The vast majority of veterinarians describe their occupation as stressful. Burnout, a syndrome of emotional exhaustion that occurs in individuals who work with people, is widespread among not only veterinarians, but also support staff, including veterinary technicians. Experiences such as compassion fatigue (ie, secondary posttraumatic stress in the context of work involving caring for others), moral distress (ie, knowing the “right” course of action to take, while being in a situation that makes it impossible to do so), overwork, and frustration with unrealistic client expectations and noncompliance are common in the field.

Despite these pervasive problems, a recent review of interventions in veterinary medicine reveals that little work has been conducted to examine strategies to ameliorate this problem. Efforts to date have typically involved small sample sizes or examined treatments only, and have included general interventions to enhance self-awareness and self-care, problem-solving, meditation, yoga, mindfulness, or breathing techniques. Rigorous, large-scale examination of interventions focusing on occupational stressors in veterinary medicine is needed.

Prior work has posited that difficult interactions with clients who are experiencing distress in the context of their pet's illness (ie, caregiver burden) are central to many stressors in veterinary medicine. The theory of burden transfer suggests that caregiver burden in veterinary clients leads to a variety of difficult interactions with providers, transferring some of the clients’ burden to the veterinary health-
care team. Indeed, specific domains of difficult veterinarian-client interactions, the Burden Transfer DANCE, have been established as related to caregiver burden in veterinary clients and predictive of stress and burnout for veterinarians. These DANCE interactions have been categorized through factor analysis as Daily hassles (e.g., clients wanting impossible predictions, having difficulty making decisions, following others’ advice about patient health needs, and shopping around to compare costs), Affect (e.g., clients requiring euthanasia counseling and demonstrating anxiety, sadness, and grief), Nonadherent or inconsiderate (e.g., clients declining recommended work-up or treatment or not showing up for appointments), Confrontation (e.g., clients becoming upset, blaming the veterinarian, refusing to pay for services, and making a complaint), and Excess communication (e.g., frequent phone or email contact). Of note, although the frequency of such encounters is a critical predictor of stress and burnout for providers, in most cases, the reaction to these encounters (i.e., how bothered the provider feels) is more important than the frequency with which they occur.

This burden transfer reaction is a modifiable risk factor for stress and burnout in veterinary medicine. A skills-based education program to reduce burden transfer reaction was recently developed on the basis of an acceptance and commitment training (ACT) framework. ACT has been extensively studied in the context of burnout in other professions, including social workers, counsellors, and schoolteachers, with good effect. Recently, a randomized pilot trial was conducted for employees of 3 small animal general and specialty referral hospitals. Participants demonstrated high rates of acceptance and use of techniques taught, significantly reduced burden transfer reaction, and lower raw scores for stress and burnout. A larger-scale clinical trial was suggested as the next step to fully examine the efficacy of this intervention in reducing occupational distress for individuals working in the field of veterinary medicine.

The present study was designed as a randomized, controlled, parallel-arms trial. The objective was to determine whether this ACT program targeting reactions to difficult client interactions would reduce burden transfer, stress, and burnout among veterinary healthcare teams. We hypothesized that (1) participants would find the program helpful and would use skills taught in the program in their daily lives and that (2) burden transfer, stress, and burnout would be more substantially decreased among participants who undertook the training program, relative to control participants who did not receive the program.

**Materials and Methods**

**Participants**

To facilitate recruitment of a heterogeneous sample, employees of 17 veterinary clinics were invited to participate. Clinics represented a variety of veterinary medical settings, including a large academic medical center, 4 privately owned general veterinary clinics, and 12 clinics, including emergency and specialty referral clinics, owned by 2 veterinary corporate groups. Criteria for participation in the study included age over 18 years and ability to speak and comprehend English sufficiently to complete study measures and participate in the program. Exclusion criteria included working in a position that involved no client interaction.

**Procedure**

The study was approved by the Institutional Review Board of Kent State University. The study was conducted between January and November 2021, and the program was offered to participating veterinary clinics in Ohio as an educational opportunity for all hospital employees, with continuing education credits available for licensed individuals. Program participants who worked with clients were given the option to participate in research.

Following completion of baseline measures, study participants were randomly assigned (Qualtrics) to an intervention or control group. To account for attrition between consent and program attendance, randomization was set to a 60:40 ratio in favor of the intervention group to maximize the likelihood of equal group sizes at the end of the study.

Participants randomized to the intervention group completed pretest baseline measurements within 2 weeks prior to the beginning of the ACT program, posttest measurements within 2 weeks after completing the program, and follow-up measurements 1 month later. Participants randomized to the control group completed measurements at comparable times; following completion of data collection, the program was made available to control participants.

The ACT program consisted of interactive sessions synchronously delivered via video conferencing by a member of the research team (MBS), a licensed clinical psychologist who was involved with program development. Through use of a random number table, 20% of program sessions were selected for recording and were checked for fidelity to the ACT protocol by a separate member of the team (ASGU); 100% fidelity to the protocol was achieved for all sessions. All data were collected online. Pretest measurements began with an informed consent describing the study purpose, participant rights, institutional review board approval status, and researcher contact information. The online protocol was otherwise the same for all 3 time points (see Measures section below). Participants were reimbursed for each survey completed via a gift card for an online retailer.

**ACT educational program**

The educational program used in the present study has been described previously. The previously described study was conducted over a period that spanned the beginning of the COVID-19 pandemic; as such, this protocol was adapted for video teleconferencing by creation of worksheets to facilitate in-session discussion. This video teleconferencing adaptation was used for the entirety of the present study.
The educational program uses an ACT framework that relies on 6 interrelated components: (1) being present (consciously experiencing internal and external events in the moment), (2) acceptance (actively embracing inner events such as thoughts, feelings, and urges while they are occurring), (3) de-fusion (viewing inner events as no more than words, sensations, and images); (4) understanding the self as context (observing inner struggles from an outside perspective), (5) values (identifying areas of importance that an individual identifies and embraces as a guide to action), and (6) committed action (behaving in a manner that serves a chosen value). The program uses experiential exercises and teaches specific techniques for behavior change, focusing on identifying DANCE interactions and reducing reactivity to these situations. Techniques to help participants be more resilient to challenging thoughts and feelings that arise during difficult client interactions were modeled and practiced in group settings. Participants identified personal values, worked through individualized plans to take concrete steps guided by their own values, and shared these plans with the group. Three group sessions were delivered, 1 week apart, with homework assigned between sessions to practice the skills discussed. Session 1 included a brief overview of the program rationale, followed by exercises teaching skills for being mindful present and identifying DANCE interactions (ie, potential points of burden transfer). Session 2 focused on accepting and defusing difficult thoughts, feelings, and urges in the context of DANCE interactions and on separating the self from these inner struggles to understand them as an observer. Session 3 helped participants clarify personal values in the work environment and create concrete plans for taking committed action to focus on alternate values as needed during DANCE interactions. All program sessions took place online, via video conferencing.

Measures
Self-reported measures used in the present study have been previously described. The Burden Transfer Inventory (BTI) measured burden transfer, asking the participant about their experiences in each of the 5 domains of client DANCE interactions. Higher BTI subscale scores reflected greater frequency of (BTI frequency score) or reactions to (BTI reaction scores) these situations. Prior work demonstrates that this measure shows excellent internal consistency (α = 0.92 to 0.94 for the combined subscales); for the present study, BTI reaction (BTI-R) scores were the primary variable of interest. The Perceived Stress Scale (PSS) is a commonly used measure of stress perception, evaluating the degree to which one feels that life is unpredictable or overloaded. Higher PSS scores reflected greater current stress. This measure demonstrates internal consistency (α = 0.68 to 0.78). The Copenhagen Burnout Inventory (CBI) was chosen as a measure of burnout because it produces separate personal, work, and client-related burnout subscales, with higher CBI scores indicating greater current burnout in each domain. This measure demonstrates high internal consistency (α = 0.85 to 0.87). Given the study's workplace emphasis, work-related (CBI-W) and client-related (CBI-C) burnout scores were used in the present study, whereas personal burnout score was not considered a variable of focus.

Participants also self-reported demographic information, specifically gender (multiple choice), age (continuously numbered slide bar), race or ethnicity (multiple choice), nature of employment (multiple choice), and years in the field (continuously numbered slide bar). At the posttest and follow-up time points, participants in the intervention group were also asked to report helpfulness of the material presented (scored on a scale from 1 to 5) and the frequency with which they had used ACT techniques during the preceding 2 weeks.

Statistical analysis
Statistical analyses were conducted with commercially available software. First, independent-samples t tests were used to examine for any pretest differences between participants retained in versus removed from analyses. Next, demographic information and primary variables were characterized with descriptive statistics (percentages for categorical data and mean, SD, and range for continuous data). To examine whether type of employment should be considered in analyses, repeated measures ANOVA was conducted. No differences in PSS, CBI-C, CBI-W, and BTI-R scores were detected among employment types; therefore, this variable was thus not considered further in analyses. Latent growth curve (LGC) analysis was used to examine the effect of the ACT educational program. LGC analysis represents repeated measures of a given variable as a function of time. Each time point measurement contributes to 2 indicators of growth (initial status [intercept] and change over time [slope]) on which individuals may vary. Because initial status is analogous to the intercept in a regression equation, in each of the tested models, unstandardized loadings of all indicators (all 3 time points for each of the measured constructs) on initial status were fixed to 1. To specify linear trends, the loading of time 1 (pretest) was fixed to 0, the loading of time 2 (posttest) was fixed at 1, and the loading of time 3 (follow-up) was fixed at 2. This was analogous to centering in hierarchical linear modeling. To examine the effects of the ACT educational program, condition was included as a fixed covariate, and the variances from the latent variables (intercept and slope) were allowed to covary. This allowed for examination of the relationship between levels of the dependent variable in the model and the rate of change across time.

Multiple imputation of missing data was accomplished with the R multivariate imputation via chained equation package. Assuming the data were missing at random, this imputed data on a variable-by-variable basis. Linear regression was used to predict continuous missing values, and multiple data sets (in this case, 5) were gener-
ated. Missing values were replaced by the means of the values generated in these 5 data sets. For each model, goodness of fit was assessed with the following indices: $\chi^2$, $\chi^2$/df, root mean square error approximation (RMSEA), the standardized root mean square residual (SRMR), comparative fit index (CFI), and the Tucker Lewis index (TLI). Although $\chi^2$ is commonly reported, it is sensitive to sample size and will more often than not return a significant value. $\chi^2$/df provides an alternative to $\chi^2$ as a measure of model fit with values < 5 considered an adequate fit. RMSEA is an absolute fit index, with values < 0.08 considered adequate fit and values < 0.05 considered good fit. SRMR values < 0.08 are considered adequate fit. CFI and TFI are incremental fit indices; Bentler and Bonett recommend that TLI values > 0.90 are acceptable fit, whereas Hu and Bentler suggest that CFI and TLI values > 0.95 indicate good fit.

Results

Participants

Of the 244 individuals who indicated initial interest in research participation, 216 completed informed consent, agreeing to participate (Figure 1). Of those who agreed to participate, 42 did not return to complete pretest measures or program sessions. In all analyses; imputed data accounted for 17.4% of the total data and no more than 3.5% of the data for any given analysis. Independent samples t tests of pretest PSS and CBI-W scores indicated no difference between individuals retained in analyses versus those removed owing to failure to return. Those who were retained in analyses had higher CBI-C ($P = 0.02$) and BTI-R ($P = 0.01$) than those removed from analyses.

The final analytic sample was 143 (intervention group, n = 72; control group, 71). Both groups were comprised primarily of females (90%) identifying as Caucasian or white (96%), with a mean age of approximately 37 years (Table 1). Employment types included veterinarians (18%), technicians (38%), assistants (12%), customer service representatives (13%), and management (12%). Years of employment in the field ranged from 1 to 40 years. No variables differed significantly between the 2 groups.

Table 1—Demographics of participants in a study of the effectiveness of an acceptance and commitment training program on burden transfer, stress, and burnout among small animal veterinary hospital employees.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Intervention</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (y)</td>
<td>Mean (SD)</td>
<td></td>
</tr>
<tr>
<td>Range 19–62</td>
<td>37.2 (10.4)</td>
<td>37.5 (11.2)</td>
</tr>
<tr>
<td>Race-ethnicity</td>
<td>White</td>
<td></td>
</tr>
<tr>
<td>Hispanic or Latino</td>
<td>1 (1.4)</td>
<td>2 (2.8)</td>
</tr>
<tr>
<td>Black or African American</td>
<td>0 (0.0)</td>
<td>1 (1.4)</td>
</tr>
<tr>
<td>Other</td>
<td>0 (0.0)</td>
<td>2 (2.8)</td>
</tr>
<tr>
<td>Gender</td>
<td>Female</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>6 (8.3)</td>
<td>8 (8.5)</td>
</tr>
<tr>
<td>Prefer not to say</td>
<td>1 (1.4)</td>
<td>1 (1.4)</td>
</tr>
<tr>
<td>Experience (y)</td>
<td>Mean (SD)</td>
<td></td>
</tr>
<tr>
<td>Range 1–40</td>
<td>12.5 (9.4)</td>
<td>10.6 (8.6)</td>
</tr>
<tr>
<td>Position</td>
<td>Veterinarian</td>
<td></td>
</tr>
<tr>
<td>Technician</td>
<td>24 (33.3)</td>
<td>30 (42.2)</td>
</tr>
<tr>
<td>Assistant</td>
<td>8 (11.1)</td>
<td>9 (12.7)</td>
</tr>
<tr>
<td>Customer service</td>
<td>8 (11.1)</td>
<td>11 (15.5)</td>
</tr>
<tr>
<td>Management</td>
<td>7 (9.7)</td>
<td>10 (14.1)</td>
</tr>
<tr>
<td>Other</td>
<td>6 (8.3)</td>
<td>4 (5.6)</td>
</tr>
</tbody>
</table>

Participants were randomly assigned to the intervention (n = 72; educational program) or control (71; no educational program) group. Unless otherwise specified, data are given as number (percentage).

Acceptability of ACT educational program

On measures completed within 2 weeks after the training program was finished (ie, posttest assessment), 67 of the 72 (93%) participants in the intervention group strongly (n = 35 [49%]) or slightly (32 [44%]) agreed that the program was helpful. Only 2 (3%) slightly disagreed with this statement, and 2 (3%) neither agreed nor disagreed (1 [1%] participant did not respond). Reported frequency of skill use in the preced-
ing 2 weeks was significantly \( (P < 0.001) \) lower at the time of the follow-up assessment (mean ± SD times skills had been used in the preceding 2 weeks, 38.0 ± 36.0 times; range, 0 to 195 times) than at the time of the posttest assessment (56.6 ± 39.7 times; range, 0 to 170 times).

**Change in BTI reaction scores**

An LGC model was specified with pretest, posttest, and follow-up as the 3 time points to determine the intercept and slope, with group (intervention vs control) as a fixed covariate (Figure 2).

Several fit indices suggested the model provided a good fit to the data \( \chi^2/[4 \text{ df}] = 2.08; \text{SRMR} = 0.04; \text{CFI} = 0.98; \text{TLI} = 0.97 \). Others \( \chi^2/[4 \text{ df}] = 8.34 \quad [P = 0.08] \) and \( \text{RMSEA} = 0.14 \quad [90\% \text{ CI, 0.07 to 0.22\%}] \) did not suggest adequate fit. Because RMSEA is inflated with low degrees of freedom, \( \chi^2 \) tends to be inflated, and the other fit indices suggested good model fit, we were confident in the specified model.

In this model, group predicted slope, such that those who received the educational program reported less perceived stress over time, relative to the control group \( \beta = –0.87; \text{P < 0.001} \). Condition did not predict the intercept \( \beta = –0.02; \text{P} = 0.84 \), indicating that participants in the 2 groups did not differ in initial reported perceived stress. Slope and intercept were not significantly associated \( r = 0.51; \text{P} = 0.28 \), suggesting that initial levels of perceived stress were not associated with the rate of change over time.

**Change in CBI work-related burnout scores**

An LGC model was specified with pretest, posttest, and follow-up as the 3 time points to determine the intercept and slope, with group (intervention vs control) as a fixed covariate (Figure 4). Several fit indices suggested the model provided a good fit to the data \( \chi^2/[4 \text{ df}] = 7.66 \quad [P = 0.10]; \chi^2/[\text{df}] = 1.92; \text{RMSEA} = 0.08 \quad [90\% \text{ CI, 0.00\% to 0.17\%}]; \text{SRMR} = 0.04; \text{CFI} = 0.98; \text{and TLI} = 0.98 \).
indices suggested the model provided a good fit to the data ($\chi^2$/df = 4.85; SRMR = 0.06; CFI = 0.99; and TLI = 0.93). Others ($\chi^2$ [4 df] = 19.04 [$P < 0.01$] and RMSEA = 0.16 [90% CI, 0.10% to 0.24%]) did not suggest adequate fit. On the basis of the fit indices, we were confident in the specified model.

In this model, group predicted slope, such that those who received the educational program reported less work-related burnout over time, relative to the control group ($\beta = -0.71; P < 0.001$). Group did not predict the intercept ($\beta = -0.07; P = 0.48$), indicating that participants in the 2 groups did not differ in initial work-related burnout. Slope and intercept were significantly associated ($r = 0.54; P = 0.04$), suggesting that higher initial levels of work-related burnout were associated with a greater rate of change over time.

Change in CBI client-related burnout scores

An LGC model was specified with pretest, posttest, and follow-up as the 3 time points to determine the intercept and slope, with group (intervention vs control) as a fixed covariate (Figure 5). All fit indices suggested the model provided a good fit to the data ($\chi^2$ [4 df] = 6.15 [$P = 0.18$]; $\chi^2$/df = 1.54; RMSEA = 0.06 [90% CI, 0.00% to 0.15%]; SRMR = 0.04; CFI = 0.99; TLI = 0.99).

![Figure 5](Image 56x284 to 284x423)

**Figure 5**—Line graph of Mean Copenhagen Burnout Inventory–Client-Related Burnout scores for study participants. Error bars represent within-subject 95% CIs.

In this model, group predicted slope, such that those who received the educational program reported less client-related burnout over time, relative to the control group ($\beta = -0.63; P < 0.001$). Group did not predict the intercept ($\beta = -0.07; P = 0.45$), indicating that participants in the 2 groups did not differ in initial client-related burnout. Slope and intercept were not significantly associated ($r = -0.12; P = 0.68$) suggesting that initial levels of client-related burnout were not associated with the rate of change over time.

Discussion

Results of the present study suggest that an ACT-based educational program designed to reduce reactivity to DANCE interactions with veterinary clients and delivered via video teleconferencing could improve several mental health outcomes for veterinary healthcare teams. Following the program, participants reported frequent use of the skills taught in the program. Those who were randomly assigned to the intervention group demonstrated decreased burden transfer reactivity, stress, and work- and client-related burnout after the program, relative to control group participants. These gains were maintained 1 month later.

Initial pilot work examining this program showed that participants found the program both appropriate and useful. Results of the present study align with these findings, demonstrating that 93% (67/72) of participants endorsed the program as helpful. At the posttest and follow-up measurements, mean use of techniques learned in the program was several times per day. Moreover, the program significantly reduced reactivity to DANCE interactions, stress, and burnout in participants, and these improvements were sustained 1 month after the program ended. Together, results of this work point to a path for improving the lives of people working in the field of veterinary medicine.

Results highlight that the veterinary healthcare team members’ reactivity to difficult client interactions is not only a key factor involved in occupational distress, but also modifiable. With relatively brief education, we can reduce reactivity to these situations and, in turn, stress and burnout. Given the current lack of evidence-based methods for reducing mental health distress in veterinary medicine, next steps will be to focus on making this program more broadly available. Although the program was initially developed for face-to-face delivery, the COVID-19 pandemic created a need to shift to remote delivery of the program. Significant improvements in desired outcomes indicate that this delivery method was effective. This knowledge will be key in considering the program’s scalability and sustainability. The success of this program in an online format, combined with increased familiarity that many people now have with technology, suggests creation of an online, asynchronous version of the program could be an effective way to make it more readily available to veterinary healthcare teams everywhere, if such methods prove effective.

An important limitation of the present work includes high rates of attrition following initial enrollment. It is noted that recruitment methods (ie, offering the program as an educational opportunity for all employees and making research participation optional) may have contributed to attrition. The decision to focus on education first and research as a secondary option was made in an effort to yield greater ecological validity and thus generalizability of results. However, participants may have felt less committed to completing all research elements, because their interest in the program was principally for education. In light of the higher baseline levels of client-related burnout and burden transfer reactivity in those who completed the study versus those who...
dropped out, it is also possible that some self-selection occurred. The people who felt they needed the program most may have had greater motivation to complete it. Overall, rates of engagement were reasonable given the time burdens faced by individuals working in veterinary medicine.

Additionally, low levels of participation from individuals of under-represented backgrounds were observed, despite intentional recruitment from clinics located in urban centers. The lack of diversity in the present sample is not surprising, given that the larger population of veterinary healthcare teams in the United States also lacks diversity.^{22} However, the sample studied here may not fully represent everyone working in the field. The usefulness of this program is expected to extend across demographic groups, including to those who are minoritized in the field. ACT demonstrates positive effects across cultures and backgrounds,^{33} and its application in this context allows each participant to identify and work on the specific types of client interactions that cause personal distress. As such, if identity-based discrimination or stigma compounds distress in client interactions, the program should be flexible enough to incorporate these contributors. While institutional policies must remain in place to address these problems, the program used here might serve as an adjuvant method for buffering their impact. Future research to examine whether individuals who were under-represented in the present study differ in experiences of improvement in burden transfer reaction, stress, and burnout will be important.

Another limitation was that the period of follow-up extended to only 1 month after the end of the program. Although the study participants maintained gains at 1 month, frequency of use of the skills taught in the program decreased significantly. It will be important to determine the duration of the program’s effectiveness in the future and to consider whether and when a “booster” session might be needed to ensure sustained benefit. Finally, because the ACT-based educational program was examined in this work relative to a wait-list comparison, it is not clear whether benefits of the program evaluated here would exceed other types of education or intervention. Whether this is the case is an empirical question that should be tested in the future.

In conclusion, this study examined the effectiveness of an ACT-based educational program to reduce reactivity to difficult client interactions in veterinary healthcare. Results showed that the program was found helpful by participants and that they incorporated skills taught in the program into their daily lives. Importantly, the program significantly decreased targeted outcomes of burden transfer reaction, stress, and burnout. Improvements were maintained one month later. Efforts must now focus on broad dissemination to make the program available for veterinary healthcare teams everywhere.

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