An Observational Study of Service Dogs for Veterans With Posttraumatic Stress Disorder

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Objectives: This study examined needs related to posttraumatic stress disorder (PTSD), assistance by service dogs, and feasibility of data collection among veterans receiving service dogs.

Methods: Questionnaires assessed PTSD-related needs and services performed or expected to be performed by service dogs among 78 veterans who had or were on a wait list for a service dog (average age, 42; women, 31%). Analyses compared pre-post characteristics among 22 veterans who received a service dog as part of the study (91% follow-up; average follow-up=3.37±2.57 months).

Results: Veterans reported that the most important services performed were licking or nudging veterans to help them "stay present," preventing panic, and putting space between veterans and strangers. High follow-up rates and improvements in outcomes with moderate to large effect sizes among recipients of study-provided dogs suggest further study is warranted.

Conclusions: Service dogs may be feasible supports for veterans with PTSD; randomized clinical trials are needed to assess effectiveness.

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Difficulties with postdeployment community reintegration are common among military veterans, particularly among those with physical or psychiatric disabilities (1,2). Poor mental health among veterans contributes to high rates of homelessness and suicide (3–5), and stigma associated with mental health problems in the military creates barriers to care seeking (6,7).

Service dogs are increasingly used by veterans with combat-sustained injuries to manage physical disabilities (8). Service dogs reduce costs for paid assistance and may reduce embarrassment in public settings, improve self-mastery, and aid in social interactions and activities (8,9). Anecdotal reports suggest other benefits, including improved well-being, greater internal locus of control, more positive affect, and improved depression symptoms (9).

Service dogs trained to provide specific behavioral tasks, such as licking or nudging to help the veteran remain focused on the immediate surroundings when faced with vivid memories or flashbacks and helping to prevent panic responses or manage crowded situations, may have particular value for veterans who are less comfortable with conventional mental health treatment (10,11). Despite increased demand for service dogs trained to help with mental health difficulties, however, little is known about the specific services and tasks that they perform or which have been found to be helpful. In addition, only anecdotal evidence supports service dog use for veterans with PTSD. To address this gap, we conducted a mixed-methods observational study of veterans who had been diagnosed as having PTSD and who had received a service dog to help manage psychiatric problems or had submitted an application and had qualified for a service dog but had not yet received one. A subset of study participants received study-funded service dogs, trained by participating organizations. The findings can be used to prepare for an adequately powered, rigorously designed randomized controlled trial that could assess the effectiveness of service dog use for veterans with PTSD.

METHODS

Researchers at Kaiser Permanente Northwest (KPNW) in Oregon and Georgia (KPG) collaborated with the following five not-for-profit organizations that train dogs for veterans with PTSD: Paws Assisting Veterans (PAVE), in Oregon; Joys of Living Assistance Dogs (JLAD), Oregon; Bergin University of Canine Studies (Bergin), California; paws4people (p4p), North Carolina; and Canine Assistants (CA), Georgia. Dogs supplied by the participating organizations were bred to be service dogs and received extensive training prior to placement; neither shelter dogs nor companion dogs were included. JLAD, PAVE, Bergin, and CA require veterans to attend intensive two-week training sessions in the proper care and use of service dogs, whereas p4p trains veterans over a longer period but with similar total training duration. All agencies are accredited by Assistance Dogs International (ADI)

(www.assistancedogsinternational.org/) except CA, which is developing an alternative accreditation system. The training of the dogs provided in the study conformed to ADI requirements and public certification tests, although training timing and processes varied across sites.

To receive a service dog, veterans in the study were required to meet the participating organization's eligibility standards, including a letter of support from a physician or psychologist; agree to the organization's standard terms and conditions; be assessed as a good candidate for receiving a service dog for psychiatric problems; be a good "match" for an available dog; complete the organization's pairing and training processes, graduate, and receive certification; and complete this process in calendar year 2014, including completing follow-up assessments a minimum of 30 days following study dog placement.

We attempted to recruit 123 veterans with self-reported PTSD and a clinician's letter supporting the veterans' need for a service dog for PTSD-related symptoms, enrolling 78 (63%). Of the 78, 54 were on waiting lists to receive a dog, and 24 had already received a dog at baseline; 22 of the 54 on waiting lists received a dog as part of the study.

Organization staff at PAVE, JLAD, and Bergin telephoned veterans with PTSD with whom they had placed service dogs and veterans with PTSD on waiting lists for dogs to solicit participation. They then mailed questionnaires to potential participants, which were returned by mail to KPNW. Canine Assistants and p4p contacted eligible individuals and requested permission to provide contact information to study staff, who recruited participants directly. All organizations other than Bergin invited qualified individuals on wait lists to participate and potentially receive a dog as part of the study. Wait-list candidates who completed questionnaires and qualitative interviews were reviewed and selected according to each organization's standards for matching dogs to veterans' needs.

We mailed study information sheets and questionnaires to potential participants and considered returned questionnaires as consent. The study was approved and monitored by KPNW's and KPG's Institutional Review Boards for Human Subjects Protection. KPNW's Research Subjects Protection Office determined that the study did not involve animal research and, therefore, did not require separate review for animals. All data were collected in 2014.

We used two questionnaires with overlapping content. The first was used for veterans who were awaiting service dogs. The second was used for veterans who had service dogs at baseline and for follow-up assessments of participants who received study dogs.

Questionnaires included the following: the Veterans RAND 12-Item Health Survey (VR-12); the PTSD Checklist–civilian version; the Deployment Risk and Resilience Inventory–2 (DRRI) combat exposure scale; and the BASIS-24 self-report measure of psychiatric symptoms and functioning. We measured regular engagement in 25 daily activities in the prior month, quality of life and psychiatric medication use from

the Wisconsin Quality of Life Index, general happiness from the General Social Survey, life stress level in the past 12 months, usual hours slept, and types of help provided by the service dog. To identify the types of help provided by the service dog, participants rated the importance of a list of services that was compiled on the basis of a review of anecdotal reports, literature provided by national and international assistance dog certification organizations, and feedback from veterans and service dog trainers. Questionnaires are available on request.

We computed univariate and bivariate statistics to describe participants' baseline characteristics and assess differences in baseline characteristics between participants who had a service dog and those who were waiting for a service dog. For baseline comparisons, we used chi-square analyses for categorical measures and one-way analyses of variance (ANOVAs) for continuous measures. We used repeated-measures ANOVA and Greenhouse-Geisser statistics for within-subjects effects to test for pre-post differences among individuals who received study-provided dogs (SPSS, version 22). We calculated Cohen's d effect sizes because small sample sizes limited power to detect differences.

RESULTS

Table 1 shows baseline characteristics of veterans with service dogs (N=24) and those awaiting receipt of a service dog (N=54). Fifty-four participants were male, and 24 were female; participants' ages ranged from 23 to 67 years, and age was normally distributed (mean±SD=42.4±12.0); 12 (16%) reported being members of racial-ethnic minority groups, including those of Hispanic ethnicity. Participants served in the military for an average of 9.9±7.5 years with an average of 2.6±2.2 deployments, including deployments in Vietnam, the Persian Gulf, Iraq, Afghanistan, Bosnia, Beirut, Somalia, South Korea, and South America. Average time on service dog wait lists was 16.3±12.0 months (median=12.5 months). Twenty of 22 (91%) individuals who received study-provided dogs completed follow-up questionnaires after receiving a dog. The questionnaires were returned an average of 3.37±2.57 months after receiving a dog (median=2.83, range 1–11 months).

At baseline, participants scored an average of 61.8±16.1 on the PTSD Checklist (a score of 50 indicates a positive screen) and 43.0±16.4 on the DRRI combat exposure scale (possible scores range from 17 to 102, with higher scores indicating greater exposure to combat). Combat exposure was higher than the mean score (25.7±11.6) reported in a national sample of veterans who were surveyed for scale development (12).

We found no between-group differences at baseline in combat exposure, VR-12 physical health scores, BASIS psychosis subscale scores, or sociodemographic characteristics, with the exception that veterans with service dogs were slightly older than those on wait lists for a dog. Baseline scores for veterans with service dogs were significantly better compared with those without dogs on the following

TABLE 1. Baseline characteristics of 78 veterans on a wait list for a service dog or with an existing service dog

Characteristic	Waiting for service dog (N=54)			Has service dog (N=24)			Test statistic[a]	df	p	Effect size (Cohen's d)
	Total N	N	%	Total N	N	%				
Female	54	17	33	24	7	29	χ^2=.33	1	.387	na
Married	52	30	58	23	15	65	χ^2=.38	1	.363	na
Income	50			22			χ^2=1.5	2	.475	na
≤$29,999		8	16		2	9				
$30,000–$69,999		32	64		13	59				
≥$70,000		10	20		7	32				
Education	52			23			χ^2=1.6	2	.450	na
High school graduate or GED		7	14		1	4				
Some college or technical school		24	46		13	57				
Associate degree or higher		21	40		9	39				
Disabled	52	28	54	23	8	35	χ^2=2.3	1	.101	na
Race	51			23			χ^2=3.2	3	.363	na
White		46	90		21	91				
African American		0	0		1	4				
Native American		3	6		1	4				
Asian American		2	4		0	0				
Hispanic ethnicity	52	5	10	22	0	0	χ^2=2.3	1	.161	na
Taking psychiatric medications	49	33	67	20	15	75	χ^2=.39	1	.373	na
Typical hours of sleep at night	51			23			χ^2=5.8	3	.120	na
≤6		41	80		14	61				
7		7	14		7	30				
8		1	2		2	9				
≥9		2	4		0	0				
Age (M±SD)	37	40.5±12.4		20	47.1±10.9		t=3.9	1,55	.052	na
Months had service dog (M±SD)	na	na		22	26.9±13.6		na	na	na	na
Months on wait list for dog (M±SD)	52	16.3±12.0		na	na		na	na	na	na
VR-12 PCS (M±SD score)[b]	50	41.5±6.1		23	40.7±7.8		t=.26	1,71	.615	−.37
VR-12 MCS (M±SD score)[b]	50	35.8±8.0		23	42.6±10.1		t=9.6	1,71	.003	.76
BASIS subscale (M±SD score)[c]										
Depression/functioning	51	2.6±.7		23	1.6±1.0		t=22.8	1,72	.001	−.85
Interpersonal relationships	49	2.3±.8		23	1.8±1.0		t=5.4	1,70	.023	−.54
Emotional lability	51	2.2±1.0		23	1.7±1.2		t=3.1	1,72	.082	−.62
Psychosis	51	1.3±1.0		23	.8±1.0		t=3.5	1,72	.065	−.11
Substance abuse	50	.5±.7		23	.2±.4		t=3.1	1,71	.082	−.36
PTSD Checklist (M±SD score)[d]	51	66.2±13.1		22	51.8±18.2		t=14.5	1,71	.001	−.98
DRRI-2 combat exposure scale (M±SD score)[e]	37	41.7±16.3		14	46.4±16.8		t=.83	1,49	.368	.28
Activity level (M±SD score)[f]	51	2.2±.4		23	2.4±.4		t=2.8	1,72	.098	.64
General happiness (M±SD score)[g]	52	2.3±.7		23	3.0±.6		t=18.2	1,73	.001	.87
Quality of life (M±SD score)[h]	50	4.3±1.7		23	6.6±2.2		t=23.5	1,71	.001	1.95

[a] Proportions were compared by using Pearson chi-square tests. Total N indicates the number of people who responded to the question.

[b] Veterans RAND 12-Item Health Survey (VR–12) Physical Component Summary (PCS) and Mental Component Summary (MCS). Possible scores range from 1 to 100, with higher scores indicating better health. The VR-12 has a normed mean of 50 and a normed SD of 10. MCS scores ranged from 21.1 to 64.2, and PCS scores ranged from 27.1 to 59.0.

[c] The BASIS–24 subscales are scored on scales from 0 to 4, with higher scores indicating worse functioning or health. Subscale ranges for study participants were as follows: depression, 0 to 3.9; international relationships, 0 to 3.7; emotional lability, 0 to 4; psychosis, 0 to 3.5; and substance abuse, 0 to 2.2. We did not include two items assessing suicidal ideation or intent to harm others and were unable to produce the total BASIS score.

[d] PTSD Checklist–Civilian. Responses are Likert scales with responses ranging from 1, "not at all," to 5, "extremely." Possible scores range from 17 to 85, with higher scores indicating more PTSD symptoms and a score of 50 considered to be positive for PTSD in military populations. Study participant scores ranged from 19 to 85.

[e] Deployment Risk and Resilience Inventory–2 (DRRI–2). Responses are Likert scales ranging from 1, "never" to 6, "daily or almost daily." Possible scores range from 17 to 102, with higher scores indicating greater exposure to combat. Missing values are common on this measure due to the sensitive nature of the items. Scores for study participants ranged from 17 to 80.

[f] Activity level represents a mean activity level across 25 possible activities. Responses for the past four weeks could range from 1 (not at all) to 5 (at least every day), with higher scores indicating higher levels of activity. Participant scores ranged from 1.48 to 3.24.

[g] General happiness responses could range from 1 (not at all) to 4 (very). Participant scores ranged from 1 to 4.

[h] Quality of life was measured on a scale from 1 (worst quality of life) to 10 (best quality of life), with higher scores indicating higher quality of life. Participant scores ranged from 1 to 10.

measures: mental component summary of the VR-12, BASIS depression/functioning and interpersonal relationships subscales, PTSD Checklist, general happiness, and quality of life. Differences on the BASIS substance abuse and emotional lability subscales neared statistical significance.

Veterans also rated the importance of specific tasks that service dogs performed, or for those waiting for dogs, could perform. For veterans with dogs, these ratings referred to the importance of the services currently provided by their dogs; for veterans on wait lists, ratings referred to needs and hopes that a service dog could help address in the future. The most commonly endorsed needs for both groups were alerting the veteran if a stranger is in the house; waking the veteran from a nightmare; preventing panic; putting space between the veteran and strangers; alerting the veteran that someone is approaching; and licking or nudging the veteran to help him or her "stay in the present" by remaining focused on the immediate surroundings when faced with vivid memories or flashbacks. Veterans with service dogs reported that the most important services performed by the dogs were licking or nudging to help the veterans "stay present" when faced with vivid memories or flashbacks, preventing panic, and putting space between them and strangers.

Finally, we computed repeated-measures ANOVAs examining differences from baseline to follow-up for participants who received a service dog as part of the study (N=22). We found statistically significant improvements on the VR-12 mental component summary (F=8.9, df=1 and 19, p=.008; Cohen's d=.76), BASIS depression/functioning subscale (F=7.5, df=1 and 19, p=.013; Cohen's d=−.84), BASIS emotional lability subscale (F=11.8, df=1 and 19, p=.003; Cohen's d=−.62), the PTSD Checklist (F=20.7, df=1 and 19, p=.001; Cohen's d=−.98), activity level (F=10.5, df=1 and 19, p=.004; Cohen's d=.64), happiness score (F=8.1, df=1 and 19, p=.01; Cohen's d=.87) and quality of life score (F=45.3, df=1 and 18, p=.001; Cohen's d=1.95). We found moderate effect sizes for the BASIS substance abuse (F=4.2, df=1 and 19, p=.055; Cohen's d=−.36) and the interpersonal relationships (F=3.7, df=1 and 19, p=.071; Cohen's d=−.54) subscales. [Details of these analyses are available in an online supplement to this report. The supplement also provides descriptive statistics for outcome measures among participants who had service dogs for less than one year or for one year or longer.]

DISCUSSION

To our knowledge, this is the first systematic study of the use of service dogs for adults with psychiatric problems. Our findings provide preliminary evidence that service dogs can be feasible supports for veterans with PTSD and suggest that further research should assess the ability of service dogs to improve veterans' mental health, PTSD symptoms, substance abuse, interpersonal relationships, happiness, activity levels, and quality of life. Results also suggest possible mechanisms by which behavioral tasks performed by the

dogs may improve PTSD symptoms. These tasks include preventing panic, waking veterans from nightmares, alerting veterans when strangers are in the house, putting space between veterans and strangers, alerting veterans that someone is approaching, and licking or nudging veterans to help them "stay in the present" when they are experiencing distressing memories or flashbacks. These tasks were reported to be important to participants and are clearly linked to PTSD's disabling symptoms. A rigorous clinical trial assessing these mechanisms could provide findings that suggest the means by which service dogs affect mental health and quality of life.

This feasibility study was not intended to evaluate the effectiveness of service dogs for PTSD treatment; a randomized controlled trial with long-term follow-up is needed to address that question. Limitations of this study included unverified PTSD diagnoses, recruitment from service dog wait lists, lack of randomization, small sample size, and lack of information about sample representativeness. Because recruitment was based on a desire to have a service dog, it is unclear if service dogs are broadly acceptable. For example, veterans who wish to avoid creating high visibility for their disability status may be deterred from using a service dog. This selected sample also limited the ability to describe veterans who would benefit most from service dogs. A constrained follow-up period prevented examination of long-term effects, and we were unable to address whether service dogs should be considered an adjunctive modality (such as yoga) or a primary treatment. Most participants took psychiatric medications, suggesting dogs served primarily as an adjunctive modality.

The study was not designed to compare service dogs with other active treatments for PTSD or to companion dogs. Future research should compare the acceptability, effectiveness, and cost of using specially trained dogs for treatment of PTSD with those of other PTSD interventions. Assessments are also needed regarding potential trade-offs between receiving help from a service dog and enhancing veterans' sense of self-mastery. Moreover, the effects of attention from others, generated by service dogs, may increase social interaction in both wanted and unwanted ways—this too deserves study. Other factors may also confound results. For example, veterans with more symptoms and less stable lives may remain on waits lists for dogs longer than more stable veterans, and veterans who are on a wait list for a dog may alter their responses at baseline in order to improve their chances of receiving a dog. In sum, the limitations described above make it impossible to draw conclusions from our results regarding the effectiveness of service dogs for veterans with PTSD. Rather, these results suggest that further research is feasible and warranted.

CONCLUSIONS

This observational study provided evidence that further research to assess the effects of service dogs trained to help

veterans with PTSD is feasible and warranted. It also documented specific tasks provided by dogs that veterans find helpful. If future clinical trials show similar findings, service dogs could provide an effective and acceptable aid to treating PTSD among veterans, and one that veterans view as potentially less stigmatizing compared with conventional treatment. For this reason, rigorous randomized clinical trials are warranted.

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