

The psychological responses of elite equestrian athletes to their horses' injuries

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43 1. Introduction

44 In Olympic equestrian disciplines (dressage, eventing and show jumping), both the horse and
45 rider must work as a team to achieve a final combined performance result (Lamperd et al. 2016;
46 Williams, 2013), therefore riders need to build a strong working relationship with their horses
47 based on mutual trust and respect (Dashper, 2014). Equestrianism differs from other sports as
48 riders must depend on their horses' well-being to perform (Lagarde et al. 2010; Reveny and
49 Stafverfeldt, 2019; Visser et al. 2008), and there is a heightened risk of injury within
50 competitive equestrian disciplines to both parties. Elite equestrian sport requires perseverance,
51 dedication, personal effort and considerable time and financial investment to be competitive
52 (Lamperd et al. 2016; Mills and McNicholas, 2005). Many riders sacrifice their social life and
53 family to their horses whom they consider as 'partners' (Wipper, 2000), however at elite level,
54 the pressures of professional sport and commercialisation could negatively impact individual
55 partnerships between horses and riders, creating a more transactional relationship (Dashper,
56 2014). Elite young riders and amateurs have both been found to experience negative cognitive
57 and emotional responses when their horses were injured (Davies et al. 2018; Davies and James,
58 2018), but the sense of loss experienced by a rider following equine euthanasia has been shown
59 to be influenced by the strength of the relationship (Field et al. 2009; Robinson, 1999). Horse-
60 rider relationships are unique, and range in intensity and type of interactions between levels
61 (Robinson, 1999). For elite equestrian athletes, coping with adversity, such as loss of a horse,
62 was identified as an important trait (Lamperd et al. 2016), thus it is imperative to explore the
63 psychological implications of equine injury on elite equestrian athletes.

64
65 Injury is common for equine athletes and can be caused by both competition and training
66 (Egenvall et al. 2013; O'Brien et al. 2005; Munsters et al. 2014; Murray et al. 2010). In all
67 equestrian disciplines, musculoskeletal injuries are the most common reason for the loss of
68 horses (Rogers et al. 2012). Injury types vary between discipline and the level of performance
69 (Murray et al. 2006; Murray et al. 2010) with up to 50% of elite Grand Prix Dressage
70 combinations reporting lameness in the preceding two years (Murray et al. 2010). Singer et al.
71 (2008) found that 21% of horses intending to compete in long format international eventing
72 competitions did not start due to injury whilst 32.5% of horse falls during the cross-country
73 phase incurred one or more injuries, and 7.2% of these were classified as serious, such as
74 fractures or tendon injury (Murray et al. 2004). Injuries can also lead to withdrawal prior to
75 competition, with 21 – 45% of horses per year withdrawing due to musculoskeletal injury
76 (O'Brien et al. 2005; Munsters et al. 2014). A setback, such as equine injury, could leave elite
77 riders vulnerable to additional psychological stressors, such as financial stress from veterinary
78 costs or lost income (Lamperd et al. 2016), feelings of guilt regarding commitments to owners
79 or sponsors, or emotional loss linked to the horse rider partnership (Davies et al. 2018; Davies
80 and James, 2018).

81
82 Injury is also considered a common source of stress in elite sport (Mosewich et al. 2014), with
83 financial pressure, emotional responses and feelings of loss all previously reported in elite
84 athletes who have experienced an injury during their career (Podlog et al. 2018). Following an
85 injury, athletes undergo a cognitive re-appraisal, considering several personal and situational
86 factors, including their perception of the cause of injury, recovery status, available social
87 support, and their ability to cope (Wiese-Bjornstal et al. 1998). This appraisal influences an
88 athlete's emotional responses, and can be viewed either positively, promoting optimal physical
89 and psychological recovery, or negatively, resulting in depression, guilt, isolation, anxiety, and
90 frustration (Thatcher et al. 2007; Walker et al. 2007). Some studies suggest that athletes
91 experiencing an injury could exhibit grief-like reactions such as those described by Kübler-
92 Ross (1969) with a 5-stage grief reaction response: denial, anger, bargaining, depression, and

93 acceptance (Brewer et al. 1994). These reactions could be explained by the sensation of loss
94 that athletes experience after an injury (Podlog et al. 2018). Emotional responses are not just
95 reported in injured athletes however, with sporting partners, teammates and coaches all
96 reporting horror, fear, helplessness, and depression following a teammate's injury, suggesting
97 that injury can psychologically affect others beyond just the injured party (Day et al. 2013;
98 O'Neil, 2008). More recently, the notion that the psychological implications of injury extend
99 beyond the injured individual has been extended to non-human animal partners within
100 equestrian sport, with riders reporting a sense of loss and grief, guilt, and denial when their
101 horse was injured (Davies et al. 2018; Davies and James, 2018). Partnerships between elite
102 riders and their horses have been perceived as more transactional, which may influence the
103 emotional responses seen in elite riders (Dashper, 2014). When an injury occurs, athletes who
104 are intensively involved with their sport may suffer more significant negative psychological
105 and emotional reactions than those who are less involved, due to challenges to their athletic
106 identity (Brewer et al. 1993; Johnston and Carroll, 1998). Individuals with stronger athletic
107 identity often experience increased stress during transitions, such as during injury or retirement
108 (Pummel et al. 2008). For elite equestrian athletes, who invest significant time and resources
109 into their career (Mills and McNicholas, 2005), and whose identity as an athlete is linked to the
110 performance capabilities of their horse (Lamperd et al. 2016), injury may negatively challenge
111 athletic identity and intensify psychological stress.

112
113 In wider sporting literature, changes to behaviour following injury have been reported to affect
114 an athlete's adherence to their rehabilitation programme, as well as their engagement with
115 medical provision, use of effective coping mechanisms and the likelihood of engaging in risk
116 taking behaviours, both within and outside of the sporting environment (Wiese-Bjornstal et al.
117 1998), influencing successful return to play (Santi and Pietrantonio, 2013). Employing effective
118 psychological coping strategies aids injured athletes in avoiding undue psychological harm
119 from difficult experiences (Mosewich et al. 2013). Early interventions can enhance emotional
120 regulation, self-motivation, and resilience, as well as access to, and perceived benefits of social
121 support (Santi and Pietrantonio, 2013). Social support has also been shown to help overcome
122 stressful events such as sports injury and is important for maintaining adherence to
123 rehabilitation (Arvinen-Barrow and Clement, 2019; Trainor, 2019). Social support was
124 previously identified by both elite young riders, and amateur equestrians as critical to their
125 psychological wellbeing when their horses were injured, with riders suggesting that non-horsey
126 people were less supportive due to a lack of understanding about the unique relationship
127 between horse and rider (Davies et al. 2018; Davies and James, 2018; Dashper, 2016). An
128 individual's satisfaction with their social support is related to mood, with more positive
129 perceptions of social support leading to a decrease in mood disturbance (Green and Weinberg,
130 2001). This could suggest that equine communities need to better understand the significance
131 of social support for riders experiencing equine injury to ensure that human wellbeing is
132 managed alongside equine recovery. The aim of this study was therefore to investigate the
133 psychological responses of elite riders to their horses' injuries.

134 135 **2. Materials and Methods**

136 **Participants**

137 Twelve elite equestrian athletes (8 women and 4 men, $\bar{x} = 30.8 \pm 10.8$ years (range 20 to 51
138 years old) participated in the study. The athletes were over 18 and must have competed in elite
139 international competitions run by the Fédération Equestre Internationale (FEI) in one or
140 multiple Olympic disciplines (dressage, eventing and/or show jumping) to be classified as
141 'elite' (Williams and Tabor, 2017). Athletes were selected based on their competition level and
142 their horse's injury status. The participants must have been riding an elite horse which had

143 sustained either a serious injury (requiring more than three months' rehabilitation) or career
144 ending injury, which impacted the rider's goals and career in the sport (Davies et al. 2018). This
145 study used purposive recruitment (Hennink et al. 2011) and participants were contacted through
146 the primary researcher's personal contacts, and supplemented by snowball sampling methods,
147 and social media posts (Browne, 2005). The method was dependent on the researcher's personal
148 connection with possible participants, and the most appropriate way to contact them was
149 deduced. Participants were sampled in a deliberate and flexible way, to select a diverse range
150 of participants to provide a variety of experiences. The final sample size (n=12) was deemed
151 sufficient to evaluate the in-depth understanding of the riders' experiences.

152

153 **Procedure**

154 Following institutional ethics approval by the XXXXXX (blinded for review) Human Research
155 Ethics Committee, informed consent was obtained from each participant during the recruitment
156 process, whereby participants were given an information sheet and consent form, detailing the
157 intentions of the study, the risks and benefits and their rights as a participant to withdraw from
158 the study at any time with no consequences to them. Following this, semi-structured interviews
159 were used to collect data from 12 participants who met the inclusion/exclusion criteria. Semi-
160 structured interviews were chosen to allow sufficient depth and exploration of the complex
161 issue of sports injury, whilst still maintaining flexibility. Guided questions, probes and non-
162 verbal cues were used to facilitate the discussion and ensure researcher understanding of the
163 participants experiences (Marshall and Rossman, 2006). The interview guide was used
164 previously by Davies et al. (2018) and was developed based on the psychology of sport injury
165 literature and the authors' experiences with severe equine injuries. The same interview guide
166 was utilised to allow comparison within the discussion of how level of combination influenced
167 the psychological responses following equine injury. The interview guide was designed to
168 address pre-injury career, the rehabilitation phase, pre-return to competition phase issues and
169 coping strategies used by riders (Davies et al. 2018; Podlog et al. 2012). All names given in this
170 study are pseudonyms to protect the anonymity of the participants, and any identifying
171 information e.g. career highlights, horse name, competition venue have been removed during
172 analysis. Each interview, conducted by VL, lasted between 18-51 minutes, and were recorded
173 using an iPhone 6 Memo Recorder. Considering the international aspect of this study and
174 language differences, the discussions were held in the rider's first language and the interviewer
175 (VL - bilingual) subsequently created verbatim transcripts in the original language which were
176 then translated into English for analysis.

177

178 Athletes and trainers can be difficult to contact due to busy schedules (Keegan et al. 2014), so
179 the researcher adapted interview methods and times to suit the participants. Building a positive
180 rapport with the riders was important due to the sensitive nature of the topic being discussed.
181 The researcher invited participants to tell stories, give personal accounts and relate their
182 behaviour in relation to the study (Smith and Sparkes, 2016). In addition, the researcher
183 personally knew most of the participants and that facilitated openness during the interviews
184 (Lamperd et al. 2016). Face-to-face and online interviews with the use of applications
185 (WhatsApp, Skype, and Facebook Messenger) were undertaken, and were implemented
186 depending on the most convenient method for the participant and increasing COVID-19
187 restrictions (Spring 2020). A total of six participants were interviewed face-to face, one was
188 interviewed via Skype, one was interviewed via WhatsApp and four via Facebook Messenger.

189

190 **Data Analysis**

191 The interviews were transcribed verbatim, and an eight-step thematic analysis process was
192 employed to allow new information to be extracted from the data (Bloomberg and Volpe, 2008).

193 The data were analysed using an eight-stage approach adapted from Lamperd et al. (2016),
194 consisting of the following: (1) verbatim transcription, and translation from French to English
195 for four interviews (VL), (2) all transcripts were reviewed, read and re-read to facilitate analysis
196 (ED, VL), (3) direct quotes were divided into the categories of the questioning framework (ED,
197 VL), (4) inductive grounded theory analysis was undertaken using line-by-line open coding
198 using tags to create themes (ED, VL), (5) focused coding was used to formulate themes (ED),
199 (6) themes were organised relative to the study aims (ED), (7) validation consensus was
200 conducted by both researchers (VL, ED), (8) followed by discussion to determine whether the
201 research aims had been appropriately met (ED, VL).

202
203 During the course of data collection and analysis, the interviewer (VL) continuously reflected
204 on her personal experience as an international rider and her own thoughts about her personal
205 experiences when her horse was injured. Her background allowed her to connect and be
206 sympathetic with participants. Furthermore, the supervisor's (ED) epistemological perspective
207 is a social constructivist lens, which framed how the thematic analysis was undertaken. It should
208 be acknowledged that interpretation of the findings and emergent themes may have been
209 influenced by the research team's experiences with personal injury within the equestrian and
210 racing sectors. Both researchers independently conducted the thematic analysis, and then
211 discussed their positioning to ensure this had not influenced their coding or subsequent themes.
212 The shared experiences of the research team however are considered a strength, as it can aid in
213 building rapport, and demonstrating empathy which may allow for increased honesty regarding
214 complex subjects during the interview process.

215

216 **3. Results**

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

225

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

Psychological responses of elite riders to equine injury

229
230

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

231
232
233
234
235

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

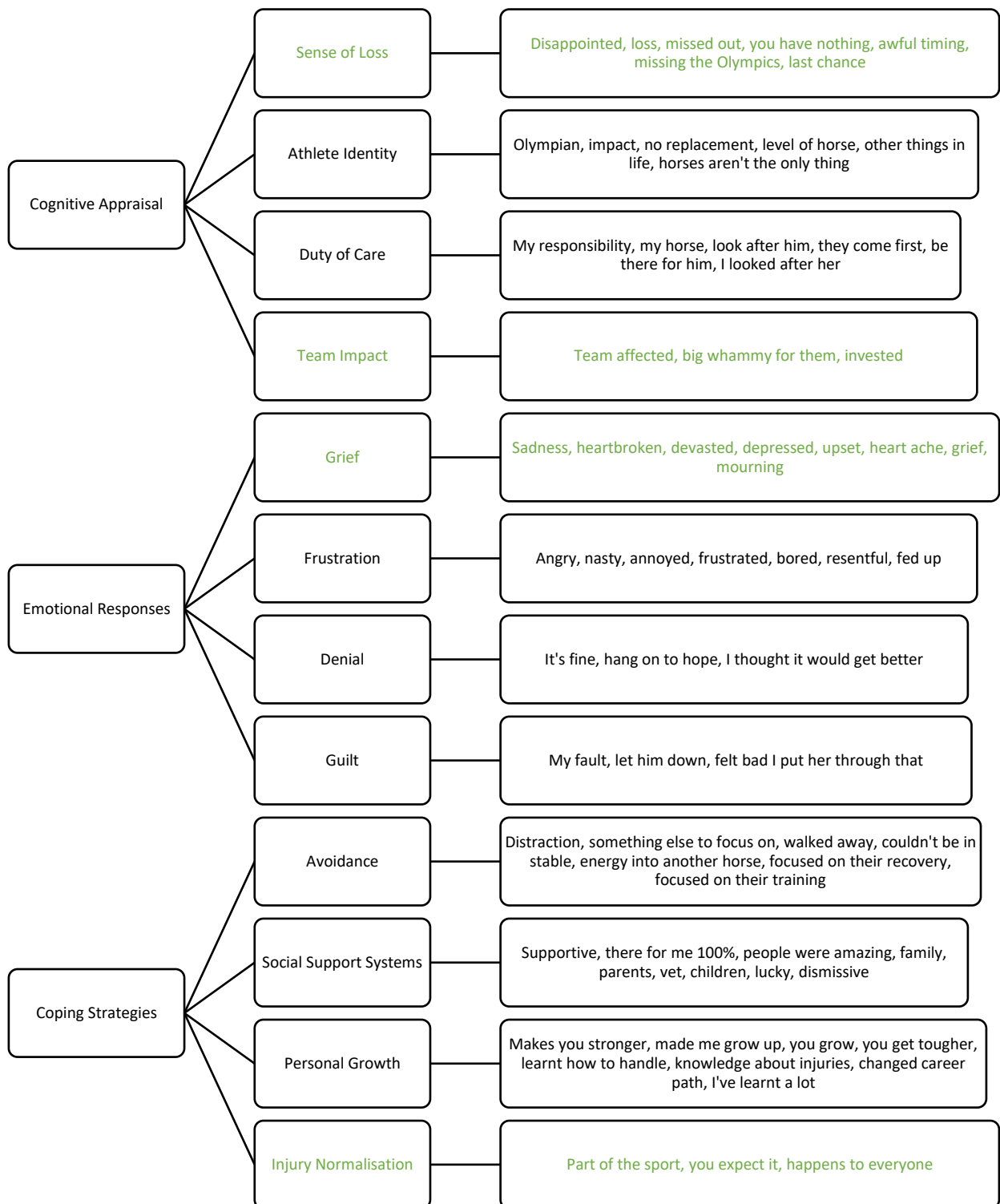


Figure 1: Higher and Lower Order Themes

240 **4. Discussion**

241 **Cognitive Appraisal**

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

247

248 *Sense of Loss*

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

251

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

254

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

258

259 A sense of loss is considered part of the cognitive appraisal process in athletes, which occurs at
260 the onset of injury and can influence negative emotional responses such as grief or devastation,
261 as seen here (Wiese-Bjornstal et al. 1998). A sense of loss is often attributed to an impact on
262 competition goals, or long-term career aspirations, with inability to perform or compete
263 reported as the major source of disappointment for injured athletes (Bianco et al. 1999; Evans
264 et al. 2012). For elite athletes, loss can be a more prominent response to injury, as they often
265 experience a sense of purpose in competition and training, which is disrupted, and they are
266 emotionally invested in their sport (Bianco et al. 1999). Previous research in equestrian sport
267 suggests that young riders also experienced loss at the onset of their horse's injury (Davies et al.
268 2018), and that riders who have invested more time into their horses may be at increased risk
269 of devastation following injury (Davies and James, 2018). Peretz's (1970) model proposes that
270 loss occurs across four dimensions: loss of a significant person, loss of some aspect of self, loss
271 of external objects and developmental loss (Ford and Gordon, 1999). Elite riders whose horses
272 are injured could experience all four dimensions of loss, thus riders' psychological state should
273 be closely monitored by coaches and performance teams following an equine injury to
274 maximise athlete wellbeing (Balk and Englert, 2020).

275

276 *Athlete Identity*

277 All participants mentioned the importance of horses in their life at the time of the injury.
278 Dashper (2016) proposed that horses were an integral part of a rider's life and thus are an
279 important part of an individual identity, which may be impacted by equine injury.

280

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

284

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

287

288 It has been suggested that riders question their own personal identity after their horse is injured,
289 as they develop a strong athlete identity surrounding their role as a rider (Davies et al. 2018).

290 Moreover, it seems that professional elite riders do not just identify themselves around the fact
291 that they are elite riders, but also around their accomplishment in the sport, such as being an
292 Olympian or a World Champion. Wylleman et al. (2012) suggested that the athletes perceived
293 a strengthened identity with their role as elite athletes after the Olympic Games. Challenges to
294 athletic identity has previously been related to decrease in mental wellbeing (Trainor, 2019),
295 suggesting that coaches and governing bodies should be cognizant of elite riders' wellbeing
296 following equine injury.

297
298 Interestingly, riders with access to only one horse, or only one elite-level horse, seemed to
299 experience increased negative psychological responses following their horse's injury, possibly
300 as they were unable to continue competing at the same level. Previous research has found that
301 elite riders struggled in their athletic identity when they lost their ride at elite level (Sparkes,
302 1998), and elite youth athletes also reported that lack of a horse at elite level made them feel
303 like they were not elite riders anymore (Davies et al. 2018). Equestrian sport incorporates both
304 horse and rider under the umbrella of 'athlete' at elite level, and this increases the risk of injury-
305 related psychological issues compared to other elite athletes. This can be seen in Anne response:

306
307 *I don't have a big string so for me an injured horse has a big impact because I don't*
308 *have a replacement (Anne)*

309
310 Two riders did not feel their athletic identity was impacted by equine injury. Individuals who
311 formulate a significant part of their identity around an activity, but have other life pursuits, and
312 do not rely on continued involvement for self-esteem, social approval, or validation, are defined
313 as having harmonious passion (Rip et al. 2006; Vallerand et al. 2003). Whilst Tom's only elite-
314 level horse had experienced a serious injury, resulting in the losing the opportunity to compete
315 at a CCI5*L competition, he reflected those external elements of his life allowed him
316 perspective on the situation, such as college or children. Margaux also reflected on family and
317 children, and ultimately decided to end her international career in favour of other pursuits.

318
319 *There is more to life than this. I mean I already had that experience that because I went*
320 *back to college, and I already had the awakening that there is more to life than horses.*
321 *(Tom)*

322
323 *...you have a family life, you have children, there are other things that make you realise*
324 *that it's not the only thing in life. Horses are not the only thing. (Margaux)*

325 326 *Duty of Care*

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

330
331 *So, he was my horse, he's my responsibility, you can't just send him away, so I have to*
332 *make sure he is all right, ... I didn't have a lot of resources at that time. And so, you just*
333 *sort of, you take responsibility for it. And it's personal because it's your horse*
334 *(Christian)*

335
336 *...you are responsible for that horse, so they are counting on you, and you know at the*
337 *end of the day, that's what matters. I think just get up do it for the horse, like you know*
338 *this is not about me. I'm not the one that is hurt, I don't need to be taken care of right*
339 *now. (Aphy)*

340

341 Horses require daily care and attention to maintain their health and wellbeing (Dashper, 2016;
342 Reveny and Stafverfeldt, 2019), and typically those responsibilities belong to the rider
343 (Williams and Tabor, 2017). In the occurrence of an injury, these responsibilities are even
344 greater. Not all riders are directly responsible for daily horse care, due to the presence of grooms
345 in some commercial yard structures, which may be more likely in elite riders compared to
346 amateurs or youth athletes. However, for doping and prohibited substances, the FEI state that
347 the athlete is still classified as the ‘person responsible’ thus ensuring that the rider is responsible
348 for oversight of their horses’ care.

349

350 *Team Impact*

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

353

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

356

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

361

362 Research has yet to identify the wider implications of sports injury on an athlete’s support
363 network (Wadey et al. 2018), although some limited research exists considering the impact of
364 athlete injury on coaches (Cavallerio et al. 2016; Day et al. 2013; Martinelli et al. 2017).
365 Coaches experienced high levels of guilt when their athletes were injured (Martinelli et al.
366 2017), and some coaches reported experiencing intrusive flashbacks, and subsequently avoided
367 sports practice following an injury incident at the gym (Day et al. 2013), demonstrating that
368 there are wider impacts of injury than just to the athlete themselves. The impact of equine injury
369 on the human athlete is already identified as a form of vicarious trauma (Davies et al. 2018;
370 Davies and James, 2018), whereby the athlete is experiencing significant psychological
371 responses to witnessing a partner or team-mates injury (Day et al. 2013; O’Neil, 2008).
372 However, the human athlete is not the only individual to develop a significant partnership or
373 bond with the horse. At elite level, grooms are common practice, and hold an integral position
374 with the equine support team, often acting as primary care giver and working closely with the
375 rider to achieve optimal equine health and performance (British Equestrian, 2023). As such, it
376 could be argued that the psychological impact of injury in elite horses is likely to produce a
377 significant emotional reaction in the grooms, which may be different than what is seen in the
378 rider and should be investigated in further research.

379

380 **Emotional Responses**

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

384

385 *Grief*

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

388

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

392
393 *Even if he was only an animal, for me at the time he represented much more than that...It*
394 *was a rather as if I had lost someone close. People who aren't riders, would find that,*
395 *would I say mad, but that's the way it was...(Margaux)*
396

397 Grief-like responses has been previously reported in injured athletes, typically resulting from a
398 sense of loss of sporting performance (Mankad and Gordan, 2010), and grief responses are
399 often heightened if the injury occurs prior to a critical event, such as the Olympic Games
400 (Bianco et al. 1999). However, the grief experienced by several riders in this study focuses on
401 the implications of injury on the horse-human bond, which may be more akin to an owner and
402 pet relationship, rather than the proposed transactional athlete and 'tool' relationship which has
403 been previously reported as a concern for elite equestrian athletes (Dashper, 2014). Research in
404 companion animals suggests that the strength of attachment between owner and pet is
405 considered a predictor of grief when an animal dies (Field et al. 2009). Whilst death was not
406 the outcome for most horses discussed as part of this study (four were euthanised, remaining
407 eight were recovering or returned to work), research has suggested that owners with higher
408 levels of empathy are more likely to recognise pain in animals (Ellingsen et al. 2010; Furnham
409 et al. 2003), and consequently experience heightened emotional reactions and a sense of
410 devastation during periods of equine injury (Davies and James, 2018). Empathy, defined as a
411 'vicariously induced emotional reaction ... that is similar to the other's emotional state or
412 consistent with the other's situation' (Eisenberg, 1988), has been shown to increase when
413 viewing others in pain or distress, particularly if there is a strong emotional attachment (Decety
414 and Cowell, 2014). It may be suggested that for some riders in this study, a stronger horse-
415 human bond, and increased feelings of empathy may have resulted in increased emotional
416 responses to their horses' injuries than other riders.

417
418 *Frustration*

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

421
422 *...then I got really angry. I got very jealous as well and bitter towards people that did*
423 *make the team [removed] I thought, well that could have been me. You know, it's not*
424 *fair that should have been me. (Aphy)*

425
426 *...looking back on it has been frustrating because I don't think I've quite achieved all*
427 *the things that I was possibly able to do... (Mandy)*
428

429 Frustration has been identified as a common emotional response to injuries in athletes (Tracey,
430 2003; Wiese-Bjornstal et al. 1998), whereby injury is seen as a setback in their career trajectory
431 (Mosewich et al. 2013). Frustration is typically seen in athletes who are highly invested in their
432 sporting career (Mosewich et al. 2013), and elite riders are known to invest considerable time
433 and finances into their sport to be competitive (Brewer et al. 1993; Lamperd et al. 2016; Mills
434 and McNicholas, 2005). Frustration can also be a secondary emotional response to feelings of
435 uncertainty, possibly in relation to injury prognosis, career opportunities or changes to routine,
436 as seen in some of the riders in this study (Bailie and Danish, 1992; Bianco et al. 1999). It is
437 also proposed that frustration is related to the level of blame an athlete puts upon themselves
438 (Tracey, 2003), and for riders, blame may be significantly higher due to having direct control

439 over their horses' daily routine, training, and care (Davies et al. 2018). This could predispose
440 riders to increased levels of frustration following equine injury. Furthermore, as riders are still
441 physically capable but unable to compete due to equine injury, this could increase the frustration
442 experienced by these riders.

443
444 *Denial*

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

448
449 *I told myself that if I used more clay, more cold water, he would recover quicker.*
450 *(Margaux)*

451
452 *To start with, I was kind of like, it's fine, it's an abscess, she is going to be fine. And*
453 *then 3 weeks in, I was like it's fine, it is going to be an abscess, like it's going to be fine*
454 *and then I was like this isn't going to be fine. And it just kind of got work. In my head, I*
455 *was like, kind of crossing my fingers it's all going to be ok, and then I was trying like to*
456 *hang on to hope and then I was like no this isn't going to be ok. (Camille)*
457

458 Denial is considered a temporary defence mechanism, employed in a negative situation,
459 whereby an individual will consciously or unconsciously refuse to accept a given reality
460 (Kubler-Ross, 1969; Prigatano and Sherer, 2020). Elite riders reported denying the severity of
461 their horse's injury, or long term prognosis, which are common portrayals of denial in other
462 athletes (Kubler-Ross, 1969; Santi and Pietrantonio, 2013). Decisions to deny or ignore the
463 injury may lead to heightened emotional reactions, and increased difficulty in coping (Samuel
464 et al. 2015), resulting in delayed access to medical treatment or rehabilitation (Harris, 2003).
465 Denial of equine injury severity and prognosis was also reported in elite youth equestrian
466 athletes (Davies et al. 2018), however, for both youth and elite equestrians, denial states did not
467 impact use of veterinary medical provision, with Margaux even highlighting additional
468 measures taken to facilitate recovery. The vicarious nature of the injury may suggest that whilst
469 the protective mechanism of injury denial is still prevalent in horse-riders with injured horses,
470 the consequences on engagement with treatment and rehabilitation for their horses may be
471 different and warrants further research.

472
473 *Guilt*

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

477
478 *It's happened, there's nothing you can do about it... what is more of an issue is it*
479 *happened because you had done something stupid (Christian)*

480
481 *But when the vet is like: I don't know what (caused it), it kind of makes it harder because*
482 *you think like: what did I do? (Camille)*

483
484 *What I remember today is that I should have anticipated this. (Guillaume)*
485

486 Guilt is considered one of the more threatening emotions reported in injured athletes and
487 increases the risk of social isolation during recovery (Bianco, 2001; Harris, 2003). Indicative
488 of an individual's perceived responsibility for the injury, due to their tactical decisions, training,

489 or management strategies (Bianco, 2001; McNamee, 2001), athletes also attribute guilt to
490 'letting the team/coach down' (Podlog and Eklund, 2007). For riders, the role of teammate also
491 extends to the horse, and this has been seen by riders in this study, as well as in previous research
492 (Davies et al. 2018). Furthermore, riders reported feeling guilty for actions or decisions which
493 may have caused the injury incident; Guillaume reported feeling guilty for not previously
494 anticipating the risk of injury when training and competing, which could suggest prioritising
495 career progression over equine welfare in training (Dashper, 2014), or could suggest a lack of
496 prior knowledge on specific injury risk factors at the time of the incident. Riders displaying
497 high levels of guilt, self-blame or frustration should be monitored closely by coaches, and peer-
498 to-peer support interventions considered, to reduce the risk of social isolation and
499 disengagement from the sport.

500

501 **Coping Strategies**

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

505

506 *Avoidance*

507 Several examples of avoidance coping were seen in elite riders, including behavioural and
508 cognitive avoidance coping (Carson and Polman, 2010). Athletes reported physically removing
509 themselves from the stables or barn, or disengaging from equestrian sport, which are examples
510 of behavioural avoidance.

511

512 *I just walked away from the stable...I couldn't really be in the stable because I knew*
513 *what it was...I just left; I didn't go into the yard for the rest of the day... I did nothing,*
514 *didn't go near the yard, didn't want to look at a horse. I just wanted to be on my own*
515 *... (Sophie)*

516

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

520

521 Behavioural avoidance is a common coping technique for situations involving vicarious trauma
522 and has been suggested to be advantageous when an individual has little to no control over their
523 circumstances, resulting in high stress levels (Day et al. 2013; Vernacchia et al. 1997). Whilst
524 avoidance coping as a temporary method of coping is designed to protect athlete wellbeing, the
525 long-term implications of avoidance coping are predominantly debilitating for successful return
526 to competition (Albinson and Petrie, 2003; Kim and Duda, 2003). This could result in elite
527 equestrian athletes disengaging from equestrian sport following equine injury, as seen in
528 Serena's case, and previously reported in youth equestrian athletes as well (Davies et al. 2018).

529

530 Previous equestrian research found that elite young riders also utilized cognitive avoidance
531 coping, employing thought-stopping techniques to distract and divert from their situation
532 (Carson and Polman, 2010; Davies et al. 2018). After a setback, athletes try to focus and direct
533 their energy on what they can do and control (Mosewich et al. 2013; Tracey, 2003). Whilst
534 youth athletes previously avoided thinking about the injury at all, and often withdrew from
535 competitive careers due to a lack of horse, elite athletes in this study redirected their focus
536 towards productive means, often investing more time into other horses. Lamperd et al. (2016)
537 suggested that the characteristics of elite equestrian athletes include coping with adversity, and
538 motivation to succeed, which may explain why some athletes chose to redirect their loss into

539 more productive career routes. Horses, whether seen as commodities or as loved ones, or both
540 (Dashper, 2014; Whipper, 2000) may help riders to overcome negative responses due to the
541 loss/injury of another horse. Having access to other high-level horses could help a professional
542 continue their career trajectory. This can be seen in Augustin's quote below:

543
544 *Probably the fact that I had the other horse **** [name], I probably the way to cope*
545 *was I put more time and effort into him rather than thinking about what happened*
546 *(Augustin)*

547
548 *Social Support Systems*

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

554
555 *But I think the community, the equestrian community, particularly the eventing*
556 *community are very very supportive, because we are all in together and everybody,*
557 *nobody gets away with not having an injured horse. So you know, not that it ever fixes*
558 *anything, at least you know people understand where you are...(Tom)*

559
560 *But maybe at the time my trainer was a bit, a bit dismissive about it, and he was more,*
561 *he wanted to forget about it more easily...he kind of just brushed it off. And was like it*
562 *doesn't matter. (Claire)*

563
564 Social support is one of the most important psychosocial factors for athlete recovery (Griffin et
565 al. 2021; Yang et al. 2010) and seeking social support is a common behavioural response
566 (Clement et al. 2015). Social support provides a buffer to psychological distress (Rees et al.
567 2010) and isolation (Mitchell et al. 2014) and enhances perceptions of psychological readiness
568 during recovery (Podlog et al. 2015). Freeman (2020) suggests that social support may
569 encompass several key relationships, including family, friends, physiotherapists, or coaches,
570 although perceptions of their support differ within the literature (Griffin et al. 2021). Athletes
571 with similar injury experiences are often seen as the best source of social support (Arvinen-
572 Barrow and Walker, 2010). These individuals, often teammates or peers, act as role models,
573 and are more relatable to injured athletes, reinforcing the belief that recovery is achievable
574 (Griffin et al. 2021). The support of the equestrian community has been previously reported in
575 injury literature, with riders identifying the best sources of support being those who
576 'understood' (Davies et al. 2018) and can be seen here in the experiences of elite riders as well.

577
578 The role of the coach during athlete injury is to aid in the athlete's successful return to sport
579 (Maurice et al. 2021), and should encompass a holistic approach, considering the psychological,
580 emotional, and social needs of the athlete, alongside their physical recovery (Fernandes et al.
581 2014). However, whilst coaches believe they are providing adequate support for athletes during
582 injury (Podlog and Dionigi, 2010), athletes are reporting dissatisfaction with that support
583 (Abgarov et al. 2012). Athletes cited coaches' resistance to acknowledge injuries, lack of
584 communication, doubt of injury severity, or increased focus on competition and training rather
585 than recovery as barriers (Abgarov et al. 2012; Maurice et al. 2021). Claire highlights a lack of
586 emotional support from her coach, which can increase psychological distress during injury
587 recovery (Green and Weinberg, 2001), and impact subsequent engagement in the sport (Griffin
588 et al. 2021). However, Maurice et al (2021) identifies that coaches receive little training on

589 supporting athletes with injury, beyond the physiological training adaptations required, thus
590 may be ill-prepared to offer emotional support. Additional training to support equestrian
591 coaches in communicating with riders during human or equine injury periods would be
592 beneficial to optimise psychological readiness for return to sport (Podlog et al. 2015).

593

594 *Personal Growth*

595 Recent research has determined that not all responses to injury are negative, with many
596 individuals reporting positive changes, in lifestyle, health or mentality following injury (Salim
597 et al. 2016). Whilst many conceptual definitions exist, personal growth is deemed as broadly
598 encompassing all growth experienced by individuals who have sustained a sporting injury
599 (Hammer et al. 2021). Positivity and personal growth can be seen in several participants
600 following equine injury:

601

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

605

606 *I think from all of it, it's you grow, and you get tougher and whatever. But at the same*
607 *time, I don't think it never gets any easier, if you got a horse that level that becomes*
608 *injured. (Sophie)*

609

610 Recent research suggests that growth has 5 dimensions: personal strength, improved social life,
611 health benefits, sporting benefits, and social support (Rubio et al. 2020). Elite equestrian
612 athletes in this study were more likely to identify personal strength and psychological benefits
613 from the injury incident, highlighting increased mental toughness, resilience, and changes in
614 attitude. Elite athletes are unique compared to non-elite as they typically emphasis positivity,
615 and this may explain why personal growth was not previously identified amateur riders
616 following equine injury (Davies and James, 2018). Whilst growth following a stressful event is
617 not exclusive to athlete injury, physical growth linked to increased knowledge around injury
618 physiology, training and recovery is considered bespoke to athletes (Salim et al. 2016) and that
619 can be seen in Claire's response, where she notes a change in her training practices, suggesting
620 an implication towards sporting benefits as well. This could suggest that for some elite
621 equestrian athletes, the experience of equine injury may help to shape future training practices.

622

623 *Injury Normalisation*

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

628

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

631

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

634

635 By choosing to engage in physically demanding or high-risk sports, athletes assume a certain
636 level of injury risk, and an expectation of injury is often seen in athletic populations, although
637 many athletes are unprepared for the consequences (Tamminen and Watson, 2022). Within
638 these sports, injury, risk-taking behaviour, and tolerance of pain is normalised, seen as 'part of

639 the sport' and this can influence the mentality and actions of injured athletes, coaches,
640 rehabilitation teams and teammates (Turner and Wainwright, 2003; Wainwright et al. 2006).
641 Whilst normalisation of injury can result in negative recovery behaviours, such as continuing
642 to train or compete whilst injured or social isolation, the culture of injury within sport has also
643 been found to positively influence personal growth (Hammer et al. 2021). Roy-Davis et al.
644 (2017) suggests that athletes who acknowledge that injuries are an acceptable risk of competing
645 in sport are more likely to experience stress-related growth. Both Tom and Christian highlight
646 a level of acceptance that has aided their cognitive appraisal and psychological recovery
647 following their horses' injuries. Unlike research on human equestrian athletes (Davies and
648 Steel, 2023; Davies et al. 2022), the injury normalisation culture seen in response to equine
649 injuries seems to facilitate a positive response in riders during periods of injury-stress.

650
651 In this study, riders mentioned the wider impact of equine injury, highlighting several key
652 members of their team: coach, grooms, owners. Examining the team's appraisal and responses
653 to equine injury would be interesting as equestrian sports, although considered an individual
654 sport, does require a substantial team investment to develop an elite horse. Future research in
655 this area should explore the wellbeing of all those working around the horse and the impact of
656 equine injuries on grooms, coaches, and wider sports science support teams (Foright, 2018).
657 Furthermore, other sports have investigated the success of both pre- and post-injury
658 interventions to enhance coping strategies in athletic populations (Santi and Pietrantonio, 2013).
659 Future research could evaluate the efficacy of pre- and post-injury intervention programmes in
660 elite equestrian populations, through the World Class Programme structure.

661
662 There are limitations to consider within the study. All riders discussed their story when one of
663 their horses was injured and their responses to this injury. There were no objective measures or
664 monitoring during the study and therefore it is based on rider self-awareness (Davies et al.
665 2018). Indeed, any story will be influenced by the teller, the audience, and the relationship
666 between the two (Day et al. 2013). There was some limitation in the sample and differences in
667 injury type and timeline. Riders talked about the injuries which affected them most during their
668 careers, but these ranged from a relatively insignificant injury to an injury which led the horse
669 being euthanised, and this could have impacted the responses of the riders. In addition, some
670 riders talked about injuries which happened some years ago and others about injuries to horses
671 which are still in the recovery process. They were at different stages of acceptance from the
672 disruption of their horse's injury. However, that allowed the examination of the responses of
673 riders to the injury of their horses as a collective (Trainor, 2019).

674 675 **5. Conclusion**

676 The impact of equine injury on elite equestrian athletes is complex, as equestrian sports are
677 dependent upon the unique partnership between horse and rider. This study found that
678 regardless of elite status, and concerns over the transactional nature of equestrian sports at elite
679 level, elite equestrian athletes still experience psychological stress when their equine partner is
680 injured. All elite riders experienced a feeling of loss and grief, although the source of this loss
681 was different for individual riders. Riders highlighted a loss of routine, career opportunities and
682 athletic identity, through loss of participation at elite level. Similar negative emotions were seen
683 in elite riders as other athletic populations, including devastation, frustration, denial, and guilt,
684 and riders employed a variety of coping mechanisms, including avoidance, and reliance on
685 social support. Supplementary coach education to facilitate the recognition of these emotions
686 and behaviours in riders following equine injury, and further training on effective
687 communication and signposting would be beneficial. Equestrian communities are still viewed
688 as most helpful during equine injury and equestrian governing bodies and performance

689 programmes should consider the development of targeted social support systems for injured
690 combinations (horse and rider). Further research should consider the impact of equine injury on
691 members of the support team, including grooms who, for elite level combinations, are often the
692 primary care giver.

693

694 **Ethical Approval**

695 This study received ethical from ***** University Ethics Committee (blinded for review).
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706 Conceptualization, ED & VL; methodology, ED; validation, ED & VL; formal analysis, ED &
707 VL; resources, ED; writing-original draft preparation, ED & VL; writing- review and editing,
708 ED & VL; visualization, ED; supervision, ED; project administration, ED. All authors have
709 read and agreed to the published version of the manuscript.

710

711 **Data Availability Statement**

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

714

715 **Conflicts of Interest**

716 The authors declare that there are no conflicts of interest.

717

718

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