

Potential Benefits of Canine Companionship for Military Veterans with Posttraumatic Stress Disorder (PTSD)

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Abstract

Investigators surveyed 30 U.S. military veterans with PTSD who reported having benefited from living with a dog. The subject population included men and women aged 34 to 67, with a mean of 56.9 years ($SD = 8.1$), who were being treated at two Department of Veterans Affairs (VA) outpatient clinics. Participants received a questionnaire packet designed to assess aspects of their mental and physical health and relationship with a canine companion, which they completed at home and returned either in person or by mail. The packet consisted of the PTSD Checklist-Military Version (PCL-M); Beck Depression Inventory, Second Edition (BDI-II); Veterans Short Form Health Survey and Health Behaviors Questionnaire (SF-36); Dog Information Sheet; Dog Relationship Questionnaire; and Lexington Attachment to Pets Scale. Respondents indicated that since adopting their dog they had experienced improvement in several areas, including feeling calmer, less lonely, less depressed, and less worried about their and their family's safety. These results suggest that living with a companion dog may help relieve some of the psychological distress associated with PTSD in some veterans.

Keywords

anxiety, canine companionship, nonhuman animal, posttraumatic stress disorder (PTSD), veteran

Posttraumatic stress disorder (PTSD) is a common disorder among military veterans from every era (e.g., Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995; Seal, Bertenthal, Miner, Sen, & Marmar, 2007). In 2004, Magruder and colleagues estimated that over half a million American veterans were suffering

from this disorder, a number that has likely since increased (Seal et al., 2007). PTSD is marked by reexperiencing symptoms related to a traumatic event or events, persistent avoidance of stimuli associated with the event, and persistent hyperarousal, according to the American Psychiatric Association (2000). It is typically chronic (Dohrenwend et al., 2006) and associated with an impaired quality of life (Richardson, Long, Pedlar, & Elhai, 2008). Common symptoms include avoidance of social activities and a sense of estrangement from, and fear of, harm to self and family, as well as marked irritability, which can be very off-putting to others (American Psychiatric Association, 2000). Individuals with PTSD are at increased risk for a variety of general medical problems ranging from metabolic symptoms, such as hypertension, abdominal obesity, or elevated blood sugar, to ischemic heart disease (e.g., Boscarino, 2008; Horn, Nunnink, & Baker, 2009). PTSD sufferers also experience an increase in all-cause mortality (Boscarino, 2006). PTSD is frequently seen in veterans with traumatic brain injury (Lew et al., 2009) and is commonly complicated by depression and substance abuse (Kessler et al., 1995).

As a result of these symptoms and associated problems, veterans with PTSD often have limited interactions with other people. The interactions that they do have with family members, coworkers, or others are often distant or marked by conflict, potentially leading to loneliness, lack of social support (e.g., Solomon & Dekel, 2008), and an inability to maintain employment. Fortunately, there have been significant advances in recent years in the treatment of PTSD—in particular, the development of two types of psychotherapy, cognitive processing therapy (CPT; e.g., Monson et al., 2006; Resick et al., 2008) and prolonged exposure therapy (PE; e.g., Foa et al., 2005; Rauch et al., 2009). In view of these therapies' demonstrated effectiveness, the U.S. Department of Veterans Affairs is currently taking vigorous steps to make each of them available to every veteran with PTSD. However, some veterans either decline to participate or drop out before completion (Harpaz-Rotem & Rosenheck, 2011). Psychotropic medications have also been reported to be helpful for some veterans with this disorder, though generally not as effective as CPT or PE (National Center for PTSD, 2011). In summary, though there have been significant advances in the care of veterans with PTSD, there is a clear need for additional effective interventions.

There have been some observational studies suggesting there are no health benefits from dog or cat companionship (e.g., Parslow, Jorm, Christensen, Rodgers, & Jacomb, 2005). Another study found no evidence that having a dog or cat reduced the risk of suicide (Helsing & Monk, 1985). However, several other reports suggest a positive link between nonhuman companionship and good health and well-being. Some suggest that association with a companion

animal can reduce loneliness, anxiety, and depression and improve physical health in older individuals or those with chronic medical problems (e.g., Allen, 2003; Friedmann & Son, 2009). A review of participants in the Multicenter AIDS Cohort Study (Siegel, Angulo, Deteis, Wesch, & Mullern, 1999) found that having a companion animal reduced the likelihood of depression in men with AIDS and that this effect was strongest in those subjects with few confidants, which is a common characteristic of veterans with chronic PTSD. They also found that high levels of attachment to a companion animal were predictive of a beneficial effect on depression. In a recent survey of patients with chronic mental illness, many reported receiving a great deal of emotional support from their nonhuman companion (Wisdom, Saedi, & Green, 2009).

Serpell (1991) studied 71 individuals who chose to adopt a dog or cat and found a significant improvement over the course of a 10-month follow-up in scores on the General Health Questionnaire-30 (Goldberg, 1978), which assesses psychological aspects of ill health. Serpell (1991) also identified a significant reduction in the number of minor subjective physical ailments. Allen, Shykoff, and Izzo (2001) studied 48 stockbrokers with high blood pressure who were treated with antihypertensive medication; half were also randomized to adopt a dog or cat. After six months, the participants with a pet showed an increase in blood pressure secondary to an experimental stressor that was only half as great as that of the group treated with medication only ($P < 0.0001$). This finding is significant in that blood pressure stress reactivity has been reported to predict later development of coronary artery calcification (Matthews, Zhu, Tucker, & Whooley, 2006). Similarly, Friedmann, Thomas, Cook, Tsai, and Picot (2007) found that the presence of a friendly canine mitigated blood pressure increases from a speaking task in older persons with hypertension.

With their affectionate natures, dogs would seem to be particularly good companions for veterans with PTSD, given the difficulty that these individuals often have in developing close relationships with other people. The tendency of dogs to bark if a stranger comes to the home might also help to assuage the veterans' exaggerated fears that someone will harm them or their families. The lead investigator for this survey study became interested in the role of dogs in veterans with PTSD six years ago. Impressed by how often veterans with PTSD stated that their dog helped them, he queried several colleagues and discovered that many of them were hearing similar comments. An example is the following comment from one patient:

I got my dog 18 months ago. When I would feel down I'd pick up and hug him and I'd feel better. He was full of joy. I would talk to him and it seemed that he would

understand. I'd be sitting there feeling down and he would come over with a toy in his mouth and jump on my lap to cheer me up. (Pedro S. Duron, personal communication, 2007)

To further explore this phenomenon, this study surveyed veterans with PTSD being seen at two VA outpatient clinics: the Frank M. Tejada Outpatient Clinic in San Antonio, Texas, and the Kerrville Outpatient Clinic in Kerrville, Texas.

Method

Participants

Clinicians were told of the study and asked to refer any patients who spontaneously mentioned benefiting in any way from having a dog and who expressed interest in participating when the study was explained to them. Thirty-five veteran outpatients with a primary diagnosis of PTSD were referred as possible study participants after mentioning to their clinician during a routine clinical interview that their dog had helped them. All veterans gave written informed consent to participate in the study, which was approved by the South Texas Veteran Health Care System (STVHCS) Research and Development Service and the University of Texas Health Science Center at San Antonio Institutional Review Board. Two declined to participate in the study, and three did not return the questionnaires, leaving a total of 30 respondents. As indicated in Table 1, 90% of the veterans were men and 53% described themselves as Hispanic. A majority had served during the Vietnam War, while 10% had served in Iraq (Operation Iraqi Freedom) since 2003. At the time of the study all were participating in supportive group psychotherapy or psychoeducational classes, but none had received either CPT or PE. All the veterans were prescribed psychotropic medication. They reported having been diagnosed by their doctor with a variety of physical problems, including arthritis (77%), hypertension (70%), chronic low back pain (70%), benign prostatic hypertrophy (37% of the men), diabetes (37%), angina or coronary heart disease (30%), chronic lung disease (28%), heart attack or myocardial infarction (23%), stroke (21%), congestive heart failure (20%), and cancer (13%).

Instruments

The participants completed the following six questionnaires, which they returned either in person or by mail:

Table 1. Demographic data for the study participants (N = 30).

Age (years)	Range 34-67, <i>M (SD)</i> 56.9 (8.1)	
Sex	Male	27 (90.0%)
	Female	3 (10.0%)
Race/Ethnicity	Hispanic	16 (53.3%)
	Non-Hispanic White	9 (30.0%)
	African-American	1 (3.3%)
	American Indian	1 (3.3%)
	Multiracial	3 (10.0%)
Lives Alone	Yes	5 (16.7%)
	No	25 (83.3%)
Period of Military Service	Vietnam War only	18 (60.0%)
	Desert Storm only	5 (16.7%)
	Vietnam and Desert Storm	1 (3.3%)
	Operation Iraqi Freedom	3 (10.0%)
	Other	3 (10.0%)
Service-Connected VA	Yes	25 (83.3%)
Disability for PTSD	No	5 (16.7%)

Beck Depression Inventory, Second Edition (BDI-II; Beck, Steer, Ball, & Ranieri, 1996). The BDI-II is a measure consisting of 21 groups of statements that assess depressive symptoms over the two previous weeks. The statements are scaled from 0 (no disturbance) to 3 (maximal disturbance). Respondents pick out the one statement in each group that best describes how they have been feeling over the past two weeks.

Dog Information Sheet. This is an 18-item questionnaire developed for this study to gather information about the respondent's canine companion (Table 2). For both this instrument and the Dog Relationship Questionnaire (see below), respondents are asked to answer about their principal companion, if they live with more than one canine. If they do not have one to whom they feel closest, they are asked to answer for all their dogs. The DIS also elicits relational information about the companion and the study participant (e.g., the amount of time spent together each day). Data from the Dog Information Sheet are shown in Table 2.

Dog Relationship Questionnaire. This is a Likert-type instrument developed for this study, in which subjects are asked to respond on a scale from 1-5 (from strongly disagree to strongly agree) to each of 18 statements. The statements

reflect common symptoms of PTSD, as well as comments frequently made to us by patients in our clinic who live with canines. Ten of the statements relate to symptom change (e.g., "Since I got my dog, I've felt calmer") and two to behavior change (e.g., "Since I got my dog, I've been getting more exercise"), while six relate to the dog's and the subject's relationship (e.g., "My dog tries to cheer me up when I'm feeling bad"). Cronbach's alpha was 0.868, indicating a high degree of internal consistency.

Lexington Attachment to Pets Scale (LAPS; Johnson, Garrity, & Stallones, 1991). This is a validated Likert scale that contains 23 statements about respondents' beliefs about their nonhuman companion, to which they are asked if they strongly agree, somewhat agree, somewhat disagree, or strongly disagree (e.g., "Quite often I confide in my pet"). Two of the items are reverse scored (e.g., "I am not very attached to my pet").

PTSD Checklist-Military Version (PCL-M; Weathers, Litz, Herman, Huska, & Keane, 1993). The PCL-M is a 17-item measure that evaluates the severity of PTSD symptoms over the past month. Each item of the PCL-M is scored on a 5-point scale ranging from 1 ("not at all") to 5 ("extremely"), resulting in a total score ranging from 17-85. The PCL-M is psychometrically sound (e.g., Keen, Kutter, Niles, & Krinsley, 2008) and is the instrument recommended to assess PTSD in military members by the VA/DoD Clinical Practice Guideline for the Management of Post-Traumatic Stress (Department of Veterans Affairs and Department of Defense, 2010).

Veterans 36-item Short Form Health Survey and Health Behaviors Questionnaire (Veterans SF-36; Jones et al., 2001). The Veterans SF-36 is a standard instrument for the assessment of the health-related quality of life in veterans. It yields two main scores: a Mental Component Score that measures mental-health-related quality of life and a Physical Component Score that measures physical-health-related quality of life.

Results

As shown in Table 2, the majority of participants (80%) had lived with their canine companion for at least one year and slightly less than half (47%) lived with more than one dog. Two-thirds of the subjects were the sole caretaker and regularly took walks with their canine companion. The average length of the walks was 49 minutes per day. Respondents reported spending nearly 14 hours per day with their canines, with 70% sharing a bedroom with the canine. Ninety-seven percent of the subjects lived with dogs when they were growing up. The respondents' companions were fairly evenly divided between large and small breeds. Information about the sex of the animals was not obtained.

Table 2. Data from the dog information sheet ($N = 30$).

Length of ownership	<1 year	6 (20.0%)
	1-5 years	13 (43.3%)
	>5 years	11 (36.7%)
Number of dogs in household	1	16 (53.3%)
	≥ 2	14 (46.7%)
Has taken training classes	Yes	4 (13.3%)
	No	26 (86.7%)
Had a dog when growing up	Yes	29 (96.7%)
	No	1 (3.3%)
Dog sleeps in bedroom	Yes	21 (70.0%)
	No	9 (30.0%)
Veteran's caretaking role	Sole caretaker	20 (66.7%)
	Shares with someone else	10 (33.3%)
Veteran walks dog	Yes	20 (66.7%)
	No	10 (33.3%)
Walk length (minutes)	$M (SD)$	25.6 (14.9)
Time/day with dog (hours)	$M (SD)$	13.8 (8.8)

The mean total score on the Lexington Attachment to Pets Scale (Johnson et al., 1991) was 81.8 ($SD = 10.9$), with a mean score for each of the 23 individual items of 3.56, with 4 indicating the highest possible degree of attachment. These results reflect a very strong bond between the veterans and their canine companions.

As shown in Table 3, the veterans reported on the Dog Relationship Questionnaire that since their companions' arrival they had experienced improvement in a variety of symptoms, including feeling calmer, less lonely, less depressed, less worried about their own and their family's safety, less irritable, and better about themselves as a person. They also reported they were exercising more, enjoying nature more, and having a very close and supportive relationship with their canine. They did not note being less bothered by painful memories or flashbacks (mean item score 3.13, where 3 = neither agree nor disagree) but indicated that the canine tried to cheer them up when they were feeling bad ($M = 4.63$, where 4 = somewhat agree and 5 = strongly agree), suggesting that the companion's presence may have lessened some of the negative

Table 3. Summary of responses on the dog relationship questionnaire (N = 30)^a.

Since I got my dog, I've...	
felt calmer.	4.43 (0.68) ^b
felt less lonely.	4.30 (0.65) ^b
felt less worried that someone might harm me or my family.	4.17 (0.79) ^b
felt less depressed.	4.03 (0.67) ^b
felt better about myself as a person.	3.70 (1.12) ^b
been less angry or irritable.	3.50 (1.01) ^b
found it easier to be with other people.	3.17 (1.12)
been less bothered by memories or flashbacks of my traumatic experiences.	3.13 (1.07)
been less bothered by bad dreams or nightmares.	3.03 (1.07)
felt more comfortable thinking or talking about my traumatic experiences.	2.87 (1.07)
been enjoying nature more.	3.83 (1.08) ^b
been getting more exercise.	3.73 (0.87) ^b
My dog loves me.	4.87 (0.43) ^b
My dog respects me.	4.80 (0.48) ^b
My dog does things that make me laugh.	4.70 (0.54) ^b
My dog tries to cheer me up when I'm feeling bad.	4.63 (0.85) ^b
I talk to my dog.	4.50 (1.14) ^b
When I have a bad dream, my dog tries to comfort me.	3.83 (0.99) ^{bc}

^a*M (SD)* score for the 30 respondents, where 5 = strongly agree, 4 = somewhat agree, 3 = neither agree nor disagree, 2 = somewhat disagree, and 1 = strongly disagree. The 10 items that assess symptom change since getting the dog are listed first, followed by the two that assess behavior change and the 6 that ask about the human/dog relationship. Within each group, items are listed in order of mean score.

^bSignificantly different from "3 = neither agree nor disagree" at the $p = .01$ level (two-tailed *t* test).

^c*M (SD)* for the 21 subjects who share a bedroom with their dogs was 4.24 (0.70).

impact of reexperiencing their trauma. They did not endorse being less bothered by bad dreams or nightmares, but 86% of the subjects who shared a bedroom with the canine strongly or somewhat agreed with the statement that the companion tried to comfort when the veteran was having a bad dream. The 16 veterans who lived with one dog noted finding it easier to be with other people since the dog's arrival ($M = 3.64$). Both married and unmarried

veterans (means of 4.30 and 4.33, respectively) reported feeling less lonely. However, the veterans did not endorse feeling more comfortable thinking or talking about their traumatic experiences ($M = 2.87$). We did not note any obvious differences in response between the female and male veterans, though it is possible that there could be real differences that we were unable to ascertain because of the very small number of women.

In terms of symptoms of PTSD, the PCL-M scores ranged from 35-85, with a mean of 63.6 ($SD = 11.2$). The majority of the veterans (93%) had PCL-M scores that were ≥ 50 , the usual cut-point for a diagnosis of PTSD (Weathers et al., 1993). Scores on the BDI-II ranged from 2-51 with a mean score in the moderate to severe range of depression ($M = 29.0$, $SD = 13.3$). In terms of quality of life, the Mental Component Scale on the SF-36 ranged from 14.3-44.9 with a mean of 31.4 ($SD = 8.8$). The participants had similar scores on the Physical Component Scale (range = 18.8-62.2; $M = 33.6$; $SD = 10.4$). Both of these scales indicated that the veterans' overall quality of life was between 1.5 and 2.0 standard deviations below the norm for U.S. residents (McHorney, Ware, Lu, & Sherburne, 1994).

Discussion

Previous research has demonstrated the many psychological and physical health benefits of canine companionship (Allen, 2003; Friedmann et al., 2007; Friedmann & Son, 2009; Friedmann & Thomas, 1995; Raina, Waltner-Toews, Bonnett, Woodward, & Abernathy, 1999). The present study evaluated the self-reported benefits of canine companions in military veterans with PTSD. The veterans reported feeling calmer, less lonely, less depressed, and less worried about their own and their family's safety since their companion dog arrived to live with them. In addition, they reported exercising more and taking walks with the canine for an average of 49 minutes a day. Those who lived with one dog (as opposed to multiple dogs) noted finding it easier to be with other people since the companion's arrival, possibly because it might be easier to interact with a neighbor while walking only one pet. Married veterans were as likely as those who were unmarried to report feeling less lonely since their dog's arrival. To our knowledge, this is the first report of its kind in veterans with PTSD who have a nonservice companion dog.

Limitations of this Research

These data need to be generalized with caution since this was a retrospective study that assessed only veterans who reported that their dog had helped them.

The results also could have been affected by any memory deficits the participants might have had, which were not specifically assessed. The results are also limited by a restricted age range, which did not include any veterans younger than their midthirties, and by the fact that few had been deployed to Iraq since 2003, and none had served in or around Afghanistan. In addition, none of the veterans had received cognitive processing therapy or prolonged exposure therapy. The fact that most patients in this study still had significant psychological distress and an impaired mental-health-related quality of life suggests that the benefits of having a dog are less than those derived from taking part in evidenced-based treatments for PTSD such as cognitive processing therapy (Monson et al., 2006; Resick et al., 2008) or prolonged exposure (Foa et al., 2005; Rauch et al., 2009). It is also important to keep in mind that living with a nonhuman animal can potentially be associated with problems as well as benefits, such as irritation on the part of the veteran resulting from the normal demands and conditions of being an animal caretaker and the sense of loss that can occur when a beloved companion dies.

How Might Dogs Help Veterans with PTSD?

The results of the present study provide some initial insight into how companion dogs might help veterans with PTSD. However, additional research is needed to explore these factors further. For example, humans often perceive their canine companions as providing unconditional positive regard, which was proposed by Carl Rogers to be a key element in successful psychotherapy (Rogers, 1957). As shown in Table 3, nearly every subject in our study strongly believed that their companion loved them. Veterans with PTSD frequently say that the dog loves them even when they are grumpy. Canines may also help by allowing veterans to express their feelings and clarify their thoughts without concern that the companion will interrupt, offer criticism or advice, or pass the information on to others, as may occur in human interactions. Confiding in one's companion dog, endorsed by most of the veterans on the Lexington Attachment to Pets Scale (Johnson et al., 1991), might confer benefits similar to that of expressive writing, in which disclosure of emotionally meaningful matters has been reported to help deal with traumatic experiences (Smyth & Helm, 2003). By receiving such confidences, canines may also provide a type of nonevaluative social support. Petting or playing with a dog may reduce feelings of anxiety and, by encouraging veterans to focus on the present moment, help them not dwell on painful memories. Taking walks with a canine companion is also a potential mechanism for improving physical health (e.g., Coleman et al., 2008; Sakuragi & Sugiyama, 2006) and might

also play a role in reducing depressive and PTSD symptoms through increased exercise (Manger & Motta, 2005). Walking through one's neighborhood with a canine could also provide an opportunity for casual, low-stress interactions with neighbors, which might reduce feelings of isolation and facilitate reintegration into society. Improvements in depression would likely be associated with an increased interest in and satisfaction from social and work activities, while reductions in fear could make veterans with PTSD feel more comfortable in social situations. Decreased irritability might help veterans get along better with relatives, friends, and coworkers, thus also facilitating their social reintegration. Adopting and caring for a dog could give veterans the satisfaction of helping another living being, which could help to assuage some of the guilt feelings they might experience from events that occurred in combat. Dogs may enhance sleep by giving veterans a greater sense of security at night and, for those who share a bedroom with their dog, comforting them if they have a bad dream. Having to get up to take walks with the dog at the same time every day might help to regularize the sleep-wake cycle, thus making it easier to fall asleep the next night. All of these hypothesized relationships between dogs and their veterans are worthy of further exploration in future research studies.

Future Directions

Our group has been exploring the possibility that giving a dog from an animal shelter as a pet to a veteran with PTSD may be a useful therapeutic intervention, while others are evaluating the role of psychiatric service dogs, who receive extensive training to enable them to perform a variety of tasks, including providing protection for the veteran 24 hours a day. If a program involving the pairing of shelter dogs with veterans is found to be an effective intervention, it could also provide a much-needed benefit to the many animals in our communities in need of a loving home, while also alleviating some of the strain on local authorities and organizations. A successful dog adoption program for veterans with PTSD could potentially lead to the development of similar programs for nonveterans with PTSD, as well as for individuals with other psychiatric and general medical disorders.

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References

- Allen, K. (2003). Are pets a healthy pleasure? The influence of pets on blood pressure. *Current Directions in Psychological Science*, 12(6), 236-239.
- Allen, K., Shykoff, B. E., & Izzo J. L. (2001). Pet ownership, but not ACE inhibitor therapy, blunts home blood pressure responses to mental stress. *Hypertension*, 38(4), 815-820.
- American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders* (4th ed.). Washington, D.C.: Author.
- Beck, A. T., Steer, R. A., Ball, R., & Ranieri, W. F. (1996). Comparisons of Beck Depression Inventories -IA and -II in psychiatric outpatients. *Journal of Personality Assessment*, 67(3), 588-597.
- Boscarino, J. A. (2006). Posttraumatic stress disorder and mortality among U.S. Army veterans 30 years after military service. *Annals of Epidemiology*, 16(4), 248-256.
- . (2008). A prospective study of PTSD and early-age heart disease mortality among Vietnam veterans: Implications for surveillance and prevention. *Psychosomatic Medicine*, 70, 668-676.
- Coleman, K. J., Rosenberg, D. E., Conway, T. L., Sallis, J. F., Salens, B. E., Frank, L. D., & Cain, K. (2008). Physical activity, weight status, and neighborhood characteristics of dog walkers. *Preventive Medicine*, 47(3), 309-312.
- Department of Veterans Affairs and Department of Defense. (2010). VA/DoD clinical practice guidelines: Management of traumatic stress disorder and acute stress reaction. Retrieved from http://www.healthquality.va.gov/Post_Traumatic_Stress_Disorder_PTSD.asp.
- Dohrenwend, B. P., Turner, J. B., Turse, N. A., Adams, B. G., Koenen, K. C., & Marshall, R. (2006). The psychological risks of Vietnam for U.S. veterans: A revisit with new data and methods. *Science*, 313(5789), 979-982.
- Foa, E. B., Hembree, E. A., Cahill, S. P., Rauch, S. A. M., Riggs, D. S., Feeny, N. C., & Yadin, E. (2005). Randomized trial of prolonged exposure for posttraumatic stress disorder with and without cognitive restructuring: Outcome at academic and community clinics. *Journal of Consulting and Clinical Psychology*, 73(5), 953-964.
- Friedmann, E., & Son, H. (2009). The human-companion animal bond: How humans benefit. *Veterinary Clinics: Small Animal Practice*, 393(2), 293-326.
- Friedmann, E., & Thomas, S. A. (1995). Pet ownership, social support, and one-year survival after acute myocardial infarction in the Cardiac Arrhythmia Suppression Trial (CAST). *American Journal of Cardiology*, 76(17), 1213-1217.
- Friedmann, E., Thomas, S. A., Cook, L. K., Tsai, C., & Picot, S. (2007). A friendly dog as potential moderator of cardiovascular response to speech in older hypertensives. *Anthrozoös*, 20(1), 51-63.
- Goldberg, D. P. (1978). *Manual of the general health questionnaire*. London: National Foundation for Educational Research.
- Harpaz-Rotem, I., & Rosenheck, R. A. (2011). Serving those who served: Retention of newly returning veterans from Iraq and Afghanistan in mental health treatment. *Psychiatric Services*, 62(1), 22-27.

- Helsing, K. J., & Monk, M. (1985). Dog and cat ownership among suicides and matched controls. *American Journal of Public Health*, 75(10), 1223-1224.
- Horn, P. S., Nunnink, S. E., & Baker, D. B. (2009). The association of posttraumatic stress disorder and metabolic syndrome: A study of increased health risk in veterans. *BMC Medicine*, 7(1), 1-8.
- Johnson, T. P., Garrity, T. F., & Stallones, L. (1991). Psychometric evaluation of the Lexington Attachment to Pets Scale. *Anthrozoös*, 5(3), 160-176.
- Jones, D., Kazis, L., Lee, A., Rogers, W., Skinner, K., Cassar, L., Wilson, N., & Hendricks, A. (2001). Health status assessments using the Veterans SF-12 and SF-36: Methods for evaluating outcomes in the Veterans Health Administration. *Journal of Ambulatory Care Management*, 24(3), 68-86.
- Keen, S. M., Kutter, C. J., Niles, B. L., & Kripsley, K. E. (2008). Psychometric properties of PTSD Checklist in sample of male veterans. *Journal of Rehabilitation Research and Development*, 45(3), 465-474.
- Kessler, R. C., Sonnega, A., Bromet, E., Hughes, M., & Nelson, C. B. (1995). Posttraumatic stress disorder in the National Comorbidity Survey. *Archives of General Psychiatry*, 52(12), 1048-1060.
- Lew, H. L., Otis, J. D., Tun, C., Kerns, R. D., Clark, M. E., & Cifu, D. X. (2009). Prevalence of chronic pain, posttraumatic stress disorder, and persistent postconcussive symptoms in OIF/OEF veterans: Polytrauma clinical triad. *Journal of Rehabilitation Research and Development*, 46(6), 697-702.
- Magruder, K. M., Frueh, B. C., Knapp, R. G., Johnson, M. R., Vaughan, J. A., & Carson, T. C. (2004). PTSD symptoms, demographic characteristics, and functional status among veterans treated in VA primary care clinics. *Journal of Traumatic Stress*, 17(4), 293-301.
- Manger, T. A., & Motta, R. W. (2005). The impact of an exercise program on posttraumatic stress disorder, anxiety, and depression. *International Journal of Emergency Mental Health*, 7(1), 49-57.
- Matthews, K. A., Zhu, S., Tucker, D. C., & Whooley, M. A. (2006). Blood pressure reactivity to psychological stress and coronary calcification in the Coronary Artery Risk Development in Young Adults study. *Hypertension*, 47(3), 391-395.
- McHorney, C. A., Ware, J. E., Lu, J. F., & Sherbourne, C. D. (1994). The MOS 36-item Short Form Health Survey (SF-36): III. Tests of data quality, scaling assumptions, and reliability across diverse patient groups. *Medical Care*, 32(1), 40-66.
- Monson, C. M., Schnurr, P. P., Resick, P. A., Friedman, M. J., Young-Xu, Y., & Stevens, S. P. (2006). Cognitive processing therapy for veterans with military-related posttraumatic stress disorder. *Journal of Consulting and Clinical Psychology*, 74(5), 898-907.
- National Center for PTSD. (2011, December 20). *Clinician's guide to medications for PTSD*. Retrieved from <http://www.ptsd.va.gov/professional/pages/clinicians-guide-to-medications-for-ptsd.asp>.
- Parslow, R. A., Jorm, A. F., Christensen, H., Rodgers, B., & Jacomb, P. (2005). Pet ownership and health in older adults: Findings from a survey of 2,551 community-based Australians aged 60-64. *Gerontology*, 51(1), 40-47.
- Raina, P., Waltner-Toews, D., Bonnett, B., Woodward, C., & Abernathy, T. (1999). Influence of companion animals on the physical and psychological health of older people: An analysis of a one-year longitudinal study. *Journal of the American Geriatrics Society*, 47(3), 323-329.
- Rauch, S. A., Defever, E., Favorite, T., Duroe, A., Garrity, C., Martis, B., & Liberzon, I. (2009). Prolonged exposure for PTSD in a Veterans Health Administration PTSD Clinic. *Journal of Traumatic Stress*, 22(1), 60-64.
- Resick, P. A., Galovski, T. E., Uhlmansiek, M. O., Scher, C. D., Clum, G. A., & Young-Xu, Y. (2008). A randomized clinical trial to dismantle components of cognitive processing therapy for posttraumatic stress disorder in female victims of interpersonal violence. *Journal of Consulting and Clinical Psychology*, 76(2), 243-258.

- Richardson, J. D., Long, M. E., Pedlar, D., & Elhai, J. D. (2008). Posttraumatic stress disorder and health-related quality of life among a sample of treatment- and pension-seeking deployed Canadian Forces peacekeeping veterans. *Canadian Journal of Psychiatry, 53*(9), 594-600.
- Rogers, C. R. (1957). The necessary and sufficient conditions of therapeutic personality change. *Journal of Consulting and Clinical Psychology, 21*(2), 95-103.
- Sakuragi, S., & Sugiyama, Y. (2006). Effects of daily walking on subjective symptoms, mood and autonomic nervous function. *Journal of Physiological Anthropology, 25*(4), 281-289.
- Seal, K. H., Bertenthal, D., Miner, C. R., Sen, S., & Marmar, C. (2007). Bringing the war back home: Mental health disorders among 103,778 US veterans returning from Iraq and Afghanistan seen at Department of Veterans Affairs facilities. *Archives of Internal Medicine, 167*(5), 476-482.
- Serpell, J. (1991). Beneficial effects of pet ownership on some aspects of human health and behavior. *Journal of the Royal Society of Medicine, 84*(12), 717-720.
- Siegel, J. M., Angulo, F. J., Detels, R., Wesch, J., & Mullen, A. (1999). AIDS diagnosis and depression in the Multicenter AIDS Cohort Study: The ameliorating effect of pet ownership. *AIDS Care, 11*(12), 157-170.
- Smyth, J., & Helm, R. (2003). Focused expressive writing as self-help for stress and trauma. *Journal of Clinical Psychology, 59*(2), 227-235.
- Solomon, Z., & Dekel, R. (2008). The contribution of loneliness and posttraumatic stress disorder to marital adjustment following war captivity: A longitudinal study. *Family Process, 47*(2), 261-275.
- Weathers, F., Litz, B., Herman, D., Huska, J., & Keane, T. (1993, November). *The PTSD Checklist (PCL): Reliability, validity, and diagnostic utility*. Paper presented at the ISTSS 9th Annual Convention, San Antonio, TX.
- Wisdom, J. P., Saedi, G. A., & Green, C. A. (2009). Another breed of "service" animals: STARS study findings about pet ownership and recovery from serious mental illness. *American Journal of Orthopsychiatry, 79*(3), 430-436.