

Chronic Illness, Quality of Life, and Equine-Assisted Activities

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Abstract

Purpose: To explore the quality of life in individuals with chronic illness and to examine if those who interact with horses are impacted by these experiences.

Methods: Adults (ages 18+) diagnosed with a chronic illness (defined as an illness that lasts for one year or longer and requires continuous medical attention (Centers for Disease Control and Prevention, 2021)) participated in a voluntary self-report online survey. The questionnaire included quality of life measures (RAND-36 and WHOQOL-BREF questionnaires), as well as an assessment of equine-assisted activities.

Results: Results of several t-tests revealed two findings approaching significance. Participants who reported Equine-assisted activities (as compared to those who did not report Equine-assisted activities) reported better physical health as measured by the physical health subscale of WHOQOL ($t(23) = 1.62, p = .071$) and the physical health subscale of RAND ($t(23) = 1.85, p = .077$). Results of all other t-tests were not significant. Spearman's rank correlation was computed to assess the relationship between frequency of involvement with Equine-Assisted Activities and each measure of Quality of Life. Results of these correlational analyses were not significant.

Conclusions: Equine-assisted activities may be related to improved physical health in individuals with chronic illness. Results are tentative given the small sample size, yet indicate possibilities that equine-assisted activities could be an effective therapeutic model for both mental health professionals and physicians to offer patients living with chronic illness.

Key Words: Chronic Illness, Quality of Life, Equine-Assisted Activities, Equine, Horse

Chronic Illness, Quality of life, and Equine-Assisted Activities

Equine-assisted activities (EAA) have a range of evidence in support of the benefits it has on mental health. Previous evidence shows positive results in areas of accomplishment, emotional regulation, self-awareness, and self-confidence in individuals who participated in equine-assisted activities for mental health issues. Limited knowledge exists, however, on the effect of EAA and how they contribute to quality of life. Specifically, research on how EAA contribute to the quality of life in individuals with chronic illness is limited. Cerulli et al. (2014) claimed to be the first in studying effects of equine-assisted therapy in breast cancer survivors. People with chronic illness experience a myriad of factors causing a disruption of quality of life including social support, autonomy, energy, ability to accomplish tasks, engagement in activities, and emotional wellbeing. The present study sought to explore the quality of life in individuals with chronic illness and to provide evidence for equine-assisted activities positively impacting the quality of life in these individuals.

Literature Review

Chronic Illness

Chronic illness has a broad range of meanings, symptoms, recovery, and impact on different populations. This study focused on chronic illness defined as "...conditions that last one year or more and require ongoing medical attention or limits activities of daily living or both," (Centers for Disease Control and Prevention, Retrieved 2022). According to the Centers for Disease Control and Prevention, six in ten adults in the United States are diagnosed with a chronic illness, and four in ten are diagnosed with more than one (Centers for Disease Control and Prevention, 2022). Chronic illness is believed to develop due to stress and chronic activation of the nervous system, which overtime negatively impacts the immune system (Mate, 2003).

Chronic illness symptoms range in severity from minor to serious and affect all demographics. Symptoms impact the four primary quality of life domains of physical, social, emotional, and functional, which all play a role in one's overall health and wellness (FACIT group, 2020).

Physical. Chronic illnesses have an immense effect on physical capabilities, either from developed symptoms, or side effects from disease treatments. Chemotherapy treatment in breast cancer patients causes nausea, fatigue, and pain (Bogaarts et al., 2011). Fibromyalgia causes constant, widespread pain throughout the body, and Hashimoto's Thyroiditis can cause fatigue, muscle weakness, and interfere with insulin and blood sugar functioning (Mayo Clinic, 2020). These symptoms and side effects create a direct impact to physical capabilities and normal body functioning. These can interfere and limit activities associated with active lifestyles.

Body image is also a major disruption of self-esteem and confidence which correspond with quality of life. A significant deterioration in positive perception of body image after diagnosis has been found specifically in regard to breast cancer survivors. This is due in large part to survivors undergoing a mastectomy (Bogaarts et al., 2011). Other body image issues can arise from side effects of medications and lack of physical activity due to mobility issues.

Social. Relationships play a vital role in health. Supportive relationships and access to positive social supports can be health promoting, while unhealthy relationships and lack of support can be stress producing (Fine, 2000). People with chronic illness can experience a disruption in their social support system. Several factors contribute to this disruption including feeling like or being a burden on others. Treatment interventions and symptoms can get in the way of daily functioning such as household chores. This can add strain to a support system as others take on more chores both inside and outside of the house that the chronically ill individual

can no longer do. Members of a support system who feel obligated or overwhelmed may also have difficulties with expressing their own stress and illnesses to the chronically ill individual.

Social integration can be challenging once a person experiences symptoms of chronic illness. Inability to stand for long periods of time or lacking energy can be factors in prohibiting chronically ill individuals from participating in social events or large gatherings of people. This can lead to social isolation which then perpetuates feelings of loneliness and depression.

Relationships can also be greatly affected by diagnosis of a chronic illness. Chronically ill individuals may avoid social situations due to symptom flare ups, not feeling well, not wanting to be a burden, or not being able to participate in activities they were otherwise able to before the onset of symptoms. Relationships that were founded on similar interests might dwindle if the chronically ill individual can no longer participate in those activities. Intimate relationships might strain if the significant other now assumes the role of caretaker.

Emotional. One's emotional domain can be highly disrupted due to the onset of symptoms and diagnosis of a chronic illness, mainly in part from an individual's perceptions of the implications that their illness places on their life. Carver et al. (2005) found correlations between optimism levels and quality of life in breast cancer survivors. They studied the participants' optimism levels in response to challenges and problems and used the data to predict effects of optimism on long-term wellbeing. Disruption of self-confidence is also affected by a chronic illness via a person's perception of their own self-competence. The loss of affected domains causes a negative impact on one's emotional wellbeing.

This negative emotional state can also lead to distress and depression, adding on more symptoms to the already symptomatic individual. Egede, L., and Ellis, C. (2010) found evidence

to support a connection between depression and type 2 diabetes. The data showed bi-directional relationships in that individuals with diabetes had an increased risk of depression, and individuals with depression had an increased risk of diabetes.

Functional. Work environments can cause strain and stress in healthy individuals. This stress can exacerbate symptoms in those with chronic illness. Heavy workplace demands can add more stress on symptoms of brain fog, fatigue, inability to concentrate, and pain associated illnesses. All these symptoms can accumulate to affect an individual's autonomy, causing a disruption in their overall functioning. Losing autonomy can lead to feeling a loss of control over life, loss of sense of purpose, and loss of a life trajectory.

All areas of the aforementioned wellness domains have a profound impact on one's identity. Requiring more attention from support systems and caregivers can also affect one's perception on how they view their autonomy and identity. Issues with workplace environment can create disruptions in desired life paths affecting purpose. Adjusting to newly placed limitations on physical capabilities can impact level of enjoyment in hobbies undertaken before the diagnosis (Wicks et al., 2019). Decreased engagement in leisure activities, hobbies, interests, and recreation lead to a loss of enjoyment and source of meaning. "Inability to perform valued activities, such as leisure, may play a substantial role in how people with chronic illness perceive their health ..." (McQuoid, J., 2017, p.89). Physical, emotional, social, and functional domains interrelate in impacting perceptions of quality of life in individuals with chronic illness.

Mind-Body Connection

Epigenetics. The mind-body connection is an important factor to take into consideration when dealing with health and wellbeing. Difficult life experiences, trauma, and neuroplasticity

play a role in epigenetics and the onset of chronic illness alongside other predisposing factors such as gene heredity and mutations. People's perceptions, beliefs, and interpretations of their environment have a direct effect on their emotional reactivity. Stress and emotional repression influences epigenetics. "The overwhelming need of the child to avoid pain and conflict is responsible for the personality trait or coping style that later predisposes the adult to disease," (Mate, 2003, p.246). Factors such as environment, trauma, emotions, and stress all play a role in epigenetics and create alterations which affect gene expression and function (Henriques, 2019). Genes are altered as a result of attached methyl groups composed of one carbon and three hydrogen atoms (CH₃). The amount of methylation is influenced by a person's environment and life experiences which can include: adverse childhood experiences, emotional stress, exercise, infections, relational attachment, and diet (Mead, 2014; 2016).

Neuroplasticity. It is possible to reverse gene alteration through the process of neuroplasticity. Neuroplasticity is "the ability of the brain to form and reorganize the synaptic connections between neurons," (Schweig, 2020, para. 3). This reorganization can be demonstrated from both positive and negative experiences. Negative, stressful experiences in a person's life can cause the brain to form maladaptive pathways, whereas positive experiences can cause the brain to form more positive pathways which aid in healing. Neuronal pruning, healing, and repair has the ability to reverse chronic illness by activating or deactivating genes affected by epigenetics.

The limbic system also impacts health and illness. Chronic illness activates the limbic system which is responsible for detecting threats in the environment. An activated limbic system in a healthy individual will respond then deactivate after the dangerous event has passed. The

limbic system in chronically ill individuals is constantly activated, causing an unremitting state of stress. The brain can retrain itself using neuroplasticity to prune these harmful pathways that overact the limbic system, reverse methylation, and turn off activated genes which lead to chronic illness (Schweig, 2020).

Emotional competency and resiliency also play a role in neuroplasticity and generating positive pathways. Evidence suggests that higher levels of resiliency correlate with decreased symptoms and severity of disability due to a chronic disease. Greater resilience limits the degree of affected psychological and physical domains of quality of life such as depression and social integration. Neuroplasticity can increase one's resilience in recovering from adverse events and generating healthy functioning in daily living activities (Manning, L., et al., 2016). Emotional competency is the ability to feel and be aware of emotions, effectively express emotions, separate reactions in the present from emotional triggers of the past, and awareness of personal needs instead of suppressing needs for the approval of others. Stress occurs when these are not fully met or embodied and the continuous disruption of emotional competence and activation of stress results in illness. It's argued that regaining emotional competence, deactivating the nervous system, and downregulating activated genes will aid in healing illness (Mate, 2013).

Equine Therapy

Animals act as a catalyst in engaging the mind-body connection to produce therapeutic results. A practice known as Farming for Health (Berget et al., 2008) in Europe uses farm animals to support health professionals in helping patients overcome illness. Animal-assisted therapy (AAT) is able to generate positive outcomes in multiple areas of people's lives. Part of these positive outcomes derives from an adopted routine of caring for an animal and finding

purpose and responsibility in caring for another living being. These strengths generate autonomy in an individual who has otherwise lost their purpose as a result from symptoms of illness. A person's quality of life is dependent upon social supports, among other domains. Access to positive social supports promotes independence and life satisfaction, and animals are a beneficial and unconditional means of support (Fine, 2000).

Horseback riding and equine-assisted therapy (EAT) create a myriad of benefits on both mind and body. Klontz et al. (2007) found that EAT can change disruptive behavior and relieve psychological distress in certain individuals. Participants in the study showed reductions in overall psychological distress as well as improvements in psychological wellbeing. Participants also reported they had fewer resentments and more independence, upon other improved qualities.

Equine-assisted activities (EAA) are defined as “any specific center activity, e.g. therapeutic riding, mounted or ground activities, grooming and stable management, shows, parades, demonstrations, etc., in which the center's clients, participants, volunteers, instructors, and equines are involved,” (Prechter, 2014, p.7). Equine-assisted therapy (EAT) is defined as “treatment that incorporates equine activities and/or the equine environment. Rehabilitative goals are related to the patient's needs and the medical professional's standards of practice,” (Prechter, 2014, p.7). The benefits in support of EAT and equine-assisted activities (EAA) arise not only from riding, but from the work associated with taking care of horses as well. “Therapeutic horsemanship involves any of a number of active physiotherapeutic exercises on and around the horse,” (Selby & Smith-Osborne, 2013, p. 418). This array of activities includes any activity around a horse such as walking, grooming, petting, and overall horse husbandry. The act of grooming and ground work allows the rider to connect with the horse and gain a sense of

accomplishment achieved by taking care of another living thing. Horses also mirror energy and can reflect feelings the rider may be experiencing in the moment. Horses are nonjudgmental beings and act as a safe space for a person's true self to come through. Horses can sense the riders' emotions and will react either by being resistant to cues, testing their limits with what the rider will allow, or by complying to what the rider is asking (Selby & Smith-Osborne, 2013).

The multidimensional therapeutic aspects of horseback riding can contribute to neuroplasticity and the ease and alleviation of symptoms of chronic illness. Improvements in physical capabilities have been highly documented around EAA. Horseback riding requires use of targeted muscles to maintain appropriate posture when riding. A rider carries their body in a specific position to enhance balance and stability. Stomach muscles support a strong upper torso, keeping the shoulders up and back. Leg muscles keep in contact with the horse and signal aids and directions. The heels are kept down at all times to maintain balance and body position. The movement known as posting requires the use of leg muscles to carry the rider's body up and down in rhythm with the horse's gait. Research documented increased oxygen levels, cardiovascular benefits, and improved muscle strength as a result of EAA (Cerulli et al., 2014). The increased muscle strength and improved physical capabilities also contribute to improved perceptions of a person's body image.

Time spent in the saddle also calls for multiple body functions in which people do not typically engage on a normal basis. Maintaining appropriate posture is imperative for always ensuring proper balance on a horse to lower the risk of falling off. Olivier et al. (2019) found that horseback riders had greater stability and posture compared to individuals who did not participate in athletic activities. They discovered that horseback riding engages muscles in both

the sagittal and vertical axes of the body due to the varying degrees of movement perpetuated from the horse's gait.

Interpersonal relationships can be strengthened from EAA. Horses act as a catalyst for behavioral growth and self-awareness by presenting riders with immediate, here-and-now challenges. These challenges can range from ignoring, walking-away, stubbornness, and insubordination, among other equine behaviors (Klontz et al., 2007). These behaviors can elicit varying emotions and reactions from riders. The therapeutic mechanism comes from the person's reaction to the horse, and the behavior in which they engage following that reaction. Chronically ill individuals can correlate reactions to these immediate conflicts with reactions to conflicts within their own relationships by bringing awareness to this behavior.

People with chronic illness can experience an increase in autonomy because of horseback riding and EAA. Symptoms of chronic illness often create a sense of dependence on others to accomplish daily tasks. Horseback riding creates autonomy by providing individuals with achievable obstacles and general responsibilities required in caring for horses. Riders must tack and untack their horse, groom, and care for their horse before and after riding. Developing new muscle strength and balance, gaining mastery over riding skills, and successfully caring for another living animal creates self-efficacy and self-confidence. Research has shown that the more time spent around horses, the more one's self-efficacy and self-confidence increases (Farias-Tomaszewski et al., 2001).

The Present Study

Previously published studies evaluating the role of horses in animal-assisted interactions focus on either individual's physical limitations, mental limitations, or quality of life. Limited

research has explored the role of horses in animal-assisted interactions focused solely on the quality of life in individuals with chronic illness. The present study builds on previously conducted research evidencing the benefits of equine-assisted activities in other populations to explore the benefits of EAA with individuals with chronic illness. The present study addresses two research questions: Do those with chronic illness experience an increase in quality of life from engaging in equine-assisted activities? Does the degree of increase of quality of life in individuals with chronic illness relate to the frequency of engaging in equine-assisted activities? It is hypothesized that people with chronic illness will experience an increase in quality of life from engaging in these activities and that individuals with chronic illness who maintain a higher frequency of engagement in these activities will exhibit a higher level in the increase of quality of life compared to those with lower or no frequency of engaging in equine-assisted activities.

Method

Participants

Participants in this study were adults who self-reported having a chronic illness. Chronic illness are defined by the Center for Disease Control and Prevention as "...condition(s) that last one year or more and require ongoing medical attention or limit activities of daily living or both," (Centers for Disease Control and Prevention, Retrieved 2021). Data reports concluded 31 participants began the survey, four participants did not meet the criteria of having a chronic illness, and two participants did not complete the survey. The total number of participants who met full inclusion criteria totaled 25. Participants consisted of 21 females, three males, and one participant who did not provide gender information. The average age of participants ($N = 24$) was 41.8 years old ($SD = 17.0$). Relationship status of participants ($N = 25$) included ten married

individuals, five reported being in a relationship, and nine participants were not in a relationship. All participants reported obtaining higher education. The number of participants' highest level of education completed was two with an AA degree, two completed some college, eight received a BA/BS degree, nine completed graduate school, and three completed trade/technical school. One participant did not provide a value for this information. All but one participant reported ethnicity as Euro-American, and one participant reported multiple ethnicities that included Euro-American and Indigenous.

Design

This study was conducted via electronic survey which had a completion time of approximately 20 minutes. Data collection began in December 2021 and ended March 2022. The data were collected to compare the quality of life in individuals with a chronic illness who engage in equine-assisted activities versus individuals with a chronic illness who don't engage in equine-assisted activities. The data were collected through a survey hosted on the Qualtrics platform.

Materials

The survey included questions about participants' background, chronic illness, symptoms resulting from a chronic illness, self-perceptions of participants' quality of life, and their history of interacting with horses.

Background Information

Participants provided demographic information regarding their age, gender, relationship status, highest level of education, and ethnicity. Age, gender, relationship status, and ethnicity were recorded using participant self-text entry. The highest level of education was recorded

using participants selecting the choice that best fit their circumstances from the provided list of options.

Chronic Illness and Symptoms

Participants indicated their chronic illness, and symptoms experienced as a result of their chronic illness, in a self-text entry.

Quality of Life

Quality of life was assessed with the RAND 36-Item Short Form Health Survey (SF-36) (Hays & Morales, 2001), and the World Health Organization Quality of Life (WHOQOL) – BREF (The WHOQOL Group, 1998).

RAND 36-Item Short Form Health Survey (SF-36). The SF-36 is the most widely used measure of health-related quality of life (Hays & Morales, 2001). It consists of 36 items designed to address eight health concepts and how these concepts impact an individual's ability to function as well as an individual's perception of their own well-being. The eight health concepts and the number of items assessed with each concept in the SF-36 are: physical function (10), role limitations caused by physical health problems (4), role limitations caused by emotional health problems (3), social functioning (2), emotional well-being (5), energy/fatigue (4), pain (2), and general health perceptions (5). These 35 items assess objective (functionality) and subjective (well-being) measures of quality of life within the past four weeks. The last item addresses any change in an individual's perceived health within the past 12 months. The measure is a mix of 3, 5, and 6-point Likert scales (1 = None – 6 = Very severe; 1 = Not at all – 5 = extremely; 1 = All of the time – 6 = None of the time; 1 = Definitely true – 5 = Definitely false), as well as Yes or No. Questions included, "During the past 4 weeks, to what extent has your physical health or

emotional problems interfered with your normal social activities with family, friends, neighbors, or groups?" Responses to the 36 items are transformed to a 0-100 possible range, with a higher number defining a more favorable health state. Each health concept is an average of the items for the concept (scale).

The eight health concepts are averaged into two summary scales. Physical health includes physical function, role limitations caused by physical health problems, energy/fatigue, pain, and general health perceptions. Psychosocial health is the average of emotional well-being, role limitations caused by emotional health problems, and social functioning. Hays and Morales indicate that the two summary scales were derived from a factor analysis with oblique rotation and provide a reliable (Cronbach alpha > 0.90) and valid measure of health-related quality of life.

World Health Organization Quality of Life (WHOQOL)-BREF. The WHOQOL-BREF is an abbreviated version of the WHOQOL-100. The WHOQOL-100 was developed in attempts to broaden the measures included in assessing quality of life beyond mortality and morbidity. These broadened measures include "... the impact of disease and impairment on daily activities ... perceived health measures ... and functional status ..." (The WHOQOL Group, 1998, p. 5). WHOQOL-BREF assesses domains of physical health (score is average of 7 items), psychological health (score is average of 6 items), social relationships (score is average of 3 items), and environment (safety, accessibility, etc.) (score is average of 8 items). The WHOQOL-100 consists of 24 facets relating to an individual's quality of life. The WHOQOL-BREF includes one question from each facet and includes two additional questions relating to overall quality of life and general health. The WHOQOL-BREF is used over the WHOQOL-100

when used with additional assessment measures. This instrument has been used to assess quality of life in a large number of cultures throughout the world.

The measure uses questions requesting individuals to consider the last four weeks and respond using of a 5-point Likert scale (1 = Not at all – 5 = Completely; 1 = Very dissatisfied – 5 Very satisfied; 1 = Never – 5 =Always). Higher scores indicate better health. Questions include, “How satisfied are you with yourself? How much do you enjoy life? Do you have enough energy for everyday life?” The WHOQOL-BREF is internally reliable (Cronbach alpha 0.66-0.84), consistent over time ($r = 0.66-0.87$), and is valid (discriminates between ill and well individuals) (The WHOQOL Group).

Experience with Equine-Assisted Activities

Experience with equine-assisted activities was assessed through an original seven-item questionnaire created specifically for this study. The measure consisted of 4, 5, and 6-point Likert scales (1 = None – 6 = Daily; 1 = Increased after each interaction – 5 = Decreased after each interaction), as well as Yes or No, and text-entry responses. Questions included, “In the past six months, how often have you engaged in equine-assisted activities?” The means for creating this measure was to assess the effects of equine-assisted activities on domains associated with quality of life. It was designed to provide comparable and contrasting data among those with a chronic illness who engage in equine-assisted activities and those with a chronic illness who don’t engage in equine-assisted activities.

Procedure

The procedure of the study involved providing a survey for volunteers who fit the criteria of having a chronic illness. The survey was issued electronically, and a link was virtually

supplied to those who wished to participate. This was a confidential study; neither the identity of the participants nor their responses were disclosed. A drawing for one (1) \$25 Visa e-gift card was offered as an incentive for participants to take part in the survey. Participants needed to self-identify as being over the age of 18 and as having a chronic illness - an illness which is defined as a condition that lasts one year or more and requires ongoing medical attention, or limits activities of daily living, or both, according to the Center for Disease Control.

Ethical Considerations

Physical risks were not anticipated in association with the completion of the survey in this study. Participants may have experienced psychological distress from answering questions about their chronic illness and subsequent limitations as a result from symptoms of their illness. Participants were referred to resources if distress was experienced. The necessity of such risks was to collect data on the participant's perception of their chronic illness, and subsequent limitations which may impact their quality of life. The psychological risk was minimal and the benefits of the study outweighed the minimal risk involved. The study was approved by the Chico State Institutional Review Board.

Results

Data Analysis

Data collection took place over two months and was conducted via electronic survey, which took approximately 20 minutes to complete. Researchers analyzed the data using the Statistical Program for Social Sciences (SPSS). Responses for chronic illness and involvement in Equine-Assisted Activities were summarized. Means and standard deviations from demographic data, quality of life domains under the WHOQOL-BREF, and summary scales of quality of life

domains under the SF-36 were calculated. T-tests were calculated to assess differences in quality of life between those who participated in Equine-Assisted Activities and those who did not participate in Equine-Assisted Activities. Correlation coefficients were calculated to examine the relationship between frequency of time spent engaging with Equine-Assisted Activities and Quality of Life.

Chronic Illness

The reported chronic illnesses encompassed illnesses categorized under neurological and autoimmune with sub-categories of connective tissue, autoinflammatory, respiratory, and multi-system disorders. Neurological disorders are qualified as diseases of the central and peripheral nervous systems and affect “the brain, spinal cord, cranial nerves, peripheral nerves, nerve roots, autonomic nervous system, neuromuscular junction, and muscles,” (World Health Organization, 2022, para. 1). Neurological disorders can result from bacterial, viral, fungal, parasitic, or immune responses.

Autoimmune diseases are qualified as the production of antibodies which directly target healthy tissue. “Autoimmune diseases develop when ... B lymphocytes (autoantibodies) and T lymphocytes ... cause a pathological and/or functional damage to the organ/tissue ...” (Johns Hopkins Medicine Pathology, 2022, para. 8).

Specific reported illnesses reflect varied chronic illness and included: Lupus, Fibromyalgia, Diabetes, Pancreatic Cancer, Asthma, Irritable Bowel Syndrome (IBS), Ehlers Danlos Syndrome (EDS), Schizophrenia, Congestive Heart Failure, and Rheumatoid Arthritis. Each participant reported a different chronic illness. Participants reported a wide variety of symptoms experienced from their illness that included fatigue, anxiety, depression, insomnia,

muscle and joint pain and weakness, limited mobility, shortness of breath, low motivation, dizziness, and brain fog.

Chronic Illness and Equine-Assisted Activities

A series of t-tests were conducted to examine possible differences in measures of Quality of Life between participants who reported Equine-Assisted Activities ($n = 10$) and those who did not report Equine-Assisted Activities ($n = 15$). Results of these t-tests revealed two differences approaching significance between participants who reported Equine-Assisted Activities and those who did not report Equine-Assisted Activities in the physical health subscale of WHOQOL ($t(23) = 1.62, p = .071$) and the physical health subscale of RAND ($t(23) = 1.85, p = .077$). Results of all other t-tests were not significant. Table 1 displays the means and standard deviations for these analyses.

Table 1

Means (Standard Deviations) for Quality of Life Scales by EAA Involvement

Scale	Equine-Assisted Activities	
	Yes Mean (SD) [$n = 10$]	No Mean (SD) [$n = 15$]
Overall quality of life (WHOQOL-BREF)	3.8 (0.92)	3.1 (1.06)
Physical health – WHOQOL-BREF*	3.3 (0.85)	2.7 (0.62)
Psychological health – WHOQOL-BREF	3.0 (0.84)	3.0 (0.94)
Social relationships – WHOQOL-BREF	3.4 (0.70)	3.0 (0.89)
Environment – WHOQOL-BREF	3.9 (0.61)	3.6 (0.58)
Physical health – RAND-36*	48.7 (22.13)	34.1 (17.29)

Psychosocial health – RAND-36	58.8 (25.68)	48.0 (22.89)
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* $p < .10$

Participants' perception of their quality of life showed an interesting contrast between those who engaged in equine-assisted activities and those who did not. Data from those who engaged in equine-assisted activities showed that 70% of participants rated their overall quality of life as either Very Good or Good, whereas 10% rated their overall quality of life as Poor. Data from those who did not engage in equine-assisted activities showed that 33% of participants rated their overall quality of life as either Very Good or Good, and 33% rated their overall quality of life as Poor. Participants in both categories also reported varying responses to the question positing what extent their physical health or emotional health problems interfered with their normal social activities. Self-reports showed that 70% of participants who engaged in EAA had None or Slight interferences to normal social activities, and 10% had Extreme interferences. Self-reports from participants who did not engage in EAA showed 14% had None or Slight interference, and 46% had extreme physical or emotional health problems interfere with normal social activities.

Equine-Assisted Activities

Eighty percent of all participants reported feeling somewhat or extremely comfortable around horses. Ten of the total 25 participants reported that they spent time around horses on at least a monthly basis, with four of the ten participants who spent time around horses reporting daily engagement with EAA. The ten participants who reported that they engaged in EAA continued with the survey answering questions solely related to EAA. Thirty percent indicated

that they spent between 30-60 minutes engaging in EAA, and 70% indicated they spent one to three hours engaging in EAA. Ninety percent of participants spent time engaging with equines prior to their diagnosis of a chronic illness. Thirty percent of participants stated that they did not engage in EAA for longer than six months at some point following their diagnosis of a chronic illness.

Participants were asked to rate how they felt after each interaction with EAA within different domains of quality of life. Table 2 displays these responses. Of those participants who responded to these survey items, one participant stated that their acceptance of their illness increased after each interaction with EAA and the majority of participants reported decreased anxiety after most interactions and increased self-confidence after most interactions. One-third of participants reported increased trust in their abilities, increased energy levels, and increased socialization after most interactions with EAA.

Table 2

Frequency of Impact on Quality of Life Domains after EAA Involvement

Quality of Life Domain	After Most Interactions with Horse...		
	Increased	Neither Increased nor Decreased	Decreased
Acceptance of illness	1	8	0
Body composition	2	7	0
Anxiety	0	3	6
Trust in physical abilities	3	6	0

Pain	1	7	1
Ability to accomplish other tasks	2	6	1
Motivation to accomplish other tasks	4	3	2
Stamina and energy	3	5	1
Self-confidence	5	4	0
Socializing with others	3	6	0

Note. $N = 9$.

Spearman's rank correlation was computed to assess the relationship between frequency of involvement with Equine-Assisted Activities and each measure of Quality of Life. Results of these correlational analyses were not statistically significant, though several coefficients were small to moderate in size (i.e., $r = 0.37-0.42$). Table 3 displays the correlation coefficients.

Table 3

Correlation Coefficients for Frequency of EAA Involvement by Quality of Life Scales

Scale	Spearman Rank Coefficient
Overall quality of life (WHOQOL-BREF)	0.37
Physical health – WHOQOL-BREF	0.32
Psychological health – WHOQOL-BREF	0.42
Social relationships – WHOQOL-BREF	0.26
Environment – WHOQOL-BREF	0.34
Physical health – RAND-36	0.38
Psychosocial health – RAND-36	0.16

Note. $N = 10$ for all analyses except Physical health – WHOQOL-BREF, $N = 9$.

Discussion

The purpose of this study was to determine if those with chronic illness experience an increase in quality of life from engaging in equine-assisted activities. The relationship between quality of life in individuals with chronic illness and the frequency of those individuals engaging in equine-assisted activities was also explored. Previous research shows significant improvements in individuals who participated in equine-assisted therapy protocols across multiple domains including body composition, strength, and quality of life (Cerulli et al., 2014). Systematic reviews of literature surrounding the efficacy of equine interventions on those with chronic illness provided support for the effectiveness of such interventions among individuals facing various health challenges (Selby & Smith-Osborne, 2013). These literature reviews aimed to highlight biopsychosocial benefits beyond populations with mobility issues. The present study sought to both broaden and narrow previous research of the use of equine interventions. The study aimed to broaden research to include all aspects of equine-assisted therapy such as time spent with horses, recreational activities, and equines as a therapeutic change agent. The study narrows research with the targeted population of those diagnosed with a chronic illness. This is believed to be the first study exploring the effects of frequency and length of time spent with EAA on quality of life in individuals with chronic illness.

The present study supports the previous research in the benefits of EAA among varying domains of quality of life. Findings involving physical health converged over two instruments (SF-36 and WHOQOL-BREF) and showed that those who spent time around horses have a better

physical health than those who do not. The results were not statistically significant but did approach significance. Findings also showed positive, small to moderate correlations between time spent with equines and overall quality of life, physical health, and psychological health. The results did not achieve statistical significance due to the limited sample size, however statistical data provides evidence for the direction that was predicted. Data are present to support practical significance that equine-assisted activities may have value to the physical health and improved quality of life of individuals with chronic illness. The quality of life of individuals improved in each case of spending time with horses. This was most notable with decreasing anxiety and increasing self-confidence.

The findings of this study support the hypothesis that people with chronic illness will experience an increase in quality of life from engaging in these activities compared to individuals who do not engage in these activities. Findings also support the hypothesis that individuals with chronic illness who maintain a higher frequency of engagement in these activities will exhibit a higher level in the increase of quality of life compared to those with lower or no frequency of engaging in equine-assisted activities.

Limitations

Several limitations to the present study should be considered when reviewing the results. The most notable limitation was the small sample size. Thirty-one people elected to take part in the research study. Four participants did not meet the inclusion criteria of having a chronic illness and two participants did not contribute data to the survey for unknown reasons. The final sample size totaled 25 participants. This small sample size impeded the achievement of statistical significance. Another limitation is the use of participant perception and self-report measures.

Quality of life is a subjective value and therefore all data must rely on patient insight, honesty, and accountability. The subjectivity also creates room for error in the meaning of terms. An example is having the option of pain being ‘extreme’ on a questionnaire, where participants may perceive ‘extreme’ on separate points of a spectrum. Not having access to prior medical data or blood work analysis prohibits the ability to definitively compare symptom changes at a clinical level.

A third limitation needs to account for external variables that may have impacted the participants’ quality of life. External variables that weren’t researched in this study can also affect an individual’s quality of life, both positively and negatively, resulting in responses that might not be impacted by the engagement of equine-assisted activities. The two measures studied participants’ quality of life over the past two and four weeks. The timeline of the survey as it relates to an individual is also something of which to be made aware. In addition to cautions of external variables influencing quality of life, the correlational approach used in the present study does not allow interpretation of causation. Does participation in equine-assisted activities cause improved quality of life or do individuals with higher quality of life have the ability and circumstances to participate in equine-assisted activities?

Future Research

The present study showed practical significance in the direction of the hypothesis. Future research should take the foundation of this study and administer it on a larger scale to accumulate a greater sample size that should yield statistically significant results. Statistically significant results in this area of study are important because they can highlight other therapeutic modes available to mental health professionals who have clients with a chronic illness impacting their

quality of life. These data promote exciting opportunities to create findings for both physicians and mental health providers. Knowledge correlating improved quality of life with specific chronic illness benefits health professionals in providing targeted interventions and treatment plans to help their patients. Research of this nature can provide a better quality of life for those facing physical and emotional impacts from their illness. Future research on this topic hopes to achieve more awareness on the effects of EAA and provide more effective therapeutic interventions and modalities.

References

- Berget, B., Ekeberg, Ø., & Braastad, B.O. (2008). Attitudes to animal - assisted therapy with farm animals among health staff and farmers. *Journal of Psychiatric and Mental Health Nursing, 15*, 576-581. <https://doi-org.mantis.csuchico.edu/10.1111/j.1365-2850.2008.01268.x>
- Bogaarts, M.P.J, den Oudsten, B.L, Roukema, J.A, van Riel, J.M.G.H, Beerepoot, L.V, & deVries, J. (2011). Development of the psychosocial distress questionnaire-breast cancer (PDQ-BC): A breast cancer-specific screening instrument for psychosocial problems. *Supportive Care in Cancer, 19*(10), 1485–1493. <https://doi.org/10.1007/s00520-010-0968-9>
- Carver, C. S., Smith, R. G., Antoni, M. H., Petronis, V. M., Weiss, S., & Derhagopian, R. P. (2005). Optimistic personality and psychosocial well-being during treatment predict psychosocial well-being among long-term survivors of breast cancer. *Health Psychology, 24*(5), 508–516. <https://doi-org.mantis.csuchico.edu/10.1037/0278-6133.24.5.508>
- Centers for Disease Control and Prevention (2021). About chronic diseases. *National Center for Chronic Disease Prevention and Health Promotion*. <https://www.cdc.gov/chronicdisease/about/index.htm>
- Centers for Disease Control and Prevention (2022). About chronic diseases. *National Center for Chronic Disease Prevention and Health Promotion*. <https://www.cdc.gov/chronicdisease/about/index.htm>

Cerulli, C., Minganti, C., De Santis, C., Tranchita, E., Quaranta, F., & Parisi, A. (2014).

Therapeutic horseback riding in breast cancer survivors: A pilot study. *The Journal of Alternative and Complementary Medicine*.

<https://www.liebertpub.com/doi/full/10.1089/acm.2014.0061>

Egede, L., & Ellis, C. (2010). Diabetes and depression: Global perspectives. *Diabetes Research and Clinical Practice*, 87 (3), 302-312. [https://www-sciencedirect-](https://www-sciencedirect-com.mantis.csuchico.edu/science/article/pii/S0168822710000471)

[com.mantis.csuchico.edu/science/article/pii/S0168822710000471](https://www-sciencedirect-com.mantis.csuchico.edu/science/article/pii/S0168822710000471)

FACIT group (2020). FACIT measures & searchable library: Overview. Retrieved November 24, 2020, from <https://www.facit.org/facit-measures-searchable-library>

Farias-Tomaszewski, S., Jenkins, S., & Keller, J. (2001). An evaluation of therapeutic horseback riding programs for adults with physical impairments. *Therapeutic Recreation Journal* 35(3), 250-257. https://is.muni.cz/el/1421/podzim2009/PSB_94/um/9231664/therapeutic_horseback_riding_-_adults.pdf

Fine, A. (2000). Handbook on animal-assisted therapy: Theoretical foundations and guidelines for practice. *San Diego: Academic Press*.

Hays, R. D., & Morales, L. S. (2001). The RAND-36 measure of health-related quality of life. *Annals of Medicine*, 33(5), 350-357. <https://doi.org/10.3109/07853890109002089>

Henriques, M. (2019). Can the legacy of trauma be passed down the generations? Retrieved November 24, 2020, from <https://www.bbc.com/future/article/20190326-what-is-epigenetics>

- Johns Hopkins Medicine Pathology (2022). Definition of Autoimmunity & Autoimmune Disease. Retrieved March 15, 2022 from <https://pathology.jhu.edu/autoimmune/definitions/>
- Klontz, B., Bivens A., Leinart, D., & Klontz T. (2007). The effectiveness of equine-assisted experiential therapy: Results of an open clinic trial. *Society and Animals*, 15, 257-267. <https://doi.org/10.1163/156853007X217195>
- Manning, L., Carr, D., & Kail, B. (2016). Do higher levels of resilience buffer the deleterious impact of chronic illness on disability in later life?, *The Gerontologist*, 56(3), 514–524. <https://doi.org/10.1093/geront/gnu068>
- Mate, G., M.D. (2003). When the body says no. *John Wiley & Sons, Inc.*
- McQuoid, J. (2017). Finding joy in poor health: The leisure-scapes of chronic illness. *Social Science & Medicine*. <https://www.sciencedirect.com/science/article/abs/pii/S0277953617302745?via%3Dihub>
- Mead, V. (2014, August 01). Epigenetics and Chronic illness. Retrieved December 10, 2020, from <https://chronicillnesstraumastudies.com/epigenetics-why-chronic-illness-may-be-reversible/>
- Mead, V. (2016, February 26). Epigenetics and Chronic illness. Retrieved December 10, 2020, from <https://chronicillnesstraumastudies.com/epigenetics-why-chronic-illness-may-be-reversible/>
- Olivier, A., Viseu, J.-P., Vignais, N., & Vuillerme, N. (2019). Balance control during stance - A comparison between horseback riding athletes and non-athletes. *PLoS ONE*, 14(2), 1–13. <https://doi-org.mantis.csuchico.edu/10.1371/journal.pone.0211834>

- Prechter, A. (2014). An assessment of equine assisted growth learning association and professional association of therapeutic horsemanship programs in Montana. *Montana State University*. <https://scholarworks.montana.edu/xmlui/bitstream/handle/1/8788/PrechterA1214.pdf?sequence=1&is>
- Schweig, S. MD. Neuroplasticity, emotional healing, and chronic illness. Retrieved December 10, 2020, from <https://www.ccfmed.com/blog/neuroplasticity-emotional-healing-chronic-illness>
- Selby, A., & Smith-Osborne, A. (2013). A systematic review of effectiveness of complementary and adjunct therapies and interventions involving equines. *Health Psychology, 32*(4), 418-432. <https://psycnet.apa.org/buy/2012-21502-001>
- The Mayo Clinic (2020, October 07). Fibromyalgia. Retrieved November 30, 2020, from <https://www.mayoclinic.org/diseases-conditions/fibromyalgia/symptoms-causes/syc-20354780>
- The WHOQOL Group. (1998). Development of the World Health Organization WHOQOL-BREF quality of life assessment. *Psychological Medicine, 28*, 551-558. <https://doi.org/10.1017/S0033291798006667>
- Wicks, S., Berger, Z., & Camic, P. M. (2019). It s how I am . . . it s what I am . . . it s a part of who I am: A narrative exploration of the impact of adolescent-onset chronic illness on identity formation in young people. *Clinical Child Psychology and Psychiatry, 24*(1), 40–52. <https://doi.org/10.1177/1359104518818868>

World Health Organization (2022). Mental health: neurological disorders. Retrieved March 15, 2022 from <https://www.who.int/news-room/questions-and-answers/item/mental-health-neurological-disorders>.