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The Impact of Equine-Assisted Therapy Rehabilitation Modalities on Perceived Psychosocial Functioning and Quality of Life

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Abstract: A convergent mixed methods study was completed examining participants' perceived effectiveness of equine-assisted therapy (EAT) in regard to psychosocial functioning and quality of life. A total of 52 participants completed a quantitative survey and seven of them completed a qualitative interview using a phenomenological research approach. The aim of this study was to determine how participation in EAT affected participants' perceptions of their quality of life. Participants generally reported benefits in psychosocial outcomes including self-esteem, confidence, independence, and social skills. Furthermore, participants reported quality of life benefits including anxiety, depression, stress, well-being, self-care, hope, and trust. Reports of improvements in depression, confidence, and stress levels significantly differed with age, where adults generally saw greater improvements in depression, p = .006, t (21.662) = 4.048, g = 1.14, CI 95% [0.391, 2.229] and confidence outcomes (27.2 years vs. 8 years old), p = .046, W = 7.50, rbc = 0.847, CI 95% [0.398, 0.969] over younger participants. Associations were found between the length of time in weeks participating in all of the forms of EAT and improvements in independence, p = .024, rt (52) = .213 and social skills, p = .037, rt (52) = .222. Associations were also found between the length of time in weeks participating in all of the forms of EAT and improvements in independence, p = .024, rt (52) = .213 and social skills, p = .037, rt (52) = .222. Finally, a logistic regression analysis revealed that an increase in age was associated with increased likelihood of reporting improvements in depression symptoms, where every year older a participant is, their likelihood of reporting improvements in depression symptoms increases by 11%, $X2$ (32) = 8.174, p = .043. Themes of increased emotional regulation, increased confidence, and the influence of the context and environment were determined through the qualitative data. Results from both the quantitative and qualitative data show a positive impact on the participants' overall quality of life and psychosocial skills.

Keywords: Equine-Assisted Therapy, Occupational Therapy, Psychosocial, Post Traumatic Stress Disorder, Quality of Life, Self-Confidence, Therapeutic Riding

1. Introduction

Horses have popularly been referred to as gentle giants [1]. This notable perception of patience, calm manner, and gentleness has led them to be used therapeutically for many years. The practice of using horses therapeutically is also referred to as equine-assisted therapy (EAT), equine-facilitated therapy, or therapeutic riding. The physical, emotional, and social influences between the individual and large animals have been said to be exceptionally beneficial [2]. EAT has also been shown to align with the World Health Organization's International Classification of Functioning,

Disability, and Health (ICF) framework to determine an individual's outcomes through rehabilitation [3]. There are limited numbers of practitioners and clients attending or providing services within EAT. The Professional Association of Therapeutic Horsemanship International [4] has only 5,424 registered and certified practitioners in this field, with only 1,222 of these practitioners specializing in mental health, and a clientele reaching about 53,000.

The literature review focused on studies that demonstrated the effects of EAT on psychosocial abilities, symptoms of conditions such as post-traumatic stress disorder (PTSD), and psychological concerns. This pilot study specifically focuses on addressing the client's perceived impacts of EAT on psychosocial functioning and their overall quality of life. Quality of life (QOL) is considered to be a subjective understanding of an individual's overall well-being that includes a holistic view of their physical, emotional, and mental capabilities or performance [5].

Twenty pieces of literature were reviewed for the purpose of this study. The primary focus of these articles centered around the use of EAT and client improvements in areas of psychosocial, psychological, behavioral, and cognitive skills. The scopes of PTSD and developmental disorders were used to focus on populations in which EAT services may be used. Supporting and contributing information as well as contradictions and areas for future research are identified in the following review. The authors would like to make note that the field of occupational therapy considers psychosocial and psychological aspects as different constructs.

1.1. Psychosocial

The term psychosocial involves the individual's psychological aspect, social aspects, or social skills of one's life. Other recognizable terms describing both youth and adult psychosocial characteristics are but not limited to self-confidence, self-esteem, and trust. As a result of a horse's natural state of mindfulness, they encourage calmness and connection for individuals of all ages to experience and work on [6]. Psychosocial traits can be built with younger individuals or regained with older individuals.

It is seen that the use of equine-assisted therapy in adults who suffer from psychosocial issues in this instance, combat veterans, benefited in areas of self-confidence, self-esteem, self-concept, and overall well-being [7]. A pilot study was conducted with seven participants who have combat experience and identify to have concerns with psychosocial characteristics and views of themselves listed above. In this study, the horse was used as an analogy for the problems or social concerns in the individual's life. All equine-facilitated activities were built to encourage psychosocial skills, views, and issues. The results of this study were characterized by themes that showed positivity and growth in the areas of, learning about oneself, spiritual connection, trust, and respect [7].

A four-month study was conducted with 75 adolescents between the ages of 12-15 participating in equine-assisted therapy to examine perceived social support, self-esteem, and general self-efficacy [8]. This study was a randomized control trial with pre and post-survey questionnaires. Social support was measured by using the tool, Resilience Scale for Adolescents (READ), self-esteem was measured using a Likert scale called Global Self-Worth, and self-efficacy was measured using a shortened version of the General Self-Efficacy scale [8]. The results of the study showed a positive correlation between the equine intervention and increased feelings of social support, but no correlation with self-esteem and self-efficacy [8]. It is important to note that this randomized control trial was conducted with adolescents who did not specifically identify to have psychosocial concerns but was conducted to see if psychosocial skills can be developed or added upon in typical developing individuals as a baseline with the use of equine-assisted therapy [8].

Individuals who suffer from neurological disorders or injuries oftentimes have issues with fatigue and feelings of isolation [9]. The controlled study led by Pálsdóttir and colleagues [9] looked at how EAT can improve activity levels, the patient's self-assessed health, and fatigue. Throughout this study, participants were evaluated on these factors based on increased exposure to nature. Nature exposure is said to enhance mental recuperation in individuals [9]. When participants were with the horses in nature rather than inside the stables, the participants were able to relax and leisurely enjoy their time instead of focusing on controlling the horse and the horse's movements. At the conclusion of this study, it was found that EAT complemented the rehabilitation of individuals with various neurological diagnoses and that there was a positive effect on the individuals' well-being and overall health [9].

1.2. Psychological

The authors would like to make note that the field of occupational therapy considers psychosocial and psychological aspects as different constructs. In a systematic review study produced by Staudt & Cherry [10], it was suggested that EAT is a beneficial treatment for those who suffer from trauma-related symptoms. Those who are trauma-exposed experience impairments in "affect regulation, attention/concentration, impulse control, self-image, and aggression/risk-taking…[and] difficulties with attachment, somatization, sexualized behaviors and dissociation," [11]. The use of EAT in treating trauma clients showed to decrease symptoms related to trauma such as anxiety and depression, as well as improve interpersonal skills and higher-level cognitive functioning [11]. Naste et. al. [11] and Staudt & Cherry [10] found that EAT gave the clients awareness of mastery and competence, and interestingly found that the horse's gait and calm demeanor promotes internal regulation and a sense of safety to the client. "The explicit features of the horse could therefore elicit attachment…and bodily-emotional level next to influencing muscle-motor activity in patients, resembling 'mother-child interactions'" [12]. EAT showed an improvement in interpersonal skills, communication strategies, and overall social functioning while focusing on attachment and empathy building.

1.3. Post-Traumatic Stress Disorder

PTSD is a debilitating condition that occurs as a result of a traumatic event. Some typical characteristics include nightmares, avoidant behaviors, altered moods, and hyperactivity [13]. Although PTSD is commonly associated with combat veterans, individuals of all ages and experiences can be impacted by this disorder. A few examples stated in Earles et al. [14] include individuals who have witnessed death, experienced a serious accident, have been physically or sexually assaulted, and have or previously had life-threatening illnesses or injuries. EAT has shown positive effects in alleviating an individual's symptoms of traumatic distress and enhancing their abilities to cope and perform tasks. It is said that the social and emotional connection formed with a horse during EAT provides an environment that helps individuals "focus and connect with their surroundings, work through their fears and engage with others" [15].

An important theme that appeared congruent within the literature reviewed was the use of mindfulness the clients needed and brought forth while interacting with horses during interventions [14]. Due to the risks of working with horses, all participants must possess awareness, compassion, care, and focus to successfully and safely interact with the animals. The process of caring for the horses and the necessary insightfulness it brings the person is what permits emotional growth and healing [16]. Literature demonstrated positive effects on participants' emotional regulation and self-efficacy with coping [16], ability to engage in and enhance their mindfulness (Earles et al., 2015), and overall self-esteem [16].

In light of the many positive effects EAT provides, literature previously mentioned that there are still limitations in the research that may influence long-term outcomes [13-16]. A common theme found within the majority of the reviewed literature on PTSD was the need for additional research and data. More specifically, a concern was a need for data on longer intervention periods. Much of the literature also discussed having small sample sizes, lack of control groups, and high participant drop-out rates which all impact the statistical data collected [13, 15-16]. Another limitation that affected long-term outcomes was specifically discussed in Arnon et al. [13], as during the 3-month follow-up, participants experienced significant deterioration even though there was clinical improvement during the completion of the EAT protocol. Arnon et al. [13] stated that this decline could be explained by the lack of post-treatment activity replacement, which they labeled as symptom rebound.

1.4. Cognitive

Equine-assisted interventions are said to improve mental functions such as anxiety, reduction of hyperactivity, improvement of self-esteem, and encourage relaxation [17]. EAT is mentioned as a positive influence on individuals who suffer from cognitive disorders such as ADHD [18]. Attention Deficit Hyperactivity Disorder (ADHD) is one of the most common cognitive disorders in both children and adults. ADHD is classified as a neurodevelopmental disorder that is found in 3-7% of school-aged children and lasts the lifespan (Yoo et al., 2016). Children and adults with ADHD oftentimes show characteristics that include hyperactivity or impulsivity which can impede social interactions and relationships. Functional changes in participants were significantly correlated with clinical improvement in the participants' symptoms of ADHD [18].

In a study consisting of 106 children who do not suffer from cognitive deficits or neurological impairment, it was concluded that the benefits of riding the horse stemmed from the vibrations made by the horse's motion [17]. The purpose of this study was to assess children's overall ability to perform Go/No-go tasks or cognitive decision-making. Overall, this study concluded that equine-assisted interventions may overall reduce stress levels [17].

1.5. Autism Spectrum Disorder

Autism spectrum disorder (ASD) is a neurodevelopmental condition affecting social interactions, communication, and behavior [19]. Literature was reviewed to determine how patients with ASD present after EAT. A recent study showed "[the] rhythmic movements of riding horses can stimulate the vestibular system… [and] may play a role in promoting calmness," [20]. Other studies reported that ASD patients who participated in EAT improved in social functioning and saw a decline in aggressive behaviors [21], as well as had longer engagement in activities compared to previous engagement prior to beginning EAT [22]. The presence of the horse is not the only variable needed to impact the functioning of a patient with ASD but rather combining techniques and strategies, as well as the animal itself, can influence successful interventions [21]. Examples of these strategies are using the patient's interests, allowing the session to be patient-led, offering the patient choices between different activities, and breaking down activities into step-by-step directions for the patient to follow [21]. Activities the patients can do with the horses that do not require mounting and/or riding are learning how to groom and care for the horse [23].

Of the studies reviewed, all varied in the duration of EAT treatment from one month to six months or longer. Srinivasan et al. [23] suggest EAT treatment for three to six months to see the most improvements in patients with ASD. It is also worth mentioning that the challenges patients with ASD face vary greatly, which may impact the duration of treatment necessary and should be taken into consideration when planning EAT interventions [23].

2. Methods

2.1. Problem Statement

QOL is dependent on an individual's perspective of their life. Through qualitative and quantitative data researchers

gathered some understanding of what may either benefit or hinder overall perceived QOL. Studies have shown that EAT has been linked with statistically significant growth in areas such as response time and attention spans [24], social interactions [25], pain relief, and ROM strengthening [2]. Within certain studies [2], outcome measures such as Functional Assessment of Cancer Therapy-Fatigue (FACT-F) were used to determine the level of QOL. The purpose of this study was to determine participants' perceived effectiveness of equine-assisted therapy (EAT) in regard to psychosocial and QOL outcomes.

2.2. Research Questions

RQ1: Do participants of EAT report improvements in psychosocial functioning associated with participation in EAT?

RQ2: Do participants of EAT perceive improvement in their quality of life associated with participation in EAT?

RQ3: Does length of participation in EAT in months predict improvements in psychosocial functioning?

RQ4: Does length of participation in EAT in months predict improvements in quality of life among participants?

2.3. Hypothesis

H_0: Participants of EAT will not report any improvements in psychosocial functioning and quality of life outcomes.

H_1: Participants of EAT will report improvements in psychosocial functioning and quality of life outcomes greater than zero.

2.4. Study Design

The study consisted of a convergent mixed methods design including a quantitative survey and a qualitative interview using a phenomenological research approach. This design was chosen to receive well-rounded information from participants that provide multiple levels of evidential support. The goal was to determine participants' perceived improvements and QOL based on their participation in EAT. To reach a greater audience, the survey was disseminated among EAT participants of a particular program setting, Loudoun Therapeutic Riding, Inc in the state of Virginia. This survey provided subjects an opportunity to participate in a follow-up interview to gather qualitative data on their thought processes, feelings, attitudes, and perceptions of their experiences and any benefits or downfalls of EAT.

2.5. Data Collection

The population included consumers of equine-assisted therapy through Loudoun Therapeutic Riding, Inc. This study was approved by the Shenandoah University Institutional Review Board prior to execution of the study. To be included in this study, individuals must have been enrolled in LTR EAT programs including therapeutic riding, carriage/cart driving, hippotherapy, or equine services for heroes (veterans). Participants must have attended a minimum of 1 EAT session. Exclusion criteria included participants who attended LTR services solely for movement-based therapeutic interventions.

Participants of LTR were contacted via email through LTR administration and supervisors. The email asked and encouraged the participants to complete a google form with the survey and asked for volunteers to complete an interview at a further time. Those who volunteered for an interview were directly contacted by researchers through email to discuss the planning and preparation of meetings. Interviews were conducted and recorded solely for the creation of transcriptions and were not shared outside of the research group. The survey sampling consisted of convenience sampling to address individuals who were representative of the chosen population and were accessible. The sampling was conducted through Loudoun Therapeutic Riding's network of participants which limited the sample pool to those who attend services through their program. The sample size was determined by the number of participants who completed the survey and interview. Dependent variables for this study included participant responses throughout the quantitative survey. Independent variables included changes in posture, balance, attention, focus, feelings of anxiety, feelings of depression, feelings of stress, overall well-being, confidence, independence, self-esteem, social skills, self-care, feelings of hope, and feelings of trust.

The quantitative survey was created to gather information pertaining to the participants' experiences and attitudes regarding EAT and how it has contributed to improvements or declines in various areas of their life. The survey was constructed in an electronic format that began by gathering demographic information as well as information specific to LTR program followed by consecutive questions addressing psychosocial aspects. The electronic format of the survey was designed to be conducive for administration, comfort, and confidentiality of the participant. The survey was then distributed to LTR facility by the program director via email to current participants as well as the option of electronic completion on site. The last two questions of the survey asked if the participant was interested in being contacted for a qualitative data collection gathering session via a one-on-one interview.

Collaboration with the program director of Loudoun Therapeutic Riding was utilized in helping to identify individuals that fit within the inclusion and exclusion criteria for this study. Once identified, the participants were provided with a quantitative survey that was composed of twenty questions that included consent and demographic information followed by perceptions of improvement in varying physical, psychosocial, cognitive, and emotional areas. Once the survey was completed, submission data was received by the researchers for review and analysis. Participants who agreed to complete the qualitative interview were contacted individually. Interviews were conducted during a one-on-one session with individual researchers. Transcripts from those interviews were coded and analyzed for representation in the study.

2.6. Data Analysis

The participants of this study included individuals who ranged across the lifespan, but focused more specifically on individuals between four and thirteen years, older teenagers, adult students, and veterans. These participants presented with psychosocial concerns such as anxiety and depression. The survey was sent to participants who have extensive experience in the program as well as individuals who were new to equine-assisted therapy. All participants have attended EAT sessions at this facility but reside in areas across the states of Virginia, West Virginia, and Maryland. Participants in this study had to complete a minimum of one EAT session to be eligible to complete the survey.

Data collected from the survey was exported and entered into the JASP statistics software program to analyze the collected quantitative data. The interview responses were transcribed and coded for themes and analysis. A frequency analysis for demographic information and average scores for Likert scale questions was performed, and descriptive data were tabulated. The Shapiro-Wilk test was utilized throughout the analysis to determine the use of parametric or non-parametric inferential analyses. For between-groups difference analyses, the Welch's T-test or the Mann-Whitney U test was used given normality of the data. Kendall's Tau-B and Logistic regression tests were used to analyze survey questions for associations and odds ratios, respectively. The correlation strength of Kendall's Tau-B analyses were based upon the Schober et al. [26] cutoff values for rank-based correlations. For the analysis of the qualitative data, Creswell's [27] interpretation of the Colaizzi process for qualitative data analysis was chosen. Once both the quantitative and qualitative data were analyzed, they were then compared and contrasted to assess the convergence of these two methods of analysis. Their overall fit regarding answering each of the research questions was then discussed.

3. Results

3.1. Quantitative Results

3.1.1. Participant Demographics

A total of 52 (N = 52) participants completed the quantitative survey. The majority of this subject pool identified as female (n = 36) compared to male (n = 16). The mean age of the sample was 26.4 years, however, there existed generally high levels of variability of participant age throughout responses (SD = 16.5 years; see Table 1). Refer to Figure 1 for frequencies regarding program participation among participants. There were no statistically significant differences in improvement in any psychosocial functioning or well-being factor based upon income level, ethnicity, choice of therapeutic riding modality, history of attending a previous therapeutic riding program or, notably, frequency of therapeutic riding visits per week between one and three times per week.

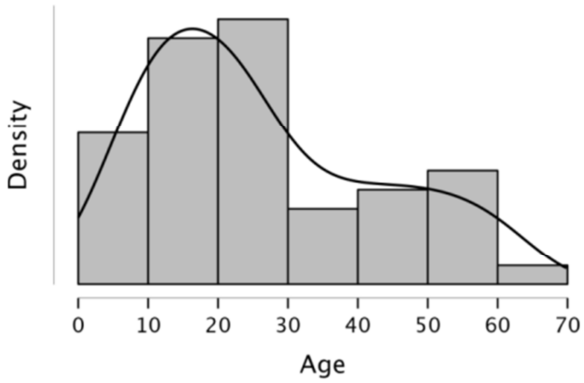

Figure 1. *Histogram of Participant Ages in Years.*

Table 1. *Equine-Assisted Therapy Program Distribution.*

Program Totals	Frequency	Percent	Cumulative Percent
Therapeutic Riding	42	66.67	66.67
Carriage/Cart	6	9.52	76.19
PT/Hippotherapy	1	1.58	77.77
Veterans	6	9.52	87.29
Unmounted	8	12.71	100
Total	63	100	

3.1.2. RQ1: Do Participants of EAT Report Improvements in Psychosocial Functioning Associated with Participation in EAT

Frequency analysis showed that participants within LTR's EAT program self-reported higher levels of improvement within psychosocial functioning areas such as self-esteem (M = 2.79, SD = 0.46), confidence (M = 2.96, SD = 0.19), independence (M = 2.71, SD = 0.50), and social skills (M = 2.78, SD = 0.47). While females reported modestly higher levels of improvement in psychosocial functioning - with the exception of self-esteem - these differences were not statistically significant.

3.1.3. RQ2: Do Participants of EAT Perceive Improvement in Their Quality of Life Associated with Participation in EAT

Overall, the majority of participants self-reported improvement in areas connected to QOL, including anxiety (M = 2.76, SD = 0.52), depression (M = 2.80, SD = 0.41), stress (M = 2.87, SD = 0.40), well-being (M = 2.96, SD = 0.20), self-care (M = 2.55, SD = 0.55), hope (M = 2.76, SD = 0.48), and trust (M = 2.76, SD = 0.48). Females reported significantly higher levels of improvement in stress (M = 2.97) when compared to males (M = 2.67), p = .016, W = *183.00*, CI 95% [0.115, 0.537].

Regarding the benefit of therapeutic riding modalities on depression conditioned upon age, a logistic regression was performed to ascertain the effects of therapeutic riding modalities and age on the likelihood that participants report improvements in depression symptoms. The logistic regression model was statistically significant, $X2$ (32) = 8.174, p = .043. The model correctly classified 87% of all cases, with a notable sensitivity of 95%. An increase in age was associated with increased likelihood of reporting improvements in depression symptoms, where every year

older a participant is, their likelihood of reporting improvements in depression symptoms increases by 11% (see Figure 2). Otherwise, while significant differences exist regarding age and both confidence and stress levels, logistic regression estimations for these variables were not statistically significant and did not have acceptable model fit.

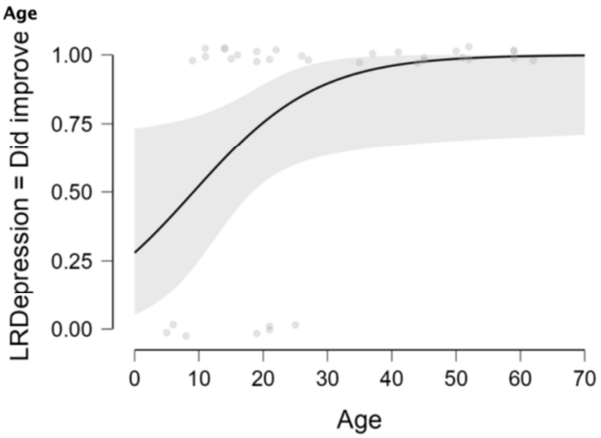

Figure 2. *Improvements in Depression with Age.*

Finally, reports of improvements in Depression and Confidence significantly differed with age, where adults generally saw greater improvements in depression (33.9 years vs. 15.0 years old), p = .006, t (21.66) = 4.05, g = 1.14, CI 95% [0.40, 2.23] and confidence outcomes (27.2 years vs. 8 years old), p = .046, W = 7.50, rbc = 0.847, CI 95% [0.40, 0.97].

3.1.4. RQ3: Does Length of Participation in EAT in Months Predict Improvements in Psychosocial Functioning

Associations were found between the length of time in weeks participating in all of the forms of EAT and improvements in independence, p = .0240, *rt (52)* = .213 and social skills, p = .037, *rt (52)* = .222. No significant associations were found for length of time in weeks and improvement within areas of confidence, p = .270, *rt (52)* = .063 and self-esteem, p = .318, *rt (52)* = .051.

3.1.5. RQ4: Does Length of Participation in EAT in Months Predict Improvements in Quality of Life Among Participants

Associations were also found between length of time of EAT participation in weeks and self-reported improvements in anxiety, p = .036, *rt (52)* = .265, well-being, p = .018, *rt (52)* = .219, self-care, p = .010, *rt (52)* = .273, hope, p = .042, *rt (52)* = .204, and trust, p = .003, *rt (52)* = .310. No significant associations were found for length of time in weeks and participation within areas of depression, p = .130, *rt (52)* = .151 and stress, p = .260, *rt (52)* = .071.

A total of 7 interviews were conducted for the qualitative portion of this study. To improve validity and reliability of the data, one researcher conducted the interviews. Transcriptions from the interviews were used to determine common themes related to the impacts of EAT. The following themes were identified: Increased Confidence, Increased Emotional Regulation, and Influence of Context and Environment.

3.2. Qualitative Results

3.2.1. Increased Emotional Regulation

Qualitatively, common responses the participants used to describe the skills they acquired from therapeutic riding can be identified as having *increased emotional regulation.* Many participants shared the same experience of how riding and the LTR atmosphere calmed down their anxious feelings and reduced their stress. Participant 3 and Participant 5 specifically mentioned how the feeling is hard to explain, there's just a connection between the rider and the horse that is relaxing. However, Participant 6 was able to describe this connection as reflection or reciprocation. The individual stated that the horse reciprocated their actions and energy. The horse reflected the rider's emotions through actions which in turn made the rider self-aware of their current emotion. The rider's example was if they were stressed or nervous, their horse would be tense. If the rider was calm and relaxed, the horse would fall asleep if they were standing still.

3.2.2. Increased Confidence

As a result of the interviews, it was commonly stated that with the use of EAT, these participants would be more willing to try or do new things than they were before the intervention. Various participants also expressed that through skills learned in EAT, they have experienced the feeling of increased independence. Certain participants noticed strength, feeling a sense of accomplishment, and acceptance. Lastly, several participants have disclosed their willingness to engage socially has increased since participating in EAT. Participant 1 described making new friendships and how their comfort level changed positively. Overall, several participants described shared experiences with feeling an increased sense of confidence after their time participating in EAT.

3.2.3. Influence of Context and Environment

Participants commonly mentioned the context and environment of the riding facility were influential in skills development and a positive experience overall. Various participants stated that the horse's temperament made them feel comfortable. It was also reported by the participants that the horses were vetted and chosen specifically for this type of program. Participants communicated feelings of connection and comfort from the staff, other participants, and the horses themselves. Participant 6 stated that the calming nature of the horses, their personality, and the program are peaceful. The riding facility, including staff and animals, created a safe and attractive environment for past and current participants.

3.2.4. Essence Statement

Based on the interviews conducted for this portion of the study, the overarching theme can be identified as an *improved perception of the individual's QOL since attending EAT.*

Table 2. *Qualitative Excerpts and Themes.*

Themes	Excerpts
Increased Confidence	1. "She was on a completely new horse this week and she was fine. She's so much more confident with the horse." (P1) 2. "I feel like she has gotten more confident over time, and has felt better about herself." (P1) 3. "It has greatly increased my confidence and my freedom." (P2)
Increased Emotional Regulation	1. "There's something about horses that is just relaxing to be around them." (P3) 2. "She said she liked the riding part, but actually it was the interaction with the horses that she finds really really relaxing and taking care of them so that is what she's doing now." (P1) 3. "I would say, the stress completely goes away once I pull up to the barn it's almost like magic." (P6)
Influence of Context and Environment	1. "There's a lot of confidence building that the trainers are good about pushing without making him feel uncomfortable." (P4) 2. "I will say from attending there—the folks that work there, they care about it… and the horses are hand-picked for the students to help with their confidence or help." (P6) 3. "Horses aren't judgmental, they don't know you. They're there, and they respond to you. They respond well, and they teach people to modulate their anxiety levels because it translates from you to the horse and back from the horse to you." (P4)

4. Conclusion

The majority of participants of this study generally reported improvements in QOL and psychosocial functioning factors participating in EAT. Of note, the total length of time a participant engages with EAT is positively associated with the overall effect of improvement in most QOL and psychosocial functioning constructs studied, including well-being, posture & balance, anxiety, independence, social skills, self-care, hope, and trust. This potentially suggests that perpetual participation in EAT may not have a ceiling effect for providing, at the very least, mild continuous benefits in these factors. While improvements in confidence, self-esteem, depression, and stress were not associated with length of total participation time in EAT, it can be reasoned that participants reported improvement in these constructs independent from the time frame of their participation, which is affirmed by both the descriptive analysis and qualitative analysis of this study. Both the quantitative and qualitative outcomes of this study support the evidence developed throughout the past ten years regarding the capacity of EAT to improve confidence and self-esteem [7-8], well-being [7, 9], depression and anxiety [11], and stress [17].

The results of this study also provide further context to the conclusions of Naste et al. [11] regarding the potential efficacy of EAT on symptoms of depression. The logistic regression model developed within this study provides support to a prospective phenomenon that the older a participant is in age, the more likely that participation in EAT is to successfully improve depression symptoms. This may be attributed to the fact that adults in the United States generally experience higher incidences of depression of any severity at ages 45 years old and greater when compared to peers aged 30 to 44 years old [28]. While further research is necessary to substantiate this finding, this result may provide further evidence that EAT can be a valuable adjunctive tool in the management of depression in both middle-aged and older adults who may require additional intervention beyond gold-standard care.

5. Strengths and Limitations

Various strengths were noted throughout the research process. The mixed methods design allowed researchers to analyze and compare both quantitative and qualitative data. Using both quantitative and qualitative research methods provided a well-rounded perspective of the population's perceptions of their lived experiences. To increase internal validity of the qualitative interview process, a designated student researcher was identified to complete all seven of the post-survey interviews. Finally, the completion of the survey was timely with a high response rate.

The study included the site-specific survey created for LTR and the specific programs provided which limited external validity. Because this survey was created uniquely for LTR, there has been no previous use to examine psychometric properties. To make this study more generalizable and reproducible, survey questions should be made applicable to broader populations. The qualitative interview process experienced difficulties with non-response from participants, as approximately 7.5% of participants agreed to participate in the qualitative post-survey interview.

6. Recommendations for Future Research

Further recommendations include modifying the survey to address a broader variety of therapeutic riding programs and their participants. Reproduction of this study with a larger sample and a broader population would be beneficial to the progression of EAT based science. Finally, reproduction of the measurement tool is recommended to further determine its psychometric properties.

Conflicts of Interest

The authors declare that they have no competing interests.

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