coefficient (95% CI) | Model 2 Coefficient (95% CI) |
|---|---|---|
| Association: treatment complexity × caregiver burden | 0.30 (0.23, 0.36) | 0.24 (0.17, 0.16) |
| Association: caregiver burden × veterinarian–client relationship | 0.11 (0.06, 0.16) | 0.11 (0.05, 0.16) |
| Association: treatment complexity × veterinarian–client relationship | 0.04 (0.01, 0.08) | 0.04 (0.01, 0.08) |
| Indirect effect | 0.03 (0.01, 0.05) | 0.03 (0.01, 0.04) |
| **Variance explained by indirect effect (%)** | **42.76%** | **37.76%** |

Model 1, unadjusted; Model 2, adjusted for disease severity and course. CI, confidence interval.

burden to a minimum. Implications extend beyond the burden experienced by the client. The indirect relationship observed between treatment complexity and the veterinarian–client relationship suggests that by decreasing the burden of complex treatment when possible, clients may view the veterinarian as more caring, compassionate, considerate of their thoughts and feelings, and trustworthy. Efforts to reduce burden for the client through use of the simplest effective treatment may thus facilitate the working relationship between veterinarian and client.

Some differences from past work emerged in the present study, including average burden that was below the clinically meaningful threshold (samples from prior work showed average burden above this threshold).[9,10] This difference is probably a reflection of recruitment methods. Whereas past work was conducted using samples recruited from a veterinary dermatological specialism clinic[9] and a dog allergy social media group,[10] the current study broadly targeted pet owners, then screened for owners of dogs experiencing itch, removing those who were not seeking current treatment from a veterinarian. The difference in recruitment methods is reflected in lower frequency of weekly treatments compared to past work[10] and lower disease severity: approximately 90% of the current sample described their dog's skin disease as "a little" or "not at all" disturbing, compared to 20–60% of the sample in the other studies.[9,10]

Although recruitment methods led to a sample with lower overall caregiver burden, fewer treatments, and less severe disease relative to past work, this methodological difference represents a strength of the current study. The replication of previously demonstrated relationships (e.g. the link between caregiver burden and disease severity, as well as between caregiver burden and treatment plan complexity) in this sample of lower severity cases speaks to the robustness of these associations. Additionally, sampling methods allowed for greater representation of gender, income and race/ethnicity in the current sample relative to past studies, addressing a shortfall in previous work[9,10] and increasing the generalisability of study findings to the general population of dog owners.

Limitations of the current work include the use of caregiver report in determining presence of skin disease severity and course in their pet. The measure used in the current study was validated against clinician pruritus assessment,[18] yet a clinician rating would be more objective. As prior work has suggested, however, adjusting for owner ratings of disease severity and course in this type of work may actually be helpful in removing variance attributable to owner reactivity.[10] Additionally, because a majority of the sample reported that a general veterinarian was overseeing their dog's skin disease treatment, findings may be more reflective of the general practice setting than dermatological specialist practice. Future work might benefit from side-by-side comparison of owner and clinician ratings, both general and specialist practice veterinary samples, as well as longitudinal mediation design to firmly establish directionality of the current findings.

## Conclusions

Overall, results suggest that more complicated skin disease treatment appears to be related to poorer client perception of rapport with the veterinarian, by way of caregiver burden. Findings emphasise the importance of utilising the simplest effective treatment possible in an effort to minimise the client's experience of burden, in turn enhancing the veterinarian–client relationship.

## Author Contributions

**Mary Beth Spitznagel**: Study conceptualization and design, acquisition, analysis, and interpretation of data, drafting and critically revising the manuscript. **Karlee Patrick**: Analysis and interpretation of data, drafting and critically revising the manuscript. **Andrew Hillier**: Study conceptualization and design, critically revising the manuscript. **Margaret Gober**: Study conceptualization and design, critically revising the manuscript. **Mark D. Carlson**: Data acquisition and interpretation, critically revising the manuscript.

## References

1. Spitznagel MB, Jacobson DM, Cox MD et al. Caregiver burden in owners of a sick companion animal: A cross-sectional observational study. *Vet Rec* 2017; 181: 321.
2. Spitznagel MB, Cox MD, Jacobson DM et al. Assessment of caregiver burden and associations with psychosocial function, veterinary service use, and factors related to treatment plan adherence among owners of dogs and cats. *J Am Vet Med Assoc* 2019; 254, 124–132.
3. Spitznagel MB, Marchitelli B, Gardner M et al. Euthanasia from the veterinary client's perspective: Psychosocial contributors to euthanasia decision-making. *Vet Clin North Am Small Anim Pract* 2020; 50: 591–605.
4. Spitznagel MB, Ben-Porath YS, Rishniw M et al. Development and validation of a Burden Transfer Inventory measure for predicting veterinarian stress related to client behavior. *J Am Vet Med Assoc* 2019; 254: 133–144.
5. Spitznagel MB, Updegraff ASG, Twohig MP et al. Reducing occupational distress in veterinary medicine personnel with acceptance and commitment training: A pilot study. *N Z Vet J* 2021; 1–7: doi: https://doi.org/10.1080/00480169.2021.1938270.
6. Kanji N, Coe JB, Adams CL et al. Effect of veterinarian–client–patient interactions on client adherence to dentistry and surgery recommendations in companion-animal practice. *J Am Vet Med Assoc* 2012; 240: 427–436.
7. Coe JB, Adams CL, Eva K et al. Development and validation of an instrument for measuring appointment-specific client satisfaction in companion-animal practice. *Prev Vet Med* 2010; 93: 201–210.
8. McArthur ML, Fitzgerald JR. Companion animal veterinarians' use of clinical communication skills. *Aust Vet J* 2013; 91: 374–380.
9. Spitznagel MB, Solc M, Chapman K et al. Caregiver burden in the veterinary dermatology client: comparison to healthy controls and relationship to quality of life. *Vet Dermatol* 2018; 30: 3-e2.
10. Spitznagel MB, Hillier A, Goeber M et al. Treatment complexity and caregiver burden are linked in owners of dogs with allergic/atopic dermatitis. *Vet Dermatol* 2021; 32: 192-e50.
11. Moyaert H, Van Brussel L, Borowski S et al. A blinded, randomized clinical trial evaluating the efficacy and safety of lokivetmab compared to ciclosporin in client-owned dongs with atopic dermatitis. *Vet Dermatol* 2017; 28: 593-e145.
12. Olivry T, DeBoer DJ, Favrot C et al. Treatment of canine atopic dermatitis: 2015 updated guidelines from the International Committee on Allergic Diseases of Animals (ICADA). *BMC Vet Res* 2015; 11: 210.

13. von Elm E, Altman DG, Egger M et al. Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) Statement: Guidelines for reporting observational studies. *Int J Surg* 2014; 12: 1,495–1,499.

14. Zarit SH, Reever KE, Bach-Peterson J. Relatives of the impaired elderly: Correlates of feelings of burden. *Gerontologist* 1980; 20, 649–655.

15. Spitznagel MB, Mueller MK, Fraychak T et al. Validation of an abbreviated instrument to assess veterinary client caregiver burden. *J Vet Intern Med* 2019; 33: 1,251–1,259.

16. Talamonti Z, Cassis C, Brambilla PG. Preliminary study of pet owner adherence in behaviour, cardiology, urology, and oncology fields. *Vet Med Int* 2015; 2,015: 618,216.

17. Ryan BL, Brown JB, Tremblay PF et al. Measuring patients' perceptions of health care encounters: Examining the factor structure of the revised Patient Perception of Patient-Centeredness (PPPC-R) Questionnaire. *J Patient Cent Res Rev* 2019; 6: 192–202.

18. Noli C, Minafò G, Galzerano G. Quality of life of dogs with skin diseases and their owners. Part 1: development and validation of a questionnaire. *Vet Dermatol* 2011; 22: 335–343.

19. Hayes AF. *Introduction to Mediation, Moderation, and Conditional Process Analysis: a Regression-Based Approach*, 2nd edition. New York, NY: Guilford Press, 2017.

20. Janke N, Coe JB, Bernardo TM et al. Pet owners' and veterinarians' perceptions of information exchange and clinical decision-making in companion animal practice. *PLoS One* 2021; 16: e0245632.

21. Bard AM, Main DCJ, Haase AM et al. The future of veterinary communication: Partnership or persuasion? A qualitative investigation of veterinary communication in the pursuit of client behaviour change. *PLoS One* 2017; 12: e0171380.

**Résumé – Contexte** – La complexité croissante des plans de traitement est associée à des niveaux plus élevés de fardeau pour les soignants propriétaires de chiens atteints de maladies de peau. Il est possible que le fardeau élevé des soignants résultant de la complexité du traitement pourrait, à son tour, affecter la relation vétérinaire-client. **Hypothèses/Objectifs** – Nous nous attendions à ce que la complexité du traitement, le fardeau des soignants et la perception du client de la relation vétérinaire-client seraient liés les uns aux autres. Nous nous attendions également à un effet indirect de le fardeau du soignant sur l'association transversale entre la complexité du traitement et le vétérinaire-client relation, et que cet effet serait robuste à l'ajustement de l'évolution et de la gravité de la maladie de peau du chien. **Participants** - Les participants étaient 349 propriétaires de chiens atteints de maladies de la peau recrutés par le biais de consommateurs en ligne panneaux. **Matériels et méthodes** – Des évaluations transversales en ligne ont été réalisées pour le fardeau des soignants, le traitement la complexité du plan, la relation vétérinaire-client et l'évolution et la gravité des maladies de la peau. Informations démographiques a également été collecté. **Résultats** – L'effet indirect du fardeau des soignants sur la relation entre la complexité du traitement et le vétérinaire–la relation client était statistiquement significative, représentant 42,76 % de la variance du modèle. Après contrôle pour la gravité et l'évolution de la maladie, cet effet est resté statistiquement significatif, représentant 37,76 % des la variance. **Conclusions et importance clinique** - Les résultats appuient l'idée qu'une plus grande complexité du traitement est liée à la perception du propriétaire de la relation vétérinaire-client via le fardeau des soignants. Efforts pour réduire le soignant fardeau en utilisant le traitement efficace le plus simple peut être bénéfique pour la relation vétérinaire-client.

**RESUMEN – Introducción**- el aumento de la complejidad de los planes de tratamiento se asocia a mayores niveles de responsabilidad de los propietarios de perros con enfermedades de la piel. Es posible que esta mayor carga para el propietario resultante de la complejidad del tratamiento pueda, a su vez, afectar a la relación veterinario-cliente. **Hipótesis/Objetivos**- esperábamos que la complejidad del tratamiento, la mayor responsabilidad para cuidadores y la percepción de los propietarios de la relación veterinario-cliente estuvieran relacionadas entre sí. También esperábamos un efecto de mediación de la mayor carga del cuidador en la asociación transversal entre la complejidad del tratamiento y la relación veterinario-cliente, y que este efecto sería sólido para el ajuste del curso y la gravedad de la enfermedad de la piel del perro. **Participantes**- los participantes fueron 349 propietarios de perros con enfermedades de la piel reclutados a través de paneles de consumidores vía telemática. **Materiales y métodos**- se completaron evaluaciones transversales en línea sobre la carga del cuidador, la complejidad del plan de tratamiento, la relación veterinario-cliente y el curso y la gravedad de la enfermedad de la piel. También se recopiló información demográfica. **Resultados** – El efecto indirecto de la carga del cuidador sobre la relación entre la complejidad del tratamiento y la relación veterinario-cliente fue estadísticamente significativo, explicando el 42,76% de la varianza del modelo. Después de controlar la gravedad y el curso de la enfermedad, ese efecto siguió siendo estadísticamente significativo y representó el 37,76 % de la varianza. **Conclusiones e importancia clínica**- los hallazgos respaldan la noción de que una mayor complejidad del tratamiento está relacionada con la percepción del propietario de la relación veterinario-cliente mediante una mayor carga del cuidador. Esfuerzos para reducir la carga del cuidador mediante el uso de tratamientos efectivos más simples pueden beneficiar a la relación veterinario-cliente.

**Zusammenfassung – Hintergrund** – Eine zunehmende Komplexität von Behandlungsplänen geht mit einer größeren Pflegebelastung für die BesitzerInnen von Hunden mit Hauterkrankungen einher. Es ist möglich, dass eine größere Pflegebelastung aufgrund komplexerer Behandlungen, in Zukunft die Beziehung zwischen dem Tierarzt/der Tierärztin und den BesitzerInnen beeinträchtigen könnte. **Hypothese/Ziele** – Wir erwarteten, dass die Komplexität der Behandlung, die Belastung der Pflegenden, sowie die Wahrnehmung der

Beziehung zwischen den VeterinärmedizinerInnen/KundInnen durch die KundInnen voneinander abhängig waren. Wir erwarteten auch einen Mediationseffekt der Belastung durch die Pflegenden auf den durchschnittlichen Zusammenhang zwischen Behandlungskomplexität und die Beziehung zwischen den VeterinärmedizinerInnen/KundInnen und dass diese Auswirkung bei Anpassungen in Bezug auf die Hauterkrankung des Hundes und ihren Schweregrad beständig sein würde. **Teilnehmende** – Es nahmen 349 BesitzerInnen von Hunden mit Hauterkrankungen teil, die durch Online KonsumentInnen Gruppen rekrutiert wurden. **Materialien und Methoden** – Querschnittsbewertungen wurden durchgeführt und Fragen bezüglich Belastung durch Pflegende, Komplexität von Behandlungsplänen, Beziehung der VeterinärmedizinerInnen und KundInnen, sowie der Verlauf und Schweregrad der Hauterkrankung beantwortet. Es wurden demografische Informationen gesammelt. **Ergebnisse** – Die indirekte Wirkung der Belastung für die Pflegenden auf den Zusammenhang der Komplexität der Behandlung und der Beziehung der VeterinärmedizinerInnen und KundInnen war statistisch signifikant, was für eine 42,76%ige Varianz in diesem Modell stand. Nach einer Kontrolle der Schwere der Krankheit und ihrem Verlauf, blieb diese Auswirkung statistisch signifikant, was für eine 37,76%ige Varianz stand. **Schlussfolgerungen und klinische Bedeutung** – Diese Ergebnisse unterstützen die Vorstellung, dass eine größere Behandlungskomplexität aufgrund der erhöhten Pflegeleistung die Wahrnehmung der BesitzerInnen ihrer Beziehung zu den VeterinärmedizinerInnen im Zusammenhang steht. Bemühungen, die Pflegebelastung durch Einsatz einfachster wirksamer Behandlungen zu reduzieren, könnte dem Verhältnis der VeterinärmedizinerInnen und ihren KundInnen dienlich sein.

要約 – 背景 - 治療計画の複雑化は、皮膚疾患を持つ犬の飼い主の介護負担の増加につながっている。治療の複雑化に伴う介護者の負担の増大は、ひいては獣医師とクライアントの関係に影響を与える可能性がある。仮説・目的 - 治療の複雑さ、介護者の負担、および獣医師・クライアント関係に対するクライアントの認識は相互に関連すると予想した。また、治療の複雑さと獣医師とクライアント関係の横断的関連に介護者の負担が媒介効果を及ぼすこと、そしてこの効果は犬の皮膚病の経過と重症度の調整に対して強力であることも予想された。参加者 - 参加者は、オンライン消費者パネルで募集した皮膚病の犬の飼い主349名であった。材料と方法 - 介護者の負担、治療計画の複雑さ、獣医師とクライアントの関係、および皮膚病の経過と重症度について、オンラインで横断的な評価が行われた。また、人口統計学的情報も収集した。結果 - 治療の複雑さと獣医師・クライアント関係との関係に対する介護者の負担の間接効果は統計的に有意であり、モデルの分散の 42.76%を占めた。疾患の重症度と経過を考慮しても、この効果は統計的に有意であり、分散の37.76%を占めた。結論と臨床的重要性 - 調査結果は、治療の複雑さが、介護者の負担を通じて獣医師とクライアントとの関係に対する飼い主の認識と関連しているという考え方を支持している。最もシンプルで効果的な治療法を用いて介護者の負担を軽減する努力は、獣医師とクライアントの関係に利益をもたらすかもしれない。

摘要 – 背景-治疗计划的复杂性增加,会增加皮肤病患犬主人的护理者负担水平。治疗的复杂性导致护理人员负担增加可能反过来影响兽医-客户关系。假设/目的-我们预期治疗复杂性、护理人员负担和客户对兽医-客户关系的看法有相互关联。我们还预期护理人员负担对治疗复杂性和兽医-客户关系之间横向关联具有调解作用, 并且该作用将对调整犬的皮肤病病程和严重程度具有稳健性。参与者-参与者是通过在线消费者小组招募的349名皮肤病患犬的主人。材料和方法-完成护理人员负担、治疗计划复杂性、兽医-客户关系以及皮肤病病程和严重程度的横向在线评估。还收集了人口统计学信息。结果-照顾者负担对治疗复杂性与兽医-客户关系关系的间接影响有统计学意义,占模型方差的42.76%。在控制了疾病严重程度和病程后,该效应仍具有统计学显著性, 占方差的37.76%。结论和临床重要性-研究结果支持这样一种观点, 即较高的治疗复杂性与主人对兽医与客户关系的看法, 与照顾者负担有关。通过使用最简单有效的治疗来减轻看护者负担的努力,可能有利于兽医与客户的关系。

**Resumo – Contexto** – O aumento da complexidade dos planos de tratamento está associado a altos níveis de sobrecarga do cuidador de cães com doenças de pele. É possível que a sobrecarga do cuidador elevada resultante da complexidade da terapia possa, desta forma, afetar a relação veterinário-cliente. **Hipótese/Objetivos** – Nós imaginamos que a complexidade do tratamento, a sobrecarga do cuidador, e a percepção do cliente da relação veterinário-cliente estariam relacionadas. Nós também imaginamos que poderia uma mediação da sobrecarga do cuidador na associação transversal entre a complexidade do tratamento e a relação veterinário-cliente, e que este efeito seria robusto para ajustar o curso e a gravidade da doença de pele do cão. **Participantes** – Os participantes foram 349 tutores de cães com doença de pele recrutados através de formulários online. **Materiais e métodos** – Avaliações transversais online foram preenchidas para sobrecarga do cuidador, complexidade do plano de tratamento, relação veterinário-cliente, e curso da doença de pele e gravidade. Dados demográficos também foram coletados. **Resultados** – O efeito indireto da sobrecarga do cuidador na relação entre a complexidade do tratamento e a relação veterinário-cliente foi significativamente significativa, sendo responsável por 42,76% da variância no modelo. Após controlar para gravidade da doença e curso, esse efeito permaneceu estatisticamente significativo, respondendo por 37,76% da variância. **Conclusões e importância clínica** – Os achados corroboram com a ideia de que a complexidade do tratamento está relacionada à percepção do tutor sobre a relação veterinário-cliente pela sobrecarga do cuidador. Esforços para reduzir a sobrecarga do cuidador utilizando planos terapêuticos mais simples podem beneficiar a relação veterinário-cliente.