

Therapy Dog Welfare

Subjects: Biology

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Definition

Animal-assisted interventions (AAIs) seek to positively affect human health by utilizing animals as adjuncts to therapy. AAIs are broadly defined as any practice that involves animals as a part of a therapeutic or ameliorative process. In an AAI setting, the intensity and duration of the procedure vary with the recipient's particular situation-specific need.

1. Introduction

Animal-assisted interventions (AAIs) seek to positively affect human health by utilizing animals as adjuncts to therapy. AAIs are broadly defined as any practice that involves animals as a part of a therapeutic or ameliorative process ^[1]. In an AAI setting, the intensity and duration of the procedure vary with the recipient's particular situation-specific need ^[2]. Dogs are the species most often involved in AAIs as they are convenient to work with, can be easily trained, and are widely available.

2. Description of Study Outcomes

Pirrone et al. ^[3] studied social synchronization patterns in handlers and dogs. Moreover, the assessment of heart rate and salivary cortisol was carried out over the course of five subsequent AAA sessions with psychologically or physiologically disabled adults. Gaze synchrony, joint attention and touch synchrony were registered before, during, and after the sessions. Social synchrony occurred prior to and during AAAs with joint attention being the most prevalent behavior. However, more gaze synchrony and joint attention were found during AAA performances than prior to sessions. No differences in salivary cortisol levels were found except for individual differences between the dogs. Although heart rate was higher in dogs on working days with AAA sessions compared to control days, values remained within the common physiological range, suggesting only minor increased arousal. Individual preferences for physical contact with recipients were described with some dogs being more willing to initiate physical contact with the recipients than others ^[3].

McCullough et al. ^[4] published their findings on salivary cortisol and behavior in dogs performing AAIs in pediatric oncology. Sessions were arranged so that a dog-handler team was paired with a child, his or her parents and hospital staff. No significant differences in the dogs' salivary cortisol were detected when working concentrations were compared to pre-working levels at the hospital site or at home. However, during AAI sessions, higher salivary cortisol was associated with an increased frequency of stress behaviors and a reduced frequency of affiliative behaviors. In dogs that exhibited higher scores of stranger-directed fear in a behavior-centered questionnaire (i.e., C-BARQ), fewer affiliative behaviors were displayed in AAI sessions. The findings suggest that only mild expressions of distress in dogs were observed; however, notably, incidences of stress and affiliative behaviors were linked with certain activities. For instance, more stress-related behaviors were seen if the child put a bandanna on the dog and fewer affiliative behaviors were found if the child used a stethoscope to listen to the dog's heartbeat, the child played a game on the dog's vest or drew a picture of the dog ^[4].

Colussi et al. ^[5] carried out an exploratory study on dog salivary cortisol responsiveness during various cognitive and physical activities that included AAA as the stimulus. In their study, dogs participated with their owners in group interventions in kindergarten, where children had verbal and tactile contact with the dogs. To assess working concentrations of cortisol, a pre-session saliva specimen was collected and compared to a post-session sample. In addition, home baseline samples were gathered. The results on working and resting salivary cortisol found no AAI-related increase. The authors stated that AAAs can be considered as low-intensity exercises, while dogs provide high psychological support to recipients.

Significantly higher pre-session cortisol levels may be associated with anticipation stress or arousal during transportation to the facility, but a causal relationship could not be inferred [5].

Uccheddu et al. [6] presented a case study on two dogs participating in weekly animal-assisted reading sessions for children with developmental disorders. In the reading interventions, the therapy dogs interacted for 30 min with a group of five children. Dog welfare indicators were salivary cortisol and behavior. One of the dogs had higher salivary cortisol responses pre-session and during the session compared to the other dog and the control condition. The most frequently observed stress behaviors were tail down and lip licking. The authors linked salivary cortisol reactions and behaviors to transportation distress or session anticipation. In general, Uccheddu et al. (2018) concluded that participation in the reading program did not result in any significant changes in physiological or behavioral variables [6].

Corsetti et al. [7] performed a behavioral study where therapy dogs participated in single AAI sessions with recipients who had mental or psychomotor disabilities. The sessions were held outdoors and indoors and were carried out at the training campsite of the AAI organization or in hospital environments. There was no difference in the occurrence of canine anxiety-related or submissive behavior during AAIs. However, the sessions were marked by an increase in non-aggressive dominance behavior, attention, sniffing, affiliative and playful behavior. Dogs were more attentive to their handlers compared to recipients or other people present. Accounting for these findings, the authors considered the workload the therapy dogs were exposed to during their investigation as adequate [7].

Clark et al. [8] studied pre- and post-session salivary cortisol responses of four therapy dogs visiting outpatient nursing units in varying intervals between sessions (i.e., biweekly, weekly, once, and twice a month). This study was the first to assess the frequencies of visits with regard to therapy dog physiological welfare. The results suggest a decrease in salivary cortisol when dogs visited the facility twice a week. Moreover, the youngest and least experienced dog of the sample was seven years old and had higher post-session cortisol values than her conspecifics in all conditions except the weekly interval scenario. In contrast, the oldest dog (twelve years old) had the lowest post-session cortisol values in all conditions except the biweekly interval scenario [8].

Silas et al. [9] examined the effect of therapy dogs participating in on-campus AAI programs. Foci were the prevalence of stress behaviors in therapy dogs, their handlers, and student AAI recipients. The research instrument was a 5-point, Likert-type visual analog scale. While there was a general reduction from pre- to post-session in the stress perception of both therapy dog handlers and students, the therapy dog experience was marked by an increase in stress when home baseline ratings were compared to post-session ratings. Interestingly, self-reported handler (not recipient) stress levels were related to more stress behaviors in their dog. According to handler ratings, 25% of therapy dogs had increased stress levels, 22.5% had decreased stress levels, and 52.5% had no change in stress level over the course of their time working in a session. The authors explain their findings with a certain excitement arising in therapy dogs when they are taken to a novel environment. The study also revealed some inconsistencies when correlating handler and researcher stress level ratings, suggesting that handler perceptions may be more accurate in reflecting their dogs' experiences [9].

Research findings by Melco et al. [10] do not suggest that therapy dogs were hyper-aroused by participating in repeated animal-assisted therapy sessions with a group of three to four children with an attention deficit hyperactivity disorder (ADHD) diagnosis. The interventions were structured into calming activities where dogs both quietly interacted with their owners and performed therapeutic exercises with the children. Neither the dogs' salivary cortisol levels nor heart rates showed any changes associated with therapy performance across six sessions. The study outcomes point at only mild stress that was evident in increased stress behaviors such as ears back, panting and lip licking [10].

One study documented an increase in salivary cortisol, heart rate and respiratory rate in experienced dogs when their AAI-related values were compared with baseline measurements at home [11]. The dataset

included a large variety of AAI settings regarding the environment, recipients, session duration and frequency. Outcomes of the study did not reveal any associations with AAI-related settings such as session duration and frequencies, time of day, recipient, dog or recipient characteristics, or whether dogs were handled with or without a leash. However, dogs performing AAA had higher heart rates than dogs who were involved in AAT. In addition, dogs that had to be transported for more than 50 min from their homes to the AAI sites panting more and had higher heart rates. Some dogs provided values considered outside of physiological thresholds, which were attributed to high temperature, fear of being transported by car and being overcrowded by recipients [11].

Clark et al. [12] collected pre- and post-session salivary cortisol samples from nine dogs and their handlers performing AAIs in a hospital. Handlers also completed a survey on their own and their dog's perceived stress levels, which was complemented by behavioral observations. No differences were found in dog or handler salivary cortisol when baseline values at home were compared to working levels across multiple measurements. However, a significant correlation between the owner's perceived stress in the dog and dog salivary cortisol was evident. These findings suggest that the handlers were sensitive to their dog's experiences and that their perception is in line with the physiological state of their dog. The most frequently observed stress behaviors were panting, lip licking and yawning [12].

In another recent study, Clark et al. [13] used multiple parameters to assess the emotional state in therapy dogs including salivary cortisol, oxytocin, tympanic ear membrane temperature, heart rate and heart rate variability as indicators of well-being. Nineteen dogs participated in both single recipient and group therapy sessions with patients diagnosed with fibromyalgia. Over the course of five sessions, no changes in cortisol or oxytocin emerged; heart rates and right tympanic ear membrane temperatures were significantly lower post-session, indicating a neutral to emotionally positive reaction towards the sessions. These novel findings indicate dogs were possibly in a more relaxed state at the end of the AAI session [13].

There was only one study that included kennel-housed shelter dogs participating in AAIs [14]. For the purpose of the study, a veterinary behavior expert pre-selected well-suited candidates based on canine personality and behavior from a shelter dog population. For the AAIs, dogs were transported from the shelter to a prison, where they interacted weekly with two inmates for a period of two months. The research findings revealed a significant decrease in baseline cortisol levels at the end of the AAI program, indicating a decline in physiological arousal. In addition, transportation for approximately 60 min resulted in a significant increase of the dogs' cortisol levels compared to baseline measurements at the kennel or post AAI session. The study results highlight that structured interaction with humans outside the shelter environment seems to be efficient in buffering hyperarousal linked with high cortisol levels in kennel-housed dogs [14].

References

1. Kruger, K.A.; Serpell, J.A. Animal-assisted interventions in mental health: Definitions and theoretical foundations. In *Handbook on Animal-Assisted Therapy: Theoretical Foundations and Guidelines for Practice*, 2nd ed.; Fine, A.H., Ed.; Academic Press: San Diego, CA, USA, 2006; pp. 21–38.
2. Glenk, L.M. Current Perspectives on Therapy Dog Welfare in Animal-Assisted Interventions. *Animals* 2017, 7, 7.
3. Pirrone, F.; Ripamonti, A.; Garoni, E.C.; Stradiotti, S.; Albertini, M. Measuring social synchrony and stress in the handler-dog dyad during animal-assisted activities: A pilot study. *J. Vet. Behav.* 2017, 21, 45–52.
4. McCullough, A.; Jenkins, M.; Ruehrdanz, A.; Gilmer, M.J.; Olson, J.; Pawar, A.; Holley, L.; Sierra-Rivera, S.; Linder, D.E.; Pinchette, D.; et al. Physiological and behavioral effects of animal-assisted interventions on therapy dogs in pediatric oncology settings. *Appl. Anim. Behav. Sci.* 2018, 200, 86–95.
5. Colussi, A.; Stefanon, B.; Adorini, C.; Sandri, M. Variations of salivary cortisol in dogs exposed to different cognitive and physical activities. *Ital. J. Anim. Sci.* 2018, 17, 1030–1037.
6. Ucheddu, S.; Albertini, M.; Pierantoni, L.; Fantino, S.; Pirrone, F. Assessing behaviour and stress in two dogs during sessions of a reading- to-a- dog program for children with pervasive developmental disorders. *Dog Behav.* 2018, 3, 1–12.

7. Corsetti, S.; Ferrara, M.; Natoli, E. Evaluating Stress in Dogs Involved in Animal-Assisted Interventions. *Animals* 2019, 9, 833.
8. Clark, S.D.; Smidt, J.M.; Bauer, B.A. Welfare consideration: Salivary cortisol concentrations on frequency of therapy dog visits in an outpatient hospital setting: A pilot study. *J. Vet. Behav.* 2019, 30, 88–91.
9. Silas, H.J.; Binfet, J.; Ford, A.T. Therapeutic for all? Observational assessments of therapy canine stress in an on-campus stress-reduction program. *J. Vet. Behav.* 2019, 32, 6–13.
10. Melco, A.L.; Goldman, L.; Fine, A.H.; Peralta, J.M. Investigation of physiological and behavioral responses in dogs participating in animal-assisted therapy with children diagnosed with attention-deficit hyperactivity disorder. *J. Appl. Anim. Welf. Sci.* 2020, 23, 10–28.
11. De Carvalho, I.R.; Nunes, T.; Sousa, L.; Almeida, V. The combined use of salivary cortisol concentrations, heart rate, and respiratory rate for the welfare assessment of dogs involved in AAI programs. *J. Vet. Behav.* 2020, 36, 26–33.
12. Clark, S.D.; Martin, F.; McGowan, R.T.S.; Smidt, J.M.; Anderson, R.; Wang, L.; Turpin, T.; Langenfeld-McCoy, N.; Bauer, B.A.; Mohabbat, A.B. Physiological State of Therapy Dogs during Animal-Assisted Activities in an Outpatient Setting. *Animals* 2020, 10, 819.
13. Clark, S.; Martin, F.; McGowan, R.; Smidt, J.; Anderson, R.; Wang, L.; Turpin, T.; Langenfeld-McCoy, N.; Bauer, B.; Mohabbat, A.B. The Impact of a 20-Minute Animal-Assisted Activity Session on the Physiological and Emotional States in Patients with Fibromyalgia. *Mayo Clin. Proc.* 2020, 95, 2442–2461.
14. D'Angelo, D.; d'Ingeo, S.; Ciani, F.; Visone, M.; Sacchettino, L.; Avallone, L.; Quaranta, A. Cortisol Levels of Shelter Dogs in Animal Assisted Interventions in a Prison: An Exploratory Study. *Animals* 2021, 11, 345.

Keywords

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