

The case for Equine-Assisted Interventions (EAI) for children and adults with specific areas of need

(overview essay)

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Abstract: *This review paper explores the validity of using therapeutic equine-assisted interventions in supporting individuals with specific disabilities, mental health needs and progressive medical conditions.*

Keywords: *Equine-assisted Interventions (EAI), Equine Assisted Psychotherapy (EAP) Mental Health, Special Educational Needs and Disabilities (SEND), Autism Spectrum Disorder (ASD), Physical Disabilities*

1 Introduction: Defining Equine Assisted Intervention

Equine-Assisted Intervention (EAI) is an alternative, therapy-based approach designed to support wellbeing and engagement through activities such as horse riding, horse care, social interaction and teamwork. Its aim is focused on developing transferrable life-skills for those experiencing social, emotional and physical needs (Harrington, 2015, p. 19); EAI has been reported to be particularly effective for developing and enhancing skills for independence (Borgi et al., 2016, p. 2). The engagement of vulnerable individuals with horses has been recognised as a successful factor in promoting positive mental health, trust-building and the creation of a sense of worth for the key reason that horses, which are generally non-judgemental and accepting in nature, are highly responsive animals, enabling people to interact with them non-verbally, through body language and gestures (Earles et al., 2015, p. 150).

2 The Aim of this review paper

This review paper explores EAI from two perspectives: Therapeutic and pastoral. EAI as a therapeutic intervention presents conflicting results; Veselinova (2013)

and White-Lewis et al. (2019) concluded that although EAI does have an impact physically, this is not significantly more than standard forms of therapy and progress has been recorded as noticeably slower. Contrastingly, as a therapeutic intervention for mental health and/or trauma, EAI is found to be highly effective, more so than standard therapies, particularly for vulnerable young people (Mueller and McCullough, 2017; Walker Buck et al., 2017). Furthermore, Harrington, (2015) identified that it had served as an effective distraction technique for a young person with a history of self-harm (p. 35). It is through the lens of this argument that the overall aim of this review is to describe and critically reflect on evidence which supports the judgement that HEI is an effective therapeutic provision for individuals with Special Educational Needs/Disabilities (SEND) and for those with mental health needs.

3 Background Context: The Human/Horse Relationship

Levine (1999, p. 29) identified that the first evidence of horses being domesticated was found to be between 3000–5000 BC. Levine's paper is now over twenty years old, and scientific methods have since advanced within the field of forensic anthropology, meaning that there is now the potential to isolate a more specific timeframe for identifying when horses were first domesticated. Anderson and Meints (2016, p. 3344) have identified that it was the Ancient Greeks, using horses primarily for transport and war, who were the first to suggest that horses could be used for therapeutic and rehabilitation purposes, thus the derivation of the term 'hippotherapy' emerged; however Librado et al. (2016, p. 423) stated that only minimal further investigation has been undertaken into the origins of domesticated horses and so no contradictory conclusions have been obtained.

The treatment of horses by humans has considerable impact on their temperament. Horses that have been mistreated – physically abused, neglected, over-exerted, confined to small spaces, for example – are more likely to display aggressive behaviours such as biting and kicking (Hausberger et al., 2008, p. 9a), but may still seek out human affection. Schaefer (2007, p. 48) states that the effects of abuse on horses are identical to the effects of abuse on humans; these being both long and short-term, including such actions as withdrawal, changes in behaviour, being over-eager to please or displaying a lack of trust. The effect of trauma and abuse on animals is an under-researched area, there is even less research into timescales regarding recovery from trauma/abuse. Considering that animals can have parallel experiences to humans regarding the effects of abuse, it might be appropriate to assume that recovery time from this treatment also shares similarities with humans, where recovery can take many years with a significant number never fully managing a full recovery but only developing strategies to learn to live with the adverse experiences (Anderson et al., 2012, p. 1279). The most significant aspect in recovering from trauma/abuse is the

establishment of new relationships and rebuilding existing ones (Lewis et al., 2015, p. 385–387) but animals who have suffered from trauma/abuse display trust issues relating to humans; this is a common issue, supporting the view that social factors can influence personality and temperament (Niemela and Esantostefano, 2015, p. 24).

Smith et al., (2018) state that horses are generally renowned for their sensitivity to human emotions and non-verbal signals, both key reasons why the human/horse bond has been, a strong one for so long (p. 307–308). Horses respond more positively to humans displaying more docile body language as opposed to those presenting dominance as this can be interpreted as threatening, as docile gestures are more calming, making the horse more approachable (p. 311). This characteristic seems to make horses ideal animals to be used in animal-related assisted interventions designed to support physically and/or emotionally vulnerable individuals.

4 Equine Assisted Intervention (EAI) and Special Educational Needs and Disability (SEND)

Despite judgements emerging from some studies' findings, notably those conducted by Srinivasan et al. (2018) and Park et al. (2013), who highlighted that results were inconclusive to credit EAI as a wholly effective intervention, there is a counter-argument supported by qualitative data collected directly from EAI participants and their families which confirms the efficacy of EAI. Tan and Simmonds (2018) and Lemke et al. (2014) both acquired responses and perspectives from those who regularly engaged in EAI. These responses conveyed how much the participants enjoyed their EAI activities and how they (and their parents and/or carers) directly related this to positive change in their lives.

4.1 A Focus on EAI and Individuals with Autism

Research into the effects of EAI on individuals with SEND largely focuses on those on the Autism Spectrum (Autistic Spectrum Disorder – ASD). ASD has been defined in many ways over the years, however recent research defines it as a neurodevelopmental condition affecting an individual's rate of typical development, social interaction, communication and cognitive functioning; it is more commonly diagnosed in boys but is becoming increasingly diagnosed in girls (Lai et al., 2014, p. 896). Jordan (2019, p. xxvii) emphasises that ASD is very much an individual condition – no two cases are the same and characteristics differ largely between individuals. Another trait of ASD is that individuals with the condition experience the world in very different ways from those without from a sensory perspective, known as 'sensory overload' which is explained as a sometimes overwhelming or intolerable amplification of the senses (Bogdashina, 2016, p. 64–65). To self-regulate, individuals with ASD might develop

repetitive behaviours such as tapping a particular object when walking past, rocking, hand flapping or lining up objects. (p. 65). Despite the differing needs of individuals with ASD, it is not an 'illness' which needs to be 'cured'; rather, these needs must be considered and accommodated to enable individuals with ASD to access the world and be treated with respect and as human beings (Jordan, 2019, p.xxvib).

A study conducted by Llambias et al. (2016) consisting of nineteen children with ASD identified that EAI was effective in addressing sensory needs. Horse riding provided enhanced (and enjoyable) vestibular-proprioceptive feedback for the children participating– the sensory systems responsible for balance, movement and spatial awareness (Cuturi and Gori, 2019, p. 1–2). Particularly within some special school settings, therapy balls are used for individuals with ASD to give the same vestibular-proprioceptive feedback that horse riding is shown to provide; the use of therapy balls has been reported as enabling children to sit for longer periods of time as they are able to bounce if they need to, making them more alert/able to concentrate and improve their overall engagement and participation (Bagatell et al., 2010, p. 896). The similarity between the use of the therapy balls and horse riding is that they get the vestibular-proprioceptive feedback from both – the therapy balls from bouncing and from horse riding by the bouncing or rocking motion as the horse moves. In addition, Lambias et al. (2016) also identified that horse riding had a calming effect on some of the participants through a combination of the motion and the quiet, outdoor environment where the EAI took place (p. 2). Similarly, Barakat et al. (2019, p. 353a) explored how the natural environment in general can have a positive effect on children with ASD, referring to it as a 'healer' and identifying the key benefits as reducing stress/anxiety and promoting positive feelings (p. 355).

A contentious area relating to the use of EAI for individuals with ASD is its positive impact on improving the social functioning of individuals with ASD. Lanning et al. (2014) compared the effects on social functioning using EAI with that of an unspecified non-EAI and the results identified that EAI had a higher rate of social functioning improvement amongst the group using this approach. Oppositely, a later study consisting of direct observation and literature analysis, found widely varying results but concluded that there is not enough clear evidence to confirm that EAI is significantly beneficial to improving the social functioning of individuals with ASD (Srinivasan et al., 2018, p. 162). However, the perspectives of parents of individuals with ASD is a far more positive one in relation to how EAI improves social functioning. Tan and Simmonds (2018) reported that parents commented on the relationships their children were building with the horses, regarding them as friends, and having increased interaction with facilitators and other children taking part in the EAI (p. 763). One parent discussed how their child, building a relationship with the horses, has enabled them to help their child consider the consequences of their behaviours, using the example that the horse would be upset (p. 764), thus utilising

the skills learned in EAI in a wider context. Another parent discussed the friendships their child formed with other children in the EAI group, commenting that not only have they built new relationships through the activity, but that these relationships have continued outside of the EAI setting with the children often seeing each other for 'playdates' (p. 754).

The perspective of the parents are valid because they consider the long-term effects of the EAI and appreciate every positive impact, no matter how insignificant it may seem. Therefore, from the perspective of parents, EAI seems to be recognised as a very valued intervention for their children with ASD as it enables them to develop skills for use in the wider world.

4.2 A Focus on EAI and Individuals with Physical Disabilities

The Office for Disability Issues, in the Equality Act (2010), defines the umbrella term 'Physical Disability' as,

“a physical or mental impairment and the impairment has a substantial and long-term adverse effect on his or her ability to carry out normal day-to-day activities” (p. 7).

Issues that physical disability may cause include full or partial paralysis and chronic pain; balance, co-ordination and general mobility issues, resulting in the use of assistive aids with challenges carrying out basic tasks such as eating and personal care (Veselinova, 2013, p. 161). In connection with EAI, Kraft et al. (2019) compared the outcomes of nine randomly-selected children aged two to five years old with physical disabilities, where four underwent EAI and five underwent an undetailed standard form of physical therapy over a course of twelve sessions. All of the participants undergoing the interventions displayed improvements in functional mobility, but the participants in the standard physical therapy group showed more significant improvements than the participants in the EAI group (p. 19); however, it is noted in the report that the standard physical therapy focused on a specific skill over a period of time whereas the EAI addresses a range of skills over the same period (p. 19b), hence this is likely to be why more progress was shown by the standard physical therapy group. Similarly, Park et al. (2013) established an identical pattern of results in their study, however they found more significant improvements in the EAI group, where larger increases in abilities to carry out personal care and mobility were identified (p. 1740). Unfortunately, both studies illustrate that, because such small sample sizes and specific age-ranges were used, this does not serve as sufficient evidence to prove the benefits of EAI across a wider participant age-range.

Much like individuals with ASD, individuals with physical disabilities have also been found to benefit socially from EAI, specifically in relation to interactions with

peers. Wanneberg (2014) investigated how EAI helped reshape the identities of adults with acquired physical disabilities; one reason for this being that it helps individuals to forget about their disability during the time that they spend on horseback because when they ride with able-bodied peers, they are not restricted by their own body's limitations like they may be when taking part in other physical activities such as walking or cycling (p. 73–74). Furthermore, just being in the EAI environment with other people who share a common interest in horses was found to be a key factor – a participant with a physical disability commented that, in that setting, everyone naturally socialises regardless of age, gender or disability purely over their enjoyment of being involved with horses (p. 73). Kendall et al. (2014) presented similar findings – that the general context in which EAI takes place is a highly positive and relaxing environment and that EAI activities are exciting and looked forward to by most participants.

As with literature relating to children with ASD, parent voice is again under-represented with regards to physical disability (Cavendish and Connor, 2018b, p. 33). Lemke et al. (2014) gathered data on the perceived impacts that EAI had on children with spinal muscular atrophy – a severe, degenerative and regressive neuromuscular disease caused by degeneration of the alpha motor neurons in the spinal cord, resulting in muscle weakness and paralysis (D'Amico et al., 2011, p. 71). Lemke et al's data/feedback was collected from the participants and their parents; their findings complemented Wanneberg's (2014) findings which focused on what individuals with physical disabilities felt like when taking part in EAI, in short they reported that they are not held back by the limitations of their bodies. Lemke (2014) quoted one participant who said, “when I got up on the horse I could do everything once I got up. I think it gave me independence” (p. 239). Others commented that physical skills they learnt during EAI were transferrable into daily life such as walking and the ability to lift objects (p. 240). One parent stated that her son did equestrian competitions, supporting the view that individuals with physical disabilities are helped to feel no different from others. Several parents stated how they noticed how much strength their children had gained since participating in EAI and how much better their balance was (p. 240), again, social and relationship aspects were frequently highlighted, with parents stating how their children would always talk about the horse they rode and the friends they met in the EAI setting (p. 241).

Rett Syndrome, is a condition mostly affecting girls, causing developmental regression and profound and multiple learning, physical and communication difficulties (Rett UK, 2016) ; an additional physical condition found in many girls with Rett Syndrome is scoliosis, or curvature of the spine, which usually progressively worsens and can become severe (Killian et al., 2017, p. 21–24), having significant impact on posture. The position assumed when riding a horse aligns the hips, shoulders and spine; to stay comfortably on the horse, this position must be maintained throughout.

This position and the movement of the horse, over time, works to strengthen the muscles and skeletal system (p. 503). Although this would not serve as a cure for scoliosis in Rett Syndrome, it helps to strengthen the spine and slow the deterioration of the condition, reducing its severity.

5 A Focus on EAI and Mental Health

Literature focusing upon the effects of EAI on individuals who have experienced mental health issues and/or trauma presents a positive picture relating to how spending time with horses can be beneficial to mental wellbeing due to their gentle natures. Yorke (2015) and Kinney et al. (2019) suggested, in their respective studies, that horses influenced increased trust and emotional healing in humans. Moreover, Yorke (2015) researching into the science of forming relationships, identified that EAI caused neurons in the brain to establish the pathways that supported emotional healing.

Depression and anxiety are two of the most common mental health disorders. Depression is characterised by feelings of low mood, guilt and fatigue, ranging from mild to severe (Sanchez Peralta, 2015, p. 34) and anxiety with recurring excessive and uncontrollable feelings of worry which are often accompanied by issues with sleeping, fatigue, memory, concentration and irritability (Stein, 2013, p. 175). Both can be triggered by stressful or traumatic events but the trigger may not always be obvious (Kinderman et al., 2015, p. 456). They are often, although not exclusively, co-morbid (Cimpean and Drake, 2011, p. 141) and allied to other physical and mental health conditions (Ahire et al., 2012, p. 177–178). One of the most common uses for EAI in terms of supporting people with depression, anxiety and mental health needs in general is in conjunction with, or as a part of, an Equine Assisted Psychotherapy programme (EAP). An EAP facilitator is a trained therapist and the horse is used as part of the practice (Johns et al., 2016, p. 199). The most important aspect to the EAP as identified by facilitators and participants is the horse's non-judgemental nature and how it simply responds to the person it sees, being able to make sense of human behaviours and respond accordingly (Wilson et al., 2017, p. 22–23). Wilson's study explored how EAP benefits individuals with depression and/or anxiety, highlighting that it is a more 'hands-on' approach because the participant is getting involved in an environment outside of the more traditional consulting room with the use of 'talking therapy' sessions (p. 25). Wilson specifically investigated the role of EAP from the perspective of the therapist, the findings indicated that progress was made within each individual session, providing benefits in a shorter time-frame than more traditional therapies (Wilson et al., 2017, p. 24). This 'hands-on' approach has also been shown to serve as a distraction from self-harm as Harrington (2015) anecdotally commented that a girl who frequently displayed self-harming behaviour was

directed to EAI in the form of grooming and trimming a horse's tail, although there was the risk that she may have used the scissors to cut herself, in this instance the use of scissors for a purposeful task relieved the urge to self-harm (p. 35a).

In their earlier study of EAP/EAI practices, Johns et al. (2016) presented identical results to Wilson et al. (2017), describing EAP as a more flexible approach to therapy without the confinements of an office (p. 200a), drawing similarities with previous studies of the effects of EAI on individuals with ASD. Johns's study also explored how participants inter-acted and engaged with their allocated horse, commenting on how the horses' personalities stood as a key factor in making them effective therapy animals by being non-judgemental and generally docile in nature but each with their own personalities and highly trusting nature (p. 201). Interestingly, Scopa et al. (2019) identified a level of commonality in the characteristics of Therapists and of horses used in EAI, when defining key Therapist attributes which included honesty, flexibility, respect, warmth, empathy and trustworthiness (p. 9); when compared with the characteristics of a horse, there is a significant similarity, perhaps this justifies why horses make ideal therapy animals?

'Project Stride' was a study carried out by Alfonso et al. (2015) which researched the impact of EAI on women aged 18–29 with anxiety. The project consisted of both riding and horse care activities and was carried out over six sessions:

- (1) *'building trust in my horse and in me'*,
- (2) *'effective communication under the saddle'*,
- (3) *'understanding my feelings and actions'*,
- (4) *'becoming a team'*,
- (5) *'sustaining the team'* and
- (6) *'putting it together and making the learning last'*.

Participants were paired with the same horse throughout (p. 464). The project incorporated the application of cognitive/behavioural techniques to the activities in a way that enabled participants to focus their attention on the horse rather than on their own actions, building strong bonds with their horse and being able to transfer those learned skills into everyday life (p. 466). Interestingly, the EAI facilitators, although well-informed for the purposes of the project, had no formal training in mental health interventions (p. 466) but they delivered a programme which was effective and relevant for the participants. Similarly, Hauge et al. (2015) observed the effects of EAI on adolescents in regard to their self-esteem and social interactions, emphasising that the EAI was not carried out as a therapeutic intervention, but as a straightforward series of activities. Carrying out horse-related tasks was found to encourage the participants to interact with each other, particularly when faced with challenging tasks where they would need to ask for help (p. 343). This demonstrates

that the benefits of EAI do not necessarily have to be directly related to the horse as just being in that particular 'equine-related environment' carrying out a variety of tasks and challenges encourages the development of social interaction. Combined, 'Project Stride' and Hauge's research, suggest that EAI does not have to be solely for therapeutic purposes in order to have a positive effect upon participants as improved/increased social interaction and enjoyment seem to be natural outcomes.

Despite the findings of the studies being largely positive, concerns were raised about the safety of the participants around the horses, although there is very little in-depth research into this within the literature. These concerns stem from inexperience with horses and not being fully informed as to the benefits and risks of EAI (Leveille et al., 2017, p. 275). A facilitator also commented that in their role, they are always on high-alert as to how a horse may react to a client (Johns et al., 2016, p. 200b), however the decision as to whether a facilitator chooses to practice psychotherapy is ultimately their own choice, taking into account their levels of experience and the needs of the participant (Wilson et al., 2017, p. 24–25). Furthermore, it is important to note that horses used in EAI are specially-selected based on their nature, temperament and response to human beings (Hauge et al., 2015, p. 336) in order to minimise risk to both facilitators and participants.

6 A Focus on EAI and Emotional Trauma

Emotional trauma is defined as being "*an experience of unendurable emotional pain and... unbearability of emotional suffering*" (Stolorow, 2015, p. 124) caused by traumatic events including, but not exclusive to, physical, emotional and sexual abuse, neglect, chronic and serious illness and divorce (Souers and Hall, 2016, p. 15). Anyone can experience trauma at any point in their lives and it can affect them both long-term and short-term in different ways (Mueser and Cook, 2013, p. 63), for example, the 'fight, flight or freeze' response, flashbacks, panic attacks and long term, specific mental health issues such as post-traumatic stress disorder (PTSD), anxiety and depression (Mind, 2020).

Mueller and McCullough, (2017) trialled an EAP approach with a group of young people with PTSD caused by adverse childhood experiences. The results were compared with a second group undertaking cognitive behaviour therapy (CBT). Comparative findings presented an equal and significant reduction in the symptoms of PTSD across both groups and although noted that the majority of the participants of the EAP intervention formed immediate bonds with the horses, this made the EAP intervention more appealing to the younger people in the study. (p. 1168). Mueller and McCullough (2017) noted that all activities carried out during the EAP sessions involved a level of intimacy with the horse that traumatised children and young people would generally fear and attempt to avoid (p. 1169). The fact that most participants in the EAP

developed bonds, almost immediately, with the horses demonstrated that they were able to form attachments which had the potential to be transferred into everyday situations (p. 1169). This potential for transference was also identified by Smith-Osborne and Selby (2010) who stated that EAP provides an ideal safe environment for practising social and attachment-forming skills because humans will generally hide their emotions, thoughts and judgements whereas horses do not, being far easier and less emotionally complex to read (p. 299).

Yorke (2010) explored the effects of animals on individuals who have experienced trauma from a neurobiological perspective, identifying that EAI helps the brain to establish neuronal pathways which contribute to healthy attachment, emotional healing and positive, overall wellbeing through physical closeness/touching and mutual trust with the horse (p. 565), further stating that such an approach that its effects have been likened to those of antidepressants but without the negative side-effects (p. 566). These findings combined with Mueller and McCullough (2017) establishing that EAI is as effective as CBT, can imply that EAI may very well have the same level of positive impact as traditional interventions for trauma and mental health issues. This is a particularly useful idea in relation to children in the care system. Children in care have all had at least one traumatic experience in their lives in being separated from their families but many have had additional traumatic experiences such as bereavement or abuse which often lead to mental health issues (Bonfield and Guishard-Pine, 2017, p. 22). Children in care often experience prolonged distress because of difficulties in accessing mental health services and those who do gain access to services frequently find that they are not useful (p. 23). This links to Walker Buck et al.'s (2017) findings that this is largely because of the impact of trauma on cognitive processes and participants' perceptions of the environment being unsafe. Furthermore, Mueller and McCullough (2017) identify that EAI is equal in effectiveness with CBT, giving the potential for it to be used during the time the child has to wait to access mental health services and/or in conjunction with traditional therapies as it does not have the waiting lists that standard mental health interventions have.

An effective EAI approach is not only restricted to being used to support the needs of vulnerable children and young adults only as Kinney et al. (2019) conducted a literature-based investigation into the effects of EAI on Veterans with Armed Service-related health conditions, a significant aspect of this being trauma and PTSD-related which was present in every participant. The most highly-reported outcome was the benefits to the veterans' abilities to form new bonds and relationships both with the horses and with their fellow colleagues on the study who had a common experience, in the form of increased trust, patience and a newfound respect for others (p. 10). In the study, the Veterans developed a more positive view of themselves through improved self-confidence and, ultimately, self-acceptance (p. 10).

7 A Focus on EAI and Progressive Diseases in Older Adults

The term 'dementia' describes a group of progressive diseases of the brain which are characterised by cognitive impairment, aphasia (speech production difficulties), apraxia (motor planning and coordination) and executive dysfunction (emotions and behaviour), with symptoms ranging from mild to severe, dependent on the individual and stage of the disease (Camicioli, 2014, p. 1). The two most common types of dementia are Alzheimer's disease, a physical disease affecting the function of nerve cells within the brain, and vascular dementia, caused by a disease of the blood vessels within the brain, a stroke or a series of transient-ischaemic attacks (TIA), causing nerve cell death (Alzheimer's Society, 2018; National Health Service, 2022). Dementia usually presents at around the age of 65 years old and although no single cause or causes have been identified, associations with family history, head injury, obesity, diabetes and mental illness have been observed (Holmes and Amin, 2017, p. 688).

Dabelko-Shoeny et al. (2014) explored how EAI might reduce challenging behaviours in individuals with dementia. These behaviours might include verbal abuse (such as shouting and/or swearing), physical abuse (hitting, biting, scratching etc.), hallucinations, agitation and upset, and wandering (Nazarko, 2011, p. 268). EAI provided a wholly multi-sensory experience for the participants – the horses may initiate the interaction and through their bodies provide touch, sound, smell, postural stimulation and participants also commented on how they enjoyed being in the countryside as it was a relaxing environment (Dabelko-Shoeny et al., 2014, p. 151). A further finding from this study was the role of EAI as a motivator for physical activity. All participants had some form of physical limitation such as getting up and standing unassisted, however when the horse was brought out, participants would attempt to get up or ask for help to do so and readily offer to walk the horses, things which care staff had never or rarely seen them do (p. 152). As Mueller and McCullough (2017, p. 1168) identified in relation to trauma, EAI/EAP is far more appealing to individuals than traditional forms of therapy, thus, it would not be unreasonable to translate this into the context of individuals with dementia and, along with Dabelko-Shoeny et al.'s (2014) findings, to conclude that EAI is motivational for individuals with dementia, thus enhancing mental, physical and emotional wellbeing; however, this study does have limitations as if participants started to show signs of distress or anxiety, they would be taken away from the horse (p. 146–147), creating difficulties in observing the effects of continuing with the activity and how it affected the challenging behaviour exhibited in that instance. In addition, the findings generated by this study as to whether EAI is effective in reducing challenging behaviours, could only be applied to the local context/environment and were not able to be generalised.

Ho (2017) investigated how voluntary work impacted upon psychological wellbeing of elderly individuals, finding that those who carried out voluntary work had

better psychological wellbeing than those who did not (p. 1037). Although this does not relate to EAI, when critiqued alongside the EAI literature, it could be interpreted that engaging in EAI activities gives the individual the same sense-of-worth and purpose that volunteering would. This effect was noted by Fields et al. (2018) who investigated how EAI can be used to improve individuals' overall quality of life in their final years/late stages of their condition/disease. As prevalent in all contexts of EAI, the social factors have been consistently heavily influenced as horses were seen to act as mediators for positive interactions, inducing increased/improved communication and engagement between the participant and the horse and the participant and the facilitator and/or staff member (p. 314). Participants expressed interest, pleasure and would willingly participate in horse-care activities (p. 313–314). Verbal feedback attained from an EAI known as the Connected Horse Project included carers commenting that *“the interaction with the horse brought her back to a better time in her life”* and *“the person with the diagnosis got to leave that role for a little bit”* (Meis, 2016, p. 15).

Parkinson's is a progressive neurodegenerative condition with cognitive symptoms not dissimilar to those of dementia but predominantly including physical and neurological symptoms such as tremors, impairment of the posture and gait and muscle weakness and stiffness (Kalia and Lang, 2015, p. 896). According to the charity Parkinson's UK (2020), the condition occurs when brain cells responsible for the production of dopamine, a chemical neurotransmitter responsible for transmitting signals between the nerve cells of the brain, makes insufficient amounts of dopamine to control body movement. Peppe et al. (2018) developed and trialled a five-week EAI programme for individuals with Parkinson's, observing the effects that it had on the physical symptoms and emotional well-being of four participants. As well as horse care and riding, in contrast with the other studies, this EAI involved additional physical exercises whilst on horseback including rotating the body, bending and stretching the arms and twisting and bending the trunk (p. 94). These exercises were designed to specifically target the physical symptoms of Parkinson's, and were aiming to improve coordination, balance, gross motor function and posture, both whilst on the horse and in the wider, practical context of daily life. In contrast, the investigation carried out by Kraft et al. (2019) comparing the effects of EAI to those of a standard form of physical therapy, reporting a year later, identified that whilst both interventions did show positive results, the physical therapy proved to be more effective as it was targeted on the development of a specific motor skill (p. 19) rather than movement generally. This suggests that whilst a targeted approach to developing physical functioning appears to be more effective overall, this can still be carried out through the means of EAI which has additional benefits, particularly relating to enhancing positive mental health and social functioning. Results of the physical

aspect of the EAI investigated by Kraft et al demonstrated immediate improvements on the physical functioning of the participants (p. 94).

As identified previously, EAI has shown the physical benefits for individuals with dementia and Parkinson's but it can also have positive physical effects on older adults in a wider context. Hallberg (2018) commented that some of the physical benefits to the elderly might include improving balance and muscle strength as well as minimising the risk of falls and aiding the recovery from falls (p. 101). de Araujo et al. (2013) explored how EAI promoted strength, balance and mobility in older people aged between 60 and 84 who were all in good health through their study which involved each participant taking part in sixteen sessions of EAI set within a programme of progressive riding activities over an eight-week period. In a similar approach to Peppe et al.'s (2018) research study into EAI for individuals with Parkinson's, additional exercises were undertaken on horseback but at a higher intensity as participants of de Araujo's study had a higher level of physical ability. de Araujo et al.'s (2013) results and findings confirmed that physical exercise is paramount to maintaining good physical health and that EAI has a strong potential for supporting this as it is shown to strengthen lower limb muscles and promote good posture. Likewise, Kim and Lee (2015) carried out a study into how Horse Simulation exercises could be an effective form of physical exercise in preventing falls in older adults in good health. Geng and Wu (2015, p. 1) explained that Horse Simulation involves a mechanical horse which is engineered from meticulous observations of horse movements and behaviours, serving as a very close substitute which copies and repeats the movements of a real horse. Kim and Lee's study compared the results of this 'simulated' EAI with the results of a conventional therapy programme, and identified that the simulated/mechanical EAI had shown that the participants demonstrated a significant improvement in their limits of stability (p. 63). However, the benefits already noted of working with real horses in an outdoor environment were, naturally, missing.

Another angle researched in relation to the effects of EAI on older adults is within the area of pain relief, specifically for those with arthritis – an inflammatory disease of the joints and bones, causing pain, stiffness and swelling (Bescoby, 2010, p. 39). White-Lewis et al (2019) reported that an EAI intervention for individuals with arthritis took place over six sessions and comprised solely of riding, with the hypothesis that it would reduce pain and improve the range of movement in their joints. This EAI was found to gradually decrease pain and improve the range of movement most notably in the back and hips after all the EAI sessions had been completed (p. 7). The improvement in movement and the reduction in pain being attributed to the rhythm of the horse's movement, allowing the rider's hips to naturally relax (p. 10); unfortunately it was also found to make knee pain worsen, likely due to pressure from the seating on a horse which requires a rider's heels to be pushed downwards in the stirrups, this particular position needing pressure from the legs to adopt correctly,

causing stress to the knees (p. 9). A conclusion of this rests in an individual's unique situation as to how their condition affects them and their preferences for pain relief – for those whose hips are affected, and EAI is more likely to help, however for those whose knees are affected, it is likely to be more of a hinderance. As the study was only carried out over a short-term period with a small participant group, only tentative results were generated, at best and so no generalisable conclusions or critical commentary can be made.

8 Conclusion: The Case for Developing the Use of EAI as a Therapeutic Approach

EAI has been identified as a positive/successful approach for supporting the development of social skills for vulnerable children, young adults and older adults. Yorke, (2010), Lanning et al. (2014), Wanneberg, (2014), Alfonso et al., (2015) and Tan and Simmonds, (2018), commented that EAI had a higher improvement rate than non-EAI applications through building relationships with horses and the other participants engaged in the equine-related activities undertaken, leading to friendship-forming and enhanced social skills. Smith-Osborne and Selby, (2010), presented a scientific perspective, and stated that EAI was found to help the brain establish neuronal pathways, contributing to forming healthy attachments demonstrating why it is effective in helping to build bonds and relationships. Wanneberg, (2014) and Hauge et al. (2015) explored how EAI enabled participants to re-shape their identities by helping them to think and function beyond their disabilities, not being limited to what their bodies can do, thus building self-esteem. While Johns et al., (2016) and Wilson et al., (2017) saw EAI as a 'hand-on' approach, preferable to talking therapies, particularly for vulnerable children and young people, as it provided a less pressured environment. For individuals with ASD, Llambias et al. (2016) identified that EAI fulfils sensory needs, vestibular-proprioceptive through the movements of the horse and the calming effects with a lack of physical restrictions created by the environment reducing stress and anxiety. Bescoby, (2010), Araujo et al., (2013), Park et al., (2013), Lemke, (2014), Dabelko-Shoeny et al., (2014), Meis, (2016), Peppe et al., (2018) and Kraft et al., (2019), commented on EAI's use in improving overall physical functioning, strength, mobility and relieving pain resulting in increased ability to carry out tasks, acting as a motivator for physical activity and an improved quality of life.

Expanding the use of EAI to support a wider range of needs seems to be a beneficial course of action due to its versatility as an intervention which can be deployed to support a range of social, emotional and physical needs (Dabelko-Shoeny et al., 2014; Wanneberg, 2014). Furthermore, the source material and literature explored in this paper have repeatedly mentioned how effective EAI is on enhancing/improving participant well-being and overall quality-of-life (Meis, 2016; Fields, et al., 2018;

Peppe et al., 2018), thus noting its real potential as a credible pastoral intervention. Where some studies (Yorke, 2010; Park et al., 2013; Wilson et al., 2017) have found standard therapies to be more effective than EAI or equal in effectiveness, there is the potential for both to be used in conjunction – the standard therapeutic approach being better to focus on specific/targeted areas and the EAI approach focusing on multiple areas of functioning (Kraft et al., 2019).

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