

St. Catherine University

**SOPHIA**

---

Master of Social Work Clinical Research Papers

School of Social Work

---

5-2015

## Animal-Assisted Interactions: Impacts for At-Risk Youth

Emily M. Axen

*St. Catherine University*

Follow this and additional works at: [https://sophia.stkate.edu/msw\\_papers](https://sophia.stkate.edu/msw_papers)



Part of the [Social Work Commons](#)

---

### Recommended Citation

Axen, Emily M.. (2015). Animal-Assisted Interactions: Impacts for At-Risk Youth. Retrieved from Sophia, the St. Catherine University repository website: [https://sophia.stkate.edu/msw\\_papers/416](https://sophia.stkate.edu/msw_papers/416)

This Clinical research paper is brought to you for free and open access by the School of Social Work at SOPHIA. It has been accepted for inclusion in Master of Social Work Clinical Research Papers by an authorized administrator of SOPHIA. For more information, please contact [amshaw@stkate.edu](mailto:amshaw@stkate.edu).

# Animal-Assisted Interactions: Impacts for At-Risk Youth

by

Emily M. Axen, B.A.

MSW Clinical Research Paper

Presented to the Faculty of the  
School of Social Work  
St. Catherine University and the University of St. Thomas  
St. Paul, Minnesota  
in Partial fulfillment of the Requirements for the Degree of

Master of Social Work

Committee Members  
Andrea Nesmith, Ph.D., LISW (Chair)  
Tanya Bailey, MSW, LICSW  
Jane Hurley Johncox, MSW, LICSW, LCSW

The Clinical Research Project is a graduation requirement for MSW students at St. Catherine University/University of St. Thomas School of Social Work in St. Paul, Minnesota and is conducted within a nine-month time frame to demonstrate facility with basic social research methods. Students must independently conceptualize a research problem, formulate a research design that is approved by a research committee and the university Institutional Review Board, implement the project, and publicly present their findings. This project is neither a Master's thesis nor a dissertation.

### Abstract

Animal-assisted interactions (AAI) have shown increasing promise in reaching at-risk youth.

Overview: This systematic review explores the biopsychosocial-spiritual impacts of AAI for at-risk youth through analyzing the existing body of empirical research in the field. Qualitative analysis of findings indicated three main themes identified as (1) “the human animal connection,” exploring the unique impacts of equine and canine partnership in treatment, (2) “a new sense of self,” describing internal benefits of AAI, and (3) “social impacts” or increased prosocial behavior in participants. Quality assessment ratings indicated need for additional research in the field; however, results indicate promising outcomes for at-risk clients.

*Keywords:* animal-assisted interactions, at-risk youth, equine, canine, impacts

### **Dedication**

I would like to dedicate this work to my husband, Kellen who has provided unyielding support and encouragement throughout this difficult process; and to my daughter, Kaitlyn, for continual hugs and kisses when I needed them most. To my dog Arnie, who inspired this project and demonstrated the unique love that can only be received from an animal, may you rest in peace.

And above all, to Jesus Christ who makes all things possible. Thank you!

### **Acknowledgments**

*Job 12:7 "But now ask the beasts, and let them teach you; And the birds of the heavens, and let them tell you."*

I would like to thank my Chair, Dr. Andrea Nesmith, who was supportive and encouraging as I completed this work. Her guidance and coaching enabled the completion of this project. I would also like to thank the members of my committee, Tanya Bailey and Jane Hurley Johncox for their guidance as they helped me refine my work.

## Table of Contents

<b>Introduction and Purpose Statement</b> .....	<b>8</b>
<b>Conceptual Framework</b> .....	<b>12</b>
<b>Methodology</b> .....	<b>14</b>
Research Design .....	14
Target Population .....	16
Inclusion Criteria .....	16
Search Strategy .....	17
Quality Assessment .....	17
Data Analysis Plan .....	18
Research Hypotheses .....	18
Study Selection .....	19
<b>Findings</b> .....	<b>20</b>
Quality Assessment Results .....	20
Study Characteristics .....	24
Thematic Analysis .....	26
Themes .....	27
<b>Discussion</b> .....	<b>37</b>
Overall Effectiveness of AAI .....	38
Implications for Social Work Practice .....	38
Study Limitations .....	39
Recommendations .....	40
<b>References</b> .....	<b>42</b>
<b>Appendices</b> .....	<b>47</b>
Appendix A: Data Abstraction Form .....	47
Appendix B: Data Abstraction Results .....	48
Appendix C: Selected Articles .....	49

**List of Tables**

**Table 1. Quality Assessment of Selected Articles.....23**  
**Table 2. Equine Interventions.....32**  
**Table 3. Canine Interventions.....34**

**List of Figures**

**Figure 1: Flowchart of Trial Process .....20**



## Introduction

In recent years, animal-assisted interactions (AAI) including equine-assisted activities and therapies (EAAT) have grown in popularity as alternative forms of treatment for children and adolescents have been implemented to treat a vast array of concerns. AAI refer to “services provided by trained professionals who practice within the scope of their education, training, licensure or accreditation, and who partner with specially-selected and trained adult, domestic animals to meet specific measurable outcomes for people” (T. Bailey, personal communication, May 7, 2015). AAI have been associated with increased well-being, with increasing empirical attention suggesting benefits for physical health as well as mental/emotional health (Parshall, 2003). Animal partners may include a variety of species, from cat to canine to equine and even dolphin (Cepeda, 2011; Chandler, 2005).

Despite recent popular and academic literary attention, AAI, including EAAT, are not a new option for treating emotional and behavioral concerns and a plethora of illnesses. Domestication of animals for a variety of purposes has been reported for over 12,000 years (Morrison, 2007) and continues today. The American Veterinary Medical Association reports that in 2012, 56% of the US population owned a companion pet. Not surprisingly, it has been publicly accepted that pets provide beneficial support to their owners (Fine, 2010).

Psychotherapeutic origins of animal-assisted therapy (AAT), including EAAT are highly contested amongst researchers, whilst the definition of “therapy” varies greatly. Early therapeutic usage in residential treatment dates back to 9<sup>th</sup> Century ACE in Belgium (Reynolds, 2012). Florence Nightingale is also cited for her early involvement of animals in treating the chronically sick (All, Loving, & Crane, 1999). Other reports include the use of animals with veterans beginning in the 1940s at Air Force Convalescent Hospital in Pawling, NY; specifically,

veterans experiencing fatigue and physical injuries were encouraged to interact with animals (Chandler, 2005).

In the 1950s, AAT was given public and professional recognition Dr. Boris Levinson after observing the therapeutic value of his dog in eliciting emotional processing in a child patient (Cepeda, 2011). His later research regarding the impact of animals as co-therapists within traditional psychotherapy and in promoting child development and prosocial behavior in the home led to continued strides in the field of AAT (Cepeda, 2011).

Equine-assisted activities and therapies (EAAT) have been shown to be particularly effective in the treatment of emotional and behavioral disorders (EBD) and mental illness, work with the developmentally disabled, work with at-risk foster youth, violence prevention programs, and trauma healing work, including treatment of post-traumatic stress disorder (PTSD) to name a few (Smith-Osborne & Selby, 2010; Casey, 2011; Ewing, MacDonald, Taylor, & Bowers, 2007).

PATH International, considered to be the “premier professional membership association” for EAAT, (formerly known as the North American Riding for the Handicapped Association), defines equine-assisted activities (EAA) as “any specific centre activity, e.g., therapeutic riding, mounted or ground activities, grooming and stable management, shows, parades, demonstrations, etc., in which the centre’s clients, participants, volunteers, instructors and equines are involved” (2014, p.1). EAA refers to both mounted and un-mounted activities with equines. Equine-assisted therapy (EAT) refers to “treatment that incorporates equine activities and/or the equine environment. Rehabilitative goals are related to the patient’s needs and the medical professional’s standards or practice” (PATH Intl, 2014, p.1). EAT specifically involves clinical interventions, which require partnership with medical or mental health professionals for the treatment of physical, emotional, and mental disorders, and includes equine-facilitated

psychotherapy (EFP) and equine-facilitated learning (EFL), whereas EAA may occur with non-clinically trained practitioners.

Two specific types of un-mounted interventions are equine-assisted psychotherapy (EAP), which emphasizes an experiential approach to traditional psychotherapy by integrating activities with horses and debriefing through emotional processing and narrative interventions, and equine-assisted learning (EAL), which focuses more on educational goals.

Statistics suggesting a need for additional and alternative support for at-risk youth, such as EAAT, are staggering. A recent University of Michigan study conducted in 2013 found that 22% of 12<sup>th</sup> graders reported having five or more alcoholic drinks in the past two weeks; 26% reported “using illicit drugs in the past 30 days” (Johnston, O'Malley, Bachman, & Schulenberg, 2013). A 2014 study by the Federal Interagency Forum on Child and Family Statistics found that 47% of youth in high school reported having sexual intercourse in 2011. Government statistics also report that “14 out of 1,000 childbirths were to females ages 15 to 17” in 2012 (Federal Interagency Forum on Child and Family Statistics, 2014, p. 1).

Not surprisingly, such statistical evidence of the prevalence of precarious behavior in today's youth suggests continued challenges for these future generations when unaddressed in childhood. Ewing et al. (2007) accurately states that “severe emotional disorders not curtailed in adolescence often [lead] to serious psychopathology in adulthood. Therefore, positive and effective interventions at the crucial adolescent stage are imperative to the emotional growth of the youths at risk” (p. 59). As such, it would appear time to address new methods of reaching these at-risk youth before it is too late and before today's youth become adults with severe emotional disturbance (SED) and/or criminal involvement.

Traditional psychotherapy or talk therapy, frequently implemented in treatment of SED, can be ineffective as youth often need creative, alternative approaches to treatment that may be more developmentally appropriate (Ewing et al., 2007; Malchiodi, 2008). Accordingly, a possible answer to increasing social-emotional competence in at-risk youth and preventing serious mental illness and behavioral concerns later in life, is the use of EAAT (O'Connell, Boat, & Warner, 2009; Pendry, 2013).

EAAT interventions appear promising in the treatment of at-risk youth. Current research suggests EAAT interventions have been positively connected to adjustment in social and emotional functioning, as well as an increase in prosocial behavior (Pendry, 2013). Further, AAI, including EAAT, may prove effective for treatment in youth who struggle to connect with adults based on mistrust, as animal interactions may prove to be less anxiety-producing for children with social inhibitions (Ewing et al., 2007).

Existing EAAT literature suggests a unique bond between the child/adolescent and horse, as a change-agent. This bond or interaction has been attributed with increased physical functioning, increased communication, and enhanced personal skills, unique to the equine experience (Casey, 2011). In addition, the stature and unique "physical attributes of the horse" are known to solicit "respect," which often presents as an area of difficulty amongst at-risk youth (Ewing et al., 2007, p. 60). Benefits of EAAT may also include increased self-esteem and positive self-concept (Casey, 2011; Chandler, 2005). Skillfully described, Liberty Counseling describes the benefit of the equine experience as the following: "Our equine companions offer immediate, honest and unbiased feedback as you interact with them and begin to increase your awareness of your own thoughts, feelings, words, and actions" (Victory Therapy Center, N.D.)

EAAT has also been suggested to aid in improving problem-solving skills and teamwork as a result of the animal-human bond (Casey, 2011).

In conjunction with other mental health professionals, social workers have been cited as employing AAI, including EAAT, in clinical practice with youth through “addressing predominately the lived experience and psychosocial aspects of EAA” in research and practice (Smith-Osborne & Selby, 2010, p. 293). However, studies comparing clinical implementation, methodology, and significant impact on youth is limited, suggesting need for further research including a systematic review of the literature.

Existing literature suggests a wide variance in setting, stipulations, methodologies, and bio/psycho/social/spiritual effectiveness of EAAT (mounted and un-mounted), as well as other AAIs for at-risk children and adolescents. Consequently, this study will seek to systematically examine the literature and effectiveness of various EAATs, mounted and un-mounted, versus other AAIs (involving non-equine animals) in treating conditions that exist within at-risk youth. Research will also seek to identify the unique factors related to AAI that may contribute to significant results, such as setting (indoor versus outdoor; school versus ranch, etc.), therapist description, voluntary versus involuntary nature of participation, and intervention duration. The study will seek to determine gaps within the literature, as well as seek to educate providers and interested parties in the availability and appropriateness of fit of a variety AAIs with at-risk youth.

### **Conceptual Framework**

In considering treatment options for at-risk youth, biopsychosocial-spiritual factors must be identified when implementing AAI, including EAAT. It is through the biopsychosocial-spiritual lens that the effectiveness of AAI, primarily EAAT, will be reviewed. The basic

premise of the biopsychosocial-spiritual model is the belief that biological, psychological, social, and added spiritual factors contribute to the causation and manifestation of illness, including mental health, and must also be considered in both treatment and health assessment. Thus, in practice, it is important to remember that “physical and psychological health and well-being are multifactorial” (Boundless, 2014).

Formulated by George Engel in the early 1950s, the biopsychosocial model laid the ground work for a radical shift of approach to the traditional medical model of healing, which focused primarily on the biological (Dowling, 2005). Engel’s model is a holistic approach and encourages practitioners to instead “attend simultaneously to the biological, psychological, and social dimensions of illness” (Borrell-Carrió, Suchman, & Epstein, 2004, p. 576). Through Engel’s model, additional attention became focused on the relationship between patient and clinician, as well as patient’s subjective experience (Borrell-Carrió et al., 2004).

Engel’s theory relied heavily upon system’s theory thus negating traditional biomedical models that initially dehumanized subjects for the sake of diagnosis (Engel, 1980). In the words of Engel (1980), “nothing exists in isolation;” therefore, attributing diagnosis solely based on organic functioning ignored essential components of the diagnostic and treatment process (p. 537).

As such, Engel’s biopsychosocial approach frees the practitioner to “move beyond the problematic issue of mind-body duality by recognizing that knowledge is socially constructed” (Borrell-Carrió et al., 2004, p. 581). Biological causation cannot be attributed to all deemed problems in medical or behavioral health. Social factors and psychological impact must also be assessed.

Continued research later went onto include spirituality as a valid and applicable clinical framework, which was added to the former approach. Specifically, the 4th edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV) added an axis code for spirituality or religiosity in 1994, demonstrating clinical significance within mental health conceptualization and also as a healing or coping mechanism to presenting problems, for measurement of problem-solving impairment, and as a motivating factor (Hall, Tisdale & Brokaw, 1994, via de Vries-Schot et al., 2008).

Existing literature points to several conceptual frameworks that have been utilized in research related to AAI, including EAAT. These include, but are not limited to, the following: 1) feminist theories in the use of equine-assisted psychotherapy (EAP) with delinquent girls (Foley, 2008), 2) Bowlby's Attachment Theory and the impact of equine-facilitated psychotherapy (EFP) for the treatment of individuals with mental illness (Zilcha-Mano, Mikulincer, & Shaver, 2011), 3) systems-oriented theory examining AAI and the human-animal bond (Walsh, 2009), and 4) Smith-Osborne's and Selby's study examining the biopsychosocial effectiveness of EAAT, which inspired this study. However, no existing literature has specifically reviewed the biopsychosocial-*spiritual* effectiveness of EAAT, mounted versus un-mounted and other AAI, as is the aim of this study. As such, this framework would seem appropriate due to the increase in literature on AAI and need for continued analysis, considering predominance of the biopsychosocial-spiritual model in practice as an accepted framework for clinical social work.

## **Methodology**

### **Research Design**

The purpose of this study was to examine the existing literature on AAI, including EAAT to determine most effective modalities for treatment amongst at-risk youth. A systematic review

of the literature was employed to synthesize and evaluate results and findings of existing studies in relation to the proposed research question. According to the Agency for Healthcare Research and Quality (N.D.), a systematic review of the literature is defined as “a critical assessment and evaluation of all research studies that address a particular clinical issue,” which includes specific criteria to organize and collect findings. Measures to ensure quality and accurate reporting are also required, which for the purposes of this study were managed through adhering to predetermined procedures outlined below, including, but not limited to the use of peer-reviewed articles, use of a diverse sample base, and committee review by experienced professionals in the field of social work. Grey literature and unpublished articles were not included in order to decrease bias and ensure quality of findings otherwise published by non-systematic reviews of the literature.

Use of the chosen research design was intentional due to the lack of attention within the literature comparing modalities for treatment with existing EAAT and other AAI (primarily involving canines). Accordingly, this study aimed to determine overall biopsychosocial-spiritual effectiveness of interactions in relation to diverse population of at-risk youth. This study also identified which modes of EAAT, or other AAI, may be most effective for specific sub-groups within the overall “at-risk” youth population. Additionally, setting (i.e. school-based), program duration, sampling criteria, therapist qualification (i.e. LICSW), as well as animal or program delivery training (i.e. Equine Specialist Certification with PATH, Int’l) were measured to define effects on outcomes with youth (see Appendix A outlining data abstraction criteria). Findings are now more readily available to interested clients and practitioners to reference for treatment options based on findings compiled by this study.



**Target Population**

The population that was examined for the purposes of this study was “at-risk” youth ages 0-17 due to the focus of existing literature on this topic. The term “at-risk” is broadly defined. For the purposes of this project, “at-risk” youth were considered as both individuals (e.g. developmentally disabled, mentally ill, or illiterate) and as part of the family system (e.g. low socioeconomic status or homelessness, parental illness or substance abuse), as well as at a mezzo level within the community (e.g. high crime neighborhood, impoverished area, problems related to racism) to determine “risk” factors.

**Inclusion Criteria**

Existing studies included for analysis were initially limited to peer-reviewed, empirical research, categorized as “peer-reviewed,” “scholarly research.” However, research reviewing validity of systematic review procedure suggests that eliminating research not classified as “peer-reviewed” may increase bias. In addition, limited publications exist relating to the study topic. For this reason, dissertations and theses describing empirical research were also included. No studies prior to the year 2000 were selected. Research overtly published outside of the United States or non-English language studies were also eliminated. However, measures were taken to ensure that culturally diverse populations were included for analysis. For this reason, one Canadian study was included based on its cultural perspective relating to First Nations and Inuit cultures and spiritual relevance to the study’s conceptual framework. Another Australian study was also selected based on study scope and quality. Population requirements excluded research studies that focused on adult interventions, as well as studies that surveyed practitioners versus client/patient participants, or populations that may not be considered “at-risk” due to protective

or socioeconomic factors. Samples studying the animal-client team were included. All chosen studies were required to pertain to the field of clinical social work.

### **Search Strategy**

Initial data abstraction plans required the use of the University of St. Thomas library “Summon” meta-database, which resulted in promising studies, but was suggested to be redundant and limited by the University Research Expert. For this reason, the following databases were utilized: Social Work Abstracts, SocINDEX with Full Text, PsychINFO (PsychNET), and Child Development & Adolescent Studies. Psychiatry Online was also searched, but eliminated based on inadequate results. Search terms included: “equine, horse, or horses,” AND “psychotherapy;” “animal assisted activit\*,” “animal assisted program\*,” “animal assisted therap\*.” Research strategy was guided by the University of St. Thomas librarian who specializes in research specific to the field of social work. The process was also reviewed by the Committee Chair. Preliminary database results were then compiled into RefWorks and reviewed online by hand based on title and abstract information to determine if inclusion criteria were met.

### **Quality Assessment**

According to Chapter 8 of “The Cochrane Handbook for Systematic Reviews of Interventions” (Higgins ed., 2011), “problems with the design and execution of individual studies of healthcare interventions raise questions about the validity of their findings; empirical evidence provides support for this concern.” In order to address research bias and determine validity of results, a quality assessment was conducted based on key design qualifiers. The researcher identified four areas of importance: sampling method, presence of a control group, number of participants, and statistical significance of results. Numeric quality ratings were assigned to each study based on the number of “yes” answers to the four criterion described

above. Scores were then tallied across these four criteria. One to zero indicated “poor” quality, two indicated “fair” quality, three indicated “good” quality, and four indicated “excellent” quality. Results are displayed on Table 1: Quality Assessment of Selected Articles (p.23).

### **Data Analysis Plan**

According to Monette, Sullivan, and DeJong (2011), qualitative data analysis allows researchers to derive meaning from through “idiographic explanations rather than nomothetic ones” (p. 432). Through inductive reasoning, the researcher allows concepts and themes to emerge from existing data sets, as in the current review, with careful attention to context.

Coding, defined as “the categorizing of observations into a limited number of categories” guides the analysis process (Monette et al., p. 434). Categories are formulated based on thematic connection. Measures were also taken to retain original language and meaning during the analytical process, including use of descriptive and pattern-based coding. Initial plans were to employ open coding systems. Monette et al. states that open coding may “expose relationships that may not have been obvious without open coding” (p. 439). Initial plans included reading through articles in succession with use of “field notes,” to notify potential relationships, themes, ideas, and theories within their contextual framework. A second pass would include highlighting key data to later be transferred to an electronic document and organized by meaning units or themes. Themes are then relayed to prior reviews of the literature and study purposes within the biopsychosocial-spiritual lens.

### **Research Hypotheses**

1. There will be a difference between the effectiveness of mounted verses un-mounted AAI for at-risk youth.

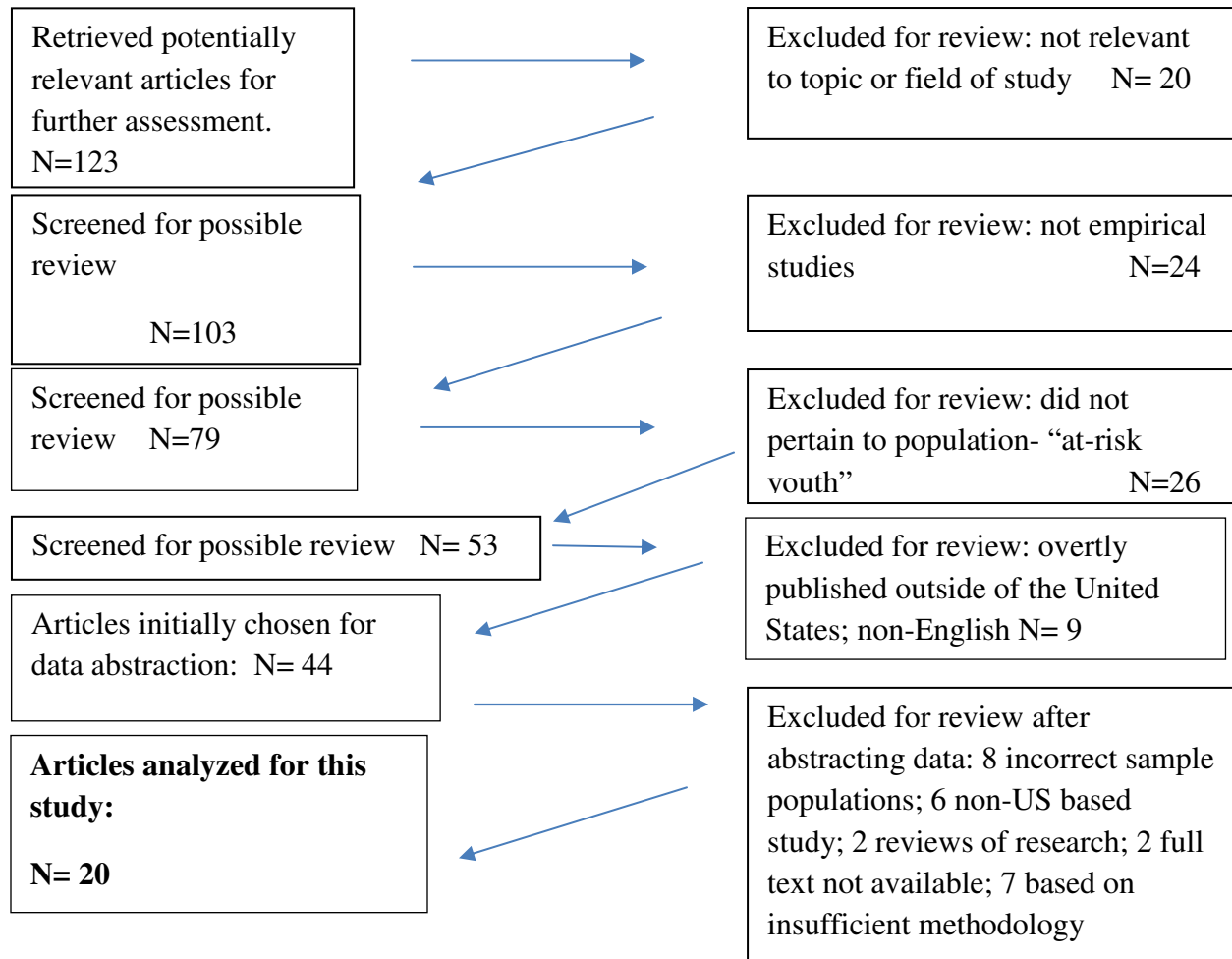
2. There will be a positive relationship between AAI intervention duration and impact of treatment.
3. Results will indicate primary AAI effectiveness demonstrated through increased pro-social behavior.
4. Therapist qualification and experience level may impact AAI program effectiveness.
5. HAI (human animal interaction) creates change.

### **Study Selection**

The search strategy aimed to identify all potentially relevant studies published by peer-reviewed journals, as well as those compiled by ProQuest Dissertations/Theses. Initial search term results yielded 123 results. Of these initial results, 20 were excluded after reviewing title and abstract due to irrelevant topic or field of study. Twenty-four articles were eliminated because they did not discuss empirical research, leaving 79 that were screened for possible review. In keeping with the research aims to address impacts of AAI for “at-risk youth,” another 26 studies were eliminated that pertained to adults ages 18 and older. Studies overtly published outside of the United States or non-English eliminated an additional nine, leaving 44 articles gathered and downloaded for data abstraction. Two reports that could not be downloaded in full-text were eliminated. Eight studies were eliminated after further examination results indicated that the population was professionals working with at-risk youth or youth that did not fit the criteria “at-risk”, versus clients interested in services. Six studies that were conducted outside of the United States were eliminated. Seven studies were eliminated based on insufficient methodology, as well as two reviews of the literature, leaving 22 articles identified for final data analysis. Seven studies were dissertations retrieved from ProQuest, while the remaining 14 were

described as “scholarly, peer-reviewed” per database description. See Figure 1 for a summary of the retrieval process.

Figure 1. Flowchart of trial process



## Findings

### Quality Assessment Results

Based on exploration of the four predetermined measures of article quality (sampling method, presence of a control group, number of participants, and statistical significance of results), overall study quality was determined to be low. Included studies were scored on a scale of one to four based on tallied number of “yes” answers to the proposed categories mentioned

above. One to zero indicated “poor” quality, two indicated “fair” quality, three indicated “good” quality, and four indicated “excellent” quality. Analysis indicated that the mean score was 1.4, indicating poor overall study quality. No studies obtained scores equivalent of “excellence” in design. Three studies (15%) were identified as “good,” two (10%) were “fair,” and eleven (55%) were “poor.”

#### **Sampling method.**

No selected studies utilized probability (random) samples; however, two studies did not clearly specify sampling means. The primary sampling strategy was purposive, convenience sampling based on availability of subjects. For this reason, sample grouping may not be representative of the overall population, “at-risk youth.”

#### **Control group.**

In experimental research, validity of treatment results may be increased by the presence of an experimental, as well as control group, which “does not receive the experimental stimulus” (Babbie, 2005, p. 231). Four studies out of 20 (20%) employed use of a control group to increase research reliability. As such, results of the remaining 16 studies do not control for impact of external factors.

#### **Number of participants.**

Fifteen out of 20 studies (75%) contained 15 or more participants within the study sample. Sample size ranged from 2-310. The mean sample size was 54.15 participants. The median was 18 participants. Based on low sample size, sampling error may be high.

#### **Statistical significance.**

Statistical significance indicates positive impact of intervention modality. Six out of 20 studies (30%) employed qualitative methods and were therefore unable to calculate statistical

significance of the results. Ten out of 14 studies (71%) demonstrated statistically significant results.

Table 1  
*Quality Assessment of Selected Articles*

No.	Criteria List	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	Random sampling	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	Control group	1	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0
3	15+ participants	1	1	0	1	0	1	1	1	1	0	1	0	1	1	0	1	0	1	1	1
4.	Statistical Sig.	1	1	1	1	n/a	n/a	1	0	n/a	0	0	1	1	0	n/a	1	n/a	n/a	1	1
	Total Rating	3	3	1	2	0	1	3	1	1	0	1	1	2	1	0	2	0	2	2	2

1=yes; 0= no Sig.= Significance; n/a= not applicable (qualitative study); Criteria number is assigned alphabetically to selected studies cited in Appendix F; Total Rating (number of “yes’ s”): 0-1=poor, 2=fair, 3=good, 4=excellent



## Study Characteristics

### **“At-risk” determinates.**

Inclusion criteria specified that eligible studies identified and treated the target population “at-risk” youth. The term “youth” referred to anyone between the ages of 0 to 18. Selected articles included participants ranged in age from 4-22. Because only “outliers” were over the ages of 18, two studies including participants ages 18-22 were included (Burgon, 2011; Maujean, Kendall, Lillian, Sharp, & Pringle, 2013). Another two studies used school grade level as a replacement for age; however, grade level indicated participants fit inclusion criteria (Sprinkle, 2008; Trotter, Chandler, Goodwin-Bond, & Casey, 2008).

Qualifiers of “at-risk” behavior or status were identified at individual, family systems, and mezzo levels.

Individual or *Micro* factors:

- mental health diagnosis (unspecified)
- Autism Spectrum Disorder (ASD)
- Attention Deficit with Hyperactivity Disorder (ADHD)
- Post-Traumatic Stress Disorder (PTSD)
- Oppositional Defiant Disorder (ODD)
- Depressive Disorders
- Emotional/Behavioral Disorder (EBD)
- Severe Emotional Disturbance (SED)
- cognitive impairment (low IQ)
- education deficit
- identified learning disabilities (LD)

- Traumatic Brain Injury (TBI)
- Cerebral Palsy (CP)
- low interpersonal/social functioning
- criminality
- insecure attachment
- adjustment concerns

Family systems qualifiers for “at-risk” youth were also identified, exemplified through participant trauma/abuse history, including witnessing inter-parental/familial violence, having at least one parent with substance abuse history, involvement of Child Protective Services (CPS) or the equivalent, low socioeconomic status (SES), and/or homelessness.

Mezzo level risk factors were not clearly included in participant descriptions within the selected studies. However, disparities between racial groups and people of low SES to fair treatment and access to resources *exist*, as evidenced by current media and historical systemic injustice and prejudice. For this reason, the assumption was made that included studies met criteria for mezzo-level risk factors, characteristic of “at-risk” populations.

### **Animal partners.**

Unique to the current study, was the significance of the animal partner as both member of the sample population and intervention team. For the current study, both equine and canine partners were examined, primarily focusing on EAAT. Analysis indicated that four of the 20 studies (20%) examined the unique impact of the canine-human bond. Sixteen of the 20 studies (80%) focused solely on equine-based interventions. One study examined impacts of equine-based interventions, as well as exposure to other AAI including dogs, cats, and other farm animals such as sheep, goats, chickens, and pigs.

Animal partners were referred to using primarily positive and egalitarian language. Canine and equine “partners” often served as “co-therapists.” Encompassing terminology included the following “pet-partner teams” (Bassette & Taber-Doughty, 2013) “therapy dog” (Bassette et al., 2013), “friends” (Dell et al., 2011- participant verbiage of equine partner), “calm presence” (Dell et al., 2011- participant verbiage of equine partner), “horse partner” (Hayden, 2005), and “pet practitioners” (Trotter et al., 2008). One study clearly referenced existing research, stating that “in EFP, both sides of the partnership are equal, with both client and equine having an advocate” (McCullough, 2012, p.10). Of the 20 studies reviewed, it would appear consistent that the *animals* are the “teachers” (Sprinkle, 2008).

Review analysis indicated that sample populations appeared representative of “at-risk” youth. Animal “teachers” or “co-therapists” served a primary role in interventions methods and appeared to have been respected partners in treatment based on reported findings and methods.

#### **Additional study characteristics.**

Detailed demographic and design data is available in Appendix C. Additional noteworthy themes related to design and methodology included significant use of pre-test/post-test design (11 studies out of 20, 55%), 1-2 hour average session length, and partnership with an experienced, “equine professional” throughout treatment for EAAT intervention.

#### **Thematic Analysis**

The purpose for information gathered was primarily to compile and examine the existing empirical literature pertaining to at-risk youth and the effects of EAAT, including other AAI. In addition to quality assessment and demographical reporting, qualitative analysis was employed to identify themes related to biopsychosocial-spiritual impacts and meaning.

Original open coding plans yielded a plethora of data, which required more focused coding methods related prior findings. Themes were color coded to track significance and reoccurrence. These were then transcribed to notecards and sorted by hand. Major descriptive and pattern-based themes were identified and described in relation to the research purpose. Minor themes that may be less impactful in this growing field of study are also briefly identified. Results are described in relation to the initial research hypotheses.

## **Themes**

### **Major themes.**

Three major themes were identified through open coding, which will be discussed in detail below. These three themes are identified as the following: (1) “Equine versus Canine Impacts: the Human-Animal Connection” (2) “New Sense of Self,” and (3) Social Impacts. Study quality on average was “fair” to “poor.”

### ***Theme 1: Equine versus Canine Impacts: The Human Animal Connection.***

While similarities were identified between all types of AAI, several reoccurring themes were identified that were unique to equine interventions and impacts of the equine-human relationship. Due to complexity, this theme was broken down into four sub-themes. The first two sub-themes are referred to as “calm” and “being-with.” A third sub-theme, deemed “physicality” was particularly evident in EAAT, but also identified in a case study measuring the impact of therapy dogs for treatment in children diagnosed with Autism Spectrum Disorder (ASD). The fourth sub-theme describes environmental impact, primarily intervention location. Finally, over-arching benefits of the animal-human bond are addressed.

*Calm presence.*

Participants often cited the effect of the calm presence of the horse and general relaxation associated with EAAT interactions. One study focused on treatment for solvent substance abuse reported participant's referring to the horses as a calm presence through treatment (Dell et al., 2011). Participants in this study recognized the impact of being "in the moment," experiencing the calm of both atmosphere and equine presence (Dell et al., 2011, p. 327). In a study of treatment for "delinquent" girls living in a residential treatment facility, participants referred to the horses as being "calm and loving;" find the program to be "relaxing and freeing" in contrast to institution life (Foley, 2009, p. 172). Similarly, participants diagnosed with comorbid disorders, substance abuse and mental illness, indicated that the horses provided a "peaceful" environment (Stiltner, 2014). Based on these examples, the calming effects of EAAT indicate possible effectiveness in the treatment of substance abuse and anxiety, which often require implementation of relaxation and calming exercises to manage restlessness, nervousness, and other somatic symptoms (i.e. sleep disturbance, muscle tension, etc.) associated with anxiety and/or substance withdrawal.

*Being with.*

The meaning unit, "being-with" was chosen to represent the expressed impact of the relationship and interaction between participant and equine. Described as "spiritual exchange," one study reported on the impact of "just being with the horses" as a change agent for at-risk youth (Dell et al., 2011, p. 327). "She will just want to be with them" stated the researcher (Dell et al., 2011, p. 327). Another study examined impacts for youth diagnosed with SED and low IQ reported illuminating qualitative feedback from observing staff. A female referred to as the "Victim" based on a history of trauma and abuse was said to have regained the ability to smile

after opening up based on interactions and emotional identification with her equine partner (Ewing et al., 2007). One participant wrote, ‘I can hide my emotions... horses can’t. They sense things’ (Dell et al., 2011, p. 329). McCullough (2012) refers to the impact of the “human animal bond,” in relation to the impact of just “being with” the horse throughout treatment. In a study of participants identified as suffering from EBD, teachers reported impact of “positive interactions with horses and staff” as a results of EAT, seeming particularly imperative for this at-risk population (Brouillette, 2006, p. 3).

*Physicality.*

Thirdly, coding procedures indicated the impact of the experiential component of EAAT, including other AAI, referred to as “physicality.” In several studies, females in particular were observed demonstrating “nurturance” or “caretaking” behaviors toward the horse (Dell et al., 2011 & Ewing et al., 2007). Males also benefited from the physical experience with the horse. Male participants were observed “hugging” the horse more often than females as a form of preferred interaction.

Similar themes of caretaking and affection were found in a program involving therapy dogs and treatment of ASD. A nine year old girl deemed unable to interact with peers finds friendship with a dog through brushing activities and talking to her canine companion (Solomon, 2010). A boy in the same study demonstrates caretaking and empathy for the service dog, also experiencing unique friendship and companionship through this unique bond (Solomon, 2010).

Due to the physical interaction and unique equine-experience, another researcher wrote that the horse served as an opportunity to address anatomy and broach issues of sexuality and healthy boundaries, particularly applicable for victims of sexual abuse (Dell et al., 2011). Deemed “authentic occurrence,” the study expressed the benefit of the unique experience for

many of the youth who had experienced unhealthy touch (Dell, 2001, p. 327). Through interactions with the animal, natural conversation and metaphorical express of trauma and healing occurred (Dell et al., 2011).

A qualitative report described additional experiential benefits for the “feral child,” referring to the experience of a child with severe developmental disabilities. In learning and participating through grooming her horse, the applicant learned to apply similar self-care tools to her own personal hygiene (Ewing et al., 2007). For participants dealing with substance abuse, the “hands-on approach” was a source of engagement and enjoyment (Stiltner, 2014).

Unique to the physicality of the equine experience, was the impact of the size and power of the horse. “She (the horse Duchess) kind of made me feel like, you know, I’m the queen of the world kind of thing because I was higher up,” stated one participant (Burgon, 2011, p.171). Addressing youth diagnosed with SEDs, a participant story is detailed of a boy diagnosed with severe Attention Deficit Hyperactivity Disorder who participated in EFL. “R” learns to trust “Dandy” (his equine companion) and instructor (Ewing et al., 2007). “Dandy” is described as “a rather large horse,” likely requiring substantial respect and self-awareness to ride (Ewing et al., 2007, p. 68). “R” in turn learns to follow directions and trust his instructor when feeling “out of control,” skills that were later transferred to his day to day life” (Ewing et al., 2007, p. 68).

#### *Environmental impact.*

Likewise, canine or other AAIs carry the benefit of experiential components; however, environmental benefits associated with EAAT, such as the ranch or farm setting may impact effectiveness. According to reviewed articles, EAAT often occurred outdoors or both indoors and outdoors, whereas canine-partnered interventions more often occurred indoors; three times out of four canine interventions occurred inside (the outlier had both an indoor and outdoor

component). However, based on discrepancies in sample and higher number of EAAT studies than other AAI within this review, data is insufficient to determine setting for other AAI and/or effects. Further research in this area is needed.

*Benefits of the human-animal bond.*

Regardless of species, the human-animal bond provides a unique opportunity in therapy with at-risk youth. The term “friend” is often used when describing the feelings of study participants toward the animal “co-therapist” (Dell et al., 2011; Ewing et al., 2007; Foley, 2009, etc.). Statistically significant results indicate positive change related to AAI, particularly for the treatment of trauma-related conditions including PTSD and EBD (Bachi et al., 2012; Bassette et al., 2013; Brouillette, 2006; Dietz et al., 2012; McCullough, 2012; Schultz et al., 2007, & Trotter et al., 2008). Experiential and physical opportunities to experience healthy touch and increase self-control likely contribute to AAI effectiveness for such at-risk populations. Additional details are available below (see Table 2. *Equine Interventions* and Table 3. *Canine Interventions*).



Table 2.

*Equine Interventions*

Study ID	Problem	Setting	Modality	Findings	Stat. Sig. Results	Rating
Bachi	SED	O	U-EFP	Stat. sig. increase in self-control; no stat. sig effect to self-image; trend of increase in trust and general life satisfaction; + long terms effects	Y	3
Brouillette	EBD	B	EAT	Staff reported increased “strength;” themes: participation, “responsible, building self-control, emotional insight, behavioral awareness, relationship skills, coping skills, + interactions with horses and staff; recounting experiences via fond stories;” improvement associated with attendance and participation in tx	Y	2
Burgon	Education Deficit, ASD, ADHD	O	U/M-EAL, EAT, TH	Themes: “confidence, self-esteem, a sense of mastery or self-efficacy, empathy, and the opening up of + opportunities;” “a commonality was of the horses appearing to be the ‘glue’ that motivated them to want to return and build up relationships with the horses, which then seemed to lead to other benefits.”	n/a	0
Dell	Solvent Sub. Abuse	B	U-EAL	“the presence of a culturally-relevant space in which the EAL program and its benefits are experienced;” 3 themes: “spiritual exchange,” “complimentary communication,” and “authentic occurrence”	n/a	1
Ewing	SED, low IQ	B	U/M-EFL	Qualitative results indicate + changes after participation in the program. “Victim” opened up to horse and discussed fears and anxieties and “was able to smile again” “Feral child”= learned how to groom self by grooming horse... and saw increase in social skills/overall functioning “Runaway”-gained ability to trust and no longer ran away... “Boost needed”-increased confidence and self-esteem and was able to move to mainstream	N	1
Foley	MI, “Delinquency”	?	M-EAP	Progress related to “empowerment,” improved “focus,” ability to manage emotions, and relaxation. Some + behavioral changes were reported. Other themes: decreased negativity, impact of horse and instructor, escape...	n/a	1
Hayden	MI	O	U/M-EFL	Major themes: enjoyable, challenge, better than previous treatment, talking is important, effective tx, horse as a metaphor, horse as a mirror, interactions with natural environment, required acts of helpfulness, role modeling (minor), mastery, positive relationships, communication skills (minor), coping skills, internal awareness	n/a	0
Maujean	“disengaged youth”	?	U/M-EFL	Themes: enjoyment, psychological and social benefits, engagement, transferrable skills, mechanisms of change	n/a	1
McCullough	Trauma, PTSD, MI	O	U/M-EFP	“Found that EFP can be an effective intervention for maltreated youth who experience PTSD-related sx.” “Human-animal bond	Y	1

				as it is exhibited in the client-equine connection during an EFP session can contribute to the effectiveness of the intervention.” “A relationship exists between a decrease in PTSD sx and an increase in human-animal bonding”		
Schultz	MI, Trauma	O	U-EAP	*all children showed an improvement in GAF scores *females showed sig. greater improvement than males *% of improvement = greater in those children with parents who had a substance abuse problem *improvement, but not stat. sig for sexual abuse of parent with a sub. abuse problem. *did not address long-term effects	Y	2
Sole	CP	?	U/M-EFT	No stat. sig. change	N	1
Stiltner	Dual Dx	?	EAP	Themes: de-institutionalizing effect of program and horse interaction, effective tx for MH and substance abuse, calm, horse as “distraction,” “hands on,” & enjoyment	n/a	0
Trotter	Behavioral, LD, Social/Adjustment Concerns	O	U/M-EAC	Participants drawn to horses with characteristics similar to their own. Stat. sig. decrease in - behaviors and a stat. sig increase in + behaviors.”	Y	2
Ward	Autism	?	M-TR	Decrease in sx of ASD following interaction; increased social communication as well as their attention, tolerance, and reactions to sensory input in the classroom.”	Y	2
Whitely	MI	O	U-EAP,EFP	7 major themes: (a) relationship skills, (b) emotional awareness, (c) responsibility, (d) self-control, (e) self-awareness, (f) self-concept, and (g) empathy. Overall= reduction in maladaptive behaviors and emotional symptoms	Y	2

\*Study ID= First listed author (see reference list); I= Indoor, B=Both (Indoor & Outdoor)

\*Stat. Sig. Results= Statistically Significant Results (Yes or No) Y= yes, N= no, n/a= not applicable; “+” indicates “positive;” “-“ indicates negative  
L= licensed, LP= Licensed Psychologist, RN= Registered Nurse, SW= Social Worker, LICSW= Licensed Independent Clinical Social Worker, EP= Equine Professional, DH= Dog Handler, P=Psychotherapist V= volunteer, T=teacher, Tr-trained, C= certified, A= accredited, MHP= mental health professionals, HCP= health care professional, AP=explicit that therapist **team** includes non-human animal partner  
Min= minutes; sx= symptom; tx = treatment

Table 3.

*Canine Interventions*

Study ID	Problem	Setting	Modality	Findings	Stat. Sig. Results	Rating
Bassette	EBD, LD	I	AAI	“all students experienced moderate to sig. improvements in on-task behavior” All = gains in on-task behaviors.	y	1
Dietz	Trauma: child sexual abuse	I	AAT	Most stat. sig. decrease for PTSD and depression; dogs with stories were the most effective! Regardless of group, “there was a trend for ethnicity as a predictor of posttest scores for the PTSD and sexual concerns posttest scores. African-American child associated with lower posttest PTSD scores... African-American child associated with higher posttest scores for sexual concerns... being a prior abuse victim and location = not predictors of any of the posttest scores	y	3
Solomon	ASD	B	AAI	Themes from 9-year-old girl: <ul style="list-style-type: none"> <li>• Able to interact with animals but not children</li> <li>• Increased ability to focus</li> <li>• Female demonstrates caretaking behavior toward the dog (brushing)</li> <li>• Increased social interaction- reassured another girl</li> <li>• Promotes conversation/socialization with peers</li> </ul> Themes from 13-year-old boy: <ul style="list-style-type: none"> <li>• Caretaking abilities and empathy for the dog (service dog)</li> <li>• Companionship and belonging</li> <li>• Friendship with an animal</li> <li>• Mutual like and acceptance</li> </ul>	n/a	0
Sprinkle	Violence prevention/character education	I	AAI	<ul style="list-style-type: none"> <li>• “levels of empathy increase as levels of aggressive behaviors and beliefs decrease”</li> <li>• females benefited more from participation based on decreased aggression</li> <li>• statistics showed a decrease in out-of-school suspensions for physically fighting</li> <li>• younger also achieved higher empathy, as did females and high SES</li> <li>• overall aggression scores decreased</li> </ul>	y	2

\*Study ID= First listed author (see reference list); I= Indoor, B=Both (Indoor & Outdoor)Min= minute

\*Stat. Sig. Results= Statistically Significant Results (Yes or No) Y= yes, N= no, n/a= not applicable

L= licensed, LP= Licensed Psychologist, RN= Registered Nurse, SW= Social Worker, LICSW= Licensed Independent Clinical Social Worker, EP= Equine Professional, DH= Dog Handler, P=Psychotherapist V= volunteer, T=teacher, Tr-trained, C= certified, A= accredited, MHP= mental health professionals, HCP= health care professional, AP=explicit that therapist **team** includes non-human animal partner

*Theme 2: New sense of self.*

Review findings indicated a plethora of data related to internal or emotional effects of AAI, deemed a “new sense of self.” Participants demonstrated increased “emotional awareness” (Sprinkle, 2008; Solomon, 2010; Whitely, 2010, etc.) and heightened “internal awareness” (Hayden, 2005). Decrease in related mental illness and behavioral deficit relate to AAIs, primarily the human-animal bond. An “attitude shift” was observed following EAAT (Foley, 2009) with increased positivity, and for clients with mental illness, observations and testing data found an “increase in life satisfaction” (Bachi et al., 2012).

AAI, including EAAT was found to be particularly effective as a trauma intervention. Analysis also indicated significant reduction in symptoms such as low self-esteem and fearfulness related to Post Traumatic Stress Disorder (PTSD) (Dietz et al., 2012, McCullough, 2012, & Schultz et al., 2007). Statistically significant findings in a study of youth suffering from mental illness and trauma-related disorders revealed “greater improvement in GAF scores after treatment than those who did not have a history of abuse and neglect” (Schultz et al., 2007, p. 268).

Specifically, participants demonstrated increased self-control, or “internal locus of control,” in both qualitative and quantitative reports (Bachi et al., 2012; Sprinkle, 2008, & Whitely, 2010, etc.). Examples included heightened focus, such as in the case of use of therapy dogs in a reading program for children in special education (Bassette et al., 2013), improved attention in children diagnosed with ASD (Ward et al., 2013), and statistical significant decrease in severity of behavior as measured by standardized testing instruments (Trotter et al., 2008), to name a few. Following treatment through AAI, participants exhibit empowerment, increased confidence, and new sense of self.

***Theme 3: Social impacts.***

In conjunction with internal/emotional benefits of AAI, review analysis specified consistent themes of positive social impacts with increase in interpersonal skills. Again, both quantitative and qualitative methods indicated positive shifts in participant behavior.

Children exposed to violence that participated in an in-school intervention with therapy dogs showed a statistically significant decrease in out-of-school suspensions related to physical fighting (Sprinkle, 2008). This finding was also supported by another study of children diagnosed with learning disorders and/or behavioral concerns, indicating statistically significant decrease in aggression score ratings. Decrease in aggressive behavior following treatment was supported across several article findings (Sprinkle, 2008; Whitely, 2010, & Foley, 2009).

Pattern-based coding indicated increased social communication skills and interaction following AAI in children diagnosed with ASD (Burgon, 2011; Solomon, 2010, & Ward et al., 2013). In a study using therapeutic riding, “positive impacts” were seen in the classroom; “specifically... teacher ratings indicated that participating children with autism improved their social communication as well as their attention, tolerance, and reactions to sensory input in the classroom” (Ward et al., 2013, p. 2195). According to Brouillette (2006), staff reports indicated that 83% of the students improved their emotional and behavioral self-control, relationship and social skills, and ability to consistently show empathy towards the horses or occasionally towards others” following treatment using EAT.

**Minor themes.**

Two minor, less significant themes will also be briefly touched on, which include “fun/enjoyment” and “distraction.” These themes may be less impactful in comparison to the

previously described benefits of AAIs; however, reoccurrence within qualitative reporting connoted importance as unique features of AAIs, as opposed to tradition “talk therapy.”

***Fun/enjoyment.***

As indicated by existing literature reviews, a common benefit of AAI is the capacity to engage youth due to the experiential, non-traditional nature of interventions. As such, it was not surprising that participants often cited benefits of AAI as interventions being “fun” or “enjoyable.” Based on interpretation of findings, 100% of included qualitative reports indicated participants use of the word fun or enjoyment, or verbiage indicating similar meaning.

***Distraction.***

Particularly in the treatment of substance abuse, equine interaction, in particular, was cited as a welcome “distraction” from thoughts of chemical use (Stiltner, 2014 & Dell et al., 2011). Interpretive analysis indicated other suggestions of EAAT as a “distractor” from mental health or other risk factors.

## **Discussion**

The goal of the research was to assess the existing literature on EAAT with regard to other AAI in order to determine the most effective modalities for treatment amongst at-risk youth. Analysis was conceptualized using the biopsychosocial-*spiritual* framework to determine effects and impacts of interventions. Thematic analysis supported the original hypothesis that HAI (human animal interaction) is vital in effecting change.

Original hypotheses citing mounted versus un-mounted AAI were not clearly specified in the selected studies, impairing conclusive analysis. Impacts related to treatment duration, therapist qualification, and training also proved inconclusive based on insufficient data and low study quality. Thematic analysis did support hypotheses related in to increase in prosocial

behavior following AAI, including EAAT, deepening effects to including internal as well as external benefits for at-risk youth. Undeniably, additional research is warranted in the field of AAI to support findings within the field.

### **Overall Effectiveness of AAI**

Of the 20 studies reviewed, 50% reported statistically significant, positive effects of AAI for “at-risk” youth sample populations. Mixed method studies that did not indicate statistically significant results, indicated positive change through qualitative measures, such as interview feedback or observations. Zero studies reported no observable impact, including one study that tested both pre-adolescents and adolescents in which findings indicated positive trends for pre-adolescents following EAAT (Sole, 2007).

“Qualitative analyses were illuminating,” as accurately put by one study (Ewing et al., 2007, p. 66). Results revealed positive themes related to increased prosocial behavior, internal locus of control, increased positivity, and high participant engagement. Longitudinal measures indicated lasting results, applicable to daily living.

Summative evidence from the 20 studies suggests that AAI, including EAAT, is an effective treatment for at-risk youth in producing positive change(s). No reoccurring themes identified significant determinates of “at-risk” populations that may benefit more or less than others from AAI.

### **Implications for Social Work Practice**

As professionals dedicated to social change and development, social workers have a responsibility to incorporate effective and alternative methods of treatment and engagement to prevent “at-risk” youth from developing into adults with SPMI, substance abuse, and criminality,

to name a few. Youth require stimulating and creative interventions, particularly when traditional interventions have failed.

AAIs, including EAATs, hold promising results and treatment interventions for populations that may not respond to traditional talk therapy or other commonly used interventions. Findings support benefits related to the human-animal connection described by some as a spiritual connection unique to AAIs. In addition, elements related to experiential components of AAIs, including EAATs, such as the size and response of the equine or impact of nature likely contribute to the change process and sustainable treatment benefits.

Further, AAIs promotes community engagement and relational connections that may affect mezzo and macro-level practice. Existing literature indicates need for “teamwork” between both professionals across varying fields of study and animal partners. As such, AAI promotes an interdisciplinary approach which is congruent with social work values and systemic approach.

However, access barriers in obtaining treatment are substantial based on animal availability, environmental limitations, and low numbers of practitioners trained and/or experienced in implementing interventions using AAI or other EAAT. Additional research to encourage funding supporting AAI, including EAAT is necessary to ensure growth and training opportunities for practitioners in this burgeoning field.

### **Study Limitations**

The current study identified several potential limitations mainly caused by the narrow scope of existing literature. Due to the lack of empirical research pertaining to AAI and at-risk youth, minor limitations were placed on study design, namely sample population must study two or more subjects. Poor design quality significantly impacts validity and reliability of results.



Table results are available for readers to make their own determination of the reliability and significance of study findings (see Appendix C). Also, based on assessment of poor quality of studies, results from this review were determined to provide insufficient evidence of intervention effectiveness for the target population. Researchers should also be aware of the impacts of bias from the inclusion of English-only publications, primarily published within the United States. Based on these limitations, findings indicate potential for additional study.

### **Recommendations**

Research findings indicate a strong need for further study related to this topic. Results indicate need for studies that examine longitudinal impacts of AAI with larger, more representative sample groups and increased use of control groups to rule out impacts of environment, therapist interaction, etc. Two studies indicated a trend in positive results reported by therapists and/or teachers involved in treatment, whereas client (and/or parent) response did not always concur (Brouillette, 2006 & Ward et al., 2013). Reasons for variance could include many factors, several of which could include practitioner/researcher bias, comprehension, and testing methods.

Comparison between AAI and other alternative interventions would also increase reporting reliability. Further study is needed to determine variables of change, i.e. setting, therapist personality, and so on.

Future studies should also seek to explore AAI impact for Asian Americans, based on lack of existing applicable literature. Only one article included in this study treated a minor percentage of Asian American participants (Sprinkle, 2008). Several studies indicated correlation between ethnicity and likelihood of positive outcome, indicating interesting areas for further research.

Based on this review, AAI, particularly EAAT, shows promising outcomes for “at-risk” youth population based on existing literature findings. Psycho-social outcomes reveal decrease in behavioral problems and increased emotional awareness for participants, as well as improved mental health. Trauma survivors and clients dealing with substance abuse, including dual diagnosis, may particularly benefit from experiential components.

Literature relating to AAI demonstrates trends in increased use and effectiveness for participants, which will hopefully continue. It is my hope that findings from this review will encourage researchers and funders to conduct more rigorous studies to continue to add to our understanding of the biopsychosocial-spiritual effects of AAT and EAAT for “at-risk” youth and other populations that may benefit from this growing field of study.

## References

- All, A. C., Loving, G. L., & Crane, L. L. (1999). Animals, horseback riding, and implications for rehabilitation therapy. *Journal of Rehabilitation*, 65(3), 49. Retrieved from [http://ezproxy.stthomas.edu/login?URL=http://go.galegroup.com/ps/i.do?id=GALE%7CA55816037&v=2.1&u=clic\\_stthomas&it=r&p=EAIM&sw=w&asid=8219ccbe9a280200ba793bfc92c0cb64](http://ezproxy.stthomas.edu/login?URL=http://go.galegroup.com/ps/i.do?id=GALE%7CA55816037&v=2.1&u=clic_stthomas&it=r&p=EAIM&sw=w&asid=8219ccbe9a280200ba793bfc92c0cb64)
- American Veterinary Medical Association. (2012). U.S. Pet Ownership Statistics. U.S. Pet Ownership & Demographics Sourcebook (2012). Retrieved from <https://www.avma.org/KB/Resources/Statistics/Pages/Market-research-statistics-US-pet-ownership.aspx>
- Babbie, E. (2005). *The basics of social research (3<sup>rd</sup> ed.)*. Belmont: Thomson-Wadsworth.
- Borrell-Carrió, F., Suchman, A. L., & Epstein, R. M. (2004). The Biopsychosocial Model 25 years later: Principles, practice, and scientific inquiry. *Annals of Family Medicine*, 2(6), 576-582. doi:10.1370/afm.245
- Boundless. "The Biopsychosocial Model." *Boundless Psychology*. Boundless, 03 Jul. 2014. Retrieved 12 Nov. 2014 from <https://www.boundless.com/psychology/textbooks/boundless-psychology-textbook/stress-and-health-psychology-17/models-for-positive-change-86/the-biopsychosocial-model-326-12861/>
- Casey, J.T. (2012). Horseback riding therapy for at-risk foster youth: A grant proposal. (Order No. 1493095, California State University, Long Beach). *ProQuest Dissertations and Theses*, 59. Retrieved from

<http://ezproxy.stthomas.edu/login?URL=?url=http://search.proquest.com/docview/866321097?accountid=14756>. (866321097).

- Cepeda, J. N. (2011). *Equine-assisted psychotherapy: A manual for therapists in private practice* (Order No. 3440790). Available from ProQuest Dissertations & Theses Full Text; ProQuest Dissertations & Theses Global. (847555777). Retrieved from <http://ezproxy.stthomas.edu/login?url=http://search.proquest.com/docview/847555777?accountid=14756>
- Chandler, C.K. (2005). *Animal assisted therapy in counseling*. New York: Taylor & Francis Group.
- Dell, C., Chalmers, D., Bresette, N., Swain, S., Rankin, D., & Hopkins, C. (2011). A healing space: The experiences of First Nations and Inuit youth with Equine-Assisted Learning (EAL). *Child & Youth Care Forum*, 40(4), 319-336. doi:10.1007/s10566-011-9140-z3/092229308X310759
- De Vries-Schot, M.R., van Uden, M.F., Heitink, G., & Pieper, J.T. (2008). Healthy religiosity and salutary faith: Clarification of concepts from the perspectives of psychology, psychiatry, and of theology. *Journal of Empirical Theology*, 21(1), 88-108. doi:10.116
- Engel, G.L. (1980, May). The clinical application of the Biopsychosocial Model. *The American Journal of Psychiatry*, 137(5), 535-544. Retrieved from <http://www.minitex.umn.edu>.
- Equine Assisted Growth and Learning Association, Inc. (EGALA). (N.D.). *What is EAP and EAL?* Retrieved from [http://www.eagala.org/Information/What\\_Is\\_EAP\\_EAL](http://www.eagala.org/Information/What_Is_EAP_EAL)
- Ewing, C.A., MacDonald, P.M., Taylor, M., & Bowers, M.J. (2007). Equine-Facilitated Learning for youths with severe emotional disorders: A quantitative and qualitative Study. *Child Youth Care Forum*, 36, 59-72. doi:10.1007/s10566-006-9031-x

Federal Interagency Forum on Child and Family Statistics. (2014). *America's Children in Brief: Key National Indicators of Well-Being, 2014*. Retrieved from

<http://www.childstats.gov/americaschildren/glance.asp>

Fine, A. H. (2010). *Handbook on animal-assisted therapy: Theoretical foundations and guidelines for practice*. San Diego: Elsevier/Academic Press

Foley, A. J. (2008). Conflict and connection: A theoretical and evaluative study of an equine-assisted psychotherapy program for at-risk and delinquent girls. (Order No. 3315784, University of Colorado at Boulder). *ProQuest Dissertations and Theses*, 257-n/a.

Retrieved from

<http://ezproxy.stthomas.edu/login?URL=?url=http://search.proquest.com/docview/287984607?accountid=14756>. (287984607).

"George Engel, M.D. (1913-1999)." *American Journal of Psychiatry*, 162(11), p. 2039.

Higgins, JPT. & Green, S. (editors). *Cochrane Handbook for Systematic Reviews of Interventions* Version 5.1.0 [updated March 2011]. The Cochrane Collaboration, 2011. Available from [www.cochrane-handbook.org](http://www.cochrane-handbook.org).

Johnston, L. D., O'Malley, P. M., Bachman, J. G., & Schulenberg, J. E. (December 18, 2013).

"American teens more cautious about using synthetic drugs." University of Michigan

News Service: Ann Arbor, MI. Retrieved from

[http://www.monitoringthefuture.org//pubs/monographs/mtf-vol1\\_2013.pdf](http://www.monitoringthefuture.org//pubs/monographs/mtf-vol1_2013.pdf)

Malchiodi, C. (2008). *Creative interventions with traumatized children*. New York, NY: The Guilford Press.

Monette, D.R., Sullivan, T.J., & DeJong, C.R. (2011). *Applied social research: A tool for the human services*.

- Morrison, M.L. (2007). Health benefits of animal-assisted interventions. *Complementary Health Practice Review, 12*(1), 51-62. doi: 10.1177/1533210107302397
- Parshall, D.P. (2003). Research and reflection: Animal-Assisted Therapy in mental health settings. *Counseling and Values, 48*(1), 47-56.
- Pendry, P. (2013). "EFL Improves Children's Social Competence." *Professional Association of Therapeutic Horsemanship International: Strides, 19*(1). Retrieved from <http://cdn.coverstand.com/12596/143454/143454.1.pdf>
- Professional Association of Therapeutic Horsemanship International (PATH Intl.). (n.d.). *EAAT definitions*. Retrieved from <http://www.pathintl.org/resources-education/resources/eaat/193-eaat-definitions>
- Smith-Osborne, A. & Selby, A. (2010). Implications of the literature on equine-assisted activities for use a complementary intervention in social work practice with children and adolescents. *Child and Adolescent Social Work Journal, 27*, 291-307. doi: 10.1007/s10560-010-0291-1.
- Toukonen, M.C. (2011). The relationship between adolescent girls and horses: Implications for equine-assisted therapies. (Order No. 3475855, Kent State University). *ProQuest Dissertations and Theses, 139*. Retrieved from <http://ezproxy.stthomas.edu/login?URL=?url=http://search.proquest.com/docview/894758377?accountid=14756>. (894758377).
- Victory Counseling Center. (N.D.) *Liberty counseling*. Retrieved from <http://victorytherapy.org/our-services/counseling/>
- Walsh, F. (2009). Human-animal bonds I: The relational significance of companion animals. *Family Process, 48*(4). doi: 10.1111/j.1545-5300.2009.01296.x

- Waite, C., & Bourke, L. (2013, December). "It's different with a horse": horses as a tool for engagement in a horse therapy program for marginalised young people. *Youth Studies Australia*, 32(4), 15+. Retrieved from [http://go.galegroup.com/ps/i.do?id=GALE%7CA371967930&v=2.1&u=clic\\_stthomas&it=r&p=HRC&sw=w&asid=3e](http://go.galegroup.com/ps/i.do?id=GALE%7CA371967930&v=2.1&u=clic_stthomas&it=r&p=HRC&sw=w&asid=3e)
- "Systematic Review." (N.D.). *Agency for Healthcare Research and Quality*. Retrieved from <http://effectivehealthcare.ahrq.gov/index.cfm/glossary-of-terms/?pageaction=showterm&termid=70>
- "Systematic Reviews." (May 2014). *King's College*. Retrieved from <http://www.kcl.ac.uk/library/help/documents/Systematic-Review-User-Guide.pdf>
- Zilcha-Mano, S., Mikulincer, M., & Shaver, P.R. (2011). Pet in the therapy room: An attachment perspective on Animal-Assisted Therapy. *Attachment & Human Development*, 13(6), 541-561.

Appendix A: Equine Effectiveness Review Data Abstraction Form

Table 1. Study Overview

Study ID	Modality	Setting	Presenting Problem	Sample Size	Sample Age	Sample Gender	Sample Race	Sample SES/Criminality	Sample Design

Table 2. Study Design and Interventions

Study ID	Therapist qualifications	Study Design	Interventions	Program/Intervention Duration	Stat. Sig. Results

Table 3. Study Findings

Study ID	Intervention Goals/Question	Findings/Themes (Bio/Psycho/Social/Spiritual Effects)

\*Study ID= First listed author (see reference list)

\*Modality= Mounted vs. Un-mounted (M vs. U; if "U," animal type); i.e. EAL= Equine Assisted Learning, EFP/L= Equine Facilitated Psychotherapy/Learning

\*Stat. Sig. Results= Statistically Significant



## Appendix B: Data Abstraction Results

## Equine Effectiveness Review Data Abstraction Form(s)

*Demographical Overview*

Study ID	Modality	Setting	Presenting Problem	Sample Size	Sample Age	Sample Gender	Sample Race	Sample SES/Criminality	Sample Design
Bachi	U- EFP	Stables - O	SED	29	14-18	?	?	70%= "low SES;" 20% CPS involvement; 20% PO	NR -V
Balluerka	U- AAT*	Farm - O	Trauma, MH, attachment	46	12-17	14-F, 32-M	63% Basque; 37% FUM	Participants under protective services	NR-V
Bassette	U- AAI, dog	School - I	EBD, LD	3	7-11	1-F, 2-M	2-W, 1- AA	?	NR, Purposive-V
Brouillette*	EAT	Farm & School - B	EBD	11	12-18	M	3-AA, 2-B, 6-W	Mid-low SES	NR, Convenience, IV
Burgon	U/M-EAL,EAT, TH	Yard - O	Education deficit, ASD, ADHD	7	11-16 (1= 21)	5-F, 2-M	?	Foster children	NR -?
Dell	U-EAL	Classroom & Equine Center-B	Solvent substance abuse	15	12-17	8-F, 7-M	First Nations & Inuit (Canadian)	?	NR-Convenience -V
Dietz	U-AAT, dog	Child Advocacy Center- I	Trauma: child sexual abuse	153	7-17	98.4% female	H, C, AA	CPS, law enforcement, CSA	NR-Convenience -IV
Ewing	U/M- EFL	School & Ranch - B	SED, low IQ	28	10-13	B?	"various ethnic backgrounds"	"poor familial environments, with low SES support"	NR-V
Foley*	M-EAP	"Horseback Miracles Program" & residential tx facility-?	"delinquency" and MI	46	10-18	F	56.5%-W, 21.7%-H, 19.6%- AA, 2.2%- I	Social service involvement, some-PO, few referred by MH system or privately placed by parents	NR- ?
Hayden*	U/M-EFP	2 Farms - O	MI	10	11-18	6-F, 1-M	6-W, 4-B	?	NR- V
Maujean	U/M-EFL	Queensland, AUS- ?	"Disengaged youth"- "failed traditional interventions"	16	12-22	5-F, 11-M	?	?	NR- ?
McCullough*	U/M-EFP	"Legends" facility- O	Trauma, PTSD, MI	11	10-18	5-F, 6-M	7-W, 1-AA, 2-H, 1-NA	CPS, PO, Homeless, Other	NR, purposive- ?
Schultz	U-EAP	?- O	MH, Trauma (intra-familial violence)	63	4-16	26-F, 27-M	32-W, 29-H, 2-B	40%- hx inter-parental violence; 27%- hx abuse and/or neglect; 20% hx sexual abuse; 32% "at least one parent with a hx of	NR, Convenience-V

								substance abuse"	
Sole*	U/M- EFT	"NARHA accredited facilities" -?	Cerebral Palsy-moderate	24	9-17	B- Equal	?	?	NR, Convenience-V
Solomon	U- AAI (dog)	Home- B	ASD	2	4-14	1-F, 1-M	?	?	NR -?
Sprinkle	U- AAI (dog)	School - I	Witnessed violence in some form	310	4 <sup>th</sup> , 5 <sup>th</sup> , and 6 <sup>th</sup> graders	156-F, 154-M	136-AA, 164-W, 5-AS, 5-L/H	Both mid-upper class and low-income district schools	NR, Convenience-V
Stiltner*	EAP	Residential Substance Abuse Tx- ?	Dual Diagnosis (ADHD, ODD, Depressive) (Marijuana, Meth., Opiates, K2, Xanax)	8	13-17	M	5- W, 2-NA, 1-H	All with hx of MH services and one with a juvenile detention stay.	NR- ?
Trotter	U/M-EAC	Ranch- O	Behavioral problems, LD, Social/Adjustment Concerns	164	3 <sup>rd</sup> -8 <sup>th</sup> grade	62-F, 102-M	136-W, 12-AA, 11-H, 5-Other	?	NR, Convenience-V
Ward	M-TR	Riding Center- ?	Autism	21	Mean: 8.1	6-F, 15-M	?	?	NR, Convenience-IV
Whitely*	U-EAP/EFP	Ranch- O	MI	20	12-19	13-F, 7-M	?	Living in a children's home	NR, Convenience-IV

Study ID= First listed author (see reference list); NR= not random; \*= Dissertation

Modality= Mounted vs. un-mounted (M vs. U; if "U," animal type); i.e. EAL= Equine Assisted Learning, EFP/L= Equine Facilitated Psychotherapy/Learning; EAP= Equine Assisted Psychotherapy; TR= Therapeutic Riding; TH= Therapeutic Horsemanship; Equine Assisted Counseling- EAC; EAT= Equine Assisted Therapy, AAT\* (equine, canine, cat, & other farm animals)

O=Outdoor, I=Indoor, B=Both; W=White/Caucasian, AA= African American, B=Biracial, H-Hispanic, I-Indian, NA-Native American, AS= Asian American, B= Black (\*Racial terms gathered directly from study descriptions). ; M=male, F=female, CSA= confirmed sexual abuse

MH= Mental Health; MI= Mentally Ill, tx= treatment; dx= diagnosis; sx= symptom(s); ?= not found or not specified; CPS= Child Protective Services; PO= Probation Officer, SED= Severe Emotional Disturbance, EBD= Emotional/behavioral Disorder, LD= Learning Disability; Study Participation: V= Voluntary, IV= Involuntary, ?=unclear

*Study Design and Interventions*

<b>Study ID</b>	<b>Therapist qualifications</b>	<b>Study Design</b>	<b>Interventions</b>	<b>Program/Intervention Duration</b>	<b>Stat. Sig. Results</b>
Bachi	L, A, MHP, EP	MM; <i>Pre/post test control</i>	Individual EFP sessions	Weekly, 7 months, (14-26 sessions <i>average</i> ), 50 min	Y
Balluerka	HCP, AP	QN, <i>Pre/post test control</i>	Individual and group AAT	12 weeks, 34 sessions	Y
Bassette	C, V, AP	QN, <i>Pre/post test</i>	Individual; read to dog; 5-10 play (walk, groom, commands, pet)	Daily, 60-120 min, 4 weeks	Y
Brouillette*	MHP, L, AP, P, LP	MM; <i>pre/post test</i>	EAT with 2 trained EAP horses	12 weeks, 120 min each	Y
Burgon	MHP, T, EP, AP	QL, participative & reflexive ethnography	TH, “invisible riding,” relational, “join up,” “emphasis on respecting and building relationships with the horses”	1-3 hours, weekly, nightly, or other for 2 years (session number <i>average</i> =?)	n/a
Dell	EP-Tr, T, P (Aboriginal Worldview)	QL, post, \$	EAL- Experiential Learning followed by Group classroom work, journaling	12 weeks, 60 min per week	n/a
Dietz	L, “Masters-level,” MHP, SW, P, T, DH	QN, <i>Pre/posttest, control(s)</i>	Group therapy topics: building trust, self-esteem, secrets, triggers, boundaries, feelings, touch	12 sessions (any time between Aug '06- Mar '07)	Y
Ewing	C,Tr, V, EP, AP=“co-therapist”	MM, <i>pre/post test</i>	EFL, “Horse Power,” skills in cooperation, trust, responsibility; horse safety, caring for horse, riding lessons, group discussion	9 weeks (120 min twice a week)	N
Foley*	AP-Tr, “experienced” staff	QL, ethnography	HBM program- Group, riding, traditional psychotherapy, obstacle course	10 weeks (4-5 hours), 10 sessions over 2 years	n/a
Hayden*	L, MHP/EP, Tr,	QL, phenomenological, participant interviews	EFP, Individual therapy MHP/team and horse; activities: touching, grooming, handling, feeding, veterinary care, putting on or taking off equipment, riding, and human/horse interaction activities on the ground	At least 4 sessions over 12.6 months ( <i>average</i> )	n/a
Maujean	LP	QL, <i>pre/posttest</i> interviews with participants; surveyed case managers, too	“Horse Play”- “natural horsemanship,” role-modeling and practice, participants were matched to a horse, applied skills to daily life	10 weekly sessions	n/a
McCullough*	AP, P, EP	QN, <i>pre/mid/posttest; control</i>	EFP-interactions with horse and psychotherapy, metaphorical use of “diamond” model	8 week (1.5-2 hour sessions)	Y
Schultz	LICSW, LP, EP	QN, Exploratory, <i>pre/posttest</i>	EAGALA method (horse reflects behavior and teaches)	18 months (mean of 19 sessions)	Y
Sole*	NARHA –C Instructors, V, EP	QN, <i>pre-posttest</i> , Likert scale	Horseback riding followed with structured lesson plans, horse care, horsemanship training, interaction with human team, following directions, processing	8 weeks (60 min session once/week)	N
Solomon	DH-Tr, AP	QL, Ethnography	Social interactions with canine- AAT	6 visits (1-2 hours)	n/a
Sprinkle	AP- primary & T-Tr, 4-year degree	QN, <i>pre-posttest</i>	“Healing Species Program”- learn conflict resolution and empathy	11 sessions, 45 min weekly	Y

	minimum				
Stiltner	AP-Tr,	QL, phenomenological, used field test	EAP using EAGALA method	2-7 months of tx	n/a
Trotter	EAGALA-C, Master's level MHP, EP, AP= "Pet practitioner"	QN, <i>pre-posttest</i> , control	AAT- social interaction with therapy dogs	12 weekly sessions (2 hours per week)	Y
Ward	PATH registered level instructor, EP, Tr	QN, interrupted time series	TR	6 weeks of TR, 6 week break, 4 weeks TR, 6 weeks break, 8 weeks TR	Y
Whitely*	Tr-CPR/1 <sup>st</sup> Aid, RN, EP, AP, EAGALA-Tr	MM, <i>pre-posttest</i>	"EAGALA method"	6 weekly, 90 min group sessions over a 3 month period	Y

Study ID= First listed author (see reference list); \*=Dissertation

Stat. Sig. Results= Statistically Significant Results (Yes or No); QN= Quantitative, QL= Qualitative, MM= Mixed Methods

L= licensed, LP= Licensed Psychologist, RN= Registered Nurse, SW= Social Worker, LICSW= Licensed Independent Clinical Social Worker, EP= Equine Professional, DH= Dog Handler, P=Psychotherapist V= volunteer, T=teacher, Tr-trained, C= certified, A= accredited, MHP= mental health professionals, HCP= health care professional, AP=explicit that therapist **team** includes non-human animal partner

Min= minutes, \$= financial incentive for participation

Y= yes, N= no, n/a= not applicable

## Appendix C: Selected Articles

- Bachi, K., Terkel, J., & Teichman, M. (2012). Equine-facilitated psychotherapy for at-risk adolescents: The influence on self-image, self-control and trust. *Clinical Child Psychology and Psychiatry, 17*(2), 298-312. doi:10.1177/1359104511404177
- Balluerka, N., Muela, A., Amiano, N., & Caldentey, M. A. (2014). Influence of animal-assisted therapy (AAT) on the attachment representations of youth in residential care. *Children & Youth Services Review, 42*, 103-109. doi:10.1016/j.childyouth.2014.04.007
- Bassette, L., & Taber-Doughty, T. (2013). The effects of a dog reading visitation program on academic engagement behavior in three elementary students with emotional and behavioral disabilities: A single case design. *Child & Youth Care Forum, 42*(3), 239-256. doi:10.1007/s10566-013-9197-y
- Brouillette, M. A. (2006). *The psychological impact of equine-assisted therapy on special education students* Available from RIS Format UTF-8.
- Burgon, H. L. (2011). 'Queen of the world': Experiences of 'at-risk' young people participating in equine-assisted learning/therapy. *Journal of Social Work Practice, 25*(2), 165-183. doi:10.1080/02650533.2011.561304
- Dell, C., Chalmers, D., Bresette, N., Swain, S., Rankin, D., & Hopkins, C. (2011). A healing space: The experiences of First Nations and Inuit youth with equine-assisted learning (EAL). *Child & Youth Care Forum, 40*(4), 319-336. doi:10.1007/s10566-011-9140-z
- Dietz, T. J., Davis, D., & Pennings, J. (2012). Evaluating animal-assisted therapy in group treatment for child sexual abuse. *Journal of Child Sexual Abuse, 21*(6), 665-683. doi:10.1080/10538712.2012.726700

- Ewing, C. A., MacDonald, P. M., Taylor, M., & Bowers, M. J. (2007). Equine-facilitated learning for youths with severe emotional disorders: A quantitative and qualitative study. *Child & Youth Care Forum, 36*(1), 59-72. Retrieved from <http://ezproxy.stthomas.edu/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=swl&AN=55892&site=ehost-live>
- Foley, A. J. (2009). *Conflict and connection: A theoretical and evaluative study of an equine-assisted psychotherapy program for at-risk and delinquent girls* Available from RIS Format UTF-8.
- Hayden, A. J. (2005). *An exploration of the experiences of adolescents who participated in equine-facilitated psychotherapy: A resiliency perspective* Available from RIS Format UTF-8.
- Kaiser, L., Spence, L. J., Lavergne, A. G., & Bosch, K. L. V. (2004). Can a week of therapeutic riding make a difference?-A pilot study. *Anthrozoös, 17*(1), 63-72.  
doi:10.2752/089279304786991918
- Maujean, A., Kendall, E., Lillan, R., Sharp, T., & Pringle, G. (2013). Connecting for health: Playing with horses as a therapeutic tool. *Journal of Community Psychology, 41*(4), 515-522. doi:10.1002/jcop.21547
- McCullough, L. M. (2012). *Effect of equine-facilitated psychotherapy on posttraumatic stress symptoms in youth with history of maltreatment and abuse* Available from RIS Format UTF-8.
- Schultz, P. N., Remick-Barlow, G., & Robbins, L. (2007). Equine-assisted psychotherapy: A mental health promotion/intervention modality for children who have experienced intra-

family violence. *Health & Social Care in the Community*, 15(3), 265-271.

doi:10.1111/j.1365-2524.2006.00684.x

Sole, D. P. (2007). *Effects of equine-facilitated therapy on self-efficacy beliefs of cerebral palsied pre-adolescents and adolescents* Available from RIS Format UTF-8.

Solomon, O. (2010). What a dog can do: Children with autism and therapy dogs in social interaction. *Ethos (00912131)*, 38(1), 143-166. doi:10.1111/j.1548-1352.2010.01085.x

Sprinkle, J. E. (2008). Animals, empathy, and violence. *Youth Violence & Juvenile Justice*, 6(1), 47-58. Retrieved from

<http://ezproxy.stthomas.edu/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=sih&AN=28012436&site=ehost-live>

Stiltner, C. (2014). *Equine-assisted psychotherapy in a residential substance abuse treatment program for male adolescents* Available from RIS Format UTF-8.

Trotter, K. S., Chandler, C. K., Goodwin-Bond, D., & Casey, J. (2008). A comparative study of the efficacy of group equine assisted counseling with at-risk children and adolescents.

*Journal of Creativity in Mental Health*, 3(3), 254-284. doi:10.1080/15401380802356880

Ward, S., Whalon, K., Rusnak, K., Wendell, K., & Paschall, N. (2013). The association between therapeutic horseback riding and the social communication and sensory reactions of children with autism. *Journal of Autism & Developmental Disorders*, 43(9), 2190-2198.

doi:10.1007/s10803-013-1773-3

Whitely, R. (2010). *Therapeutic benefits of equine assisted psychotherapy for at-risk adolescents* Available from RIS Format UTF-8.

Yeckley, K. A. (2009). *Sensory integration theory as applied through equine facilitated psychotherapy with a child diagnosed with autistic spectrum disorder* Available from RIS

Format UTF-8.