Injury 57 (2026) 112907

Contents lists available at ScienceDirect

Injury

journal homepage: www.elsevier.com/locate/injury

Factors influencing equestrian helmet use, purchase and safety perceptions: A cross-sectional study

H. Gosbee, P.A. Hume, A Theadom *

TBI Network, Department of Psychology and Neuroscience, Faculty of Health and Environmental Science, Auckland University of Technology, Auckland, New Zealand

ARTICLE INFO

Keywords:
Concussion
Awareness
Equestrian
Helmets
Brain injury

ABSTRACT

Objective: Helmets play a critical role in preventing and reducing the severity of head injuries in high-risk sports. Understanding the factors influencing equestrian helmet use and safety perceptions is needed to optimise injury prevention strategies.

Methods: In this cross-sectional study of 596 equestrian participants aged ≥12 years, we assessed helmet use, factors influencing helmet purchase decisions, and perceptions of helmet safety. Chi square tests and regression models examined differences by age, professional status, jumping versus non-jumping disciplines and concussion history.

Results: Helmet use whilst riding was high (96 % participants). A high proportion of helmets used for competition (97 %) met at least one safety standard, however this was lower for recreational use (65 %). Younger equestrians (aged 12-44 years) and those who had not experienced a concussion were more likely to rank price as the most important factor for helmet purchase decision making. There were no differences by jumping or non-jumping equestrian disciplines or professional status. Older age and being female were independently linked with higher perceptions of helmet safety in the regression model ($p = 0.01$).

Conclusion: Safety messages need to focus on improving understanding of helmet standards and the reasoning behind safety recommendations to help reduce the injury risk in equestrian sports, particularly targeting adolescents/young adults.

Introduction

Equestrian sports have a high risk of injury, with approximately one in five riders experiencing a serious injury during their riding career [1]. In New Zealand, equestrian injuries account for 3.5 % of total trauma events in hospital [2]. Brain injuries and concussions make up 10-15 % of all equestrian related injuries [3]. A review by Meredith et al, [4] found the most common horse related injuries involved falling off horses, however injuries frequently occurred when leading or working with horses on the ground (e.g. being kicked or knocked by the horse). Females have approximately a three times higher risk of injury from engagement in equestrian activities compared to males [5].

Helmets are a common safety measure used to reduce risk of head injuries particularly in high-risk sports such as equestrian activities [6]. Helmets are designed to reduce superficial injury and prevent skull fractures. Equestrian sports organisations often mandate that riders wear a helmet that meets at least one recognised safety standard for competitions and organized events. For example, in New Zealand (NZ), the following standards apply; AS/NZS 3838, VG1, ASTM, PAS 015 Snell E2016 or later. Riders are asked to show compliance in meeting one of these standards to compete in Equestrian Sports New Zealand (ESNZ) and New Zealand Pony Club Association competitions by having their helmet 'yellow tagged' (a yellow sticker put on strap by an authorized person confirming they meet at least one of the above standards). Whilst all of the safety standards include testing for vertical flat impact and crush resistance, the need to pass other tests such as edge or rotational impacts varies considerably. A study by Connor et al [7] found that helmets certified to the most stringent standard were overrepresented in the undamaged group of helmets following an impact.

Multi-Directional Impact Protection System (MIPS) is a recent technology being added to equestrian helmets which is designed to reduce the risk of concussion by absorbing impact [8]. This suggests that equestrian helmets with the MIPS system can further reduce the injury risk compared to helmets without this system. However, further testing

* Corresponding author at: Director of the TBI Network, School of Clinical Sciences, Level 4 Tukutuku Building, AUT North Campus, 90 Akoranga Drive, Auckland, New Zealand.

E-mail address: alice.theadom@aut.ac.nz (A. Theadom).

https://doi.org/10.1016/j.injury.2025.112907
Accepted 25 November 2025
Available online 27 November 2025

into the effectiveness of MIPS technology is needed. Consequently, different types of helmets are likely to provide different levels of protection [9]. Therefore, it is important to wear a helmet that will provide the best protection, to reduce injury risk.

Studies have found huge variation in the use of helmets in equestrians. A systematic review by Young et al [10] found that helmet use in the United States of America (USA) and United Kingdom (UK) ranged widely from <6.0 % up to 66.7 %. A later study in NZ reported higher levels of helmet use with 95.3 % of participants wearing a helmet when competing, 89.4 % when hacking (riding for leisure out on roads, across fields or bridleways), and 87.9 % when schooling [11]. One of the reasons contributing to the difference in findings may be due to fewer western riders in NZ compared to the USA, as helmet use has been found to be lower in western equestrian disciplines [12]. Whilst equestrian organisations strongly advocate for the use of helmets when riding and working with horses, evidence has shown that there are a wide range of factors that influence equestrians' decisions whether or not to wear an equestrian helmet when not mandated. Factors include being influenced by others as well as increasing helmet use with age [13–15]. Evidence also suggests that a lower proportion of professionals always wear a helmet compared to amateurs [14,15].

A range of factors have also been found to influence helmet purchase decision making. A focus group study by Johnson [16] revealed that whilst safety was a consideration, the look of a helmet was the most influential factor. Comfort, fit, price, social influence and brand loyalty were also found to affect helmet buying decisions. However, the focus group included only eight American university students with similar riding experience [16]. It remains unclear how these factors influence decision making on a broader level and whether they differ by experience, age or equestrian discipline. For example, jumping disciplines which have an increased risk of falling (e.g. showjumping which is the riding of horses over a course of fences in an arena and eventing which involves jumping over cross country fences over a long distance in addition to a showjumping course and dressage test), may have greater perceptions of helmet importance than non-jumping equestrian disciplines such as dressage (training the horse to execute precise, coordinated movements with relaxation and suppleness).

Another factor likely to influence helmet safety is knowledge and awareness about safe helmet practice. A previous study in New Zealand using an online questionnaire, investigated the knowledge, attitudes and behaviours towards concussions in equestrians [11]. Knowledge around concussions was high, however knowledge about the function of helmets was low, and suggested that there are gaps in public knowledge around helmet use [11]. Current guidance [15] states that helmets should be replaced after a fall where the rider experiences a hit to the head due to potential structural change to the helmet and to replace a helmet after five years as materials may degrade over time [15]. However, equestrian awareness of these recommendations remains unclear.

This study aims to identify the factors important to riders when choosing an equestrian helmet, helmet use and the factors influencing perceived importance of helmet safety by age, equestrian discipline, riding experience and professionalism.

Methods

Ethical approval was obtained by The Auckland University of Technology Ethics Committee (Reference 24/125). Participants were recruited via social media (e.g., advertisements were posted to Instagram and shared via Facebook equestrian groups/pony clubs throughout New Zealand) and posters were put up at equestrian events. The advertisement was also distributed by organisations ESNZ, Harness Racing NZ and Thoroughbred Racing to their members. Participants were eligible to participate if they were aged ≥12 years old, were currently residing in NZ and were currently involved with horses. Participants voluntarily chose to participate by clicking on the link or scanning the QR code provided on the advertisement which took them to the online questionnaire administered via Qualtrics. Participants were given the information sheet and consent form, and if they agreed, they proceeded to complete the survey. The online survey was able to be completed over three-months (16th June to 11th August 2024). The survey contained 28 questions and took an average of five minutes to complete.

Participants were asked their gender, age, ethnicity, equestrian discipline, duration of riding experience, and whether they were competitive or noncompetitive, professional or amateur, or had experienced a concussion from equestrian activities. Participants were asked questions about their helmet use including whether they owned an equestrian helmet, how often they wear an equestrian helmet, how often they purchase new helmets, whether they dispose of helmets after a fall, how many helmets they owned, and the helmets' brand, age, use and yellow-tag eligibility (Supplementary Information 1). Participants were asked to rank in order from most important to least important the factors that influenced their decision-making when choosing a helmet. Factors identified in the Johnson [16] small qualitative study were included (i.e., price, brand, visual appeal, safety standard, fit, ventilation, customisation options, comfort, and what friends or coaches or top equestrians use).

All survey responses were anonymous. Participants had the option to enter into the prize draw for vouchers and equestrian products kindly donated by sponsors to encourage participation. If participants wanted to enter the prize draw, they were invited to enter their contact details on a separate survey to ensure their identity could not be linked to their survey responses. Data were extracted from Qualtrics software into SPSS Version 29 [17] and cleaned before analysis.

Data analysis

A priori sample size calculation for a multiple linear regression with 90 % power, alpha 0.05, six predictor variables with a Cohen's f^2 effect size of 0.15, revealed that a minimum total sample size of 123 participants would be needed for the study to have sufficient statistical power. The target sample size was increased to 133 to allow for the exclusion of 8 % of the participants expected to provide incomplete data as found in a previous online study of awareness of concussion in equestrian athletes [11].

Frequencies and percentages were used to describe the sample, helmets owned and how they were used and the importance ranking of factors influencing helmet purchase. Chi square tests including Yates' continuity correction were used to determine differences in the most important factors when choosing a new helmet by age group, jumping versus non jumping disciplines, amateur versus professional, and those who had or had not experienced concussion from equestrian activities. A multiple linear regression was conducted to determine whether there was a relationship between demographic and equestrian activity related variables, and the overall perceived importance of helmet safety (rated on a scale from 1 very unimportant to 5 very important). The two non-binary participants were excluded from the regression analysis to enable exploration of the potential role of gender. As this was an exploratory study, p values were considered to be statistically significant at the $p < 0.05$ level.

Results

There were 630 people who clicked onto the survey. Eleven participants were not a current equestrian and were removed from the dataset. To reduce the impact of missing data on results any responses where <80 % of the questionnaire was completed were removed (n = 23, 3.7 %), resulting in 596 participants data being included in the analysis.

Cohort characteristics are presented in Table 1. The majority of participants were female (97.1 %), with only two transgender/non-binary respondents. Most respondents identified as NZ European (93.1 %) and there was a good spread of age with more than 15 % in each of

Table 1
Cohort characteristics.

		Frequency	Percentage
Gender	**Male**	15	2.5 %
	Female	579	97.1 %
	Other (trans, non-binary)	2	0.4 %
Age	**12-17 years**	70	11.7 %
	18-24 years	98	16.4 %
	25-34 years	93	15.6 %
	35-44 years	91	15.3 %
	45-54 years	133	22.3 %
	55-64 years	76	12.8 %
	65+	35	5.9 %
Ethnicity	**NZ European**	555	93.1 %
	Māori/Pacific	15	2.5 %
	European	14	2.3 %
	Other*	12	2 %
Discipline*	**Eventing**	206	34.6 %
	Show-jumping	246	41.3 %
	Show-hunter	89	14.9 %
	Dressage	290	48.7 %
	Para riding	3	0.5 %
	Showing	70	11.7 %
	Mounted games	7	1.2 %
	Endurance/Competitive trail riding	29	4.9 %
	Polo/polocrosse	14	2.3 %
	Hunting	46	7.7 %
	Thoroughbred racing	17	2.9 %
	Harness racing	4	0.7 %
	Track work	16	2.7 %
	Pony club	93	15.6 %
	Adult ride club	106	17.8 %
	Riding school	35	5.9 %
	Hobby	129	21.6 %
	Hacking/Trekking	276	46.3 %
	Western	14	2.3 %
	Working equitation	10	1.7 %
	Groundwork	112	18.8 %
	Farm work	51	8.6 %
	Driving	12	2 %
	Other#	8	1.3 %
Equestrian activity	**Jumping**	327	54.9 %
	Non-jumping	269	45.1 %
Duration involved in equestrian activities	**Less than 5 years**	34	5.7 %
	5-9 years	69	11.6 %
	10-19 years	140	23.5 %
	20+ years	353	59.2 %
Professional status	**Amateur**	483	81.0 %
	Professional	113	19.0 %
Competitive	**Yes**	510	85.6 %
	No	86	14.4 %
Previous concussion	**Yes**	352	59.1 %
	No	244	40.9 %

* People could respond to multiple options therefore percentages do not equal 100 %.

The other category included side saddle, riding for the disabled and horse re-training.

Table 2
Summary of helmet use and associated behaviours.

		Frequency	Percentage
Do you own an equestrian helmet?	Yes	593	99.5 %
	No	3	0.5 %
How often do you wear a helmet?	Every single time	569	95.5 %
	Most of the time	20	3.4 %
	Sometimes/ occasionally	6	1.0 %
	Never	1	0.2 %
How often do you buy new helmets?	Every year or more frequently	10	2.0 %
	Every 2 years	50	8.4 %
	Every 3 years	69	11.6 %
	Every 4 years	22	3.7 %
	Every 5 years	49	8.2 %
	Every 6 years or less frequently	21	3.5 %
	Only when I have to	375	62.9 %
Do you dispose of helmets after a fall?	Yes	185	31.0 %
	No, I keep it but don't ride in it	113	19.0 %
	No, I keep riding in it	47	7.9 %
	Depends on how badly I fall	213	35.7 %
	Other	38	6.4 %
How many helmets do you own?	None	1	0.2 %
	One	247	41.4 %
	Two	283	47.5 %
	Three or more	65	10.9 %
Perceived importance of helmet safety	Very important	492	82.6 %
	Somewhat important	84	14.1 %
	Neutral	10	1.7 %
	Somewhat unimportant	0	0.0 %
	Very Unimportant	2	0.3 %
	Missing	8	1.3 %

the 18-54 age brackets. Some responses were aggregated for analysis. For example, age was categorized into <44 years and ≥45 years and ethnicity into European and non-European. The most common equestrian disciplines for respondents were dressage (48.7 %), hacking/trekking (46.3 %), showjumping (41.3 %), and eventing (34.6 %). Disciplines were classified as jumping (e.g. showjumping or eventing) and non-jumping activities (e.g. dressage and hacking). Over half (59.2 %) of respondents had been equestrians for more than 20 years. Approximately half of participant (59.4 % of females and 46.7 % of males) reported experiencing a concussion from equestrian activities.

Data on helmet use and associated behaviours is summarized in Table 2. Almost all respondents (99.5 %) owned at least one equestrian helmet and most (95.5 %) reported wearing a helmet every time they rode or drove a horse. However, only 8.9 % of equestrians wore a helmet when participating in groundwork. A high proportion (62.9 %) of respondents reported only buying a new helmet when they had to (e.g., due to changing safety standards or after a fall). Nearly half of participants (47.5 %) reported having two helmets (e.g., one for competition and one for home use) or using different helmets for different disciplines (e.g., dressage and eventing). There were 28.4 % of respondents who kept a helmet specifically for competitions. Most (96.6 %) helmets used for competition met at least one safety standard. However, for home and recreational use, only 64.9 % of helmets were reported to have met at least one safety standard. Of respondents, 31.0 % reported disposing of a helmet after a fall, 35.7 % only disposed of their helmet if they considered the fall to be bad enough, 8 % continued to ride in it and 19 % reported keeping their helmet but not riding in it (e.g., as a spare helmet or as decoration). Other responses included sending the helmet to be repaired, using it for riding bikes or wearing the helmet on the ground around horses, and using the helmet for education purposes.

Respondents used helmets from over 30 different brands, with the most popular brands including Samshield, RIF, Kask, Charles Owen, and Dublin.

The most important factors that respondents considered when

buying a helmet were safety (41.3 %), comfort/fit (27.2 %), price (22.3 %), visual appeal (6.7 %), brand (1.2 %) and special features such as MIPS technology. Differences in factors perceived to be of most importance by age, professional/amateur, concussion history and discipline were explored using chi square tests (Table 3). Significantly more younger equestrians (aged 12-44 years) were more likely to rank price as most important, while those aged ≥45 year ranked safety as the most important factor in helmet decision making. Those who had not experienced a concussion were significantly more likely to rank price as the most important factor in helmet decision making. There were no differences in factors by discipline (jumping vs non-jumping disciplines) or professional versus amateur equestrians.

In the multiple linear regression, the competitive and non-competitive variable was found to be highly correlated with professional/amateur, so was not included in the model. Regression results showed that the model (described in Table 4) was significant ($F = 5.36$, $p \leq 0.001$) but only explained a very small amount of variance in the perceived importance of helmet safety ($R^2 = 0.04$).

Older participants reported significantly higher perceptions of helmet safety when compared to younger equestrians and females reported significantly higher perceptions of helmet safety than males. Ethnicity, length of time the respondent had been an equestrian, whether the respondent was professional or amateur, and concussion history, did not significantly influence perceptions of the importance of helmet safety.

Discussion

This study explored helmet use, factors influencing helmet purchase decisions, and perceptions of helmet safety importance within equestrians. The study identified that most helmets used for competitions met at least one safety standard, however helmets compliant with safety standards were much lower for home use. More than two thirds of equestrians only replaced a helmet when they felt they had to. Safety, price and comfort/fit were considered the most influential factors in terms of helmet purchase decision making. Equestrians who were older or had previously been concussed were more likely to rank safety as the most important factor on helmet decision making. Younger equestrians and those who had not experienced a concussion were more likely to rank price as the most important factor in purchasing a helmet. There were no differences in the importance of factors by jumping versus non-jumping disciplines or professional versus amateur equestrians.

Compliance with wearing a helmet was high, with 96 % of equestrians reporting wearing their helmet every single time they rode (or drove) a horse. This was much higher than rates previously reported in a review of studies from the USA and UK ranging between 6-67 % [10]. However, there has been an increase in educational messaging since that review was completed almost a decade ago. It is important to determine when people are wearing their helmet given the potential risks and safety concerns associated with equestrian riding. For example, in this study there was high helmet use when riding or driving horses, however helmet use when doing groundwork was much lower (<10 %). A high proportion of injuries from equestrian activities are sustained when not riding (e.g., being kicked in the head when on the ground) [4]. Consequently much greater awareness is needed to encourage helmet wearing for other activities when working with horses to reduce risk of injury.

Whilst introducing mandatory helmet use regulations in NZ [18] has increased the use of helmets compliant with safety regulations at competitions (97 %), compliance is much lower for helmets used at home or recreationally (65 %). In many cases the survey respondents reported using helmets that were old or that did not meet standards at home so that they could keep their newer helmet that met regulations for competitions. Riders need to be advised that all equestrian helmets should meet safety standards to facilitate rider safety and provide clearer guidance to equestrians. However, there are challenges in implementing recommendations outside of controlled competitive environments. These findings highlight the importance of improving equestrians' understanding of the reasoning behind helmet safety standards and recommendations to improve helmet safety behaviours within a recreational context. This is particularly needed given that for most equestrians, more time is spent riding outside of competitions increasing their risk of injury.

Evidence has shown that the materials in motorcycle helmets can degrade over time, particularly in response to high sun exposure [19]. Consequently, equestrian helmet manufacturers recommend replacing helmets every five years to prevent degradation reducing performance of the helmet. However, this study found that more than half of participants only purchased a new helmet when they had to. There are no clear guidelines on how a user can assess the quality of a helmet after purchase based on the years of use, how it is stored or the number of times it has been worn. Additionally, there is a lack of evidence on whether, and to what extent, materials in equestrian helmets degrade over time. This makes it difficult for equestrians to know when to

Table 3
Differences in the three most common factors rated as most important in helmet decision-making by concussion history, age, amateur/prefessional status and equestrian discipline.

	N (%) Ranked as most important factor		Chi square test p value (2-tailed)
	Concussion	**No concussion**	
Safety	**N=314**	**N=220**	0.626
	148 (42.0 %)	95 (38.9 %)	
Price	66 (18.8 %)	65 (26.6 %)	0.020
Comfort/ fit	100 (28.4 %)	60 (24.6 %)	0.421
	12-44 years	**≥45 years**	
Safety	**N=303**	**N=231**	<0.001
	121 (34.4 %)	122 (50.0 %)	
Price	90 (35.6 %)	41 (16.8 %)	0.014
Comfort/ fit	92 (26.1 %)	68 (27.9 %)	0.717
	Professional	**Amateur**	
Safety	**N=95**	**N=439**	0.097
	38 (33.6 %)	205 (42.4 %)	
Price	23 (20.4 %)	108 (22.4 %)	0.714
Comfort/ fit	34 (30.1 %)	126 (26.1 %)	0.476
	Jumping	**Non-jumping**	
Safety	**N=286**	**N=248**	1.000
	133 (40.7 %)	110 (40.9 %)	
Price	73 (22.3 %)	58 (21.6 %)	0.914
Comfort/ fit	80 (24.5 %)	80 (29.7 %)	0.169

Table 4
Multiple Regression Model of the factors linked to perceptions of importance of helmet safety on a scale from 1 (very unimportant) to 5 (very important).

	Unstandardised B	Std. Error	Standardised B	t	Sig (p)
(Constant)	3.99	0.31			
Age ≥45 years versus 12-44 years	0.13	0.04	0.14	3.28	0.001
Non-European versus European[∞]	-0.11	0.11	-0.04	-1.01	0.314
Professional versus amateur	-0.07	0.05	-0.05	-1.30	0.194
Concussion versus no concussion	0.01	0.04	0.01	0.12	0.907
Female versus male	0.42	0.12	0.14	3.36	<0.001

[∞] The European group includes participants who identified as NZ European or European and the non-European group included all other participants.

purchase a new helmet if they have not suffered an impact to the helmet.

The most important factor reported for influencing helmet purchase decisions overall was safety. This contrasted with a previous qualitative study which found that comfort and brand loyalty were identified as key factors [16]. However, this prior study only interviewed eight younger participants in the USA, which may explain the differences in findings. Given safety was considered the most important factor in helmet decision making, injury prevention messaging should now focus on differences between the helmet safety standards and evidence regarding new technologies so that riders can make informed decisions more easily about which helmets they should buy. Different helmet safety standards involve passing different testing procedures, with helmets certified under the most stringent standards more likely to remain undamaged after an impact [20]. Independent testing comparing different types of helmets and improved understanding of differences in safety standards is likely to improve equestrians' knowledge and confidence in determining a helmets safety rating in comparison to others.

Comfort/fit whilst not significantly different between groups was rated more highly by professional equestrians, potentially due to the amount of time they are required to wear a helmet. This supports findings from the previous qualitative study which found comfort and fit and price to be the most important factors when buying a helmet [16]. Other research has found that helmets being uncomfortable and not fitting well were the most common reasons for not wearing an equestrian helmet [15]. These findings offer guidance to helmet manufacturers in informing helmet design and what their customers are looking for.

In contrast to previous research which found the helmets used by professionals, trainers, barns, and teams can impact trends which influence the helmets people use [16] the influence of others and brand loyalty was relatively low. This may indicate differences in the effects of social influence between NZ equestrians and equestrians in other parts of the world. Alternatively, this difference may be due to changes in the impact of social influence over time. Other factors that affected decisions on which helmet to choose, included the helmet having MIPS technology, and previous research and safety testing of helmets. This indicates good public awareness of the availability of new technologies such as MIPS, which aims to allow the helmet to move and potentially reducing impact to the brain. MIPS technology has been found to reduce the force of impact and lessen the rotation of the neck reducing the risk of injury, [8] however research to test its effectiveness has been limited and its relevance to real-life situations remains unclear. A study investigating rotational technology in equestrian helmets found that whilst it does work under certain impact conditions, it is not a universal improvement [21].

Younger age was found to be associated with lower perceptions of the importance of helmet safety. Previous research also found helmet use to be associated with age, with older adults always wearing helmets more than younger riders [15] Previous research has also found that younger equestrians (aged 13-19 years) are more likely to suffer a concussion or head injury for equestrian related activities, compared to adults aged 20-35 or 26-55 years old [22]. This reveals a need for targeted injury prevention messaging regarding helmet use.

Whilst concussion history was not independently predictive in the regression model on perceptions of importance, those with a history of concussion were more likely to select helmet safety as the most important factor in helmet decision making. This suggests that people are learning by experience rather than by proactive prevention messaging. Whilst there was high engagement in the study across the equestrian disciplines, a limitation of the study was that the results are unlikely to represent all equestrians in New Zealand and there was likely self-selection bias towards people with an interest in helmet safety. There were also low numbers in many of the discipline categories such as para dressage, mounted games, polo/polocrosse, harness racing, thoroughbred racing, track work, western, working equitation, and driving and note that in some disciplines there is no requirement for helmets to be yellow tagged. This study identified a lower rate of concussion in males than females, however, the rate in males was higher than found in a previous study which explored all types of injuries from equestrian sports [5]. Additionally, a survey of engagement in sport found an approximate 1:2 ratio of men to women engaged in equestrian sports in New Zealand [23]. The lower proportion of male participants in our survey sample is a limitation and reduces the generalizability of findings for males. A further limitation is that the survey did not ask about concussion injuries not sustained within equestrian sports which may have changed the findings on the influence of concussion history on helmet use and decision making

Conclusion

Safety messages need to focus on improving understanding of helmet standards recommendations to help reduce the injury risk in equestrian sports and increase use of helmets meeting current standards for recreational use. There needs to be particular focus on targeting messaging on helmet safety for adolescents/young adults.

Funding sources

This research was supported by Canter for Cancer, RideWell TrainWell, VivantEqui, teQ, Uber Snug, and Equine America who donated prizes for the prize draw. No commercial entities were involved in the design, analysis or interpretation of the results.

Ethical statement

The study was conducted in accordance with all applicable international and national ethical regulations, and the participants who took part in the study provided informed consent and had the right to withdraw from the study at any time. The study data were collected and processed in accordance with privacy protection principles, and all personally identifiable information has been deleted or encrypted.

CRediT authorship contribution statement

H. Gosbee: Writing – original draft, Project administration, Methodology, Data curation, Conceptualization. **P.A. Hume:** Writing – review & editing, Conceptualization. **A Theadom:** Writing – review & editing, Supervision, Project administration, Methodology, Formal analysis, Data curation, Conceptualization.

Declaration of competing interest

The authors have no competing interests to declare.

Acknowledgments

The authors would like to thank the participants who took part in the study. We would also like to acknowledge Dr Matthew Williams who provided support with the statistical analysis.

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.injury.2025.112907.

References

[1] Havlik HS. Equestrian sport-related injuries: a review of current literature. Curr Sports Med Rep 2010;9(5):299–302. https://doi.org/10.1249/JSR.0b013e3181f32056.

[2] Jones AR, Smith A, Christey G. Equine-related injuries requiring hospitalisation in the Midland Region of New Zealand: a continuous five-year review. NZMJ 2018; 131(1483).

[3] Zuckerman SL, Morgan CD, Burks S, et al. Functional and structural traumatic brain injury in equestrian sports: a review of the literature. World Neurosurg 2015; 83(6):1098–113. https://doi.org/10.1016/j.wneu.2014.12.030.
[4] Meredith L, Ekman R, Brolin K. Epidemiology of equestrian accidents: a literature review. 2019 Jan 01;17(1), Article 9. Internet J Allied Health Sci Pract 2019;17(1). https://doi.org/10.46743/1540-580X/2019.1795.
[5] Stigson H, Klingegård M. Characteristics of equestrian accidents and injuries leading to permanent medical impairment. BMC Sports Scence Med Rehabil 2024; 16(184). https://doi.org/10.1186/s13102-024-00973-8.
[6] Eliason PH, Galarneau JM, Kolstad AT, et al. Prevention strategies and modifiable risk factors for sport-related concussions and head impacts: a systematic review and meta-analysis. Br J Sports Med Jun 2023;57(12):749–61. https://doi.org/10.1136/bjsports-2022-106656.
[7] Connor TA, Clark JM, Jayamohan J, Stewart M, McGoldrick A, Williams C, Seemungal BM, Smith R, Burek R, Gilchrist MD. Do equestrian helmets prevent concussion? A retrospective analysis of head injuries and helmet damage from real-world equestrian accidents. Sports Med - Open 2019;5(1). https://doi.org/10.1186/s40798-019-0193-0. doi.
[8] Dodds F, Fabre D, Schrum K, Oster R, Buford T, Gould S. A novel equestrian helmet testing method: helmet liner performance in highly realistic simulation. Phys Sport Aug 2024;52(4):381–5. https://doi.org/10.1080/00913847.2023.2282381.
[9] Yu WY, Chen CY, Chiu WT, Lin MR. Effectiveness of different types of motorcycle helmets and effects of their improper use on head injuries. Int J Epidemiol 2011;40 (3):794–803. https://doi.org/10.1093/ije/dyr040.
[10] Young JD, Gelbs JC, Zhu DS, Gallacher SE, Sutton KM, Blaine TA. Orthopaedic injuries in equestrian sports: a current concepts review. Orthop J Sports Med 2015; 3(9). https://doi.org/10.1177/2325967115603924.
[11] Theadom A, Reid D, Hardaker N, Lough J, Hume PA. Concussion knowledge, attitudes and behaviour in equestrian athletes. J Sci Med Sport 2020. https://doi.org/10.1016/j.jsams.2020.05.008. May 17:S1440-2440(19)30735-2. Online ahead of print.
[12] Vande Kamp KS. Use and perceptions of Equestrian Safety Equipment. Middle Tennessee State University; 2021.
[13] Ikinger CM, Baldamus J, Spiller A. Animals: an open access journal from MDPI, 6 (2), 14. Factors Influencing the Safety Behavior of German Equestrians: Attitudes towards Protective Equipment and Peer Behaviors. Anim (Basel) 2016;6(2). https://doi.org/10.3390/ani6020014.
[14] Haigh L, Thompson K. Helmet use amongst equestrians: harnessing social and attitudinal factors revealed in online forums. Anim: Open Access J MDPI 2015;5 (3):576–91. https://doi.org/10.3390/ani5030373.
[15] Stanfill AG, Wynja K, Cao X, Prescott D, Shore S, Baughman B, Oddo A, Tsao JW. Helmet use in equestrian athletes: opportunities for intervention. Concussion 2020; 6(1). https://doi.org/10.2217/cnc-2020-0019.
[16] Johnson E. The influence of brand loyalty on equestrian helmet buying decisions. Alfred University; 2022. https://aura.alfred.edu/items/d89939f1-d87a-4c5a-a0d6-c82fd4924cf9.
[17] *IBM SPSS Statistics for Windows, Version 29.0.2.0* IBM Corp.
[18] Equestrian Sports New Zealand. Helmet standards. https://www.nzequestrian.org.nz/safety/helmet-tagging/.
[19] Ramli R, Che Man Z, Nordin R, Abdul Karim F, Rashdi MF, Oxley J. Viet Cuong, P. Photo-oxidative degradation of motorcycle helmets in Hanoi, Vietnam: A prospective preliminary study. Traffic Inj Prev 2016;17(1):79–85. https://doi.org/10.1080/15389588.2016.1203428. Sep.
[20] Connor TA, Clark JM, Stewart M, Annaidh AN, Gilchrist MD. Post-accident evidence basis for new equestrian standards: Relationship between helmet liner residual crush and accident parameters. Appl Eng Sci 2021;(6(100044). https://doi.org/10.1016/j.apples.2021.100044.
[21] Murphy A, Post A, Gilchrist MD. Comparing equestrian helmets with and without rotational technology using an equestrian concussive-specific helmet test protocol. Sports Engineering, 27; 2024. https://doi.org/10.1007/s12283-023-00445-1.
[22] Camargo F, Lawyer A, Glueck A, Morris S, Higgins J, Wright M, Han D, Gombeski W. Teens at greater risk for equestrian sport related concussions and head injuries. Br J Sports Med 2024;58(1). https://doi.org/10.1136/bjsports-2023-concussion.147.
[23] Sport New Zealand. Sport and Active Recreation Profile: Equestrian & Horse Riding – Findings from the 2013/14 Active New Zealand Survey. https://sportnz.org.nz/assets/Uploads/2013-14-Sports-Profile-Equestrian-and-Horse-riding.pdf.