Beyond Symptom Reduction: Equine-Assisted Services, Recovery, and Reintegration Among Military Veterans

Abstract

Posttraumatic stress disorder (PTSD) remains a significant concern among military Veterans and may affect emotional regulation, relationships, social functioning, and successful reintegration following military service. Equine-assisted services (EAS) have emerged as a complementary approach for Veterans experiencing PTSD and trauma-related symptoms, yet their potential contribution beyond symptom reduction remains less clearly understood. This integrative review synthesized empirical research published between 2018 and 2025 examining EAS among military Veterans and service members, with particular attention to recovery processes, reintegration-relevant outcomes, program development, and equine welfare. Searches of PsycINFO, PubMed, Scopus, and Google Scholar identified 21 empirical studies for inclusion. Across therapeutic riding, adaptive horsemanship, equine-assisted psychotherapy, and structured horsemanship programs, the most consistent findings involved short-term reductions in PTSD symptoms. Additional findings included improvements in emotional regulation, coping, self-efficacy, resilience, trust, confidence, relational engagement, and social functioning. These outcomes suggest that EAS may influence proximal recovery processes relevant to Veteran reintegration; however, direct evidence demonstrating sustained improvements in civilian role functioning, employment, education, community participation, and long-term reintegration remains limited. Across studies, recurring features relevant to evidence-informed program development included structured skill progression, participant autonomy, meaningful responsibility, psychological safety, relational engagement, ground-based options, systematic evaluation, and attention to equine welfare. EAS therefore represents a promising adjunctive

approach to Veteran recovery, while further research is needed to determine whether gains achieved within equine environments translate into sustained reintegration outcomes..

Keywords: veterans, posttraumatic stress disorder, equine-assisted services, recovery, reintegration, horsemanship, program development

Lay Summary

Military Veterans with posttraumatic stress disorder (PTSD) may face challenges that extend beyond symptoms, including difficulties with trust, relationships, confidence, purpose, social connection, and participation in civilian life. Equine-assisted services (EAS) use structured interactions with horses through approaches such as therapeutic riding, adaptive horsemanship, equine-assisted psychotherapy, and other horsemanship programs. This review examined 21 studies published between 2018 and 2025 to better understand what EAS may contribute to Veteran recovery beyond reducing PTSD symptoms. The most consistent finding was short-term improvement in PTSD symptoms. Veterans also reported improvements in emotional regulation, coping, confidence, resilience, trust, relationships, and social engagement. These changes may support processes important to reintegration, although current research has not yet established whether they consistently lead to long-term improvements in employment, education, family roles, community participation, or other areas of civilian functioning. The review also identified several considerations for developing Veteran equine programs, including structured skill development, participant choice, meaningful responsibility, psychological safety, relationship building, ground-based activities, outcome evaluation, and protection of horse welfare. The findings support EAS as a promising complementary approach to Veteran recovery while highlighting the need for longer-term research examining whether benefits experienced with horses transfer into everyday civilian life.

Introduction

Recovery from military trauma is rarely defined by symptom reduction alone. For many Veterans, the greater challenge lies in rebuilding trust, restoring purpose, reconnecting with others, and establishing meaningful roles following military service. Posttraumatic stress disorder (PTSD) remains one of the most prevalent and persistent health concerns among military Veterans, yet improvements in symptoms do not always translate into successful reintegration or improved quality of life. [1,2]

Equine-assisted services (EAS) have emerged as a complementary approach to support Veterans experiencing PTSD and trauma-related symptoms. EAS encompasses a range of mounted and ground-based interventions, including therapeutic riding, adaptive horsemanship, equine-assisted psychotherapy, and structured horsemanship programs. Although these approaches differ in delivery, they share an emphasis on experiential learning, relationship-building, skill development, and engagement in meaningful activities. Many Veterans describe EAS as an active, non-stigmatizing alternative to traditional clinical settings that emphasizes participation, connection, and experiential learning. [3,4,5] Researchers have increasingly examined its potential effects on PTSD symptoms, emotional regulation, resilience, and social functioning. [6, 7, 8]

The evidence base supporting EAS has grown substantially over the past decade. Earlier reviews and mapping studies reported promising but preliminary findings and noted methodological concerns, including small sample sizes, inconsistent outcome measures, limited follow-up, and variability in intervention reporting. [9, 10, 11.] Since those reviews were published, randomized trials, multisite evaluations, adaptive horsemanship studies, psychophysiological investigations, and research involving women Veterans and military sexual trauma survivors

have further contributed to the literature. [12, 13, 14.] At the same time, attention has increasingly focused on outcomes beyond symptom reduction, including resilience, social engagement, reintegration, and quality of life.

Although existing reviews have examined the relationship between equine-assisted services and PTSD symptom outcomes, considerably less attention has been directed toward outcomes that may support Veteran recovery and reintegration beyond symptom reduction. The literature remains fragmented across intervention models and outcome domains, making it difficult to determine which reported changes reflect proximal recovery processes, broader psychosocial functioning, or direct reintegration outcomes. Veteran reintegration is multidimensional and extends beyond symptom improvement to include social connectedness, identity, meaningful roles, purpose, and community participation. [2, 15] Consequently, the contribution of EAS to these broader domains, as well as the program design features most consistently associated with favorable recovery outcomes, remains insufficiently synthesized.

The purpose of this integrative review was to synthesize contemporary evidence on equine-assisted services for military Veterans with PTSD and trauma-related symptoms, with particular attention to outcomes beyond symptom reduction. Specifically, the review examined clinical outcomes, self-regulation and resilience, relational and social functioning, feasibility and safety, and equine welfare. The review emphasized whether reported outcomes directly indicate Veteran reintegration or reflect proximal recovery processes that may contribute to longer-term reintegration. The review also examined potential mechanisms through which equine-assisted services may influence recovery and identified priorities for program development and future research.

The guiding review question was: What does contemporary evidence indicate about the effects of equine-assisted services on recovery processes and reintegration-relevant outcomes among military Veterans with PTSD and trauma-related symptoms, and to what extent have these outcomes been demonstrated to translate beyond the equine environment into broader civilian functioning?

Methods

An integrative review methodology was used to synthesize contemporary evidence concerning equine-assisted services (EAS) for military Veterans with PTSD and trauma-related symptoms. This approach was selected because the developing EAS literature includes quantitative, qualitative, mixed-methods, feasibility, implementation, and psychophysiological research. The integrative design allowed the review to examine findings across these methodological traditions collectively while preserving distinctions in study design, intervention model, and outcome domain.

The review was limited to studies published between 2018 and 2025 to capture contemporary developments following earlier syntheses of the field. [10, 11.] We conducted literature searches in PsycINFO, PubMed, Scopus, and Google Scholar to identify empirical studies published during that period. The final search was completed in June 2026. We also examined reference lists of relevant reviews and eligible primary studies to identify additional publications. The search was structured around three primary concepts: military Veteran or service member populations, equine-assisted services, and PTSD or trauma-related outcomes. Search terminology included variations of veteran, military, service member, equine-assisted services, equine-assisted psychotherapy, equine-facilitated psychotherapy, therapeutic riding, adaptive horsemanship, horsemanship, posttraumatic stress disorder, PTSD, trauma, recovery,

and reintegration. Search terms and Boolean combinations were adapted as necessary to match the indexing conventions of each database.

Studies were eligible for inclusion if they were primary empirical investigations published between 2018 and 2025; included military Veterans or service members; examined a mounted or ground-based equine-assisted intervention; and assessed PTSD, trauma-related symptoms, recovery processes, psychosocial functioning, or outcomes relevant to Veteran reintegration. Studies addressing conditions commonly co-occurring with trauma exposure, including traumatic brain injury, chronic pain, and military sexual trauma, were eligible if their findings were relevant to Veteran recovery or reintegration.

Studies were excluded if they focused exclusively on civilian populations, did not include an equine-assisted intervention, were conceptual or theoretical papers, commentaries, dissertations, conference abstracts, or prior reviews, or did not report empirical findings relevant to the review objectives. Previous reviews were retained for background and context but were not included in the primary evidence synthesis.

The author conducted study selection using a sequential screening process. Search results were managed in EndNote. The initial search identified 1,435 records for title and abstract screening. After reviewing titles and abstracts, the author retained 231 records for further assessment. We then identified and removed four duplicate records in EndNote, leaving 227 unique records for full-text review. We assessed full-text articles against the predefined eligibility criteria, resulting in 21 empirical studies included in the final integrative synthesis. The remaining 206 full-text records were excluded because they did not meet at least one eligibility criterion.

Data were extracted from each included study on study design, participant characteristics, intervention characteristics, outcomes, implementation factors, and equine welfare. Findings were synthesized findings using an integrative approach that emphasized convergence, divergence, and recurring themes across the literature. Attention was given to distinguishing clinical outcomes from recovery processes and from reintegration-relevant outcomes. Because substantial methodological heterogeneity existed across study designs, intervention models, and outcome measures, we did not perform quantitative pooling. **Table 1** summarizes the characteristics and key findings of the 21 empirical studies included in the review.

Table 1

Characteristics and Key Findings of Empirical Studies Included in the Review

Study	Design	Population	Intervention	Primary Findings
Johnson et al. (2018)	Randomized wait-list controlled trial	Veterans with PTSD	Therapeutic riding	Reduced PTSD symptoms; improved coping self-efficacy and emotion regulation
Burton et al. (2019)	Clinical intervention	Veterans with PTSD	Equine-assisted psychotherapy	Reduced PTSD symptoms; increased resilience
Fisher et al. (2021)	Open clinical trial	Veterans with PTSD	Manualized equine-assisted therapy	Improved PTSD symptoms; high engagement and feasibility
Rankins et al. (2024a)	Randomized pilot study	Veterans with PTSD	Ground-based adaptive horsemanship	Reduced PTSD symptoms without mounted riding
Marchand et al. (2023b)	Observational study	Veterans with PTSD	Horsemanship skills training	Improved PTSD symptoms and functional outcomes
Romaniuk et al. (2018)	Program evaluation	Veterans and partners	Equine-assisted retreat	Improved well-being, relationship functioning, and PTSD symptoms
Kowalski et al. (2025)	Multisite observational evaluation	Veteran trauma survivors	EAGALA psychotherapy	Reduced PTSD symptoms across community sites

Lanning et al. (2024)	Mixed-methods study	Veterans and service members	Therapeutic riding	Improved autonomy, competence, and relatedness
Rosing et al. (2022)	Qualitative study	Military and police Veterans with PTSD	Equine-assisted therapy	Enhanced self-regulation, bonding, hope, and emotional awareness
Campbell & Murphy (2024)	Qualitative narrative study	UK military Veterans	Equine-facilitated psychotherapy	Improved well-being, trust, emotional regulation, and connection
Marchand et al. (2023a)	Intervention study	Trauma-exposed Veterans	Mindfulness/self-compassion equine psychotherapy	Improved self-compassion, emotional tolerance, and coping
Gehrke et al. (2018)	Psychophysiological study	Combat Veterans with PTSD	Horsemanship program	Improved HRV and positive affect; reduced stress reactivity
Bradshaw et al. (2022)	Qualitative study	Women Veterans with MST	Equine therapy	Empowerment, safety, trust, and identity reconstruction
Vincent et al. (2023)	Cohort study	Women Veterans	Equine-facilitated therapy	Improved confidence, emotional safety, and empowerment
Arnon et al. (2020)	Program development/feasibility study	Veterans with PTSD	Manualized equine-assisted therapy	Demonstrated feasibility and treatment acceptability
Sylvia et al. (2020)	Acceptability study	Veterans with PTSD and/or TBI	Equine-assisted activities and therapies	High participant satisfaction and acceptability
Blackburn (2021)	Qualitative evaluation	Canadian Armed Forces Veterans	Equine-assisted therapy	Viewed as experiential, non-stigmatizing, and complementary to treatment
Rankins et al. (2024b)	Behavioral study	Horses in adaptive horsemanship	Adaptive horsemanship	Supported equine welfare and workload tolerance
Rankins et al. (2025)	Physiological pilot study	Veterans and horses	Adaptive horsemanship	Demonstrated feasibility of dual HRV monitoring
Malinowski et al. (2018)	Physiological pilot study	Veterans and horses	Equine-assisted therapy	Supported human–horse physiological monitoring

McDuffee et al. (2024)	Psychophysiological study	Veterans and horse partners	Equine-facilitated psychotherapy	Supported two-species monitoring approaches

Note. PTSD = posttraumatic stress disorder; MST = military sexual trauma; TBI = traumatic brain injury; HRV = heart rate variability; EAGALA = Equine Assisted Growth and Learning Association.

Results

PTSD Symptom Outcomes

Across the included studies, reductions in PTSD symptom severity were the most consistently reported clinical outcome following participation in EAS. Improvements were reported in randomized pilot trials, open clinical trials, observational studies, program evaluations, and multisite implementation studies. Positive findings were observed across therapeutic riding, equine-assisted psychotherapy, adaptive horsemanship, and structured horsemanship programs, although intervention format, duration, sample characteristics, and outcome measures varied substantially across studies. Collectively, these findings indicate a consistent pattern of short-term symptom improvement, while limiting conclusions about the comparative effectiveness of specific EAS models.

Controlled evidence supporting EAS includes therapeutic riding. In a randomized wait-list controlled trial, Veterans who completed six weekly therapeutic riding sessions demonstrated significant reductions in PTSD symptoms, with improvements emerging by week three and continuing through week six. Participants also reported gains in coping self-efficacy and emotion regulation, suggesting that symptom improvement may occur alongside changes in adaptive functioning. These findings provide controlled support for therapeutic riding while remaining limited by the relatively small sample and short-term follow-up. [6] Participants also reported gains in coping self-efficacy and emotional regulation, supporting the possibility that symptom improvement may be accompanied by broader changes in adaptive functioning.

Evidence from psychotherapy-integrated and ground-based approaches also demonstrated favorable short-term outcomes. Burton et al. [7] reported significant reductions in PTSD symptoms and concurrent increases in resilience following a six-week equine-assisted psychotherapy program. Similarly, Fisher et al. [8] likewise reported improvement in PTSD symptoms, strong participant engagement, and high feasibility using a manualized equine-assisted therapy protocol developed for Veterans with PTSD. Ground-based adaptive horsemanship also demonstrated promise. In a randomized pilot study, reported reductions in PTSD symptoms among Veterans participating in structured ground-based horsemanship activities, indicating that mounted riding is not required for favorable short-term outcomes. However, the small sample and pilot design warrant cautious interpretation.[12]

Observational and implementation studies provide additional evidence across structured horsemanship and community-based EAS programs. Marchand and colleagues reported improvements in PTSD symptoms and functional outcomes among Veterans participating in horsemanship skills training, suggesting that structured skill development may contribute to outcomes beyond symptom reduction, while Romaniuk and colleagues reported improvements in PTSD symptoms, well-being, and relationship functioning among Veterans and their partners following participation in an intensive equine-assisted program. [16, 17.] In a multisite evaluation of equine-assisted psychotherapy delivered through the EAGALA model, Kowalski et al. [13] documented significant reductions in PTSD symptoms across multiple community sites using the EAGALA model, demonstrating that favorable outcomes have also been observed when EAS is delivered outside a single research setting. Collectively, these studies extend the evidence beyond controlled trials and identify functional improvement, relationship functioning, and community-based implementation as relevant areas for continued investigation.

Collectively, the included studies demonstrate a recurring pattern of short-term improvement in PTSD symptoms across therapeutic riding, equine-assisted psychotherapy, adaptive horsemanship, and structured horsemanship programs. However, substantial variation in study design, sample size, intervention format, duration, and outcome measurement limits direct comparison across models and prevents conclusions regarding the relative effectiveness of specific EAS approaches. The available evidence therefore supports EAS as a promising adjunctive approach for Veterans experiencing PTSD and trauma-related distress while underscoring the need for larger studies, greater methodological consistency, and longer-term follow-up.

Self-Regulation and Resilience

In addition to symptom reduction, evidence suggests that equine-assisted services (EAS) may influence several processes associated with recovery, including emotional regulation, coping, self-efficacy, resilience, and psychological flexibility. Although findings in these domains are less uniform than those for PTSD symptom outcomes, positive changes have been reported across therapeutic riding, equine-assisted psychotherapy, adaptive horsemanship, and mindfulness-informed equine interventions.

Several studies identified improvements in coping and emotional regulation following participation in EAS. In a randomized therapeutic riding trial, Johnson et al. [6] reported gains in coping self-efficacy and emotion regulation alongside reductions in PTSD symptoms, suggesting that Veterans may develop greater confidence in managing distress through repeated engagement with equine activities. [6] Similarly, Burton et al. [7] observed significant increases in resilience among participants receiving equine-assisted psychotherapy, while Fisher et al. [8] reported

improvements in trauma-related functioning and strong participant engagement using a manualized equine-assisted therapy protocol developed specifically for Veterans with PTSD.

Evidence also points toward the development of self-efficacy and perceived competence as potential mechanisms of change. Using a mixed-methods design informed by self-determination theory, Lanning et al. [18] found improvements in autonomy, competence, and relatedness among military service members and Veterans participating in therapeutic riding. These findings are notable because they align closely with qualitative reports describing increased confidence, greater willingness to attempt challenging tasks, and a renewed sense of capability following participation in equine programs. Veterans frequently described learning to regulate emotional responses, remain present during discomfort, and successfully navigate unfamiliar situations with horses, experiences that may generalize to challenges encountered outside the equine setting.

Qualitative studies demonstrated particularly strong convergence. Veterans consistently reported increased self-awareness, improved emotional regulation, enhanced confidence, and greater tolerance of distress following participation in EAS. [4, 5] Participants often described horses as providing immediate, nonjudgmental feedback that encouraged patience, emotional awareness, and intentional responses rather than reactive behavior. Similar themes emerged in mindfulness- and self-compassion-based equine interventions, where participants reported gains in emotional tolerance, self-kindness, and adaptive coping. [19] Structured horsemanship programs likewise emphasized mastery, persistence, and experiential learning, with participants describing increased confidence and resilience as they acquired new skills and developed relationships with horses. [16]

Emerging psychophysiological evidence further supports these observations. In an eight-week horsemanship program for combat Veterans with PTSD, participants demonstrated significant improvements in heart rate variability and positive affect, findings consistent with enhanced autonomic regulation and reduced physiological stress reactivity. [20] Taken together, the evidence suggests that EAS may support recovery not only through reductions in PTSD symptoms but also through the cultivation of self-regulatory capacities, resilience, and self-efficacy. Across intervention models, Veterans consistently report experiences of mastery, confidence, emotional awareness, and adaptive coping, indicating that these processes may represent important pathways through which equine-assisted interventions contribute to recovery.

Reintegration and Social Functioning

Evidence related to social functioning, interpersonal trust, quality of life, and community participation is less developed than the literature on PTSD symptom reduction but demonstrates a consistently positive pattern across qualitative, mixed-methods, and observational studies. Veterans participating in equine-assisted services (EAS) frequently reported improved relationships, greater social engagement, increased confidence in interpersonal interactions, and a renewed sense of purpose and connection. [17, 4, 5] Although these outcomes are often measured indirectly, they represent domains that many Veterans identify as central to recovery and successful reintegration into civilian life.

Several studies highlighted the importance of trust and relational engagement. In qualitative investigations, Veterans described horses as providing immediate and nonjudgmental feedback that encouraged emotional awareness, patience, and intentional communication. [4, 5] Participants frequently reported learning to establish boundaries, tolerate closeness, and interpret

relational cues in ways that felt safer and more manageable than comparable interactions with people. These experiences were often described as extending beyond the equine setting and influencing relationships with family members, peers, and broader social networks.

Research involving women Veterans further emphasized EAS's role in fostering psychological safety, agency, and identity reconstruction. Bradshaw et al. [21] and Vincent et al. [14] reported strong engagement among women Veterans, many of whom had experienced military sexual trauma, alongside perceived improvements in self-confidence, emotional safety, and personal empowerment. Participants described equine environments as supportive spaces in which they could rebuild trust, reclaim a sense of control, and develop greater confidence in their abilities and relationships.

Findings from couple- and family-oriented programming also suggest broader social benefits. Romaniuk et al. [17] reported improvements in well-being and relationship functioning among Veterans and their partners following participation in an intensive equine-assisted retreat program. Across studies, themes of connection, belonging, trust, communication, and renewed engagement with others emerged with notable consistency. Collectively, these findings suggest that EAS may contribute to recovery not only through symptom reduction but also through processes associated with social reconnection, identity development, and community reintegration.

Feasibility, Safety, and Equine Welfare

Across intervention models, EAS were consistently reported as feasible, acceptable, and well-tolerated by Veteran participants. High levels of participant satisfaction were observed across therapeutic riding, equine-assisted psychotherapy, adaptive horsemanship, and retreat-based programs, with Veterans frequently describing EAS as engaging, meaningful, and less

283 stigmatizing than traditional mental health services. [6, 22, 23] When attrition occurred, it was most
284 often attributed to logistical barriers such as transportation challenges, scheduling conflicts,
285 competing responsibilities, or geographic distance rather than dissatisfaction with the
286 intervention itself. [22]

287 Evidence from qualitative studies further supports the acceptability of EAS among
288 Veterans. Participants consistently described the horse as a calming, nonjudgmental presence and
289 emphasized the value of engaging in an active, experiential process rather than a solely verbal
290 therapeutic approach. [3, 4, 5] Veterans frequently reported that the equine environment promoted
291 feelings of safety, trust, autonomy, and connection, factors that may contribute to sustained
292 engagement and program completion.

293 Safety findings were similarly encouraging. Across studies, serious adverse events were
294 rare, and interventions were generally delivered without significant safety concerns for
295 participants when appropriate screening, supervision, and risk-management procedures were in
296 place. [6, 22, 23] These findings support the feasibility of implementing EAS within Veteran-serving
297 organizations using established equine-industry safety standards and trauma-informed practices.

298 An important development in the recent literature is the increasing attention given to
299 equine welfare and two-species monitoring. Several investigations have incorporated behavioral
300 and physiological measures to assess horse responses during equine-assisted activities. Rankins
301 et al. [24] reported that horses participating in adaptive horsemanship sessions generally tolerated
302 activities well when workload and pacing were appropriately managed, while Rankins et al. [25]
303 demonstrated the feasibility of monitoring heart rate variability in both Veterans and horses
304 during intervention delivery. Similarly, Malinowski et al. [26] and McDuffee et al. [27] incorporated

physiological monitoring protocols to evaluate responses within the human–horse dyad without compromising participant or animal welfare.

Collectively, the evidence indicates that EAS can be delivered safely and acceptably across a variety of settings while maintaining attention to participant well-being and equine welfare. The emergence of two-species monitoring approaches represents an important advancement in the field, reflecting a growing recognition that ethical and effective EAS programs depend on the well-being of both Veterans and horses.

Discussion

EAS and PTSD Recovery: Beyond Symptom Reduction

The findings of this integrative review indicate that EAS are consistently associated with short-term improvements in posttraumatic stress disorder (PTSD) symptoms among military Veterans across intervention models such as therapeutic riding, equine-assisted psychotherapy, adaptive horsemanship, and structured horsemanship programs. [6, 7, 8, 12, 13] Despite methodological variability, positive outcomes have been reported in randomized trials, open clinical studies, observational cohorts, and multisite implementation evaluations. These findings suggest that the potential benefits of EAS extend beyond highly controlled research settings.

The evidence reviewed indicates that the impact of EAS extends beyond symptom reduction. Across multiple studies, Veterans reported improvements in emotional regulation, coping skills, resilience, confidence, interpersonal trust, and social functioning, as well as reductions in PTSD symptoms. [6, 7, 18, 4] Qualitative research consistently highlights experiences of mastery, connection, hope, and renewed engagement with others. These outcomes are central to recovery but are often insufficiently captured by symptom-based measures alone. [5, 4]

These findings are consistent with contemporary models of Veteran recovery, which emphasize functioning, participation, identity, social connectedness, and community reintegration alongside symptom management. [2, 15] Recovery from trauma encompasses not only the reduction of distress but also the restoration of meaningful roles, relationships, and a sense of purpose. Several studies in this review documented improvements in social engagement, trust, self-confidence, and relationship functioning, indicating that EAS may support broader psychosocial outcomes beyond traditional clinical endpoints. [17, 21, 14]

Collectively, the evidence indicates that EAS are best conceptualized as recovery-oriented adjunctive interventions rather than solely symptom-focused treatments. The consistency of positive outcomes across diverse program models suggests that the therapeutic value of EAS is likely attributable to common processes that foster regulation, mastery, relational engagement, and meaningful participation. Elucidating these mechanisms may clarify why positive outcomes are observed across both mounted and ground-based approaches and inform future program development and research.

Mechanisms of Change: Self-Efficacy, Regulation, and Relational Engagement

Although research on equine-assisted services (EAS) is still developing, the findings reviewed here suggest several mechanisms through which these interventions may support Veteran recovery. Across intervention models, improvements have been reported in PTSD symptoms, self-confidence, coping, emotional regulation, resilience, and social functioning [6, 7, 8, 18], indicating that EAS may influence recovery through processes that extend beyond symptom reduction.

Bandura's [28] theory of self-efficacy provides one framework for understanding these findings. Veterans frequently reported experiences of mastery, competence, and increased

confidence through activities such as grooming, leading, riding, and communicating with horses. These experiences may strengthen perceptions of competence and agency, which are often disrupted by chronic PTSD. Reported improvements in coping self-efficacy and resilience support this interpretation. [6, 7] Findings are also consistent with self-determination theory, which emphasizes autonomy, competence, and relatedness. Lanning et al. [18] documented improvements in all three domains among Veterans participating in therapeutic riding.

Emotional regulation represents another potential mechanism. Qualitative studies consistently describe increased emotional awareness, patience, and the ability to remain present during stressful situations. [4, 5] Because horses respond to human behavior and affect in real time, interactions may provide opportunities to recognize and regulate emotional responses. Preliminary psychophysiological evidence further supports this interpretation. Gehrke et al. [20] reported improvements in heart rate variability and positive affect among combat Veterans participating in an eight-week horsemanship program, suggesting potential effects on autonomic regulation.

Relational engagement may provide an additional pathway for recovery. Veterans often described horses as nonjudgmental and emotionally responsive partners that fostered trust, communication, and connection. [4, 5] Attachment-based perspectives suggest that such interactions may contribute to new expectations regarding safety and relationships following trauma. [29]

Collectively, the evidence indicates that EAS may support recovery through experiential mastery, self-efficacy, emotional regulation, and relational engagement. These mechanisms align with broader models of Veteran recovery that emphasize psychological adaptation, social reconnection, and restoration of meaningful roles following military service. [2, 15]

Implications for Veteran Reintegration

A key finding from this review is that many reported benefits of EAS correspond with domains associated with successful Veteran reintegration. While most studies primarily addressed PTSD symptom reduction, participants also reported improvements in interpersonal trust, self-confidence, communication, relationship functioning, social engagement, and sense of purpose. [17, 4, 5] These outcomes indicate that EAS may facilitate recovery beyond clinical symptom management, addressing broader challenges of post-military adjustment.

Veteran reintegration often requires rebuilding identities and roles disrupted by trauma, injury, or the transition from military to civilian life. Contemporary frameworks increasingly conceptualize reintegration as a multidimensional process involving psychological health, social connectedness, role functioning, and community participation rather than a simple return to baseline functioning. [2, 15] PTSD can interfere with participation in family relationships, employment, education, and community engagement, often leading to social withdrawal and reduced quality of life. The findings reviewed here suggest that EAS may provide opportunities to reengage with meaningful activities while fostering confidence, competence, and a renewed sense of agency. Interactions with horses place Veterans in situations that demand responsibility, communication, problem-solving, and emotional awareness, skills that may transfer to other areas of daily life.

The relational components of EAS appear particularly relevant to the process of reintegration. Qualitative studies consistently report that Veterans experience trust, connection, and acceptance during interactions with horses. [4, 5] These experiences are especially significant for individuals whose trauma histories have impaired interpersonal relationships or social engagement. While horses do not replace human relationships, they offer opportunities to practice communication, boundary setting, emotional regulation, and relational awareness in

environments perceived as safe, immediate, and nonjudgmental. Such experiences may facilitate broader social reconnection.

Research involving women Veterans further underscores the relevance of EAS for reintegration and identity reconstruction. Studies with women who have experienced military sexual trauma highlight themes of empowerment, personal agency, emotional safety, and renewed confidence. [21, 14] Participants often described equine environments as spaces to reclaim control, rebuild trust, and enhance confidence in themselves and their relationships. These findings indicate that EAS may address recovery dimensions not typically captured by traditional symptom-focused outcomes.

Collectively, the evidence suggests that EAS may support Veteran reintegration by fostering mastery, connection, responsibility, and meaningful participation. These outcomes correspond with domains frequently associated with successful reintegration, including social connectedness, identity development, role functioning, and community engagement. [2, 15] Although further research is required to directly assess reintegration outcomes, consistent findings regarding trust, social engagement, confidence, and relationship functioning indicate that EAS may contribute to the broader process of rebuilding lives following military service. Future research should include measures of community participation, role functioning, belonging, and Veteran reintegration to more fully capture these potential benefits.

Implications for Practice and Program Development

The findings of this review support the development of evidence-informed EAS programs for Veterans experiencing PTSD and trauma-related challenges. Across intervention models, several recurring elements were associated with favorable outcomes, including structured skill development, participant autonomy, emotional regulation, relational engagement,

psychological safety, and meaningful responsibility. These findings do not establish a single best model of EAS. Rather, they identify program design considerations that can inform the development of structured Veteran-centered services. Table 2 summarizes evidence-informed program design considerations from the included literature.

Table 2

Evidence-Informed Program Design Considerations for Veteran Equine-Assisted Services

Evidence-Informed Component	Supporting Findings	Program Application
Structured skill progression	Mastery, competence, confidence, and self-efficacy were reported across horsemanship and therapeutic riding studies.	Use progressive activities in which Veterans acquire observable horsemanship skills rather than participating only in unstructured horse interaction.
Participant autonomy and choice	Improvements in autonomy, competence, relatedness, agency, and empowerment were reported.	Allow meaningful participant choice, control over pacing, and increasing responsibility.
Ground based options	Ground based adaptive horsemanship was associated with positive outcomes without mounted riding.	Riding should not be required. Groundwork can serve as a primary intervention format.
Emotional regulation	Studies reported improvements in emotional awareness, coping, regulation, distress tolerance, and physiological stress responses.	Include activities that require Veterans to recognize activation, regulate their behavior, remain present, and respond intentionally.
Trust and relational engagement	Veterans reported improvements in trust, bonding, communication, connection, relationship functioning, and awareness of relational cues.	Use horse interactions that require observation, communication, appropriate boundaries, patience, and development of trust.
Mastery and meaningful responsibility	Horsemanship activities were associated with self-efficacy, competence, confidence, resilience, and experiences of accomplishment.	Give Veterans meaningful responsibility for grooming, leading, handling, preparation, horse care, and progressive horsemanship tasks.
Psychological safety	Veterans frequently described equine environments as safe, nonjudgmental, engaging, and less stigmatizing than traditional treatment environments.	Maintain predictable structure, participant choice, appropriate pacing, clear expectations, and trauma informed practices.
Reflection and experiential learning	Veterans described increased self-awareness, emotional awareness, coping, patience, and intentional responding during equine interactions.	Incorporate structured opportunities to reflect on what occurred during the horse interaction and identify lessons that may be relevant beyond the equine environment.

Structured and reproducible programming	Manualized interventions and multisite programs demonstrated feasibility, acceptability, and implementation across different settings.	Establish written session objectives, progressive activities, instructor guidance, safety procedures, and consistent program delivery while allowing individual adaptation.
Social connection and belonging	Studies reported bonding, hope, relationship improvements, connection, relatedness, and renewed social engagement.	Include opportunities for appropriate peer interaction, shared responsibility, communication, and relationship development rather than focusing exclusively on individual horse work.
Identity, agency, and empowerment	Research identified themes of empowerment, personal agency, confidence, safety, and identity reconstruction.	Design activities that allow Veterans to make decisions, solve problems, assume responsibility, develop competence, and experience themselves in meaningful roles.
Equine welfare	Behavioral and physiological research indicated that horse workload, pacing, behavior, and physiological responses should be considered during equine assisted services.	Establish horse selection criteria, workload limits, behavioral monitoring, adequate rest, and procedures for removing a horse from participation when welfare concerns arise.
Two species monitoring	Studies demonstrated the feasibility of examining physiological responses in both Veterans and horses.	When resources allow, evaluate both Veteran outcomes and equine responses rather than assessing participant outcomes in isolation.
Outcome evaluation	Existing research measures PTSD symptoms most frequently but also identifies regulation, resilience, confidence, relationships, social functioning, and quality of life.	Evaluate outcomes beyond PTSD, including self efficacy, regulation, trust, relationships, belonging, purpose, participation, and reintegration relevant functioning.
Long term transfer and reintegration	Evidence for trust, confidence, social engagement, purpose, and relationship functioning is promising, but direct evidence for sustained reintegration remains limited.	Include follow up measures examining whether gains extend into family relationships, education, employment, community participation, meaningful roles, and civilian life.

Note. EAS = equine-assisted services; PTSD = posttraumatic stress disorder. Program applications represent evidence-informed considerations derived from findings across the included studies. They are intended to guide program development and evaluation and should not be interpreted as established best-practice standards. Direct evidence regarding long-term Veteran reintegration remains limited.

Positive outcomes were reported across therapeutic riding, adaptive horsemanship, equine-assisted psychotherapy, and structured horsemanship programs. These findings suggest that effective programming does not depend on a single equine activity or require mounted riding. Ground-based horsemanship may offer meaningful opportunities for skill development, mastery, communication, emotional regulation, and relationship building, while allowing

programs to accommodate differences in participant ability, comfort, and goals. Structured progression appears particularly relevant, as several studies identified improvements in competence, self-efficacy, confidence, resilience, and autonomy. Programs may therefore benefit from providing Veterans with increasingly challenging horsemanship tasks that enable observable skill development and meaningful responsibility, rather than relying primarily on unstructured interaction with horses.

Participant choice and psychological safety should also remain central to program design. Studies of therapeutic riding, psychotherapy, adaptive horsemanship, and women Veterans consistently identified autonomy, trust, empowerment, connection, and emotional safety as key participant experiences. Predictable structure, clear expectations, appropriate pacing, and opportunities for Veterans to make meaningful decisions may support engagement while reducing unnecessary loss of control. These principles are especially relevant when working with individuals whose military or trauma experiences may have affected trust, agency, or interpersonal functioning.

The findings also underscore the importance of deliberate attention to the relationship between the Veteran and the horse. Veterans frequently reported improvements in emotional awareness, patience, trust, communication, bonding, and intentional responding during equine interactions. Accordingly, program activities should extend beyond task completion and offer opportunities for participants to observe equine behavior, adjust their responses, set appropriate boundaries, communicate clearly, and build relationships through repeated interaction. Structured reflection may help participants identify what occurred during these experiences, although the transfer of these skills to civilian functioning should be evaluated rather than assumed.

Equine welfare is essential to ethical program design. Research on horses participating in Veteran EAS underscores the need to attend to horse selection, workload, pacing, behavioral monitoring, physiological responses, rest, and removal from participation when welfare concerns arise. The horse should therefore be considered an active participant whose physical and behavioral well-being must be protected throughout program delivery

Finally, systematic evaluation should be integrated into program development from the outset. PTSD symptoms remain the most frequently assessed outcome in the literature, but this review indicates that self-efficacy, emotional regulation, resilience, trust, relationship functioning, belonging, purpose, and social engagement are also relevant. Programs designed to support Veteran reintegration should extend evaluation further by examining whether changes experienced in the equine environment translate into improvements in family functioning, education, employment, community participation, meaningful civilian roles, and sustained reintegration over time.

Limitations of the Review

Several limitations warrant consideration. A single reviewer conducted study identification, eligibility screening, and data extraction, introducing the possibility of selection and extraction bias. A formal methodological quality or risk-of-bias appraisal of the included studies was not conducted; therefore, findings were synthesized by reported outcomes and study design rather than weighted by methodological quality. The review was also restricted to empirical studies published between 2018 and 2025 and identified through PsycINFO, PubMed, Scopus, Google Scholar, and reference list searches. Relevant studies outside this publication window or sources not captured by these search methods may therefore have been missed. Dissertations and other non-peer-reviewed sources, which strengthened the focus on published

empirical evidence but may have increased susceptibility to publication bias. Finally, substantial heterogeneity in intervention models, study designs, populations, and outcome measures prevented quantitative pooling and limited direct comparison across EAS approaches.

Limitations of the Evidence

Although the findings of this review are encouraging, several limitations within the current evidence base warrant consideration. First, much of the research remains preliminary. Many studies were conducted at single sites, involved modest sample sizes, and were designed as pilot or feasibility investigations, limiting statistical power and the generalizability of findings.

A second limitation is the heterogeneity of equine-assisted services. Studies varied substantially in intervention format, duration, staffing models, and therapeutic objectives, including therapeutic riding, adaptive horsemanship, equine-assisted psychotherapy, and intensive retreat-based programs. Although positive outcomes have been reported across intervention types, this variability complicates direct comparisons and limits conclusions regarding the most effective program components.

Measurement inconsistency further constrains the literature. Studies employed diverse outcome measures and frequently emphasized different secondary outcomes, including resilience, coping, emotional regulation, quality of life, relationship functioning, and physiological responses. Reliance on self-report measures may also increase susceptibility to expectancy effects and social desirability bias. In addition, relatively few studies included long-term follow-up, limiting understanding of whether observed improvements are sustained over time and translate into meaningful functional change.

Several Veteran-specific factors remain underexamined. Although some studies included participants with traumatic brain injury, chronic pain, military sexual trauma, and other comorbid

conditions, limited research has explored potential moderators of treatment response, including moral injury, avoidance severity, combat exposure, service era, gender, and co-occurring mental health conditions.

Finally, despite growing interest in recovery and reintegration, these outcomes remain less frequently assessed than PTSD symptom reduction. Many findings related to trust, identity, belonging, purpose, and relationship functioning have emerged primarily from qualitative research, yielding stronger evidence of symptom improvement than of broader reintegration outcomes. Overall, the evidence supporting equine-assisted services for Veterans with PTSD is promising but remains in development. Larger multisite studies, greater methodological consistency, standardized outcome measures, longer follow-up periods, and increased attention to reintegration outcomes are needed to strengthen the evidence base and clarify how, for whom, and under what conditions these interventions are most effective.

Future Directions

The expanding evidence base supporting EAS for Veterans with PTSD provides a foundation for more rigorous investigation. Future research should prioritize larger multisite studies that evaluate interventions across diverse Veteran populations and service settings. Greater methodological consistency, including the adoption of standardized outcome measures, would strengthen cross-study comparisons and future evidence synthesis.

In addition to PTSD symptoms, researchers should routinely assess emotional regulation, resilience, social functioning, quality of life, and reintegration outcomes, including identity reconstruction, belonging, role functioning, and community participation. [2, 15] The development of Veteran-centered reintegration measures and longer follow-up periods would improve

understanding of whether observed benefits are sustained and translate into meaningful functional change.

Future studies should also examine mechanisms of change and moderators of treatment response. The findings of this review suggest that self-efficacy, emotional regulation, experiential mastery, and relational engagement may represent important pathways through which EAS contributes to recovery. Factors such as moral injury, military sexual trauma, traumatic brain injury, chronic pain, avoidance severity, and gender may influence treatment outcomes and warrant further investigation.

Continued advancement of equine welfare and two-species research remains essential. Integrating behavioral and physiological assessments of both Veterans and horses may improve understanding of human–horse interactions while ensuring that therapeutic benefits are achieved without compromising animal welfare. As the field matures, research should move beyond determining whether EAS reduces PTSD symptoms and focus on how these interventions support recovery, reintegration, and long-term well-being among Veterans.

Conclusion

This integrative review synthesized contemporary evidence on equine-assisted services for military Veterans with PTSD and trauma-related symptoms, with particular attention to outcomes beyond symptom reduction. Across intervention models, the most consistent evidence supported short-term improvement in PTSD symptoms, while additional findings identified changes in emotional regulation, self-efficacy, resilience, trust, confidence, relational engagement, and social functioning. These outcomes suggest that EAS may influence recovery processes relevant to broader Veteran reintegration, although direct evidence demonstrating

sustained improvements in civilian role functioning, community participation, employment, education, and long-term reintegration remains limited.

The review also identified recurring features that may inform evidence-informed program development, including structured skill progression, participant autonomy, meaningful responsibility, psychological safety, relational engagement, ground-based options, systematic outcome evaluation, and explicit attention to equine welfare. These components should not yet be considered established best-practice standards, but they provide a defensible foundation for developing and evaluating Veteran-centered EAS programs. Future research should determine whether gains in regulation, mastery, trust, confidence, and social connection are sustained and transfer into family relationships, education, employment, community participation, meaningful civilian roles, and long-term reintegration.

References

1. Maguen S, Griffin BJ, Copeland LA, Perkins DF, Finley EP, Vogt D. Gender differences in prevalence and outcomes of exposure to potentially morally injurious events among post-9/11 Veterans. J Psychiatr Res. 2020;130:97-103. doi:10.1016/j.jpsychires.2020.06.020.
2. Carlton T. Evidence integration review of multimodal interventions for PTSD, social reintegration, and economic stability in Veterans. J Vet Stud. 2025;11(2):15-27. doi:10.21061/jvs.v11i2.683.
3. Blackburn D. Equine-assisted therapy as complementary practice in the treatment of operational stress injuries of Canadian Armed Forces Veterans. SunText Rev Neurosci Psychol. 2021;2(1):125. doi:10.51737/2766-4503.2021.025.
4. Rosing T, Malka M, Brafman D, Fisher PW. Equine-assisted therapy for Israeli military and police Veterans with PTSD—impact on self-regulation, bonding and hope: a qualitative study. Health Soc Care Community. 2022;30(6). doi:10.1111/hsc.13922.
5. Campbell I, Murphy D. Equine-facilitated psychotherapy and well-being: exploring the experiences of UK military Veterans using a dialogical narrative approach. J Vet Stud. 2024;10(3). doi:10.21061/jvs.v10i3.603.
6. Johnson RA, Albright DL, Marzolf JR, Bibbo JL, Yaglom HD, Crowder SM, et al. Effects of therapeutic horseback riding on post-traumatic stress disorder in military Veterans. Mil Med Res. 2018;5(1):3. doi:10.1186/s40779-018-0149-6.
7. Burton LE, Qeadan F, Burge MR. Efficacy of equine-assisted psychotherapy in Veterans with posttraumatic stress disorder. J Integr Med. 2019;17(1):14-19. doi:10.1016/j.joim.2018.11.001.

8. Fisher PW, Lazarov A, Lowell A, Arnon S, Turner JB, Bergman M, et al. Equine-assisted therapy for posttraumatic stress disorder among military Veterans: an open trial. J Clin Psychiatry. 2021;82(5):21m14005. doi:10.4088/JCP.21m14005.
9. Kinney AR, Eakman AM, Lassell R, Wood W. Equine-assisted interventions for Veterans with service-related health conditions: a systematic mapping review. Mil Med Res. 2019;6(1):28. doi:10.1186/s40779-019-0217-6.
10. Boss L, Branson S, Hagan H, Krause-Parello C. A systematic review of equine-assisted interventions in military Veterans diagnosed with PTSD. J Vet Stud. 2019;5(1):23-33. doi:10.21061/jvs.v5i1.134.
11. Marchand WR, Andersen SJ, Smith JE, Hoopes KH, Carlson JK. Equine-assisted activities and therapies for Veterans with posttraumatic stress disorder: current state, challenges and future directions. Chronic Stress. 2021;5:2470547021991556. doi:10.1177/2470547021991556.
12. Rankins EM, Quinn A, McKeever KH, Malinowski K. Ground-based adaptive horsemanship lessons for Veterans with posttraumatic stress disorder: a randomized controlled pilot study. Front Psychiatry. 2024;15:1390212. doi:10.3389/fpsyt.2024.1390212.
13. Kowalski H, Van Buiten H, Hopkins P, Baldwin C, Nazarenko E, Marchand WR. A multi-site observational evaluation of the Equine Assisted Growth and Learning Association model of equine-assisted psychotherapy for Veteran trauma survivors. Int J Environ Res Public Health. 2025;22(10):1557. doi:10.3390/ijerph22101557.

14. Vincent A, Ballard I, Farkas KJ. Mind Full or Mindful? A cohort study of equine-facilitated therapy for women Veterans. J Creat Ment Health. 2023;18(3):367-382. doi:10.1080/15401383.2021.1984353.
15. Carlton T. BRAVE Theory: Military Transition, Trauma, and Reintegration. Cham (CH): Springer Nature; 2026. doi:10.1007/978-3-032-13695-4.
16. Marchand WR, Smith J, Hoopes KH, Osborne M, Andersen SJ, Bell K, et al. A pilot observational study of horsemanship skills training for Veterans with posttraumatic stress disorder. Complement Ther Med. 2023;72:102910. doi:10.1016/j.ctim.2022.102910.
17. Romaniuk M, Evans J, Kidd C. Evaluation of an equine-assisted therapy program for Veterans who identify as wounded, injured or ill and their partners. PLoS One. 2018;13(9). doi:10.1371/journal.pone.0203943.
18. Lanning BA, Mecate C, Evans-Warshaw J. Using self-determination theory through a mixed methods approach to examine the effects of therapeutic riding for military service members and Veterans. J Vet Stud. 2024;10(1). doi:10.21061/jvs.v10i1.504.
19. Marchand WR, Lackner R, Hartquist A, Finnell L, Nazarenko E. Evaluation of a mindfulness and self-compassion-based psychotherapy incorporating horses for Veterans who have experienced trauma. Complement Ther Med. 2023;72:102914. doi:10.1016/j.ctim.2023.102914.
20. Gehrke EK, Noquez AE, Ranke PL, Myers MP. Measuring the psychophysiological changes in combat Veterans participating in an equine therapy program. J Mil Veteran Fam Health. 2018;4(1):60-69. doi:10.3138/jmvfh.2017-0015.
21. Bradshaw S, Hedges B, Hill K, Luckman H, Dagenhard-Trainer P. Overcoming sexual trauma with equine therapy. J Vet Stud. 2022;8(1). doi:10.21061/jvs.v8i1.241.

22. Sylvia L, West E, Blackburn AM, Gupta C, Bui E, Mahoney T, et al. Acceptability of an adjunct equine-assisted activities and therapies program for Veterans with posttraumatic stress disorder and/or traumatic brain injury. J Integr Med. 2020;18(2):169-173. doi:10.1016/j.joim.2020.01.005.
23. Arnon S, Fisher PW, Pickover A, Lowell A, Turner JB, Hilburn A, et al. Equine-assisted therapy for Veterans with PTSD: manual development and preliminary findings. Mil Med. 2020;185(5-6). doi:10.1093/milmed/usz444.
24. Rankins EM, McKeever KH, Malinowski K. Behavioral and physiological responses of horses to ground-based adaptive horsemanship lessons for Veterans with posttraumatic stress disorder. J Equine Vet Sci. 2024;135:105049. doi:10.1016/j.jevs.2024.105049.
25. Rankins EM, Faremi BE, Hartmann K, Quinn A, Posada-Quintero HF, McKeever KH, et al. Heart rate variability responses of horses and Veterans with post-traumatic stress disorder to ground-based adaptive horsemanship lessons: a pilot study. Transl Anim Sci. 2025;9. doi:10.1093/tas/txaf019.
26. Malinowski K, Yee C, Tevlin JM, Birks EK, Durando MM, Pournajafi-Nazarloo H, et al. The effects of equine-assisted therapy on plasma cortisol and oxytocin concentrations and heart rate variability in horses and measures of PTSD symptoms in Veterans. J Equine Vet Sci. 2018;64:17-26. doi:10.1016/j.jevs.2018.01.011.
27. McDuffee LA, Montelpare WJ, LeBlanc C. Psychophysiological effects of equine-facilitated psychotherapy on Veterans with PTSD and their horse partners. J Mil Veteran Fam Health. 2024;10(3):135-147. doi:10.3138/jmvfh-2023-0063.
28. Bandura A. Self-efficacy: the exercise of control. New York (NY): W.H. Freeman; 1997.

651 29. Meyer L, Sartori A. Attachment theory and equine-facilitated psychotherapy for Vietnam
652 Veterans. Soc Anim. 2018;26:1-19. doi:10.1163/15685306-12341510.