# A literature review of the social value of equestrianism

Full report


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## Summary

This literature review was commissioned by the British Equestrian Federation (BEF) to capture the social value of equestrian activity in the UK. It aimed to uncover evidence in four outcome areas:

- Physical and mental health;
- Subjective wellbeing;
- Individual development; and
- Social and community development.

The methodology used for the review of literature was a *'Quick Scoping Review'* (as described by Collins et al., 2015), in which the aim was to search for both academic published material and unpublished 'grey literature', summarise the findings, and provide an informed conclusion on completion.

The overall findings of the reviews can be summarised as follows:

- The review found evidence of mixed volume and quality on the extent to which equestrianism contributes to social outcomes. There has been a steady increase in the number of papers published since 2016 indicating a continued interest in this area of research.
- Of the papers found, the largest volume of literature was around the outcome area of physical and mental health. Individual development, subjective wellbeing, and social and community development had significantly less. This does not correspond to less importance but suggests a gap in existing empirical evidence.
- The majority of papers examined the social value of equestrianism in treating people with existing disabilities or long-term health conditions, opposed to preventing the development of such conditions.
- There are some negatives associated with equestrianism such as a risk of injury, severe injuries, and illness.
- Equestrianism has been found to contribute social value in all four outcomes. And the evidence suggests there is a unique value in equestrianism not found in other activities.
- There is a need for further, and higher quality, research quantifying the social value of equestrianism. Particularly in the outcomes of individual development, subjective wellbeing and social and community development.

## Introduction

This literature review was commissioned by the British Equestrian Federation (BEF) to capture the social value of equestrian activity in the UK.

The purpose of the literature review is to identify, summarise and synthesise existing evidence on equestrian activity and social outcomes. In particular, it aims to uncover evidence in four outcome areas:

- Physical and mental health;
- Subjective wellbeing;
- Individual development; and
- Social and community development.

The British Equestrian Federation comprises of nineteen independent member bodies representing an estimated three million riders, vaulters, and carriage drivers in Great Britain. These constituent members oversee activities from elite competition to leisure and trade for participants, volunteers, and workers (British Equestrian Trade Association, 2023).

A previous report found that the New Zealand Riding for the Disabled Association (NZRDA) delivered $1,933,391 every 6 months of measurable good to New Zealand society. For every $1 spent, NZRDA returned $3.20 (New Zealand Riding for the Disabled Association, 2022).

## Methodology

The methodology used for the review of literature was a *'Quick Scoping Review'* (as described by Collins et al., 2015), in which the aim is to identify the evidence available, summarise the findings, and provide an informed conclusion on completion. The specific aims of the literature review were to review evidence on the *relationship between* equestrian activity (including participation, volunteering, and working) and social outcomes.

The literature review includes material from both published academic papers and non-academic unpublished 'grey literature', such as reports from British Equestrian Federations' (BEF) Member Bodies. The search involved the use of a range of online academic databases, including SPORTDiscus, (EBSCO host); Scopus (Elsevier); Cochrane (Wiley); Web of Science (Clarivate), and Google Scholar. This formal literature search was supplemented with a public Call for Evidence by BEF and a targeted search for grey literature conducting Google searches using the same search terms. The terms outlined in Table 1 were used in various combinations, in order to conduct the collection of evidence.

Table 1: Search terms used in the Scoping Literature Review

| Type of engagement | Type of impact | Geographical area | Social outcome areas | Sub social outcome areas |
|---|---|---|---|---|
| • Horse Riding<br>Competing<br>Recreational/Leisure<br>Therapeutic<br>• Hacking/trekking<br>• Carriage driving<br>• Disabled driving<br>• Riding for the disabled<br>• Disability riding<br>• Dressage<br>• Endurance<br>• Eventing<br>• Horseball<br>• Mounted games<br>• Caring/Owning<br>• Volunteering<br>• Employees e.g. Grooms,<br>• riding instructors<br>• Horsemanship<br>• Hippotherapy<br>• In-hand (agility or showing)<br>• Equine assisted therapy<br>• Equine facilitated learning<br>• Equine assisted services<br>• Psychotherapy | • Social impact<br>• Social value<br>• Social benefit | • England<br>• Scotland<br>• Wales<br>• International | • Physical and mental health<br>• Subjective wellbeing<br>• Individual development<br>• Social and community development | **Physical and mental health:**<br>• Physical health<br>• Mental health<br>• Anxiety<br>• Depression<br>**Subjective wellbeing:**<br>• Subjective wellbeing<br>• Life satisfaction<br>• Happiness<br>• Worthwhileness<br>• Quality of life<br>**Individual development:**<br>• Crime<br>• Pro-social behaviour<br>• Anti-social behaviour<br>• Academic attainment<br>• Educational attainment<br>• Academic achievement<br>• Educational achievement<br>• Employability<br>• Volunteering<br>• Confidence<br>• Self-confidence<br>• Social rehabilitation<br>• Self-efficacy<br>**Social and community development:**<br>• Social capital<br>• Social trust<br>• Social connections<br>• Communities<br>• Friendships<br>• Loneliness<br>• Belonging<br>• Culture<br>• Cultural development<br>• Language<br>• Heritage |

All literature found from these searches was then screened by reading either the abstract, executive summary or introduction, and those papers deemed irrelevant to the review aims were excluded (Figure 1). Due to the high volume of papers, the exclusion criteria were increased to ensure those that remained were of high quality and were relevant to the aims of the study. The full exclusion criteria can be found in Table 2. The remaining papers were downloaded, read in full and the data from them (including reference details, research methodologies, demographic groups, key themes and findings), was extracted and stored in a specially designed database.

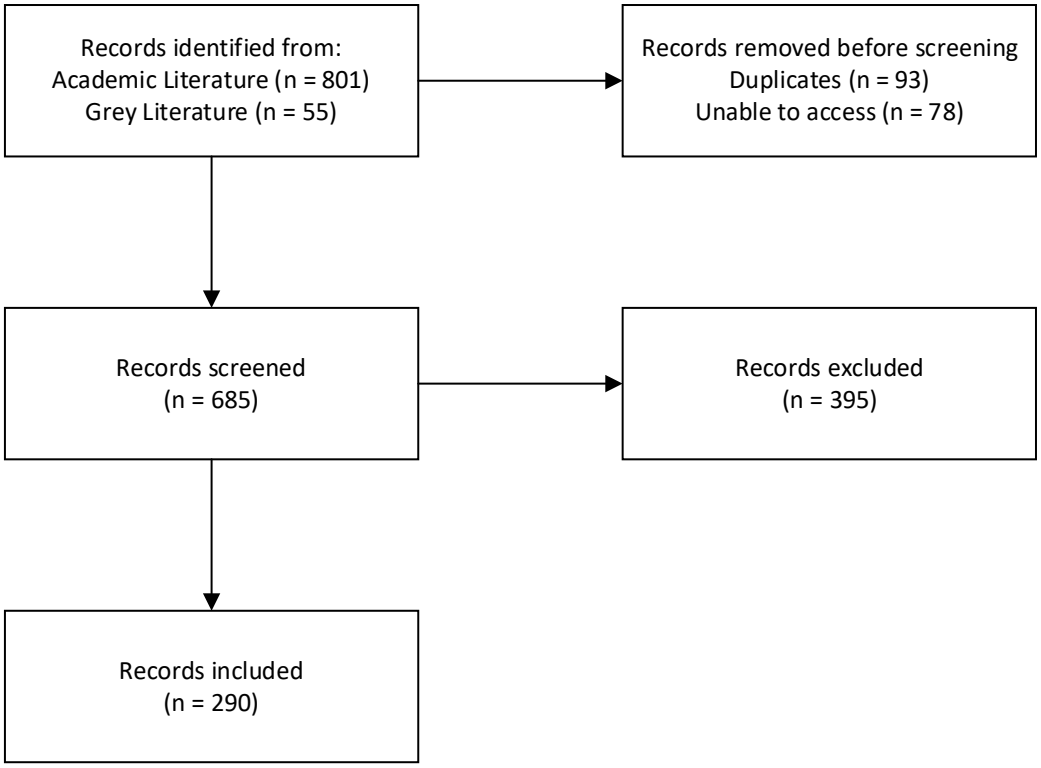


Figure 1: The process completed searching, screening, and identifying papers to be included in the literature review.

The subsequent sections of this report outline the findings of the review, grouped into each of the four outcome areas, and each of these sections identifies what the literature demonstrates about the impact of engagement in the activity, any gaps in knowledge, and some assessment of the overall quality of the literature. It should be noted that some papers cover more than one of the outcome areas, and therefore appear in more than one section of the report. The final section summarises the overarching findings, gaps in the existing literature, and the implications of the review findings for any potential subsequent Social Value or Social Return On Investment research.

Table 2: Full exclusion criteria for removing papers during the screening process.

| Exclusion Criteria |
| --- |
| • Full article not in English<br>• Published before 2000<br>• Less than 3 pages<br>• Book / Book chapter<br>• Conference paper / Poster<br>• Dissertation / Thesis<br>• Pilot / Feasibility / Exploratory / Preliminary Study<br>• Horse Racing / Polo<br>• Not equestrian specific (e.g. support animals but does not specifically mention horses or injury prevalence which mentions equestrian as one category but the paper is not specifically about equestrianism)<br>• News article / Press Release / Magazine / Opinion piece<br>• Perceptions of EAS from a healthcare staff perspective<br>• Testing equipment or methodology of facilitating Equine Assisted Services (EAS) but not actually measuring impact of EAS<br>• Discuss academic theory<br>• Educational e.g. road safety knowledge in athletes<br>• Single case study e.g. only based on one person or very small sample at the same riding centre with no control group<br>• Generally low standard of paper e.g. does not state methodology used or has little context to findings<br>• Focusses the impact on the horse rather than the person<br>• Not relevant - some papers slipped through the initial sifting and are not relevant to the study<br>• Equine Veterinary<br>• Economic impact |

# Results

## Scale and Scope

As shown in Table 3, there has been a steady increase in the number of published papers about the social value of equestrianism since 2016. This is highlighted further with 44% of the included papers published since 2020. The literature search was conducted in June 2024, half-way through the year; therefore, it is expected for the total number of published papers to be in line with previous years.

The papers included were published from forty-three different countries. The most prevalent country was the United States of America (76) followed by the United Kingdom (30). The top ten countries published 63% of included papers as shown in Table 4.

Table 3: Publication years of included articles

| Publication Year | Number | Percentage (%) |
|---|---|---|
| 2000 | 2 | 1% |
| 2001 | 1 | 0% |
| 2002 | 0 | 0% |
| 2003 | 2 | 1% |
| 2004 | 2 | 1% |
| 2005 | 2 | 1% |
| 2006 | 1 | 0% |
| 2007 | 4 | 1% |
| 2008 | 3 | 1% |
| 2009 | 9 | 3% |
| 2010 | 4 | 1% |
| 2011 | 10 | 3% |
| 2012 | 9 | 3% |
| 2013 | 8 | 3% |
| 2014 | 16 | 6% |
| 2015 | 21 | 7% |
| 2016 | 13 | 4% |
| 2017 | 16 | 6% |
| 2018 | 19 | 7% |
| 2019 | 16 | 6% |
| 2020 | 29 | 10% |
| 2021 | 30 | 10% |
| 2022 | 27 | 9% |
| 2023 | 28 | 10% |
| 2024 | 15 | 5% |
| Blank | 3 | 1% |
| **Overall** | **290** | **100%** |

Table 4: Number of papers published by country

| Country | Number | Percentage (%) |
|---|---|---|
| USA | 76 | 26% |
| United Kingdom | 30 | 10% |
| Sweden | 14 | 5% |
| Australia | 13 | 4% |
| Brazil | 12 | 4% |
| South Korea | 11 | 4% |
| Spain | 10 | 3% |
| Norway | 8 | 3% |
| Germany | 6 | 2% |
| New Zealand | 6 | 2% |
| Poland | 6 | 2% |
| Canada | 4 | 1% |
| Greece | 4 | 1% |
| Israel | 4 | 1% |
| Japan | 4 | 1% |
| China | 3 | 1% |
| Czechia | 3 | 1% |
| Egypt | 3 | 1% |
| Finland | 3 | 1% |
| France | 3 | 1% |
| Hungary | 3 | 1% |
| Turkey | 3 | 1% |
| India | 2 | 1% |
| Ireland | 2 | 1% |
| Italy | 2 | 1% |
| Switzerland | 2 | 1% |
| Austria | 1 | 0% |
| Belgium | 1 | 0% |
| Croatia | 1 | 0% |
| Iran | 1 | 0% |
| Lithuania | 1 | 0% |
| Maylasia | 1 | 0% |
| Mexico | 1 | 0% |
| Netherlands | 1 | 0% |
| Portugal | 1 | 0% |
| Russia | 1 | 0% |
| Singapore | 1 | 0% |
| South Africa | 1 | 0% |
| Taiwan | 1 | 0% |
| Thailand | 1 | 0% |
| Not specified | 35 | 12% |
| Multiple countries | 4 | 1% |
| **Overall** | **290** | **100%** |

Only 4% of papers stated whether the data had been collected from a rural, semi-rural, or urban area (Table 5).

Table 5: Number of papers categorised by rurality of data collected.

| Geography | Number | Percentage (%) |
|---|---|---|
| Rural | 8 | 3% |
| Semi-rural | 1 | 0% |
| Urban | 4 | 1% |
| Not specified | 277 | 96% |
| **Overall** | **290** | **100%** |

The majority of papers utilised a quantitative methodology (58%) (Table 6). The hierarchy of research indicates the quality of the study's design. The case study is ranked the lowest due to the higher risk of bias and the lower potential of generalisability of the findings. In comparison, systematic reviews have lower risk of bias and higher generalisability of findings. As shown in Table 7, this study included papers primarily from the lower levels of hierarchy with only 21% as randomised controlled trials (RCT) or systematic reviews.

Table 6: Number of papers categorised by methodology utilised.

| Methodology | Number | Percentage (%) |
|---|---|---|
| Quantitative | 169 | 58% |
| Qualitative | 57 | 20% |
| Mixed | 41 | 14% |
| Not specified | 23 | 8% |
| **Overall** | **290** | **100%** |

Table 7: Number of papers categorised by the hierarchy of research.

| Hierarchy of Research | Number | Percentage (%) |
|---|---|---|
| Case study | 52 | 18% |
| Case-series study | 45 | 16% |
| Cohort / Case-control study | 60 | 21% |
| Cross-sectional study | 44 | 15% |
| Evidence / Literature Review | 30 | 10% |
| Randomised Controlled Trials | 31 | 11% |
| Systematic Review | 28 | 10% |
| **Overall** | **290** | **100%** |

Research measuring the social value of equestrianism has been heavily focused on Physical and Mental Health with 45% of all papers explored at least one physical or mental health sub-outcome Table 8. The least researched category was Social and Community Development (13%).

Table 8: Number of papers categorised by social value outcome.

| Social Value Outcomes | Number | Percentage (%) |
|---|---|---|
| hysical and Mental Health | 217 | 45% |
| Subjective Wellbeing | 105 | 22% |
| Individual Development | 96 | 20% |
| Social and Community Development | 60 | 13% |
| **Overall** | **478** | **100%** |

Nb. N = 478 because some papers looked at multiple outcomes

Terminology within the research varied dependent on where it was published. The Professional Association of Therapeutic Horsemanship International produced a definition guide for researchers with the aim to mitigate confusion of terminology (2023). In collaboration with BEF, these definitions were adapted and utilised within the literature review to categorise equestrian related activity in a consistent manner (Table 9). Equine Assisted Therapy (EAT) was the most researched area of equestrianism with 51% of papers, this is activity such as hippotherapy that requires a specialised therapist to deliver the session along with an equine (Table 10). Volunteering and working were noticeably low accounting for 2% of papers collectively.

Table 9: Definitions of engagement terms adapted from PATH Intl. (2023)

| Term | Definition |
|---|---|
| Equine assisted services (EAS) | interventions, activities and facilitated services |
| Equine assisted therapy (EAT) | hippotherapy, psychotherapy, counselling, occupational therapy, physical therapy, speech-language pathology, recreational therapy, therapeutic horse riding |
| Equine assisted learning (EAL) | education, organisations, personal development |
| Therapeutic equine activity (TEA) | para vaulting, Riding for the Disabled Association (RDA), equine activity with no health care professionals involved |

There was a fairly even split of papers that used adults or children and adolescents as participants (Table 11). As shown in Table 12, the papers measured the social value of equestrianism on a variety of populations. Whereas ‘healthy adults’ and ‘athletes / riders’ account for 9% of the papers, medical conditions account for 34%.

Table 10: Number of papers categorised by type of engagement in equestrian activity.

| Type of Engagement | Number | Percentage (%) |
|---|---|---|
| Equine Assisted Therapy | 148 | 51% |
| Equine Assisted Services | 42 | 14% |
| Horse Riding | 40 | 14% |
| Equestrian Sports | 15 | 5% |
| General Equestrian Related | 15 | 5% |
| Equine Assisted Learning | 13 | 4% |
| Therapeutic Equine Activities | 6 | 4% |
| Owners | 4 | 1% |
| Volunteering | 4 | 1% |
| Working | 2 | 1% |
| Events / Tourism | 1 | 0% |
| **Overall** | **290** | **100%** |

Table 11: Number of papers categorised by age of the population.

| | Number | Percentage (%) |
|---|---|---|
| Adults | 139 | 48% |
| Children and adolescents | 117 | 40% |
| Not specified | 34 | 12% |
| **Overall** | **290** | **100%** |

Table 12: Number of papers categorised by the 15 most common population groups.

| | Number | Percentage (%) |
|---|---|---|
| Autism | 21 | 7% |
| Athletes / Riders | 19 | 7% |
| Elderly / older adults | 18 | 6% |
| Mental illness / disorder | 15 | 5% |
| ‘At risk’ / marginalised young people | 14 | 5% |
| Multiple Sclerosis | 12 | 4% |
| PTSD | 12 | 4% |
| Cerebral Palsy | 10 | 3% |
| Substance use disorder | 8 | 3% |
| Healthy adults | 7 | 2% |
| ADHD | 7 | 2% |
| College students | 7 | 2% |
| Intellectual disability | 6 | 2% |
| Stroke | 5 | 2% |
| Neurological disorder | 4 | 1% |
| **Overall** | **172** | **59%** |

# Physical and Mental Health

Physical and mental health was the most common social outcome with 45% of papers exploring at least one sub-social outcome in this category. Individually, 174 and 59 papers included at least one aspect of physical and mental health, respectively. It had a high level of evidence with an overall total of 28 systematic reviews and 26 RCTs. The most researched sub-outcome area was the impact equestrian activity has on improving motor function. The following section first presents physical health sub-outcomes followed by mental health.

## Physical Health

### Injury

28 papers discussed injuries related to equestrian activities, both 'on-the-horse' and 'off-the-horse' activity. Falling is consistently reported as the most common mechanism of injury, with head injuries or fractures to the extremities the most commonly cited injuries (Gates & Lin, 2020). Other articles looked specifically at breast pain, saddle horn injuries, maxillofacial fractures, and neuro-ophthalmic injuries (Burbage & Cameron, 2017; Collinge et al., 2009; Fleming et al., 2001; Stier et al., 2022).

Meredith et al. (2019) studied 29,900 equestrian related injuries treated in a hospital across a seventeen-year period. Women accounted for 90% of injuries and 70% of fatalities, whilst in the 50+ and 70+ age groups, respectively, men were the most common affected group. Women accounted for the majority of injuries in several studies retrospectively using hospital data (Franzén Lindgren et al., 2023; Smartt & Chalmers, 2009).

Meyer et al. (2022) reported the injury rate in showjumping to be 3.7 per 1,000 hours of exposure from a retrospective cross-sectional survey of 363 showjumpers. Lower levels of performance and the use of helmets and safety vests lowered the injury rate.

Injuries from equestrian activities have been reported to have significant long-term impacts. 41 of 100 paediatric patients who were treated in hospital due to an equestrian related injury, still experienced disabilities four years post injury (Dekker et al., 2004). This is despite the injuries only initially causing, on average, two weeks absenteeism from school and four months from horse riding (Dekker et al., 2004). Another study found a significant relationship between concussion post head injury and high levels of depression and low levels of wellbeing (McGivern et al., 2021).

### Respiratory pathogens

Two papers looked at the possible exposure volunteers and workers have of pollutants in indoor riding arenas. One case study reported that the respirable crystalline silica levels were within range for increased risk of lung cancer (Bulfin et al., 2019; Tumlin et al., 2021).

### Chronic Pain

One case-control study of 32 professional and amateur riders (18-32 years old) reported 81% lifetime prevalence of back pain (Deckers et al., 2021). Professional riders and those that predominantly used jumping saddles opposed to dressage or other riding saddles, were significantly more likely to have had back pain. The lower the score on the functional mobility test the higher the pain reported.

Although certain equestrian activity may increase pain and particularly back pain, five studies measured the effectiveness of equine assisted therapy in managing chronic lower back pain. This

sub area included one systematic review and one RCT (Collado-Mateo et al., 2020; Rahbar et al., 2018).

Collado-Mateo et al. (2020) included 11 articles (seven were controlled trials) and due to the high risk of bias they found, they conducted a meta-analysis of the articles. There was a significant difference found between pre- and post- measurements with a large effect size indicating a reduction in chronic lower back pain. These studies predominantly utilised mechanical horse-riding simulators. Therefore, the authors called for more studies with real horses as they have the potential for greater reduction in pain due to the positive psychological effects that could be achieved using horses.

A further two studies discussed pain in addition to other parameters such as quality of life and motor function for patients with Multiple Sclerosis (Hammer et al., 2005; Vermöhlen et al., 2018).

### Cardiorespiratory fitness

Douglas et al. (2012) conducted a systematic review of the physiological and biomechanical performance of equestrian athletes. They found that a rider's heart rate and oxygen consumption increase in relation to their horse's gait (walk, trot, and canter). The level of muscular control a rider has will affect their ability to achieve a controlled upright trunk position or the more 'forward' seating position required for faster gaits and jumping. Both these positions further increase the metabolic cost (or energy used).

Two further systematic reviews found that equine-assisted services improved cardiovascular fitness (e.g. heart rate, oxygen saturation, blood pressure, and respiratory rate) in children with ADHD, Cerebral Palsy, and physiological and neurological disorders (Helmer et al., 2021; Kovács et al., 2024). Sessions typically lasted around 45 minutes but interventions varied in duration, for example from 10 weeks to 10 months. However, Rigby and Grandjean (2016) noted that the term equine assisted services is broad and not all activities have been proven to cause long term cardiovascular improvements as seen generally when participating in physical activity.

A RCT reported significant improvement in pulmonary function and aerobic capacity after 10 weeks of hippotherapy in children with Idiopathic Scoliosis which affects the thoracic region (Abdel Ghafar et al., 2022).

It is thought that recreational horse riding, including grooming, meets the criteria for moderate intensity exercise for women, with the intensity increasing if trotting and cantering (Beale et al., 2015; The British Horse Society, n.d.). Furthermore, after a 12-week period of no horse riding due to COVID-19 restrictions, 61 female adolescents had increased body weight and BMI, and decreased strength, hip mobility, and cardiovascular fitness (Demarie et al., 2022). However, another study reported that oxygen consumption and carbon dioxide production remained below the anaerobic threshold during a 20-minute session of walking, trotting, and cantering. Heart rate was close to the threshold in cantering only. Sainas et al. (2016) concluded that "riding imposes only light to moderate stress on the aerobic and anaerobic energy systems".

## Motor Function

In total, 91 articles looked at the effects of equestrian activity on an individual's overall motor function including balance (46), gait (25), muscular strength (14), motor control (19), postural control (15), spasticity[1] (10), flexibility (9), and neuromuscular activation (10).

24 papers focused on children and adolescents with Cerebral Palsy, 10 used people with Multiple Sclerosis, 10 used older / elderly adults, and nine looked at children and adolescents with Autism and ADHD. Other conditions explored were intellectual disabilities, breast cancer, back pain, Down's Syndrome, ankylosing spondylitis, stroke, Global Developmental Delay, Dyspraxia, Hemiplegia, movement disorders and musculoskeletal disorders, neurological disorders and acquired brain injuries, Parkinson's Disease, and inactive adults.

There were 16 systematic reviews and 17 RCTs. 13 RCT studies reported statistically significant improvement in motor function for people who participated in hippotherapy or horse riding simulators compared with the control group who received standard physical therapy (Beatriz et al., 2011; Bunketorp-Käll et al., 2019; Bunketorp-Käll, Lundgren-Nilsson, Samuelsson, et al., 2017; Chinniah et al., 2020; Hemachithra et al., 2020; Herrero et al., 2010, 2012; Kabuk & Şevgin, 2024; Kaya et al., 2023; Li et al., 2023; Lucena-Antón et al., 2018; Salbaş & Karahan, 2023; Temcharoensuk et al., 2015). A further two studies found a positive improvement of motor function from pre- to post-intervention, although it was not statistically significant to the control group (Prieto et al., 2021; Vermöhlen et al., 2018).

This spread of findings is similar to a systematic review of equine-assisted therapy targeting physical symptoms in adults (White-Lewis et al., 2017). They found that 94% of papers (29/31) reported statistically significant improvements in at least one outcome. Looking specifically at different aspects of motor function, balance, cadence and gait, stability, muscle strength and coordination, and spasticity, were all significantly improved in at least 75% of the studies.

One RCT found that participating in hippotherapy once or twice per week had no effect on improvement which is a positive finding for reducing the cost of the therapy whilst maintaining the impact (Prieto et al., 2021). Another positive finding relating to the delivery cost is that four RCTs found that horse riding simulators had significant improvements in motor function which will be less expensive than traditional hippotherapy (Beatriz et al., 2011; Hemachithra et al., 2020; Herrero et al., 2010; Salbaş & Karahan, 2023).

Although the effects of hippotherapy and horse-riding simulators offer significant improvements to a range of motor functions in a variety of populations, there is not a clear consensus regarding the longevity of those improvements. Whereas Herrero et al. (2012) reported that the improved sitting balance in children with Cerebral Palsy was not maintained in the 12 week follow up. Bunketorp-Käll et al. (2017) found that some of the improvements in balance and gait were retained in the six month follow up.

[1] Spasticity is defined as exaggerated muscle tone with increased tendon reflexes. Spasm describes violent reflexive muscle contraction which occurs in response to cutaneous and visceral stimulation.

## Mental Health

### Post Traumatic Stress Disorder

Six of the ten papers looking at the effect of equine-assisted therapy on Post Traumatic Stress Disorder (PTSD) symptoms in military veterans found significant reductions including one systematic review and one RCT (Gehrke et al., 2018; Johnson et al., 2018; Kinney et al., 2019; Romaniuk et al., 2018; Rosing et al., 2022; Willmund et al., 2021). Marchand et al. (2021) called for more studies, in particular RCTs and to standardise the intervention on offer to veterans.

Johnson et al. (2018) carried out a RCT involving 57 participants, with 29 participants engaging in a six-week therapeutic horse-riding programme. They experienced a significant reduction in PTSD symptoms compared to the control group. A later study by Johnson et al. in 2021, 20 of the experimental group completed a qualitative questionnaire about their perceptions of the programme. They viewed the programme positively citing benefits such as “relaxing” and “connection to the horse” with some reporting no cons or that it was “too short”.

Other studies such as Willmund et al (2021) recruited 36 soldiers and their partners as participants. The intervention group received equine-assisted psychotherapy and showed notable improvements in current somatic and communication issues, depressive symptoms, and partnership quality, compared to the control group. PTSD symptoms, specifically related to negative thoughts, were significantly reduced. These findings demonstrate the effectiveness of equine-assisted psychotherapy in enhancing both relationship quality and the mental health of military partners. The results of Romaniuk et al. (2018) indicate that significant improvement in PTSD symptoms for veterans may be reliant on their partners also engaging in the intervention as there were significant differences between couples and individuals.

One case-control study measured the effect equine-assisted psychotherapy had on PTSD symptoms in adolescents aged 10-18 (Mueller & McCullough, 2017). Although the intervention group demonstrated a reduction in PTSD symptoms, it was not significantly more than the control group who received traditional treatment. Therefore, suggesting that, equine-assisted psychotherapy may be a good alternative to, but is not necessarily better than, office-based therapy.

### Substance Use Disorder

Five papers looked at substance use disorder and equine-assisted therapy. Two papers, including a literature review, suggested that the inclusion of EAT in a substance use disorder treatment programme reduced drop-out rates and improved retention of patients who then completed the programme (Diaz et al., 2022; Kern-Godal et al., 2015). However, a RCT in 2020 reported no significant differences in completion, retention, or drop-out rates albeit the experimental group had a 12% higher completion rate than the control group (Gatti et al., 2020). The authors did acknowledge that a number of patients transferred onto a different programme during the study and this unforeseen reduction in participants may have resulted in the lack of statistical significance. They recommended the study to be repeated with a larger sample size.

Further to a possible effect on retention of patients in substance use disorder treatment programmes, one study found significant reduction in a behavioural problems subscale that included alcohol and substance use amongst the experimental group compared to the control group (Machová et al., 2023). Those in the experimental group received on average two hours of equine-assisted psychotherapy (EAP) for seven weeks. In the verbal evaluation at the end of the

study, even participants that scored lower in the happiness scale commented that the EAP was a positive experience, that it 'gave me a break' and allowed them to 'enjoy the moment'. This supports Kern-Godal et al.'s findings in 2016.

### Eating Disorder

One systematic review explored the relationship between animal assisted therapy and eating disorder symptoms (Fennig et al., 2022). Four of the papers included specifically focused on equine-assisted therapy. Two quantitative papers found a greater reduction in anxiety and depression in those inpatients who had greater contact with horses, however there was not a control group. The two qualitative studies suggested that the horses created a calm environment that fostered positive growth and better communication for people with eating disorders.

Further research and more robust studies are needed to determine whether equine-assisted activities have a positive effect on people with eating disorders.

### Anxiety

There were 20 papers that explored anxiety as a sub-outcome but all of them also measured at least one other outcome, such as PTSD or self-efficacy. Therefore, some of the papers have been discussed in more detail elsewhere.

Hoagwood et al. (2022) measured the effect of equine-assisted therapy on young people aged 8 -15 (n=39) whose caregivers reported them to have anxiety in a case-series study. The self-reported anxiety scores were significantly reduced after the ten-week intervention. They also collected oxytocin (relaxation) and cortisol (stress and anxiety) levels at four intervals. Both hormones trended in the right direction across the ten-weeks but were only statistically significant between week one and week seven. Other physiological measure of anxiety used in studies was heart rate variability (HRV). Matsuura et al. (2011, 2017) have published two papers suggesting that 30 minutes of horse trekking can have a significant impact on a person's nervous system, as indicated by HRV, shifting towards the parasympathetic control which is indicative of relaxation or lowered anxiety. Whilst on the horse produced greater results there were also positive results from riding a mechanical simulator (Matsuura et al., 2011).

One study found 12-weeks of equine-assisted therapy to be more effective than classroom-based therapy for young people who are 'at-risk' (Trotter et al., 2008). Anxiety was one of the seventeen behaviour areas that were significantly improved after EAT, compared to the five in the control group. A further two studies found positive results in reducing anxiety in children and adolescents (Burgon, 2013; Harvey et al., 2020).

One aspect of equestrianism that can increase anxiety is riding on the roads. Pollard and Furtado (2021) surveyed 6390 equestrians in the UK and found that 84% use roads at least once per week, 68% had a near miss in the last year, and 6% had an 'injury-causing incident'. Sustaining an injury was associated with increased anxiety using roads and ceasing to use roads.

### Depression

11 papers measured the change in levels of depression after engaging with equestrian activity. Four papers studied children and adolescents. One case-control study of 'at-risk' adolescents found that a five-week equine-assisted learning (EAL) programme significantly reduced levels of depression and increased hope compared to a control group who continued to receive standard treatment (Frederick et al., 2015). This result contradicts an early study by Ewing et al. (2007) which reported that a nine-week EAL programme for adolescents with severe emotional

disorders did not significantly reduce levels of depression. Two papers used the Behavioural Assessment System for Children (BASC) scale which is designed to be completed by the children, parents, or teachers (García-Gómez et al., 2016; Trotter et al., 2008). The three-month equine-assisted therapy was not found to significantly reduce depression as reported by their teacher (García-Gómez et al., 2016) or by the children, but was found to have a significant difference when completed by the parents (Trotter et al., 2008).

Equine-assisted therapy has been shown to reduce depressive symptoms in people with lower back pain and breast cancer (Mattila-Rautiainen et al., 2023; Viruega et al., 2023). It was also found that military veterans who completed an equine-assisted intervention with their partner reported significantly less symptoms of depression than those who completed as individuals (Romaniuk et al., 2018). The positive findings were maintained at the three-month follow up. However, riding horses generally has been linked to increased injuries and subsequently an increase in levels of depression. An international cross-sectional study of 511 equestrian athletes reported 71% of riders had suffered between one and five concussions. There were significant differences between groups with those who had experienced more concussions reporting higher levels of depression (McGivern et al., 2021). Interesting to note that Australia, Canada, and the USA had significantly higher wellbeing scores than the UK.

### Summary

Horse riding meets the threshold for moderate to vigorous intensity physical activity and can have positive physiological benefits. However, it also has a risk of injury which can be severe and have significant impact long term. The risk of these can be reduced by using equipment such as helmets, safety vests, and certain types of saddles. The risk of respiratory pathogens in indoor riding arenas and the possible link with increased risk of lung cancer needs further research.

Hippotherapy has been proven to have a positive impact on people with chronic back pain. There is also a high level of evidence that hippotherapy, both traditional and using a simulator, can significantly improve motor function such as balance, gait, muscular strength, spasticity, and flexibility, for people with disabilities or long-term health conditions. There is no agreed structure of these sessions and further research is needed to determine how long the improvements in motor function are retained.

Equine-assisted therapy has also been found to have a positive impact on people's mental health. In particular, significantly reducing PTSD symptoms in veterans. Although further research is needed to understand the involvement of partners in the treatment; standardise intervention protocols; and test if equine-assisted therapy has the same impact on PTSD symptoms in other populations.

## Subjective Wellbeing

22% of papers look at subjective wellbeing as an outcome. Quality of life was the most researched sub-outcome with 42 papers.

### Stress

Ten papers look at stress as a sub-outcome of subjective wellbeing, they often also looked at other outcomes such as PTSD (Johnson et al., 2021) or anxiety (Hoagwood et al., 2022) and have been discussed in more detail elsewhere in the report.

One study measured the effect of equine-assisted learning on quarantine control workers' stress levels. After 16-weeks they reported a significant reduction in perceived stress and an improvement in all three stress coping factors, social support seeking, problem solving, and avoidance. They also found a significant improvement to their quality of life. However, there was no control group to compare the results to (Jung et al., 2022).

A survey of 6259 horse owners was conducted to capture the impact of COVID-19 restrictions in the UK. They found the majority of owners reported increased stress from the reduced access to their horses (Williams et al., 2020).

### Life satisfaction

Four papers look at life-satisfaction, two specifically focused on owners. Luhmann and Kalitzki (2018) tested whether certain positive or negative factors of owning an animal, such as perceived social support or financial costs, contribute to satisfaction and mood. Income, autonomy, positive emotions, social roles, negative emotions, financial strain, and attachment were all significant factors for horse owners. These were the same for dog and cat owners apart from income. The paper reported other differences between horse, dog and cat owners, with horses tending to contribute more to a sense of purpose and to greater positive and negative emotions. The second paper qualitatively explored dressage horse owners' motivations (Bornemann, 2024). The author found that horse ownership contributes to psychological wellbeing, in part, from the satisfaction gained from their horses' response to their care decisions.

One study ran a three-day hippotherapy programme for four consecutive cohorts of a physiotherapy course (n=252) (Choińska et al., 2022). They found a significant improvement in 'overall satisfaction / happiness', and a significant reduction in heart rate, after the three days in female students (n=191). There was a positive trend but no significant differences in the males (n=61).

### Quality of Life

The majority of papers looking at quality of life did so as a result of improving their physical or mental health. A systematic review by White-Lewis et al. (2017) on the impact of equine-assisted therapy (EAT) on adults reported that 91% of papers (n = 10/11) had statistically significant improvements in quality of life. It was widely found that improving a person's Multiple Sclerosis symptoms, as a result of EAT, would significantly improve their quality of life (Kabuk & Şevgin, 2024; Lavín-Pérez et al., 2022; Moraes et al., 2021; Suárez-Iglesias et al., 2021; Vermöhlen et al., 2018). This positive relationship was also seen in other disabilities or long-term health conditions such as Alzheimer's disease, breast cancer, and ankylosing spondylitis, and, also in older adults (Gámez-Calvo et al., 2022; Kocyigit et al., 2023; Salbaş & Karahan, 2023; Viruega et al., 2023). However, a mixed response was found in papers focused on children with autism spectrum disorder (Bator et al., 2020; García-Gómez et al., 2014; Lanning et al., 2014) and no effect was found in children with cerebral palsy in two RCT (Ahn et al., 2021; Davis et al., 2009). García-Gómez et al. (2016) found no significant group differences in the behaviour of young people with ADHD but for the experimental group there was an improvement in the 'interpersonal relationships' factor in the quality of life questionnaire they completed.

An improvement in quality of life was also found in caregivers. Bunketorp-Käll et al. (2017) conducted a RCT with 106 stroke patients and their caregivers (72% were spouses). The stroke patients received either a rhythm and music intervention, an equine-assisted intervention, or were in the control group. The paper does not distinguish between the interventions in the results

but there was a significant improvement in the caregiver's responses post-intervention and three-months later compared to the control group. This was predominantly due to a decrease in 'worry' a caregiver had. There was not a significant difference 6 months after the intervention.

### Summary

Engaging with horses through equine-assisted activities is thought to reduce stress, increase a feeling of calmness and improve life satisfaction. Several studies captured the impact of owning horses and it has been suggested to have a positive impact due to the perceived social support and satisfaction gained.

A significant consequence of improving a person's long term health condition such as PTSD or motor function in MS and stroke patients, can have a significant improvement in both the patient and their carer's, quality of life.

## Individual Development

20% of papers looked at individual development as an outcome with nine-sub-outcomes. Self-esteem and confidence was the sub-outcome with the greatest number of papers (34).

### Education

Seven papers specifically focused on education or study skills. A RCT found that an 11-week equine-assisted learning programme significantly improved behaviour in school in 10–14-year-olds compared to the control group (n=131) (Pendry et al., 2014). The results also indicated that increased attendance predicted both positive and negative behaviour. In a qualitative case study, parents observed that their child with mental illness had better academic performance and reduced absenteeism after the equine-assisted intervention.

Three papers used the Behaviour Assessment System for Children (BASC) scale that has a study skills factor (García-Gómez et al., 2014, 2016; Harvey et al., 2020). Only one found a significant improvement in study skills in children and adolescents with mental health diagnosis or family issues as reported by teachers after a ten-week equine-assisted learning intervention (Harvey et al., 2020).

### Employability skills

There were two grey literature reports that focussed on employability of grooms and volunteers. First, the British Grooms Association reported 63% have opportunities to learn or develop in their position but only 32% feel there is opportunity to progress (Brooke-Holmes & Calamatta, 2014). Second, the RDA stated that 54% of respondents (for who it was applicable for) believe volunteering with the RDA has improved their career prospects (Riding for the Disabled Association, 2018).

There has also been links between participants and employability skills in academic papers. A cross-sectional survey of adolescents from four separate equestrian organisations (n=329) found a positive relationship between the frequency a person uses horsemanship skills (riding, handling, safety, health management, and nutrition) and life skills (decision making, critical thinking, communicating, goal setting, and problem solving) (Smith et al., 2006). (Oliveira et al. (2016) recruited 180 students aged 16-24, 90 who regularly ride and 90 non-riders. Out of the 23 soft skills they were asked to rate their proficiency of such as communication, problem solving,

and empathy, there were only two that the riders were not significantly more proficient in compared to non-riders. These were self-confidence and decision making.

Furthermore, a qualitative case study found that for people with mental health issues participating in an equine-assisted therapy programme had a positive relationship with occupational engagement (Højgaard-Bøytler & Argentzell, 2023). This was suggested to be because of developing friendship and trust, becoming calmer and feeling more in control, and building structure into their life.

### Prosocial behaviour

Three papers measured the impact that equine-assisted activity has on the development of prosocial behaviour in adolescents (Norwood et al., 2021; Park & Jung, 2024; Pelyva et al., 2020).

Pelyva et al. (2020) conducted a cross-sectional study (n=525) utilising 10 agricultural secondary schools to compare students aged 14-18, with no physical or psychological additional needs, whose studies had no connection with horses against students who spent two days per week with horses as part of a four-year horse groom training programme. After controlling for age and gender, the study found that the adolescents who had regular contact with horses displayed fewer behavioural problems and stronger prosocial skills than the control group. Although these characteristics were found already at admission into the school suggesting those with stronger social skills are more likely to select the horse groom training programme, the decline in behavioural problems was more significant than in the control group. This finding indicates that equine-assisted activities and learning may support strengthening these skills.

Positive findings were also reported by Norwood et al. in 2021 with adolescents who were ‘at-risk’ and had disengaged with traditional school. Two-hour sessions with horses for five weeks without specific therapist intervention significantly reduced poor behaviour and improved attention. However, the group size (n=12) was small so further research is needed in this population.

A recent study by Park and Jung (2024) found equine-assisted learning significantly reduced participants tendency towards internet gaming addiction and also improved emotional and behavioural problems. However, these behaviours increased again one month after the intervention stopped. Therefore, suggesting continued engagement is needed to maintain positive results.

### Volunteering

Vincent (2024) conducted a RCT with participants who volunteer at equine-assisted therapy sessions. They measured physiological changes in response to their volunteer roles as indicators of stress and bonding. Whilst the findings were not significant there were trends to suggest that volunteers did experience increased stress but simultaneously had feelings of bonding or satisfaction. Therefore, increased stress as a result of volunteering is not necessarily negative. The participants responses suggested they felt a sense of responsibility but enjoyed being able to assist riders. Overall, volunteering was thought to positively contribute to their overall wellbeing.

A report by the RDA of 3,000 volunteers found that the RDA has a positive effect on 94% of volunteers, 92% feel more useful and 74% feel close to other people (Riding for the Disabled Association, 2018). 80% feel that they have gained knowledge that helps in other areas of their life - most commonly cited factors were an increased understanding of disability (31%), empathy (18%), social skills (15%), hard skills (9%), and managing stress (7%).

## Self-esteem and Confidence

There were 34 papers that looked at the effect of equestrian activity on self-esteem or confidence. Eighteen case studies and case-series studies observed an increase in self-esteem and confidence after participation (Bizub et al., 2003; British Equestrian, n.d.; Burgon, 2003; Cagle-Holtcamp et al., 2019; Corring et al., 2013; Debuse et al., 2009; Fridén et al., 2022; Fullagar et al., 2024; Gehrke et al., 2018; Glazer et al., 2004; Håkanson et al., 2009; Hatcher et al., 2019; Lundquist Wanneberg, 2014; Meinersmann et al., 2018; Pretty et al., 2007; Saunders-Ferguson et al., 2008; Stoppard & Donaldson, 2024; Warner et al., 2023). Two studies did not find any changes in self-esteem or confidence (Ewing et al., 2007; Hauge et al., 2015). Hauge et al. (2015) commented that a change in self-esteem was more expected in clinical populations.

Volunteering is also thought to affect self-esteem and confidence. 63% of RDA volunteers (n = 3,000) felt their social skills and confidence had dropped since before the COVID-19 restrictions (Riding for the Disabled Association, 2020).

A cross-sectional study in 2015 (n=239) reported that female equestrian athletes experienced the same decline in self-esteem as sedentary 15–17-year-olds and other athletes, however there was a greater increase at 18 years compared to other sports (Davies & Collins, 2015). A later paper by Forino et al. (2021) focused specifically on self-esteem in relation to body image of 493 female equestrians. They perceived a smaller body frame than their own was ideal and that they perceived a larger body frame was perceived more negatively by judges. Viruega et al. (2023) also reported significant improvement in body image after hippotherapy for breast cancer survivors.

## Self-efficacy

Of the 11 papers that look at self-efficacy, there were two RCT. In Johnson et al.'s (2018) trial with veterans aimed at reducing PTSD symptoms, one of the secondary outcomes was self-efficacy. The authors found a positive trend in the experimental group, albeit non-significant. Souilm (2023) measured the effect of a six-week equine-assisted therapy programme on patients with substance use disorder. They reported a significant improvement in self-efficacy compared to the control group who received standard care. A significant improvement in adult's self-efficacy was also found in two case-control studies (Brämig & Schütz, 2023; Meola et al., 2022).

Hauge et al. (2014, 2015) reported no significant differences in the levels of self-efficacy in adolescents after four-months of therapeutic equine activity compared to the control group. However, lower levels of self-efficacy at the beginning of the programme were associated with increased persistence in tasks during the intervention. Mastering skills requires persistence, therefore it indicates those with lower self-efficacy may benefit more from this type of programme despite there not being a significant difference in self-efficacy. Another paper on children and adolescents found a non-significant but positive trend in self-efficacy levels (Hoagwood et al., 2022).

## Crime

An observational study measured the effectiveness of equine-assisted learning (EAL) on reducing domestic violence incidents in families (Hemingway & Sullivan, 2022). In total 14,075 families were registered with the 'troubled families programme', of those 268 had a key worker and attended ten hours across one week of an equine-intervention, 2119 were supported by a key worker only, 1119 had a key worker and received further support but not equine-related, and 10,569 had no support offered. The EAL group had a significantly lower number of domestic

violence incidents and 'child in need' status during the one-year post intervention compared to the other groups.

### Self-regulation and Coping skills

There were 13 papers that looked at self-regulation or coping skills. Six were case studies, two focussed on parents who have children with disabilities (Panczykowski et al., 2022; Tan & Simmonds, 2018), two were with young people who were in care or 'at-risk' (Burgon, 2013; Matias et al., 2023), one was with young women who had adverse childhoods (Craig et al., 2020), and one studied substance use disorder patients (Kern-Godal et al., 2016). All wrote how engaging in either equine-assisted services or equine-assisted therapy helped the participants to develop coping skills or become better at self-regulating their emotions.

The two RCT mentioned in self-efficacy had similar results with emotional-regulation and coping, that there was a positive but non-significant difference in veterans with PTSD (Johnson et al., 2018) and a significant positive improvement in substance use disorder patients (Souilm, 2023).

There were four case-series studies that found an improvement in self-efficacy as a result of engaging in equine-assisted therapy or learning (Boshoff et al., 2015; Coffin, 2019; Hoagwood et al., 2022; Jung et al., 2022). Boshoff et al. (2015) delivered a six-week intervention with 39 boys who were in a youth care facility for displaying problem behaviour. They found a significant improvement in their problem focussed coping, emotional coping, and subjective wellbeing. However, the levels of dysfunctional coping did not change. Coffin (2019) measured the impact of a six to ten-week programme that 270 young people aged 6-25 who identified as Aboriginal participated in over one year. The authors qualitatively observed improvements in self-regulation, self-awareness, and socialisation skills. The parents and teachers also completed questionnaires that indicated changes in self-regulation, behaviour, and socialisation.

### Anger and anti-social behaviour

Two qualitative case studies explored how engaging in an equine-assisted learning programme effects young people (Fullagar et al., 2024; Törmälehto & Korkiamäki, 2020). They both found increased feelings of calmness in the young people after interacting with the horses. This was compared to the possibly chaotic home lives and difficult school experience 'at-risk' young people can face (Fullagar et al., 2024). The suggestion was that by shifting the young persons' response to the horses' behaviour to being calmer, this would help change their responses to anger in other situations (Fullagar et al., 2024). A reduction in aggressive behaviour was captured quantitatively after equine-assisted therapy. Whereas Harvey et al. (2020) only reported a reduction in some of the young people, García-Gómez et al. (2014) found a significant improvement in aggressive behaviour displayed in children and adolescents with ASD.

Nurenberg et al. (2015) conducted a RCT which comprised of ten weeks of equine-assisted psychotherapy for psychiatric inpatients. They found a significant reduction of violent incidents and aggressive behaviour in the equine group compared to canine-assisted therapy, social skills therapy, and standard hospital care.

### Summary

Overall, equestrianism has been associated with reducing poor behaviour, improving good behaviour, improving a person's ability to cope, their self-efficacy and self-confidence, and the development of skills which would be beneficial for employment. However, some areas have mixed results or have a low volume of published research, therefore it needs further study.

## Social and Community Development

Social and community development was the least researched social value outcome with 13% of papers. Of the 11 sub-outcomes searched for, papers were found relating to five (Table 1). These were trust, friendship, loneliness, communication, and social connections.

### Communication

21 papers looked at communication and language, nine of those focussed on people with Autism Spectrum Disorder (ASD).

In 2015, a RCT reported a significant improvement in the social communication, number of words, and new words in children with ASD after a 10-week therapeutic horse-riding intervention (Gabriels et al., 2015). This result was supported by Zhao et al. (2021) who found that a 16-week intervention significantly improved six to seven socialisation and communication factors in children with ASD compared to the control group. Furthermore, Xiao et al. (2023) conducted a systematic review of equine-assisted therapies for people with ASDand four papers looked specifically at language. Two studies found a significant improvement in the development of language compared with the control group; another two studies also found improvements albeit not significant. One study reported improvements were retained in the six-month follow-up. Xiao et al., (2023) concluded that the limited evidence suggested a positive relationship between equine-assisted therapy and improving the language skills in people with ASD, but the relationship needs further research.

A systematic review that focussed on people with dementia found similar results, that equine-assisted therapy had a positive effect on communication skills but called for more robust studies (Sebalj et al., 2024). The need for higher quality research is reflected in 10 of the 21 papers being case studies.

### Social Trust

One quantitative case-control study reported a significant improvement in trust in 'at-risk' adolescents living in a residential home (Bachi et al., 2012). The intervention comprised of weekly individual equine-assisted psychotherapy sessions for seven months. Another two papers, qualitative case studies, noted a relationship between trust and equine-assisted therapy / learning (Glazer et al., 2004; Stoppard & Donaldson, 2024). Both papers focussed on children, with the former specifically on children experiencing grief.

### Social Interactions

A systematic review and meta-analysis of five studies (four RCTs) found a significant improvement in social communication, awareness, cognition and motivation after engaging with equine-assisted therapy amongst children with ASD (Chen et al., 2022). Together these impacts would have a positive impact on the child's social interaction. This finding supports Pendry et al.'s (2014) results that participation in an 11-week equine-assisted learning programme had a statistically significant with a moderate effect size on a child's development of social competence. They found that greater attendance predicted greater development. The authors commented that developing social competence in young people "is an effective strategy to prevent mental, emotional, and behavioural disorders in adulthood".

The impact of increased social interactions may not be the same for all people. Sáez et al. (2022) surveyed 2,651 people regarding the perceived benefits and barriers of horse-riding. They found that males and those aged 25+ valued social contact significantly more than females and people

under 25. This suggests that certain sub-populations would benefit more from equestrian programmes increasing their social interaction.

### Friendship and Loneliness

Two case studies qualitatively explored how engaging with horses can affect the development, and expression of friendship. Fullagar et al. (2024) conducted a nine-month equine-assisted learning programme for marginalised students who were not attending traditional school. The young people commented that becoming comfortable with the horse and caring for it, made them more able to connect with their peers. This connection of love and friendship with the horse expanding into interactions with other humans was also expressed in children with ASD with limited verbal communication (Portela-Pino et al., 2020).

Forsberg and Tebelius (2011) observed and interviewed adolescent girls who regularly attended a riding school. The girls spoke of encouraging and being inspired by their peers. The authors found that the friendships the girls developed and their engagement in this predominantly female space, resulted in the girls being able to discuss "different gender positions with feelings of independence and competence". This sense of autonomy and empowerment was carried outside of the stables too, for example the girls rejected the pressure of certain appearances that existed at their schools.

Johnson et al. (2018) conducted a RCT primarily focused on reducing PTSD symptoms in military veterans. They also measured coping self-efficacy, emotion regulation, and social and emotional loneliness. Whilst all secondary outcomes were non-significant, loneliness actually increased from pre, peri (three weeks), and post (six weeks) for both the control group and the intervention group. The authors postulated that a longer intervention period may yield more positive results or that loneliness within the specific population of veterans is better captured using a different scale. Another quantitative study also found that loneliness did not decrease after four hours per week of equine-assisted learning for nine weeks (Ewing et al., 2007). However, there was a non-statistically significant trend of increased loneliness in the control group. This finding suggested that engagement with equine-assisted services may not reduce feelings of loneliness but may prevent them.

A report in 2018 (n = 3,000) suggests that volunteering with the RDA has a positive impact on a person's friendship and loneliness (Riding for the Disabled Association, 2018). 88% of respondents agreed they felt they belonged to the RDA community, it helped them feel close to other people (74%), and they spoke regularly with other members (78%).

### Summary

Social and community development had less research and fewer high-quality studies than other social value outcomes. Although, there are positive trends that equestrianism has a positive effect on increased social interaction, development of friendship, and social trust. Perhaps surprisingly equestrian activity was not found to significantly reduce feelings of loneliness, however RDA volunteers report a positive connection and studies called for more research in this area. Finally, equine assisted therapy has strong links with increased communication and language skills, especially in children with autism spectrum disorder.

## Conclusion and Implications

This report presented the findings from a 'scoping' literature review aimed at understanding the social value of equestrianism. 290 papers were collated and then separated into four outcomes – physical and mental health, subjective wellbeing, individual development, and, social and community development.

The overall findings of the reviews can be summarised as follows:

- The review found evidence of mixed volume and quality on the extent to which equestrianism contributes to social outcomes. There has been a steady increase in the number of papers published since 2016 indicating a continued interest in this area of research.
- Of the papers found, the largest volume of literature was around the outcome area of physical and mental health. Individual development, subjective wellbeing, and social and community development had significantly smaller volume. This does not correspond to less importance but suggests a gap in existing empirical evidence.
- The majority of papers examined the social value of equestrianism in treating people with existing disabilities or long-term health conditions, opposed to preventing the development of such conditions.
- There are some negatives associated with equestrianism such as a risk of injury, severe injuries, and illness.
- Equestrianism has been found to contribute social value in all four outcomes. And the evidence suggests there is a unique value in equestrianism not found in other activities.
- There is a need for further, and higher quality, research quantifying the social value of equestrianism. Particularly in the outcomes of individual development, subjective wellbeing, and social and community development.

This literature review indicates there is sufficient evidence in the literature to complete a Social Value or Social Return on Investment in the future to estimate a financial value British equestrian activity contributes to society. Where equestrian-specific outcomes cannot be quantified because of the lack of appropriate financial proxies, they should be reported qualitatively in addition to the quantified measures.

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