



Review Article

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A Review of Female Equestrian Challenges



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Abstract

Equestrianism is generally a female dominated physical activity yet has received comparatively little research attention within the literature. Female equestrians face a range of challenges, some constituting barriers to participation or competitive success. As an early start, late specialisation sport, female equestrian participation can last a lifetime if identified challenges can be successfully addressed. These challenges are grouped into hormonal challenges including menstruation, pregnancy and menopause; physical challenges including pain and injury, functional movement, breast and bra issues and body protectors; and psychological challenges including self-esteem, anxiety, coping strategies and body image. This study population has the potential to not only add to the limited research focussing on female physical activity and sport, but also to identify effective solutions to barriers to enhanced equestrian participation and performance, and as such warrants increased research interest in future.

Keywords: Menstruation; World Health Organisation; Oestrogen; Progesterone; Equestrian

Abbreviations: EIBP: Exercise-Induced Breast Pain; FMS: Functional Movement Screen; RVBD: Relative Vertical Breast Displacement; BI: Body Image; BS: Body Size; WHO: World Health Organisation

Introduction

Equestrianism is the only sex-integrated Olympic Sport [1] and has a novel sporting population. Females account for 85% of regular horse riders in the United Kingdom (UK) [2] and 35% are more than 55 years of age. Non-equestrian sports science literature has historically focussed on males and research attention has only recently considered the female athlete [3]. Equestrian athletes could provide a valuable population for study yet have specific barriers to participation themselves requiring further targeted investigation. The World Health Organisation (WHO) recommend a minimum of 150 minutes moderate intensity exercise each week for adults [4] but 40-50% of adults do not meet these guidelines [5].

Oxygen consumption levels in female horse riders meet the criteria for moderate intensity exercise [6] and since 48%

of female equestrians indicated horse riding was their only exercise activity [7], challenges to female equestrian participation should be considered, especially as 33% of women do not meet these weekly activity recommendations [8]. Horse riding requires complex inter-species interactions [9] through the application of subtle cues, often influenced by diverse factors and miscommunication results in negative outcomes for horse welfare and rider safety [10]. Female specific challenges can impact equestrian participation and many warrant further investigation to promote female physical activity.

Hormonal Challenges

As female equestrian career longevity can extend beyond that expected of many other athletes [11], each life stage can pose its own specific challenges, requiring further research attention.

Menstruation

Menstruation presents complex physiological and psychosocial challenges that are likely to influence female equestrian participation and performance. Female sport research is historically underrepresented [3] and only ~6% of sports science literature uses all-female samples [12]. This is commonly attributed to a lack of methodological consistency when accounting for the menstrual cycle. Non-equestrian athletes have reported 51-93% perceived negative performance impacts at certain cycle phases [13]. Symptoms (pain, fatigue, mood disturbance) are the primary documented drivers rather than objective performance decrements [13,14]. In addition to symptomology, cognitive fluctuations have been reported across cycle phases including reaction time and anticipatory differences [15].

Equestrian sports require fine motor control, trunk stability, emotional regulation and rapid decision making [9] and as such cognitive impairment, perceived impact on performance and mood may affect rider-horse communication with risk implications to both horse and rider [10]. In the athletic population prevalence of menstrual disorders ranges from 0-61% [16] with higher prevalence reported in endurance disciplines, which are likely linked to energy deficiency and training load, this raises questions regarding energy availability and training load in high-volume riders.

Menstruation remains socially regulated within sports environments; adolescent athletes report avoidance of physical activity during menses due to fear of embarrassment [17]. Equestrian specific uniform traditions including historically light-coloured breeches have exacerbated these concerns [18]. Whilst new equestrian governing body regulations may permit darker breeches in some settings, reluctance to discuss menstrual health with coaches remains common, particularly where coaching is male dominated [19].

Hormonal changes across the menstrual cycle, especially shifts in oestrogen and progesterone, are known to affect balance and posture [20]. Olivier et al. [21] tested riders on a riding simulator during two phases of their menstrual cycle. Sensors measured how riders controlled their posture and how much vibration travelled through their spine and head. Postural control did not change between menstrual phases, but vibration exposure did: riders experienced lower lumbar vibration doses and reduced neck-level vibration during the early follicular phase compared to the luteal phase.

This suggests that menstrual phase and hormone levels may influence how the female rider's body absorbs vibration, even when posture remains steady. Understanding this could help improve rider well-being and guide training or injury-prevention strategies. Given that 48% of female equestrians identify as riding being their only form of exercise [7], menstrual related barriers may disproportionately affect overall physical activity levels in this population. Greater menstrual health literacy within

equestrian coaching and governance structures has potential for participation sustainability.

Pregnancy

Pregnancy presents unique challenges for female riders as equestrian activities are commonly categorised as high risk because of the potential for falls and abdominal trauma [22-24]. Despite this perception, current clinical guidelines encourage pregnant women with uncomplicated pregnancies to engage in regular moderate-intensity physical activity due to well-established benefits, including reduced risk of gestational diabetes, hypertensive disorders, and postpartum depression, as well as improved mental health and body image [22,23,25-27].

However, there is limited evidence specifically addressing the risks or outcomes associated with continuing to horse ride during pregnancy, and existing recommendations often rely on perceived rather than demonstrated risk. Equestrian participation raises additional uncertainties because pregnancy-related physiological changes such as increased joint laxity and altered balance may theoretically affect riding safety, although empirical data remain scarce. A retrospective study of multiple sports has reported generally low rates of abdominal injury, even in physically demanding activities, highlighting the need for sports specific research [23].

Given the large proportion of women involved in equestrian sport across recreational, amateur, and professional contexts [11], understanding how pregnancy affects horse riding activity and performance is essential for future researchers. Findings from Lewis et al. [28], provide new insight into female riders' experiences. In their survey of adult female riders, most pregnancies were classified as low risk, and higher-level competitors particularly in dressage and eventing, reported continuing to ride later into pregnancy, often until the sixth or seventh month.

Pre-pregnancy competition level significantly increased the likelihood of returning to the same level postpartum (OR = 1.08), whereas increasing age reduced return probability (OR = 0.96). Pregnancy risk and discipline were not significant predictors. Postpartum recovery trajectories varied considerably: 31% of riders required more than a year to return to pre-pregnancy weight, and 23% never returned to it. Barriers to resuming riding included lack of time, reduced confidence, balance difficulties, and fatigue.

These findings underscore the complex interplay between pregnancy, physical recovery, and equestrian participation. For many female riders, decisions about continuing or resuming riding are shaped not only by physical changes but also by competitive aspirations, social expectations, and perceived safety. Collectively, the evidence highlights the need for evidence-based, sport-specific guidance to support informed decision-making for pregnant and postpartum equestrians.

Menopause

Perimenopause and menopause represent a largely underexplored life stage for female equestrians. Recent survey data from >1600 female riders reported high prevalence of joint pain (74%), fatigue (71%), anxiety (78%), loss of confidence (76%) and cognitive symptoms such as brain fog (80%) during this climacteric transition [29]. Riding confidence was reported to be reduced in 75% of riders with higher risk disciplines (Eventing, Show Jumping) declining substantially. In a sport that requires balance, rapid decision making and co-ordinated interspecies communication, cognitive and psychological symptoms may have implications for rider participation and horse welfare.

The role of the coach appears influential during this transition, female riders were significantly more likely to feel able to discuss menopausal symptoms with female compared with male coaches, and over 60% of these riders perceived symptoms to negatively affect their coaching experiences [29]. Indeed, Howard and Mills [30] identified that 77% of equestrians surveyed felt that equestrian coaches should be more aware of the support they can provide in this life stage and suitable training should be facilitated in future.

Despite recognised health benefits and improved mental health benefits of equestrian activity, symptom burden has been associated with reduced enjoyment and for some cessation of competitive activity. Given that 35% of UK equestrians are over 55 years of age [2], menopause represents a critical, overlooked window for participation attention. Proactive awareness, coach education and evidence informed support strategies are essential to retain experienced female riders and sustain lifelong engagement in equestrian activity.

Physical Challenges

Pain and Injury

Chronic pain is a significant and under-recognised issue among female equestrian riders, who comprise most participants in many disciplines. Across multiple cohorts, 59–96% of rider's self-report chronic pain [31-34], far exceeding prevalence rates in the general population (35-51%) [35]. Despite this, equestrian research has traditionally prioritised acute injury epidemiology [36,37], potentially obscuring the substantial long-term functional, quality-of-life, and health consequences of chronic pain [38,39].

Back pain, particularly lower back pain is consistently the most frequently reported pain site among riders [31]. However, disciplines specific patterns exist; riders in jumping disciplines report higher rates of upper back, neck, and shoulder pain [33,34]. Chronic pain is perceived to hinder riding performance and daily functional tasks such as horse care [33,34,40], reflecting broader chronic pain literature linking pain with reduced mobility, impaired everyday activity, and diminished wellbeing [41]. Sleep disturbance, another recognised contributor to pain severity and performance, has also been documented in rider populations [42].

Chronic pain also has socioeconomic implications, particularly for female riders juggling employment, caregiving, and equestrian responsibilities. It is associated with reduced labour market participation and lower household income [43], which is pertinent in a sector already exposed to substantial cost pressures [44]. In sport more generally, chronic pain is linked to increased risk of dropout and retirement [45-48], emphasising potential threats to participation and talent retention in equestrianism. Identifying the prevalence and perceived effects of chronic pain is therefore a critical step for developing appropriate mitigation strategies [49] for female equestrians.

Cultural dynamics within equestrian sport may further contribute to the under-recognition and under-management of pain. Athletes often normalise pain as an expected aspect of performance, reinforcing a broader "culture of risk" [50,51]. Similar patterns of pain concealment and toughness are reported in rhythmic gymnastics [52] and in equestrian workplaces such as racing yards [40,53,54]. These behaviours align with equestrian identity narratives that frame physically demanding work as "a way of life" [55] and reflect patterns observed in other labour-intensive sectors, including agriculture and the military [56,57].

The consequences of chronic pain extend beyond physical discomfort. Pain can impair cognitive processing and decision-making [58] and elevate anxiety-like symptoms [59], which is concerning in equestrian sport where rapid, accurate decisions are essential for safety [60-62]. Additionally, equipment and riding demands may exacerbate pain for the female rider: saddle design influences posture and back pain risk [32,63], while stirrup length [64] and horse symmetry [65] further affect rider biomechanics. Collectively, these findings highlight chronic pain in female riders as a multifaceted performance, health, and safety issue requiring preventative and rehabilitative interventions rather than reliance on symptom suppression alone.

Functional Movement

Functional movement limitations and reduced motor control are increasingly recognised as key contributors to pain and performance issues in female equestrian riders, that requires high levels of trunk stability, lumbopelvic control, and coordinated multi-segmental movement. Female rider functional movement screening consistently demonstrates low Functional Movement Screen (FMS) scores relative to other athletic populations [66], with mean composite scores typically ranging from 12.8–14.15, near or below established injury-risk thresholds [66,67]. Although a cut-off ≤ 14 is commonly used to indicate elevated injury risk, questions about FMS sensitivity have prompted suggestions for higher thresholds [68]. Notably, similar scores in female riders with and without pain [67,69] suggest that poor movement quality is not simply a by-product of pain and warrants multidimensional evaluation.

The FMS assesses movement quality across domains including mobility, stability, range of motion, and movement pattern integration [70]. Functional asymmetries and movement deficits identified by the FMS are linked to increased injury risk and reduced performance in athletes [71-73]. In female riders, lower-scoring components such as rotary stability, hurdle step, shoulder mobility, and deep squat indicate limitations in trunk control, hip stability, and cross-body coordination [66]. These abilities are fundamental in equestrian sport, where the rider must maintain dynamic trunk stability and adapt continuously to perturbations generated by the horse.

Mechanistically, impaired movement quality may relate to uneven spinal loading and altered motor strategies. Postural asymmetry associated with muscular imbalance, pelvic tilt, or leg length discrepancy can contribute to asymmetrical trunk range of motion and increased spinal load [74]. Reduced lateral trunk mobility is also associated with low back pain [75] and uneven spinal loading is implicated in pain development and persistence [76,77]. Among female riders specifically, deficits in spinal motor control and lumbar involvement have been linked to back pain [78], reinforcing the need for targeted interventions addressing trunk and segmental stability.

Riding performance depends on coordinated interactions between the pelvis, trunk, head, and limbs to maintain synchrony with the horse and achieve an independent seat. This requires skilled dissociation of the lumbopelvic-hip complex from upper-body actions [79,80]. Successful riders exhibit complex intersegmental coordination patterns with the horse's vertical motion across head, trunk, pelvis, and feet [81-84]. In elite dressage riders, pelvic-trunk coupling appears especially important for maintaining synchronisation [85]. However, larger or more powerful gaits, such as the extended trot, can increase perturbation and trunk instability, elevating strain and injury risk [85]. These findings underscore the importance of examining how female rider movement strategies vary across disciplines and gait demands in relation to pain aetiology, particularly as female riders may be at a biomechanical disadvantage compared to their male counterparts [86].

Breast and Bra Issues

Given the inherent biomechanical disadvantage of female equestrians [86], the impact of the breast and breast support warrant investigation in this population. The breast is a complex anatomical structure of glandular and adipose tissue, nerves, ligaments and skin [87-89]. Lacking any muscular support [90], breasts are readily displaced by external forces [91], leading to excessive breast movement and, potentially, exercise-induced breast pain (EIBP), tissue strain, and reduced exercise performance [87,92,93]. To minimise breast movement and discomfort, sports bra wear is recommended [94,95], though most existing research focuses on running populations [96] or females in physically active occupations [97-99]. As breast support requirements are activity

specific [100], identifying the breast support requirements of female equestrians should be a research priority.

Female equestrians report a high prevalence of EIBP (40%) during equestrian activities [101,102] increasing linearly with self-reported breast size. The sitting trot gait was most frequently reported to cause exercise-induced breast pain (EIBP) and 21% of respondents reported EIBP negatively impacted equestrian performance. Issues associated with bras were reported by 59% of respondents and were reported more frequently by large breasted riders [101]. Breast related barriers to equestrian participation were reported by 25% of respondents and large breasted riders were significantly less satisfied with their bra for horse riding. A large proportion of respondents (70%) stated that improvements in bra design were required for equestrian use [102] including support, style and fitness. These findings suggest that breast and bra issues are significant challenges for female equestrians, impacting rider performance, participation and potentially rider-horse interactions.

Equestrian activities may well give rise to novel breast movement, distinct from that seen in running activities which forms the design basis for most available sports bras. The horse rider must absorb large vertical excursions of the horse's body [80] and as such, bras designed for running activities may not provide appropriate breast support for equestrians. Cameron et al. [103] established that increased breast support significantly reduced relative vertical breast displacement (RVBD) and EIBP. A significant improvement in rider position was also consistently observed, particularly in torso position in sitting trot [103]. Yet many equestrians do not consider themselves as athletes and may not be aware of the breast support options available to them and equestrian specific educational initiatives could address these challenges in future [104].

Body Protectors

The use of body protectors in equestrian sport has increased in recent years; however, their design, comfort, and biomechanical implications for female riders remain insufficiently understood. Most commercially available protectors are unisex designs, offering limited accommodation for breast shape and volume, despite the predominance of female participants in equestrian sport [1]. Research in the military and police sectors has documented problems among female personnel, including breast discomfort, restricted movement, and poor fit during physical tasks when wearing similar apparel [99,105,106].

Notably, emerging evidence suggests that wearing a body protector may reduce breast pain experienced during riding, indicating potential benefits if designs were better optimised for female anatomy, however these findings are yet to be published. Most existing equestrian body protector research focusses on efficacy for injury prevention [107,108,109] with limited attention to comfort [110], performance implications, adoption [111] and

female specific fit issues. Given the high percentage of horse riders who are female, often competing in equestrian disciplines where body protector wear is mandatory such as racing or eventing, further research is warranted to explore breast, bra and body protector interactions, along with any subsequent performance implications.

Psychological Challenges

Female equestrians may also face novel psychological challenges including self-esteem [112], pre-competition anxiety [113], coping strategies [114] and body image [115].

Self-Esteem, Anxiety and Coping Strategies

Equestrian sport is classified as an 'early start, late specialisation' sport and over 25% of equestrians are under 16 years of age, potentially participating throughout their lifespan [1]. Like non-equestrian sports, attrition rates are highest during adolescence and may be related to changes in self-esteem [116]. Females demonstrate lower levels of self-esteem throughout adolescence compared to males [117] so self-esteem may be an important challenge for female equestrians, particularly in adolescence.

Davies & Collins [112] found that female equestrians in early adolescence experience a decline in self-esteem and perception of physical appearance and identified a subsequent increase post 18 years of age which was greater than that seen in other sports. This suggests that although younger adolescent female equestrians experience reduced self-esteem, if they remain within equestrianism, perceptions of appearance and overall self-esteem can be enhanced by equestrian participation.

Pre-competition anxiety is not specific to female equestrians, however due to the high proportion of female equestrians, may warrant more female specific research attention. McGinn et al. [113,118] identified some similarities in pre-competition anxiety and coping strategies in equestrian athletes to athletes in non-equestrian sports; however significant differences were seen across the different phases of eventing [11] suggesting that more targeted research should investigate how equestrian disciplines with differing gender demographics impact anxiety and coping.

Body Image

Female body image (BI) has been investigated in many sports and is impacted by sports type [119], yet in female-dominated equestrianism, BI has only recently attracted research attention. Equestrian apparel is novel in sporting environments, still based on male equestrian attire adopted by female equestrians in the early twentieth century as part of sweeping social changes [120]. Some equestrian disciplines are based on judging aesthetic appeal, i.e. dressage, and as such, appearance and BI may be more important to performance than in non-aesthetic sports.

Forino et al. [115] found that smaller body size (BS) was considered ideal for equestrianism and that respondents felt judges favour riders with smaller frames. Riders with a larger BI felt more self-conscious when riding and more respondents perceived the ideal equestrian BS to be smaller than their own BI [115].

Riders classed as dissatisfied with their BI were more likely to be self-conscious when riding, potentially hindering equestrian participation and performance. Further study found that the perceptions identified regarding judge and coach bias [115] were not entirely speculative.

Equestrian judges and coaches identified a smaller BS as being "ideal" for all horses [121] and agreed that BS impacts horse rider performance. This means that female equestrian perception may be valid, potentially causing barriers to participation and competitive success. These perceptions of BI may also contribute to implications beyond equestrian activities such as disordered eating [122,123] and should be further investigated in this population.

Conclusion

Equestrianism is generally a female dominated activity and as such, could provide a novel study population to increase research attention on the lived experiences of female athletes. However, female equestrians face a range of challenges that can impact participation and competitive performance including hormonal, physical and psychological issues. These areas warrant increased research attention particularly as the female equestrians' active participation can last a lifetime.

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