

An Exploratory Observational Study of Rearing Behaviour in Horses

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Article Info	ABSTRACT
Received: 23.05.2026 Accepted: 11.07.2026 Online first: 21.07.2026 Published: 27.07.2026 Keywords: Equine welfare, Exploratory observational study, Horse behaviour, Management, Rearing.	Rearing is a behaviour in which a horse stands on its hind limbs while lifting its forelimbs off the ground. Although it can occur as part of the normal behavioural repertoire, repeated or contextually inappropriate rearing may compromise horse welfare and rider safety. This exploratory observational study described horses with and without reported rearing behaviour on horse farms in Adana, Mersin and Konya, Türkiye. Data were collected for 80 horses through farm records, semi-structured interviews with owners, consultations with farm veterinarians and observations in stables and paddocks. The study included 59 horses with reported rearing behaviour and 21 horses without reported rearing behaviour. The sample comprised 32 Thoroughbreds, 24 Arabians, 16 Belgian horses and 8 ponies. The observations underline the importance of evaluating potential health problems, management conditions, training practices and rider-horse interactions when a horse exhibits rearing behaviour. Differences in distributions were observed for sex (exact $p=0.004$; Holm-adjusted $p=0.014$), intended use (exact $p<0.001$; Holm-adjusted $p<0.001$) and recorded health status (exact $p=0.003$; Holm-adjusted $p=0.014$). No evidence of distributional differences was observed for breed (exact $p=0.436$; Holm-adjusted $p=0.873$) or age (exact $p=0.444$; Holm-adjusted $p=0.873$). Health problems were recorded in eight horses overall: two of the 59 horses with reported rearing behaviour and six of the 21 horses without reported rearing behaviour. Limited field-based information is available regarding the characteristics of horses exhibiting rearing behaviour in Türkiye. Therefore, the present exploratory observational study aimed to describe horses with and without reported rearing behaviour and to provide a basis for future analytical studies. Further studies with larger, prospectively selected samples and standardised behavioural assessments are required to identify factors associated with rearing behaviour.

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INTRODUCTION

The invention of technological tools has caused horses to lose their working characteristics. Nowadays, they are primarily bred for racing and sports (Hacan et al., 2018; Paksoy et al., 2026). Under appropriate care and feeding conditions, horses demonstrate their true performance. However, when appropriate management strategies are not implemented, or when any health problems arise, horses may exhibit abnormal behavior. This abnormal behavior can reduce the horse's performance. Among these abnormal behaviors, frequent rearing is considered a significant fault in horse breeding (Gücüyener Hacan and Akçapınar, 2013; Paksoy and Gücüyener Hacan, 2023; Yalçın, 2009). To achieve optimal productivity, horses must be bred well, and this is only possible if they are healthy and in a peaceful environment. Proper care and feeding are essential for the health of horses. Routine practices such as regular grooming, hoof care and stable cleaning are vital (Arabacı, 2018; Paksoy and Ünal, 2010).

The nutritional needs of horses are affected by whether they are bred for hobby, sport or racing purposes. Their carbohydrate and protein requirements vary depending on how they are used (Şehu, 1997). The conditions in which horses live determine their welfare level. Conversely, behaviour is a parameter that provides information about the welfare level of horses (Waran, 2007). Behaviour is defined as the responses of animals to stimuli from their environment. If these responses are in the horse's nature, they are called 'normal behaviour'. Examples of normal behaviours include imitation, forming friendships, feeding, reproduction, resting, sleeping and playing (Paksoy & Koluman, 2025; Paksoy et al., 2025). From a breeding perspective, these are beneficial behaviours that should be present. Abnormal behaviours, on the other hand, are generally acquired behaviours that are very difficult to abandon. They can lead to serious financial and moral losses from a breeding perspective and are considered defects. Examples of abnormal behaviours include chewing wood, wind-swallowing, head-bobbing, hitting walls, biting and spinning around (Gücüyener Hacan and Akçapınar, 2013; Paksoy and Gücüyener Hacan, 2023; Yalçın, 2009).

Limited field-based information is available regarding the characteristics of horses exhibiting rearing behaviour in Türkiye. Therefore, the present exploratory observational study aimed to describe horses with and without reported rearing behaviour and to provide a basis for future analytical studies.

MATERIAL and METHODS

Ethical Approval

This study was evaluated by the Ethics Committee of Çukurova University, Ceyhan Faculty of Veterinary Medicine, and approved as ethically appropriate (Decision No: 2-4, Date: 13.02.2026).

Sample design and animals

This exploratory observational study was conducted on horse farms in the provinces of Adana, Mersin and Konya, Türkiye. A total of 80 horses of different ages and breeds were included. The sample comprised 32 Thoroughbreds, 24 Arabians, 16 Belgian horses and eight ponies. Based on owner reports and field observations, 59 horses were classified as exhibiting rearing behaviour and 21 horses were classified as not exhibiting rearing behaviour. The study was designed as a descriptive field assessment and was not intended to estimate population prevalence or establish causality. Horses were included using a convenience sampling approach from participating farms. Therefore, the proportion of horses exhibiting rearing behaviour in the study sample should not be interpreted as a prevalence estimate for the wider horse population.

Rearing Behavior: A horse was considered to have exhibited rearing behavior if it lifted its two front legs into the air and stood on its two hind legs. The duration of time it stood on its hind legs was not considered.

Data Collection

Information on age, sex, coat colour and breed was obtained from available farm and pedigree records. The intended use of the horses and behavioural observations were recorded through semi-structured interviews with owners. Researchers also observed the horses in stables and paddocks at specified intervals. Information on health status was obtained through consultation with veterinarians responsible for the participating farms.

Statistical Analysis

Data were entered into Microsoft Excel and summarised descriptively. Given the exploratory nature of the study and the small number of observations in several categories, exact tests were used for selected categorical variables. Two-sided Fisher's exact tests were applied to 2×2 tables (age, sex and health status), whereas Fisher–Freeman–Halton exact tests were used for larger contingency tables (breed and intended use). Because five exploratory exact tests were performed, Holm's method was used to adjust p-values for multiple testing. Exact and Holm-adjusted p-values are reported. No regression models were fitted. These analyses were univariable, unadjusted and hypothesis-generating; they do not account for confounding, the unmatched group structure, convenience sampling or farm-level clustering and should not be interpreted as evidence of causality, independent risk factors or population-level prevalence estimates.

RESULTS

A total of 80 horses were included in the study. Of these, 59 (73.8%) were classified as exhibiting rearing behaviour and 21 (26.3%) as not exhibiting rearing behaviour. Breed distribution is shown in Table 1, and additional descriptive characteristics, including age, sex, intended use and health status, are presented in Table 2. Exploratory exact-test results are summarised in Table 3. Differences in distributions were observed for sex (exact $p=0.004$; Holm-adjusted $p = 0.014$), intended use (exact $p<0.001$; Holm-adjusted $p<0.001$) and recorded health status (exact $p = 0.003$; Holm-adjusted $p=0.014$). No evidence of distributional differences was observed for breed (exact $p=0.436$; Holm-adjusted $p=0.873$) or age (exact $p=0.444$; Holm-adjusted $p=0.873$). Health problems were recorded in eight horses overall: two of the 59 horses with reported rearing behaviour and six of the 21 horses without reported rearing behaviour. These exact comparisons are exploratory and unadjusted for confounding and should not be interpreted as causal or population-level effects.

Table 1. Breed distribution by rearing status

Breed	Total n (%)	Rearing behaviour present n (%)	Rearing behaviour absent n (%)
Thoroughbred	32 (40.0)	26 (44.1)	6 (28.6)
Arabian	24 (30.0)	18 (30.5)	6 (28.6)
Belgian horse	16 (20.0)	10 (16.9)	6 (28.6)
Pony	8 (10.0)	5 (8.5)	3 (14.3)
Total	80 (100.0)	59 (100.0)	21 (100.0)

Note: Percentages in the “Total” column were calculated using the total sample size as the denominator (n = 80). Percentages in the “Rearing behaviour present” column were calculated using the number of horses with reported rearing behaviour as the denominator (n = 59). Percentages in the “Rearing behaviour absent” column were calculated using the number of horses without reported rearing behaviour as the denominator (n = 21). These values describe the selected study sample only and should not be interpreted as breed-specific prevalence estimates, population-level prevalence estimates or evidence of associations.

Table 2. Descriptive characteristics by rearing status

Variable	Category	Total n (%)	Rearing behaviour present n (%)	Rearing behaviour absent n (%)
Age	≤3 years	35 (43.8)	24 (40.7)	11 (52.4)
	>3 years	45 (56.3)	35 (59.3)	10 (47.6)
Sex	Female	35 (43.8)	20 (33.9)	15 (71.4)
	Male	45 (56.3)	39 (66.1)	6 (28.6)
Intended use	Racing	30 (37.5)	26 (44.1)	4 (19.0)
	Sport/show	40 (50.0)	32 (54.2)	8 (38.1)
	Hobby/recreational	10 (12.5)	1 (1.7)	9 (42.9)
Health status	No recorded health problem	72 (90.0)	57 (96.6)	15 (71.4)
	Recorded health problem	8 (10.0)	2 (3.4)	6 (28.6)

Note: Percentages in the “Total” column were calculated using the total sample size as the denominator (n = 80). Percentages in the “Rearing behaviour present” column were calculated using the number of horses with reported rearing behaviour as the denominator (n = 59). Percentages in the “Rearing behaviour absent” column were calculated using the number of horses without reported rearing behaviour as the denominator (n = 21). These values are descriptive only and should not be interpreted as prevalence estimates, evidence of associations or causal relationships.

Table 3. Exploratory exact tests by rearing status

	Exact test	Exact p-value	Holm-adjusted p-value
Breed	Fisher–Freeman–Halton exact test	0.436	0.873
Age	Fisher’s exact test	0.444	0.873
Sex	Fisher’s exact test	0.004	0.014
Intended use	Fisher–Freeman–Halton exact test	<0.001	<0.001
Health status	Fisher’s exact test	0.003	0.014

Note: Two-sided Fisher’s exact tests were used for 2 × 2 tables (age, sex and health status), and Fisher–Freeman–Halton exact tests were used for larger contingency tables (breed and intended use). Holm-adjusted p-values account for the five exploratory exact tests. These analyses are univariable, unadjusted and hypothesis-generating and do not account for confounding, matching, convenience sampling or farm-level clustering.

DISCUSSION

Rearing is a behaviour in which the horse raises its forelimbs while standing on its hind limbs (McDonnell, 2003). Although it may occur in the normal behavioural repertoire, repeated or contextually inappropriate rearing can create important welfare and safety concerns. Previous reports

have emphasised that pain, inappropriate equipment, management conditions, training practices and rider-horse interactions should be considered when evaluating horses that exhibit this behaviour (Jonckheer-Sheehy et al., 2012; McGreevy et al., 2009; Romness et al., 2020).

Clinical evaluation should also include possible musculoskeletal discomfort, because back and sacroiliac region pain have been reported in horses with poor performance or ridden behavioural problems (Barstow and Dyson, 2015; Girodroux et al., 2009; Martin and Klide, 1999). In addition to individual clinical examination, the broader farm-level health and biosecurity context should be considered descriptively. Previous studies in Turkish horse populations have reported infectious disease risk factors and variability in biosecurity practices on horse properties (İnce and Sevik, 2022; İnce et al., 2024). However, these aspects were not analysed as determinants of rearing behaviour in the present study.

Behavior problems in horses are often thought to be due to the horse's bad attitude, which commonly results in them being punished. However, when these cases are carefully worked up, there may be an underlying physical problem, and pain may play an important role (Jonckheer-Sheehy et al. 2012). Furthermore, in academic studies, rearing behavior is generally defined as the horse's attempt to throw its rider off or its effort to escape from constraints that restrict its instinct to avoid an approaching danger. Similar findings were obtained in the conducted study.

The exploratory exact tests suggested differences in the selected sample by sex, intended use and recorded health status, whereas breed and age did not show evidence of distributional differences. These findings require substantial caution. The non-rearing group was smaller ($n = 21$) and was not individually matched to the rearing group, and the sample was obtained through convenience sampling. Consequently, the observed distributions may reflect selection mechanisms, confounding or differences in management context rather than independent relationships with rearing behaviour. In particular, recorded health problems were more frequent in the non-rearing group; this pattern must not be interpreted as evidence that health problems are protective against rearing. The breed, age, sex and intended-use distributions reported in this study should be interpreted primarily as characteristics of the selected sample. Although exploratory exact tests were performed, they do not establish susceptibility patterns, independent risk factors or causal relationships. Observations derived from owner interviews and field assessments may also be affected by reporting bias, recall bias and differences in management practices across farms. Future research should use prospectively defined case criteria, standardised behavioural assessment protocols, repeated direct observations, detailed clinical examinations and clearly defined observation periods. Larger multicentre studies should recruit adequately sized comparison groups, consider matching or design-based control of major confounders where appropriate, and use analytical models that account for farm-level clustering and relevant animal-level variables. A priori sample-size planning and adequately powered multivariable analyses will be necessary to evaluate potential factors associated with rearing behaviour.

This study has several limitations. The sample was restricted to participating farms in three provinces and was not selected to estimate prevalence in the wider horse population. The non-rearing group was small ($n = 21$) and unmatched, limiting statistical power and increasing vulnerability to confounding and selection bias. Behavioural classification was based on field observations and owner reports, which may be affected by reporting and recall bias. Several categories contained small numbers of horses, and standardised repeated behavioural scoring and detailed clinical examinations were not available for all horses. The exact tests were univariable and exploratory and did not account for farm-level clustering or other confounders. For these reasons, the findings cannot be used to identify independent risk factors or support causal inference.

CONCLUSION

Rearing behaviour should be evaluated on a case-by-case basis. When a horse repeatedly rears during riding or handling, potential pain and other health problems should first be excluded. Management conditions, training practices, equipment and rider-horse interactions should then be reviewed. The present exploratory study identified distributional differences in the selected sample for some categorical variables, but these findings do not establish independent factors associated with rearing behaviour. Future studies should use standardised behavioural assessment protocols, prospective sampling designs, adequately sized and appropriately selected comparison groups, detailed clinical examinations and powered analytical methods before conclusions about associated factors can be drawn.

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Ethics Approval

This study was evaluated by the Ethics Committee of Çukurova University, Ceyhan Faculty of Veterinary Medicine, and approved as ethically appropriate (Decision No: 2-4, Date: 13.02.2026).

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Conflict of Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Research Design (CRediT 1) Yavuzkan Paksoy (%50) – Ömer Barış İnce (%25) – Nazan Koluman (%25)

Data Collection (CRediT 2) Yavuzkan Paksoy (%50) – Ömer Barış İnce (%25) – Nazan Koluman (%25)

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Sustainable Development Goals (SDG)

Sustainable Development Goals: 3 Good Health and Well-Being

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