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SENSORY SCREENING AS A READINESS TOOL FOR EQUINE-BASED SPORT PARTICIPATION IN CHILDREN WITH AUTISM

Fatin Aqilanajwa Bt Adenan[1]
Ahmad Fadly Bin Abdul Rahman[2]

[1]Akademi Golf Nasional, Universiti Utara Malaysia, 06010 Sintok Kedah Darul Aman, Malaysia.
(Email: fatinan@uum.edu.my)
[2]Akademi Golf Nasional, Universiti Utara Malaysia, 06010 Sintok Kedah Darul Aman, Malaysia.
(Email: a.fadly@uum.edu.my)
*Corresponding author: fatinan@uum.edu.my

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Abstract: *Equine-based sports activities are increasingly recognised as an inclusive physical activity option for children with autism spectrum disorder (ASD), offering opportunities for movement, balance, coordination, and social engagement. However, participation in equine-based sports requires careful consideration of safety and readiness due to the sensory sensitivities commonly observed in ASD and the responsive nature of horses. Although norm-referenced sensory pre-assessment standards for equine activity participation have been established, limited literature has examined how these standards can be applied practically to support sport participation readiness and programme planning. This paper describes the application of a sensory readiness screening framework to support safe participation decisions for equine-based sports activities among children with ASD. The screening focuses on tactile, vestibular, proprioceptive, and auditory perception which are sensory domains closely related to balance control, body awareness, equipment tolerance, and sound reactivity during sport participation. Threshold values adopted from previously published norm-referenced standards are translated into practical readiness categories. The applied framework supports consistent decision-making, individualised sport activity planning, and safer participation in equine-based sports contexts.*

Keywords: *Equine-based sports, sensory readiness, sport participation screening, autism spectrum disorder.*

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Introduction

Equine-based sports activities have gained increasing attention as inclusive physical activity options for children with autism spectrum disorder (ASD), providing opportunities to develop balance, coordination, postural control, and social interaction through structured movement-based participation (Ward et al., 2013; Srinivasan et al., 2018). Participation in equine-based sports involves both mounted and unmounted activities that require body control, attention regulation, and responsiveness to environmental cues, which are essential components of safe sport engagement (Adenan et al., 2023; Maresca et al., 2020). Within a sport context, equine-based activities require structured instruction, progressive task demands, and adherence to safety principles similar to other movement-based sports, particularly when participants present with diverse sensory and behavioural profiles (White-Lewis, 2019; Zadnikar & Kastrin, 2011).

Despite its potential benefits, equine-based activities involve safety risks because horses can react to unexpected sounds, movements, and emotional states in their environment, while children with ASD may have behaviours (for example: vocalisations, sudden movements) that can unintentionally startle a horse (Adenan et al., 2023; British Horse Society, 2022). Safety and readiness are therefore critical considerations in the planning and implementation of THR programmes, particularly in community and instructional contexts where instructors may not be medical professionals yet carry responsibility for safe session delivery (Adenan et al., 2023; White-Lewis, 2019).

Sensory differences are common in ASD and are recognised in diagnostic frameworks, including DSM-5, which highlights sensory processing issues as a feature that may influence behaviour and participation (American Psychiatric Association, 2013; Ben-Sasson et al., 2009). Sensory-related difficulties may interfere with engagement, adaptive responses, and participation in meaningful activities, especially when sensory demands are high (Humphry, 2002; Kuhaneck & Britner, 2013). In equine-based activities, tactile, vestibular, proprioceptive, and auditory responses can be particularly relevant because they influence equipment tolerance, balance, body awareness, and sound reactivity during horse interaction (Adenan et al., 2023; Ayres, 1979).

Norm-referenced standards for equine-based sport participation, sensory pre-assessment have previously been established to identify minimum readiness thresholds and support consistent participation decisions (Adenan et al., 2023). However, beyond reporting thresholds, applied programmes often need guidance on how to interpret screening outcomes for practical decisions whether a child can proceed immediately, requires modification, or benefits from delayed entry with preparatory activities (Adenan et al., 2023; McDaniel Peters & Wood, 2017). Therefore, the aim of this paper is to describe an applied framework for using sensory pre-assessment screening outcomes to support readiness and safety decisions prior to THR participation among children with ASD (Adenan et al., 2023; White-Lewis, 2019).

Literature Review

Equine-Based Sports Participation among Children with Autism

Equine-based sports activities have increasingly been recognised as inclusive physical activity options for children with autism spectrum disorder (ASD), offering opportunities for movement engagement, balance development, postural control, and social interaction (Ward et al., 2013; Srinivasan et al., 2018). Unlike traditional clinical interventions, equine-based sports participation involves structured physical activity demands similar to other sports, including

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task execution, instructor–participant communication, environmental awareness, and adherence to safety procedures (White-Lewis, 2019).

Previous studies have reported positive associations between equine-assisted activities and improvements in motor performance, balance, and engagement among children with neurodevelopmental conditions (Zadnikar & Kastrin, 2011; Maresca et al., 2020). These outcomes are often attributed to the rhythmic and repetitive movement of the horse, which provides dynamic postural challenges and multisensory input that stimulate motor and perceptual systems (Adenan et al., 2023; Ayres, 1979). From a sport science perspective, such movement-based stimulation aligns with principles of motor learning and physical activity participation, particularly for populations requiring adapted sport environments (Humphry, 2002).

However, participation in equine-based sports differs from other forms of physical activity due to the involvement of a live animal with its own behavioural responses. Horses are sensitive to sudden movements, loud sounds, and emotional cues from their surroundings, which may pose safety challenges when participants display unpredictable behaviours (British Horse Society, 2022). These characteristics necessitate careful screening of participants' readiness before engagement in equine-based sports activities, particularly among children with ASD (Adenan et al., 2023).

Sensory Processing and Sport Participation in Autism Spectrum Disorder

Sensory processing differences are a core feature of ASD and are formally recognised in diagnostic frameworks such as the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) (American Psychiatric Association, 2013). Children with ASD commonly exhibit atypical responses to sensory stimuli, including hypersensitivity or hyposensitivity to touch, movement, sound, and body position (Ben-Sasson et al., 2009; Rogers & Ozonoff, 2005).

From a physical activity and sport participation perspective, sensory processing plays a crucial role in an individual's ability to engage safely and effectively in movement-based tasks. Sensory systems, particularly tactile, vestibular, proprioceptive, and auditory systems, contribute to balance regulation, body awareness, coordination, and responsiveness to environmental cues (Ayres, 1979; Williams & Shellenberger, 1994). Difficulties in these sensory domains may interfere with postural control, task execution, and attention regulation during sports participation (Humphry, 2002; Kuhaneck & Britner, 2013).

In equine-based sports activities, sensory demands are particularly pronounced. Participants must tolerate tactile input from equipment and the horse, adapt to vestibular challenges created by mounted movement, demonstrate proprioceptive control to maintain posture, and respond appropriately to auditory stimuli such as environmental noise or instructor cues (Adenan et al., 2023). Failure to manage these sensory demands may increase the risk of distress behaviours, loss of balance, or unsafe interactions with the horse, highlighting the importance of sensory readiness in sport contexts involving equine participation (Adenan et al., 2023; Magnee et al., 2011).

Sensory Screening and Readiness Assessment in Sport Contexts

In sport and physical activity settings, readiness screening is commonly used to support safe participation, appropriate task progression, and injury risk reduction (Zadnikar & Kastrin, 2011). Screening tools help practitioners identify individual capabilities and limitations before

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engagement in activities with inherent physical or environmental risks. For children with ASD, readiness screening is particularly important due to variability in sensory responses and adaptive behaviours (Schaaf & Lane, 2015).

Norm-referenced sensory pre-assessment standards have previously been developed to support participation decisions in equine-based activities (Adenan et al., 2023). These standards provide objective threshold values that indicate whether an individual meets minimum sensory requirements for safe participation. However, while such standards establish an evidence-based foundation, sport practitioners and instructors often require applied guidance on how to interpret screening outcomes for real-world decision-making (McDaniel Peters & Wood, 2017).

Current literature has largely focused on either the therapeutic benefits of equine-assisted activities or the development of assessment tools, with limited emphasis on how sensory screening outcomes can be operationalised as readiness categories within sport participation frameworks (White-Lewis, 2019). This gap suggests a need for applied research that translates sensory screening results into practical recommendations for sport programme planning, activity modification, and progression strategies.

Critical Synthesis and Research Gap

Although previous studies have demonstrated the potential benefits of equine-based and equine-assisted activities for children with ASD, the literature remains largely descriptive and outcome-focused, with limited attention given to pre-participation decision-making within sport contexts. Sensory processing research highlights the importance of sensory systems for movement participation and regulation. However, these principles are rarely translated into applied sport readiness frameworks. Similarly, while norm-referenced sensory thresholds provide an evidence-based foundation, existing studies offer minimal guidance on how such thresholds can be interpreted and applied by practitioners in real-world sport settings. This highlights a clear need for an applied readiness framework that bridges sensory assessment evidence with practical equine-based sport participation decisions.

Problem Statement

Equine-based sports activities are increasingly promoted as inclusive physical activity opportunities for children with autism spectrum disorder (ASD). Existing research has largely focused on therapeutic outcomes, behavioural improvements, or the development of assessment instruments related to equine-assisted activities. While norm-referenced sensory pre-assessment thresholds have been established to support participation eligibility and safety decisions, there remains limited guidance on how these thresholds can be operationalised within applied sport settings.

In practice, equine-based sport programmes are often delivered by instructors or coaches rather than clinicians, and participation decisions are frequently based on subjective judgement, informal observation, or overly cautious exclusion. This creates a knowledge-to-practice gap, whereby empirically established sensory assessment evidence is not systematically translated into practical readiness decision frameworks that support safe, inclusive, and consistent sport participation.

The absence of an applied sensory readiness framework limits instructors' ability to make evidence-informed decisions regarding activity progression, modification, or delayed entry with preparatory activities. Addressing this gap is essential to ensure that children with ASD

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can participate safely in equine-based sports activities while maintaining programme consistency, inclusion, and safety.

Objectives of the Study

The objectives of this study are to:

1. Describe the application of a sensory readiness screening framework for equine-based sports participation among children with autism spectrum disorder.
2. Translate established sensory pre-assessment thresholds into practical readiness categories to support sport participation decisions.
3. Provide applied guidance for instructors and sport practitioners in planning safe, inclusive, and individualised equine-based sports activities for children with ASD.

Methodology

This study adopts an applied translational framework design, focusing on the practical application of previously established sensory pre-assessment thresholds to support sport participation readiness decisions in equine-based activities. Rather than developing or validating a new measurement instrument, the study translates existing sensory assessment evidence into a structured readiness framework intended for use by instructors and practitioners in community-based sport settings.

Sensory Readiness Screening Framework for Equine-Based Sports Participation

The applied screening framework focuses on four sensory domains relevant to equine-based activities participation: tactile, vestibular, proprioceptive, and auditory perception (Adenan et al., 2023). These domains align with foundational sensory systems described within sensory integration perspectives and learning hierarchies, where sensorimotor systems support higher-level participation and engagement (Ayres, 1979; Williams & Shellenberger, 1994). The selection of these domains is consistent with practice-oriented screening needs in equine-based activities settings where safety and functional participation are prioritised (Adenan et al., 2023; White-Lewis, 2019).

The screening tool structure reflects common approaches used in sensory profiling and behavioural observation of sensory responsiveness, including parent or proxy reporting of observable responses and participation challenges (Dunn, 1994; Schaaf & Lane, 2015). The items relate directly to equine-based activities relevant behaviours, such as tolerance to riding equipment, comfort with touch, balance tolerance, body awareness, and response to environmental sounds that may influence horse safety (Adenan et al., 2023).

Importantly, this paper does not re-establish norms or conduct psychometric validation. Instead, the threshold values and grading logic are adopted from previously published norm-referenced standards developed specifically for equine-based activities participation screening in children with ASD (Adenan et al., 2023). This approach is consistent with applied translation of evidence into practice where established thresholds guide programme decision-making rather than serving as the primary research contribution (Adenan et al., 2023; Rust et al., 2003).

Screening Context and Administration in Sport Practice

The screening is intended for use prior to equine-based activities participation as part of programme intake and safety planning (Adenan et al., 2023). In applied settings, screening may be administered with parents or proxies, supported by personnel familiar with horse-related activities and the child's behavioural profile, to capture responses across daily contexts and

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relevant to safe participation in equine-based sports activities scenarios (Adenan et al., 2023; Schaaf & Lane, 2015). This aligns with best-practice recommendations that sensory features in ASD are often context-dependent and benefit from multi-informant input rather than single-setting observation alone (Schaaf & Lane, 2015; Rogers & Ozonoff, 2005).

Screening prior to participation supports instructors' responsibilities for safety planning, including understanding participant limitations, potential contraindications, and required supports for effective session delivery (Adenan et al., 2023). Equine-based activities planning commonly includes structured mounted and unmounted activities; thus, readiness screening can guide progression and risk management within both types of activities (Adenan et al., 2023; McDaniel Peters & Wood, 2017).

The screening focus is practical: to help practitioners anticipate sensory-related challenges that could affect horse–human interaction, emotional response, and behavioural stability during sessions (Adenan et al., 2023; O'Haire, 2013). This is particularly important because horses may react to sudden noises or abrupt movements, and children with ASD may have difficulty with sustained attention or sensory modulation under novel conditions (Adenan et al., 2023; Magnee et al., 2011).

Interpretation of Screening Outcomes

Screening outcomes are translated into readiness categories to support decision-making rather than to label or exclude participants (Adenan et al., 2023). The applied interpretation follows assessment principles where results guide tailored instruction and supports, similar to how assessment criteria can inform adjustments in teaching or intervention dosage based on individual needs (Rust et al., 2003; Le Brun & Johnstone, 1994).

The readiness categories reflect three practical decisions commonly required in community equine-based activities programmes: (1) proceed with participation, (2) proceed with modifications and increased supports, or (3) delay participation and implement preparatory activities first (Adenan et al., 2023). This applied interpretation is consistent with inclusive intervention approaches that aim to optimise engagement and safety by adapting activities and environments rather than excluding participants due to challenges (Schaaf et al., 2013; White-Lewis, 2019).

Threshold values referenced in this screening are adopted from Adenan et al. (2023), who proposed minimum passing scores derived from a norm-referenced standard approach for equine-based activities sensory pre-assessment in children with ASD (Adenan et al., 2023). In this paper, those thresholds serve as a decision-support anchor for readiness categorisation rather than a reported outcome requiring replication (Adenan et al., 2023; McDaniel Peters & Wood, 2017).

Framework Development Rationale

The readiness framework was developed to address practical decision-making needs in equine-based sport settings, where instructors must balance participant safety, inclusion, and activity progression. The framework focuses on tactile, vestibular, proprioceptive, and auditory sensory domains due to their direct influence on balance control, body awareness, equipment tolerance, and responsiveness to environmental stimuli during equine-based sports participation. These domains align sensory assessment evidence with functional sport participation demands.

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Practice and Expert Considerations

While formal expert panel validation was not conducted for this applied framework, its structure was informed by prior empirical findings, established sensory integration theory, and practical considerations inherent in equine-based sport delivery. The framework reflects decision-making processes commonly used informally by instructors, now organised into a systematic, evidence-informed readiness classification approach.

Limitations of Adopting Existing Thresholds

The adoption of previously established sensory thresholds presents certain limitations. Threshold values were derived from a specific population and context and may not fully represent variability across different equine-based sport settings. Sensory readiness may also change over time with exposure and training; therefore, screening outcomes should be interpreted as dynamic indicators rather than fixed determinants. Accordingly, the framework is intended to support, rather than replace professional judgement and ongoing participant monitoring.

Results

In applied use, sensory pre-assessment screening provides structured guidance for readiness decisions prior to equine-based activities participation (Adenan et al., 2023). Across typical programme intake scenarios, many children demonstrate sensory responses compatible with immediate participation, while a subset may show sensory-related challenges that warrant modifications such as gradual exposure to equipment, additional behavioural supports, or adjusted activity sequencing (Adenan et al., 2023; Schaaf & Lane, 2015).

Screening outcomes are particularly useful for identifying equine-based activities specific safety risks linked to tactile defensiveness, balance intolerance, or sound over-reactivity that could increase the likelihood of distress behaviours (e.g., crying, running away, vocalisations) that may in turn startle a horse (Adenan et al., 2023). In ASD, sensory behaviours vary in severity and presentation, and these differences may meaningfully impact participation and safety if not anticipated (Ben-Sasson et al., 2009; Rogers & Ozonoff, 2005).

Rather than acting as a gatekeeping tool, screening supports individualised planning and readiness progression by guiding decisions about whether to begin with unmounted groundwork, shorten session demands, increase supervision, or delay mounted activities until preparatory goals are met (Adenan et al., 2023; White-Lewis, 2019). This aligns with programme planning recommendations that equine-based activities should be structured and adapted to the participant's capabilities for safe and effective participation (Adenan et al., 2023; Zadnikar & Kastrin, 2011).

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Table 1: Interpretation of Sensory Pre-Assessment Screening Outcomes for Equine-based Sport Participation Readiness

Screening Category	Interpretation	Recommended Action
Meets minimum readiness	Sensory responses within acceptable range across domains	Proceed with Equine-based Sport participation
Requires modification	Mild sensory challenges observed in one or more domains	Modify activities, increase supervision
Not ready for participation	Significant sensory challenges affecting safety	Delay participation; provide preparatory activities

The decision categories are applied interpretations informed by the threshold framework reported by Adenan et al. (2023) and are intended for practice use rather than revalidation (Adenan et al., 2023). Source: Adenan et al., 2023.

Discussion

This paper describes the applied translation of sensory pre-assessment standards into a practical readiness screening framework for equine-based sport activities participation among children with ASD (Adenan et al., 2023). While norm-referenced standards provide an objective foundation for determining minimum readiness thresholds, applied programmes frequently require an interpretation structure that converts scores into decisions that support safety planning and session design (Adenan et al., 2023; Rust et al., 2003).

Readiness screening is particularly relevant in equine-based activities due to the dynamic nature of horse behaviour and the potential for unexpected stimuli to trigger the horse's startle response, especially when paired with ASD-related behaviours such as sudden vocalisations or abrupt movement (Adenan et al., 2023; British Horse Society, 2022). Safety planning therefore benefits from structured screening that anticipates sensory triggers, promotes proactive modifications, and supports gradual exposure strategies when needed (Adenan et al., 2023; White-Lewis, 2019).

From a developmental and sensory integration perspective, foundational sensory systems influence engagement and adaptive participation; difficulties at the sensory level may interfere with higher-order functioning and meaningful activity participation (Ayres, 1979; Humphry, 2002). This is consistent with learning-hierarchy perspectives in which sensorimotor foundations support learning and self-regulation capacities, reinforcing the need to assess sensory readiness in contexts that require body control and attention stability such as THR (Williams & Shellenberger, 1994; Adenan et al., 2023).

In ASD, sensory behaviours are common but heterogeneous, meaning two children may present very different sensory needs that require different programme supports (Ben-Sasson et al., 2009; Rogers & Ozonoff, 2005). A screening framework supports consistent decisions across participants while still enabling individualised adaptation. For example, a child showing tactile defensiveness toward equipment may benefit from desensitisation and gradual equipment exposure, while a child with vestibular insecurity may require a staged progression from unmounted to mounted activities with additional stabilisation and supervision (Adenan et al., 2023; Schaaf & Lane, 2015).

Importantly, equine-assisted interventions are not intended to replace medical treatment but may complement broader intervention plans when appropriately structured and monitored

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(Adenan et al., 2023; White-Lewis, 2019). A readiness screening framework supports responsible integration by guiding whether participation should be immediate, modified, or delayed to reduce risks and optimise engagement (Adenan et al., 2023; McDaniel Peters & Wood, 2017).

Practical Implications for Equine-Based Sports Practice

For community-based equine-based activities providers, sensory readiness screening offers an applied method to support instructors who may not be clinicians but still require structured tools to plan safe activities (Adenan et al., 2023). Screening can inform lesson planning, horse selection suitability considerations, supervision levels, and communication strategies during sessions, aligning practice with safety and participant-centred programming (Adenan et al., 2023; Zadnikar & Kastrin, 2011).

Conclusion

Sensory readiness screening provides a practical decision-support approach for planning safe equine-based sports activities participation among children with autism spectrum disorder (ASD) (Adenan et al., 2023). By applying previously established pre-assessment thresholds within a clear readiness category framework, instructors and practitioners can make informed decisions regarding immediate participation, activity modification, or delayed entry with preparatory activities, rather than relying solely on subjective judgement (Adenan et al., 2023; White-Lewis, 2019). This applied approach supports structured sport participation while acknowledging individual sensory differences commonly observed in children with ASD.

From a sport participation perspective, readiness screening contributes to safer and more inclusive physical activity environments by ensuring that participants possess the sensory and postural capacities required to respond appropriately to task demands and environmental stimuli inherent in equine-based sports activities (Ayres, 1979; Zadnikar & Kastrin, 2011). The consideration of tactile, vestibular, proprioceptive, and auditory readiness enables instructors to anticipate potential challenges related to balance control, body awareness, equipment tolerance, and sound reactivity, which are critical factors influencing safety during horse–human interaction (Adenan et al., 2023).

Importantly, the use of sensory readiness screening does not function as a restrictive gatekeeping mechanism. Instead, it promotes individualised sport participation planning by guiding appropriate task progression, supervision levels, and instructional strategies based on each child's sensory profile (Schaaf & Lane, 2015; White-Lewis, 2019). Children who do not initially meet readiness criteria may still be supported through gradual exposure, unmounted preparatory activities, or adapted sport tasks, aligning with inclusive sport principles and long-term physical activity engagement goals (McDaniel Peters & Wood, 2017).

Integrating sensory screening into routine equine-based sports programme intake may further strengthen safety planning, improve consistency in participation decisions, and enhance programme quality across community-based settings (Adenan et al., 2023). For instructors and sport practitioners, the applied readiness framework offers a practical tool to support evidence-informed decision-making while maintaining flexibility to accommodate individual needs.

Future research may extend this work by examining the longitudinal impact of sensory readiness screening on sport participation outcomes, progression rates, and safety indicators in equine-based sports programmes. Additionally, exploring the integration of sensory screening

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with other sport readiness measures may further support inclusive and sustainable physical activity participation among children with ASD.

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