

Equine-assisted Services for People with Down Syndrome: A Scoping Review to Inform Syndrome-Informed Practices

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Introduction

- Many Individuals with Down Syndrome (DS) participate in interventions to improve overall functioning and quality of life.
- Equine-assisted services (EAS) are a promising intervention for individuals with DS and can be adapted as syndrome-informed services to address specific areas of vulnerability for these individuals.
- This scoping review sought to comprehensively review the existing literature regarding EAS in individuals with DS to inform future directions in this area of research.

Research Aims

To characterize the current evidence regarding equine-assisted services in individuals with DS we aimed to:

1. Characterize the individuals with DS included in equine-assisted services research.
2. Describe the specific characteristics of the equine-assisted services under investigation, including the type of service, dosage, and intervention components.
3. Describe study design and outcomes, including tools used to measure outcomes and reported results.

Methods

Design: This scoping review identified research through an online database search, inclusion criteria were applied to relevant papers, and data was extracted to answer research aims.

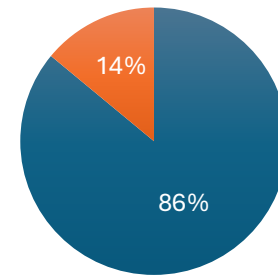
Search Procedure: 21 specific search terms were used to search 9 databases yielding 34 unique papers and 7 additional papers were added after manual search of reference lists yielding 41 unique records which were uploaded into Colandr, an open-access web-based tool for conducting reviews

Inclusion Criteria: Original peer-reviewed research, published in English between 1980-2024, predominantly focused on equine-assisted services, and include a participant population of at least 80% individuals with DS. 14 studies ultimately met inclusion criteria.

Data Extraction: HG extracted data relevant to research aims using Microsoft Excel, such as participant age, intervention dosage (duration, frequency, length of sessions), and reported outcomes. CP reviewed extracted data and both reviewers came to a consensus on any disagreements.

Results

Figure 1: Studies including older participants

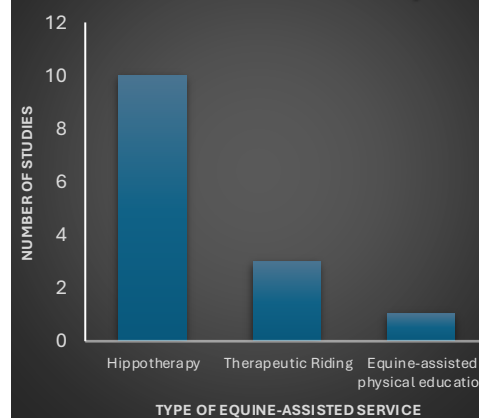


■ No participants > 18 ■ Included participants > 18

Aim 1: 93% of studies exclusively included individuals with DS as participants. 87% of studies only included participants under the age of 18 as depicted in Figure 1. Height and weight, IQ, and baseline gross motor function measure scores (GMFM-88) were included in 36%, 21%, and 14% of studies, respectively. 79% of studies mentioned atlantoaxial instability as an exclusion criterion.

Aim 2: 71% of studies used hippotherapy as the primary intervention, while therapeutic riding and "equine-assisted physical education" were used in 21% and 7% of studies, respectively as depicted in Figure 2. Intervention duration ranged from 6-30 weeks (avg. 15.7, individual sessions lasted between 15-50 minutes (most common 30 min, n=8), and the total number of sessions ranged from 6-72 sessions (avg. 22.7). All studies had participants ride the horse. The next most common intervention components were mounted exercises (n=6), different positions on horse (n=6), mounted games and activities (n=5), and use of different equine gaits and speeds (n=3).

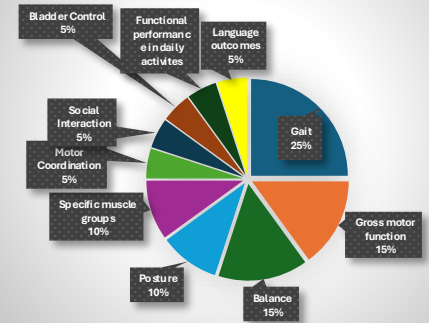
Figure 2: Primary Intervention in Study



Results

Aim 3: Only 2 out of 14 studies were RCTs, with an average sample size of n=37. 43% of studies used one-group, pre-post design, the most common study design in this review. The sample size in these studies ranged from 4-15 participants. 93% of studies used at least one outcome measure related to motor function. Gait was the most frequently studied outcome measure, followed by gross motor function and balance, as depicted in Figure 3. Non-motor function outcome measure included social interaction, bladder control, functional performance in daily activities, and language outcomes.

Figure 3: Proportion in All Studies of Specific Outcome Measure



Discussion

- Current research has mostly investigated the utility of EAS in youth with DS, therefore an opportunity exists for further research to investigate equine-assisted services as lifestyle interventions to promote healthy outcomes and prevent physical and cognitive decline in adults with DS.
- Across all studies in this review, study protocols did not detail how the intervention was adapted to accommodate the specific needs of individual participants. Future research should develop protocols that are adaptable to the DS phenotype.
- While hippotherapy and therapeutic riding are among the most common EAS¹, future research could investigate interventions like equine-assisted learning. This intervention may provide beneficial effects in areas like executive functioning, an area of relative weakness in individuals with DS².
- EAS have provided promising gross motor outcomes for individuals with DS, however, several studies used assessments with unknown reliability and validity in the DS population. Future research should utilize assessments that have validity and reliability in this population and are adapted in a syndrome-informed fashion.
- Future research can seek to utilize syndrome-informed, adaptive EAS protocols that aim to provide benefits in areas like executive function, behavioral regulation, and expressive language.
- Individuals with DS are at a high risk of developing dementia³, and preliminary studies indicate EAS may improve quality of life in these people⁴. Future studies should further investigate the benefits of EAS for individuals with DS and dementia.

References

¹Professional Association of Therapeutic Horsemanship International. (2025). 2024 Fact Sheet. Professional Association of Therapeutic Horsemanship International.
²Grieco, J., Pulsifer, M., Seligson, K., Skotko, B., & Schwartz, A. (2015). Down syndrome: Cognitive and behavioral functioning across the lifespan. *American Journal of Medical Genetics Part C: Seminars in Medical Genetics*.
³Snyder, H. M., Bain, L. J., Brickman, A. M., Carrillo, M. C., Esbensen, A. J., Espinosa, J. M., Fernandez, F., Fortea, J., Hartley, S. L., & Head, E. (2020). Further understanding the connection between Alzheimer's disease and Down syndrome. *Alzheimer's & Dementia*, 16(7), 1065-1077.
⁴Sebalj, M., Lakhani, A., Grindrod, A., & Stuckey, R. (2024). Equine-assisted services for people living with dementia: a systematic review. *Alzheimer's Research & Therapy*, 16(1), 76.