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Published in:
International Journal of Equine Science

Publication date:
2023

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Citation for published version (APA):

Davies, E., & Loyer, V. (in press). The psychological responses of elite equestrian athletes to their horses' injuries. *International Journal of Equine Science*, 2(2), 24-36.

The Psychological Responses of Elite Equestrian Athletes to Their Horses' Injuries

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Received: 06 July 2023; Revised: 28 August 2023; Accepted: 14 September 2023; Published: 18 October 2023



Academic Editor: Roberta Ferro de Godoy, Writtle University College, Chelmsford, United Kingdom

Abstract

Equestrian sport requires optimal performance from horse and rider for a successful partnership, and the high-risk nature increases the injury risk for both parties. Negative psychological responses have been reported following equine injury in amateur and youth riders, but little is known about elite athletes, for whom the horse-rider relationship may be more transactional than familial. The aim was to investigate the psychological responses of elite riders to their horses' injuries. Twelve international riders (8 women, 4 men, $\bar{x} = 30.8 \pm 10.8$ years (range 20–51 years), who had competed from CCI-2* to the Olympics and World Equestrian Games (WEG), were interviewed about their experiences of equine injury. Interview questions explored athletes' careers, initial reactions, coping mechanisms, and return to elite competition. Thematic analysis revealed three themes: cognitive appraisal, emotional responses, and coping strategies. Riders reported a sense of loss, and several felt this impacted their athletic identity. All riders reported a sense of duty towards their horse. Elite athletes experienced negative emotional responses, including devastation, frustration, denial, and guilt, at the onset of equine injury. Several coping strategies were utilized, including avoidance and reliance on social support, and some riders also reported personal growth. Elite riders reported wider psychological impacts on support networks and responses were shaped by the normalization of injury within the equestrian community. Further research should explore the benefits of intervention programs on equestrian athletes' coping strategies, as well as the impact of equine injury on the mental health of grooms.

Keywords

Cognitive appraisal; emotion; partnership; coping; horse rider; Olympian

1. Introduction

In Olympic equestrian disciplines (dressage, eventing, and show jumping), both the horse and rider must work as a team to achieve a final combined performance result [1,2], therefore riders need to build a strong working relationship with their horses based on mutual trust and respect [3]. Equestrianism differs from other sports as riders must depend on their horses' wellbeing to perform [4–6], and there is a heightened risk of injury within competitive equestrian disciplines to both parties. Elite equestrian sport requires perseverance, dedication, personal effort, considerable time, and financial investment to be competitive [1,7]. Many riders sacrifice their social life and family to their horses whom they

consider as 'partners' [8], however at elite level, the pressures of professional sport and commercialization could negatively impact individual partnerships between horses and riders, creating a more transactional relationship [3]. Elite young riders and amateurs have both been found to experience negative cognitive and emotional responses when their horses are injured [9,10], but the sense of loss experienced by a rider following equine euthanasia has been shown to be influenced by the strength of the relationship [11,12]. Horse-rider relationships are unique, and range in intensity and type of interactions between levels [12]. For elite equestrian athletes, coping with adversity, such as loss of a horse, was identified as an important trait [1], thus it is imperative to

explore the psychological implications of equine injury on elite equestrian athletes.

Injury is common for equine athletes and can be caused by both competition and training [13–16]. In all equestrian disciplines, musculoskeletal injuries are the most common reason for the loss of horses [17]. Injury types vary between discipline and the level of performance [16,18] with up to 50% of elite Grand Prix Dressage combinations reporting lameness in the preceding two years [16]. Singer *et al.* [19] found that 21% of horses intending to compete in long-format international eventing competitions did not start due to injury whilst 32.5% of horse falls during the cross-country phase incurred one or more injuries, and 7.2% of these were classified as serious, such as fractures or tendon injury [20]. Injuries can also lead to withdrawal prior to competition, with 21–45% of horses per year withdrawing due to musculoskeletal injury [14,15]. A setback, such as equine injury, could leave elite riders vulnerable to additional psychological stressors, such as financial stress from veterinary costs or lost income [1], feelings of guilt regarding commitments to owners or sponsors, or emotional loss linked to the horse rider partnership [9,10].

Injury is also considered a common source of stress in elite sports [21], with financial pressure, emotional responses, and feelings of loss all previously reported in elite athletes who have experienced an injury during their career [22]. Following an injury, athletes undergo a cognitive re-appraisal, considering several personal and situational factors, including their perception of the cause of injury, recovery status, available social support, and their ability to cope [23]. This appraisal influences an athlete's emotional responses and can be viewed either positively, promoting optimal physical and psychological recovery, or negatively, resulting in depression, guilt, isolation, anxiety, and frustration [24,25]. Some studies suggest that athletes experiencing an injury could exhibit grief-like reactions such as those described by Kübler-Ross [26] with a 5-stage grief reaction response: denial, anger, bargaining, depression, and acceptance [27]. These reactions could be explained by the sensation of loss that athletes experience after an injury [22]. Emotional responses are not just reported in injured athletes however, with sporting partners, teammates, and coaches all reporting horror, fear, helplessness, and depression following a teammate's injury, suggesting that injury can psychologically affect others beyond just the injured party [28,29]. More recently, the notion that the psychological implications of injury extend beyond the injured individual has been extended to non-human animal partners within equestrian sport, with riders reporting a sense of loss and grief, guilt, and denial when their horse was injured [9,10]. Partnerships between elite riders and their horses have been perceived as more transactional, which may influence the emotional responses seen in elite riders [3]. When an injury occurs, athletes who are intensively involved with their sport may suffer more significant negative psychological and emotional reactions than those who are less involved, due to challenges to their athletic identity [30,31]. Individuals with stronger athletic identities often experience increased stress during transitions, such as during injury or retirement [32]. For elite equestrian athletes, who invest significant time and resources into their career [7], and whose identity as an athlete is linked to the performance capabilities

of their horse [1], injury may negatively challenge athletic identity and intensify psychological stress.

In wider sporting literature, changes to behavior following injury have been reported to affect an athlete's adherence to their rehabilitation program, as well as their engagement with medical provision, use of effective coping mechanisms, and the likelihood of engaging in risk-taking behaviors, both within and outside of the sporting environment [23], influencing successful return to play [33]. Employing effective psychological coping strategies aids injured athletes in avoiding undue psychological harm from difficult experiences [21]. Early interventions can enhance emotional regulation, self-motivation, and resilience, as well as access to, and perceived benefits of social support [33]. Social support has also been shown to help overcome stressful events such as sports injuries and is important for maintaining adherence to rehabilitation [34,35]. Social support was previously identified by both elite young riders and amateur equestrians as critical to their psychological wellbeing when their horses were injured, with riders suggesting that non-horse people were less supportive due to a lack of understanding about the unique relationship between horse and rider [9,10,36]. An individual's satisfaction with their social support is related to mood, with more positive perceptions of social support leading to a decrease in mood disturbance [37]. This could suggest that equine communities need to better understand the significance of social support for riders experiencing equine injury to ensure that human wellbeing is managed alongside equine recovery. The aim of this study was therefore to investigate the psychological responses of elite riders to their horses' injuries.

2. Materials and Methods

2.1. Participants

Twelve elite equestrian athletes (8 women and 4 men, \bar{x} = 30.8 ± 10.8 years (range 20–51 years old) participated in the study. The athletes were over 18 and must have competed in elite international competitions run by the Fédération Equestre Internationale (FEI) in one or multiple Olympic disciplines (dressage, eventing, and/or show jumping) to be classified as 'elite' [38]. Athletes were selected based on their competition level and their horse's injury status. The participants must have been riding an elite horse which had sustained either a serious injury (requiring more than three months' rehabilitation) or a career-ending injury, which impacted the rider's goals and career in the sport [9]. This study used purposive recruitment [39] and participants were contacted through the primary researcher's personal contacts, and supplemented by snowball sampling methods, and social media posts [40]. The method was dependent on the researcher's personal connection with possible participants, and the most appropriate way to contact them was deduced. Participants were sampled in a deliberate and flexible way, to select a diverse range of participants to provide a variety of experiences. The final sample size ($n=12$) was deemed sufficient to evaluate the in-depth understanding of the riders' experiences.

2.2. Procedure

Following institutional ethics approval by the Hartpury University Human Research Ethics Committee, informed consent was obtained from each participant during the recruitment process, whereby participants were given an

information sheet and consent form, detailing the intentions of the study, the risks and benefits and their rights as a participant to withdraw from the study at any time with no consequences to them. Following this, semi-structured interviews were used to collect data from 12 participants who met the inclusion/exclusion criteria. Semi-structured interviews were chosen to allow sufficient depth and exploration of the complex issue of sports injury, whilst still maintaining flexibility. Guided questions, probes, and non-verbal cues were used to facilitate the discussion and ensure the researcher's understanding of the participants' experiences [41]. The interview guide was used previously by Davies *et al.* [9] and was developed based on the psychology of sports injury literature and the authors' experiences with severe equine injuries. The same interview guide was utilized to allow comparison within the discussion of how the level of combination influenced the psychological responses following equine injury. The interview guide was designed to address pre-injury career, the rehabilitation phase, pre-return to competition phase issues, and coping strategies used by riders [9,42]. All names given in this study are pseudonyms to protect the anonymity of the participants, and any identifying information e.g. career highlights, horse name, and competition venue have been removed during analysis. Each interview, conducted by VL, lasted between 18–51 minutes and was recorded using an iPhone 6 Memo Recorder. Considering the international aspect of this study and language differences, the discussions were held in the rider's first language and the interviewer (VL - bilingual) subsequently created verbatim transcripts in the original language which were then translated into English for analysis.

Athletes and trainers can be difficult to contact due to busy schedules [43], so the researcher adapted interview methods and times to suit the participants. Building a positive rapport with the riders was important due to the sensitive nature of the topic being discussed. The researcher invited participants to tell stories, give personal accounts, and relate their behavior in relation to the study [44]. In addition, the researcher personally knew most of the participants, and that facilitated openness during the interviews [1]. Face-to-face and online interviews with the use of applications (WhatsApp, Skype, and Facebook Messenger) were undertaken and were implemented depending on the most convenient method for the participant and increasing COVID-19 restrictions (Spring 2020). A total of six participants were interviewed face-to-face, one was interviewed via Skype, one was interviewed via WhatsApp and four via Facebook Messenger.

2.3. Data Analysis

The interviews were transcribed verbatim, and an eight-step thematic analysis process was employed to allow new information to be extracted from the data [45]. The data were analysed using an eight-stage approach adapted from Lamperd *et al.* [1], consisting of the following: (1) verbatim transcription, and translation from French to English for four interviews (VL), (2) all transcripts were reviewed, read and re-read to facilitate analysis (ED, VL), (3) direct quotes were divided into the categories of the questioning framework (ED,

VL), (4) inductive grounded theory analysis was undertaken using line-by-line open coding using tags to create themes (ED, VL), (5) focused coding was used to formulate themes (ED), (6) themes were organised relative to the study aims (ED), (7) validation consensus was conducted by both researchers (VL, ED), (8) followed by discussion to determine whether the research aims had been appropriately met (ED, VL).

During the course of data collection and analysis, the interviewer (VL) continuously reflected on her personal experience as an international rider and her own thoughts about her personal experiences when her horse was injured. Her background allowed her to connect and be sympathetic with participants. Furthermore, the supervisor's (ED) epistemological perspective is a social constructivist lens, which framed how the thematic analysis was undertaken. It should be acknowledged that the interpretation of the findings and emergent themes may have been influenced by the research team's experiences with personal injury within the equestrian and racing sectors. Both researchers independently conducted the thematic analysis, and then discussed their positioning to ensure this had not influenced their coding or subsequent themes. The shared experiences of the research team however are considered a strength, as it can aid in building rapport, and demonstrating empathy which may allow for increased honesty regarding complex subjects during the interview process.

3. Results

A total of 12 participants were interviewed for this study (8 women and 4 men, $\bar{x} = 30.8 \pm 10.8$ years (range 20–51 years old)). All participants were international athletes in their respective disciplines, with six eventers, one dressage, and para dressage rider, and the remaining five reported competing in more than one discipline (three riders competed in both eventing and show jumping, and two riders in eventing and dressage). All riders were competing internationally at the time of their horse's injury which impacted their competitive career in the sport. At the time of the interviews, five horses had fully recovered, three were still undergoing recovery and four were euthanized (**Table 1**).

The themes identified by the primary researcher were independently confirmed by the remaining author. Ultimately, the analysis resulted in three higher-order themes: cognitive appraisal, emotional responses, and coping strategies (**Figure 1**).

4. Discussion

4.1. Cognitive Appraisal

The first higher-order theme was cognitive appraisal undertaken by the riders at the onset of their horses' injuries. All riders reported feeling a sense of loss when their horses were injured, and this led to some of them re-evaluating their athletic identity. Riders also reported a duty of care to their horses and felt responsible for the horse's health and wellbeing during recovery. Furthermore, several riders discussed the impact of the injury on their wider support team.

Table 1: Participant details including rider age, nationality, competition level, equine injury status, and impact.

Participant	Age	Gender	Nationality	Discipline	Level	MI	Recovery	NbH	Owned Horse?	Main Impact
Aphy	25	Female	Canadian	Dr/Para-Dr	Junior and Young Rider FEI WEG Para-dressage	SL	PTS (colic)	1	Yes	Olympic Selection Trials
Camille	20	Female	British	Ev/Dr	FEI Pony Trials PSG	DDFT	R	2	Yes	1st Inter I
Sophie	28	Female	Dutch	Ev/SJ	European Championships CCI4*-L	T	R	+	No	European Championship & Olympic Selection Trials
Mandy	42	Female	British	Ev	European Championships CCI-5*	F	Y	+	No	Olympic Games
Anne	-	Female	Swiss	Ev	European Championships CCI4*-L	Frac	Y	2	Yes	Performance Swiss Championships
Claire	20	Female	Swiss/French	Ev	FEI Pony Trials CCI3*-L	T	Y	2	Yes	None
Margaux	40	Female	French	Ev/SJ	CCI-2*	T	PTS (colic)	2	Yes	End of International career
Serena	22	Female	French/English	Ev/Dr	FEI Pony Trials	Frac	PTS (injury)	1	Yes	Stopped riding
Tom	42	Male	Irish	Ev/ SJ	Olympic Games CCI5*	T	R	+	No	CCI5*L Participation
Christian	51	Male	Australian	Ev	CCI5*	T	PTS (colic)	1	Yes	Time out of Elite level
Guillaume	26	Male	French	Ev	CCI3*-L	F	Y	1	Yes	Time out of Elite level
Augustin	23	Male	Irish	Ev	CCI3*-L	T	Y	2	Yes	Loss of competition horse

MI- Main injury / NbH- Number of horses

Dr- Dressage / SJ- Show jumping / Ev- Eventing / WEG – World Equestrian Games

SL- Suspensory ligament / DDFT – Deep Digital Flexor Tendon/ T – other Tendon injury / F- Foot injury / Frac – Fracture

PTS – Put to sleep / R- in recovery during data collection / Y – Recovered

+ - Multiple horses but senior or elite horse was injured

4.1.1. Sense of Loss

Most riders discussed a sense of loss, linked to their routine, dreams, purpose, and career aspirations.

I just didn't know what, didn't have anything to do, at all. It's just hard when you done it every day all day for like years and years, and you have nothing. (Camille)

And that day I was very disappointed because, you know, it was a competition I really wanted to finish and do well at, and yeah, it didn't happen so that was, at that moment very disappointing. (Tom)

A sense of loss is considered part of the cognitive appraisal process in athletes, which occurs at the onset of injury and can influence negative emotional responses such as grief or devastation, as seen here [23]. A sense of loss is often attributed to an impact on competition goals, or long-term career

aspirations, with an inability to perform or compete reported as the major source of disappointment for injured athletes [46,47]. For elite athletes, loss can be a more prominent response to injury, as they often experience a sense of purpose in competition and training, which is disrupted, and they are emotionally invested in their sport [46]. Previous research in equestrian sport suggests that young riders also experienced loss at the onset of their horse's injury [9], and that riders who have invested more time into their horses may be at increased risk of devastation following injury [10]. Peretz's [48] model proposes that loss occurs across four dimensions: loss of a significant person, loss of some aspect of self, loss of external objects, and developmental loss [49]. Elite riders whose horses are injured could experience all four dimensions of loss, thus riders' psychological state should be closely monitored by coaches and performance teams following an equine injury to maximize athlete wellbeing [50].

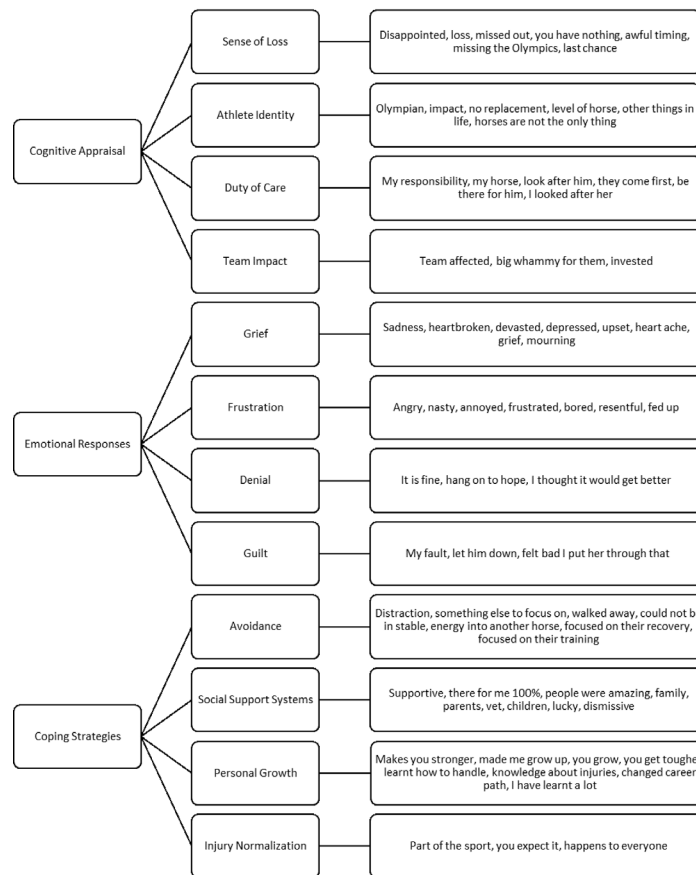


Figure 1: Higher and lower-order themes.

4.1.2. Athlete Identity

All participants mentioned the importance of horses in their life at the time of the injury. Dashper [36] proposed that horses were an integral part of a rider's life and thus are an important part of an individual identity, which may be impacted by equine injury.

...were given all the new team stuff and it had all of the Olympic logos on and everything.... But actually, I haven't worn that at all. I feel like I don't really want to, because I am not going to the Olympics, and I have no chance anymore (Sophie)

That was hard as well, cause I was I have nothing else now, like I was afraid ... worried, am I going to forget how to ride at that level? (Augustin)

It has been suggested that riders question their own personal identity after their horse is injured, as they develop a strong athlete identity surrounding their role as a rider [9]. Moreover, it seems that professional elite riders do not just identify themselves around the fact that they are elite riders, but also around their accomplishments in the sport, such as being an Olympian or a World Champion. Wylleman *et al.* [51] suggested that the athletes perceived a strengthened identity with their role as elite athletes after the Olympic Games. Challenges to athletic identity have previously been related to a decrease in mental wellbeing [35], suggesting that

coaches and governing bodies should be cognizant of elite riders' wellbeing following equine injury.

Interestingly, riders with access to only one horse, or only one elite-level horse, seemed to experience increased negative psychological responses following their horse's injury, possibly as they were unable to continue competing at the same level. Previous research has found that elite riders struggled with their athletic identity when they lost their ride at the elite level [52], and elite youth athletes also reported that lack of a horse at elite level made them feel like they were not elite riders anymore [9]. Equestrian sport incorporates both horse and rider under the umbrella of 'athlete' at elite level, and this increases the risk of injury-related psychological issues compared to other elite athletes. This can be seen in Anne's response:

I don't have a big string so for me an injured horse has a big impact because I don't have a replacement (Anne)

Two riders did not feel their athletic identity was impacted by the equine injury. Individuals who formulate a significant part of their identity around an activity, but have other life pursuits, and do not rely on continued involvement for self-esteem, social approval, or validation, are defined as having harmonious passion [53,54]. Whilst Tom's only elite-level horse had experienced a serious injury, resulting in losing the opportunity to compete at a CCI5*L competition, he reflected on those external elements of his life that allowed him to gain perspective on the situation, such as college or

children. Margaux also reflected on family and children, and ultimately decided to end her international career in favor of other pursuits.

There is more to life than this. I mean I already had that experience that because I went back to college, and I already had the awakening that there is more to life than horses. (Tom)

...you have a family life, you have children, there are other things that make you realize that it's not the only thing in life. Horses are not the only thing. (Margaux)

4.1.3. Duty of Care

Participants discussed feeling a sense of responsibility towards the care of their injured horse. They expressed gratitude towards their horses, who did a lot for them, and wanted them to have a happy life, which involved making decisions about what was best for them.

So, he was my horse, he's my responsibility, you can't just send him away, so I have to make sure he is all right, ... I didn't have a lot of resources at that time. And so, you just sort of, you take responsibility for it. And it's personal because it's your horse (Christian)

..you are responsible for that horse, so they are counting on you, and you know at the end of the day, that's what matters. I think just get up do it for the horse, like you know this is not about me. I'm not the one that is hurt, I don't need to be taken care of right now. (Aphy)

Horses require daily care and attention to maintain their health and wellbeing [5,36], and typically those responsibilities belong to the rider [38]. In the occurrence of an injury, these responsibilities are even greater. Not all riders are directly responsible for daily horse care, due to the presence of grooms in some commercial yard structures, which may be more likely in elite riders compared to amateurs or youth athletes. However, for doping and prohibited substances, the FEI states that the athlete is still classified as the 'person responsible' thus ensuring that the rider is responsible for oversight of their horses' care.

4.1.4. Team Impact

Along with discussing their own responses, several elite athletes also reported the impact of the horse's injury on wider members of their teams, including family, owners, grooms, and coaches.

I mean the team, obviously, you know, they live everything, feel everything just as much as you do...that was really a big whammy for them too. (Mandy)

Everybody shares your disappointment because it is a team effort...it's not only my disappointment but the grooms, they also, for them going to a big competition is every bit as important that it is for me. And so, I think the whole team share the disappointment. (Tom)

Research has yet to identify the wider implications of sports injury on an athlete's support network [55], although some limited research exists considering the impact of athlete injury on coaches [28,56,57]. Coaches experienced high levels of guilt when their athletes were injured [57], and some coaches

reported experiencing intrusive flashbacks, and subsequently avoided sports practice following an injury incident at the gym [28], demonstrating that there are wider impacts of injury than just to the athlete themselves. The impact of equine injury on the human athlete is already identified as a form of vicarious trauma [9,10], whereby the athlete is experiencing significant psychological responses to witnessing a partner or teammates injury [28,29]. However, the human athlete is not the only individual to develop a significant partnership or bond with the horse. At elite level, grooms are common practice, and hold an integral position with the equine support team, often acting as a primary caregiver and working closely with the rider to achieve optimal equine health and performance [58]. As such, it could be argued that the psychological impact of injury in elite horses is likely to produce a significant emotional reaction in the grooms, which may be different than what is seen in the rider and should be investigated in further research.

4.2. Emotional Responses

A range of emotions were identified in riders at the onset of their horse's injury, including depression, denial, anger, frustration, blame, disappointment, and guilt. In response to equine injury, four lower-order themes were identified: grief, frustration, denial, and guilt.

4.2.1. Grief

Several riders reported experiencing devastation and grief when their horses were injured, akin to losing a family member or a best friend.

So that was pretty traumatic cause he was like my best friend, cause it was basically me and him together coming up here from Australia, ..., he shared the whole experience. (Christian)

Even if he was only an animal, for me at the time he represented much more than that...It was a rather as if I had lost someone close. People who aren't riders, would find that, would I say mad, but that's the way it was...(Margaux)

Grief-like responses have been previously reported in injured athletes, typically resulting from a sense of loss of sporting performance [59], and grief responses are often heightened if the injury occurs prior to a critical event, such as the Olympic Games [46]. However, the grief experienced by several riders in this study focuses on the implications of injury on the horse-human bond, which may be more akin to an owner and pet relationship, rather than the proposed transactional athlete and 'tool' relationship which has been previously reported as a concern for elite equestrian athletes [3]. Research in companion animals suggests that the strength of attachment between owner and pet is considered a predictor of grief when an animal dies [11]. Whilst death was not the outcome for most horses discussed as part of this study (four were euthanized, remaining eight were recovering or returned to work), research has suggested that owners with higher levels of empathy are more likely to recognize pain in animals [60,61], and consequently experience heightened emotional reactions and a sense of devastation during periods of equine injury [10]. Empathy, defined as a 'vicariously induced emotional reaction ... that is similar to the other's emotional state or consistent with the other's situation' [62], has been shown to increase when viewing others in pain or

distress, particularly if there is a strong emotional attachment [63]. It may be suggested that for some riders in this study, a stronger horse-human bond, and increased feelings of empathy may have resulted in increased emotional responses to their horses' injuries than other riders.

4.2.2. Frustration

Some riders reported feeling angry or frustrated at their situation, and this was often linked to missed opportunities, such as team selection or career goals.

...then I got really angry. I got very jealous as well and bitter towards people that did make the team [removed] I thought, well that could have been me. You know, it's not fair that should have been me. (Aphy)

...looking back on it has been frustrating because I don't think I've quite achieved all the things that I was possibly able to do... (Mandy)

Frustration has been identified as a common emotional response to injuries in athletes [23,64], whereby injury is seen as a setback in their career trajectory [21]. Frustration is typically seen in athletes who are highly invested in their sporting career [21], and elite riders are known to invest considerable time and finances into their sport to be competitive [1,7,30]. Frustration can also be a secondary emotional response to feelings of uncertainty, possibly in relation to injury prognosis, career opportunities, or changes to routine, as seen in some of the riders in this study [46,65]. It is also proposed that frustration is related to the level of blame an athlete puts upon themselves [64], and for riders, blame may be significantly higher due to having direct control over their horses' daily routine, training, and care [9]. This could predispose riders to increased levels of frustration following equine injury. Furthermore, as riders are still physically capable but unable to compete due to equine injury, this could increase the frustration experienced by these riders.

4.2.3. Denial

Several riders reported experiencing denial when their horses were injured. Riders typically acknowledged the injury occurrence but were more likely to be in denial about the severity or long-term prognosis.

I told myself that if I used more clay, more cold water, he would recover quicker. (Margaux)

To start with, I was kind of like, it's fine, it's an abscess, she is going to be fine. And then 3 weeks in, I was like it's fine, it is going to be an abscess, like it's going to be fine and then I was like this isn't going to be fine. And it just kind of got work. In my head, I was like, kind of crossing my fingers it's all going to be ok, and then I was trying like to hang on to hope and then I was like no this isn't going to be ok. (Camille)

Denial is considered a temporary defense mechanism, employed in a negative situation, whereby an individual will consciously or unconsciously refuse to accept a given reality [26,66]. Elite riders reported denying the severity of their horse's injury, or long-term prognosis, which are common portrayals of denial in other athletes [26,33]. Decisions to deny or ignore the injury may lead to heightened emotional reactions, and increased difficulty in coping [67], resulting

in delayed access to medical treatment or rehabilitation [68]. Denial of equine injury severity and prognosis was also reported in elite youth equestrian athletes [9], however, for both youth and elite equestrians, denial states did not impact the use of veterinary medical provision, with Margaux even highlighting additional measures taken to facilitate recovery. The vicarious nature of the injury may suggest that whilst the protective mechanism of injury denial is still prevalent in horse riders with injured horses, the consequences of engagement with treatment and rehabilitation for their horses may be different and warrant further research.

4.2.4. Guilt

Some of the elite riders questioned their personal responsibility for the injury, with some attributing causality to their own actions, or questioning their lack of anticipation of the injury incident.

It's happened, there's nothing you can do about it... what is more of an issue is it happened because you had done something stupid (Christian)

But when the vet is like: I don't know what (caused it), it kind of makes it harder because you think like: what did I do? (Camille)

What I remember today is that I should have anticipated this. (Guillaume)

Guilt is considered one of the more threatening emotions reported in injured athletes and increases the risk of social isolation during recovery [68,69]. Indicative of an individual's perceived responsibility for the injury, due to their tactical decisions, training, or management strategies [69,70], athletes also attribute guilt to 'letting the team/coach down' [71]. For riders, the role of teammate also extends to the horse, and this has been seen by riders in this study, as well as in previous research [9]. Furthermore, riders reported feeling guilty for actions or decisions that may have caused the injury incident; Guillaume reported feeling guilty for not previously anticipating the risk of injury when training and competing, which could suggest prioritizing career progression over equine welfare in training [3], or could suggest a lack of prior knowledge on specific injury risk factors at the time of the incident. Riders displaying high levels of guilt, self-blame, or frustration should be monitored closely by coaches, and peer-to-peer support interventions considered, to reduce the risk of social isolation and disengagement from the sport.

4.3. Coping Strategies

All riders discussed various coping resources and strategies they employed when their horse was injured. Lower-order themes included avoidance, social support systems, growth, and injury normalization.

4.3.1. Avoidance

Several examples of avoidance coping were seen in elite riders, including behavioral and cognitive avoidance coping [72]. Athletes reported physically removing themselves from the stables or barn, or disengaging from equestrian sport, which are examples of behavioral avoidance.

I just walked away from the stable...I couldn't really be in the stable because I knew what it was...I just left; I didn't go

into the yard for the rest of the day... I did nothing, didn't go near the yard, didn't want to look at a horse. I just wanted to be on my own ... (Sophie)

I stopped going to the yard. I decided I was not going to ride horses for the moment because it was too difficult, too hard. I didn't put a foot at the yard for 6 months, not to see his stable, not see the stuff that was here and stuff. (Serena)

Behavioral avoidance is a common coping technique for situations involving vicarious trauma and has been suggested to be advantageous when an individual has little to no control over their circumstances, resulting in high-stress levels [28,73]. Whilst avoidance coping as a temporary method of coping is designed to protect athlete wellbeing, the long-term implications of avoidance coping are predominantly debilitating for successful return to competition [74,75]. This could result in elite equestrian athletes disengaging from equestrian sport following equine injury, as seen in Serena's case, and previously reported in youth equestrian athletes as well [9].

Previous equestrian research found that elite young riders also utilized cognitive avoidance coping, employing thought-stopping techniques to distract and divert from their situation [9,72]. After a setback, athletes try to focus and direct their energy on what they can do and control [21,64]. Whilst youth athletes previously avoided thinking about the injury at all, and often withdrew from competitive careers due to a lack of horses, elite athletes in this study redirected their focus towards productive means, often investing more time into other horses. Lamperd *et al.* [1] suggested that the characteristics of elite equestrian athletes include coping with adversity, and motivation to succeed, which may explain why some athletes chose to redirect their loss into more productive career routes. Horses, whether seen as commodities or as loved ones, or both [3,8] may help riders to overcome negative responses due to the loss/injury of another horse. Having access to other high-level horses could help a professional continue their career trajectory. This can be seen in Augustin's quote below:

*Probably the fact that I had the other horse **** [name], I probably the way to cope was I put more time and effort into him rather than thinking about what happened (Augustin)*

4.3.2. Social Support Systems

All elite riders discussed social support systems used during their horse's injury period, however, not all of these were viewed positively. It was generally agreed upon that the equestrian community was more understanding of equine injury than non-horsey individuals, due to shared social norms and experiences, however, Claire also reported a lack of empathy from her trainer when her horse was injured.

But I think the community, the equestrian community, particularly the eventing community are very very supportive, because we are all in together and everybody, nobody gets away with not having an injured horse. So you know, not that it ever fixes anything, at least you know people understand where you are...(Tom)

But maybe at the time my trainer was a bit, a bit dismissive about it, and he was more, he wanted to forget about it more

easily...he kind of just brushed it off. And was like it doesn't matter. (Claire)

Social support is one of the most important psychosocial factors for athlete recovery [76,77] and seeking social support is a common behavioral response [78]. Social support provides a buffer to psychological distress [79] and isolation [80] and enhances perceptions of psychological readiness during recovery [81]. Freeman [82] suggests that social support may encompass several key relationships, including family, friends, physiotherapists, or coaches, although perceptions of their support differ within the literature [76]. Athletes with similar injury experiences are often seen as the best source of social support [83]. These individuals, often teammates or peers, act as role models, and are more relatable to injured athletes, reinforcing the belief that recovery is achievable [76]. The support of the equestrian community has been previously reported in injury literature, with riders identifying the best sources of support being those who 'understood' [9] and can be seen here in the experiences of elite riders as well.

The role of the coach during athlete injury is to aid in the athlete's successful return to sport [84], and should encompass a holistic approach, considering the psychological, emotional, and social needs of the athlete, alongside their physical recovery [85]. However, whilst coaches believe they are providing adequate support for athletes during injury [86], athletes are reporting dissatisfaction with that support [87]. Athletes cited coaches' resistance to acknowledge injuries, lack of communication, doubt of injury severity, or increased focus on competition and training rather than recovery as barriers [84,87]. Claire highlights a lack of emotional support from her coach, which can increase psychological distress during injury recovery [37], and impact subsequent engagement in the sport [76]. However, Maurice *et al.* [84] identify that coaches receive little training on supporting athletes with injury, beyond the physiological training adaptations required, thus may be ill-prepared to offer emotional support. Additional training to support equestrian coaches in communicating with riders during human or equine injury periods would be beneficial to optimize psychological readiness for return to sport [81].

4.3.3. Personal Growth

Recent research has determined that not all responses to injury are negative, with many individuals reporting positive changes, in lifestyle, health, or mentality following injury [88]. Whilst many conceptual definitions exist, personal growth is deemed as broadly encompassing all growth experienced by individuals who have sustained a sporting injury [89]. Positivity and personal growth can be seen in several participants following equine injury:

I think positively. I think it kind of made me grow as a person, as in making more mature to injuries, and kind of just accepting the fact that horses do get injured...made me more patient, more careful on how I work my horses... (Claire)

I think from all of it, it's you grow, and you get tougher and whatever. But at the same time, I don't think it never gets

any easier, if you got a horse that level that becomes injured.
(Sophie)

Recent research suggests that growth has five dimensions: personal strength, improved social life, health benefits, sporting benefits, and social support [90]. Elite equestrian athletes in this study were more likely to identify personal strength and psychological benefits from the injury incident, highlighting increased mental toughness, resilience, and changes in attitude. Elite athletes are unique compared to non-elite as they typically emphasize positivity, and this may explain why personal growth was not previously identified in amateur riders following equine injury [10]. Whilst growth following a stressful event is not exclusive to athlete injury, physical growth linked to increased knowledge around injury physiology, training, and recovery is considered bespoke to athletes [88] and that can be seen in Claire's response, where she notes a change in her training practices, suggesting an implication towards sporting benefits as well. This could suggest that for some elite equestrian athletes, the experience of equine injury may help to shape future training practices.

4.3.4. Injury Normalization

There seems to be a normative culture of injury in equestrian sports, where both equine and rider injuries are accepted and even expected as part of engagement within the sport. This viewpoint seems to have been used as a coping strategy by many riders to regulate their emotional reactions to the injury.

I do think it's part of the sport and arguably it's part of life, you do need to learn how to deal with it because it is going to happen (Christian)

To be honest, ..., I think if you are in the sport, unless you're a complete naïve and young and inexperienced, you know that those (things) happen (Tom)

By choosing to engage in physically demanding or high-risk sports, athletes assume a certain level of injury risk, and an expectation of injury is often seen in athletic populations, although many athletes are unprepared for the consequences [91]. Within these sports, injury, risk-taking behavior, and tolerance of pain are normalized, and seen as 'part of the sport' and this can influence the mentality and actions of injured athletes, coaches, rehabilitation teams, and teammates [92,93]. Whilst normalization of injury can result in negative recovery behaviors, such as continuing to train or compete whilst injured or social isolation, the culture of injury within sport has also been found to positively influence personal growth [89]. Roy-Davis *et al.* [94] suggest that athletes who acknowledge that injuries are an acceptable risk of competing in sports are more likely to experience stress-related growth. Both Tom and Christian highlight a level of acceptance that has aided their cognitive appraisal and psychological recovery following their horses' injuries. Unlike research on human equestrian athletes [95,96], the injury normalization culture seen in response to equine injuries seems to facilitate a positive response in riders during periods of injury stress.

In this study, riders mentioned the wider impact of equine injury, highlighting several key members of their team: coaches, grooms, and owners. Examining the team's appraisal and responses to equine injury would be interesting as equestrian sports, although considered an individual sport, do require a

substantial team investment to develop an elite horse. Future research in this area should explore the wellbeing of all those working around the horse and the impact of equine injuries on grooms, coaches, and wider sports science support teams [97]. Furthermore, other sports have investigated the success of both pre- and post-injury interventions to enhance coping strategies in athletic populations [33]. Future research could evaluate the efficacy of pre- and post-injury intervention programs in elite equestrian populations, through the World Class Programme structure.

There are limitations to consider within the study. All riders discussed their story when one of their horses was injured and their responses to this injury. There were no objective measures or monitoring during the study and therefore it is based on rider self-awareness [9]. Indeed, any story will be influenced by the teller, the audience, and the relationship between the two [28]. There was some limitation in the sample and differences in injury type and timeline. Riders talked about the injuries that affected them most during their careers, but these ranged from relatively insignificant injuries to injuries that resulted in the euthanization of the horse, and this could have impacted the responses of the riders. In addition, some riders talked about injuries which happened some years ago, and others about injuries to horses which are still in the recovery process. They were at different stages of acceptance from the disruption of their horse's injury. However, that allowed the examination of the responses of riders to the injury of their horses as a collective [35].

5. Conclusion

The impact of an equine injury on elite equestrian athletes is complex, as equestrian sports are dependent upon the unique partnership between horse and rider. This study found that regardless of elite status, and concerns over the transactional nature of equestrian sports at elite level, elite equestrian athletes still experience psychological stress when their equine partner is injured. All elite riders experienced a feeling of loss and grief, although the source of this loss was different for individual riders. Riders highlighted a loss of routine, career opportunities, and athletic identity, through loss of participation at elite level. Similar negative emotions were seen in elite riders as in other athletic populations, including devastation, frustration, denial, and guilt, and riders employed a variety of coping mechanisms, including avoidance, and reliance on social support. Supplementary coach education to facilitate the recognition of these emotions and behaviors in riders following equine injury, and further training on effective communication and signposting would be beneficial. Equestrian communities are still viewed as most helpful during equine injury and equestrian governing bodies and performance programs should consider the development of targeted social support systems for injured combinations (horse and rider). Further research should consider the impact of equine injury on members of the support team, including grooms who, for elite level combinations, are often the primary caregiver.

Authors' Contributions

Conceptualization, ED & VL; methodology, ED; validation, ED & VL; formal analysis, ED & VL; resources, ED; writing-original draft preparation, ED & VL; writing- review and editing, ED & VL; visualization, ED; supervision, ED; project

administration, ED. All authors have read and agreed to the published version of the manuscript.

Acknowledgments

The authors would like to acknowledge those riders who kindly took the time to participate in the study.

Data Availability

The data supporting the findings of this study are available upon request from the corresponding author.

Funding

The research has not received any funding.

Conflicts of Interest

The authors declare that there are no conflicts of interest.

Ethical Approval

This study received ethical from Hartpury University Ethics Committee. The study complied with the guidelines of the Declaration of Helsinki.

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How to Cite

Davies E, Loyer V. The Psychological Responses of Elite Equestrian Athletes to Their Horses' Injuries. *Int J Equine Sci* 2023;2(2):24–36.