How Animal Assisted Therapy with Dogs is Understood and Perceived among Health Care Providers and the General Public in Canada

Healey Gardiner Dr.
University of Windsor, dr.gardiner@midlanddbt.com

Jill Singleton-Jackson Dr.
University of Windsor, jjackson@uwindsor.ca

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Cover Page Footnote

Correspondence concerning this article should be sent to Dr. Jill Singleton-Jackson, Professor, Department of Psychology and Associate Dean of Student Experience and Inter-faculty Programs in the Faculty of Arts, Humanities, and Social Sciences at the University of Windsor, Windsor, Ontario, Canada. Email: jjackson@uwindsor.ca

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Healey M. Gardiner and Jill A. Singleton-Jackson

Department of Psychology, University of Windsor

Author Note

Abstract

When a dog is included in treatment to meet an individual's therapeutic goal it is known as Animal-Assisted Therapy (AAT). Although AAT has increased in popularity, limited research exists regarding its efficacy. According to the diffusion of innovation theory an innovation must be properly communicated to all appropriate channels before it may be adopted into practice. Little is known about how AAT is understood and perceived among healthcare professional and public populations in Canada. In the present study, health care professionals and the public in Canada were surveyed. Attitude toward dogs, openness to experience, agreeableness, and subjective distress were investigated. Results suggest that both professional and public populations have limited knowledge of AAT but are interested in learning more about the intervention. Although attitude toward dogs appears to be positively associated with attitude toward AAT, the impact of openness to experience, agreeableness, and subjective distress is limited.

How Animal Assisted Therapy with Dogs is Understood and Perceived among Health Care

Providers and the General Public in Canada

Animal-Assisted-Therapy (AAT) is the integration of an animal into the surroundings of an individual for a therapeutic purpose (Waite et al., 2018). AAT may be utilized with a variety of animals (Fine, 2010). Although equine therapy is the most well-recognized form of AAT, the use of AAT with therapy dogs is gaining popularity. At present, there are over 50,000 therapy dogs in America (Lombardi, 2018). In this study, the term "AAT" will refer to AAT specifically with dogs.

The notion of therapy dogs is not new. Dogs have been utilized as service animals for several centuries (Bremhorst et al., 2018; Fishman, 2003). Excavations at Pompeii identified what is arguably the first representation of a blind man being led by a dog. Further, a mid-thirteenth-century Chinese scroll painting depicts a blind man holding a leash in his left hand and a staff in his right. In the 1960s, Levinson (1962) was one of the first to investigate the purposeful use of dogs in mental health treatment for therapeutic benefits.

The use of dogs as service animals has expanded from physical disabilities to include assistance for psychological disabilities, resulting in three distinct classifications of assistance dogs: service dogs, therapy dogs, and emotional support dogs (Fine, 2010; Finn-Stevenson, 2016; Schoenfeld-Tacher et al., 2017). A therapy dog may assist and support a person with or without a specific disability. Therapy dogs work in many settings and have varying levels of training. Commonly, they do not have any specialized training beyond completing behavioural assessments to ensure a safe and calm demeanor (Parenti et al., 2013).

Despite the increased use of therapy dogs, scientific data regarding the efficacy of AAT

is scarce and existing evidence is methodologically weak and contradictory (Finn-Stevenson 2016; Germain et al., 2018; Goldmann et al., 2015; Stefanini et al., 2015). Further, despite the existence of formal operational definitions, considerable variation exists in the understanding and perceptions of AAT among the public and healthcare professionals (Schoenfeld-Tacher et al., 2017.

In addition to the variation in attitudes toward AAT, little research exists examining this topic. As understanding and perceptions of AAT may be utilized to identify areas of improvement in proper dissemination and communication, further investigation is needed to elucidate the current understanding and perceptions of AAT among both health care professionals, and the public.

Therapy Dogs in Mental Health Treatment

The use of therapy dogs is less established and more controversial than service dogs. For instance, Levinson (1965) noted that although his observations of the therapeutic effects of pets were echoed by many of his colleagues, most were coincidental, with the pet being involved by chance. Nonetheless, Levinson (1962) was one of the first researchers to investigate the purposeful use of dogs in mental health treatment.

The Development and Administration of AAT

In 1989 the Delta society (now known as Pet Partners) developed a certification program for proficiency in AAT. Their recommendations for AAT continue to be the foundational guidelines for AAT as an intervention. AAT has been utilized for behavioural interventions in schools (Finn-Stevenson, 2016), to assist individuals in improving social skills (Muela et al., 2017), and as a complement to conventional treatments for acute psychological disorders such as eating disorders (Stefanini et al., 2015), PTSD (Owen et al., 2016), depression (Hoffman et al.,

2009; Souter & Miller, 2007), anxiety, trauma, and intellectual disabilities (Date, 2011; Matas, 2012; Schuck et al., 2015). Evidence also suggests that AAT may be an effective complement to couple and family therapies (Policay & Falconier, 2019).

A primary deficit of AAT is a lack of formal intervention procedures resulting in a large degree of variability in the use of AAT. Two foundational resources exist for a clinician wishing to use AAT: *Standards of Practice in Animal-Assisted Interventions* by Pet Partners (2018) and the *Handbook on Animal Assisted Therapy* by Aubrey H. Fine (2010).

Plausible Mechanisms of Action and Evidence for AAT

Although an evidence-based mechanism of action for AAT has not been determined, there are many proposed explanations for observed benefits. Proposed mechanisms of action include the soothing and relaxing impact of a dog, improved motivation to attend therapy, and the promotion of safe attachments between the client and the dog. Further, these psychosocial mechanisms may be promoted by physiological mechanisms such as the release of oxytocin, lowering of blood pressure, decreased physiological arousal, and reduced levels of epinephrine (Ernst, 2014).

Although some studies have demonstrated evidence to support AAT (Muela et al., 2017; Stefanini et al., 2015), other studies have found no evidence to support the efficacy of AAT (Goldmann et al., 2015), and others have methodological flaws which yield inconclusive findings (Finn-Stevenson, 2016).

Impact of Understanding and Perception on Innovation Diffusion

According to the Diffusion of Innovation Theory, successful communication channels are a key element in the successful adoption, implementation, and eventual institutionalization of any innovation (Murray, 2009). AAT may be viewed as an innovation in therapeutic practice. To

properly diffuse an innovation, Rogers (2003) designated four required main elements: the

innovation must exist, communication channels must properly diffuse the innovation, time must

pass by which the innovation may be tested and practiced, and the social system influences the

adoption of the innovation. Significant barriers exist for successful implementation of this

innovation: confusion and varying attitudes; the limited number of studies providing empirical

evidence on the efficacy of AAT; and the lack of clear, operational definitions and formal

procedures. investigating specifically how both the professional and public populations

understand AAT at present is crucial to improving proper communication and diffusion.

Extension of the Literature: Impact of Personal Factors on Perception of AAT

As AAT lacks widespread scientific evidence, it may be conceptualized as a form of

complementary and alternative medicine (CAM). Examples of CAM interventions include

acupuncture and chiropractic adjustments. Studies of CAM interventions have shown the impact

of personal factors on who is more likely to use CAM interventions, including personality traits

and degree of subjective distress. Specifically, openness to experience and agreeableness have

been related to increased willingness to use CAM interventions (Sirois & Purc-Stephenson,

2008; Smith et al., 2008). Further, indices of subjective distress have been related to increased

health-seeking behaviours (Rickwood & Brathwaite, 1994; Thomas et al., 2013; Vogel & Wei,

2005). Increased distress has been related to increased use of CAM interventions (Lengacher et

al., 2006; Rhee & Harris, 2016).

Purpose of the Present Study

The present study aimed to explore how AAT with dogs is understood and perceived in

Canada by health care professionals and the general population. This study also investigated the

impact of personality and subjective distress factors on the perception of AAT with dogs among both populations.

The understanding and perception of psychotherapy was measured for health care professionals and the general population. There are numerous forms of psychotherapy, some of which are considered evidence based. Other therapeutic modalities exist which lack sufficient evidence supporting their efficacy. To distinguish any distinct differences in the understanding and perception of AAT compared to psychotherapy, both were measured in this study.

The present investigation was the first known study to examine the understanding and perceptions of AAT with dogs in a Canadian population, to examine the understanding and perceptions of AAT specifically with dogs among individuals in the general population, and to consider the impact of personal factors in the perception of AAT for the public and health care professionals.

Method

Mixed-Methods Research Design

This study employed a concurrent nested mixed-methods research design in which qualitative data were gathered to expand upon the quantitative data by providing contextual information (Hanson et al., 2005). The data were collected concurrently. Greater priority was given to the quantitative data, and the qualitative data were utilized to provide contextual information and a broader perspective.

Participants

Health Care Professionals and the General Public

Participants were required to reside in Canada. Participants in this population were health care professionals identified as health care practitioners by the Canadian Institute for Health

Information (CIHI) and were likely to either utilize AAT in their services or recommend AAT to

a client as a form of treatment. Identified health care professionals included physicians,

occupational therapists, social workers, psychologists, psychotherapists, and recreational

therapists (CIHI, 2001). Participants from the public were adults (age 18+). Based on an *a priori*

power analyses and to account for attrition and missing or unusable data, we attempted to recruit

120-160 participants from each population. The final sample size for the health care population

was 107 and for the general population was 153. Demographic and relevant background

information for both samples can be found in Table 1. Of the 153 participants from the general

population, 96 (62.7%) indicated they were currently seeking psychological treatment and 134

(87.6%) had sought treatment in the past.

Measures

Attitude Toward Dogs

Three measures were used to assess attitude toward dogs for both populations: **Coleman**

Dog Attitude Scale. (C-DAS; Coleman et al., 2016). **Pet Attitude Scale. (**PAS; Templer &

Arikawa, 2011). **Pet Relationship Scale.** (PRS; Lago et al., 1988).

Personality Dimensions

All participants completed the **Big Five Inventory** (BFI; John et al., 1991; John et al.,

2008) to assess their agreeableness and openness to experience.

Subjective Distress

Participants in the general population sample completed the **Kessler Psychological**

Distress Scale (K10; Kessler et al., 2003).

Understanding and Perceptions of Psychotherapy

Both populations completed a survey adapted from Matas (2012) intended to capture

understanding and perception of psychotherapy.

Understanding and Perceptions of AAT

Health Care Professional Population and General Public Population- Quantitative and Qualitative Questions. Participants completed a survey adapted from Matas (2012) (see Table 2). For both populations, qualitative items were added to provide contextual information (Black et al., 2011).

Procedure

The study was advertised as an investigation into how psychotherapy is understood and perceived as opposed to specifically referencing AAT in the title. This was to prevent potential selection biases based on participants' existing attitudes and/or relationship with dogs (e.g., to avoid having only dog owners participating). Participants were recruited online and invited to take part in the study via an advertisement containing a web link to an online Qualtrics survey. A professional page controlled by the primary investigator was created on both Instagram and Facebook containing the project advertisement and a link to the survey. Upon opening the survey, participants chose whether they were completing the survey as a health care professional or as a member of the public, at which time they were directed to the correct survey. As compensation after completion of the survey, participants were given the option to enter a draw for one $100 Amazon gift card. This study was approved by the University's Research Ethics Board.

Results: Quantitative Data

Approach to Data Analysis

Quantitative data from both populations were analyzed using the Statistical Package for Social Sciences (SPSS) version 27.0. Items intended as validity checks were inserted into the CDAS, BFI, and Understanding and Perceptions of AAT scales to evaluate random or inattentive responding.

Prior to analysis, the data were examined for missing values. Little's MCAR test was not significant for either the health care professional population, $p = .737$, or the general population, $p = .145$, indicating that values were missing completely at random. Less than 0.01% of all possible values were missing in each population. The percentage of cases with missing values for each item ranged 0 to 3.7% for the health care professional population, and from 0 to 4.6% for the general population. Expectation maximization was used to replace all missing values given that when a very small proportion of the data is missing, similar results are produced from almost any procedure to replace missing values (Tabachnik & Fidell, 2007).

Health Care Professional Population

Descriptive statistics were examined for each variable used in analyses (Table 3) to check for univariate outliers, identified by standardized values (z-scores) greater than |3|. A total of eight outliers were identified across all measures, and they were reduced using Winsorization (Tabachnik & Fidell, 2007). Because some variables were not normally distributed (see below), we also used the standardized Median Absolute Difference (sMAD) method of identifying outliers (see Rousseeuw & Croux, 1993). This method identified the same cases as outliers for each variable except Animal Assisted Therapy Familiarity. However, Winsorizing values that

exceeded the cutoff of +/- 3 sMAD units did not result in any changes affecting the interpretation

of findings -- i.e., values of correlation coefficients were slightly different, but the pattern of

significance was the same. The correlations reported for the health care professional sample is

based on correlations derived from Winsorizing cases based on z-values for normally distributed

variables and sMAD for non-normally distributed variables.

Table 1
Sociodemographic Characteristics: Health Care Professional and General Population

Characteristic	Health Care Professionals		General Population	
	n	*%*	*n*	*%*
Gender				
Female	93	86.9	126	82.4
Male	9	8.4	8	5.2
Non-binary	4	3.7	14	9.2
Non-binary man	0	0.0	1	0.7
Transgender Man	1	0.9	1	0.7
None/Agender	0	0.0	3	2.0
Province				
Alberta	22	20.6	21	13.8
British Columbia	12	11.2	22	14.5
Manitoba	3	2.8	11	7.2
New Brunswick	0	0.0	3	2.0
Newfoundland and Labrador	3	2.8	5	3.3
Nova Scotia	7	6.5	8	5.3
Ontario	51	47.7	70	46.1
Quebec	4	3.7	7	4.6
Saskatchewan	4	3.7	4	2.6
Yukon	0	0.0	1	0.7
Ethnicity (check all that apply)				
Arab/West Asian	3	2.8	2	1.3
Caribbean	0	0.0	1	0.7
Caucasian	79	73.8	110	71.9
East Asian	4	3.7	12	7.8
European	18	16.8	33	21.6
Indigenous	5	4.7	8	5.2

South Asian	5	4.7	6	3.9
South/Central American	0	0.0	3	2.0
Other: Central Asian	1	0.9	0	0.0
Other: Metis	1	0.9	0	0.0
Highest Educational Level				
High School	0	0.0	46	30.3
College Degree	11	10.3	31	20.4
Bachelor's Degree	24	22.4	54	35.5
Master's/Professional Degree	65	60.8	17	11.2
Doctorate Degree	6	5.6	4	2.6
Other: Post-Doctorate	1	0.9	0	0.0
Current Profession*				
Physician	7	6.5		
Nurse Practitioner	2	1.9		
Psychologist/Psychotherapist	30	28.0		
Social Worker	30	28.0		
Counsellor	29	27.1		
Recreational Therapist	4	3.7		
Occupational Therapist	5	4.7		
Current Professional Setting*				
Inpatient Hospital	5	4.7		
Outpatient Setting	27	25.2		
General Hospital	3	2.8		
Campus Clinic	2	1.9		
Campus Counselling	2	1.9		
Private Practice	37	34.6		
Other	31	29.0		
Theoretical Orientation*				
CBT	6	20.0		
EFT	2	6.7		
Humanistic	2	6.7		
Psychodynamic	3	10.0		
Integrative	13	43.3		
Other: Solution-Focused	1	3.3		
Other: Somatic	3	10.0		

* Only asked of Health Care Professionals

Table 2
Background Experience with AAT for Health Care and General Population

Characteristic: *Health Care Professionals*	n	%
Currently own a Dog		
Yes	52	48.6
No	55	51.4
Afraid of Dogs		
Yes	4	3.74
No	102	97.2
Prefer not to say	1	0.94
Training in AAT with a Therapy Dog		
Yes	5	4.67
No	102	97.2
Administered AAT with a Therapy Dog		
Yes	6	5.61
No	101	94.39
Recommended/Referred a Patient for AAT with a Therapy Dog		
Yes	17	15.89
No	81	75.7
Recommended/Referred to AAT with other animals	9	8.41
If Recommended/Referred to AAT with other animals, specify		
Horse	8	7.48
Other Farm Animals	1	0.94

Characteristic: *General Population*	n	%
Currently own a Dog		
Yes	53	34.6
No	100	65.4
Afraid of Dogs		
Yes	11	7.2
No	139	90.8
Prefer not to say	3	2
Received AAT with a Therapy Dog		
Yes	9	5.9
No	138	90.2
Received AAT with other animals	6	3.9
If received AAT with other Animals, Please Specify		
Cat	3	2
Horse	3	2

Recommended/Referred to AAT by a Health Care Professional		
Yes	4	2.6
No	146	95.4
Recommended/Referred to AAT with other animals	3	2
If Recommended/Referred to AAT with other animals, specify		
Cat	2	1.3
Horse	1	0.7

Table 3

Descriptive Data for All Measures: Health Care Professional Population

Variable	*N*	Range	*M*	Median	*SD*	Cronbach's α
AAT-A	107	12.00 – 30.00	21.52	22.00	4.63	0.74
AAT-F	107	6.00 – 15.00	8.95	9.00	2.10	0.79
BFI-A	107	27.00 – 45.00	36.46	36.00	4.50	0.70
BFI-O	107	27.00 – 50.00	39.16	39.00	5.72	0.76
CDAS	107	57.00 – 120.00	100.08	102.00	16.31	0.96
PAS	107	49.00 – 126.00	100.40	102.00	17.25	0.90
PRS	107	33.00 – 88.00	64.02	64.00	11.57	0.91
TH-A	107	12.00 – 33.00	22.96	23.00	3.93	0.72
TH-F	107	4.00 – 15.00	11.26	12.00	3.12	0.71

Note: AAT-A = Animal Assisted Therapy - Attitudes Subscale; AAT-F = Animal Assisted Therapy – Familiarity Subscale; BFI-A = Big Five Inventory – Agreeableness Subscale; BFI-O = Big Five Inventory – Openness to Experience Subscale; CDAS = Coleman Dog Attitude Scale; PAS = Pet Attitude Scale; PRS = Pet Relationship Scale; TH-A = Psychotherapy – Attitudes Subscale; TH-F = Psychotherapy – Familiarity Subscale

Each variable was assessed for linearity and normality by evaluating scatter plots,

histograms, the Shapiro-Wilk (*SW*) statistic, and the values of skewness and kurtosis. Scores for

the AAT-A, BFI-A, BFI-O, PRS, and TH-A variables approximated the normal distribution, and

the *SW* statistic was not significant (*p*'s > .08). The *SW* statistic was significant for all remaining

variables (AAT-F, CDAS, PAS, TH-F; *p*'s < .05). However, for these variables the plots

approximated the normal distribution, skewness values were within the acceptable range of ±2,

and kurtosis values were within the acceptable range of ±3. Further, transformations applied to

these variables did not result in improvements on any metric. Consequently, non-transformed

values were used for each of these measures in all analyses.

Attitude toward dogs and perception of AAT were significantly positively correlated,

r=.42, *p*<.001 (see Table 4). Contrary to hypotheses, openness to experience and perceptions of

AAT were not significantly positively correlated, *r*=.05, *p*=.61. Similarly, agreeableness and

perceptions of AAT were not significantly positively correlated, *r*=.08, *p*=.39.

Table 4

Intercorrelations Between All Study Variables: Health Care Professional Population

Variables	1	2	3	4	5	6	7	8
1. AAT-A	-							
2. AAT-F	.21*	-						
3. BFI-A	.08	.18*	-					
4. BFI-O	.05	.14	.16	-				
5. CDAS	.42**	.23*	.04	-.003	-			
6. PAS	.46**	.16	.08	.06	.75**	-		
7. PRS	.24*	.19*	.01	.03	.63**	.61**	-	
8. TH-A	.22*	.13	.04	-.05	.10	.01	-.06	-
9. TH-F	.17	.13	.09	.11	-.01	-.01	-.06	.67**

Note: *p<.05, **p<.01, N=107
AAT-A = Animal Assisted Therapy - Attitudes Subscale; AAT-F = Animal Assisted Therapy –
Familiarity Subscale; BFI-A = Big Five Inventory – Agreeableness Subscale; BFI-O = Big Five
Inventory – Openness to Experience Subscale; CDAS = Coleman Dog Attitude Scale; PAS = Pet
Attitude Scale; PRS = Pet Relationship Scale; TH-A = Psychotherapy – Attitudes Subscale; TH-
F = Psychotherapy – Familiarity Subscale.

General Population

Consistent with the health care professional population, descriptive analyses were performed on each variable to check for univariate outliers, using z-scores greater than |3| for variables that met the assumption of normality and sMAD deviations greater than |3| sMAD units for non-normally distributed variables. In this sample the sMAD method identified an additional 27 outliers across the non-normal variables. Consequently, Winsorization for these variables was based on the sMAD method. A comparison of the two methods resulted in little change to the correlation coefficients. Correlations reported for this sample were based on Winsorizing outliers on cases based on z-values for normally distributed variables and sMAD for non-normally distributed variables.

Table 5

Descriptive Data for All Measures: General Public Population

Variable	N	Range	M	Median	SD	Cronbach's α
AAT-A	153	12.00-30.00	22.90	23.00	4.74	0.79
AAT-F	153	3.00-15.00	6.82	6.00	2.50	0.80
BFI-A	153	17.00-45.00	33.50	34.00	5.39	0.71
BFI-O	153	15.00-49.00	36.62	37.00	7.25	0.82
CDAS	153	51.00-120.00	103.87	110.00	17.27	0.96
K10	153	10.00-50.00	28.76	28.76	8.70	0.91
PAS	153	54.00-126.00	104.35	107.00	16.44	0.91
PRS	153	41.00-88.00	68.03	69.00	11.15	0.95
TH-A	153	15.00-29.00	23.28	23.00	2.78	0.78

| TH-F | 153 | 2.00-15.00 | 9.95 | 11.00 | 3.25 | 0.84 |

Note: AAT-A = Animal Assisted Therapy - Attitudes Subscale; AAT-F = Animal Assisted Therapy – Familiarity Subscale; BFI-A = Big Five Inventory – Agreeableness Subscale; BFI-O = Big Five Inventory – Openness to Experience Subscale; CDAS = Coleman Dog Attitude Scale; K10 = Kessler Psychological Distress Scale; PAS = Pet Attitude Scale; PRS = Pet Relationship Scale; TH-A = Psychotherapy – Attitudes Subscale; TH-F = Psychotherapy – Familiarity Subscale

As with the health care population, the level of measurement assumption was met as the variables in this study are continuous. Lastly, each variable was assessed for linearity and normality by evaluating histograms, the Shapiro-Wilk (*SW*) statistic, and the values of skewness and kurtosis. Scores for the BFI-A, BFI-O, K10, and TH-A variables approximated the normal distribution, and the *SW* statistic was not significant (p's > .05). The *SW* statistic was significant for all remaining variables (AAT-A, AAT-F, CDAS, PAS, PRS, TH-F; p's < .05). However, for these variables the plots approximated the normal distribution, skewness values were within the acceptable range of ±2, and kurtosis values were within the acceptable range of ±3. Further, transformations applied to these variables did not result in improvements on any metric.

Attitude toward dogs and perception of AAT were significantly positively correlated, $r=.52$, $p<.001$ (see Table 6). Subjective distress and perceptions of AAT were not significantly positively correlated, $r=.06$, $p=.44$. Similarly, openness to experience and perceptions of AAT were not significantly positively correlated, $r=.09$, $p=.29$. Lastly, agreeableness and perception of AAT were significantly positively correlated, $r=.16$, $p=.05$.

Table 6

Intercorrelations Between All Study Variables: General Public Population

Variables	1	2	3	4	5	6	7	8	9
1. AAT-A	-								
2. AAT-F	.44**	-							
3. BFI-A	.16*	.07	-						
4. BFI-O	.09	.09	.08	-					
5. CDAS	.51**	.16	.13	.11	-				
6. K10	.06	.12	-.20*	-.16	.18*	-			
7. PAS	.55**	.25**	.26**	.04	.78**	.20*	-		
8. PRS	.44**	.19*	.22**	.02	.62**	.14	.68**	-	
9. TH-A	.20*	.04	.20*	-.05	.25**	-.05	.22**	.11	-
10. TH-F	.23**	.21**	.10	.13	.20*	.12	.23**	.11	.48**

Note: $^{*}p<.05$, $^{**}p<.01$, N=153
AAT-A = Animal Assisted Therapy - Attitudes Subscale; AAT-F = Animal Assisted Therapy –
Familiarity Subscale; BFI-A = Big Five Inventory – Agreeableness Subscale; BFI-O = Big Five
Inventory – Openness to Experience Subscale; CDAS = Coleman Dog Attitude Scale; K10 =
Kessler Psychological Distress Scale; PAS = Pet Attitude Scale; PRS = Pet Relationship Scale;
TH-A = Psychotherapy – Attitudes Subscale; TH-F = Psychotherapy – Familiarity Subscale.

Results: Qualitative Data

Approach to Data Analysis

To provide contextual information for understanding and perceptions of ATT by both

populations, content analysis was used to analyze participants' responses to the open-ended

questions.

Coding Procedures

The same coding procedures were used for each population. A subset of fifty responses to

the open-ended questions were randomly chosen from the full dataset. The subset of responses to

the open-ended questions was analyzed by a team of coders. Four undergraduate psychology

students were recruited and randomly assigned in pairs to either the health care professional or

the general public data set. The principal investigator coded all data from each population and

acted as a mediator for any discrepancies between the two coding teams.

Consistent with Kohlbacher (2006), each team of coders coded approximately 50% of the

dataset independently then met with their coding partner and the principal investigator. In this

meeting any differences in coding between coders were discussed to reach a conclusion. A

resolved code was reached by deleting the previously assigned codes that differed and deciding

on a mutually agreed upon code. After completion of this progress meeting, the coders

completed the data set then met to discuss the final codes and categories, using the same process

for deliberation and resolution.

Results of Qualitative Analysis: Health Care Professional Population

Table 7 contains the most frequent themes identified in response to the qualitative questions
regarding how the health care professional population understands and perceives AAT.

Table 7

*Qualitative Results: Perception and Understanding of Animal Assisted Therapy – Health Care
Professional Population*

Dimension	Category	Quote
Knowledge of AAT with dogs	A lot	"I have run AAT events with students on campus before while volunteering with an organization where I fostered and trained a dog guide."
	A moderate amount	"Attended colloquium on the topic at my university"
	A small amount	"I don't know much about it, but my understanding is the dog is present during

	Nothing	sessions to provide emotional support (i.e., petting)."
Perception of AAT with dogs	Positive/Could be Useful	"I think AAT with therapy dogs is an amazing therapy that has unbelievable benefits if done properly with the right population"
	Negative/Not Useful Neutral	
	Uncertain	"It has potential value but seems under-regulated"
Opinion on the Effectiveness of AAT with dogs as an Intervention	Yes/Effective	"Yes because depending on the reason for therapeutic services, dogs can assist people to feel safer and more connected. They can also provide secure attachments for those who may have not experienced any or limited others."
	No/Not Effective	"I have no basis for an informed opinion on this."
	Unsure	"I imagine it might be but I would want to see evidence before I knew what to believe"
	Potentially Effective	
Training in AAT with dogs	Formal Training	"Yes. Certification and experience."
	Informal Training	"Not officially but I have run therapy dog events before."
	Related Training	"I do have some experience with F.E.E.L. [equine therapy]"
	No Training	
Experience using AAT with dogs	Yes – Formally	"Yes, we use them whenever a dog is available. We don't have many around the small community"
	Yes – Informal Experiences	"I have brought a therapy dog in once a week on an informal basis and it was something that was looked forward to by the women."
	No Experience	

Would you use AAT with dogs?	Yes	"Yes, it is proven to aid in different mental and physical illnesses and identifying, triggers and early changes."
	Conditionally Yes	"If I read the research and was trained in evidence-based practice and one or more of my dogs was a fit, yes."
	No	
	Unsure	"Perhaps, only if evidence base becomes stronger."
Would you recommend AAT with dogs?	Yes	"I have done so, as I have seen changes in clients, for the better when exposed to the therapy dogs."
	Conditionally Yes	"Yes, I would, if it seemed to me that it fit their clinical issues and they love dogs."
	No	"No, this would fall outside the scope of my practice."
	Unsure	"I would need to learn about the benefits and risks prior to recommending this therapy."
Desired knowledge on AAT with dogs	**General Knowledge**	"Training programs. Breed recommendations. Potential tax benefits etc."
	Evidence and Research	"What the research has to say about effectiveness"
	Therapy Process	"I would want to know about practitioners who do this, their qualifications, how it exactly works with the animal, and about feedback from patients. I would also want to know information on what types of clients would be best suited for this therapy."
	Training/certification	
	Available programs	

Note: **Bold** indicates the most frequent category

Results of Qualitative Analysis: General Population

Table 8 contains the most frequent themes identified by the qualitative questions

regarding how the health care professional population understands and perceives AAT.

Table 8

Qualitative Results: Perception and Understanding of Animal Assisted Therapy – General
Public Population

Dimension	Category	Quote
Knowledge of AAT with dogs	General Knowledge	"I know that many people use dogs in their therapy because of the creation of a bond with a loving creature. I've seen that many dogs can be trained to comfort people."
	Limited Knowledge	"Very little! I'm aware that AAT can be helpful for some individuals with trauma and some that just connect with animals better than other humans. Beyond that, I have no idea the specifics of AAT or what benefits it specifically provides in certain situations."
	Nothing	
Perception of AAT with dogs	**Positive/Could be Useful**	"It is good. I've never been to AAT with therapy dogs (or any AAT), but it seems that it works well for some people."
	Uncertain	"I don't really have one? Dogs are very comforting so I guess I am open to the concept."
	Unsure	
	Conditionally Positive	"It can work but needs the dogs to be properly trained. Not all dogs can be assistance dogs"
Opinion on the Effectiveness of AAT with dogs as an Intervention	Yes/Effective	"I think dogs make most people (who don't have aversions) happy. I know of studies that show reductions in cortisol levels among people

	No/Not Effective	who pet dogs, even for only short periods of time."
	Unsure	
		"I've heard for physical issues, I have no idea about mental?"
	Potentially Effective	
		"It is effective, but not as the only form of intervention. Similar to the standard recommendation of equal parts medication and counselling services."
Experience using AAT with dogs	Yes – Formally	"Yes - my therapist had a trained therapy dog who accompanied at some appointments. He would stay near me and try to comfort me if I was overwhelmed."
	Yes – Informal Experiences	"Not formally, however I bring one of my dogs to my outdoor therapy sessions (not the one referenced above as the source of stress). I have found that I move more and do not freeze up during somatic scans as I otherwise do."
	No Experience	
Would you use AAT with dogs?	Yes	"Yes. I feel like it would be easier to talk to a therapist if there was a dog present."
	Conditionally Yes	"I would if it seemed appropriate, to my needs.
	No	"Probably not, but due to cost reasons…I perceive AAT to be more expensive than regular therapy, so I would not seek it out for myself."
	Unsure	
Would you recommend AAT with dogs?	Yes	"I would, because I think it can be helpful! It would depend on the person though - I wouldn't try to push it on someone who was uncomfortable."
	No	

		"I would not, only based on the fact that I don't know anything about it really. I'm very aware of the intricacies of many other forms of therapy, so I'd be far more inclined to recommend them."
	Possibly	
	Not Enough Knowledge	"I have no knowledge or experience either way, so I wouldn't necessarily recommend it, but I might tell them it's worth looking into."
Desired knowledge on AAT with dogs	**General Knowledge**	"Just more info about what it actually is, how it's applied, any data to back it up."
	Evidence and Research	"I would like to know whether it is evidence-based and whether other animals can do AAT."
	Therapy Process	"I'd like to know more about how dogs are chosen and trained for it, how effectiveness of intervention is evaluated, and how animal welfare is taken into consideration throughout."
	Training/certification	
	Available programs	"If any such service were available in any capacity I would want to know about it to refer people."

Note: **Bold** indicates the most frequent category

Discussion

Association between Attitude toward Dogs and Perception of AAT

In both populations, attitude toward psychotherapy was significantly positively associated with attitude toward AAT with therapy dogs: a positive attitude toward dogs and a positive attitude toward therapy are related to a positive attitude toward ATT with therapy dogs. However, it is important to note that the relationships among many of the study variables are in the small to medium effect size range and despite a positive correlation between attitude toward

dogs and attitude toward AAT with dogs, health care professionals largely did not reference dogs when stating their perception of AAT with therapy dogs. Should future research demonstrate efficacy of AAT with dogs, these findings may be valuable in determining for whom the intervention is best suited. Specifically, AAT with therapy dogs may be best suited for individuals who have positive attitudes toward dogs.

Association between Personality Traits and Perception of AAT

We hypothesized that in both samples openness to experience and agreeableness would be positively associated with perception of AAT with dogs due to the conceptualization of AAT as a form of CAM (Lilienfeld et al., 2020). These hypotheses were largely unsupported. Contrary to predictions, openness to experience was not significantly associated with attitude toward AAT with dogs in either sample. It is plausible that the lack of knowledge and understanding of AAT accounts for this lack of relationship, as evidenced by the qualitative responses from each population. Further, although AAT may meet criteria as a CAM, its lack of recognition as an intervention may impede forming an attitude or opinion.

In comparison, a positive association between agreeableness and perception of AAT was found in the public sample, but not among the health care professionals. It is worth noting that the correlation present for the general public was marginally significant at exactly $p=.05$. The lack of recognition and knowledge of AAT reported may also explain the lack of relationship between agreeableness and perception of AAT by health care professionals.

The differences in responses between the public and professional populations may be explained in the level of education obtained by each population. Specifically, approximately 67% of the health care professional population reported obtaining at least a master's or professional-

level degree compared to 14% of the general population. Differences in social background, such as level of education, have been associated with differing attitudes toward constructs in science and healthcare. Higher education is related to a more positive attitude toward science, as such perhaps despite level of agreeableness, the highly educated health care professional population may be less likely to perceive AAT positively due to the lack of scientific evidence. As the public may be less likely to rely on the presence of scientific evidence, being high in agreeableness may have influenced their perception in a manner not found in the professional population.

Association between Subjective Distress and Perception of AAT

We hypothesized that subjective distress would be positively associated with perception of AAT with therapy dogs in the public population. This hypothesis was not supported. This may be due to the lack of opportunity to form an attitude about AAT. Additionally, this lack of relationship may be due to a lack of content validity in the scale utilized to measure subjective distress. The K10 was chosen to assess psychological distress in this study due to its strong psychometric properties. The K10 assesses levels of psychological distress over the previous four weeks; it is possible that the scale did not account for level of distress at the time of participation (Kessler et al., 2003). Assessing more immediate distress may have provided a more accurate measure of current distress.

Further, although evidence has demonstrated increased help-seeking behaviours and increased willingness to use CAM methods are associated with increased distress (Lengacher et al., 2006; Rhee & Harris, 2016; Rickwood & Brathwaite, 1994; Thomas et al., 2013; Vogel & Wei, 2005), this may not extend to a largely unknown intervention such as AAT.

Understanding of AAT with Therapy Dogs

We hypothesized that both populations would have a limited understanding of the use of AAT with dogs. These hypotheses were supported by the qualitative responses. The knowledge disclosed by the health care professional population was limited largely to knowledge of a dog providing comfort for an individual in distress during a therapy session or in a stressful environment. Relatedly, the overwhelming majority reported no training or experience with AAT with dogs. These findings are consistent with those of Curtiss (2010) and Berget and colleagues (2008), who each found that professionals in their studies had little AAT knowledge or training. These findings are consistent with those of Matas (2012), who found that most psychologists had no familiarity with or limited knowledge of AAT. The public sample indicated knowledge limited to the use of dogs as service animals for mental health ailments. Those who did indicate knowledge of AAT with dogs referred largely to dogs being used to comfort children.

Despite the lack of knowledge, it was evident that both populations desired more information regarding AAT with therapy animals. Both populations expressed an interest in acquiring further general information about the intervention. The health care professional population indicated added interest in existing evidence and research on AAT; the public population expressed interest in this information but to a lesser degree. These findings are consistent with those of Black and colleagues (2011. Thus, these results indicate that the Canadian population, both professional and public, is uninformed about AAT yet is willing and interested in learning more about the intervention.

Perception of AAT with Therapy Dogs

We hypothesized that, due to the lack of evidence, both populations would be skeptical of the effectiveness of AAT with therapy dogs. These hypotheses were supported by the data received in the qualitative responses. When asked about perception of AAT with dogs and its effectiveness as an intervention, respondents in both samples reported uncertainty due to lack of knowledge. Both samples also reported conditionally positive attitudes toward the efficacy of the intervention but cited a lack of knowledge as their main hinderance to having a clear opinion. This perception appeared to extend to willingness to use, provide, or recommend AAT with dogs for treatment.

The health care professionals' skepticism was largely due to a lack of empirical evidence of the effectiveness of AAT. Many declined to express an opinion due to lack of knowledge on the subject. When considering whether they would refer a client for AAT with dogs or use AAT with dogs in their practice, most were conditionally willing. Specifically, participants reported a willingness to consider the intervention after receiving proper training and scientific research was provided.

These findings are consistent with those of other studies reporting that psychologists' knowledge of AAT was related to their endorsement of AAT with increased knowledge related to more favourable attitudes toward AAT as well as a positive attitude regarding the effectiveness of AAT being conditional on obtaining further information on procedure and efficacy (Black, et al., 2011 & Matas, 2012).

The public sample largely reported a positive attitude on AAT with dogs and regarded it as a potentially effective intervention. Participants in this population were open to considering

AAT with dogs as an intervention. Most cited the comfort a dog can bring as the primary

motivation for AAT. However, the public population was largely hesitant to recommend the

intervention to others due to the lack of knowledge.

These findings indicate a need for education about this intervention, an active interest in

the Canadian population to learn more about AAT, and for more research to be conducted to

demonstrate the efficacy of this intervention.

Strengths and Limitations of the Present Research

Research Strengths

This study had several strengths. Firstly, the mixed-method approach provided valuable

contextual information for the quantitative data. Secondly, the present study was the first to

investigate personal factors in relation to perception of AAT with dogs. And while all hypotheses

incorporating these variables were not supported, this study may serve as a first attempt to

identify factors which may influence suitability to administer and/or receive AAT with dogs.

Lastly, the eligibility criteria for each population were designed to maximize generalizability.

The public population survey was available to any individual over age eighteen; the health care

professional population survey was restricted to specific professions but was broadened beyond

psychotherapy and social. This broad eligibility criteria and country-wide sampling resulted in a

diverse demographic sample. Although most respondents from each population were in Ontario

(48% and 46% respectively), over half of respondents from each sample resided in other

provinces and territories across Canada. Ontario accounts for approximately 40% of the

population of Canada, so this regional distribution suggests a sample generalizable to that of the

Canadian population.

Research Limitations

This study also had several limitations. Namely, the measure used to assess subjective distress in the public population. As noted, limitations to content validity in the scale utilized may have negatively impacted the ability to assess a relationship between subjective distress and perception of AAT.

A further limitation is the lack of ethnic diversity among respondents. Although the sample from each population was geographically diverse, there was limited ethnic diversity with 74% of the health care professionals and 72% of the general public identifying as at least partially Caucasian. This limitation is a prominent concern as different cultures may have different perceptions of dogs, AAT, and healthcare overall.

Future Directions

The results of this study provide insight into the current understanding of AAT, specifically with dogs, among both professionals and the public in Canada. The results of this study suggest two broad conclusions: professional and public populations have limited understanding and awareness of AAT with dogs, and professional and public populations perceive AAT with dogs as potentially effective and are interested in receiving further information to form a stronger opinion.

Results of this study may be used to disseminate information on AAT. As the potential utilizers of AAT, health care professionals could benefit from detailed information on what AAT is and how it is administered, and from being provided with empirical evidence of the efficacy of AAT.

Information dissemination efforts are critical to further investigations into the efficacy of AAT with dogs. As stated, the diffusion of innovation theory demonstrates how integral successful dissemination is to the successful adoption of any innovation (Murray, 2009; Rogers, 2003). Recalling Rogers's (2003) four main elements for successful diffusion, communication channels must successfully diffuse the innovation before it may be tested and practiced. Further, Murray (2009) noted that an innovation may possess all other required characteristics and will fail to be adopted if proper communication does not occur. The results of the present study may highlight the need for proper communication and education of AAT before further diffusion may occur. Additionally, Rogers (2003) noted that scientific research is not sufficient to successfully communicate an innovation; both professional organizations and public populations must be educated about the innovation. By disseminating accurate information regarding the purpose, procedure, and evidence of AAT with dogs, this may increase chances of successful administration and utilization of ATT. Future studies may also incorporate personal factors to investigate the impact of such factors on treatment success, which may serve to identify the best candidates to utilize ATT.

Conclusion

This study demonstrated the need for proper education about AAT in both professionals and the public. Most participants in this study relayed that while uninformed about AAT, they want to learn more. Results also demonstrated the potential impact of personal factors on people's attitude toward AAT; people who have a positive attitude toward dogs may be better candidates for AAT than individuals with neutral or negative attitudes toward dogs. Further investigation is required to determine factors regarding who may be suitable to administer or receive AAT as well as need for further investigation of the efficacy of AAT. Research that

informs proper education of AAT is needed to maximize the validity and reliability of any future

clinical studies. Results of this study may be used to provide this education and customize it in a

manner that fits the needs of the target audience.

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