2022

Equine Assisted Psychotherapy: Implications for Treating Trauma

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A Literature Review

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A Doctoral Project Presented to the Graduate School in Partial Fulfillment of the Requirements for the Degree of Doctor of Psychology

Eastern Kentucky University

2022

Doctoral Project Approval Form

This doctoral project was submitted by Kara L. Harrison under the direction of the chair of the doctoral project committee listed below. It was submitted and approved in partial fulfillment of the requirements for the degree of Doctor of Psychology at Eastern Kentucky University.

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Date of Final Approval: November 30th, 2022

Abstract

Trauma related symptoms and Posttraumatic Stress Disorder (PTSD) have been increasingly recognized for the key roles they occupy in mental health and overall individual well-being within both adult and childhood populations. They often represent significant barriers to the provision of mental healthcare within military populations and individuals diagnosed with serious mental illness (SMI). This original contribution to practice explores the significance of Equine Assisted Psychotherapy as a novel adjunctive approach to treating trauma. symptoms in adults and children. An extensive literature review examines current research and discussion on common definitions and nomenclature. It begins with discussion on the broader areas of Human Animal Interventions and Animal Assisted Interventions and narrows to Equine Assisted Therapies as readers are led to focus on Equine Assisted Psychotherapy (EAP) for treating trauma. This is followed by a comprehensive review of the current empirically based research on EAP and its specific uses in the provision of trauma-focused mental healthcare. Commonly occurring themes, within the literature base, are identified and further explored. They centered on the current applications of EAP, methods employed in the provision of EAP for trauma, and issues with research design and methodology. General conclusions indicate EAP is likely an effective adjunctive approach to more traditional models of trauma focused psychotherapy. However, several significant barriers to the production of rigorous future research must be overcome to further define specific mechanisms of action while validating a standardized nomenclature and manualized EAP treatment protocol.

Keywords: Human Animal Interventions, Animal Assisted Interventions, Equine Assisted Therapy, Equine Assisted Psychotherapy, Equine Facilitated Psychotherapy, Equine Facilitated Mental Health, Equine Assisted Counseling, Equine Assisted Mental Health, Trauma

Acknowledgement

I have been gifted with several invaluable mentors and trusted advisers throughout early youth and adulthood. One came into my life when I was an infant and the others appeared at the most wonderfully opportune points along the way. They all inspired me by example and individual lives well lived. Each possessed their own unique and amazing gift to touch my mind and heart, while exciting my dreams and fueling my will to achieve. Each shared their knowledge and expertise with the heartfelt generosity and spirit of true mentors and educators who love to guide and inspire those hungry to listen and learn. It is with the deepest appreciation and immeasurable gratitude that I acknowledge each of them. As I travel forward on my new path, as a Doctor of Clinical Psychology, it will be my pleasure to honor these individuals by striving to emulate their personal and professional exceptionalism to benefit and serve others.

First and foremost, I want to thank my parents, Joseph and Laurel Brown, for their depth of love, enduring commitment to family, and examples of excellence. Jessie Wrenn always afforded endless hours of time, moral support, and friendship as she benefited me with indispensable life experience. Jessie has always been a pillar of feminine strength and accomplishment. Her example as a working mother of eight, while earning a Master's in Primary Education and Juris Doctor in Law, made lofty dreams seem achievable. Her husband, Dr. Joe Everett Winstead, gave endless encouragement and insight as the Dean of Science and Technology at Southern Arkansas University. Her knowledge and love for students and learning calmed my anxiety and feelings of intimidation, as I attempted to navigate my path to graduate school.

Thank you to the Psychology Department and Faculty at Eastern Kentucky University, who's professional expertise, nurturing culture, and passion for higher education made this

possible. Thank you to Dr. Cheryl Ramey, Dr. Robert Mitchell, and Dr. Richard Osbaldiston for encouraging and fueling excitement over the possibilities. Special thanks to Dr. Theresa Botts for always believing in my ability to help others and will to stay the course. A million kudos to Dr. Michael McClellan for his remarkable appreciation and support for the unique struggles associated with being female and single parenting, while surviving hardship and aspiring to keep your dreams alive. Last but certainly not least, thank you to Dr. Dustin Wygant for his vision, leadership, and pivotal contributions to the development of our beloved Eastern Kentucky University Clinical Psychology Psy.D. program. I will forever miss the fascinating lectures in forensic psychology! I am truly proud to have been among the few accepted to pursue this degree and to stand with the 3rd cohort to graduate this exceptional program.

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Section I: Introduction

Peter Levine made this statement in his 1997 book Waking the Tiger: Healing Trauma, "In dreams, mythical stories, and lore, one universal symbol for the human body and its instinctual nature is the horse. If we look back through much of human history and cultures, the power of horses to heal our spirit and our soma has been known from time indefinite" (Levine, 1997, p. 66). Winston Churchill once said, "there is something about the outside of a horse that it good for the inside of a man" (Snyder, 2020, p. 84). Both physical and mental benefits, garnered from equine-human interactions, were appreciated as far back as the ancient Greeks in 460 BC (Fine & Andersen, 2021). Equestrians and horsemen in general know the power the horses have to connect, to develop trusting and intimate relationships within their own herd and with humans, and ultimately to promote healing (see Appendix A). Modern healthcare providers are harnessing this power, and learning to skillfully wield its capacity for healing, in unique ways that benefit therapeutic processes and goals. "Cognitive behavioral therapy, Experiential therapy, Gestalt therapy, and Object Relations Theory were all cited as theoretical or clinical approaches in Equine Facilitated Psychotherapy" (Bachi, 2013, p. 188).

The natural instincts, behaviors and overall qualities of the horse are well suited to assisting with mental healthcare that focuses on treating trauma survivors (Trotter & Baggerly, 2018). Horses are prey animals and are wired to be "actively concerned with safety and survival much of the time. Like victims of trauma, the lower regions of horses' brains are engaged, attending to environmental cues to determine whether they need to fight or flee, or can be at rest. When an individual's insides do not match their outsides, i.e., there is inner turmoil in the form of emotional dysregulation but a relatively calm external presentation, horses are alarmed by this incongruence. Horses will respond to the internal emotional state of the person rather than the

physical exterior. They read body energy, a skill that allows them to distinguish between a lion stalking and a sheep grazing near the herd" (Trotter & Baggerly, 2018, p. 155-156).

Can a horse really be used as an assistive device (or tool of sorts) when seeking to provide effective mental health treatment to trauma survivors, or is using equines to boost or enhance empirically supported approaches to trauma care just another horse lover's dream? Even if an abundance of anecdotal evidence exist, is there empirical support and what do the results indicate? If empirical research supports using horses to assist therapists in administering trauma focused mental healthcare, how and with what do they assist? Horses can be expensive for most individuals to access and maintain, so what unique contributions do they make to trauma treatment strategies and goals that might justify their use over other animal assisted therapies? These are commonly asked questions that deserve convincing answers if this area of practice is going to overcome significant barriers and experience validation and growth among professional treatment providers (see Appendix A).

Definition of Equine Assisted Psychotherapy and Introduction to Terminology

Before considering some of the answers to these questions it can be helpful to familiarize oneself with some of the current terminology connected to this area of practice. Equine Assisted Modalities (EAM), Equine Assisted Therapy (EAT), and Equine Assisted Interventions are three examples of broad-based umbrella terms, encompassing a breadth of therapeutic approaches and purposes, extending beyond the confines of licensed mental health providers and treatments. For example, occupational therapists, physical therapists and rehabilitation specialists employ a variety of equine assisted techniques, to help achieve a host of both physical and mental health treatment goals (White-Lewis, 2019). When researching the subject, readers will likely encounter a lengthy list of related terms and may experience difficulty conceptualizing how each version of

Equine Assisted Treatment is employed and for what purposes (see Appendix A) (Marchand et al., 2021). “Equine or horse therapy has not yet been conceptually defined in the literature. Also, the taxonomy of equine-assisted therapy (EAT) is confusing” (White-Lewis, 2019, p. 58). Commonly employed terms include (but are by no means limited to) Equine Assisted Therapy, Equine Assisted Learning, Equine Assisted Activities, Equine Facilitated Learning, Equine Assisted Learning, Hippotherapy, Therapeutic Horsemanship, and Equine Therapeutic Riding (see Appendix A). Another researcher preferred the term Equine Assisted Intervention (EAI) and stated, “Equine assisted interventions (EAI) are an emerging field of animal assisted interventions (AAIs), employing horses in a wide variety of activities with humans” (Scopa et al., 2019, p.1). “EAI is an umbrella term that includes a wide diversity of methodologies and approaches to improve human wellbeing through the involvement of horses (Equine assisted therapy—EAT; equine assisted education—EAE; equine assisted activity—EAA)” (Scopa et al., 2019, p. 2).

The take-away for readers is that Equine Assisted Modalities (or whichever umbrella term readers might prefer) in general have experienced rapid growth in the United States, over the past twenty years. As a result of rapid growth, a variety of organizations have sprung into action attempting to provide structure, professional oversight, and licensure. Examples include the Professional Association of Therapeutic Horsemanship International (PATH Intl., Equine Assisted Growth and Learning Association (EAGALA), The Human-Equine Relational Development Institute (HERD Institute), and the American Hippotherapy Association (AHA) (see Appendix A). Within each organization a distinct theoretical orientation and approach to treatment is present, with some level of overlap existing between them (see Appendix A) (Marchand et al., 2021). Multiple organizations have developed their own “approved and

recognized terminology that can also be readily understood by the general public" (Fine & Andersen, 2021, p. 2). There is recognition of the need to develop a standardized nomenclature, including the key role it plays in the replication of empirical research (Marchand et al., 2021). However, the wide variance in purpose, practice, and treatment goals between sectors, for example mental health services compared to hippotherapy services, continues to complicate this process. Ultimately, the lack of general terminology mixed with a variety of ever evolving services and certifications, continues to fuel "confusion with the public, policymakers, researchers, and industry professionals" (Fine & Andersen, 2021, p. 2). On a final note, with regard to terminology and industry standards, forward progress is underway. The Association for Animal Assisted Intervention Professions began operations in January 2022 and seeks to support the needs of all animal-assisted therapy professionals (Gilbertson, 2022).

In this literature review we will use the term Equine Assisted Psychotherapy (EAP), unless otherwise specified in the literature, with the understanding that this term encompasses equine-based activities specific to the provision of clinical mental health treatment and goals. Readers can consider the following terms, among those commonly used, when referring to the use of equines in the provision of mental healthcare: Equine Assisted Psychotherapy (EAP): Equine-Facilitated Psychotherapy (EFP), Equine-Facilitated Mental Health (EFMH), Equine Assisted Counseling (EAC), Equine Experiential Psychotherapy (EEP) (see Appendix A). It is also worth noting that Equine Assisted Modalities are viewed as a sub-section of Animal Assisted Therapy (AAT). Animal Assisted Therapy (AAT) is defined as "a goal-directed intervention in which an animal that meets specific criteria is an integral part of the treatment process" (Fine, 2006, p. 23). An identifying factor, often distinguishing EAP from other EAMs is the required presence of a state licensed mental health clinician in addition to a

professional/certified equine handler. In some cases, the licensed mental health clinician also has the skills and certifications to serve in the dual capacity of equine handler. Using a certified equine handler allows licensed mental health clinicians to incorporate the assistance of equines within their mode of treatment, even when they may have limited or no equine handling and/or riding skills. In many cases licensed clinicians, with the ability to serve in the dual role of equine handler, choose to employ the services of a handler so they are free to focus on the client and providing therapy while maintaining a high degree of safety for all involved (Trotter & Baggerly, 2018).

Equine Assisted Psychotherapy (EAP) is not generally employed by mental health professionals as a stand-alone treatment but is instead more often implemented as a complimentary or assistive tool uses horses in conjunction with standard approaches to treating mental illness (Selby & Smith-Osborne, 2013). It is just as its name implies, an adjunctive therapeutic modality that integrates horses to assist or enhance therapeutic outcomes. A variety of licensed mental health providers, grounded in a wide array of theoretical orientations, can successfully integrate EAP into their treatment plans (Trotter & Baggerly, 2018). “Equine-assisted psychotherapy (EAP) incorporates horses experientially for emotional growth and learning. It is a collaborative effort between a mental health professional and a horse specialist working with clients and horses to address treatment goals” (Lee et al., 2015, p. 13)

Elements of Theory Behind Equine Assisted Psychotherapy for Trauma

As prey animals, horses are built to instinctually attend to their environmental cues as they constantly assess whether they need to fight or take flight in order to survive (Trotter & Baggerly, 2018; Wharton et al., 2019). Newborn foals are often born literally searching for where they might suckle milk and attempting to put weight on their limbs, seconds after delivery.

The newborns' survival can depend on its ability to quickly get on its feet and flee predators. Horses' natural fight or flight instinct is such an intrinsic part of their normal functioning that most newborns are on their feet within minutes after birth and ready to run. Horses have a keen innate capacity to sense intent, especially threats to their well-being (see Appendix A). Consider how predators in the wild, for example lions, often approach their prey. It is not uncommon for them to crouch and slowly attempt to "slip in" (see Appendix A) ever closer without alarming their intended prey. At times some may even pretend to be innocently resting nearby. The horses' opportunity to avoid, thwart or survive the pending attack relies entirely on its' ability to sense and accurately assess a predator's intent (Trotter & Baggerly, 2018). What therapeutic value can this have for trauma survivors? "The horse's keen attunement to nonverbal signals is helpful in identifying emotional disconnect in the trauma victim" (Trotter & Baggerly, 2018, p. 156) that he/she may or may not be aware of within themselves. "The horse's emotional attunement and his ability to provide feedback are instinctual and part of his survival mechanism, his responsiveness to the client is usually earlier and more constant than that of a human's abilities. Therapists can use these characteristics (acknowledged, translated verbally and processed) to restore or provide an experience of emotional, behavioral and physical attunement and feedback. Thus, the horse may serve as a big mirror" (Bachi, 2013, p. 192).

The nature of the relationship between horse(s) and client(s), and the feedback experienced between the two and the therapist, often exposes important aspects of clients' internal functioning (Bachi, 2013). Moreover, these are often aspects of internal functioning that are not easily captured or observed within traditional treatment delivery platforms. Most horses weigh anywhere between 750 and 1500 pounds depending on their breed and environmental factors present during their developmental years. The sheer power and presence of a living being

of that size and weight, within our immediate vicinity or even close proximity to our personal space, represents a powerful sensory experience demanding our full attention and respect (see Appendix A). Whether a client is simply in the horse's presence, interacting with them from the ground, or engaging the horse from a mounted position the experience provides a unique opportunity for clients to explore issues related to power, control and vulnerability through metaphor, analogy, biofeedback and in-vivo experiences (Mandrell, 2014). (See also Wharton et al., 2019; EAGALA, 2015; Lentini & Knox, 2009).

As prey animals, horses are constantly scanning and evaluating their environment for threats (see Appendix A). When they sense even the slightest hint that a threat might be present within their environment they will attempt to move away. Moving away can be as subtle as casually walking off while stopping to grab mouthfuls of grass along the way or as abrupt as a sudden leap (or spook) in any direction followed by a full-on gallop to get away, depending on whether the potential threat startled the horse and just how fear inspiring the horse perceives it to be. It can be difficult to even get close enough to pet or catch a loose horse if your internal state does not match with outward body language that avoids alerting the horse's sense of flight. I personally experienced more than one busy day on the farm when I felt pressed for time and needed to hustle out to catch a certain horse. If I did not stop and purposely calm my inner self, and make sure my outward body language expressed a truly calm state of being, I could count on the horse I needed taking off in the opposite direction! (see Appendix A). Another researcher summarized it well with the statement "Equine-assisted interventions teach clients to hone their communication and social skills by staying attuned to the nonverbal cues they are transmitting through their own body language while also reading those communicated by the equine,

reinforcing the need for self-awareness, accurate reading of social cues and body language which requires mindful, present focus" (Forstrom D'Agostino, 2019, p. 35).

Physiological Parameters and Neural Pathways Linked to Trauma

Scientific literature and research in medical care and mental health is increasingly reflecting progress in the medical field's ability to measure and assess the human body's physiological responses to trauma and the subsequent connections to mental health symptoms. This area of research is sometimes referred to as trauma biology and includes current research into "changes in limbic system functioning, hypothalamic-pituitary-adrenal axis activity changes with variable cortisol levels, and neurotransmitter-related dysregulation of arousal and endogenous opioid systems" (Substance Abuse and Mental Health Services Administration, 2014, p. 65). Research within the field of EAP has recognized the relevance and potential impact of defining physiological parameters and neural pathways that might benefit from the use of EAP. Examples of research are further explored within the literature review section of this paper. For the purpose of understanding some common theory related to this area consider an excerpt from the book Equine-Assisted Mental Health for Healing Trauma (Trotter & Baggerly, 2018, pp. 73-74):

> Lewis et al. (2000) proposed in order to move a person from trauma to healing requires the neural pathways to be restructured. The only way for this to happen is for the individual to experience new responses and activities, which soothe or regulate the limbic region of the brain. This neurological re-wiring will occur when the following three stages are met; 1) Limbic resonance: shared empathy in which two mammals attune to each other's inner states 2) Limbic regulation: two mammals reading each other's emotional cues, adjusting to each other and physiologically soothing or regulating the

other 3) Limbic revision: the adaptation to a healthier template for future relationships. Neural restructuring via Lewis et al.'s (2000) three stages is achieved through the powerful and effective therapeutic intervention of EFP, as an alternative to talk therapy. Horses can facilitate the three stages in the following way: 1) Horses are naturally non-verbal and have a heart that is ten times the size of a human's heart. Simply being amongst a herd of horses naturally creates limbic resonance by becoming part of the magnetic energy fields and leads to resonating with and tuning into the horses (McCraty & Zayas, 2014); 2) Human arousal levels are required to become regulated in order to become accepted by and to engage with any horse(s). Therefore, the individual begins to learn healthy adjustment and control of his/her limbic regulation (Panksepp, 2011); 3) Limbic revision is achieved through specific exercises or tasks assigned to the client by the therapist, which necessitates the individual to regulate themselves and respond to cues from the horse with a new emotion. This allows for restructuring of neural pathways that move away from the initial traumatic response. Since horses are socially supportive and able to give love and unconditional acceptance, humans experience a template for future relationships (Trotter et al., 2008)

EAP and Engagement and Attrition in Psychotherapy

The literature suggests another potential benefit to using equines to assist in administering mental health treatments is improved engagement with treatment and reduced attrition rates (Wharton et al., 2019). Stigma and privacy concerns are common barriers to accessing mental healthcare, particularly in rural areas and small community settings where stigma and confidentiality can be heightened issues for individuals in need of services. Stigma and confidentiality can also be significant barriers within the U.S. veteran population, with the

added pressures connected to long standing military traditions and culture related to the common perception that mental health concerns indicate personal weakness. The Veterans Health Administration provides some of the most highly skilled and advanced trauma care, while adhering closely to empirically supported treatment methods. Yet rates of accessing care among veterans who could benefit remain disappointingly low and are further compounded with high drop-out rates "despite strong positive outcomes related to these therapies" (Wharton et. al, p. 268). Research studies suggested veteran trauma care, offered from an equine facilitated psychotherapy setting, may counteract some of the stigma and resistance to care and reduce attrition rates (Cohen et al., 2010; Wharton et al., 2019).

Another potentially meaningful difference between EFP and most traditional models of therapy is the nature of the setting where EFP is administered. The majority of EFP services are provided at farms where multiple other equine activities co-exist for example: hippotherapy, traditional riding lessons, driving lessons, equine rescue and rehabilitation are only a few. From a client's perspective arriving at a farm or barn to participate in EFP is a lot less conspicuous to outsiders than arriving at a VHA mental health clinic and signing in to see a known mental healthcare provider.

When considering trauma focused treatment for survivors of sexual assault with PTSD, "the most effective treatment models include some form of exposure to feared memories or situations, which can be frightening to survivors" (Bleiberg et al., 2005, p. 275). The exact reasons for higher attrition rates, relative to 11% attrition rates (Bleiberg et al., 2005) for other models of psychotherapy, are not clearly understood. However, research suggests it may be the result of several elements of trauma-focused care including exposure to memories trauma survivors commonly seek to avoid (Wharton et al., 2019). This presents a significant hurdle to

clinicians seeking to provide effective trauma-focused psychotherapy. For example, the literature suggests Prolonged Exposure (PE) "is the most effective treatment package available for PTSD" (Bleiberg et al., 2005, p. 277). However, "up to 26% of participants will drop out of PE and other CBT treatments aimed at reducing PTSD symptomatology" (Bleiberg et al., 2005, p. 277). Prolonged Exposure requires rape survivors to re-experience traumatic events in their mind, with the notion that habituation to survivors' fear and anxiety will occur in the process of confronting events (or memories) they previously sought to avoid. Altschuler, 1999 reported anecdotal evidence, garnered from patients with PTSD, suggesting the presence of animals assisted to reduce their anxiety during trauma-focused treatment and likely increased treatment compliance and attendance (Bleiberg et al., 2005).

EAP and Attachment Theory

In the article *Application of Attachment Theory to Equine-Facilitated Psychotherapy* (Bachi, 2013), the author explained several ways primary concepts of attachment-based psychotherapy, like secure base and haven of safety through the provision of a holding environment, affect mirroring, mentalizing and reflective functioning, and non-verbal communication and body experience, can be a good fit with therapy sessions simultaneously employing an equine assisted model (Bachi, 2013). Research "examining factors that account for the relation between insecure attachment and PTSD symptoms indicated that individuals with greater attachment anxiety reported stronger physical reactions to memories of their trauma and more frequent voluntary and involuntary rehearsal of their trauma memories. These phenomenological properties of trauma memories were in turn associated with greater PTSD symptom severity" (Ogle et al., 2015, p. 1). Bachi (2013) discussed client projections that can occur when witnessing typical equine herd behaviors, like older horses chasing younger horses

away from the herd. Some clients may describe the younger horses as anxious and frightened, while others perceive the same scenario as playfulness and the young horses desire to avoid being left alone. The Bachi et al., (2011) article, *Equine-Facilitated Psychotherapy for At-Risk Adolescents: The Influence on Self-Image, Self-Control and Trust,* considered these client projections as "windows into the client's internal world" (p. 299) and opportunities for therapists to explore further that might not otherwise be obtained. This article also noted instantaneous feedback as a unique and valuable aspect of using equines to assist psychotherapy sessions and the positive contribution it makes to affect mirroring along with mentalizing and reflective functioning (Bachi et al., 2011).

Mounted Versus Unmounted

EAP benefits are most commonly experienced/delivered using an unmounted delivery system, however mounted versions of treatment are also utilized and can provide their own unique benefits. For example, traumatized individuals, who cope with stress by dissociating, can be challenged to maintain adequate engagement in the therapeutic process during mounted sessions. The nature of remaining seated upon a 1200-pound live animal, particularly when it is in motion, demands some degree of attention (Kruger, 2018). Unmounted EAP is generally provided using a licensed mental healthcare provider and a certified equine specialist. The licensed mental healthcare provider is not required to be a "horse-person" and does not require professional skills in horse handling or training to become a qualified provider of EAP (see Appendix A). It is the role of the certified equine specialist to manage the horse(s) and overall environment during sessions in a manner that prevents physical injury to the animal, client, or licensed mental health treatment provider. However, most licensed mental health treatment providers choosing to include equines as assistive devices in conjunction with their typical model

of trauma care, seek additional training and certification in one or more of the available programs or models for administering EAP. A few examples include the Equine Assisted Growth and Learning Association (EAGALA), Professional Association of Therapeutic Horsemanship International (PATH Intl.) and The Herd Institute (see Appendix A).

Mounted versions of EAP should always be conducted in the presence of a qualified riding instructor. The certified equine specialist and/or the licensed mental healthcare provider can serve in the dual role of qualified riding instructor in mounted sessions (see Appendix A). Therapeutic riding instructor certification can also be obtained through the Professional Association of Therapeutic Horsemanship International (PATH Intl.). It is highly recommended that EAP providers seek the required training and certification from the entity of their choice and acquire appropriate liability coverage prior to providing services. Individuals seeking to receive services including EAP should request proof of all required licensures and recommended certifications prior to participation in these activities (see Appendix A).

Clinical Whole Health Perspectives

A common theme throughout the literature on EAP, relates to anecdotal evidence suggesting it may contribute to patient perceptions and self-report of overall improvement in psychological and physical well-being (Boshoff et al., 2015) (see also Koukourkos et al., 2019 & Gehrke et al., 2018). Historical perspectives in Western medicine underscore the notion that mental and physical health conditions are not connected. In the past several decades empirically based research has made significant progress in substantiating and seeking to explain the nature and mechanisms of the mind-body connection. The results have begun to reshape the way we conceptualize and approach mental and physical health concerns, including those within a clinical domain. Healthcare providers and entities have begun to embrace and more importantly

institute an integrated-team approach to providing services, as they shift toward a whole health view of addressing human illness. It is no longer uncommon for medical doctors and practitioners to work on integrated teams of professionals, including mental health care providers. In the process, general recognition and awareness of the role trauma plays in a whole health human perspective has improved (Boshoff et al., 2015) (see also Gehrke et al., 2018 & Koukourkos et al., 2019).

This is not to infer that a linear relationship exists between traumatic experiences and physical health problems (Richmond & Bhandari, 2018, Why It Might Happen section, para. 5). If an individual experiences trauma, he/she will not automatically develop physical health problems. Multiple additional factors including other life experiences, social and familial support systems, and genetics are key contributors in every unique individual response to traumatic experiences. The key thing to recognize is a significant number of individuals, with one or more traumatic experiences present, also incur "an increase in just about every medical issue over time," says Bessel Van Ker Kolk, MD, a trauma researcher and author" (Richmond & Bhandari, 2018, Why It Might Happen section, para. 5). Peter Levine, a prominent trauma expert, made this statement in his book titled *In an Unspoken Voice: How the Body Releases Trauma and Restores Goodness*: "when trauma is addressed and healed, mental and physical health both improve."

Section II: Literature Review

EBSCOhost databases were accessed and offered 66 databases. A search conducted on the Forces in Mind Trust Research Centre database (FiMT) using the term "equine" resulted in 7 peer-reviewed articles published in the Journal of Military, Veteran and Family Health between 2018 and 2022.

A search of the Academic Search Ultimate database using terms “equine assisted psychotherapy,” “equine assisted mental health,” “equine facilitated psychotherapy,” “equine assisted counseling,” “equine facilitated mental health,” and “trauma” was conducted. The results yielded ran from 2010 to 2022 and included 183 academic journals, 36 magazines, 5 reviews, 1 trade publication and 1 report. A second search was conducted on the PsychINFO database using the same terms and search parameters. The PsychINFO database results included 60 dissertations, 55 academic journals, 39 books and 2 electronic collections. The search results were further filtered to create a collection of the articles, books, and empirical studies most relevant to this review.

Trauma Prevalence and EAP for Addressing PTSD

Among the general population, 60% of men and 40% of women endorse one or more traumatic experiences across their lifespan (Kessler, 1995). Although a much smaller segment of the population goes on to develop clinically significant trauma-related mental illness, these numbers suggest effective methods of administering post-crisis and trauma informed mental healthcare may be of significant value to somewhere near half the U.S. population at some point during their lifetimes. Post-traumatic Stress Disorder rates among the general adult population in the United States hover around 4%, while the rate of occurrence within post-deployment U.S. military veterans is over triple the general population rate at 15% (Wharton et al., 2019). Additionally, the results of a study conducted by McFarlane et al. (2001), indicated patients with a history of PTSD were 8 to 10 times more likely to develop anxiety and/or psychotic disorders than individuals without a history of PTSD and “suggested that traumatic experiences and PTSD may have a great impact on the development and course of various other psychiatric disorders” (Floen & Elklit, 2007, p. 2). Among individuals with serious mental illness (SMI), the statistics

are even more profound with some clinical studies indicating between 34 and 81% of individuals with severe mental illness (SMI) experienced childhood physical, emotional, and/or sexual abuse (Mueser et al., 2001). Another study, conducted by McFarlane et al., 2001, identified a history of at least one traumatic event present among 61% of a sample of psychiatric inpatients.

Current literature suggest EAP can assist in administering psychotherapy focused on addressing trauma wounds like those present in individuals diagnosed with PTSD. Interactions with the horses often represent non-verbal powerful corrective experiences needed to heal the psychic damage resulting from traumatic experiences embedded in the limbic system of the brain (Trotter & Baggerly, 2018) which is responsible for our most primitive fight of flight survival instincts. “The quality of the attunement, regulation, and presence of the organisms, both human and equine, that support the process allows for a remapping of one’s neuroception” (Trotter & Baggerly, 2018, p. 9) or their subconscious ability to detect threats, risk, and safety. The human therapist/handler and the horse serve as healthy regulators in combatting constant states of either hyper or hypo arousal (Trotter & Baggerly, 2018).

Manual Development and EAP for Traumatized Veterans

A common evidence-based intervention used by Veterans Health Administrations to treat trauma is Cognitive Processing Therapy (CPT), which focuses on modifying maladaptive cognitions resulting from a traumatic event. Cognitive restructuring techniques are employed to assist participants in developing a healthier and more balanced internal evaluation of the event and themselves. “Recovery and/or decreased symptoms are proposed to stem from this restoration of adaptive thought processes” (Wharton et al., 2019, p. 269). The VHA routinely considers avenues for improving treatment outcomes and attrition rates, including the addition of equine-facilitated activities within CPT protocol.

In the study, *Pilot Testing a Manualized Equine-Facilitated Cognitive Processing Therapy (EF-CPT) Intervention for PTSD in Veterans,* a licensed clinical psychologist with 30 years of experience working with military and veteran populations and a VA trainer for CPT collaborated to create a manual for providing Equine Facilitated Cognitive Processing Therapy (EF-CPT) (Wharton et al., 2019). The goal was to conduct a study of the effectiveness of EF-CPT using a manualized EF-CPT treatment model, opening a path for future study replication and similar research studies, while adhering to the overall integrity of the standard CPT model for Veterans used by the VHA. Treatment consisted of 12-sessions of EF-CPT administered to twenty-seven participants diagnosed with PTSD according to the VA protocol for diagnosing PTSD, which includes ICD-10 and DSM-IV criteria. A pre-post design was employed using two measures: The PTSD Checklist (PCL)-Military version (PCL-M) and the Trauma Related Guilt Inventory (TRGI). A Working Alliance Inventory-Short form (WAI-SF) was administered after the final treatment session to assess the therapeutic alliance between client and therapist. Finally, the Human-Animal Bond Scale (HABS) was also administered following the final treatment session to measure the bond developed between the participant and the equine over the entire course of treatment.

The study authors co-created a manualized version of EF-CPT, consisting of the traditional CPT for military treatment model "infused" (Wharton et al., 2019, p. 271) with equine facilitated psychotherapy techniques. Veterans focused on identifying emotions, retelling of the traumatic event, identifying thinking patterns, and addressing trust, intimacy, power, and control. The sessions of EF-CPT focused on the same topics while involving participants in task like leading the horse with no lead rope of physical contact.

> This activity provides a platform to engage with the therapist on leadership styles, alpha behavior, force versus coercion, and other concepts which may play a part in a combat-related trauma. Through activities like these, clients can both use the horse as a reflection of behavior—either in observation of the horse or herd, or in how humans interact with the horse or herd. They also provide an externalizing focus that engages active movement which may also provide some neurocognitive stimulation that can help in processing memories (Wharton et al., 2019, p. 272).

The study included a detailed example (Figure 1) of an EF-CPT session:

Figure 1

Example EF-CPT Session Foci and Exercises

Example Session 2: Focuses on the meaning of an activating event. Work includes addressing identifying emotions, and identifying the connections between the event, thoughts, and feelings using the A-B-C strategy.
Suggested equine exercise: Set up a herd dynamic with an alpha horse and several other herd-mate horses alone in the paddock with hay; the participant and therapist observe the herd behavior in this situation from a safe distance, and discuss what is observed, what the individual perceives to be happening and resulting, and how s/he feels about it; this will involve both discussion of the perception and education around herd and human pecking order and resulting behavior.

Example Session 4: Focuses on the participant telling a story of trauma, with as much sensory detail, and emotional recall as possible. The individual will be coached and supported in feeling emotions related to the event and continuing in the telling of the story.

Suggested equine exercise: The participant selects and grooms a horse from the prior sessions. As before, the horse will be held or tied as per the horse handler's safety-based decision and the individual will be given a curry comb as a well as a soft brush and instructed briefly in the use of these items. The participant will curry in a circular motion and brush in lengthwise strokes during the session. Participant is asked Socratic questions by the therapist as they groom the horse. If the participant has difficulty with the Socratic questions about his/her memories of the event, the participant will be asked to anthropomorphize the behavior of the horses as observed in the previous sessions, and this can be a springboard to relate to the participant's own memories of his/her event.

Example Session 6: Involves learning more about challenging questions and finding examples of problematic thinking patterns. The client will practice, with coaching, thinking through the challenging questions. This will help to identify ways in which faulty cognitions have created reactions to the trauma event that helps to frame the meaning. Because this phase of the intervention involves growing

the confidence of the participant to identify and challenge his/her own beliefs, equine exercises will address building self-confidence in actions, in creating thought processes, and in decision making. **Suggested equine exercise:** A variation of Parelli's friendly game may be used to work on building self-confidence: the participant is asked to hold the lead rope of the horse, and boldly and firmly step close to the horse and notice the reaction. Most horses will be uncomfortable with this bold approach and give some indication of that discomfort, such as tossing the head or moving back. Examine with the participant the horse's reaction and any reaction that the participant may have had and relate these to feelings about having personal boundaries violated. Coach the participant through ways to ask and approach the horse and be accepted into the space. The participant may need reassurance that retreat and trying again is a completely acceptable choice when there is discomfort in boundary violation. Issues to be discussed include boundaries, comfort levels, recognizing and respecting discomfort, retreating, and what it is like to be the alpha and lead with respect. Discussion will also include the benefits of getting horses/people to respond in ways because they want to, rather than out of fear.

Note. EF-CPT = equine-facilitated cognitive processing therapy. *All sessions also include material from appropriate sessions found in the VA-endorsed cognitive processing therapy (CPT) manual. From "Pilot Testing A Manualized Equine-Facilitated Cognitive Processing Therapy (EF-CPT) Intervention For PTSD In Veterans," by T. Wharton, J. Whitworth, E. Macauley, and M. Malone, 2019, *Psychiatric Rehabilitation Journal*, *42*(3), p. 271 (https://doi.org/10.1037/prj0000359). Copyright 2019 by the American Psychological Association.

Results revealed significant improvements in PCL scores (M1 = 68.25, M2 = 35.96, $p \leq .001$) as well as TRGI scores ($p \leq .001$ on all scales). The HABS and WAI measures indicated significant improvements in the working relationship between the therapist and client, and between the horse and client over the course of treatment. Two participants dropped out after attending one session resulting in a 7% attrition rate. Previous research evaluating the effectiveness of CPT, including a systematic review, found between 40 and 60% of participants no longer scored in the clinical range, using a cut-off point of 50 on the PCL-M. Results from this study indicate 84% ($n = 21$) no longer met criteria for Post-traumatic Stress Disorder. While

the small number of participants and lack of comparison studies, indicate further research is required to establish the scientific validity of these results, these findings indicate the potential usefulness of incorporating equine assisted components into standard treatment models.

A more recent 2020 study, entitled *Equine-Assisted Therapy for Veterans with PTSD: Manual Development and Preliminary Findings*, also focused on the use of EAT for treating veterans with PTSD (Arnon et al., 2020). Participants included two pilot groups of veterans with PTSD symptoms. The authors developed their own manualized protocol, EAT-PTSD, and conducted an open trial pilot test to assess the effects of eight 90-minute group treatment sessions. They collected data at pretreatment, mid-point, post-treatment, and 3-month follow-up. One notable motivation for developing and executing the study was a 2018 Veterans Affairs mandate, allotting funds from the VA's Adaptive Sports Program to support the continued development and implementation of Equine Assisted Therapies. Interestingly, the authors cited one of their goals to differentiate EAT-PTSD from standard group therapy (Arnon et al., 2020).

Unlike, most other EAT sessions the licensed mental health professional did not incorporate a traditional form of therapy (Arnon et al., 2020). Instead, the clinician sought to facilitate each session by assisting patients to reflect and process their experiences. Sessions focused the use of unmounted work including equine grounding exercises which often incorporate relaxation exercises while promoting attunement and being present in the moment (Arnon et al., 2020). After excluding participants with any history of a psychotic disorder, unstable bipolar disorder, severe depression, recently severe or moderate substance use disorder(s), or increased risk of suicide eight of twenty-one potential participants (6-men and 2-women) were included in the study. Arnon et al. (2020) provided patient demographics and clinical diagnoses, which are available in the Figure 2:

Figure 2

Patient Demographics and Clinical Variables

	n	**%**
Gender		
Male	6	75.0
Female	2	25.0
Race		
White	5	62.5
Black	2	25.0
Mixed	1	12.5
Ethnicity		
Hispanic	3	37.5
Non-Hispanic	4	50.0
Not disclosed	1	12.5
Marital status		
Never married	2	25.0
Married	2	25.0
Living with partner	2	25.0
Widowed	1	12.5
Divorced	1	12.5
Employment status		
Working full-time	3	37.5
Unemployed	2	25.0
Disabled	1	12.5
Keeping house	1	12.5
Other	1	12.5
Income		
$10,000–$20,000	2	25.0
$20,000–$30,000	1	12.5
$40,000–$50,000	2	25.0
Over $50,000	2	25.0
Not disclosed	1	12.5

From “Equine-Assisted Therapy For Veterans With PTSD: Manual Development And Preliminary Findings,” by S. Arnon, P. W. Fisher, A. Pickover, A. Lowell, J.B. Turner, A. Hilburn, J. Jacob-McVey, B.E. Malajian, D.G. Farber, J.F. Hamilton, A. Hamilton, J.D.

Markowitz, J. C., and Y. Neria, 2020, *Military Medicine*, 185(5-6), p. e559 (https://doi.org/10.1093/milmed/usz444). Copyright 2020 The Society of Federal Health Professionals.

Measures, used in the Arnon et al. (2020) study, included the Clinician Administered PTSD Scale (CAPS-IV), Hamilton Depression Rating Scale (HAM-D), and self-report measures including the Posttraumatic Symptom Checklist (PCL-5), Beck Depression Inventory (BDI-II), and the Quality of Life Enjoyment and Satisfaction Questionnaire-Short Form (QLESQ-SF). The authors also assessed patients' contentment with treatment by administering the Client Satisfaction Questionnaire (CSQ) post-treatment. Sessions were conducted by EAGALA-certified mental health clinicians and equine handlers (Arnon et al., 2020). The authors provided the following figure with detailed explanations of each treatment component and session:

Figure 3

Equine Assisted Therapy Treatment Outline

Description	Focus
Session 1: Welcome, introduction, and orientation to treatment team and group members; group, safety rules, confidentiality; tour of facility; horse greeting	Psychoeducation: PTSD and EAT-PTSD; introduction and orientation with framework, staff, horses, participants
Session 2: Opening circle; horse greeting; equine-assisted exercises: grooming, lead walking, lead/walk/stop exercise, 4 feet; closing circle	Becoming acquainted with horses; establishing framework of treatment; recognition of nonverbal communication, facilitation of frustration tolerance, communication skills, adaptability, and teamwork
Session 3: Opening circle; horse greeting; equine-assisted exercises: grooming, A-leg-up, lead/walk/stop, fly fishing, closing circle	Further mastery and comfort with horse; introduction to working with the wand; team building; awareness of arousal cues; facilitation of assertiveness and self-regulation

Session 4: Opening circle; horse greeting; equine-assisted exercises: grooming, a leg-up, 4 feet, fly-fishing, send-away; closing circle	Development of more advanced skills needed for join-up exercise; recognition of nonverbal communication and interpretation of others' intentions; emphasizing teamwork; focusing on assertiveness (rather than aggressive or passivity); self-regulation; expression of personal needs; development of coping skills; boundary setting
Session 5: Opening circle; horse greeting; equine-assisted exercises: grooming, fly fishing, wand walking, send away, first two patients complete join-up (guided by equine specialist; closing circle)	Advance horsemanship skills; teamwork; execution of "join-up" exercise; enhancement of trust self-efficacy; facilitation of communication skills, confidence, skill, mastery; establishing personal space, communicating assertively; facilitation of problem-solving skills, anxiety tolerance; begin conversation about approaching termination
Session 6: Opening circle; horse greeting; equine-assisted exercises: obstacle course, second pair complete join-up (guided by equine specialist); closing circle	Completion of more advanced exercises; Awareness of arousal cues and present moment; facilitation of teamwork through navigation of horse through obstacles; gain of mastery and skills, problem-solving, coping, and communication skills; continue conversation about pending termination
Session 7: Opening circle; horse greeting; equine-assisted exercises: grooming, tarp exercise, join-up; closing circle	Completion of more advanced exercises; encouragement of attempting new skills; attention to arousal cues; frustration tolerance and addressing change; dealing with uncertainty; processing of thoughts, feelings, and reactions regarding impending termination
Session 8: Opening circle; horse greeting; equine-assisted exercises: grooming, lead walking, join-up; saying goodbye to horses; graduation ceremony	Execution of more advanced exercises; focusing on familiarity of exercises; termination and goodbye; managing transitions; lessons learned.

From "Equine-Assisted Therapy For Veterans With PTSD: Manual Development And Preliminary Findings," by S. Arnon, P.W. Fisher, A. Pickover, A. Lowell, J.B. Turner, A. Hilburn, J. Jacob-McVey, B.E. Malajian, D.G. Farber, J.F. Hamilton, A. Hamilton, J.C. Markowitz, and Y. Neria, 2020, *Military Medicine*, 185(5-6), p. e561

(https://doi.org/10.1093/milmed/usz444). Copyright 2020 The Society of Federal Health Professionals.

Closing circle was the final exercise at the end of each session and provided participants with an opportunity to review and discuss their session experiences. All participants completed the study. The following, from Arnon et al. (2020), reflects outcomes for each measure:

Figure 4

Outcomes Per Measure Used

	Pretreatment		Midpoint		Post-treatment		Follow-up	
	M	SD	*M*	SD	*M*	SD	*M*	SD
CAPS-5$_{a,b,c}$	39.63	10.49	29.86	13.26	23.13	11.66	22.67	10.76
HAM-D$_{a,b,c}$	15.75	5.37	11.71	6.55	6.88	4.36	8.17	4.88
PCL-5$_{a}$	46.29	14.08	34.71	17.72	23.13	14.25	22.83	13.36
BDI$_{a}$	27.29	11.01	18.43	11.60	11.88	8.64	12.33	10.78
QLESQ$_{a}$	52.38	11.40	55.29	16.54	61.25	13.16	60.00	19.36

Note: Superscript denotes significant difference ($p < 0.05$).
a - Pre/post-treatment.
b - Pretreatment/follow-up.
c - Midpoint/follow-up.

From "Equine-Assisted Therapy For Veterans With PTSD: Manual Development And Preliminary Findings," by S. Arnon, P.W. Fisher, A. Pickover, A. Lowell, J.B. Turner, A. Hilburn, J. Jacob-McVey, B.E. Malajian, D.G. Farber, J.F. Hamilton, A. Hamilton, J.C. Markowitz, and Y. Neria, 2020, *Military Medicine*, 185(5-6), p. e559 (https://doi.org/10.1093/milmed/usz444). Copyright 2020 The Society of Federal Health Professionals.

Arnon et al. (2020) used "IBM SPSS Statistics version 25, to conduct separate repeated measures ANOVAs on CAPS-5, HAM-D, PCL-5, BDI, and QLESQ scores (pretreatment, midpoint, post-treatment, and follow-up) for all participants with complete data sets. When significant, analyses were followed by paired sample t-tests using all available data. Cohen *d* determined small ($d = 0.2$), medium ($d = 0.5$), and large ($d = 0.8$) effect sizes. PTSD remission and response were assessed post-treatment ($n = 8$) and at follow-up ($n = 6$). Response was defined a priori as >30% decrease from pretreatment CAPS-5, and remission as CAPS-5 total score ≤ 10" (Arnon et al., 2020, p. e560). CSQ results reflected a high degree of participant satisfaction with EAT.

Arnon et al. (2020) results also reported significant ANOVA results for the CAPS-5 ($F(3,15) = 5.19$, $p = 0.012$) and follow-up *t*-tests also reflected significant results including "significant decreases pre to post-treatment ($t = 9.58$, $p < 0.001$, $d = 1.49$), midpoint to post-treatment ($t = 2.70$, $p = 0.035$, $d = 0.54$), and pretreatment to follow-up ($t = 3.35$, $p = 0.020$, $d = 1.60$)" (p. e561). However, CAPS-5 results worsened or increased for four of the six participants evaluated between week 8 and follow-up. HAM-D data produced significant ANOVA results also ($F(3,15) = 3.90$, $p = 0.030$) with subsequent t-tests reflective of "significant decreases pre- to post-treatment ($t = 7.13$, $p < 0.001$, $d = 1.81$), midpoint to post-treatment ($t = 2.68$, $p = 0.037$, $d = 0.87$), and pretreatment to follow-up ($t = 3.46$, $p = 0.018$, $d = 1.48$)" (pp. e561-e562). The same four participants who reported worsened or increased CAPS-5 results between week 8 and follow-up also reported increased HAM-D results within the same time frame. ANOVA results for the self-report measures were not significant, although the authors suggested this may have been due to the small sample size or Type II error. So, they ran paired-sample t-tests on the pre- and post-treatment self-report data and "revealed significant improvement from pre- to post-

treatment: PCL-5 ($t = 3.80$, $p = 0.009$, $d = 1.63$); BDI ($t = 4.74$, $p = 0.003$, $d = 1.56$); and QLESQ ($t = -2.69$, $p = 0.031$, $d = 0.72$)" (p. e562).

Overall, the Arnon et al. (2020) results appeared to indicate that using Equine Assisted Psychotherapy alone (with no other form of therapy included) to address trauma in veterans produced significant improvements in symptoms. However, it should be noted the CAPS-5 and HAM-D scores increased (or worsened) between week 8 (the last session of EAP) and a 3-month follow-up. So, while patients experienced steadily significant clinical improvement in symptoms, between pre-treatment and the final session of EAP, four of the 6 participants regressed between the final session and follow-up. The authors proposed several potential reasons for the regression, including a lack of treatment specificity or a lack of persisting effect. Additionally, once participants completed their course of EAP treatment, they did not continue with other forms of treatment potentially leading to a return or "rebound" of symptoms (p. e562). It was also suggested that many PTSD patients may require longer-term treatment protocols, including repeated processing of trauma experiences and the resulting maladaptive thoughts, emotions, and behavior patterns (Arnon et al., 2020).

Arnon et al. (2020) noted strong patient satisfaction and an impressive zero attrition. We know from studies discussed earlier in this literature review, higher than average attrition rates are a common obstacle for trauma focused mental healthcare. The authors cited previous research results indicating "high treatment dropout rates among PTSD patients broadly (roughly 20%) and veterans specifically (approximately 30–40%)" (p. e562) underscoring the potential importance of their study results (Goetter et al., 2015; Imel et al., 2013; Kehle-Forbes et al., 2016; Olatunji et al., 2009). Arnon et. al (2020) also discussed a potentially valuable reason for the improvement in attrition rate and explained their thoughts via the following statement,

"Anecdotally, we found patients eager to enroll in EAT-PTSD. Some patients preferred group EAT to individual psychotherapy; others were excited about group EAT adjunctive to ongoing treatment. Outcome research has emphasized the importance of patient preference in treatment outcome" (p. e562) (See also Kocsis et al., 2009; Markowitz et al., 2015; McHugh et al., 2013; Swift et al., 2010). Patient treatment preference appears to have a statistically significant impact on treatment outcome. The literature, on EAP and EAM in general, repeatedly noted anecdotal evidence suggesting they are often preferred over traditional forms of therapy (Arnon et al., 2020).

A Meta-Analysis of Animal Assisted Interventions Including Horses

Several studies in a 2015 meta-analysis entitled *Animal-Assisted Interventions for Trauma: A Systematic Literature Review* focused entirely on the use of horses or a combination of dogs and horses (O'Haire et al., 2015). All studies, included in the analysis, were published between 2010-2015. The studies that included horses were conducted at riding facilities and included individual and group-based therapy sessions. The specific activities and protocols used were not reported with enough detail to replicate the studies. Three of the studies only used horses and one of the three included mounted activities (riding). The other two studies did only groundwork (unmounted only) based on what they referred to as "basic horsemanship" (p. 5) and "natural horsemanship" (p. 5). All of the studies, including horses, used the interactions between clients and horses as metaphors for the clients' relationships with others. The average length of treatment was 7.8 weeks and included an average of 11.6 sessions. The number of participants in each study ranged between 1 and 153, with 50% of the studies conducted with ≤ 11 participants and males occupying 20.2% of the total sample size across 10 studies. Seven of the studies were conducted with children and adolescents (n = 279) and three were conducted with adults (n =

87). Participants included war veterans diagnosed with PTSD, children and adolescents exposed to family violence including physical and sexual abuse and other unspecified traumas. Fifty percent of the studies (*n* = 5) included a comparison condition, with the rest (with the exception of *n* = 1 that used retrospective interviews) using a pre-post design (*n* = 4) (O'Haire et al., 2015).

Six of the 10 studies, looking at Animal Assisted Interventions (AAI) for trauma, reported a significant reduction in depression symptoms after the last session. This was the most commonly occurring treatment outcome. There was some question about whether the changes were only short-term, with "variability in the timing magnitude of changes, with the mean percent change from before to after AAI ranging from -19 to -72%" (p. 7). Effect sizes, for changes in depressive symptoms, ranged from small to large. Reduction in symptoms of PTSD occurred in 5 of the 10 studies and was the second most commonly occurring outcome. Interestingly, the reductions were significant in the study using only horses with 30 participants (Kemp et al., 2013), but were not significant in a different study using dogs with 153 participants (Dietz et al., 2012). Additionally, significant reductions in dissociation were present in both studies. Effects sizes were small to large. One comparison study of 30 traumatized children and adolescents, with problematic behaviors, showed a 63% reduction in these behaviors after receiving treatment incorporating horses (O'Haire et al., 2015).

EAT and Mindfulness and PTSD symptoms

Earles et al. (2015) conducted the study, *Equine-Assisted Therapy for Anxiety and Posttraumatic Stress Symptoms,* to investigate the effectiveness of EAT for reducing symptoms of anxiety, depression, and posttraumatic stress disorder while increasing mindfulness. Mindfulness is a commonly used approach to boosting coping skills in individuals struggling with depression and anxiety related disorders. Earles et al. (2015) hypothesized that working

with horses "could increase insight and mindfulness, which in turn could decrease anxiety and PTSD symptoms" (p. 149). The authors pointed to horses' typically high level of responsiveness to humans and supported this with separate study results (Yorke et al., 2013) demonstrating a "positive correlation between cortisol levels in children with PTSD and cortisol levels in their therapy horses" (Earles et al., 2015, p. 150). As herbivores, horses are not prey animals and instead are often preyed upon in the wild. They prefer to exist in herds and are hyper-vigilant, with constant attention on their surroundings. Horses have strong fight or flight instincts and will respond to gestures from others in their environment, including humans. Highly domesticated horses are generally more relaxed and can also be playful and inquisitive. These natural tendencies mean that almost all horses will provide immediate feedback to nonverbal cues or behaviors (Earles et al., 2015). As the authors of this study pointed out, "horses may crowd a person who is hunched and avoiding eye contact" (p. 150) most likely because they are not feeling threatened and have become curious. Or they may "back away from a person who is approaching quickly with prolonged eye contact" (p. 150). The horses' typically rapid responses to non-verbal (and verbal) ques tend to demand awareness from humans in their presence, unless they are ok with being run over by a 1200-pound animal or on the lighter side simply catch a mucous filled snort or nostril blow! (see Appendix A). Yetz (2011) hypothesized that the imposing nature of horses may encourage attention and model a present focus. This process helps to develop heightened levels of self-awareness and increased personal insight relative to body language, behaviors, and emotions. These are core components of mindfulness and can seem easy to embrace but are quite challenging for many traumatized individuals to put into practice. Routine interactions with horses may afford participant's an environment that demands

they remain present in the moment, ultimately helping to forge new habits conducive to long term symptom reduction (Earles et al., 2015).

Mental health practitioners recruited 12 female adults and 4 male adult participants meeting the DSM-V Criterion A guideline for experiencing two traumatic events (across their lifetime), using the Life Events Checklist (LEC) (Earles et al., 2015). Chosen participants also scored above the recommended threshold for the likely presence of PTSD, using the Post-Traumatic Checklist-Specific (PCL-S). Each participant identified their worst traumatic experience, and these included serious accident, physical or sexual assault, life threatening illness or injury, and sudden violent death. Participants reported time lapses ranging between 1 to 39 years, since each individual traumatic experience occurred. Researchers used a pre-post design, with three groups of participants and 5-6 in each group. Pre-treatment self-report measures including the PTSD Checklist-Specific (PCL-S), Life Events checklist (LEC), Trauma Emotion Questionnaire, Generalized Anxiety Disorder Scale, 9-item Patient Health Questionnaire measuring depression, 10-item Alcohol Use Disorders Identification Test, and the 15-item Somatic Symptom Severity Scale of the Patient Health Questionnaire were administered to each group, with post-treatment questionnaires administered on-site immediately after the last session (Earles et al., 2015). Social support, coping strategies, and mindfulness were measured using the 39-item Five Facet Mindfulness Questionnaire, 14-item Proactive Coping subscale of the Proactive Coping Inventory, 9-item General perceived Self-Efficacy Scale, 15-item Social Support Scale, 5-item Satisfaction with Life Scale, and the 10-item Life Orientation Test-Revised. Figure 5 reports means, standard deviations, and effect sizes for each measure (Earles et al., 2015).

Each of six total 2-hr sessions incorporated horses into psychotherapy activities focused on developing noncritical self-awareness, improved concentration, improved listening skills, nonverbal interactions (including their effects and relationship boundaries), dealing with challenges while under stress, creating safe spaces, how to remain focused when confronted with distractions and/or temptations, and skills to boost inner stillness and stability (Earles et al., 2015).

Figure 5

Effects of 12 Hours of Equine-Assisted Therapy

	Pretest		Posttest		
Variable	*M*	*SD*	*M*	*SD*	*d*
Posttraumatic Stress	50.93	12.63	39.38	16.73	1.21***
Trauma emotion	3.22	0.80	2.83	0.90	0.60*
Generalized anxiety	12.56	6.20	8.31	5.47	1.01**
Depression	20.50	7.45	18.25	6.26	0.54*
Alcohol use	3.25	2.59	2.56	2.06	0.58*
Physical health	7.87	3.34	7.13	3.07	0.37
Mindfulness	109.69	16.86	123.34	19.26	1.28***
Proactive coping	39.53	9.00	39.50	9.02	0.00
Self-efficacy	28.63	7.63	30.19	5.80	0.45
Social support	12.19	2.48	12.22	2.27	0.02
Life satisfaction	17.81	6.10	19.13	7.66	0.25
Optimism	19.06	7.51	19.69	7.08	0.18

Note. $N = 16$; analysis was paired *t*-test. $*p < .05$. $**p < .01$. $***p < .001$.

From "Equine-Assisted Therapy For Anxiety And Posttraumatic Stress Symptoms" by J.L. Earles, L.L. Vernon, and J.P. Yetz, 2015, *Journal of Traumatic Stress, 28*(2), p. 151 (https://doi.org/10.1002/jts.21990). Copyright 2015 International Society for Traumatic Stress Studies.

Results of the Earles et al. (2015) study indicated significant reductions in alcohol use, symptoms of depression, symptoms of anxiety, emotional distress, and symptoms of PTSD. Mindfulness indicators increased for all participants at the end of treatment. Results also indicated that significant changes did not occur in optimism, life satisfaction, social support, proactive coping, general perceived self-efficacy, and physical health. These results indicated "equine-assisted therapy can be an effective therapeutic technique for PTSD and other anxiety symptoms" (p. 151). The study authors recommended future research "use a control group design, examine the long-term effects of the treatment and the influence of group dynamics and expectancy effects on treatment outcome" (Earles et al., p. 151).

Mounted EAT, PTSD and Trauma in Veterans

Johnson et al. (2018) conducted the study *Effects of Therapeutic Horseback Riding on Post-Traumatic Stress Disorder in Military Veterans* using a randomized controlled design with repeated measures to investigate the value of Therapeutic Horse Riding (THR) with military veterans diagnosed with PTSD and/or Traumatic Brain Injury (TBI). The authors hypothesized that participation in THR would be "associated with a decrease in PTSD symptoms, increases in coping self-efficacy, emotional regulation, and a decrease in social and emotional loneliness among veterans" (p. 3). Twenty-nine participants, all of whom were military veterans, were randomly assigned to the horse-riding group (n = 15) or the control group (n = 14). Participants in the control group did not receive treatment or TRI, until after the first 6-week session (with participants in the randomized group) was completed. The control group was not "expected to have any changes in outcome measures during the 6-week waitlist control period" (Johnson et al., 2018, p. 3).

Authors explained the history of THR, which was initially developed to assist adults with a variety of physical impairments. Although the authors noted, other THR studies, have reported a host of gains in psychological and social outcomes including self-efficacy, motivation, courage, reduced psychological distress, enhanced psychological well-being, and improved social involvement (Johnson et al., 2018). An interesting aspect of this study was the sessions did not include any form of psychotherapy or counseling. They were strictly horse-riding sessions designed to be therapeutic in nature and were similar to standard group riding lessons accessed by the general public. Session activities included learning basic horsemanship skills, grooming, tacking up (putting the saddle, bridle, and any other tack on the horse in preparation to ride), and riding with a leader for the horse and two side walkers (for safety purposes) (Johnson et al., 2018) (See Appendix A).

Symptoms of PTSD and/or TBI were measured using the PTSD Checklist-Military Version (PCL-M), the Coping Self Efficacy Scale (CSES), the Difficulties in Emotion Regulation Scale (DERS), and the Social and Emotional Loneliness Scale for Adults-short version (SELSA) (Johnson et al., 2018). Measures were administered to the randomized group at baseline, 3-weeks, and 6-weeks (end of treatment). Measures were administered to the control group at baseline, again at the end of 6-weeks with no treatment (immediately prior to the 2nd 6-week period when they would begin THR), 3-weeks after beginning THR, and after 6-weeks of THR (end of treatment) (Johnson et al., 2018).

Results included descriptive statistics (frequency, frequency descriptions and correlations between relevant variables) and inferential statistics (repeated measures ANOVA, confirmatory analysis and logistic regression) (Johnson et al., 2018). Post-traumatic Checklist - Military version scores were significantly decreased, within group receiving THR, at both the 3-week and

6-week intervals. The military uses a 5-point decrease as the minimum threshold to determine that an individual has responded to treatment. A 10-point improvement is necessary to achieve clinically meaningful results. Results for this study are in figure 6 and reflected 6-point mean improvements in PTSD symptoms at the 3-week data point and 13 points at the 6-week data point (when receiving THR). These results support clinically meaningful improvement in PTSD symptoms (according to military standards) for participants receiving THR. The DERS and CSES scores moved in the predicted direction but were not statistically significant changes. The SELSA indicated increased loneliness, which was the opposite of authors' predicted outcome. However, authors reported multiple participant's expressed sadness that the THR program was ending and suggested this may have influenced the SELSA scores. "Overall, participants had an 81.8% likelihood of improvement in PTSD levels" (p. 8). The authors acknowledged the presence of a multitude of extraneous variables that may have influenced their findings. They also discussed why it is "not realistic that each of these components could be studied separately in a randomized controlled trial; their individual relevance is perhaps less important than the complete THR experience because these components would not naturally occur in isolation" (Johnson et al., 2018, p. 9).

Shelef et al. (2019) conducted a case series study titled, *Equine Assisted Therapy for Patients with Post Traumatic Stress Disorder: A Case Series Study*, using Equine Assisted Therapy (EAT) to treat patients with posttraumatic stress disorder. The authors noted an important development, the 2014 creation of an evidence-based protocol and best practices approach for using therapeutic horseback riding (THR) when treating veterans with posttraumatic stress disorder (Martz, 2014). The main activity involved in THR is mounted

horseback riding, however THR activities include other components of equine assisted therapy (EAT) for example grooming, saddling, and groundwork (Shelef et al., 2019).

The study included twenty-three veterans, previously diagnosed with PTSD, and referred by the Israel Ministry of Defense's to the Therapy, Research & Care Institute (TRCI) in Tel-Mond, Israel (Shelef et al., 2019). TRCI provides treatment to members of the Israel Defense Forces suffering from PTSD and other physical, emotional, and/or cognitive concerns. Each participant previously met DSM-IV-TR criteria for a PTSD diagnosis for a period of no less than 1-year. Participants participated in 3-hour weekly EAT sessions for 6-months. The purpose of this case study was to examine the effect of EAT in patients with PTSD within three domains: work, family and social functioning. Measures included the Short Post Traumatic Stress Disorder Rating Interview (SPRINT) and the Sheehan Disability Scale (SDS) for "assessing subjective functional disability due to psychiatric disorder" (p. 395). Psychiatrist collected demographic and clinical data and administered the SDS and SPRINT scales at baseline (before the first EAT session). They administered the SDS a second time after the first 30-days, or after four EAT sessions were completed, and a third time at the end of the 6-month period. The SPRINT scales were administered for a second time at the end of the 6-month period (Shelef et al., 2019).

Participants participated in group EAT sessions (maximum of 12 participants per session) including 20-minutes of introduction to each planned activity (given by a social worker and certified therapeutic riding instructor), 25-minutes of grooming and saddling procedures, followed by a 45-minute mounted (riding) or THR session and a 15-minute break (Shelef et al., 2019). The break was followed by a 45-minute groundwork session focused on trust and communication. Each weekly session concluded with a 45-minute group session to process

experiences and shared observations including participant and horse behaviors and coping skills. The final 45-minute sessions were "based on short-term group therapy models emphasizing aspects such as universality, installation of hope, imitative behavior, interpersonal learning, socialization techniques and more" (Shelef et al., 2019, p. 396).

Shelef et al., (2019) used descriptive statistics to assess the tested variables and parameters and examined demographic data between study completers and study dropouts. "Paired-t test and a signed rank test were performed for the SPRINT and SDS scales. The data were analyzed using SAS Software 9.3 version, (Cary, NC)" (p. 396). Only thirteen of the twenty-three participants completed the program. Demographic data (age, sex, and years of education) did not differ between those who completed the study and participants who dropped out. The resulting statistics for each measure are in figures 6 and 7 (Shelef et al., 2019):

Figure 6

SPRINT changes at 6 months N = 13

SPRINT Scale	Baseline ± SD	6 Mos. ± SD	Change ± SD	*p*-Value (paired *t*-test)	*p*-Value (Signed-Rank Test)
Bothered by unwanted memories	2.92 ± 1.04	2.85 ± 1.14	-0.08 ± 1.12	0.80	0.69
Effort to avoid thinking/talking about the event	2.77 ± 1.79	2.46 ± 1.39	-0.31 ± 1.25	0.39	0.53
Lost enjoyment for things	3 ± 1	2.46 ± 1.56	-0.54 ± 1.27	0.15	0.12
Bothered by poor sleep or concentration	3.08 ± 1.32	3.08 ± 1.26	0 ± 0.71	1	1
Bothered by pain/aches/tiredness - baseline	3.15 ± 1.14	2.46 ± 1.51	-0.69 ± 1.6	0.14	0.19
Upset when stressful events happen	3.15 ± 1.07	3.08 ± 1.19	-0.08 ± 1.04	0.79	0.98

Symptoms interfered with ability to work/carry out daily activities	3.23 ± 0.93	2.54 ± 1.33	-0.69 ± 0.95	0.02*	0.04*
Symptoms interfered with relationships with family/friends	3.08 ± 1.12	2.62 ± 1.39	-0.46 ± 0.97	0.11	0.17
SPRINT SUM of 1-8	24.38 ± 6.4	21.54 ± 7.94	-2.85 ± 4.14	0.02*	0.04*

*Note: *p ≤ 0.05.* From "Equine Assisted Therapy For Patients With Post Traumatic Stress Disorder: A Case Series Study," by A. Shelef, D. Brafman, T. Rosing, A. Weizman, R. Stryjer, and Y. Barak, 2019, *Military Medicine*, *184*(9-10), p. 398 (https://doi.org/10.1093/milmed/usz036). Copyright 2019 Association of Military Surgeons of the United States.

Figure 7

SDS changes at 6 months N = 13

SDS Scale	Baseline ± SD	6 mos. ± SD	Change ± SD	*p*-Value (Paired *T*-Test)	*p*-Value (Signed-Rank Test)
Symptoms disturb at work/studies	7 ± 3.16	5.77 ± 3.30	-1.23 ± 4.07	0.29	0.24
Symptoms disturb in social life	7.15 ± 2.73	6.31 ± 3.15	-0.85 ± 1.95	0.14	0.17
Symptoms disturb at home	7.23 ± 3.47	6.46 ± 2.99	−0.77 ± 2.49	0.28	0.29
Inactive days during last week	2.85 ± 1.99	1.35 ± 1.97	-1.5 ± 2.90	0.08	0.08
Inefficient days during last week	4.15 ± 2.73	1.88 ± 2.18	-2.27 ± 2.70	0.01*	0.01*
SDS SUM of items	28.38 ± 9.82	21.77 ± 11.14	-6.62 ± 8.86	0.01*	0.01*

Note: *$p \leq 0.05$. From "Equine assisted therapy for patients with post-traumatic stress disorder: A case Series study," by A. Shelef, D. Brafman, T. Rosing, A. Weizman, R. Stryjer, and Y. Barak, 2019, *Military Medicine, 184*(9-10), p. 398 (https://doi.org/10.1093/milmed/usz036). Copyright 2019 Association of Military Surgeons of the United States.

Shelef et al. (2019) reported a statistically significant improvement in total scores on the SPRINT, evidenced by a decrease of 2.85 ± 4.14 ($p < 0.05$) at the end of treatment. SDS results indicated a statistically significant "reduction in the number of days of inefficiency (work/study/housework)" (pp. 397 – 398) and statistically significant improvements in overall scores after 1-month of EAT and again after 6-months of EAT. The authors reported personal perspectives including shared observations and perceptions (from both clinicians and participants) indicating subjective improvements in self-image, coping skills, relationship skills, and belonging. In one apparent example of how typical horse behavior can assist patients to improve self-awareness and coping skills one participant stated, "after a thunderstorm occurred during an EAT session one participant reportedly stated, "I did it, I knew the horse needed me to stay calm, so I did. Now I know I can be a Dad. I'll be there for my son because he needs me" (Shelef et al., 2019, p. 398).

Overall, Shelef et al. (2019) described helpful improvements in PTSD symptoms and daily functioning. They cited Lanning et al. (2017) in support of their findings, in addition to the Earles et al. (2015) study previously discussed. Reported study limitations were highly consistent with other studies and included "an open trial model, case study design, use of a convenience sample, lack of control group, small sample size, and poor completion rate" (p. 399). The study discussed the need (and difficulty) to identify which specific features of EAT resulted in statistically significant improvements in PTSD symptoms and suggested the improvements, in

PTSD symptoms, may have been related to EAT demands including persistence and motivation (Shelef et al., 2019).

Nagrath (2020) used a quasi-experimental nonrandomized control group design in the research article: *Investigating the Efficacy of Equine Assisted Therapy for Military Veterans with Posttraumatic Stress Symptomology*. Nagrath (2020) included a section devoted to suicide among veterans and cited a 2019 National Veteran Suicide Report indicating the total number of veteran suicides exceeded 6,000 per year between 2008 and 2017. Furthermore, the same VA report indicated suicide rates among veterans diagnosed with PTSD between 2005 – 2017 increased from 40+ per 100,000 to 50+ per 100,000 (VA, 2019). The Nagrath 2020 study reported among 407 veterans surveyed, individuals with PTSD "were four times more likely to report suicidal ideation. Furthermore, the risk of suicide was almost six times higher in those with two or more coexisting psychiatric disorders" (p. 3) for example those with PTSD and depression. These findings underscored the need to continue advancing improvements in empirically based treatments for PTSD. Nagrath (2020) noted the following about EAT:

> EAT has the potential to demonstrate that trauma reactions can be managed with less attention on the actual trauma and more emphasis on building connections, empathic reflection, relational reciprocity, and respect (Cukor et al., 2009; Lancia, 2008). Broadly, incorporating the equine and equine assisted activities into a treatment plan directly contributes to a client's experiential processes and subsequent gains therein. As Selby and Smith-Osborne (2013, p. 419) stated, "horses are engaged as change agents to facilitate the process of enhanced biopsychosocial development, growth, and education (pp. 3-4).

Nagrath (2020) was conducted using 50 total participants, split to allow for 25 participants between the treatment group and the control group. Participants were referred by the VA and other organizations supporting veterans. Three sections of 8 – 10 veterans each comprised the treatment group and received EAT three separate days per week.

> The researcher applied the recommended minimum power of 0.80 (a beta value [β] or Type II error rate), an alpha value of 0.025 (Type I error rate) with an estimated effect size of r = 0.90, which was set based on Cohen's (1988) commonly used effect size in psychological research (Lakens, 2013). Additionally, the alpha value was adjusted from 0.05 to 0.025 after applying the Bonferroni Correction since two outcome measures were used for this study. This helps (Field, 2018) to reduce the chances of obtaining false-positive results (Type I errors) when multiple tests are performed on a single set of data (p. 6).

The control group received treatment as usual including cognitive and exposure therapies commonly employed by the VA. Control group participants received treatment as usual while the treatment group engaged in 10 weekly 3-hr EAT sessions. Standardized measures used included the PTSD Checklist-Military Version (PCL-M) and the Functional Assessment of Chronic Illness Therapy-Spiritual Well-Being Scale (FACIT-Sp). Baseline data was collected prior to week one and paired samples t-test were conducted on the pre-treatment and post-treatment scores. ANCOCA was used to assess differences between the independent variable (EAT) and dependent variables (PTSD and well-being). Sessions were conducted at a Professional Association of Therapeutic Horsemanship International (PATH Intl.) accredited facility named McCormick Research Institute. The treatment (or intervention) was very similar to the Shelef et al. (2019) study in that it included a combination of groundwork and activities in addition to

"mounted equine assisted activities" (p. 7). A brief review of the McCormick Research Institute Equine Assisted Therapy curriculum is in figure 8:

Figure 8

McCormick Research Institute Equine Assisted Therapy Curriculum Review

Description	**Session Overview**
Week 1: Welcome; introductions; confidentiality; group rules; overview of program; safety.	**Theme: Trauma Intelligence:** understanding PTSD – arousal, avoidance; triggers; awareness – feelings/thoughts/emotions (Handout: Body Language).
Equine Assisted Activities (EAA)	**Focus:** Building confidence/communication skills; (Handout: Parts of Horse); Activity: Choose or Be Chosen (horse behavior [fight or flight response]; body language; herd dynamics; leading/grooming; nonverbal communication)
Wrap-up	**Self-reflection:** overcoming challenges; building confidence; adapting; Q&A.
Week 2: Welcome; Introduce present moment experience.	**Theme: Awareness of Feelings** (Handouts: Myths/Symptoms of PTSD; Awareness Wheel; Emotional Regulation); hyperarousal; self-regulation of emotions/feelings to a place of rest/ calm for endurance/survival.
EAA	**Focus:** Continue building connection/trust; Activities: Grooming with Intention; Around the World (incongruency of intention versus behavior); group work.
Wrap-up	**Self-reflection:** awareness; nonjudgmental; teambuilding; reframing; Q&A.
Week 3: Welcome; Review: feelings; introduce "Around Me" + "Actions" (thoughts/behavior)	**Theme: Triggers** (Handout: Triggers); response/reaction to triggers; review emotional regulation; practice being present, fully attentive, focused on task at hand.
EAA	**Focus:** Building confidence/assertive communication; Activities: Grooming with Intention (continue building connection, trust); Activity demo for triggers: demonstrate

	desensitization; tack-up/riding (bonding with horse).
Wrap-up	**Self-reflection:** empowerment; healthy ways of coping with triggers; importance of grounding: mental/emotional states; present moment awareness; Q&A.
Week 4: Welcome; Review from previous weeks: Awareness Wheel and Triggers (handouts).	**Theme: Problem Solving;** (Handout: A+B=C (Antecedent, Behavior, Consequences); exploring habits; (Handouts: Stress Cycle and Setting Goals); problem solving (working through resistance and fear).
EAA	**Focus: Problem-solving;** (Handout: Colors of Horses); demonstration on saddling; Activities: Saddling/Leading horse over tarp with obstacles (associations to triggering stimuli; flooding of emotions; reframe/replace emotions); Riding (how to stop, turn, ride forward).
Wrap-up	**Self-reflection:** problem-solving; addressing fears; analyze maladaptive behaviors (Handout: Relaxed Breathing Techniques); learn/practice diaphragmatic breathing; Q&A.
Week 5: Welcome; Review feelings: Awareness Wheel; stress cycle (old versus new behavior); setting goals.	**Theme: Regulating Your Energy** – positive energy/emotional fuel to accomplish goals; negative energy can derail goals; Review: Body Language i.e., how we communicate nonverbally/ with words; (Handout: Passive-Assertive-Aggressive).
EAA	**Focus:** Energy: passive-aggressive-assertive; (Handout: Lunging); walk-trot-canter; safety related to lunging/kick zone; Activity: Lunging a Horse.
Wrap-up	**Self-reflection:** communication style (energy); reflect on energy style; what needs to change (commitment); Handout: Communication; Q&A.
Week 6: Welcome; Awareness Wheel; Communication style: pass-ive/assertive/aggressive.	**Theme: Telling your story – Poor Choices vs. Healthy Choices**

EAA **Wrap-up**	Poor choices: avoiding/numbing/suppression/reactionary. Healthy choices: action oriented versus reactionary; avoidance eliminates processing traumatic event/feelings. **Focus:** Desensitization; Art Activity: Telling your Story; (Handouts: Symbols of Indians and Horse Markings). **Self-reflection:** storytelling/symbolic communications; recognize the transcending of trauma memories using art; Q&A.
Week 7: Welcome; Communication: interaction of triggers, beliefs, and feelings; impact on (irrational) thinking styles. **EAA** **Wrap-up**	**Theme: Communication/Actions** (review story from last week) Communication: use of tone (passive-aggressive-assertive); energy (positive or negative); Goal of good communication: keep space safe, be heard & hear other (way to connect, to feel heard/cared about, bonding). Actions: awareness of thoughts/unresolved issues; emotional intensity (reactionary vs action-oriented). **Focus:** Communication: listening; teamwork; Activity: Rotating Appendages (teamwork rotations to halter/saddle the horse). **Self-reflection:** equine activity: being in different roles? preference? (Handouts: I-Messages/ Imago Dialogue; Reflective Listening); Q&A.
Week 8: Welcome; Awareness Wheel; Communication (review body language). **EAA** **Wrap-up**	**Theme: Listening** (when trauma memories resurface; disconnect from feelings; difficulty concentrating); keep space safe; reflective listening/mirroring; assertive/passive/aggressive). **Focus:** Trust/communication/leadership; Activity: Blindfold Obstacle Course (discerning between internal vulnerability/external fear; strategy for being assertive but compassionate).

	Self-reflection: equine activity: was it easy to receive or give instructions? (frustrations/anxiety/tolerance; self-efficacy); Q&A.
Week 9: Welcome; Review: feelings /listening.	**Theme: Communication and Connection** (defusing conflict; being hypersensitive to tone of voice; lack focus).
Equine Assisted Activities	**Focus:** listening and connecting; Activities: Grooming and Tacking, Drill Team Exercises (walk/canter side by side; simple formations); focus on communication (verbal and non-verbal); learn to be assertive with the horse or adjust communication style/pattern when necessary; building confidence.
Wrap-up	**Self-reflection:** communicating skills; leading horse through drill team formation; mindfulness – were you mindful of other horses and the rider's needs; coping – on learning new skills; Q&A.
Week 10: Welcome; Overview of weekly themes.	**Theme: Words of Affirmation:** write words of affirmation for each other; sharing among group.
EAA	**Focus:** purpose and meaning behind trail ride; Activity: Trail Ride (grooming, tacking, sad-dling, riding).
Wrap-up	**Self-reflection:** communicating with/leading horse during trail ride; describe feelings-sense of accomplishment; reflect on transition (learnings, next steps, goal setting); Q&A; opportunity to continue participating in weekly drill team (to maintain connection with horse).

From "Investigating The Efficacy Of Equine Assisted Therapy For Military Veterans With Posttraumatic Stress Symptomology," by J. Nagrath, 2020, *Journal of Veterans Studies*, *6*(2), p. 8 (https://doi.org/10.21061/jvs.v6i2.187). Copyright 2020 the Author(s).

Results of the Nagrath (2020) study revealed an impressively low attrition rate for therapy sessions focused on treating PTSD. Of the twenty-five participants in the treatment group (n = 25) only 3 dropped out of the study (n = 3) before completing all 10 sessions (reportedly due to scheduling conflicts) and one participant in the treatment group (n = 1) did not complete posttest measures. All of the control group participants (n = 25) completed the study and pre and post-test measures. Paired samples *t*-test results for both the intervention and controls groups are reflected in figures 9 and 10 (Nagrath, 2020):

Figure 9

PCL-M Paired Samples t-test – Intervention and Control Groups

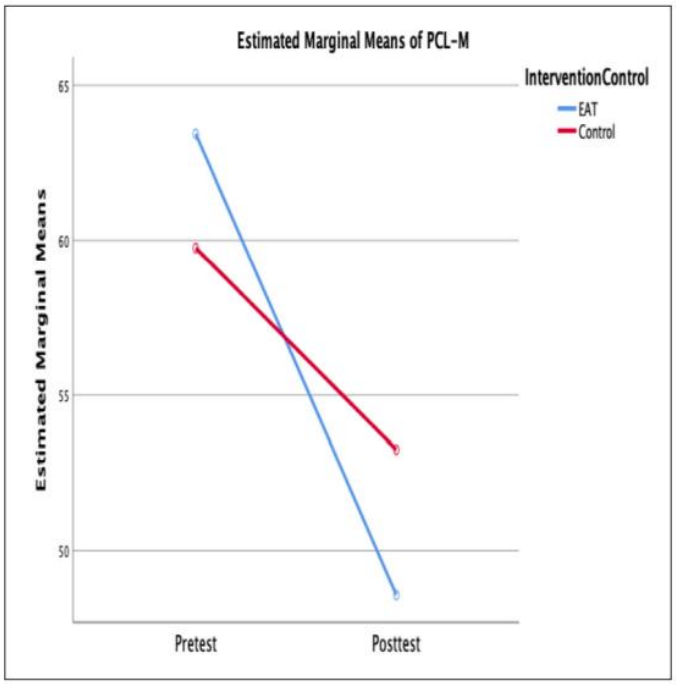
Paired Differences									
		Mean	Std. Deviation	Std. Error Mean	97.5% Confidence Interval of the Difference		*t*	*df*	Sig. (2-tailed)
					Lower	Upper			
Intervention Group	Pretest – Posttest	14.857	15.951	3.481	6.423	23.291	4.268	20	.000*
Control Group	Pretest – Posttest	6.520	10.859	2.172	1.327	11.713	3.002	24	.006*

Note: t = *t*-test statistic; *df* = degrees of freedom; Sig. = Significance level/*p*-value; * $p < .025$.

From "Investigating The Efficacy Of Equine Assisted Therapy For Military Veterans With Posttraumatic Stress Symptomology," by J. Nagrath, 2020, *Journal of Veterans Studies*, 6(2), p. 12 (https://doi.org/10.21061/jvs.v6i2.187). Copyright 2020 the Author(s).

Figure 10

Change in PTSD Symptom Scores Pretest-Posttest



Note: The posttest scores significantly reduced by almost 15-points for the EAT completers when compared to control group where posttest scores decreased by only 7-points. From "Investigating The Efficacy Of Equine Assisted Therapy For Military Veterans With Posttraumatic Stress Symptomology," by J. Nagrath, 2020, *Journal of Veterans Studies*, 6(2), p. 12 (https://doi.org/10.21061/jvs.v6i2.187). Copyright 2020 the Author(s).

ANCOVA analysis was conducted on pre- and post-test data derived from the PCL-M scores, measuring PTSD symptoms. There was "no significant difference in mean changes on the PCL-M, F (1, 43) = 3.255, p = 0.078, partial $\eta 2$ = 0.070, which suggests a medium-small effect size" (p. 13). A second ANCOVA analysis was conducted on the FACIT-Sp scores, measuring quality of life and well-being. There was "no significant difference in mean changes on the

FACIT-Sp, F (1, 43) = 0.368, p = 0.547, partial $\eta 2$ = 0.008, which suggests a very small effect size" (Nagrath, 2020, p. 13).

Nagrath (2020, p. 13) reported paired samples t-test scores using the PCL-M data from the treatment group, revealing a significant reduction in PTSD symptoms of almost 15 points. These "results were also similar to published PTSD change scores (i.e., greater than 10-points) across comparable research studies indicating clinically meaningful improvements using EAT intervention for veterans with PTSD." (R. A. Johnson et al., 2018; Romaniuk et al., 2018). This difference reflects an 18% reduction in PTSD symptoms compared to 8% for the control group. While the ANCOVA results were not statistically significant the authors noted the total sample size of N = 50 did not afford this study the "N = 106 (i.e., 53 participants in each group per G*Power 3.1.9.4 calculations) needed to reach power (1–β) of 0.80 with a medium to large effect size (d = 0.6) and alpha value (α = 0.025)" (p. 14). FACIT-Sp scores, assessing participant spiritual well-being including their perceptions related to meaning, peace, and faith in their daily lives, reflected a similar pattern of statistically significant paired t-test results and ANCOVA results that did not meet minimum criteria for statistical significance. Therefore, while the paired samples t-test results represented meaningful reductions in PTSD symptoms the ANCOVA results prevented any conclusions regarding the efficacy of EAT. However, the author did note improvements in the long history of trauma symptoms among members of the Vietnam War and suggested research on EAT continue and employ larger sample sizes while suggesting that "integrating the multi-modal, multi-dimensional, bio-psycho-social-spiritual model into the EAT intervention, could leverage significant outcomes of holistic health and wellbeing for veterans with PTSD symptomology" (p. 15).

EAP and Returning Duty Service Members (RSMs) with Trauma

Similar too research studies focused on treating military veterans, researcher scientist and mental health clinicians report homogenous barriers when providing trauma-focused care to returning duty service members (RSMs) exhibiting symptoms of PTSD. The common hurdles to providing trauma-focused mental healthcare to active-duty military members include negative stigma, common perceptions related to notions of personal weakness, and risk of potential job loss among service members seeking mental health services. The Steele et al. (2018, p. 403) research article *TRR's Warrior Camp: An Intensive Treatment Program for Combat Trauma in Active Duty Military and Veterans of All Eras* stated, "It is a well-documented fact that significant numbers of RSMs also meet criteria for clinical diagnoses such as PTSD, mild and severe traumatic brain injury, and substance use disorders" (Butler et al., 2011; Ramchand et al., 2011; Shen et al., 2012). RSMs often experience (p. 403) "combat and operational stress reactions, sexual assault, and relational distress secondary to combat exposure " (Bryan et al., 2014; Claassen & Knox, 2011; Cook & Snyder, 2005; Farnsworth et al., 2014; Turchik & Wilson, 2010). Suicidality and moral injury are also prevalent reactions associated with exposure to trauma, among active-duty military and RSMs. The military often expresses and emphasizes "critical concern" (p. 403) over suicidality among RSMs and the need to continue expanding and improving novel treatment approaches to "mitigate against death by suicide" (Steele et al., 2018, p. 403). EAP is one of several treatment approaches provided to RSM's referred to the TRR Warrior Camp. Steele et al. (2018) examined the clinical outcomes of EAP among participants.

Eighty-five participants (60 males and 25 females) were recruited from VA healthcare facilities, online referrals, and military installations (Steele et al., 2018). Of the 85 participants all were RSMs and 91.7% had previous deployments to combat zones. All participants engaged in

the Trauma and Resiliency Resources Inc.'s Warrior Camp (WC), consisting of a 7-day intensive therapeutic and experiential military mental health treatment program. WC treated participants using eye movement desensitization and reprocessing (EMDR), EAP, yoga, and narrative writing. The study was conducted at an equine center, where all participants resided on site for the duration of the 7-day treatment period (Steele et al., 2018). A pre-post study design used the following measures to collect trauma related data before and after treatment; Mississippi Scale for Combat-related PTSD, Davidson Trauma Scale, Patient Health Questionnaire-9 (PHQ-9), Revised Adult Attachment Scale (RAAS), and the Moral Injury Events Scales (MIES). "Paired t-tests were used to assess for treatment effects for each of the dependent variables. Effect size statistics were also computed to allow for computation of the relative program effects because effect size measures are less sensitive to sample size. In addition to hypothesis testing, the relative program effects were evaluated with Hedge's g, an effect size measure that corrects for biases related to a small sample size" (p. 405). The data from each measure reflected statistically significant pre- and post-treatment values for each measure ($p < 0.001$) with effect sizes ranging from small to large. The authors displayed results in Figure 11 (p. 405) for each dependent variable (Steele et al., 2018).

Figure 11

Differences Between Pretest and Posttest Scores on Outcome Measures

	Assessment Period				Analysis	
	Pre-treatment		Post-treatment			
Outcome Variable	Mean	SD	Mean	SD	*p*	Hedge's *g*
PTSD (Mississippi Scale for PTSD)	110.63	20.96	95.62	21.64	0.000*	0.70
Depression (PHQ-9)	17.66	6.50	11.84	7.34	0.000*	0.84

Adult Attachment (RAAS)	47.65	10.22	43.15	9.88	0.000*	0.45
Moral Injury (Moral Injury Scale)	37.43	12.40	33.60	11.82	0.000*	0.31
Davidson Trauma Scale	80.38	28.54	45.04	29.09	0.000*	1.22
Dissociative Experiences Scale	21.37	14.64	14.75	13.34	0.000*	0.47

Note: Hedge's *g* is an effect size, which is a standardized index of the effects of treatment. An effect size of 0.20 is Considered small, 0.50 medium, and 0.80 large. *$p < 0.001$. From "TRR's Warrior Camp: An Intensive Treatment Program For Combat Trauma In Active Military And Veterans Of All Eras," by E. Steele, D.S. Wood, E. J Usadi, and D.M. Applegarth, 2018, *Military Medicine*, *183*(suppl_1), p. 405 (https://doi.org/10.1093/milmed/usx153). Copyright of Military Medicine. Reprinted with permission.

Steele et al. (2018) noted the inability of their study design to isolate and attribute a specific statistical value to the effect or contribution of the equine component (EAP). Although, they expressed their support for the use of equines as an important element of treatment. This coincides with the accurate understanding and view of EAP as a method of assisting with the provision of various treatment models and enhancing the outcomes. Consistent with other research results Steele et al. (2018, p. 405 – 406) suggested:

> The equine element of treatment may help to establish safety and development of trust, self-esteem, and increased self-efficacy. The equine–human relationship is often characterized by affection, trust, and acceptance. The development of this relationship and the significant decrease of PTSD symptom severity, depressive symptoms, and moral injury is congruent with multiple research studies which indicate that when animals are part of the therapeutic process, results suggest improvements in the areas of loneliness,

lack of trust, stress, and depression. These results may suggest that EAP may help address the symptoms of PTSD, depression, attachment problems, moral injury, and dissociative experiences because horses are able to give feedback about participants' experience in a way that encourages thoughtful exploration and resolution (Mueller & McCullough, 2017; Usadi & Levine, 2017; Whittlesey-Jerome New Mexico State University, 2014; Yorke et al., 2008).

PTSD and Trauma Symptoms in Children and Adolescents

Researchers investigating the efficacy of equine therapy for children conducted, *Evaluating the Efficacy of Equine Therapy Among At-Risk Youth: A Meta-Analysis*, noting some of the challenges and differences associated with the way children and adolescents experience psychotherapy compared to adults (Wilkie et al., 2016). Namely that children are not always aware of any problems, often think therapy is unnecessary, and are typically referred by a parent or guardian. These factors can make it difficult for therapists to engage this population and build rapport and willing participation in treatment. The authors also refer to challenges associated with adapting therapeutic approaches to the child's ability to understand and childhood developmental barriers that make it difficult for children to identify and understand emotions and behaviors "as they relate to their environment" (p. 378). Developmentally, younger children have not yet developed the "ability to think abstractly (Piaget 1962)" (p. 378). This is a necessary element of most traditional therapeutic approaches. The typical lack of it during childhood presents unique barriers to providing mental health treatment to children. Therapy with children and adolescents can also be challenging simply due to the stormy nature their identity development and attitudes. Wilkie et al., 2016 hypothesized that Equine Assisted Therapy can "benefit children and adolescents because it holds the potential to circumvent barriers often

reported in traditional therapy with youth populations" (p. 378). For example, horses are highly attuned to their surroundings and generally offer immediate feedback to others within their immediate environment. Therapist can guide child participants to view the horse as a mirror into their own attitudes, emotions, and behaviors while the reciprocal nature of these interactions can facilitate therapeutic change. Children can project their experiences and emotions onto the horse and in turn learn to process and regulate them, eventually generalizing the newly learned skills to their life experiences outside of EAP sessions. EAP can afford therapists and children a unique and novel approach to clearing treatment hurdles incidental to childhood (Wilke et al., 2016).

Successfully navigating some of the aforementioned challenges in treating children can be further impeded when the child has experienced trauma. The authors incorporated several studies investigating EAT for traumatized children, including Schultz, Remick-Barlow and Robbins (2006), whose results supported EAT as a method of "increasing the social, psychological, and school functioning of children with mood disorders, anxiety disorders, and post-traumatic stress disorder resulting from intra-family violence" (p. 380). Wilkie et al. (2016) cited results of another study, Kemp et al. (2013), investigating EAT with sexually abused children with results indicating "a significant decrease in anxiety, negative affect, and undesirable behaviors associated with trauma after experiencing sexual abuse" (Kemp et al., 2013, p. 380).

Results of the Wilkie et al. (2016) meta-analysis were separated into two separate summary effect sizes. One for studies using a pre-post design and a second for studies using a treatment versus control group design. Results indicated a statistically significant medium effect size for studies using a pre-post design ($g = 0.714$, $p < 0.001$. There was a small to medium effect size ($g = 0.402$, $p = 0.002$), for results evaluating studies employing a treatment and

control group design. These results indicated that participation in EAT can be a useful tool when striving to improve the overall level of functioning in at-risk youth, many of whom have been impacted by traumatic experiences. Wilkie et al., 2016 noted limitations within their study including limited access to a small number of available studies and problematic study designs such as the use of a treatment as usual group versus a true waitlist group in two studies employing a treatment and control group model. They noted a third limitation relative to the lack of standardized/manualized EAP treatment protocols between studies included in their meta-analysis. The studies included used a "superfluous" (p. 389) variety of terms when referring to their treatment models including equine-facilitated psychotherapy, equine-assisted counseling, equine-assisted psychotherapy, equine-facilitated therapy, and equine-assisted learning. Wilkie et al., 2016 noted relative similarities between each of the terms/treatment models, however they were not identical. This creates an array of problems for research scientist attempting to isolate and study specific mechanisms of action and replicate research (Wilke et al., 2016).

The National Center for Mental Health Promotion and Youth Violence Prevention estimated 26% of U.S. children will witness or experience a traumatic event before they turn four. Elizabeth Craig's (2020) journal article entitled, *Equine-Assisted Psychotherapy Among Adolescents with Adverse Childhood Experiences (ACE): Cultivating Altercentrism, Expressiveness, Communication Composure, and Interaction Management*, summarized the impact of trauma on childhood development:

> Research suggests that early childhood exposure to ACEs predicts PTSD in adolescence (Dunn et al., 2017) and is associated with developmental, social, and behavioral delays (Liming & Grube, 2018). Complex trauma has been shown to influence significant changes in the development of brain networks (i.e., the survival brain) that service

> automatic processes, including dysregulated information processing, bias towards perceiving threat in the environment, and maladaptive emotion regulation strategies motivated by harm avoidance (Greene, Grasso, & Ford, 2014). These processes are foundational in how children perceive, conceptualize, and respond to the self and others; however, these functions in key brain areas can be influenced and changed (p. 651).

These powerful effects of trauma, occurring during the most vulnerable periods of early childhood and adolescents, underscored the need to continue advancing effective methods of administering trauma-focused mental healthcare for children and adolescents (Craig, 2020).

Craig (2020) examined therapy incorporating equines with children as means of assisting to develop patient awareness, emotion regulation, communication skills (among adolescents with ACEs) and the generalization of newly learned communication skills to other relationships and situations (Craig, 2020). Craig (2020, p. 644) quoted a definition of adverse childhood experiences from Kalmakis & Chandler (2014, p. 1495) stating "childhood events, varying in severity and often chronic, occurring within a child's family or social environment that cause harm or distress, thereby disrupting the child's physical or psychological health and development." Additional research, cited by Craig (2020), identified EAT as a potentially helpful method for treating PTSD, including children struggling with the effects of sexual violence and children coping with intra-family violence. Craig (2020) highlighted what the author referred to as the "communicative processes" (p. 645) that occur between horse and patient during EAP sessions. Craig (2020) also reiterated previous research hypotheses related to the potential for interactions (between horse and patient) to facilitate improvements in self-awareness, emotional insight and regulation, improved communication skills, and eventually overall gains in well-

being due to improvements in patient ability to develop and maintain healthy relationships (Craig, 2020).

Craig (2020) reiterated previous concepts discussed outlined earlier in this review including the nature of equine nonverbal communication and common behaviors the horses exhibit as animals of prey and integral members of a herd with typical herd behaviors. Craig, 2020 postulated that communication experiences accessed during through the provision of EAP can offer therapists a novel approach to enhance self-reflection and engagement while also connecting traumatized children to the "Rogerian (Rogers, 1961) core concepts of congruence, ongoing positive regard, and empathy" (Craig, 2020, p. 645).

Craig, 2020 employed qualitative research techniques, to investigate EAT with adolescent females including observations, informal interviews, and semi-structured interviews. The author noted that while "qualitative research findings are not generalizable, they can be transportable" (p. 646). Eleven adolescent females, ages 13 to 17, engaged in weekly EAT sessions and were assessed over a 4-month period. Procedures included more than 60 hours of observation and informal conversations, with participants and staff, before using the information gathered from this process to create a set of one-on-one interview questions. The resulting questionnaire centered on the "experiences and benefits of working with horses, tutoring and academic progress, and relationships outside of the therapy setting" (p. 647). Craig described herself as an interpersonal communication scholar and applied interpersonal communication theories to balance openness and skepticism while avoiding expressions of judgment. "The observations and interviews focused on the form and function of message, relationship building, trust, interdependence, assertive communication, conflict management, openness, and autonomy" (p. 657). "Analytical techniques from a grounded theory approach" (p. 647) were employed to

identify consistent threads or themes and subsequently aid in the development of "formal interview protocols and additional observations" (p. 647). An exhaustive process involving constant comparative techniques and an iterative process referred to as "open coding" (p. 648) was applied to the resulting data and existing theory (Craig, 2020).

> "Equines responded in ways that prompted complex altercentric engagement, which allowed the scaffolding of competencies like decoding, emotion regulation, expressiveness, assertiveness, and communication coordination. More importantly, themes that emerged organize a nuanced process of skill development for adolescents, with meaningful transfer to human relationships. These themes described below are cumulative, with lower order skills cultivating higher order skills and competencies and the larger individual, relational, or interactional functions that resulted from the skill development" (p. 648).

The themes were identified as: attention cultivated awareness; awareness cultivated emotion regulation; higher order communication competencies including perspective taking cultivated comfort, assertiveness cultivated advocacy, and interaction coordination promoted adaptability and relational management (Craig, 2020)

The author shared some interesting observations and examples of likely mechanisms of action. The incidental heightened level of attention and self-awareness equines command of those engaging with them caused adolescents to "learn to be attentive to their equine partner" (p. 648) and forced recognition of inherent dangers resulting from inattention and how dangerous incidents often resulted in barriers to the participants' own communication goals. When participants experienced uncooperative equines, it sometimes required them to manage intense feelings of anger, frustration, and fear. One participant reportedly commented, "If you start talking negative, they'll (horses) start doing really negative things like jumping" (p. 648) and

another stated, “It made me more aware of what I was doing. I’m not saying that it’s fixed, but it has made me realize” (p. 648). Abandonment issues could be highlighted for example one female participant stated, “I’m jealous and want people to pay attention to me, only me. I don’t want people to leave me. I realized, I just noticed, it was a terrible thing to be jealous about” (p. 649). Eventually participants recognized the gains in self-regulating, self-compassion, assertiveness, and self-advocacy were things that helped them overall and were not to be feared (Craig, 2020).

Equines are large animals and can act on their own agenda at times (Craig, 2020). This natural consequence of engaging with equines facilitated to another benefit to adolescents when they had to learn to set boundaries for themselves. Participants described moments requiring them to be assertive and protect themselves in ways that were appropriate and healthy for the horses and for themselves. These experiences reportedly aided traumatized adolescents to recognize and learn how to appropriately establish and defend personal boundaries while just as importantly recognizing they deserved to be treated better (Craig, 2020). “Adolescents described and were observed using a culmination of skills like message clarity, assertiveness, and perspective-taking, skills that are vital foundations to strategic and routine relational maintenance” (p. 650).

Craig, 2020 cited multiple treatment modalities for available to clinicians desiring to incorporate equines in the provision of trauma-focused mental healthcare including “trauma-informed practice, psychotherapy, experiential learning, cognitive-behavioral therapy, and play therapy (Hallberg, 2017)” (p. 651). The Craig, 2020 study concluded that using horses to assist with the provision of adolescent trauma care constituted a novel and beneficial approach to caring for adolescents with ACEs. These results reflected a beneficial and potentially improved method of motivating adolescents too engage in more “proactive strategies for emotion

regulation" (p. 651) and the subsequent "shifting from automatic responses to more complex engagement in treatment" (p. 651). Craig, 2020 suggested clinicians also consider ways EAT might improve their own attention and emotion regulation, during the provision of trauma focused care when they can be subject to their own "hyper-vigilant attention to the knowledge they have of an ACE or trauma" (Craig, 2020, p. 651).

In the article, *Effects of Equine-Facilitated Psychotherapy on Post-Traumatic Stress Symptoms in Youth*, Meuller and McCullough (2017) described EAP as a "complimentary" (p. 1164) mental health treatment approach for addressing trauma in youth but was also careful to not limited empirical research assessing its effectiveness. This study recruited 68 children and adolescents, between ages 10 and 18, from two comprehensive therapeutic programs focused on treating traumatized youth. Each participant met a baseline score of 12 or higher on the Revised-Children's Inventory of Events Scale-13 (CRIES-13) for measuring symptoms of post-traumatic stress. Participants were quasi-randomly assigned to the treatment with EFP group (n = 36) or the control group (n = 32). Random assignment was not 100% due to things like scheduling conflicts at the treatment facility and/or transportation problems, however the authors noted their good faith effort to randomly assign participants as often as possible. Fourteen participants were not included in the data analysis because they either had to withdrawal due to allergies, scheduling conflicts preventing them from completing treatment, or discharge from treatment after baseline data was collected (Meuller & McCullough, 2017).

Ten weekly 2-hr session of EFP were administered to the treatment group over the course of 12-weeks (Meuller & McCullough, 2017). The control group received Trauma Focused-Cognitive Behavior Therapy (TF-CBT) in a traditional office-based setting. Treatment group sessions were administered by a licensed clinical social worker (LCSW) in cooperation with a

PATH Int'l certified therapeutic riding instructor. Participants in both groups were administered the CRIES-13 at baseline (week 1), mid-treatment (week 5), and post-treatment (week 10). The Human Animal Bond (HAB) questionnaire was administered to the treatment group on the same schedule to investigate treatment group participant bonding with the horse and the possible effects it may have had on reductions in symptoms of post-traumatic stress. Independent *t* tests ($\alpha = 0.05$) and repeated measures analysis of variance (ANOVA) were applied to the data to assess differences across all 3 points in time. A Pearson's correlation was employed to evaluate post-treatment HABS scores and changes in symptoms of post-traumatic stress (Meuller & McCullough, 2017).

Study findings suggested a significant decrease in posttraumatic stress symptoms across the intervention for both the treatment and control group, but the treatment group did not decrease significantly more than the control group (Meuller & McCullough, 2017). These findings suggest that EFP may be an effective additional treatment modality for post-traumatic stress symptoms, but there was no evidence from this initial study that EFP was significantly more effective than traditional office- based therapy. However, the majority of youth rated their bond with the horse as very high after the first session, and these scores remained high across the mid-intervention and post-intervention assessments" (p. 1168) indicating the majority of youth participants experienced and immediate and strong connection with their horse. The authors explained the relationship was correlational and not causal, but also suggested it provided "support for the viability of EFP as a treatment option that is appealing to youth. Interacting with horses may be a mechanism to engage youth in the therapeutic process and could be a promising strategy for motivating youth to participate in therapy" (Meuller & McCullough, 2017, p. 1168).

Unfortunately, the authors did not specify a theoretical or empirically based treatment model used during EFP sessions (Meuller & McCullough, 2017). For future research purposes, a more exact description of the structure and theoretical model of treatment the horses are facilitating or assisting is needed. They did however point out, the results indicating the effects of EFP were commesensurate with the control group that received TF-CBT and "Trauma-Focused CBT (TF-CBT) is currently one of the only interventions established as efficacious in treating child and adolescent trauma" (Meuller & McCullough, 2017, p. 1168).

In their article, *Equine Facilitated Therapy for Complex Trauma (EFT-CT)*, Naste et al. (2017) reported the diagnosis of Posttraumatic Stress Disorder (PTSD) was originally developed to encompass a group of typically observed psychiatric symptoms present in traumatized adults, however PTSD has subsequently been recognized in slightly "over one-in-four" trauma-exposed children seeking follow-up mental health treatment (Naste et al., 2017, p. 289). While the construct, complex trauma, has not been formally recognized as an official diagnosis it is commonly used to refer to a pattern of self-regulatory, relational, and attributional deficits often observed in children who've experienced maltreatment, exploitation, and/or neglect. "The complex trauma construct was intentionally designed to capture the intertwined relationship between adverse caregiving and victimization experiences and subsequent survival-based adaptations that alter normative developmental trajectories across the lifespan" (p. 289). They examined preliminary support for 3 separate "complementary and integrative forms of intervention" (p. 290) that focus on mitigating some of the most difficult manifestations of complex trauma in treatment resistant patients. These included internalizing symptoms and behaviors, somatic dysregulation, executive dysfunction, and clinical dissociation. EAP was one of the complimentary interventions examined, it was defined as "the use of a horse in a

therapeutic context involving a registered mental health practitioner who engages the horse to facilitate psychological and social insights" (p. 291). Naste et al, (2017) cited multiple other studies where EAP (or sometimes EFP was the authors' chosen term) reduced symptoms of externalizing behaviors, posttraumatic stress, depression, and anxiety in samples of child survivors of trauma including but not limited to sexual abuse (Kemp et al., 2014; Lentini & Knox 2015; McCullough et al., 2015: Signal et al., 2013, Yorke et al., 2013). Additionally, the Signal et al. (2013) study was noted for its report of larger effect sizes for EFP, when used to reduce internalizing symptoms, than those previously identified for TF-CBT alone.

Data was collected from a mental health program conducted by the Justice Resource Institute (JRI), which uses an evidenced based approach to treating complex trauma in youth called Attachment, Regulation, and Competency (ARC) (Naste et al., 2017). Naste et al. (2017, p. 291) noted several references supporting the assertion that "ARC has been shown to be effective in the reduction of PTSD symptoms, internalizing difficulties, and externalizing behaviors in youth in diverse treatment settings" (Arvidson et al. 2011; Hodgdon et al. 2015; Hodgdon et al. 2013; IFC MARCO 2010). JRI collaborated with the Bear Spot Foundation for Equine Facilitated Psychotherapy, to "integrate existing EFP practices with the ARC model, resulting in Equine Facilitated Therapy for Complex Trauma (EFT-CT)" (p. 292). Naste et al. (2017, p. 292) provided the following description:

> EFT-CP is an ARC-based intervention that can be used alone or in conjunction with more traditional forms of psychotherapy. Consistent with the ARC framework, EFT-CT incorporates 3 core components of intervention that target areas impacted by exposure to trauma including: 1) safety, 2) attachment, and 3) regulation. In addition, routines and

rituals (i.e., treatment techniques that create an environment reflective of safety, predictability, and consistency) are woven throughout the model.

In the EFT-CT treatment model, safety was described as a "critical component in complex trauma treatment" (p. 292) and was defined as the "shared sense of relational safety between the client and horse, which is theorized to foster treatment engagement, positive attachment, and relationship building" (p. 292).

Attachment consisted of caregiver affect management, consisting of clinicians coaching and modeling healthy interactions with the horse so participants can learn how to identify, attune themselves to, and respond to the non-verbal cues of equines. This was postulated to allow participants to "learn about and attend to the emotional world of the horse. In turn, the horse begins to focus on the client, respond to the client's interactions, and consequently develop trust. These new communication skills, and resulting attachment, can then be generalized to human relationships" (p. 293). The third and final component of EFT-CT, regulation, focused on body awareness, body co-relation (between participant and horse), and rhythm. The incidental nature of interactions with a horse(s) forces participants to learn how things like body language, tone of voice and facial expressions impact the horses' behaviors and responses to participants. Through this process and observing the clinician (or equine handler) demonstrate communication with the horse(s), participants learn how to regulate their own behaviors and subsequently generalize these lessons to their daily lives and interactions with others (Naste et al., 2017).

The case reports included feedback from attending clinicians in addition to multiple standardized measures included in the Client Assessment Tracking System (CATS). The CATS system includes a mixture of self-report and clinician/caregiver rated measures focused on assessing six core domains commonly effected by complex trauma (Naste et al., 2017).

Conclusions derived from observational data and the aforementioned measures supported reductions in symptoms associated with trauma including anxiety, depression, somatic reports, and dysregulated behaviors. Positive trends toward post-treatment improvements in social skills, communication strategies, boundary setting (and respecting), trust, overall social functioning, and the development of positive coping strategies were also noted. Other encouraging results noted positive improvements in the ability to "recognize and respect boundaries within the context of effective trust and relationship building" (p. 299). Participants reportedly gained improved attunement to and awareness of the horses relative to themselves, enabling participants to experience "safe and positive touch fostering therapeutic progress and a sense of safety and empowerment" (p. 299). Lastly, the authors noted a specific benefit of mounted EAP work, which is the power behind the horses' natural rhythms and gaits and the unique support it offers to a patient's internal self-regulation.

Naste et al. (2017) cautioned on the need to consider their results "very preliminary" (p. 299) however also encouraging and potentially indicative of EFT-CT as a valuable tool in providing complex trauma-focused mental health treatment for children and youth. The overall limitations research in EAP were discussed and remained consistent with those noted in previous studies. There is "little consensus" (p. 300) across the area of Equine Assisted Therapies including Equine Assisted Psychotherapy in terms of "theory and technique" (p. 300) used in their provision. The literature, including most research articles too date, do not provide detailed information about specific treatment modalities incorporating EAP. The lack of standardized manuals or treatment protocols for providing EATs, including EAP, continues to be a significant barrier to replicating studies and existing treatments. In conclusion Naste et al., 2017 offered support for EAP as a novel adjunctive approach to treating children with trauma. However, they

also identified several important areas of weakness for future clinicians and scientist to work toward improving and stated, “there is a lack uniformity across the wide variety of extant EFPs, and many do not offer a set of generalizable techniques, thus limiting treatment dissemination” (p. 292). Finally, existing EFP treatments for trauma are limited with respect to their integration of existing evidence-based frameworks (Naste et al., 2017).

In the article, *Equine-Assisted Psychotherapy: A Mental Health Promotion/Intervention Modality for Children who have Experienced Intra-Family Violence*, Schultz et al. (2006) investigated the efficacy of EAP for treating a cross-sectional group of 63 children who experienced intra-family violence and exhibited various childhood behavioral and mental health issues. The study spanned an 18-month period and participants were referred for treatment employing EAP from a variety of therapists, pediatricians, and school counselors. The therapist in this study was an LCSW and based her EAP methods on the EAGALA model. The author of this study described EAP as an “experiential approach to psychotherapy based on the use of metaphors with a basic goal to encourage client insight through horse examples” (p. 266) and to generate positive engagement. Shultz et al. (2006) also described EAP as a “modality closely related to Gestalt therapy in that a basic tool of the therapy is the use of body language” (p. 266) and suggested EAP can be tailored to meet the needs of individual children and assist them to learn to identify and express their feelings, especially those they might be unaware of, as the horse mirrors and reflects their behaviors back to them. EAP allows the child to interact and experience a “large, powerful animal that commands respect and elicits fear. Overcoming these obstacles and building a relationship promotes confidence, relationship skills and problem solving. Equine assisted therapy is designed to address self-esteem and personal confidence,

communication and interpersonal effectiveness, trust, boundaries, and limit-setting, and group cohesion" (Schultz et al., 2006, p. 266).

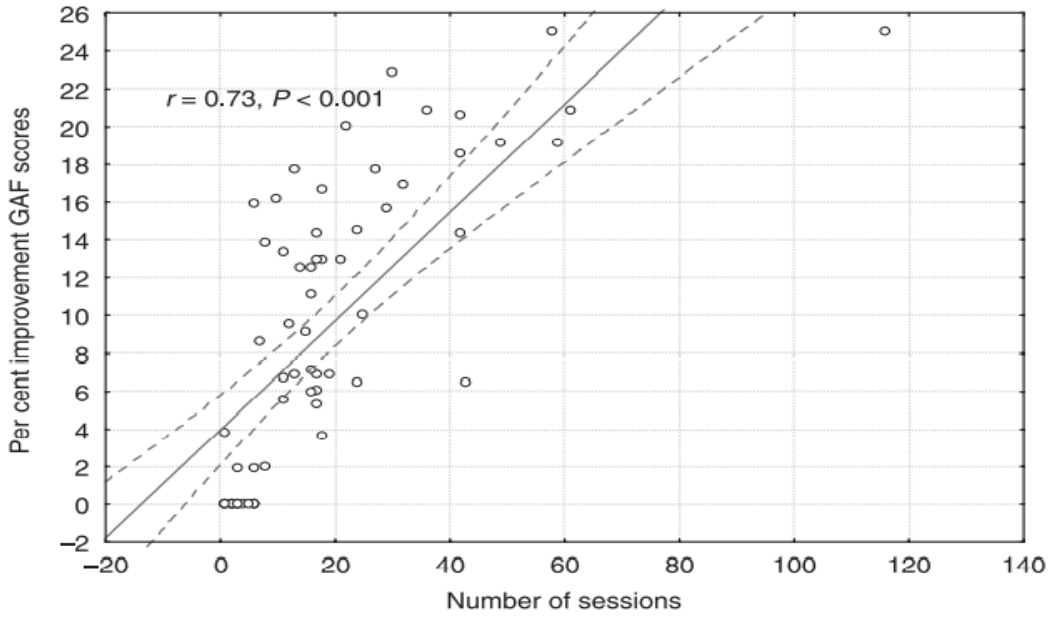
In addition to demographic data collection at intake The Children's Global Assessment of Functioning (GAF) was administered before treatment and at 3-month intervals until treatment concluded. Participant DSM-IV diagnostic categories included: mood disorders (36 or 57%), disruptive behavior disorders (3 or 5%), adjustment disorders (3 or 5%), ADHD (10 or 16%), and post-traumatic stress disorder (5 or 8%). The authors defined three categories of violent experiences: inter-parental violence (violence between parents), child/abuse and/or neglect was defined as the child's removal from the home by protective services due to physical abuse or neglect, and sexual abuse including any form of "physical abuse of a sexual nature (i.e., sexual contact, sexual intercourse or anal penetration)" (p. 267). Intra-family violence was an umbrella term of sorts and included any combination of the first three. A few of the author's data analyses combined all three into one term referred to as "overall child abuse" (p. 267). Various statistical analyses were used to report unpaired and paired t-tests, chi-square test, frequencies and percentages, analysis of variance, and Pearson's correlation coefficient.

Of the 63 total participants, forty-nine (78%) completed at least six or more sessions of EAP (116 maximum sessions). All 63 participants received one or more EAP session, but only those scores from children who completed 6 or more sessions were used in data analyses. Pre and post GAF scores, for all participants, reflected improvement (paired $t = 9.06$, $d.f. = 96$, $P < 0.001$) with "a statistically significant correlation between the percentage of improvement of the GAF scores and the number of sessions given ($r = 0.73$, $P < 0.001$)" (p. 268). Additionally, "when GAF scores were analyzed by history of abuse/neglect, sexual abuse or inter-parental violence, the data did not show any statistically significant differences in pre- and post-treatment

scores between those with and without histories of intra-family violence. However, in the group of children who had a history of physical abuse and neglect, there was a statistically significant greater percentage improvement in the GAF scores after treatment than in those who did not have a history of abuse and neglect. Those children who had a history of sexual abuse had similar findings, but these did not reach statistical significance" (p. 268). The authors provided results in figures 12, 13, and 14:

Figure 12

Correlation between the percentage improvement in Children's Global Assessment of Functioning scores and the number of completed sessions.



From "Equine-Assisted Psychotherapy: A Mental Health Promotion/Intervention Modality For Children Who Have Experienced Intra-Family Violence," by P.N Schultz, G.A. Remick-Barlow, L. Robbins, 2006, *Health & Social Care in the Community*, 15(3), p. 268 (https://doi.org/10.1111/j.1365-2524.2006.00684.x). Copyright 2006 the Authors, Journal compilation and 2006 Blackwell Publishing Ltd.

Figure 13

Children's Global Assessment of Functioning scores by age category: (SD) standard deviation

		Mean score (+SD)		
Age category (years)	Number of children	Pretreatment	Post-treatment	Mean percentage of improvement (+SD)
<8	4	54.5 + 2.0	68.3 + 2.4	20.1 + 1.9
8 – 12	27	52.6 + 3.3	61.5 + 4.7	12.5 + 6.8
>12	18	54.6 + 3.4	60.6 +_4.8	9.5 + 5.8

From "Equine-Assisted Psychotherapy: A Mental Health Promotion/Intervention Modality For Children Who Have Experienced Intra-Family Violence," by P.N Schultz, G.A. Remick-Barlow, L. Robbins, 2006, *Health & Social Care in the Community*, 15(3), p. 269 (https://doi.org/10.1111/j.1365-2524.2006.00684.x). Copyright 2006 the Authors, Journal compilation and 2006 Blackwell Publishing Ltd.

Figure 14

Children's Global Assessment of Functioning scores by history of intra-family violence

		Pre-treatment			Post-treatment			Percentage improvement		
Type of intra-family violence	No. of Children	Mean (±SD)	*t*-test (d.f.= 47)	*P*-value	Mean (±SD)	*t*-test (d.f.=47)	*P*-value	Mean (±SD)	*t*-test (d.f.=47)	*P*-value
Abuse/Neglect:										
Yes	17	52.8 ± 3.1	1.60	0.1	62.8 ± 2.2	0.96	0.3	15.9 ± 4.0	2.58	0.01
No	32	54.4 ± 3.1			61.3 ± 5.6			10.6 ± 7.0		
Sexual Abuse:										
Yes	12	53.0 ± 3.3	1.32	0.2	60.9 ± 4.2	0.64	0.5	11.8 ± 7.0	0.44	0.6
No	37	54.4 ± 3.2			62.0 ± 5.2			12.8 + 6.1		
Interparental violence:										
Yes	25	53.5 ± 3.4	1.19	0.2	61.4 ± 5.4	0.42	0.7	10.7 ± 7.0	1.51	0.1
No	24	54.6 ± 3.0			62.0 ± 4.4			13.6 ± 6.1		

From “Equine-assisted psychotherapy: A mental health promotion/intervention modality for children who have experienced intra-family violence,” by P.N Schultz, G.A. Remick-Barlow, L. Robbins, 2006, *Health & Social Care in the Community*, 15(3), p. 269 (https://doi.org/10.1111/j.1365-2524.2006.00684.x). Copyright 2006 The Authors, Journal compilation and 2006 Blackwell Publishing Ltd.

The Schultz et al. (2020) study concluded that EAP appeared effective at improving Global Assessment of Functioning scores in children diagnosed with adjustment disorder, mood disorders, PTSD, ADHD, and disruptive disorders all of which are commonly occurring diagnoses in children with a history of trauma.

Neuro Imaging, Physiological Effects and Equine Treatment Modalities

Modern advancements in neuroscience and research, coupled with the desire to provide more concrete evidence for the effectiveness of Animal Assisted Psychotherapy, have begun to drive experimental research investigating the physiology related to interactions between humans and dogs. In his article entitled *Animal-Assisted Therapy — Magic or Medicine?* Odendaal (2000) used an experimental design to investigate the physiology related to interactions between humans and dogs. One experiment looked at changes in physiological parameters (hypertension and neurochemicals) associated with positive human-animal interaction including: B-endorphin, oxytocin, prolactin, B-phenylethylamine, dopamine, and cortisol. The results showed significant increases in the neurochemicals investigated, in both humans and dogs, and reduced blood pressure after engaging in positive interactions with one another. These results support the notion that both animals and humans derive mutual benefits from positive interaction, including physiological effects that mitigate stress (Wilkie et al., 2016).

In the article titled, *Neural Changes Following Equine Assisted Therapy for Posttraumatic Stress Disorder: A Longitudinal Multimodal Imaging Study*, Zhu et al. (2021) investigated how EAT might complement existing PTSD treatments by tracking changes in participants over time. This was done with the use of neuro imaging including: structural magnetic resonance imaging (sMRI), resting state-fMRI (rs-fMRI), and diffusion tensor imaging (DTI). The study authors developed a manualized system of employing EAT to treat individuals with PTSD and ran a pilot test (Arnon et al., 2020) and conducted an open trial (Fisher et al., 2021) with a subset (n = 20) of a larger number of military veteran participants (n=63) previously diagnosed with PTSD. The authors specifically assessed for "pre- to post-treatment changes in: a) rsFC in reward, executive control, default mode, and salience networks; b) regional grey matter volume (GMV), measured by sMRI; and c) fractional anisotropy (FA) measured by DTI" (p. 1931). They also investigated possible changes in multimodal imaging biomarkers (sMRI, rsfMRI, DTI) and considered whether they might represent baseline predictors of clinical improvement (Zhu et al., 2021).

Nineteen of 20 original participants completed the study and provided pre-treatment MRI baseline data and post-treatment and 3-month follow-up MRI data (Zhu et al., 2021). Participants were allowed to continue mental health care routines established prior to the study, including treatment using psychotropic medication(s), but were not allowed to initiate psychotherapy or pharmacotherapy during the course of this study. Several of the measures did not reflect statistically meaningful changes. Although, significant changes were evident in the caudate, a cluster of the basal ganglia network (BGN), and the thalamus. "The caudate nucleus is involved in reward anticipation and response. Abnormal functioning within the caudate has been documented in depression (Eshel & Roiser, 2010), and substance abuse (Volkhow, Baler, &

Goldstein, 2011), and most relevant for the present study, in PTSD (Elman et al., 2009; Sailer et al., 2008; Zhu et al., 2021)" (p. 1936). The caudate reflected a significant post-treatment increase in rsFC. Additionally, significant reductions in the gray matter volume (GMV) were noted in the thalamus. The authors reported the changes of caudate rsFC were the same whether or not subjects were taking medications. The increases in caudate rsFC were significantly (positively) correlated with improved posttraumatic symptom checklist (PCL) scores (pre-post; $r = .60$, $p = .015$) and higher levels of baseline caudate connectivity were predictive of greater reductions in post-treatment symptoms (Zhu et al., 2021).

Another encouraging result was indicated by an even stronger correlation with sustained improvement assessed at three-month post-treatment follow-up (Zhu et al., 2021). "The PCL score improvement correlation was stronger 3-months later and correlated with CAPS-5, HAM-D, and BDI symptom improvement" (p. 1936). The results of neuroimaging in this study indicated that incorporating an 8-week course of EAT, as a complimentary addition to more traditional PTSD treatment protocols, was associated with positive changes in both caudate reward networks and gray matter volume in the thalamus (Zhu et al., 2021).

In the article *Measuring the Psychophysiological Changes in Combat Veterans Participating in an Equine Therapy Program*, Gehrke et al, 2018 assessed psychophysiological changes in combat veterans participating in an equine therapy program. They cited the need to continually identify and develop complimentary methods of addressing PTSD due to an "exponential increase in symptoms associated with PTSD" (p. 61) among combat veterans. At the time this article was published the authors cited a veteran suicide rate 23% higher than the general population. Depression and suicidality are commonly recognized among mental health care providers as prominent symptoms closely associated with undiagnosed and/or untreated

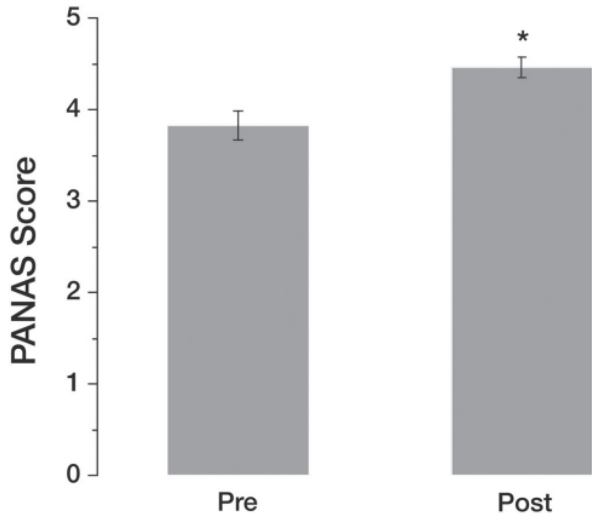
trauma and PTSD. The need for more quantitative research was discussed and the authors desire to expand and build upon "previous research demonstrating that equine interaction can improve heart rate variability (HRV) in executive coaching sessions with a quantifiable measure in HRV, matching values of a well-trained athlete" (p. 61). This was an exciting study because it represented early attempts to identify a potential neuro-physiological basis for the application of EAP for trauma (Gehrke et al, 2018).

"There are more than 30 VA Medical Centers and Navy hospitals participating in Equine Facilitated Mental Health (EFMH) programs around the US" (Gehrke et al., 2018, p. 61). The field is growing with the support and leadership of Military Healthcare Providers. This study sought to contribute toward filling in the gap between anecdotal and quantitative evidence related to EFMH which is a form of EAP developed by EAGALA. Two non-invasive measures were used: HRV to evaluate participants' physiologic response to EAP and the Positive and Negative Affect Schedule (PANAS) which is a measure of positive and negative feelings. The study included 17 male and female participants (veterans) and divided them among three cohorts (5-7 participants per cohort). A repeated measures design was employed to collect instrument data before, during, and after 8-weekly treatment sessions (Gehrke et al, 2018).

"Analysis of the PANAS revealed an increase in self-esteem and a reduction in irritability and anxiety for participants after the horsemanship sessions. Post scores showed improvement in overall average affect as the average PANAS score increased 14.4%, from 3.81 pre-session to 4.45 post-session. Figure 15 reflects the significantly different between pre- and post-session scores using a paired *t*-test between the two related groups ($t = -5.76$, $p < 0.001$, 95% CI, -1.0 to -0.24)" (p. 64).

Figure 15

Average PANAS scores over the 8-week program



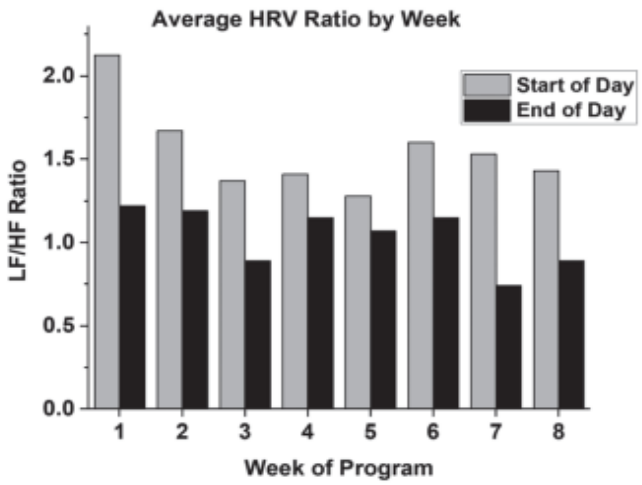
Note: Error bars show the standard error (SE). *Improvement in affect was significantly different between pre and post-session using a paired *t*-test, $p < 0.001$, $N = 17$. PANAS = positive and negative affect schedule. From "Measuring The Psychophysiological Changes In Combat Veterans Participating In An Equine Therapy Program," by E.K. Gehrke, A.E. Noquez, P.L. Ranke, and M.P. Myers, 2018, *Journal of Military, Veteran and Family Health*, 4(1), p. 64 (https://doi.org/10.3138/jmvfh.2017-0015). Used under Creative Commons CC-BY license.

The authors reported statistically significant changes in HRV after the first session ($F = 5.83$, p – 0.011) and indicated statistically significant increased HRV and "increased parasympathetic tone with horse interaction (Gehrke et al., 2018).

Figure 16

HRV analysis results by average LF/HF ratio at start of day (left bars) and end of day (right bars). The average beginning LF/HF ratio level drops and levels out at a healthier lower level over the course of the 8-week program. The average end of day LF/HF ratio levels stay low at a

healthy level of near 1 over the course of the 8-week program. Note: N = 10. HRV = heart rate variability; LF/HF = low frequency/ high frequency



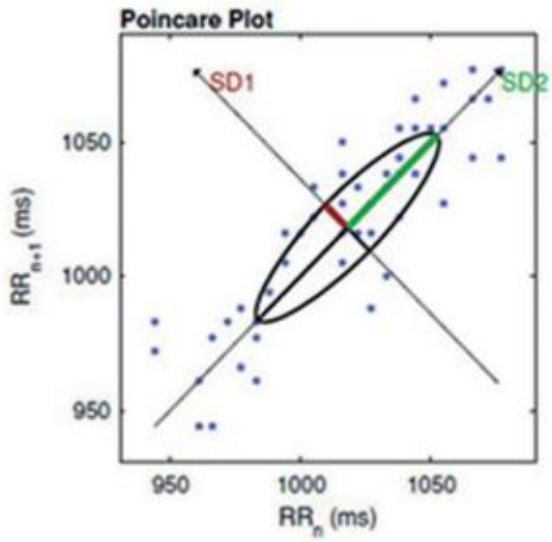
Note: N = 10. HRV = heart rate variability; LF/HF = low frequency/ high frequency. From "Measuring The Psychophysiological Changes In Combat Veterans Participating In An Equine Therapy Program," by E.K. Gehrke, A.E. Noquez, P.L. Ranke, and M.P. Myers, 2018, *Journal of Military, Veteran and Family Health*, 4(1), p. 66 (https://doi.org/10.3138/jmvfh.2017-0015). Used under Creative Commons CC-BY license.

Gehrke et al. (2018) acknowledged typical EAP research limitations including their small sample size. The results for HRV were based on data from 10 participants able to record their heart rate during sessions (limitations in device availability limited this number to 10). However, the authors cited recommendations from the widely respected publication *Statistics and Data Analysis for Nursing Research* (Polit & Lake, 2018) recommending an "eta-squared value of 0.52 which requires an *N* of at least 6 to reach the generally accepted minimum power of 0.80 with a significance criterion of 0.05 in order to avoid a type II error. Therefore, our sample size of 10 for the HRV results exceeds the minimum N required to find a statistically meaningful

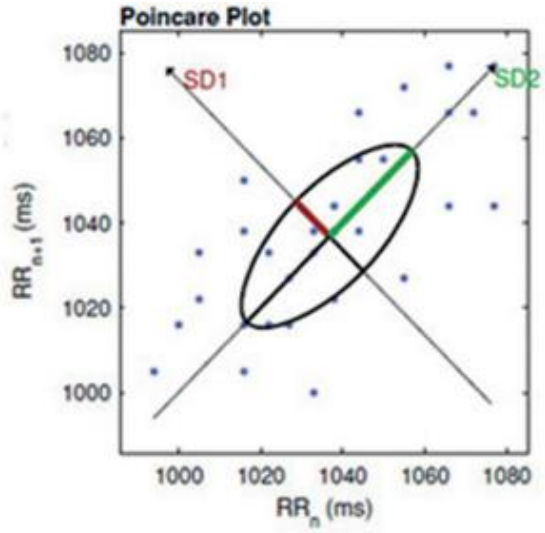
result" (p. 67). Several Poincare plots, representing before, during, and after treatment data provided a nonlinear analysis of HRV and added additional support for the previous findings of increased HRV after participation in Equine Facilitated Mental Health. Gehrke et al. (2018) stated, "Equine-assisted activities help humans overcome stress, reduce anxiety, and promote healing" (p. 66).

Figure 17:

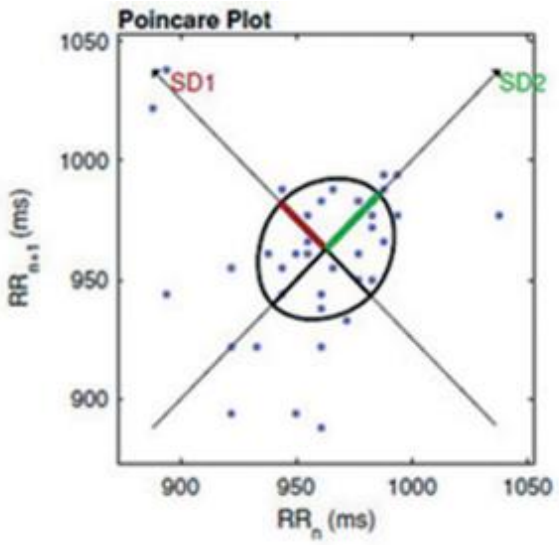
Before Treatment



During Treatment



After Treatment



From "Measuring The Psychophysiological Changes In Combat Veterans Participating In An Equine Therapy Program," by E.K. Gehrke, A.E. Noquez, P.L. Ranke, and M.P. Myers, 2018, *Journal of Military, Veteran and Family Health*, 4(1), p. 66 (https://doi.org/10.3138/jmvfh.2017-0015). Used under Creative Commons CC-BY license.

Criticisms and Future Directions

The article, *A Commentary On the Contemporary Issues Confronting Animal Assisted and Equine Assisted Interventions*, highlighted some of the contemporary issues impacting AAI and EAI (equine assisted interactions) (Fine & Andersen, 2021). The authors discussed barriers associated with a lack of general consensus on terminology and manualized protocols of treatment, the current status of empirical evidence and research, concerns about animal welfare, the need for professional standards of practice, and the need for public policy changes. Fine and Anderson (2021) acknowledged an increase in scientific research considering the potential value of human animal interactions (HAI) and pointed out that said research appears to support what many have accepted based on personal intuition and anecdotal evidence all along, that human-

animal interactions have a positive impact on human well-being. However, human-beings are often passionate about their animals and easily excited about the perceived benefits they experience from interacting with them. Most individuals familiar with “horse people” are well-aware of the depth and endurance commonly associated with horse enthusiasts and their passionate involvement in everything equine (often extending to other animals and pets) (see Appendix A). Fine and Anderson (2021) pointed to a possible exaggeration in public’s point of view of the potential impact of these interactions on both humans and the animals and suggested this is likely the result of relying on “emotional beliefs” (p. 1) and anecdotal evidence, to support positive perceptions of HAI, during the formative years.

Fine and Anderson (2021) indicated their research also pointed to an apparent bias within scientific literature and media, leading to the publication of more studies reporting the positive findings of Human-Animal Interactions (HAI) (Serpell et al., 2017) and “an overemphasis on media’s sensationalism of the unscientific findings on the relationship between animals and humans” (p. 1). As professional caregivers and gatekeepers to the public acquisition of mental health services, licensed therapist will want to consider how they can effectively administer psychoeducation, to their patients/clients, and avoid fueling disparities between the public perceptions about the healing power of horses (and pets) and published research findings. One researcher performed an informal google search for articles published in the media, between 2010 and 2020. Of eighty-one articles approximately 70% focused on the positive benefits of human-animal relationships and interactions, while failing to mention studies that found no significant difference between animal assisted and non-animal assisted conditions (Fine & Anderson, 2021).

Other individuals have criticized EAP for trauma by suggesting it may cause the animals undue stress and potentially constitute abuse of the animal(s) (Merkies et al., 2018). Merkies et al. (2018) noted an abundance of literature reporting the effects of stress on humans working in the mental health field and suggested the need to consider whether similar levels of stress might be imposed on the animals in HAI. They used a quantitative model to investigate behavioral responses of horses, when they are used to assist therapist in administering EAP for trauma. The authors reviewed typical signs of equine stress often expressed through changes in their gait, head height, ear position, or the distance they seek to maintain from humans and did not identify any major differences between sessions for individuals with PTSD and neuro-typical individuals. In fact, Merkies et al. (2018), reported less stress related behaviors among horses when they were in the presence of humans. They horses were also reportedly more responsive to those humans with more equine experience than others. The results of observations suggested horses were more likely to respond to the physical actions and cues humans provided than "implied emotional needs" (p. 66) and indicated the importance of using accurate knowledge and understanding of horse behavior and meaning to develop therapy programs, especially in those moments when clinicians may be inclined to justify horse responses with patient behaviors (Merkies et al., 2018).

In the Merkies et al. (2018) study the only difference horses displayed when interacting with humans was in their heart rate. Based on the results of this study the horses exhibited "typical equine behaviors regardless of the mental status of the human. If two humans physically appear and move similarly, they may be perceived as equivalent to the horse from a physical aspect, thus, any differences the horse displays in how it interacts with various humans is likely not due to a transmitted emotional or mental human need" (p. 66). Merkies et al. (2018) referred

to criticisms related to previous suggestions by different clinicians and EAT program managers inferring horses used in therapy settings will differentiate and respond to the different mental states of patients. They suggested this is not currently well supported by science based on sound empirical models and may be unethical. Merkes et al. (2018) cited other authors who noted similar concerns including (McGreevy et al., 2009) who questioned the validity behind provider inspired interpretations and subsequent patient expectations that horses will "sympathize with riders or handlers to achieve mutual goals" (p. 66) or that horses can "sense the human mental state" (p. 66) especially that of individuals who have been mentally traumatized. Merkes et al. (2018) discussed the risk to patients and to respect for HAI within the scientific community that may result from misunderstandings, potentially inaccurate interpretations, and invalid expectations and cited DeAraugo et al. (2014) who proposed those who engage in EATs should not allow the horse to "carry the idealistic responsibility of acting as the primary caregiver to the human in times of need" (p. 66).

The Merkies et al. (2018) results discussed a positive implication for EAT therapy programs and proposed the horses lack of response to human mental states might offer patients opportunities to experience normalcy. Individuals with mental illness, including those who've been traumatized, usually experience common stigma attached to mental illness. They can fear and seek to avoid experiencing the resulting prejudice and discrimination. Opportunities to engage in treatment and situations where others (including horses) do not respond to cues and behaviors indicative of mental illness can afford patient's the chance to experience normalcy. This may be particularly helpful to traumatized patients who may experience triggers resulting in bursts of anxiety or panic during treatment, by affording them the opportunity to apply newly learned coping skills against unaffected surroundings. In Merkies et al. (2018) closing remarks

they referred readers to a meta-analysis on AATs, by Nimer & Lundahl (2007), and noted results of the meta-analysis reflected numerous methodological errors within the scientific literature on AAT at the time. These included a "lack of control groups, ignoring outliers in the data set, small sample sizes, over generalized findings, author/research bias, and inconsistency between observations and actual discoveries" (p. 66). This once again underscored the presence of commonly occurring themes of serious deficiency in scientific rigor and methodology within the literature base as far back as 2007.

Current literature continues to maintain a lack of empirically based support for EATs, including EAP, derived from sound scientific methodological design. The legitimacy for using Equine Assisted Psychotherapy and Equine Assisted Psychotherapy for treating trauma cannot be firmly established until this is resolved. "In order for the field to be taken more seriously in the research, medical, and therapeutic community, more research studies need to employ a standardized, controlled, and longitudinal research methodology" (Lentini & Knox, 2009, p. 56). Multiple factors, naturally conducive to the field, impede the development and production of strong empirical support for EAP. The lack of a manualized form of Equine Assisted Psychotherapy makes it difficult to impossible to obtain a clear description of the treatment administered including what has been done, in what order it was done, and with what expectations or assumptions. Additionally, it is not uncommon for therapist utilizing animal assisted modalities to resist following a manualized form of treatment, often pointing out the potential confines imposed by a manualized approach especially for therapists using psychodynamic approaches (Wharton et al., 2019). It must also be noted that EAP actively incorporates the behaviors and attitudes of a 1,000-pound animal within the therapeutic alliance

and framework, animals whose actions and inputs do not readily conform to a manualized approach (see Appendix A).

Still, popular demand and a wrath of anecdotal evidence contributed to rapid growth in Equine Assisted Activities and Therapy and its various subfields since the 1990s. Between 2009 and 2016 alone the number of Professional Association of Therapeutic Horsemanship International (PATH Intl) accredited centers offering services to Veterans, expanded from 89 to 335 (Marchand et al., 2021). The rapid expansion of service providers contributed to the simultaneous surge in governing organizations and professional certifications. These organizations developed their own certifications, trainings, and terminology. Among the most successful in terms of growth in services and membership include the Professional Association of Therapeutic Horsemanship International (PATH Intl.) and the Equine Assisted Growth and Learning Association (EAGALA). Adding to public confusion, various organizations support a variety of trainings and certifications in treatments focused on addressing concerns beyond mental health and include licensed occupational and physical therapist. While these often share some common practices and treatment goals, the co-mingling and rapid surge in growth led to confusion among consumers and even licensed professionals and providers. A lack of standardized language and terminology coupled with significant differences in treatment models and goals created significant barriers for research and the application of rigorous study models and their subsequent replication (Marchand et al., 2021).

Marchand et al. (2021) went beyond the need to develop standardized nomenclature and proposed the need to distinguish between mental health counseling services that “tend to be problem-oriented, short-term and skills based and psychotherapy which is frequently longer-term with a focus on behavior change, self-awareness, and symptom reduction. Furthermore,

psychotherapy is often provided in the form of manualized, evidence-based interventions, such as cognitive behavioral therapy" (p. 5). These are just a sampling of the areas in need of further clarification and standardization. Others have pointed to additional problems imposed by the lack of a manualized form of Equine Assisted Psychotherapy, for example clinicians and/or research scientist cannot easily obtain a clear description of the treatment administered including what has been done, in what order it was done, and with what expectations or assumptions. Further complicating matters, it is not uncommon for therapist utilizing animal assisted modalities to resist following a manualized form of treatment and point to potential confines imposed by a manualized approach. Wharton et al. (2019) indicated this problem is especially common among therapists using psychodynamic approaches. A lack of standardization and manualized treatment protocols, within the literature base, contributed to research results heavily criticized for their reliance on anecdotal evidence, self-reported measures, and lacking study design (Wharton et al., 2019).

The space for continued evolution in standardization and specification takes on another dimension when you begin to consider the specifics of the equine interactions themselves and whether they included "groundwork, riding or both as well as the frequency, duration, intensity, and intervention components" (Marchand et al., 2021, p. 5). In regard to the growth in EAP for Veterans with PTSD, Marchand et al. (2021), recommended study conductors use a detailed description of the intervention such that it can be replicated regardless of the terminology used. However, Marchand et al. (2021), also proposed the use of terminology outlined in Figure 20 and included their suggestions for advancing research into the equine assisted therapy for veterans with PTSD in Figure 21. While the Marchand et al. (2021) research was focused on military

populations and veterans, the research in trauma focused care with other populations share identical or closely related confounds.

Figure 20

Example of a nomenclature for equine assisted activities and therapies based upon the work of (Hallberg, 2018 as cited in Marchand et al., 2021)

From "Equine-Assisted Activities And Therapies For Veterans With Posttraumatic Stress Disorder: Current State, Challenges, And Future Directions," by W.R. Marchand, S.J. Andersen, J.E. Smith, J. E., K.H. Hoopes, and J.K. Carlson, J. K., 2021, *Chronic Stress*, *5*, 247054702199155, p. 4 (https://doi.org/10.1177/2470547021991556). Copyright 2021 by the Author(s)

Figure 21

Key research recommendations to advance the field of EAAT for Veterans with PTSD.

- Standardized Nomenclature
- Standardization of the psychotherapy component
- Focusing mechanism of action studies on the human-horse bond

- Biological metrics to investigate physiology of the human-horse bond, such as MRI, heart rate variability, oxytocin levels and electroencephalogram
- Careful management of potential confounding variables, such as concurrent mental health treatment and psychiatric comorbidities
- Intervention model consisting of six two-hour sessions of groundwork and psychotherapy (without riding)
- Report equine training and evaluation process used as well as any adverse effects from participation for humans or horses
- Further investigate the impact of EAP work on equines

From "Equine-Assisted Activities And Therapies For Veterans With Posttraumatic Stress Disorder: Current State, Challenges, And Future Directions," by W.R. Marchand, S.J. Andersen, J.E. Smith, J. E., K.H. Hoopes, and J.K. Carlson, J. K., 2021, *Chronic Stress, 5*, 247054702199155, p. 4 (https://doi.org/10.1177/2470547021991556). Copyright 2021 by the Author(s)

Beyond their discussion of nomenclature and standardized models of treatment Marchand et al. (2021) offered a detailed summary relative to potential mechanisms of action that could explain "why horses might contribute to the psychotherapeutic process for Veterans with PTSD" (p. 5). Please note multiple similarities between the mechanisms of action proposed by Marchand et al. (2021) and those discussed in the introduction to this research article. Other implications for trauma focused treatment (Marchand et al., 2021, p.5) centered on the horse human bond which may be the result of the same mechanisms hypothesized to explain "attachment theory and biophilia as well as neurobiological mechanisms, such as the activation of the oxytocin system" (see also Beetz, 2017; Beetz et al., 2012). They also pointed to the possible effects of a safe and nonjudgmental environment, experience of control/autonomy, the horse as a mirror or metaphor, mindfulness, and the incidental exposure to nature that occurs naturally when spending time around horses. Marchand et al. (2021) also referenced a suggestion from Beetz et al. (2012)

proposing future research consider the possibilities associated with the theoretical orientation "anthropomorphism, a focus on the experiential system instead of the verbal-symbolic system, implicit processes and intrinsic motivation, and distraction processes by" (p. 5). Future research on equine assisted therapies would also likely benefit from incorporating the use of psychometrics and biometrics to explore the psychological and physiological mechanisms of change associated with equine assisted therapies. Additionally, Marchand et al., (2021) discussed examples of physiological measures already employed in other EAP research including oxytocin levels, electroencephalogram, heart rate variability, and functional MRI (Cabiddu et al., 2016; Cho, 2017; Jang et al., 2015; Kang et al., 2018; Matsuura et al., 2016; Yoo et al., 2016).

Critics are correct to point out the need for larger, well designed, repeated, randomized controlled studies, less reliant on self-report measures and using standardized manualized treatment protocols to demonstrate the effectiveness of EAP and its ability to be generalized across populations (Cukor et al., 2009; Foa et al., 1997; O'Haire et al., 2015). O'Haire et al. (2015) further discussed the need for future research in AAI to incorporate appropriate control conditions. To many current studies do not use a control condition, which is necessary to identify any effects of AAI beyond treatment as usual and exactly how AAI can add value to existing treatment models. O'Haire et al. (2015) proposed future studies be conducted using a "placebo or sham treatment to disentangle the effects of the animal from potential effects due to novelty, expectancy biases, or extraneous treatment components" (p. 10). Marchland et al. (2021) stated, "studies must have high internal and external validity and be comparable and replicable to establish efficacy and effectiveness and ultimately to advance the field" (p. 6).

Relative to barriers associated with the cost of providing and accessing EAP, Marchand et al. (2021) asserted that equines "should be specifically trained for EAP work" (p. 8). Horses must

be deemed safe and appropriate for EAP by equine professionals with a well-schooled eye for suitable temperament and behaviors without undue vice or risk. However, horses do not need specific (and potentially expensive) training to meet the needs and demands of equine assisted psychotherapy. Most horses deemed suitable for beginner riding and/or horsemanship lessons already possess the characteristics that will make them good candidates for equine assisted psychotherapy (see Appendix A). The same may not always true for equines used within therapy models targeting specific physical disabilities, for example hippotherapy, requiring mounted work on an especially quiet, well-mannered, reliable horse. This point of difference may be one avenue (among many) for cutting potential cost associated with providing EAP relative to other EATs (see Appendix A).

Summary

This article sought to provide a comprehensive review of the current literature and empirically supported research relative to the potential applications, weaknesses, and benefits of incorporating equines in the provision of trauma focused mental healthcare. Unfortunately, many individuals have reportedly endured exposure to one or more traumatic events across their lifespan. The effects of traumatic experiences and their association with a variety of other mental and physical illnesses has assumed a more prominent role in human healthcare. Yet, the development and advancement of effective trauma focused mental healthcare remains lacking and struggles to catchup with the needs. This article helps to inform healthcare providers, including clinicians seeking novel methods of circumventing common barriers to successful trauma focused mental healthcare, on the current status of Equine Assisted Psychotherapy (EAP) as an adjunctive approach to traditional care.

First, the history and examples of common perceptions related to the impact of equines on human health and well-being were explored along with several reasons for the more recent growth and popularity of Equine Assisted Psychotherapy (EAP) for treating trauma. This was followed by a review of common terms and nomenclature commonly utilized in Equine Assisted Therapies (EAT) in general, and specifically Equine Assisted Psychotherapy (EAP). An attempt was made to further define several EAT terms and explain their relationship to different models of EAT before the focus narrowed to a discussion of Equine Assisted Psychotherapy and its potential applications within trauma focused care.

Second, we reviewed several different common treatment populations and applications used in EAP accompanied by the more prominent theories and support for each. This may offer future clinicians and researcher scientist a comprehensive view of popular theories and applications and the reasons practicing clinicians find them useful. It is the author's wish that future research continues to further refine and strengthen empirical support for the most effective and appropriate applications of EAP in the provision of trauma focused care.

Third, the current lack of standardized nomenclature and manualized treatment protocols and the inherent problems these have imposed on the evolution and empirical research of EAP were discussed. The most prominent naturally occurring barriers to accessing and providing EAP were also briefly outlined and included things like cost of treatment, insurance, access to equine facilities, and the need for a licensed mental health provider and a licensed equine handler or specialist at each session. The overall impact and limitations of all three aforementioned factors; a lack of standardized nomenclature, a lack of manualized treatment protocols, and naturally occurring barriers inherent to using equines have imposed on the production of empirically based research centered on rigorous research designs and sound scientific methods was reviewed.

Lastly, various weaknesses in the current research and suggestions for future research were evaluated. Several common criticisms were consistently present in the literature, among both critics and supporters of EAP, and tended to be centered on a lack of rigorous scientific research support and replication. Suggestions for future research included the use of studies including a much larger number of participants, randomized treatment and control groups, the use of a placebo treatment group, and valid measures beyond those confined to self-report.

In conclusion, Equine Assisted Psychotherapy appears to offer several unique and novel aspects to conventional trauma focused mental healthcare. The potential benefits or enhancements to treatment as usual include the unique components of the horse-human bond, the provision of a safe and nonjudgmental environment, potential enhancements to patients' experience of control and autonomy, the effects of using the horse as a mirror or metaphor, a horse's natural ability to force individuals to be present in the moment (mindfulness), the incidental impact of spending time in nature that naturally occurs when engaging with horses. A more recent development in EAT research, including EAP, includes research on neurobiological based mechanisms of action associated with the effects of EAP. This is an especially exciting and promising development, reflective of current progress toward a modern clinical whole health perspective, that recognizes the obvious mind-body connection and its appropriate role in mental healthcare and future research.

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APPENDIX A

Kara L. Harrison, M.S.

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EDUCATION

Eastern Kentucky University - Richmond, KY
Doctor of Psychology (Psy.D.) in Clinical Psychology — December 2022

Eastern Kentucky University - Richmond, KY
Master of Science, Clinical Psychology — May 2018

Eastern Kentucky University - Richmond, KY
Bachelor of Science, Major: Psychology — August 2016

CLINICAL EXPERIENCE

Doctoral Internship: Western Kentucky Psychology Internship Consortium (Western State Hospital assigned)
September 2021 – December 2022

- Doctoral Intern: Inpatient psychiatric hospital providing acute psychiatric care to patients in Western Kentucky
- Complete psychiatric intake assessments and provide recommendations for diagnosis and treatment of patients with severe and persistent mental illness, mild and moderate intellectual disability, traumatic brain injury and various forms of dementia
- Provide individual psychotherapy including cognitive behavioral, dialectical behavioral, and trauma focused models
- Provide group psychotherapy with patients
- Complete psychiatric evaluations to determine cognitive and emotional functioning
- Complete forensic evaluations for competency to stand trial and guardianship hearings
- Risk assessment and crisis management including safety planning with patients experiencing suicidality
- Participate in multi-disciplinary treatment teams
- Participate in weekly supervision and seminars at the doctoral level

Practicum: EKU Psychology Clinic
May 2018 – June 2021
Supervisors: Amy Taylor, PsyD., Michael McClellan, Ph.D., Myra Beth Bundy, Ph.D., Theresa Botts, Ph.D., Dustin B. Wygant, Ph.D.

- Administered and evaluated assessments and clinical interviews for learning disability, Autism Spectrum Disorder, ADHD, Anxiety, PTSD, Major Depressive Disorder, and suicidality under direct supervision
- Performed therapy with clients of varying age and diagnoses under direct supervision

Practicum: Morehead State University Counseling & Health Services
Fall 2020 – August 2021
Supervisor: Goldie Clatworthy Williams, Theresa Botts, Ph.D.

- Provide Individual therapy to MSU students within a university counseling center setting.
- Trained on Encompass Integrated Treatment for Adolescents and Young Adults incorporating Motivational Enhancement Therapy and Cognitive Behavioral Therapy components.

Professional Association of Therapeutic Horsemanship International – Certified Therapeutic Riding Instructor
July 2021
Central Kentucky Riding for Hope, Kentucky Horse Park – Lexington, Ky
Supervisor: Theresa Botts, Ph.D., Toby Cross MOT, OTR/L

- Provide individual therapeutic riding sessions to individuals between ages 5 to 65
- Work with a variety of mental health diagnoses including Attention Deficit Hyperactivity Disorder, Autism Spectrum Disorder, Generalized Anxiety Disorder, Post Traumatic Stress Disorder, and depression.

Practicum: CHI Saint Joseph Health - Senior Renewal Center
May 2019 – March 2020
Supervisor: Michael McClellan, Ph.D., Beth Clark, M.S.
Berea, Ky

- Provide group therapy to adults age 50 and over in an outpatient mental health setting
- Work with a myriad of clients with widely varying diagnoses
- Focus on group therapy psychoeducation topics including end of life, stress management, dementia, anxiety, depression, effective communication with family, life in assisted living, suicidality, changes in independence and daily living
- Participation in consultation meetings with administration, co-group therapist, and staff nurse
- Assessments including anxiety, depression, and suicidality

RELATED EXPERIENCE

Graduate Assistant, Sarah Steele, Ph.D.
Eastern Kentucky University, Department of Psychology Fall 2017 – Spring 2018
Richmond, KY

- Graded and provided feedback on group work.
- Logged class attendance and graded student coursework such as assignments and exams

Graduate Assistant, Richard Osbaldiston, Ph.D.
Eastern Kentucky University, Department of Psychology Spring 2017 and Fall 2018
Richmond, KY

- Assisted with research and data collection
- Provided feedback and assistance to students
- Graded student coursework including assignments and exams

Graduate Assistant, Yoshie Nakai, Ph.D.
Eastern Kentucky University, Department of Psychology Spring 2019 – Fall 2019
Richmond, KY

- Organized and conducted Psychology 200 lectures when needed
- Provided feedback and assistance to students
- Graded student coursework including assignments and exams

Graduate Assistant, Dan Florell, Ph.D.
Eastern Kentucky University, Department of Psychology Spring 2020
Richmond, Ky

- Grade individual coursework and exams
- Generate chapter outlines for lectures

EMPLOYMENT HISTORY AND CAREER RELATED EXPERIENCE

Colby Fields LLC Midway & Winchester, Kentucky **April 1989 – September 2012**
Owner & Manager

- Colby Fields LLC owned and operated commercial equine farm located in Midway, Kentucky (and later in Winchester, KY) 1989 – 2012
- Provided commercial boarding, training, and teaching services to individuals engaging in Sport Horse riding, competing, and breeding. 1989 – 1999
- Provided commercial thoroughbred breeding and racing services to thoroughbred race owners and breeders. 1999 - 2012

Independent Ky Representative for three International Equine Transport Companies
New York, Chicago, Los Angelos **1995 - 2007**
http://www.globalhorsetransport.com

https://www.irt.com

http://www.horseamerica.com/

- Independently contracted representative for International Equine Transport companies providing services out of Kentucky
- organizing import/export jockey club requirements
- creating and executing USDA import/export equine health papers
- organizing and coordinating isolations with state and USDA offices and veterinarians in order to meet export requirements for countries including the European Union, Australia, New Zealand, South Korea, Turkey, and parts of Asia
- organizing and operating 5-Hr isolations
- meeting with and clearing U.S customs
- planning and executing load plans for trucks and planes

Lexington Fayette Urban County Government Division of Parks & Recreation
Masterson Station Park Equestrian Program Lexington, Kentucky **1981-1989**
http://mastersonequestrian.org/

- Assistant Riding Instructor
- Riding Instructor
- Assistant Program Director
- Interim Program Director

VOLUNTEER WORK

Central Kentucky Riding for Hope
Kentucky Horse Park
Lexington, KY

CLINICAL TRAINING AND CERTIFICATIONS

- Trauma Focused Cognitive Behavioral Therapy Summer 2018
- Cognitive Processing Therapy Fall 2018
- Prolonged Exposure for PTSD Fall 2018
- Assessment and Management of Suicidality (CAMS) Training Spring 2019
- Dialectical Behavior Therapy (DBT) Summer 2019
- The Future of Personality Disorder by Martin Sellbom Ph.D. Fall 2019
- Personality Assessment (MMPI and PAI) Spring 2018
- Forensic Psychology Spring 2020
- Forensic Mock Trial Testimony in Collaboration with UK Law School Spring 2020
- Telepsychology Best Practices 101: Clinical Evaluation and Care: Cultural Competencies Summer 2020
- Telepsychology Best Practices 101: About the Tech... Video, Email, Text Messaging & Apps Summer 2020
- Telepsychology Best Practices 101: Legal, Regulatory & Ethical Rules of the Road Summer 2020
- Lethal Means Reduction Training Series: Creating and Using Partnerships to Reduce Access to Lethal Means for Suicide Prevention Summer 2020

- Encompass - Integrated Treatment for Adolescents and Young Adults using Motivational Enhancement Therapy & Cognitive Behavior Therapy — Summer 2020
- Trauma Informed Care in the Era of Covid-19 — Fall 2020
- Suicide and Older Adults with Dr. Yeates Conwell and Dr. David A. Jobes — Fall 2020
- Suicide and Communities of Color with Dr. David A. Jobes And Dr. Sherry Davis Molock — Fall 2020
- PATH International Certified Therapeutic Riding Instructor — July 2021
- Motivational Interviewing Training with MINT Member Michelle Stephen Seigel — August 2021

PROFESSIONAL SOCIETIES AND AWARDS

- American Psychological Association
  - Division 19 – Society for Military Psychology
  - Division 20 – Adult Development and Aging
  - Division 40 – Society of Clinical Neuropsychology
  - Division 28 – Psychopharmacology and Substance Abuse
  - Division 32 – Society for Humanistic Psychology
  - Division 35 – Society for the Psychology of Women
  - Division 38 – Health Psychology
  - Division 50 – Psychology of Addictive Behaviors
  - Division 55 – American Society for the Advancement of Pharmacotherapy
  - Division 56 – Trauma Psychology
  - Division 17 – Society of Counseling Psychology – Human Animal Interactions
- Kentucky Psychological Association
- Professional Association of Therapeutic Horsemanship International (PATH Intl.)
- National Alliance on Mental Illness (NAMI) – Kentucky
- The National Society of Leadership and Success
- Eastern Kentucky University Psychology Club
- International Psi Chi – EKU Chapter
- Colonel to Colonel Mentor Program
- Dean's List
- Kappa Delta Sorority
- TOBA – Thoroughbred Owners & Breeders Association
- American Trakehner Association
- Mid-South Combined Training & Dressage Association
  Combined Training Horse of the Year 1990 – Training Level
  Training Level Dressage Horse of the Year 1995
- United States Dressage Federation Training Level 5th place nationally - Trakehner Division 1995

PRESENTATIONS

- "The Effect of Animal-Assisted Therapies on Mental Disorders: A Systematic Review." Oral Presentation at Kentucky Academy of Science Conference, Louisville, KY, November 4, 2016.

- "Older Adults and Animal-Assisted Therapy: Many Complex Problems, One Effective Solution." Poster presented at Kentucky Academy of Science Conference, Louisville, KY, November 5, 2016.

- Institutionalized older populations and animal-assisted therapy: A meta-analysis. Osbaldiston, R., Napier, M., Harrison, K., Mullikin, K., Meuhler, T., Studler, C., Grogan, L. Poster presented at the Markesbury Symposium on Aging and Dementia, November 5, 2016, Lexington, KY.

- Institutionalized older populations and animal-assisted therapy: A meta-analysis. Osbaldiston, R., Harrison, K., Napier, M., Mullikin, K., Muehler, T., Studler, C., Grogan, L. Poster presented at Living with Animals Conference, March 26, 2017, Richmond, KY.

REFERENCES

Susan Redmond-Vaught, Ph.D., Director Psychology Department Western State Hospital
- **Susan.vaught@ky.gov**
- 270.889.2819

Michael McClellan, Ph.D., Assistant Professor Eastern Kentucky University
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- Central Kentucky Riding for Hope
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