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Retrospective Analysis of Equine Traumatic Injury: Patterns and Insights

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ABSTRACT

Traumatic injury is a catastrophic and second most frequent emergency condition that is significantly labor intensive and expensive to treat, raising a welfare concern in the equine industry. Even though the incidence is high, there is still a lack of data addressing the prevalence of these traumatic injuries, particularly in Malaysia. Therefore, this study aims to describe the occurrence and patterns of the traumatic injuries experienced by the subpopulation of horses in Malaysia. The records of horses reported to the University Veterinary Hospital, Universiti Putra Malaysia between January and December 2023 were reviewed to determine traumatic injury cases and all data were analysed descriptively. Among 422 patient medical records, 99 horses (23.0%) were reported to have sustained a total of 107 traumatic injuries. Majority of the injuries were reported to occur in the stable (26.2%), while being ridden (18.7%), and during the competition (18.7%), in which most of the cases were associated with wounds (60.7%), but the occurrence of fractures (9.3%) and injured ligaments or tendons (15.0%) were also high. Occurrence of being kicked by another horse (11.2%) and penetration by sharp objects (11.2%) were the most common mechanisms of injury, whereby forelimbs (38.8%) and hindlimbs (29.8%) were injured the most, commonly at the distal aspect. This data will enable horse owners and veterinarians to employ better traumatic injury–preventative strategies.

Keywords: Horse, prevalence, risk factor, traumatic injury

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INTRODUCTION

Traumatic injury refers to the damage or harm inflicted upon the structure or function of the body as a result of an external or internal force, encompassing both physical and chemical components (Owen et al., 2011). Traumatic incidents in horses can occur in general–purpose and sport horses. These injuries encompass a wide range of severity, from minor cuts and scrapes caused by saddle material, falls, kicks, or bites to more serious traumas that involve fractures of bone or torn ligament and tendon. In cases of catastrophic musculoskeletal injury, there is a high probability horses will be resorted to humane euthanasia to alleviate the suffering and painful condition.

Most recent research has focused particularly on injury in sport or performance horses, with special attention given to identifying the causes and risk factors that predispose to injuries in polo ponies (Inness & Morgan, 2014), dressage horses (Murray et al., 2010), jumping horses (Gibson et al., 2023), and racehorses (Crawford et al., 2021; Rouette et al., 2021). Briefly, tendon injuries were perceived as the major problem in polo ponies in which the hard ground provides an important risk factor for this incidence, followed by wounds and splint bone fracture. In racehorses, traumatic musculoskeletal injuries were the most common cause of death reported in Canada and the United Kingdom, comprising over 70.0% of racehorse fatalities (Allen et al., 2017; Physick-Sheard et al., 2018; Rosanowski et al., 2016). The high occurrence of traumatic injuries in sport horses has significant implications for training losses and wastage in horses across various disciplines (Mekete, 2022; Reilly & Bryk-Lucy, 2021). Nonetheless, general – purpose horses are also at risk of experiencing the incidence of traumatic injuries. A study in the United Kingdom has shown that 40.0% of general–purpose horses also sustain a traumatic injury (Owen et al., 2011). Sixty–two percent of the incidence occurred in the field, while 13.0% was during ridden exercise. The breed of horse, ownership duration, turn out environment, and stabling all time during spring were identified to be the factors associated with the increased risk of traumatic injury.

Despite injuries that take place during competition or being ridden, trauma in horses is also attributed to the incidence of bite and kick, which prevalence was found to be 8.0% and 21.6% in Swiss equine populations (Knubben et al., 2008). Apart from chasing, rearing, and mounting, biting and kicking are also typical horse behaviours and are associated with aggressive, threatening, submissive, and avoidance behaviour to preserve a long–lasting relationship, while some might happen by mistake as a result of exuberant excitement behaviour. Therefore, ensuring a stable group hierarchy and providing sufficient space in pasture and paddock have been identified as crucial elements in preventing these injuries (Knubben et al., 2008). Besides, trauma to horses in transport vehicles during a long journey also occurred frequently. The majority of research has focused on horses intended for human consumption that are transported by road using commercial companies, in which the incidence of injuries varies from 1.6% to 33.0% (Roy et al., 2015a, 2015b). In Australia, 45.0% of survey participants reported an incidence of traumatic injury related

to both commercial and non-commercial horse transportation (Padalino et al., 2016). Additionally, a retrospective survey of injury during non-commercial transportation has reported that equine behaviour was the attributed cause of 56.0% of incidents reported and most incidents occurred during the first hour of travel (Hall et al., 2020).

Wounds, bone fractures, and injuries to ligaments as well as tendons were commonly associated with trauma in horses. Wounds at the limbs were the most frequently seen in the form of abrasions, lacerations, or incisions. A survey in New Zealand demonstrated a high occurrence of skin wounds, particularly on the distal limb, which were costly and time-consuming to manage and may lead to decreased performance, retirement, or euthanasia (Theoret et al., 2015). On the other hand, bone fractures can occur in any part of the body. Kick injuries have been reported to cause fractures of the second and fourth metacarpal and metatarsal bones, followed by bones of the skull, proximal and distal phalanx, pelvis, and tibia (Donati et al., 2018). The fracture can be either simple fractures, comminuted fractures, fissures, or depression fractures, as well as the least seen, were Salter–Harris fractures.

Despite the high occurrence of traumatic injury to the equine population worldwide, the data on traumatic injuries are still limited, particularly in Malaysia. Therefore, the aims of the study are to highlight the occurrence of equine traumatic injuries by determining the frequency and assessing the patterns associated with the incidence. These findings will provide valuable insights for the horse owners and direct the veterinary teams to offer more specific care and enable prevention strategies for the horses.

MATERIALS AND METHODS

The case records of all horses reported to the University Veterinary Hospital, Universiti Putra Malaysia were reviewed. Data from January to December 2023 were selected and analysed for the occurrence of the equine traumatic injury. Cases that were confirmed or suspected traumatic injury incident had taken place were selected. A confirmed traumatic injury was determined based on the keyword “Traumatic injury” indicated in the record and as well as based on the case history. Meanwhile, records for all horses with a suspected traumatic injury were examined and deemed eligible for inclusion in this study, in which any of the following criteria were met: the presence of one or several lacerations, incision, ulceration, or abrasion wounds, swelling of the affected region, pain upon palpation, lame upon walk or trot and fracture of a bone. Cases were excluded if there was insufficient or no clear evidence of a traumatic injury based on the case report. Case information was collected detailing the date of occurrence, signalment of the horse (breed, sex, age, uses), aetiology of injury, and physical examination findings. Additional information regarding the cases was obtained through verbal communication with the veterinarian responsible for the cases.

Data were entered and managed in Microsoft Excel 2021 ((Microsoft Corporation) and IBM SPSS Statistics version 27 software (IBM Corporation) was utilized to analyse the data

and determine the frequency distribution. The analysed data were reported as frequencies and percentages. The distribution of traumatic injury was divided into groups in accordance with the risk factors. Outcomes of each aspect were evaluated and were expressed as a percentage of the total number of outcomes from all aspects by using tables and charts.

RESULTS

A comprehensive analysis of 422 patient medical records yielded a total of 107 traumatic injury cases reported from 99 horses (23.0%) from January until December 2023 as illustrated in Figure 1. Among these, 8 horses sustained multiple injuries, whereas the remaining 91 horses were reported to have suffered only a single injury each. The average number of cases that occurred was 9 cases in a month, which ranged from a minimum of 6 cases seen in February, March, October, and December to the highest of 15 cases reported in June.

Table 1 shows the number and percentage of traumatic injury according to sex, age, breed and horse's uses classifications. Of all horses examined, there were comparable number of mare and geldings recorded with small portion of stallion and filly. Among them, there were a higher number of adults reported with injuries compared to foal and geriatric horse. The breed distribution comprised of Thoroughbred, Polo Ponies, Warmblood, Arabian, Criollo, Friesian and local pony. Most horses were used for sport and companionship. However, in 15 horses, there was no information regarding their uses at the time of injury reported.

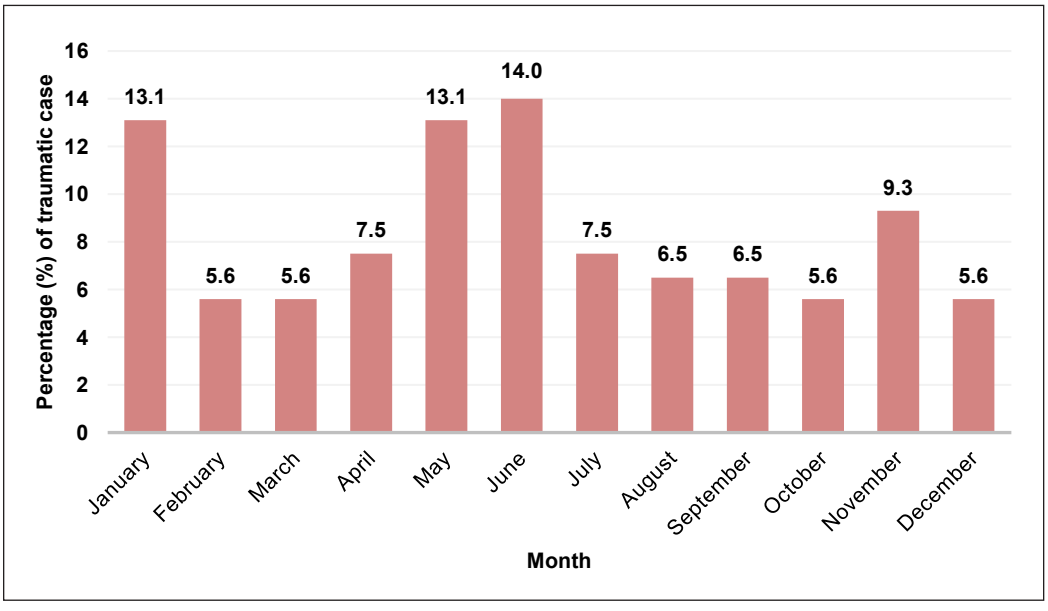

Figure 1. Monthly distribution of traumatic injury cases in horses, from a total of 107 cases, presented to the University Veterinary Hospital, Universiti Putra Malaysia, from January to December 2023

The locations of traumatic injury incident took place are shown in Table 2. The occurrence was mostly reported to occur at the stable or stall. This was followed by injuries that occurred during competition, as well as during ridden for training and leisure rides, which had similar occurrences in this study. Traumatic injury also takes place when the horse is released into the paddock. Rarely, traumatic injury was also reported to occur during transportation. However, in two cases, the location of the injury was not documented in the medical record.

Table 3 displays the causes of traumatic injury sustained by the horses over the year. The most frequent causes of injury were a kick from another horse and also penetration by

Table 1
Distribution of horses reported with traumatic injury to University Veterinary Hospital, Universiti Putra Malaysia according to sex, age, breed and uses from January to December 2023

Signalments		Frequency	Percentage (%)	Confidence Interval (95%)
Sex				
	Mare	50	50.5	(0.41, 0.60)
	Gelding	46	46.5	(0.37, 0.56)
	Stallion	2	2.0	(0.00, 0.05)
	Filly	1	1.0	(0.00, 0.03)
	Total	99	100.0	
Age				
	Foal	1	1.0	(0.00, 0.03)
	Adult	77	77.8	(0.70, 0.86)
	Geriatric	21	21.2	(0.13, 0.29)
	Total	99	100.0	
Breed				
	Thoroughbred	35	35.4	(0.26, 0.45)
	Warmblood	16	16.2	(0.09, 0.23)
	Arabian	11	11.1	(0.05, 0.17)
	Polo ponies	32	32.3	(0.23, 0.42)
	Criollo	1	1.0	(0.00, 0.03)
	Friesian	1	1.0	(0.00, 0.03)
	Local pony	1	1.0	(0.00, 0.03)
	Unknown	2	2.0	(0.00, 0.05)
	Total	99	100.0	
Uses				
	Dressage and show jumping	23	23.2	(0.15, 0.32)
	Endurance	19	19.2	(0.11, 0.27)
	Polo match	27	27.3	(0.18, 0.36)
	Pleasure	10	10.1	(0.04, 0.16)
	Patrol	6	6.1	(0.01, 0.11)
	Unknown	15	15.2	(0.08, 0.22)
	Total	99	100.0	

sharp objects. Other causes involved falling or stumbling, crashes and hits that occurred during polo matches, and also improper saddle or bit used. Some horses also exhibited self–inflicted injury. This self-mutilation encompasses behaviours such as biting, stomping, kicking, rubbing, and lunging into objects. Wounded during transportation occurred rarely. However, about half of the cases, the cause of injury could not be determined.

Table 4 presents the various types of traumatic injuries sustained by horses that were presented to the hospital throughout the year 2023. Of all the trauma cases, injury presented with single or multiple cutaneous wounds contributes to the highest cases reported to the hospital. This wound includes laceration, abrasion, or incision wounds that involve any parts of the body. Injury toward the ligament and tendon accounted for 15.0% of the cases, particularly involving the ligament and tendon of the limbs. This was followed by

Table 2
Distribution of location of traumatic injury incident took place in horses presented to University Veterinary Hospital, Universiti Putra Malaysia from January to December 2023

Location	Frequency	Percentage (%)	Confidence Interval (95%)
Stable or stall	28	26.2	(0.18, 0.34)
Competition	20	18.7	(0.11, 0.26)
Ridden	20	18.7	(0.11, 0.26)
Paddock	9	8.4	(0.03, 0.14)
Transportation	2	1.9	(0.00, 0.10)
Not mentioned	28	26.2	(0.18, 0.34)
Total	107	100.0	

Note. Out of a total of 99 horses, 8 horses sustained two traumatic injuries, while the remaining 91 horses sustained a single traumatic injury

Table 3
Distribution of the causes of traumatic injury in horses presented to University Veterinary Hospital, Universiti Putra Malaysia from January to December 2023

Causes of traumatic injury	Frequency	Percentage (%)	Confidence Interval (95%)
Kick	12	11.2	(0.05, 0.17)
Stumble/ Fall	11	10.3	(0.05, 0.16)
Improper bit/ saddle	7	6.5	(0.02, 0.11)
Penetration by a sharp object	12	11.2	(0.05, 0.17)
Crash and hit during polo game	9	8.4	(0.03, 0.14)
Transportation	2	1.9	(0.00, 0.10)
Self-inflicted	7	6.5	(0.02, 0.11)
Not mentioned	47	43.9	(0.35, 0.53)
Total	107	100.0	

Note. Out of a total of 99 horses, 8 horses sustained two traumatic injuries, while the remaining 91 horses sustained a single traumatic injury

fractures which mostly occur to the splint bone, where the lateral aspect of the limbs was injured in approximately 86.0% and the medial aspect in 14.0% of the cases. Rarely there were also fractures toward the sesamoid bone, nasal bridge, and tooth. Trauma to the eye attributed to the 8.4% of the cases reported. The horses were also suffering from puncture wounds which resulted from nail penetration of the sole or other penetration of muscle by sharp objects. Infrequently, traumatic incidents occurred without visible physical injury, although horses exhibited signs of inflammation and recumbency.

The occurrences of injuries on various body parts showed significant variation as demonstrated in Table 5. The proportion of injuries on the limb was the highest, in which the injury to the forelimb was significantly more than those that occurred to the hindlimb. Injury to the head region was lesser than the limb, which was attributed to the eye, mouth, ear, and nose, respectively. The traumatic injuries also inflicted the hoof, trunk, chest, and hindquarters. The genital and neck regions exhibited the lowest frequency of distribution.

Table 4
Proportion of traumatic injuries by type in horses presented to University Veterinary Hospital, Universiti Putra Malaysia from January to December 2023

Type of traumatic injury	Frequency	Percentage (%)	Confidence Interval (95%)
Single wound	44	41.1	(0.32, 0.50)
Multiple wounds	21	19.6	(0.12, 0.27)
Fracture	10	9.3	(0.04, 0.15)
Ligament/ tendon injury	16	15.0	(0.08, 0.22)
Eye trauma	9	8.4	(0.03, 0.14)
Hoof and muscle penetration/ puncture	5	4.7	(0.01, 0.09)
No visible injury*	2	1.9	(0.00, 0.10)
Total	107	100.0	

Note. Out of a total of 99 horses, 8 horses sustained two traumatic injuries, while the remaining 91 horses sustained a single traumatic injury. * = Horses were reported to have experienced traumatic incidents exhibited signs of inflammation and recumbency, with an absence of visible external or internal injuries

Table 5
Distribution of the traumatic injuries relative to anatomical location in horses presented to University Veterinary Hospital, Universiti Putra Malaysia from January to December 2023

Anatomical location distribution	Frequency	Percentage (%)	Confidence Interval (95%)
Head			
Eyes	9	7.4	(0.03, 0.12)
Mouth	7	5.8	(0.02, 0.10)
Ear	1	0.8	(0.00, 0.03)
Nose	1	0.8	(0.00, 0.03)
Neck	1	0.8	(0.00, 0.03)

Table 5 *(continue)*

Anatomical location distribution	Frequency	Percentage (%)	Confidence Interval (95%)
Chest	3	2.5	(0.00, 0.05)
Trunk	6	5.0	(0.01, 0.09)
Hindquarters	3	2.5	(0.00, 0.05)
Genital	1	0.8	(0.00, 0.03)
Forelimb	47	38.8	(0.30, 0.47)
Hindlimb	36	29.8	(0.21, 0.38)
Hoof	6	5.0	(0.01, 0.09)
Total	121	100.0	

Note. The total figure indicates to horses that have experienced one or two injuries, and also horses with multiple wounds presented with injuries at multiple body locations

DISCUSSION

This retrospective study presents a comprehensive description of the frequency and patterns of injuries experienced by a subpopulation of horses in Peninsular Malaysia. Overall, all cases reported to the veterinary teaching hospital within 12–month period showed the occurrence of horses with traumatic injuries was 23.0%. The figure is lower compared to the 40.0% reported by a previous study in the United Kingdom (Owen et al., 2011). This difference could be attributed to the data collection approach used, as this study collected information on the injury incidents reported to the hospital and which were attended by the veterinarian. Meanwhile previous study by Owen et al. (2011) used a questionnaire survey from horse owners who may have reported minor injuries that may not have been attended by a veterinarian. Additionally, a study by Satessa and Lema (2014) reported an overall injury occurrence of 45.5% in working equines, which is higher than the occurrence observed in this study. The nature of these animals as working equines may increase their exposure to injury due to the physical demands and environmental factors associated with their labor. However, our occurrence appeared to agree with the survey studies in Australia and New Zealand that reported their occurrence as 22.5% and 25.0% respectively (Theoret et al., 2015; Sole et al., 2015). Indeed, our figure may underestimate the true prevalence of traumatic injury in Malaysia as it only evaluated a small portion of the horse population in Peninsular Malaysia. Besides, there is also the possibility that the horse owners did not report the trauma incidents to the veterinarian as well as they treated the condition without veterinary assistance. Similar to situation in Australia, where horse owners are known to manage some wounds independently, which could lead to underreporting of injury cases (Sole et al., 2015). While these studies did not assess the welfare impact of this practice, it raises concerns about the effects on horse health, particularly given the need for proper veterinary care for serious injuries.

Moreover, the age and sex distribution exhibited no significant influence on the occurrence of traumatic injury in the horses. However, the breed of horse and its use appear to have an impact on raising the risk of exposure to a traumatic incident. In this study, horses engaged in competitive activities experienced a higher frequency of sustaining injuries. The endurance competition mostly featured by Thoroughbred and Arabian horses, while polo matches involved Polo ponies, and Warmbloods were utilized in dressage and show jumping events. As endurance is considered a strenuous exercise, it is noteworthy that horses were exposed to sharp object penetration on the track, along with falls or stumbles due to fatigue. The speed, inexperienced rider, previous injuries of the horses, track and other unmeasured factors may also co–influence the risk for traumatic injury during an endurance race (Nagy et al., 2013). Moreover, given the nature of the polo game that requires the ponies to sprint at maximum speed, turn abruptly, make sudden stops, retain balance when riders shift their weight significantly off–centre, and even collide with other horses, the potential for injuries is consistently high for the ponies as well as for the players. This discovery aligns with the findings of a previous study which also identified tendon injuries, wounds, and splint bone fractures as the most often reported injuries in polo ponies (Inness & Morgan, 2014). Additionally, a significant number of show jumping and dressage horses also encounter difficulties related to their ligaments and tendons. This supports previously described clinical findings that demonstrated a high risk of forelimb superficial digital flexor tendon (SDFT) injury and distal deep digital flexor tendon (DDFT) injury in show jumping horses and hindlimb suspensory ligament injury in dressage horses (Murray et al., 2006; Tranquille et al., 2024). This could be attributed to the repetitive loading during jumping and considerable strain on landing, which relatively cause a great strain on the show jumping horse (Murray et al., 2006; Sousa et al., 2017). Meanwhile, the training regime and surface–related factors normally predisposed the dressage horse to this injury (Murray et al., 2006; 2010). Hence, performance horses are at greater risk of sustaining traumatic injury compared to general–purpose horses.

Despite the high number of horses used for sport, many horses were injured while in the stable compared to during competition, where the incident took place at the stable compound or in the individual stalls. Other than mechanical injury, the individual housing practice possibly induces abnormal behaviour in the horses which leads to self–inflicted injury. This study discovered that some horses had self–mutilation behaviours, in which there was a tendency to bite their bodies and as well as to scratch the stall wall. This self–inflicted injury can be caused by firstly normal behavioural response to continuous or intermittent physical discomfort, secondly by self–directed intermale aggression, or thirdly by stereotypic activity, for example nipping at various areas of the body in a relatively invariant pattern, stomping, or kicking rhythmically against an object (McDonnell, 2008; Winskill et al., 1995). Additionally, horses that were socially confined also may

be injured or injure other horses when they are released to stay in the group, particularly in the paddock (Knubben et al., 2008). These horses were predisposed to demonstrating abnormal behaviours to redirect sexual behaviour, as a defensive mechanism, or to establish hierarchy within a group (Knubben et al., 2008; McGreevy, 2004). These abnormal or exaggerated normal behaviours may be likely to increase the risk of injury to horses within the group. Furthermore, the horse also was injured when ridden, both for training and leisure. One of the issues was caused by poor saddle or bit used. Poorly fitted saddle will cause wounds, particularly at the wither and loin region. An ill-fitting saddle can hinder the horse's thoracolumbar function, leading to stiffness in that area, which may contribute to back pain for the rider (Dyson et al., 2015). Similarly, a saddle that does not fit the rider properly can affect their position and balance, resulting in back or hip pain. Identification of an ill-fitting saddle involves inspecting it both off and on the horse without and with the rider, while observing horse movement. Examine for uneven flocking, ensure the gullet is appropriately sized, and check for complete tree coverage to avoid pressure on the spine. A saddle that tips forward or backward or has uneven panel contact can cause pain and restrict the horse's movement. Indeed, correct saddle fit for horse and rider is an important equine welfare issue. Besides, the bits used might also wound the oral region. The bit induces pressure on the sensitive structures of the horse mouth, which include the lip commissures, buccal mucosa, tongue, and the bars of the lower jaw, and in certain bit types, it also causes pressure to the hard palate and the base of the second premolars (Anttila et al., 2022; Manfredi et al., 2005a; 2005b; 2009). However, an ill-fitting bit can potentially put excessive pressure, pinching or rubbing of oral tissues or limit the movement of the tongue, which eventually causes oral trauma and thus pain for the horse (Björnsdóttir et al., 2014; Mata et al., 2015; Tuomola et al., 2019). Hence, a significant number of traumatic injuries also happen in stables and during ridden due to factors like poor housing practices and ill-fitting equipment, thus it is vital to monitor and understand horses' behaviour as well as to ensure the proper choice of saddle and bits to minimize the traumatic injury incidents.

In addition, the cause of most injuries was not determined as it was not mentioned in the patient record as well as owners were not present at the time of injury. However, in this study, kicking by another horse and penetration by a sharp object were the most common mechanisms of injury to happen. There were significantly larger proportion of Thoroughbreds were victims of kick injuries than were other breeds, which is a finding in line with a previous study that revealed Thoroughbreds and Thoroughbred crossbreds as more likely to be victims of kick wounds (Schroeder et al., 2013). This study also found that kick injuries most take place when a group of horses are let into the paddock together, this is a similar scenario to a previous study that demonstrated that kick incidents occurred on pasture (Derungs et al., 2004). As an important aspect of equine behaviour, kicking

serves as a defensive mechanism and a means of establishing group hierarchy, particularly occurring when dominant or socially confined horses are placed together (McGreevy, 2004; Knubben et al., 2008). Penetration by sharp objects occurred mostly at the sole of the hoof, and caused laceration of the corneal of the eye. The nails including the horseshoe nail were the main cause of the punctured sole. Meanwhile, laceration of the corneal normally resulted from stable doors, fence posts, trees, and sand. Both penetration of the sole and corneal by a sharp object can be deadly if it is involved with vital structure and normally is associated with the introduction of pathogenic microorganisms (Burba, 2013; Lazareva et al., 2022). Stumble and fall took place during training or competition, and even at stable. This is contributed by the uneven terrain or slippery surfaces that make horses difficult to maintain their footing. Horses undergo strenuous also may experience fatigue or limb and hoof issues which lead them to a lack of coordination and increased risk of stumbling. Moreover, the traumatic injury also occurred due to the crash and hit during a polo match, which focused more on the polo horses. Despite, the high number of wound cases determined in this study, polo horses are always at risk for tendon injuries due to their nature and need for speed, agility and constant exposure to stress during the match (Inness & Morgan, 2014; Schumacher & Gehlen, 2024). Transportation–associated injuries usually occurred during vehicle movement, and less frequently during unloading, loading and while stationary, in relation to behaviours such as scrambling and panicking (Riley et al., 2016). It has also been reported that mechanical failure of a trailer or truck, driver errors, as well as traffic and road condition contribute to injury during the transportation (Riley et al., 2016).

The forelimb and hindlimb of horses experienced the highest number of injuries, with the distal portion of the limb being the most commonly affected area. Wounds were the most prevalent type of injury, followed by problems with ligament and tendon and splint bone fracture. Among the causes of wounds to the limb were related to the penetration by sharp objects, stumbles and falls, kicks as well the injury during polo matches. The lower limb is subjected to injury due to its limited soft tissue, thus resulting in inadequate protection compared to the upper limb and trunk (Kayode, 2017). Wounds that involve the distal aspect of the limb are frequently more problematic due to their closeness to the ground makes them more likely to become contaminated and infected (Jørgensen et al., 2021; Kayode, 2017). Moreover, the head region is also exposed to injury, particularly the muzzle and eye. As mentioned above, the high incidence of injury at the muzzle or generally oral region is normally correlate with the poor choice of bits. It is vital to identify the correct bit size in accordance with each horse's oral dimension. Since, the oral dimensions vary by age, sex, and breed, measuring oral dimensions as part of routine dental examination aids in choosing a bit mouthpiece size that fits to avoid discomfort (Anttila et al., 2022). There is a notable correlation between the eye injuries sustained with performance horses

which may be related to penetrating objects such as sand for racehorses and polo sticks in polo ponies, however, there was also exposure of potentially hazardous in the stable, such as feed troughs, water buckets, and hay racks. A study showed that horses kept in stable, sustained more ocular disease compared to the horses kept primarily at pasture (Ludwig et al., 2025). Even though this study reported more findings on ulcerative eye lesions, the horses are also always at risk to sustain the non–ulcerative eye lesions that able to lead to detrimental conditions such as fungal stromal abscess formation, cataracts and corneal perforations.

CONCLUSION

In conclusion, this present study has demonstrated that there is significant occurrence of traumatic injury in the subpopulation of horses in Peninsular Malaysia. It was also shown that the majority of injuries were noted in the horses that participated in competition, however general–purpose horses are also predisposed to traumatic injuries, and the most frequent causes of injury were being kicked by another horse and being penetrated by a sharp object. Most of the cases were presented with wounds and the forelimb and hindlimb were the body parts implicated by most traumatic injuries, which were expensive and time–consuming to treat and may lead to reduced performance, retirement, or euthanasia. Therefore, these findings highlight the need for a better preventive measure, improved management practices, and stronger safety protocols**.** Ultimately, a comprehensive understanding of these injury patterns will promote the overall health and welfare of horses. This proactive approach can significantly reduce the incidence of traumatic injuries in equine populations.

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