

Psychoneuroimmunological Perspective of Animal - Assisted Therapy

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Animal-assisted therapy is a new and upcoming form of therapy that has shown multifarious benefits to participants. It is a goal-oriented therapeutic process with the incorporation of a qualified therapy animal in the therapeutic activities and conversations. This paper explores these benefits from a psychoneuroimmunological lens, wherein the interplay of and impact on an individual's psychological, neurological and immune systems are discussed. Positive physical interaction with therapy animals reduces undesirable symptoms and ailments such as stress, anxiety, depressive symptoms, aggressive tendencies, harmful behaviours, cardiovascular issues and unhealthy tendencies amongst others. It further promotes a healthier lifestyle, promoting quality of life, better heart health, cognitive functioning and overall well-being. The biological basis of these benefits is discussed.

Keywords: Animal-assisted therapy; Health; Immunity; Psychoneuroimmunology; Therapy Dog.

Animals have been a part of human lives from time immemorial. We see their presence in ancient carvings, idols, scriptures and even as holy figures, deities and gods in many cultures. They have been an integral part, be it for protection, hunting, status symbols, by-products or more recently for companionship, guidance and healing. Scientific research about their effectiveness in therapy had not begun until the 1960s¹ but over time more researchers have taken an interest in the benefits that interactions with animals can bring about. Today, our bond with animals has gotten stronger than ever, with many considering them as family and some even preferring to get a pet over birthing a child.

The inclusion of a therapy animal in a therapeutic process from diagnosis, treatment, maintenance, guidance and/or rehabilitation is

known as animal-assisted therapy (AAT). It is a goal-oriented process that entails activities that the animal is a part of and the progress is measured for the specified goals and objectives for the individual or group. In AAT, the animal must meet specific criteria in terms of its health, behaviour, temperament and training that qualify it as a therapy animal.² The mere presence of an animal in a therapy setting is known to bring about more positive outcomes, so one can imagine how effective structured interventions with them can be. This paper will explore the psychoneurological impact of animal-assisted therapy. Psychoneuroimmunology was first coined by George F. Solomon³ and it refers to the interaction between an individual's immune system and their psychological and neurological functioning.

Neurotransmitter and Biochemical Regulation

Animal-assisted activities of just fifteen minutes impact neurochemicals such as dopamine, endorphins, prolactin, oxytocin and beta phenylethylamine.⁴ Endorphins act as a hormone as well as a neurotransmitter. It impacts the immune system, has analgesic properties, and relieves pain and stress⁵ and through the release of transmitters, it helps regulate respiration and muscles of the intestine.⁶ Pleasurable states such as laughter, copulation, and enjoying food are related to the release of endorphins.⁷

Stress is caused due to high levels of norepinephrine and very low levels contribute to depressive symptoms. Interaction with therapy animals helps regulate this chemical. It plays a crucial role in regulating blood pressure, heart rate, body fat breakdown and sugar levels. It also impacts attention, focus, memory and sleep-wake cycles.⁸ The limbic system is impacted by its release leading to an enhanced sense of well-being, happiness, contentment, and improved psychomotor functioning.⁸

The HPA (hypothalamus - pituitary gland - adrenal gland) axis- releases cortisol, high levels of which negatively impact the functioning of the immune system.^{9,10} It also impairs memory, and cognition,¹¹ and depressive symptoms,¹² and regulates the behaviour and mood of individuals.⁴ AAT helps reduce cortisol levels relieving stress, depressive symptoms and anxiety,^{13,14,15} preventing further damage.

Skin is the largest organ of our body and positive physical interactions with therapy animals help release oxytocin in humans and animals.¹⁶ It improves the participants' social interactions by improving their empathy, memory, self-perception, eye contact, and social skills and lowers depression.^{17,18} It helps maintain eye contact for longer and improves attachment,¹⁹ learning, maternal care and bonding while reducing aggression and stress.²⁰ Its release also impacts the immune system, increasing the threshold for pain, and providing an anti-inflammatory and anxiolytic effect.²¹ Furthermore, the parasympathetic nervous system functioning is improved as well as the endocrine system wherein the gastrointestinal tract and digestive function are benefitted leading to growth and restoration.²² It is distributed throughout

the nervous system, impacting gastrointestinal, socio-sexual and cardiovascular health.⁴

Post AAT a significant increase in the levels of prolactin has been observed²³ which further impacts oxytocin, progesterone, oestrogen, insulin and growth hormone.²⁴ It reduces pain,²⁵ impacts sleep-wake, the growth and development of mammary glands and other tissues, metabolises carbohydrates and fat²⁴ and modules psychoneuroendocrine responses.²⁵ The immune system functioning is improved as seen through the rise in salivary immunoglobulin.^{13,26}

Cardiovascular and Physiological Implications of AAT

Therapy in the presence of a therapy dog, even without physical interactions with it, has been shown to positively impact participant blood pressure and heart rate.²⁷ The dog's presence improved morale and motivated individuals to seek therapy and make efforts towards achieving healthier conditions. It caused a long-term impact, which is a key predictor for motivation and higher levels of good health.² It is amazing to note that positive outcomes have been reported not just through long-term physical contact with therapy animals, but also with shorter visits, observations or virtual encounters.²⁸

Stressors such as psychosocial, childhood trauma, separation, depression or anxiety compromise the competency of the immune system to fight infections, cancer or other diseases. Stress also directly and negatively impacts cardiovascular functioning²⁹ and causes irregular sleep, dysregulation of the bowels, headaches and other symptoms.³⁰ Interactions with therapy animals in such situations act as a distraction, entertaining the participants, and relieving their stress while giving them a chance to bond and build companionship. It improves self-esteem and psychosocial functioning.³¹

Systolic and diastolic blood pressure is impacted during interactions with a therapy animal, and reduced blood pressure³² and heart rate³³ are observed. Individuals with coronary heart disease and other cardiovascular diseases have reported positive outcomes, with health improvement.³³ They had lower levels of cholesterol and triglycerides.³⁴ A brief exposure to therapy animals, as reported by Odendaal (1999) shows reduced

mean arterial blood pressure and an increase in phenylethylamine, which further alleviates fatigue and elevates mood. Present in the limbic system, it performs as a regulator of emotions. An increase in plasma dopamine level was also indicated, which has a crucial role to play in the kidneys. This includes species-specific behaviours, complex movements, emotional responses,⁶ behavioural activation and reward perceptions.³⁵

Health, Lifestyle and Psychological Benefits

After AAT sessions, individuals have reported better overall life satisfaction, improved competence with social situations, personal cleanliness, psychosocial functioning, and self-concept³⁶ and improved interactions in social situations, leading to a reduction in underlying symptoms.^{37,38,39} It helps to increase tolerance towards stress by changing the individual's perception towards stressors and improving overall health and well-being.⁴⁰ There are many long-term benefits as well, individuals have reported that post-sessions they have better overall health and reduced visits to the doctor^{20,41}, and reduced consumption of medication.⁴¹ They felt more motivated to stay healthy, engaged in more fitness-related activities, slept better, exercised more, had reduced absenteeism from work⁴² and initiated fewer visits to the doctor.^{42,43}

These long-term positive changes were observed not just for physical health but mental health too.⁴⁴ They had better emotion regulation, a better sense of empathy and responsibility, adopted healthier attitudes⁴⁵ and more positive behaviours.⁴⁶ This resulted in fewer negative behaviours, self-harm,¹⁶ and aggressive tendencies,⁴⁷ with an overall better state of mind.⁴⁸ Reduced number of seizures,⁴⁹ improved gait, mobility, walking⁵⁰ and hearing⁵¹ have also been reported.

Along with the cognitive and behavioural benefits discussed above, positive interactions with therapy animals caused improved attention, sensory sensitivity and motivation while reducing sedentary behaviours and distractions.⁵² Improvements in spatial orientation, memory and attention, language, temporal orientation and overall cognitive functioning were observed.^{53,54} Interactions with pets reduce the pressure and stress of conversations and can be largely non-verbal. It makes speaking and expressing oneself easier and passively starts improving their mental and physical health without

the discomfort of having to discuss it, especially in the case of traumatic events wherein it has led to neurobiological benefits.⁵⁴

After animal-assisted therapy sessions, individuals took more interest in day-to-day activities and felt more participative, and engaged with their lives,⁵⁵ and a better quality of life and overall well-being.⁵⁶ They reported better habits related to the consumption of food, wherein they were eating healthier and more nutritious foods.⁵⁷ Improved self-awareness and reduced distress, as well as outbursts, were experienced.⁵⁵ Individuals with various diseases and disorders have observed improvements with AAT, including anxiety, depression, mood disorders, Alzheimer's, autism, psychotic ailments, heart conditions, dementia and oncological difficulties amongst others.²

CONCLUSION

Animal-assisted therapy is a relatively new type of therapy and has a lot of scope for future research. Positive interactions with therapy animals in a structured manner play an integral role in psychoneuroimmunology. It impacts the psychological, behavioural, neurological, and immune systems; and regulates various neurotransmitters and biochemicals that interact with these systems. The short and long-term benefits include reduced negative symptoms while reporting improved cardiovascular functioning, overall health, well-being, quality of life, cognitive functioning, healthier behaviours and better immunity.

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Conflict of Interest

There are no conflicts of interest to disclose.

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