

RESEARCH

Exploring the role of service dogs for Canadian military Veterans experiencing suicidality

Alexandria R. Pavelich^{1,2*} , Colleen A. Dell²  and Paul De Groot³

Abstract

Despite ample anecdotal evidence, there are limited meaningful studies speaking to the important role of the human-animal bond (HAB) in reducing suicidality. However, research is increasingly showing the viability of service dogs (SDs) as a complementary approach for military Veterans suffering from post-traumatic stress disorder (PTSD) and substance use harms – two of the strongest indicators of suicidality across any population. An original, exploratory study completed in 2020 focused on how SDs supported Canadian Veterans living with PTSD and substance use concerns. From this work, a secondary analysis was then undertaken: 28 transcripts were examined through thematic analysis to explore the experiences of the Veterans who were identified as being at high risk for suicide to better understand how SDs may assist with their suicidality. Our methodological approach for the secondary analysis employed affective coding to discover how the social support system enabled by the SDs reduced experiences of loneliness and hopelessness, as well as symptoms of PTSD, depression, and substance use concerns that are commonly associated with suicidality. The SDs were reported by the Veterans as being a catalyst in reducing self-harm and suicidality, as the HAB provided a unique and necessary form of social support for Veterans that was distinct from what other human-human interactions could provide. While acknowledgement of how context specificity and the lived experience of each individual remains crucial for making sense of suicidality, the significant finding from this research has been the identification of the critical impact that SDs have in the lives of Veterans when it comes to preventing suicide. The SD has been explained as a bridge to improve Veterans' overall quality of life and reduce markers commonly recognized as precursors to suicide – a finding that may be critical in helping reduce future suicide risk among military Veterans, and warrants further investigation.

Keywords: human-animal bond, service dogs, suicidality, animal-assisted intervention, suicide prevention, mental health, Veterans, PTSD, working dogs, assistance dogs

Introduction

SUICIDALITY AMONG MILITARY VETERANS

The World Health Organization (2020) indicates approximately 800,000 people die by suicide annually. A population at high risk for suicide is military Veterans (Simkus and VanTil, 2018), with the United States Department of Veteran Affairs (2019) estimating an average of 20 Veterans die by suicide daily. This situation is similar in the Canadian context: the Canadian Armed Forces have identified suicide prevention as a top priority for Canadian Veterans given that Canadian males are identified as having 1.4 times higher risk of death by suicide compared to their civilian

counterparts, with female Veterans also having a 1.9 higher risk than the general population (Simkus *et al.*, 2019). While these statistics are alarming, the numbers are also underreported as many service members do not seek help for their mental distress due to the stigma of potentially receiving a psychiatric diagnosis or appearing weak and/or affected from the potential occupational stressors they are exposed to (Leenaars, 2013).

Suicidality is an all-encompassing concept that includes not only suicidal ideation (i.e., thinking about suicide), but also active suicide planning, self-harm gestures with the intent to kill oneself, or attempts made on one's life (Pavelich, 2021; American

Affiliations: ¹Department of Interdisciplinary Studies, University of Saskatchewan, Saskatoon, Saskatchewan, S7N 5A5, Canada; ²Department of Sociology, University of Saskatchewan, Saskatoon, Saskatchewan, S7N 5A5, Canada; ³Patient Partner, University of Saskatchewan, Saskatoon, Saskatchewan, S7N 5A5, Canada

*Corresponding Author: Alexandria R. Pavelich. Email: Alexandria.pavelich@usask.ca; Alexandria.pav@gmail.com

Submitted: 23 February 2024. Accepted: 11 April 2024. Published: 06 May 2024

© The Authors 2024. Open Access. This article is licensed under a Creative Commons Attribution-NonCommercial 4.0 International License, which permits use, sharing, adaptation, distribution and reproduction in any medium or format, as long as the use is non-commercial and you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons licence, and indicate if changes were made. The images or other third party material in this article are included in the article's Creative Commons licence, unless indicated otherwise in a credit line to the material. If material is not included in the article's Creative Commons licence and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this licence, visit <https://creativecommons.org/licenses/by-nc/4.0/>. The Creative Commons Public Domain Dedication waiver (<http://creativecommons.org/publicdomain/zero/1.0/>) applies to the data made available in this article, unless otherwise stated in a credit line to the data.

Psychological Association, 2023). Suicide risk refers to a range of factors outside the individual that can increase the possibility that a person may attempt suicide; these factors can occur at the individual, relational, community, or macro-societal levels (Rudd *et al.*, 2006; APA, 2013). For example, an existing diagnosis of post-traumatic stress disorder (PTSD) paired with substance use concerns puts an individual at a heightened risk of experiencing suicidality, as these are two of the strongest indicators for increased suicide risk across any population (Beck *et al.*, 1993; Wilcox *et al.*, 2004; Zaheer *et al.*, 2008; Maguen *et al.*, 2015). In the Veteran context, risk can be further increased by easy access to firearms, difficult reintegration into civilian life, increased psychosocial stressors or relationship difficulties at home, loss of collegial social support that was available in the active service context, and occupational stress injuries resulting from the demanding and life-threatening nature of in-service activities (Thompson and Veterans Affairs Canada, 2010; Rodgers and Suicide Prevention Resource Center, 2011).

Alternative to risk, there are protective factors that can decrease suicidality, but far fewer studies have been conducted with this focus. For Veterans, existing research suggests that shorter or less frequent deployment and easy access to mental health treatment can be effective, but these are not always possible, and high levels of stigma can exist when attempting to access assistance through a facility (Centre for Suicide Prevention, 2020). For Veterans, the presence of strong social supports (e.g., religious affiliation, responsibility of/for one's family, ongoing unit support, and work culture cohesion) is gaining traction as viable treatment and prevention routes (Thompson and Veterans Affairs Canada, 2010), but further empirical research is needed in this area.

THE HUMAN-ANIMAL BOND FOR IMPROVED WELLBEING

Increasing data shows the viability of Veterans working alongside service dogs (SDs) in the treatment of PTSD and substance use harm (Nock *et al.*, 2013; Gillett and Weldrick, 2015; Dell *et al.*, 2017; Husband *et al.*, 2020; Williamson *et al.*, 2021; Dell *et al.*, 2022). SDs (sometimes referred to as psychiatric service dogs or assistance dogs) are domesticated canines that live in a home as a companion animal but are highly trained with a variety of skills; they can complete tasks meant to help individuals based on their specific needs to assist with daily living challenges – whether those be physical, mental, or emotional (Serpell *et al.*, 2010).

The accompaniment of SDs to military Veterans is a relatively new area of academic inquiry, alongside the literature showing how the human animal bond (HAB) can positively affect the management of symptoms associated with mental distress (Rossetti and King, 2010; Berget and Ihlebaek, 2011; McConnell *et al.*, 2011; Zilcha-Mano *et al.*, 2011; Peacock *et al.*, 2012; Nepps *et al.*, 2014; LaFollette *et al.*, 2019). Our conceptualization of the HAB is taken from the American Veterinary Medical Association's (2023) definition, which describes it as the “mutually beneficial and dynamic relationship between people and animals” (para. 2). Veterans working alongside SDs, who are specially trained to help manage PTSD through certain types of assistive behaviors (e.g., waking someone from a night terror, acting as a barrier between doors, objects, or other people while in public, helping self-regulate while experiencing heightened emotions), report that this complementary support results in increased calmness, more positive affect, and reduced feelings of anxiety and nervous system hyperarousal or states of hypervigilance, which can worsen suicidality (Yount *et al.*, 2012; Yarborough *et al.*, 2017; O'Haire and Rodriguez, 2018; van Houtert *et al.*, 2018; Vincent *et al.*, 2018; Whitworth *et al.*, 2019; Rodriguez *et al.*, 2020; van Houtert *et al.*, 2022; Williamson *et al.*, 2022).

The introduction of human-animal interactions to increase socialization and lessen symptoms associated with PTSD has shown benefits for Veterans and may correlate with a reduction in suicidality (Kruger and Serpell, 2006; Taylor *et al.*, 2013). Our

team's on-going SD research alongside Veterans also speaks to how SDs can act as a facilitator of social interaction and increase experiences of social integration which may reduce suicide risk (Dell *et al.*, 2022). Junger's (2016) ethnographic work with Veterans' explores the importance of social integration: he explains that unidimensional models for suicide focusing predominantly upon biological understandings – where untreated mental disorder is often explained as a leading cause – do not account for the sociocultural factors leading to Veteran suicidality post-active service, such as the often-reported feelings of alienation, isolation, and loneliness.

A reduction in PTSD symptoms, improvements to depression, and an increase in the overall quality of life are necessary elements in suicide prevention (Thompson and Veterans Affairs Canada, 2010; White *et al.*, 2016). Crucial in Taylor *et al.*'s (2013) study, SDs provide companionship to their Veteran handlers and become surrogate attachment figures within their family unit. A secure attachment bond, which is similar to those that can form between humans, is arguably one of the most important factors in reducing suicidality (Beck and Katcher, 1996; Kleiman and Liu, 2013; Özer *et al.*, 2015; White *et al.*, 2016; Hatcher *et al.*, 2017), especially as it promotes a sense of “mattering” to reduce hopelessness and promote help-seeking behavior (Elliott *et al.*, 2005; Flett, 2018). Despite this growing body of work, there is still a dearth of meaningful studies speaking to the important role that the HAB may play in reducing overall suicidality.

PURPOSE

Existing studies speak to the importance of the unique form of social support that can be provided through the HAB, as it is distinct from the social support provided through human-human interactions. Love (2021) conducted a study where it was found that companion animals provided comfort, distraction, and a reason to live, thus acting as a protective factor against suicidality. Further, Young *et al.* (2020) found that relationships with companion animals may be protective against suicide for older adults. Therefore, it is logical that the bond and interactions that occur between a Veteran and their SD – as opposed to companion animals – may also serve a purpose in mediating overall suicidality.

To date, the literature on the HAB and those experiencing suicidality has not overlapped for direct investigation. Therefore, the purpose of this secondary analysis was to better understand the complex social impact SDs have for military Veterans who are living with distressing psychological symptoms that may increase suicidality. The questions that this exploratory research considers are as follows:

- Does the relationship between the military Veterans and their SD, and the unique support canines offer, reduce feelings and/or factors that increase the risk of suicidality?
- How can the perspectives of the Veterans help us better understand the human-animal bond as it may assist in the reduction or prevention of suicidality?

Methods

ETHICS

The data used for this secondary analysis was obtained from an original research study conducted Dr. Colleen Dell and Nathaniel Osgoode through the One Health & Wellness Office at the University of Saskatchewan entitled, “The Impact of Service Dogs in the Lives of Veterans Who Problematically Use Substances.” This study was funded by Health Canada through the Substance Use and Addictions (SUAP) program. Ethics was approved by the Human and Animal Research Ethics Boards at the University of Saskatchewan [BEH 17-371; AUP 20170114], and ethics granted additional approval to review the transcripts for secondary analysis [17-371]. Animal Research Ethics Board approval was not required.

ORIGINAL STUDY

The focus of the original, exploratory study was to assess the role that SDs have in supporting Canadian Veterans living with PTSD and on-going substance use concerns led by Dell. However, throughout this study, Dell and the other project interviewer were struck by how often the experiences of suicidality were brought up in the interviews without prompt, thus identifying it as an area for further examination. As such, Pavelich implemented a secondary analysis to re-examine the data by focusing specifically on how the SDs may impact the Veterans' suicidality.

In the original, exploratory study, purposeful sampling was applied to examine the impact of SDs on Veterans' substance use activities through a community-based approach in partnership with a national service dog training program, AUDEAMUS Inc. In 2016, our research team began a long-standing research partnership with AUDEAMUS which is a not-for-profit organization ran by injured veterans dedicated to providing SDs and support to Veterans and First Responders who have been injured while in the line of duty (AUDEAMUS, 2024). This initial partnership was led by Dell with the long-term goal of exploring how SDs could support Veterans and First Responders with their physical, social, and spiritual wellbeing; this research partnership continues with this study.

PARTICIPANTS

To recruit participants, a representative of AUDEAMUS reviewed its waitlist of Veterans to be matched with a SD and were diagnosed with PTSD and self-identified as having substance use challenge. Five veterans met the inclusion criteria, all agreed to participate in the study, but one dropped out mid-way for personal reasons. Specifics about the study were shared with the Veterans in-person by the lead researchers, and consent was obtained. All participants understood that they would receive the same services from AUDEAMUS regardless of whether they participated in the study or not.

The study was based on a sample of five male Canadian Veterans. The mean age of this group was 43 years (range: 36–51 years). Two participants were identified as Caucasian, two as *Métis*, and one as First Nations ($n = 5$). Most ($n = 4$) were married with children, and one was in a romantic relationship until 3 months into the data collection period. Each Veteran had been diagnosed with PTSD by a clinical provider, and each was self-identified as using substances in a harmful way. Three Veterans were matched with dogs to train at the start of the study, and two had companion dogs they had prior to their involvement with AUDEAMUS. These two companion dogs were young and purchased just before the study began. Of note, only transcripts from four Veterans were used for the secondary analysis as one participant did not complete all interviews; because the data from this original study were amalgamated for the secondary analysis, this made it impossible to identify which demographics listed above correlate to which participant.

An exploratory, patient-oriented, time-series research design was used in the original study to allow for Veteran engagement at all levels of the project. Data was collected over 18 months through semi-structured interviews beginning in May 2018, with interviews happening with Veterans at intervals of: baseline, months 1, 3, 6, 9, 12, and 18. A total of 28 interviews were conducted in-person, led by Dell and her other project lead, Darlene Chalmers, except for one session completed by telephone due to weather-imposed travel restrictions. Both Dell and Chalmers have an extensive background in conducting qualitative interviews in the substance use field and research in the area of human-animal interactions.

Interviews were transcribed using external services. Upon receipt of the interview transcripts, totaling approximately 35 h, the primary author began coding the analysis in NVivo 12 for the secondary analysis. In line with a patient-oriented approach, the preliminary findings from the secondary analysis were shared with the Veteran

participants by Pavelich and Dell through a results presentation for verification and discussion. This afforded the Veterans an opportunity to provide feedback, insights, and verification, where they confirmed that the selected quotations and overall analyses resonated with their experiences. This results presentation occurred after the secondary thematic analysis was conducted by Pavelich, and attended by Dell and de Groot, in Summer 2021 – not during the completion of the original study in 2020. Due to the ongoing COVID-19 pandemic at the time of analysis, the discussion was hosted via an online meeting platform (Zoom) over 2 h, with a social worker in attendance for additional support as needed.

Lastly, none of the participants were recruited specifically on indicators of suicidality, but we proceeded with the secondary analysis with the understanding that all the participants were at high risk for suicide based on their life experiences. However, no direct questions from the study focused on suicidality; rather, the topic that was openly raised and discussed by the Veterans without prompts inquiring about suicidality specifically from either of the researchers during the interviews.

DATA ANALYSIS

For the secondary analysis, Pavelich drew upon a collection of interview transcripts from the original study ($n = 28$) where pre-coding activities involved initially reading the transcripts for open-coding and highlighting significant passages deemed as “codable moments” worthy of attention as they relate to suicidality. This preparatory method was guided by holistic coding, which aims to identify broad themes within data by absorbing them as a whole rather than analyzing the data line by line (Saldana, 2015). Pavelich first pre-coded for references to suicidality, along with any well-established indicators linked to increased risk; this was done to ensure that the sample population qualified as “high risk” for suicide. However, as mentioned, suicidality was not being a primary focus of the original study, but it was actively present throughout the transcripts.

The indicators and warning signs of suicidality explicitly outlined by Veteran Affairs Canada, as adapted from the American Psychiatric Association (2013) to suit military personnel, were used to guide the coding process. Indicators with existing Veteran suicide literature were cross-referenced to finalize the “Suicidality” markers for the coding framework which were: suicidal ideation, suicidal behavior, the presence of depression or PTSD, feelings of hopelessness, verbalized feelings of social isolation, substance use harms or other self-harm activities, and increased stress.

THEMATIC CODING

Within the thematic coding, the primary author focused on affective coding methods to investigate the subjective qualities of the human experience (Saldana, 2015). Affective coding was conducted by identifying emotions experienced by the Veterans as they related to feelings of suicidality. For example, regarding “*suicidal ideation*” (the “code” or “node”), this would refer to thinking about or planning suicide; therefore, the coding process would identify any verbalization of suicidality, whether past or present. Such examples in the transcript were: “I have thought about ending my life”, or “I came very close to killing myself a couple of times... I should have been dead [after excessive drinking]”. Another code, depression, would identify any verbalization of a depressed mood, extreme sadness, or immense sorrow or grief; for example: “The inside of my head is nasty and horrible, it is just down the drain every day.”

Given the complex nature of the interactions between Veterans and SD, simultaneous coding was also employed by the primary author during this process. This coding method recognizes that social interactions do not occur in isolated units; there can be multiple meanings elicited, where both descriptive and inferentially meaningful interpretations of the data can exist with both manifest

and latent meaning within a transcript (Saldana, 2015). For example, when coding for social isolation: "I am home alone all day with my thoughts which is actually a really [explicit] dangerous place", speaking to the perceived danger of isolation, alongside the potential consequences of, perhaps, wanting to participate in self-harm.

The 1st cycle of coding identified passages relevant to the presence of experiences pertaining to suicidality (as provided in the examples provided previously). The 2nd cycle of coding, by way of pattern coding, allowed for analysis via expansion and discussion. Pattern coding is appropriate for condensing large amounts of data while examining social networks and patterns of social relations (Saldana, 2015). This enables the researcher to move beyond simply identifying categories (as done with affective coding) and develop an analytic story that can move into a broader theoretical direction (as done with simultaneous coding) to explicate how the HAB and interactions with the SD correlated to experiences of suicidality.

This 2nd cycle approach also revealed how each participant spoke to the unique aspects of social support provided through the HAB, where each Veteran directly attributed the SD with improving their well-being in multiple and complex ways that were distinct from the humans in their life. While the aim of the 2nd cycle coding was not to produce a specific theme, it did enable a better understanding of the unique role SDs and the HAB have as a synergistic mechanism to improve overall well-being. This complements existing understandings in the suicide prevention literature that focus on the importance of social support.

Results

The findings of the analysis revealed that the interactions and bond that existed between the Veteran and their SD had an important impact on a reduction of many indicators that can increase suicidality, such as depression, on-going PTSD symptoms, social isolation, and substance use. Further, the Veterans reported that the SDs were a catalyst in reducing suicidality, indicating that the relationship with their SD acted as the initial "bridge" and connection to improve their overall quality of life, as well as an anchor to provide feelings of hope and improved optimism.

SERVICE DOGS DIRECTLY IMPACTING SUICIDALITY

Our first research question queried whether the relationship between the military Veterans and their SD reduces feelings and/or factors commonly associated with an increased risk of suicidality. The Veterans indicated that the bond with their SD was unique compared to the relationship they had with other existing supports in their life. Throughout the transcripts, the Veterans reported positive benefits from SD in the context of reducing their experiences with suicidality. While the relationship with the SDs provided feelings of hope and improved well-being, the Veterans also identified the dogs as the catalyst in reducing self-harm and suicidality. In particular, the Veterans repeatedly indicated that the social support received from the SDs, and their bond with their dogs, brought significance, meaning, purpose, and belonging to their lives. The Veterans' emphasized that their SDs provide a form of non-stigmatizing and non-judgmental, unconditional love and support that they did not feel was always present with their human support systems. This speaks to the distinct difference between human-human and human-animal interactions.

More specifically, the Veterans reported relief in markers related to depression, social isolation, feelings of hopelessness, and symptoms indicative of their diagnosed PTSD. Veteran 3, when asked to speak about how the dog directly supported him, indicated that: "I need my dog to get out of the dark; I knew enough in my head that I couldn't do it on my own; I needed to have her guide me out – she is the only guide I have." Additionally, Veteran 1 said that, with respect to the unique social support received by his dog, "We

[Veterans] get needs met that we can't get from humans.... I think that is why we [Veterans and dogs] get along so good."

The use of substances frequently precedes a suicide attempt due to an increase in impulsivity and lack of coherency that can occur while under the influence (Butler and Taylor, 2015). Williamson *et al.* (2021) from our team has published separate findings from this study's same dataset, specifically on the reduction in substance use harms for Veterans while working with SDs. This facet is important, given how concerns with substance use is a common precursor to suicidality. With Veteran 4 directly reporting that, "I should have been dead – I drank the 26 of rye and I got in my apartment and kept going, and woke up the next afternoon in my own feces and a shotgun in my lap."

All Veterans reported experiences of suicidality, with three of the four Veterans indicating that, on more than one occasion, their SD was the catalyst in preventing self-harm and suicidal acts. The Veterans are quoted as follows: "It doesn't matter how bad it gets, the dog is still right beside you," (Veteran 3), and Veteran 4 reported that, "she saved my life," as well as:

You are never really depressed, and if you go to sleep and want to kill yourself... you get up in the morning, it is sunny outside, the first thing she wants to do is play and go for a walk. Your day is always going to be better, even if you wanted to kill yourself when you go to bed.

Veteran 4 explained how previously he would experience severe depression with intermittent suicidality for months. However, he experienced profound changes in his attitude toward suicide after working with his SD for several months:

When I had the breakdown, not once did the fact of suicide come into my head. Actually, that is a lie – it did come into my head. It really did. And I was thinking about getting a hotel and just doing myself in at the hotel... When we were driving there, and then I said, well, I can't kill myself because [the Dog] is in the room with me being dead all night long—that would kill [the Dog]. And then, where is [Dog] going to go if I die? So, in a way, she is ultimately the one who kept me from doing it. (Veteran 4)

The Veterans were prescribed numerous psychiatric medications to aid in the management and treatment of their depression, anxiety, and PTSD symptoms. However, the Veterans reported a large reduction in their psychiatric medication use, which they directly attributed to working with their SD. One Veteran indicated that his own suicidality had increased shortly after being prescribed medication for the management of PTSD. He later discovered that increased suicidality was a side effect of the medication; this was the same Veteran who explained that the SD was the catalyst in him not following through on a suicide attempt. The Veteran suggested that if he had been prescribed this medication but did not have his SD, he believed he would have taken his own life.

These findings – where the Veterans explain that the SD was the reason they were able to stop a planned suicide attempt – are critical; it warrants further direct investigation, especially in respect to how the HAB relates to suicide prevention as a unique and novel support in the lives of Veterans' living with PTSD and substance use.

SERVICE DOGS AS A UNIQUE SOCIAL SUPPORT

The second research question queried how the perspectives of the Veterans, contextualized in the relationship they have with their SD, could allow researchers to better understand the human-animal bond as it relates to the reduction or prevention of suicidality and overall improvements to well-being. To explore this, instances of hope, perseverance, resilience, or indicators of the presence of the HAB (as it provided a form of social support, suggesting that the relationship with a SD improved well-being) were additionally coded for. The latter was the chosen focus for additional coding, as the suicide literature in the Veteran context suggests that social support can be a catalyst in reducing overall suicide risk.

The Veterans cited how the SDs reduced feelings of hopelessness and brought purpose, significance, and meaning to their lives. Veteran 1 relayed how, “[this] is the first time I have had hope that something might actually work,” with Veteran 4 saying, “I can see a future now,” and Veteran 3 reporting, “I think I have more optimism now than I did before.” While the original interview questions had already asked if the SDs brought any attitudinal changes to their lives – which resulted in these responses – Pavelich also asked, out of an abundance of caution given the nature of secondary analysis, the Veterans to confirm if their perceived positive life changes were attributed directly to their SD while the results presentation was occurring; to this, each Veteran said yes.

The Veterans highlighted in this study that they had tried multiple other therapeutic routes to no avail, and the acquisition of an SD was one of their last options – one that they reported proved to be the most effective in their personal recovery and “healing.” To elaborate on how this relationship is important to improved well-being, Veteran 4 indicated, “What guys have to understand is they [SDs] are going to help you with your recovery, they are going to give you a purpose, they are going to give you everything that you could possibly want out of anything. My life is coming back now.”

Furthermore, Veteran 2 explained how he never used to laugh and rarely experienced joy since no longer actively serving, but he now found a new sense of lightheartedness because of having a SD:

I didn't laugh before [getting this dog] – there really wasn't any humor. I also find where the end of the tunnel was always dark – it seems a hell of a lot lighter having him there like, you know, coming out of the shadows, and you are going to make it there, and hell – you don't need to have that flashlight anymore because there is enough light to help get you there, and he [my dog] has brought that out.

ADDITIONAL CONSIDERATIONS FROM THE VETERANS

In line with a patient-oriented research approach, our team sought clarification and feedback of the results detailed above with the Veteran participants themselves. Seeking clarification on analytic findings is a form of member-checking and data triangulation in patient-oriented or community-based health research (Chudyk *et al.*, 2024). After the secondary analysis had been completed by Pavelich, they and Dell and de Groot were able to meet with the participants to discuss the findings and seek feedback at length via Zoom meeting.

During a results presentation for verification and discussion with the original study participants, the Veterans indicated alignment of the findings and support for disseminating the results. The Veterans elaborated on how it was only because of their SD and what this relationship brought to their life that they were able to begin “healing” to “get back pieces lost” during time in service. Both during this discussion, and repeatedly within the data, the Veterans indicated that the dog was a secure base or “anchor” in their lives. The dogs provided stable, consistent, and strong social support in what was considered an otherwise chaotic life, where many difficult social interactions or interpersonal relationship conflicts occurred. They explained the dog as the starting point for their new life post-service: by having the SD, the Veterans were able to increase their self confidence and feel safe enough to attempt to access additional therapeutic routes (such as attending group therapies or counselling sessions, and feeling confident enough to leave the house due to the SD support provided). They were also able to improve their existing social relationships: the SD helped with their ability to be mindful and present, thus decreasing tensions in their daily life, alongside a reduction of their symptoms associated with PTSD, substance use, and depression.

One Veteran indicated that he understood his SD to be an important “bridge” and a core connection that, currently, affected all other aspects of his life. Not only does this speak to the important

and specialized role animals may play in health promotion or resilience-building activities, but it also illustrates how this synergistic relationship may improve many aspects of one's life. This is critical given the myriad of risk factors that contribute to one's experiences of suicidality. In the data, the Veterans explained that the specific support, non-judgment, and confidence they received from their SD transcended what they could possibly receive through a human-human interaction or other, existing supports.

Also relevant to the unique support provided by the SDs, the Veterans noted how they valued the additional support received by being connected to the service dog organization, AUDEAMUS. The AUDEAMUS organization also acts as a social support network where Veterans can access on-going SD training opportunities among peers, as well as communal socialization among others working with SDs. Activities of the organization include time spent together doing hobbies, volunteering in the community as a group, practicing public access with their SDs at local businesses, and other more informal social gatherings. A level of solidarity and comradery was identified here, as each of the Veterans navigated their ongoing SD training in a group setting, allowing them an outlet to rely on or receive support from others experiencing a similar struggle. The connection to AUDEAMUS provided a sense of community and a new level of belonging that they felt they had lost when they exited military service.

Discussion

The objective of this study was to identify the potential significance of SDs for Veterans experiencing suicidality. Numerous, secondary benefits of working alongside an SD were brought forth by the Veterans directly outside the context of suicidality, such as noted improvements to social interactions, increased physical activity, reduced social isolation and substance use, increased hope and optimism, and a lessening of symptoms related to their experiences of PTSD, anxiety, and depression.

Drawing from the understanding that social support can positively impact experiences related to suicidality, this discussion focuses on two key findings pertaining to the potential significance of the HAB: the first is the need for, and importance of, unique social supports for Veterans experiencing suicidality, and the second is how an SD can directly impact suicidality for a Veteran by providing hope and improved well-being.

As outlined in the results, the Veterans detailed how significant they felt the relationship with their SD was to their overall well-being. Social support needs to remain a central focus in suicide prevention activities, as many suicide scholars indicate that feelings of loneliness, depression, and/or instances of social isolation are primary factors contributing to attempts at self-harm and overall suicidality (White *et al.*, 2016; Motillon-Toudic *et al.*, 2022; Blázquez-Fernández *et al.*, 2023). The importance of social support in the military context is also brought forth in Junger's (2016) ethnographic work, in which he explained that the loss of a stable social support unit (present in the active-duty context of service members) in transitioning back into highly individualistic civilian life had immensely negative mental health consequences for Veterans. In light of the COVID-19 pandemic, this has been especially crucial, and the Veterans emphasized the importance of being tied to and welcomed into a Veteran-affiliated SD organization that was possible solely due to their acquisition of an SD.

Further, the findings showed that the SD positively impacted the markers that would put Veterans at “high risk” for suicide based on the existing literature. Changes were noted regarding substance use activities, PTSD, depression, and anxiety, along with reduced loneliness, hopelessness, and social isolation. While there is a complex interplay of factors, it cannot be understated that the Veterans themselves repeatedly indicated that the positive changes in their lives were due to now having an SD in it. Findings specific to changes around PTSD and substance use have been

published by our team (Gibson *et al.*, 2021; Williamson *et al.*, 2021), as well as other positive improvements to their wellbeing (Dell *et al.*, 2022; Williamson *et al.*, 2022) and were mentioned previously, but this study's unique contribution to this larger body of work is the synthesis of these factors to illuminate the direct impact of SDs on suicidality.

The Veterans struggling with suicidality indicated that their SD was the reason they managed to find their way out of suicidal ideation and/or avoid attempts at self-harm. A broader element of this pertains to how many of the Veterans reported feeling hopeful since the introduction of the SD in their life: the dog provided a new level of optimism or joy for them, so a reduction in feelings of hopelessness were noted, with an increased mention of feeling personally significant: like they now had a purpose or they "mattered." This supports other studies in suicide prevention, where "mattering" – the human need to feel significant, important, or needed in the eyes of others – is recognized as a protective factor against suicidality (Elliott *et al.*, 2005; Flett, 2018). Due to the interdependence between a Veteran and their SD, Veterans often felt compelled to do things for their dog and experienced guilt if they did not take proper care of them, meaning that the SD was also a catalyst to motivate the Veterans into action and provide purpose – something that was previously difficult due to feeling overwhelmed by their depression or PTSD.

This level of importance and reliance – to perform and complete a task for the benefit of another – can reduce feelings of hopelessness and increase feelings of personal significance (Flett, 2018); it is in line with much of the suicide literature, where unremitting anxiety, tension, aggression, and withdrawal from social activities can worsen suicidality. Factors such as a sense of belonging, usefulness, and responsibility are known protective factors against suicidality and included in all models of "mattering" (Kleiman and Liu, 2013; Flett, 2018; Pavelich, 2021), and these were aspects that the Veterans reported as being directly provided by the SD. Further exploration of how "mattering" can exist through the HAB for Veterans should be explored, and our findings on "mattering" in the Veteran and SD context will be the core focus of our next publication.

Additionally, the ability to access adequate medical and therapeutic treatments is recognized as a protective factor for Veterans in suicide research (Veteran Affairs, 2019). Although the presence of an SD does not imply that the dogs themselves are *the* therapy, it can be argued that they can have immense therapeutic value. For example, Veterans were able to include their dogs as a support to feel confident in entering public spaces. The SDs also provided a safe anchor that gave the Veterans' an increased sense of safety needed to access additional treatment or resources for other areas of concern in their life that they may have previously avoided. During the results presentation for verification and context, the Veterans reinforced this by indicating that it was only after receiving their SD that they could consider returning to work, which restored – to some degree – an increased sense of purpose or mattering. This suggests that the SD was the bridge that enabled a sense of significance in other arenas of their lives.

Finally, it must be mentioned that SDs have the capacity to offer support on an on-going basis, regardless of time or location, which is something that many other service systems struggle to offer or accomplish for Veterans. Given the implications that the HAB may have for suicide intervention or prevention directly, the results of this study speak to the utmost importance of having readily available social support on a 24/7 basis for Veterans who experience suicidality. Considering the limitations of our current medical system, this is not always possible, which is why the attainment of an SD and unrestricted public access for the dog (such as during travel) becomes essential; SDs should be understood as a constant companion and material support or aid for a Veteran living with symptoms of distress that may increase their suicide risk.

STRENGTHS/LIMITATIONS

The primary limitation of this study was that it was a secondary analysis of existing data, where suicidality was not a primary consideration during the initial research design and data collection process. Given the participants lived experience of PTSD and substance use, we found the sample to be suitable for this secondary analysis given the likelihood of them experiencing suicidality based on these precursors. However, since suicidality was not a primary component intended for measurement, this study also mitigates the potential of social desirability coming from the participants when discussing their experiences around suicide, speaking further to the authenticity of how the SDs can positively impact suicidality.

The inclusion of intercoder reliability (ICR) is intended to improve the communicability, consistency, trustworthiness, and transparency of the coding frame and process, which is sometimes questioned within qualitative research activities (O'Connor and Joffe, 2020). However, it was not applied as our collective position on this secondary study is that ICR activities contradict the interpretive nature of this qualitative work. As the goal of this research is not to attain objectivity or provide generalizability due to its exploratory nature, the use of ICR to achieve the so-called reliability undermines the steps taken to illuminate the lived experience of the Veterans, as interpreted by the researcher. Qualitative researchers have proposed alternative criteria – all of which were employed – to ensure trustworthiness and validity: a fully transparent reporting of the analytic strategy and procedures; producing thorough and thick descriptions of the data, attention to and elaboration upon deviant cases; and asking participants to validate the legitimacy of the analytic interpretations (O'Connor and Joffe, 2020), thus ensuring accountability and rigor. Further, ongoing member checking by Dell of the secondary thematic findings did occur throughout the analytic process.

Our in-depth interviews allowed the study to remain in-line with a patient-oriented and critical theoretical approach where the perspective of the participants remained central to knowledge production. Additionally, presenting the findings to the Veterans to elicit feedback, suggestions, and additional data strengthened our analysis and transparency; it allowed for additional considerations that may have been missed had verification of the findings not been sought. Given that our sample was relatively small, which can be perceived as a limitation in some forms of research, we suggest greater exploration of this topic for additional Veteran and SD pairings. The sample limitations also mean that areas where we would have liked to know more about the impact of participant demographics – such as Indigeneity, given the interconnected worldview of Indigenous peoples (i.e., inherent relationship between animals, humans, and the environment) – was also not possible.

Of note, the HAB typically refers to a reciprocal relationship between a human and dog (AVMA, 2023). However, for this secondary analysis, only the human perspective of the bond and interaction was assessed, and there must be equal accountability for the dog welfare in this dynamic. As we were investigating the unidirectional impact of how an SD may support a Veteran living with suicidality, it is warranted that a study be conducted focusing specifically on the animal welfare perspective to assess the impact and stress that it may cause SDs, and speak further to the reciprocal nature of these interactions. Quite simply, if an SD is not healthy, it will not be able to optimally assist the Veterans they are working with. Furthermore, in a time where health systems are increasingly overburdened, SDs may play a greater role than originally intended and trained for. Therefore, the potential impact of this on the dogs' welfare must be considered.

Finally, it is important to recognize that the HAB, as it specifically relates to Veterans working alongside an SD, is still a relatively new field of study. Therefore, this exploratory, secondary analysis can serve only as a starting point for numerous other endeavors

exploring how SDs can impact any factor relevant to suicidality – whether that is the social, biological, or psychological dimension.

CONCLUSION

The research presented here explored the significance that SDs can have for Veterans experiencing suicidality living with PTSD and substance use concerns. The qualitative coding process and analysis illustrated important themes from the Veteran perspective, bringing forth many potential avenues for how the HAB may assist in suicide prevention activities. The results indicate that the HAB provides a unique form of social support where the SDs can reduce many associated risk factors that increase suicidality for Veterans, as well as be a catalyst in preventing suicidality.

Suicidality is a complex phenomenon. The HAB will have varying levels of impact depending on each individual and their life experiences. This research does not, and is not intended to, suggest that all military Veterans have had the same experiences or have suffered the same challenges. It also does not suggest that SDs are feasible for every individual who may be at risk of suicidality. The aim of our work was to simply highlight the important role dogs may play for some Veterans, especially regarding suicide prevention. There is much anecdotal evidence speaking to how animals save lives, thus suggesting the strong feasibility of the HAB continuing to play a role for those actively experiencing suicidality, which must be further explored empirically.

The findings bring forth many thought-provoking ideas about how Veterans may perceive SDs as a primary line of defense against suicidality or reducing overall risk, with results having relevance to the fields of social psychology, public health, medical sociology, and other human-animal interaction research. The findings also extend our understanding of how the presence of an SD is a complementary approach in supporting a Veterans' overall well-being, recovery from PTSD or substance use, and ability to be uniquely supported while living with suicidality. As the interactions between a Veteran and SD are highly dynamic, interdependent, and reciprocal, this work also challenges future researchers to recognize the importance of animal welfare in any HAB.

CONFLICT OF INTEREST

The authors declare no competing interest.

ETHICS STATEMENT

All relevant guidelines were followed.

ACKNOWLEDGMENTS

The author would like to acknowledge the incredible stories and feedback provided by the Veterans working alongside their service dogs, which made this research possible. As well, the support of the One Health & Wellness Office and PAWSitive Connections Research Lab for their ongoing support throughout this project and manuscript development, as well as Dr. Darlene Chalmers for her original data collection work. Thank you to our reviewers who also strengthened this work throughout the submission process.

AUTHOR CONTRIBUTIONS

ARP conceptualized and led analysis on the secondary study and drafted the manuscript. CAD offered guidance throughout the study and contributed to the manuscript. PDG reviewed the study findings, as well as the final manuscript.

FUNDING STATEMENT

Funding for the original study was provided by Health Canada through their Substance Use and Addictions (SUAP) program. The secondary analysis was funded by the Social Science and Humanities Research Council, Master's level Canada Graduate Scholarship.

DATA AVAILABILITY

This data is not publicly available and is currently stored on a private and secure Datastore server directly affiliated with the University of Saskatchewan, under control exclusively of Colleen Anne Dell.

References

- American Psychiatric Association (APA) (2013) *Diagnostic and Statistical Manual of Mental Disorders*, 5th edn. American Psychiatric Association, Arlington, VA.
- American Psychological Association (APA) (2023) Suicidality. APA Dictionary of Psychology. Available at: <https://dictionary.apa.org/> (accessed 20 March 2023).
- American Veterinary Medical Association (AVMA) (2023) Human-Animal Bond. Available at: <https://www.avma.org/one-health/human-animal-bond> (accessed 1 January 2024).
- AUDEAMUS (2024) About. Available at: <https://www.audeamus.ca/about> (accessed 1 February 2023).
- Beck, A. and Katcher, A. (1996) *Between Pets and People: The Importance of Animal Companionship*. Purdue University Press, West Lafayette, IN.
- Beck, A.T., Steer, R.A., Beck, J.S. and Newman, C.F. (1993) Hopelessness, depression, suicidal ideation, and clinical diagnosis of depression. *Suicide and Life-Threatening Behavior* 23(2), 139–145.
- Berget, B. and Ihlebaek, C. (2011) Animal-assisted interventions: Effects on human mental health – A theoretical framework. In: Uehara, T. (ed.) *Psychiatric Disorders – Worldwide Advances*. InTech Open, London, pp. 121–138. DOI: 10.5772/27318.
- Blázquez-Fernández, C., Lanza-León, P. and Cantarero-Prieto, D. (2023) A systematic review on suicide because of social isolation/and loneliness: Does COVID-19 make a difference? *Journal of Public Health (Oxford, England)* 45(3), 680–688. DOI: 10.1093/pubmed/fdad001.
- Butler, R.L. and Taylor, O.D. (2015) Substance abuse and posttraumatic stress disorder in war veterans. *Journal of Human Behavior in the Social Environment* 24, 344–350. DOI: 10.1080/10911359.2014.97442z.
- Centre for Suicide Prevention [Canada] (2020) Statistics. Available at: <https://www.suicideinfo.ca/resource-type/statistics/> (accessed 1 November 2022).
- Chudyk, A.M., Stoddard, R., Duhamel, T.A., Patient Engagement in Research Partners and Schultz, A.S.H. (2024) Future directions for patient engagement in research: A participatory workshop with Canadian patient partners and academic researchers. *Health Research Policy and Systems* 22(1), 24. DOI: 10.1186/s12961-024-01106-w.
- Dell, C., Arratoon, C., Lapointe, M. and Lohnes, C. (2017) The impact of service dogs in the lives of veterans who problematically use substances. *Canadian Veterinary* 12. Available at: <http://www.colleendell.ca/wp-content/uploads/2018/08/CvetSeptember-October-2017.pdf> (accessed 1 June 2021).
- Dell, C.A., Kosteniuk, B. and Bentley, E. (2022) Benefits and challenges of having a service dog among veterans in recovery from substance use harms. *Anthrozoös* 36(1), 1–15. DOI: 10.1080/08927936.2022.2074190.
- Elliott, G.C., Colangelo, M.F. and Gelles, R.J. (2005) Mattering and suicide ideation: Establishing and elaborating a relationship. *Social Psychology Quarterly* 68(3), 223–238. DOI: 10.1177/019027250506800303.
- Flett, G.L. (2018) *The Psychology of Mattering: Understanding the Human Need to be Significant*. Elsevier Academic Press, Cambridge, MA.
- Gibson, M., Williamson, L., Henwood, G., Chalmers, C. and Dell, C. (2021) Perceptions and use of alcohol and medical cannabis among Canadian military Veterans living with PTSD. *Journal of Veteran Studies* 7(1), 59–70. DOI: 10.21061/jvs.v7i1.200.
- Gillett, J. and Weldrick, R. (2015) *Effectiveness of Psychiatric Service Dogs in the Treatment of Post-Traumatic Stress Disorder among Veterans*. Canadian Institute for Military and Veteran Health Research, ON. Available at: https://www.cf4aass.org/uploads/1/8/3/2/18329873/psd_and_veterans_living_with_ptsd_-_gillett_march_23_2014_2.pdf (accessed 1 November 2022).
- Hatcher, S., Crawford, A. and Coupe, N. (2017) Preventing suicide in indigenous communities. *Current Opinion in Psychiatry* 30(1), 21–25. DOI: 10.1097/YCO.0000000000000295.
- Husband, A., Ahmed, A. and Dell, C.A. (2020) An exploratory case study of the impact of psychiatric service dogs on problematic substance use

- among PTSD-diagnosed veterans. *Journal of Substance Use* 25(2), 113–117. DOI: 10.1080/14659891.2019.1664663.
- Junger, S. (2016) *Tribe: On Homecoming and Belonging*. Harper Collins Ltd, New York.
- Kleiman, E.M. and Liu, R.T. (2013) Social support as a protective factor in suicide: Findings from two nationally representative samples. *Journal of Affective Disorders* 150(2), 540–545. DOI: 10.1016/j.jad.2013.01.033.
- Kruger, K.A. and Serpell, J.A. (2006) Animal-assisted interventions in mental health: Definitions and theoretical foundations. *Handbook on Animal-Assisted Therapy: Theoretical Foundations and Guidelines for Practice* 2, 21–38.
- LaFollette, M.R., Rodriguez, K.E., Ogata, N. and O'Haire, M.E. (2019) Military veterans and their PTSD service dogs: Associations between training methods, PTSD severity, dog behavior, and the human-animal bond. *Frontiers in Veterinary Science* 6(23), 1–11. DOI: 10.3389/fvets.2019.00023.
- Leenaars, A. (2013) *Suicide among the Armed Forces: Understanding the Cost of Service*. Baywood Publishing, Amityville, NY.
- Love, H.A. (2021) Best friends come in all breeds: The role of pets in suicidality. *Anthrozoös* 34(2), 175–186. DOI: 10.1080/08927936.2021.1885144.
- Maguen, S., Madden, E., Cohen, B.E., Bertenthal, D., Neylan, T.C. and Seal, K.H. (2015) Suicide risk in Iraq and Afghanistan veterans with mental health problems in VA care. *Journal of Psychiatric Research* 68, 120–124. DOI: 10.1016/j.jpsy.2015.06.013.
- McConnell, A.R., Brown, C.M., Shoda, T.M., Stayton, L.E. and Martin, C.E. (2011) Friends with benefits: On the positive consequences of pet ownership. *Journal of Personality and Social Psychology* 101(6), 1239–1252. DOI: 10.1037/a0024506.
- Motillon-Toudic, C., Walter, M., Séguin, M., Carrier, J.-D., Berrouiguet, S. and Lemey, C. (2022) Social isolation and suicide risk: Literature review and perspectives. *European Psychiatry* 65(1), e65–e65. DOI: 10.1192/j.eurpsy.2022.2320.
- Nepps, P., Stewart, C.N. and Bruckno, S.R. (2014) Animal-assisted activity: Effects of a complementary intervention program on psychological and physiological variables. *Journal of Evidence-Based Complementary & Alternative Medicine* 19(3), 211–215. DOI: 10.1177/2156587214533570.
- Nock, M.K., Deming, C.A., Fullerton, C.S., Gilman, S.E., Goldenberg, M. et al. (2013) Suicide among soldiers: A review of psychosocial risk and protective factors. *Psychiatry: Interpersonal and Biological Processes* 76(2), 97–125. DOI: 10.1521/psyc.2013.76.2.97.
- O'Connor, C. and Joffe, H. (2020) Intercoder reliability in qualitative research: Debates and practical guidelines. *International Journal of Qualitative Methods* 19, 160940691989922. DOI: 10.1177/1609406919899220.
- O'Haire, M.E. and Rodriguez, K.E. (2018) Preliminary efficacy of service dogs as a complementary treatment for posttraumatic stress disorder in military members and veterans. *Journal of Consulting and Clinical Psychology* 86(2), 179–188. DOI: 10.1037/ccp0000267.
- Özer, Ü., Yildirim, E.A. and Erkoç, Ş.N. (2015) Relationship of suicidal ideation and behavior to attachment style in patients with major depression. *Noro Psikiyatrisi* 52(3), 283–288. DOI: 10.5152/npa.2015.7459.
- Pavelich, A. (2021) *Exploring Mattering and the Human-Animal Bond: The Impact of Service Dogs for Military Veterans at High Risk for Suicide*. Master's Thesis, University of Saskatchewan. Harvest. Available at: <https://hdl.handle.net/10388/13727>.
- Peacock, J., Chur-Hansen, A. and Winefield, H. (2012) Mental health implications of human attachment to companion animals: Companion animals and mental health. *Journal of Clinical Psychology* 68(3), 292–303. DOI: 10.1002/jclp.20866.
- Rodgers, P. and Suicide Prevention Resource Center (2011) *Understanding Risk and Protective Factors for Suicide: A Primer for Preventing Suicide*. Education Development Center, Inc, Newton, MA.
- Rodriguez, K.E., LaFollette, M.R., Hediger, K., Ogata, N. and O'Haire, M.E. (2020) Defining the PTSD service dog intervention: Perceived importance, usage, and symptom specificity of psychiatric service dogs for military veterans. *Frontiers in Psychology* 11, 1638. DOI: 10.3389/fpsyg.2020.01638.
- Rossetti, J. and King, C. (2010) Use of animal-assisted therapy with psychiatric patients. *Journal of Psychosocial Nursing and Mental Health Services* 48(11), 44–48. DOI: 10.3928/02793695-20100831-05.
- Rudd, M.D., Berman, A.L., Joiner, T.E., Jr., Nock, M.K., Silverman, M.M. et al. (2006) Warning signs for suicide: Theory, research, and clinical applications. *Suicide and Life-Threatening Behavior* 36(3), 255–262.
- Saldana, J. (2015) *The Coding Manual for Qualitative Researchers*. Sage, Thousand Oaks, CA.
- Serpell, J.A., Coppinger, R., Fine, A.H. and Peralta, J.M. (2010) Welfare considerations in therapy and assistance animals. In: Fine, A.H. (ed.) *Handbook on Animal-Assisted Therapy: Theoretical Foundations and Guidelines for Practice*. 3rd edn. Elsevier Academic Press, Cambridge, MA, pp. 481–503.
- Simkus, K. and VanTil, L. (2018) *2018 Veteran Suicide Mortality Study*. Report, Government of Canada, p. 51.
- Simkus, K., Hall, A., Heber, A. and VanTil, L. (2019) *2019 Veteran Suicide Mortality Study*. Report, Government of Canada.
- Taylor, M.F., Edwards, M.E. and Pooley, J.A. (2013) "Nudging them back to reality": Toward a growing public acceptance of the role dogs fulfill in ameliorating contemporary veterans' PTSD symptoms. *Anthrozoös* 26(4), 593–611. DOI: 10.2752/175303713X13795775535896.
- Thompson, J.M. and Veterans Affairs Canada (2010) *Suicide Prevention at Veterans Affairs Canada: Framework*. Available at: http://publications.gc.ca/collections/collection_2018/acc-vac/V32-391-2018-eng.pdf (accessed 1 November 2022).
- van Houtert, E.A., Endenburg, N., Wijnker, J.J., Rodenburg, B. and Vermetten, E. (2018) The study of service dogs for veterans with post-traumatic stress disorder: A scoping literature review. *European Journal of Psychotraumatology* 9(Suppl. 3), 1503–1523. DOI: 10.1080/20008198.2018.1503523.
- van Houtert, E.A., Rodenburg, T.B., Vermetten, E. and Endenburg, N. (2022) The impact of service dogs on military veterans and (ex) first aid responders with post-traumatic stress disorder. *Frontiers in Psychology* 13, 1–9. DOI: 10.3389/fpsyg.2022.834291.
- Veteran Affairs (2019) *National Veteran Suicide Prevention Annual Report*. Office of Mental Health & Suicide Prevention – U.S. Department of Veteran Affairs. Available at: https://www.mentalhealth.va.gov/docs/data-sheets/2019/2019_National_Veteran_Suicide_Prevention_Annual_Report_508.pdf (accessed 1 November 2022).
- Vincent, C., Dumont, F., Gagnon, D.H., Belleville, G. and Auger, E. (2018) Potential effectiveness of psychiatric service dogs used by veterans with post-traumatic stress disorder (PTSD) in Canada. *Mental Health and Prevention* 10, 42–49. DOI: 10.1016/j.mhp.2018.01.002.
- White, J., Marsh, I., Kral, M.J. and Morris, J. (2016) *Critical Suicidology: Transforming Suicide Research and Prevention for the 21st Century*. UBC Press, Vancouver, Canada.
- Whitworth, J.D., Scotland-Coogan, D. and Wharton, T. (2019) Service dog training programs for veterans with PTSD: Results of a pilot-controlled study. *Social Work in Health Care* 58(4), 412–430. DOI: 10.1080/00981389.2019.1580238.
- Wilcox, H.C., Conner, K.R. and Caine, E.D. (2004) Association of alcohol and drug use disorders and completed suicide: An empirical review of cohort studies. *Drug and Alcohol Dependence* 76, S11–S19.
- Williamson, L., Dell, C., Osgood, N., Chalmers, D., Carleton, N. and Amundson, G. (2021) Examining changes in posttraumatic stress disorder symptoms and substance use among a sample of Canadian Veterans working with service dogs: An exploratory patient-oriented longitudinal study. *Journal of Veterans Studies* 7, 1–13. DOI: 10.21061/jvs.v7i1.194.
- Williamson, L.E., Dell, C.A., Chalmers, D., Cruz, M. and De Groot, P. (2022) Strengthening zoeoia: Understanding the human-animal bond between veterans living with comorbid substance use and posttraumatic stress disorder and their service dogs. *Human-Animal Interaction Bulletin* 10(2), 20–47. DOI: 10.1079/hai.2022.0018.
- World Health Organization (2020) *Suicide Data*. Available at: https://www.who.int/mental_health/prevention/suicide/suicideprevent/en/ (accessed 30 September 2019).
- Yarborough, B.J.H., Owen-Smith, A.A., Stumbo, S.P., Yarborough, M.T., Perrin, N.A. and Green, C.A. (2017) An observational study of service

dogs for veterans with posttraumatic stress disorder. *Psychiatric Services* 68(7), 730–734. DOI: 10.1176/appi.ps.201500383.

Young, J., Bowen-Salter, H., O'Dwyer, L., Stevens, K., Nottle, C. and Baker, A. (2020) A qualitative analysis of pets as suicide protection for older people. *Anthrozoös* 33(2), 191–205. DOI: 10.1080/08927936.2020.1719759.

Yount, R.A., Olmert, M.D. and Lee, M.R. (2012) Service dog training program for treatment of posttraumatic stress in service members.

U.S Army Medical Department Journal, Apr–June, 63–69. Available at: <https://www.ncbi.nlm.nih.gov/pubmed/22388685>.

Zaheer, J., Links, P.S. and Liu, E. (2008) Assessment and emergency management of suicidality in personality disorders. *Psychiatry Clinical North America* 31(3), 527–ix. DOI: 10.1016/j.psc.2008.03.007.

Zilcha-Mano, S., Mikulincer, M. and Shaver, P.R. (2011) An attachment perspective on human–pet relationships: Conceptualization and assessment of pet attachments. *Journal of Research in Personality* 45, 345–357.