



## Short Communication

## Role of pets and animal assisted therapy in suicide prevention



Sheikh shoib<sup>a</sup>, Syed Sameer Hussaini<sup>b</sup>, Miyuru Chandradasa<sup>c</sup>, Fahimeh Saeed<sup>d</sup>, Tuba Khan<sup>e</sup>, Sarya Swed<sup>f,\*</sup>, Aiste Lengvenyte<sup>g,h,i</sup>

<sup>a</sup> Department of Psychiatry, Jawahar Lal Nehru Memorial Hospital, Srinagar, Kashmir, India

<sup>b</sup> M.S. Ramaiah Medical College, Bengaluru Karnataka, India

<sup>c</sup> Department of Psychiatry, University of Kelaniya, Ragama, Sri Lanka

<sup>d</sup> Department of Psychiatry, Psychosis Research Center, University of Social Welfare and Rehabilitation Sciences, Tehran, Iran

<sup>e</sup> Md. ziauddin university, Karachi, Pakistan

<sup>f</sup> Faculty of Medicine, Aleppo University, Aleppo, Syria

<sup>g</sup> IGF, University of Montpellier, CNRS, INSERM, Montpellier, France

<sup>h</sup> Faculty of Medicine, Institute of Clinical Medicine, Psychiatric Clinic, Vilnius University, Vilnius, Lithuania

<sup>i</sup> Department of Urgent and Post Urgent Psychiatry, CHU Montpellier, Montpellier, France

## 1. Suicide overview

Suicide is caused by intended self-injurious behaviour that leads to fatal harm to oneself. It is a public health issue affecting people of all age groups worldwide. According to the WHO (World Health Organization), around 700,000 people die by suicide each year. Furthermore, suicide attempt, described as the self-injurious behaviour intended to cause death but leads to a non-fatal outcome, is reported to be 20 times more frequent than the suicide itself [1]. Suicidal deaths occur in all races, genders, and age groups, but disproportionately affects males and youth in almost all populations [2]. For instance, it was reported to be the fourth leading cause of death in youth in 2019 (WHO, 2021). Notably, although suicide deaths occur in populations of various income levels, 77% of the cases are reported in low to middle-income countries (WHO, 2021). Higher suicide rates are seen in vulnerable groups, such as refugees, victims of abuse, sexual minorities, and patients suffering chronic medical or mental conditions. People undergoing psychiatric treatments and those affected by mental health conditions are disproportionately at risk for suicidal ideations and completed suicide (WHO, 2021).

Suicidal behaviours are extremely complex, and there is never a single causal factor that leads to it. According to the widely accepted stress-diathesis model, suicide results from an interaction between diathesis, or an individual vulnerability caused by an interaction between genes and early experiences, and proximal risk factors, such as stressful life events or mental disorders [3]. During the stressful period, the person might experience severe psychological pain, of which, in the worst case scenario, suicide might be chosen as an escape strategy in

vulnerable individuals [4]. While the most robust predictor of suicide is the history of a previous suicide attempt [5], reflecting the role of individual vulnerability throughout life, other more proximal warning signs clinicians and close contacts of the patients should be aware of are a loss of interest in present and future activities, a sudden withdrawal from social activities, talking about suicide or expressing the wish to die, changes in behaviour, appearance, and sleep patterns, death of a loved one, divorce, or separation, suffering from long term pain or terminal medical condition, chronic substance abuse issues, isolation, and expressing feelings of hopelessness [6,7].

Not everyone who has suicidal ideation will attempt suicide, but it is not an argument to ignore any expression of the ideation, as current models of suicide prediction fail to show which patients will progress to suicide attempt [8]. Suicidal ideation is frequently present in a waxing and waning manner, and thus the presence of common warning signs may fluctuate. Since attempts generally show impaired decision making and increased impulsivity, many times, suicide is an impulsive behaviour in face of life stressors [4,9]. However, while the need for prevention is clear in individuals that express suicidal ideation, a recent systemic review of interprofessional clinical guidelines on the prevention of suicide concluded that there was no gold standard for assessing and preventing suicide in those with suicidal ideation/attempts [10]. Different people may benefit from different interventional strategies and preventive measures. Preventive measures in suicidal patients include immediate crisis management with rapid-acting medications and hospital admission of patients who are at extremely elevated risk, creating a safety plan, eliminating any means which may facilitate self-injury,

\* Corresponding author.

E-mail addresses: [Sheikhshoib22@gmail.com](mailto:Sheikhshoib22@gmail.com) (S. shoib), [drsyyedshussaini@gmail.com](mailto:drsyyedshussaini@gmail.com) (S.S. Hussaini), [miyuruc@kln.ac.lk](mailto:miyuruc@kln.ac.lk) (M. Chandradasa), [Fa.saeed@uswr.ac.ir](mailto:Fa.saeed@uswr.ac.ir) (F. Saeed), [Doctortubakhan@gmail.com](mailto:Doctortubakhan@gmail.com) (T. Khan), [saryaswed1@gmail.com](mailto:saryaswed1@gmail.com) (S. Swed), [aistelengvai@gmail.com](mailto:aistelengvai@gmail.com) (A. Lengvenyte).

preliminary treatment of underlying psychiatric illnesses, psychotherapy, and assuring the continuity of care between the hospital and primary care/mental health professionals [11,12]. One emerging prevention program that targets such suicide-related factors as isolation and psychological pain is the Animal Assisted Intervention (AAI) that incorporate animals for therapeutic benefits and improve general health and well-being [13].

## 2. The beginning of animal-assisted therapies

Humans have been in contact with pets for thousands of years. We often form strong attachments with our pets, and pet ownership is known to provide physical and emotional well-being in children, adolescents, and adults [14,15]. For instance, in northern Israel, a human skeleton holding a puppy was discovered and is estimated to be 12,000 years old [16]. In the 9th century, animals were used to treat the disabled in Belgium. In England, during the 1700s, rabbits and chickens were part of therapy for the mentally ill. In the 1800s, West Germany used farm animals and horses to treat patients with epilepsy. James Bossad released a publication titled 'The mental hygiene of Owning a Dog', followed by a publication by Borris Levinson titled 'The Dog as a Co-Therapist' [17]. In the 1970s, psychiatrists and many psychotherapists reported using animals in the treatment, and research on the effects of this type of treatment started to emerge. The 'humane society' conducted a program called "pet mobile", in which animals were brought to different nursing homes to interact with residents [16]. As the years went on, the use of animals in the therapeutic process grew, and continues to expand in various therapy programs.

## 3. Pet therapy/animal assisted therapy

Pet Therapy is a goal-directed intervention based on positive human interactions with animals to help people better cope or even recover from various health problems. AAT is a growing therapeutic technique. It provides a series of therapeutic sessions where a person and a trained animal can interact with assistance provided by the pet's handler. The benefits of the AAT include improved self-worth, increased verbal communication, decreased depressive and anxiety symptoms and loneliness, increased motivation, and enhanced social skills [18,19]. Animal-assisted therapy does not depend on any specific theory in particular. Instead, it encompasses different psychological and behavioral approaches.

An interaction with an animal is generally associated with the impression of unconditional affection and non-judgemental interaction. Moreover, at least some species of animals have been reported to be able to, to a certain degree, recognize human emotions and empathize with them, putting them at the advantageous position to monitor and respond to changes in the human's emotional state [20,21]. Pet therapy can use a wide range of animals, the most widely used among them being dogs, followed by horses, cats, and rabbits [22]. Clients of animal-assisted therapy can also benefit from the pet handler/professional. The observed relationship between the animal and the professional can serve as a model for a healthy relationship [23]. The professional will also

observe the interaction between the client and the animal and use this information to help clients recognize their behavioural patterns. Table 1 demonstrates the benefits and setbacks of AAT.

## 4. Pet therapy and suicide prevention

Pet therapy may benefit people at increased risk of by interacting with a number of pathogenesis factors, including the mental health conditions such as dementia, autism spectrum disorder, schizophrenia, attention deficit hyperactivity disorder, post-traumatic stress disorder (PTSD), and substance abuse. Indeed, AAI have been repeatedly shown to have potential to reduce pain, and the symptoms of PTSD, anxiety, and depression [24–26]. Interaction with animals has been shown to improve blood pressure levels and reduce the levels of stress hormones, such as cortisol, adrenaline, and aldosterone [13]. In a clinical trial with birds, a group of patients with chronic psychiatric disorders was given a bird for therapeutic purposes, and another group was observed with no animal. The patients who took care of an animal had better ratings for happiness at the end of the trial than those who did not [27]. There have also been several studies suggesting that AAT in children/adolescents who suffered traumatic experiences improved their mental health, and the children were less likely to engage in risky behaviours [28]. Multiple case-control/observational studies show that animal therapy in patients with dementia resulted in more social behaviours, increased treatment engagement, reduced behavioural disturbances, lesser agitation [29]. For some, owning a pet may be a source of strength and self-worth as they provide care for the other and provide a sense of purpose [30].

AAT has also been shown to be beneficial in autism spectrum disorder, which is linked to extraordinary high risk of suicidal behaviours, resulting in increased social interaction, decreased problem behaviours, and psychological stress [31,32]. Fig. 1 depicts a possible pathway for the prevention of suicide in an autistic adult considering suicide. A dog owner knows that the animal depends on them to be cared for, increasing the sense of purpose and responsibility. At the same time, when the animal shows affection to the owner, it might increase the sense of acceptance and belonging, ultimately reducing the psychological pain, improving the well-being by lowering negative feelings. Indeed, studies have shown that individuals with autism have been positively affected by pet therapy, and there was a high satisfaction rate among the participant's families [33].

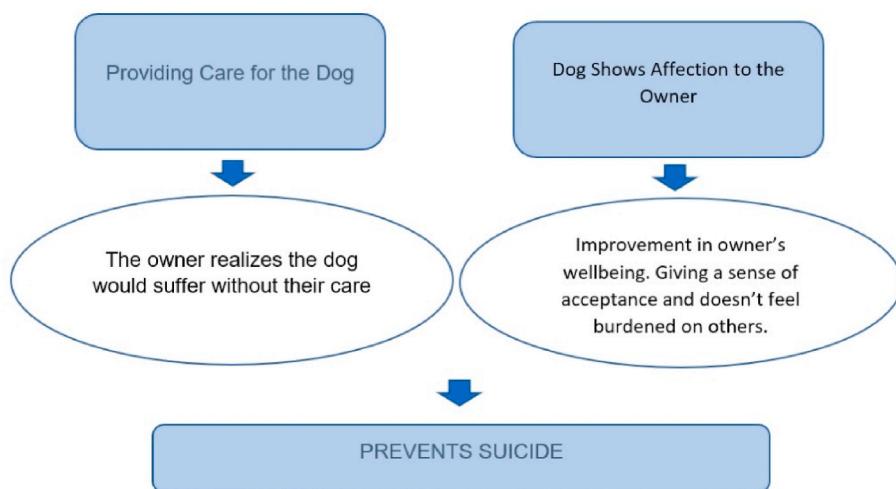
Another psychiatric disorder notoriously associated with increased risk of suicidal behaviours, increased psychological pain, and decreased ability to control suicidal impulses is the borderline personality disorder [34]. Individuals with borderline personality disorder often experience a state of crisis during which they are susceptible to self-injurious behaviours, aggressive impulses, intense anxiety, and depression and suicide attempts are frequently observed in these states [35]. Offering support, staying connected, and maintaining autonomy are the most specific interventions to manage the impulsive behaviours in borderline personality disorder. It has been proposed that people with borderline personality disorder would benefit from owning a pet, obtaining a purpose in life, positive emotional attachments, influencing social connections, promoting participation and engagement in meaningful activities [36].

## 5. The Overcome-AAI program

The "Overcome-AAI" is a pioneering program to prevent suicidal behaviours through animal-assisted intervention. This group-based program consists of six weekly 90-min sessions [13], with a focus on interpersonal and emotional regulation skill development. The sessions provide information to the participants about the facts, risk factors, and warning signs of suicide. It helps them develop skills to manage hostility towards themselves, create a safety plan, and provide them with additional resources in situations of suicide risk. In this program, the role of the animal (a dog) is primarily to facilitate and promote socialisation

**Table 1**  
Advantages and disadvantages of Animal Assisted Therapy.

| Advantages                                | Disadvantages  |
|---|--|
| Increased physical activity               | Allergies to animal dander                                       |
| High adherence rates to treatment         | The animal may act violently                                     |
| Reduce aggressive behaviour               | Patients may become attached to animals and become possessive    |
| Used in conjunction with other treatments | The animal may get sick or die, negatively impacting the patient |
| Provides a relaxing experience            | The patient may have a fear or phobia of the particular animal   |



**Fig. 1.** Effect of pets on a person with autism spectrum disorder for prevention of suicide.

and communication between the participants and the therapists. The dog is also used to train the participants to distract themselves in moments of emotional crisis. For example, the participant would be asked to think a negative thought that may trigger an emotional response leading to suicidal thoughts or behaviours. Immediately, they would practice distracting recreational activities with the animal, which show the participant how important distracting techniques could be with suicidal ideations [13]. Overcome AAI is an example of animal-assisted therapies helping reduce the risk of suicide, and future programmes could be developed based on this framework.

## 6. Putative disadvantages and risks associated with the animal assisted therapy

While many benefits are listed above, pet therapy might not be beneficial to everyone. First, many people are allergic to a variety of species most commonly used in pet therapy, such as cats, dogs, and horses. Secondly, it is yet unclear whether creating a connection with a pet and later ending it would not create of abandonment and be difficult for some people. Indeed, a death of a companion dog has been reported to be as hurtful as the loss of a close relative or a friend [37]. Side effects of unpleasurable interactions with animals during the therapy (e.g. bites or refusal to interact) might occur, and the consequences of such events is yet to be explored. It is also not clear whether studies with certain species and breeds are generalizable to others, and how to select the most appropriate animal.

## 7. Conclusion

Stressful life events can cause enormous stress on individuals, making them feel hopeless, isolated, and distressed. During these moments, a vulnerable person may end up attempting suicide that could result in death. Suicide is a challenging issue that involves multiple factors, yet prevention is possible with prompt measures. Many humans have an innate desire to engage with and interact with animals, and the bonds they form during this interaction could provide them with a relaxing experience, decrease psychological pain, increase the sense of purpose and engagement. Combining AAT with other supportive therapies might help to interrupt suicidal thoughts and prevent suicide. Therefore, we call for studies with AAT in patients with increased risk of suicide. Studies should also examine not only the efficacy of such therapies, but also what species and breeds are the most beneficial.

## Sources of funding

NA.

## Ethical approval

NA.

## Consent

NA.

## Author contribution

MMH, MB: conceived the idea, designed the study and drafted the manuscript.

IR, MB, AMS, EK, SP, IJ: conducted literature search and created the illustrations. PKB, RS, SS, MMH: revised the manuscript critically and refined the illustrations.

MMH, MB, SS, MYE, and IR: revised the final version of the manuscript critically and gave the final approval.

## Registration of research studies

1. Name of the registry: NA
2. Unique Identifying number or registration ID: NA
3. Hyperlink to your specific registration (must be publicly accessible and will be checked): NA

## Guarantor

Sarya Swed.

Faculty of Medicine, Aleppo University, Aleppo, Syria.

Email: [saryaswed1@gmail.com](mailto:saryaswed1@gmail.com).

## Declaration of competing interest

NA.

## References

- [1] G. Borges, M.K. Nock, J.M. Haro Abad, I. Hwang, N.A. Sampson, J. Alonso, et al., Twelve-month prevalence of and risk factors for suicide attempts in the World Health Organization World mental health Surveys, *J. Clin. Psychiatr.* 71 (12) (2010) 1617–1628.

- [2] S.A. Sumner, B. Ferguson, B. Bason, J. Dink, E. Yard, M. Hertz, et al., Association of online risk factors with Subsequent youth suicide-related behaviors in the US, *JAMA Netw. Open* 4 (9) (2021), e2125860.
- [3] J.J. Mann, M.M. Rizk, A brain-centric model of suicidal behavior, *Am. J. Psychiatr.* 177 (10) (2020) 902–916.
- [4] I. Conejero, E. Olié, R. Calati, D. Ducasse, P. Courtet, Psychological pain, depression, and suicide: recent evidences and future directions, *Curr. Psychiatr. Rep.* 20 (5) (2018) 33.
- [5] Y. Finkelstein, E.M. Macdonald, S. Hollands, M.L. Sivilotti, J.R. Hutson, M. M. Mamdani, et al., Risk of suicide following deliberate self-poisoning, *JAMA Psychiatr.* 72 (6) (2015) 570–575.
- [6] D.G. Jacobs, C.J. Ross Baldessarini, Y. Conwell, J.A. Fawcett, L. Horton, H. Meltzer, C.R. Pfeffer, R.I. Simon, J.S. McIntyre, D.J. Anzia, I.A. Cook, M.T. Finnerty, B. R. Johnson, J.E. Nininger, P. Summergrad, S.M. Woods, J. Yager, R. Pyles, M. Ann Barnovitz, D.A. Regier, Practice guideline for the assessment and treatment of patients with suicidal behaviors workgroup on suicidal behaviours American psychiatric association steering committee on practice guidelines area and component liaisons staff assessment and treatment of patients with suicidal behaviors. <http://www.appi.org/CustomerService/Pages/Permissions.aspx>, 2010. <http://www.appi.org/CustomerService/Pages/Permissions.aspx>.
- [7] R. Calati, C. Ferrari, M. Brittner, O. Oasi, E. Olié, A.F. Carvalho, et al., Suicidal thoughts and behaviors and social isolation: a narrative review of the literature, *J. Affect. Disord.* 245 (2019) 653–667.
- [8] B.E. Belsher, D.J. Smolenski, L.D. Pruitt, N.E. Bush, E.H. Beech, D.E. Workman, et al., Prediction models for suicide attempts and deaths: a systematic review and Simulation, *JAMA Psychiatr.* 76 (6) (2019) 642–651.
- [9] J. Rimkeviciene, J. O'Gorman, D. De Leo, Impulsive suicide attempts: a systematic literature review of definitions, characteristics and risk factors, *J. Affect. Disord.* 171 (2015) 93–104.
- [10] B. Harmer, S. Lee, T.V.H. Duong, A. Saadabadi, Suicidal Ideation. StatPearls. Treasure Island (FL), StatPearls Publishing Copyright © 2022, 2022. StatPearls Publishing LLC.
- [11] D. Wasserman, M. Iosue, A. Wuestefeld, V. Carli, Adaptation of evidence-based suicide prevention strategies during and after the COVID-19 pandemic, *World Psychiatr.* 19 (3) (2020) 294–306.
- [12] A. Lengvenyte, E. Olié, R. Strumila, A. Navickas, A. Gonzalez Pinto, P. Courtet, Immediate and short-term efficacy of suicide-targeted interventions in suicidal individuals: a systematic review, *World J. Biol. Psychiatr.* 22 (9) (2021) 670–685.
- [13] A. Muela, N. Balluerka, E. Sansinenea, J.M. Machimbarrena, J. García-Ormaza, N. Ibarretxe, et al., A social-emotional learning program for suicide prevention through animal-assisted intervention, *Animals* 11 (12) (2021).
- [14] J.P. Polheber, R.L. Matchock, The presence of a dog attenuates cortisol and heart rate in the Trier Social Stress Test compared to human friends, *J. Behav. Med.* 37 (5) (2014) 860–867.
- [15] R. Purewal, R. Christley, K. Kordas, C. Joinson, K. Meints, N. Gee, et al., Companion animals and child/adolescent development: a systematic review of the evidence, *Int. J. Environ. Res. Publ. Health* 14 (3) (2017).
- [16] O. Kim, S. Hong, H. Lee, Y. Chung, S. Si-Jong Lee, Animal assisted intervention for rehabilitation therapy and psychotherapy, in: Complementary Therapies for the Body, Mind and Soul. IntechOpen, 2015.
- [17] B.M. Levinson, The dog as a "co-therapist", *Ment. Hyg.* 46 (1962) 59–65.
- [18] T. Geist, Conceptual framework for animal assisted therapy, *Child Adolesc. Soc. Work. J.* 28 (2011) 243–256.
- [19] J. Nimer, B. Lundahl, Animal-assisted therapy: a meta-analysis, *Anthrozoös* 20 (3) (2007) 225–238.
- [20] S. Karl, L. Huber, Empathy in dogs: with a little help from a friend – a mixed blessing, *Anim. Sentience* 2 (14) (2017) 13.
- [21] N. Albuquerque, K. Guo, A. Wilkinson, C. Savalli, E. Otta, D. Mills, Dogs recognize dog and human emotions, *Biol. Lett.* 12 (1) (2016), 20150883.
- [22] C. Moeller, N. King, V. Burr, G.R. Gibbs, T. Gomersall, Nature-based interventions in institutional and organisational settings: a scoping review, *Int. J. Environ. Health Res.* 28 (3) (2018 Jun) 293–305, <https://doi.org/10.1080/09603123.2018.1468425>.
- [23] S. Kuzara, P. Pendry, N.R. Gee, Exploring the handler-dog connection within a university-based animal-assisted activity, *Animals* 9 (7) (2019).
- [24] C. Ambrosi, C. Zaiontz, G. Peragine, S. Sarchi, F. Bona, Randomized controlled study on the effectiveness of animal-assisted therapy on depression, anxiety, and illness perception in institutionalized elderly, *Psychogeriatrics* 19 (1) (2019) 55–64.
- [25] J.D. Charry-Sánchez, I. Pradilla, C. Talero-Gutiérrez, Animal-assisted therapy in adults: a systematic review, *Compl. Ther. Clin. Pract.* 32 (2018) 169–180.
- [26] B. Carey, C.A. Dell, J. Stempien, S. Tupper, B. Rohr, E. Carr, et al., Outcomes of a controlled trial with visiting therapy dog teams on pain in adults in an emergency department, *PLoS One* 17 (3) (2022), e0262599.
- [27] M. Sahebalzamani, O. Rezaei, L.F. Moghadam, Animal-assisted therapy on happiness and life quality of chronic psychiatric patients living in psychiatric residential care homes: a randomized controlled study, *BMC Psychiatr.* 20 (1) (2020) 575.
- [28] K.E. Hoagwood, M. Acri, M. Morrissey, R. Peth-Pierce, Animal-assisted therapies for youth with or at risk for mental health problems: a systematic review, *Appl. Dev. Sci.* 21 (1) (2017) 1–13.
- [29] S. Peluso, A. De Rosa, N. De Lucia, A. Antenora, M. Illario, M. Esposito, et al., Animal-assisted therapy in elderly patients: evidence and controversies in dementia and psychiatric disorders and future perspectives in other neurological diseases, *J. Geriatr. Psychiatr. Neurol.* 31 (3) (2018) 149–157.
- [30] A. White, Pet dogs as promoters of wellbeing, *Br. J. Community Nurs.* 22 (7) (2017) 332–336.
- [31] M.E. O'Haire, Animal-assisted intervention for autism spectrum disorder: a systematic literature review, *J. Autism Dev. Disord.* 43 (7) (2013) 1606–1622.
- [32] K. Kölves, C. Fitzgerald, M. Nordentoft, S.J. Wood, A. Erlangsen, Assessment of suicidal behaviors among individuals with autism spectrum disorder in Denmark, *JAMA Netw. Open* 4 (1) (2021), e2033565.
- [33] C.M. Siewertsen, E.D. French, M. Teramoto, Autism spectrum disorder and pet therapy, *Adv. Mind Body Med.* 29 (2) (2015) 22–25.
- [34] R. Borschmann, C. Henderson, J. Hogg, R. Phillips, P. Moran, Crisis interventions for people with borderline personality disorder, *Cochrane Database Syst. Rev.* (6) (2012), Cd009353.
- [35] C. Reichl, M. Kaess, Self-harm in the context of borderline personality disorder, *Curr. Opin. Psychol.* 37 (2021) 139–144.
- [36] M. Hayden-Evans, B. Milbourn, J. Netto, 'Pets provide meaning and purpose': a qualitative study of pet ownership from the perspectives of people diagnosed with borderline personality disorder, *Adv. Mental Health* 16 (2) (2018) 152–162.
- [37] S. Ucheddu, L. De Cataldo, M. Albertini, S. Coren, G. Da Graça Pereira, A. Haverbeke, D.S. Mills, L. Pierantoni, S. Riemer, L. Ronconi, I. Testoni, F. Pirrone, Pet humanisation and related grief: development and validation of a Structured questionnaire instrument to evaluate grief in people who have lost a companion dog, *Animals* 9 (11) (2019) 933.