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1 **Potential impacts of body image perception in female equestrians**

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6

7 **Abstract**

8 Female body image (BI) has been investigated in many sports yet, in female-dominated
9 equestrianism, there is a paucity of BI research. This study aimed to identify self-perceptions
10 of BI, rider perceptions of judge and coach bias, relationships between BI and self-
11 consciousness and effect of breast size. A 4-part, 27 question survey (GoogleForms™) was
12 completed by female equestrians (n=493). The second smallest BI was considered ideal for
13 equestrianism ($\chi^2=352.751$, $P<0.001$) regardless of age, own BI or level of riding commitment.
14 There was a perception judges favour riders with smaller frames ($\chi^2=54.2111$, $P<0.001$) and an
15 association between riders with a larger BI feeling self-conscious when riding ($\chi^2=87.514$,
16 $P<0.001$). More respondents perceived the ideal equestrian BI to be smaller than theirs
17 (Median= -1.5, $W=7777.00$, $P<0.001$) and an association between those dissatisfied with their
18 BI and self-consciousness when riding was seen ($\chi^2=83.649$, $P<0.001$). Perception of the ideal
19 equestrian frame is smaller than many riders' own BI, and a larger BI perception negatively
20 impacts self-confidence, potentially hindering performance and participation. Female riders
21 with a larger frame feel they are perceived negatively by judges and further study is indicated
22 to investigate the extent of this potential bias on subjective judging in equestrian disciplines.

23 Keywords: Horse riding; Self-Confidence; Physique; Appearance; Body Appreciation

24

25

26 **1. Introduction**

27 There is an array of popular equestrian disciplines [1]. Equestrian activities range from non-
28 competitive to elite/World Class level [2]. Whilst many equestrian disciplines are objectively
29 measured e.g. according to completion time, least obstacles lowered and so on, some, such as

30 dressage are subjectively judged [3]. Each movement in a test is scored, but impressions of the
31 riding ability of each competitor are also scored and have impact on the overall placings [4]
32 and of the three Olympic equestrian disciplines; dressage, show jumping and eventing, both
33 dressage and eventing contain subjective judging to a varied extent. In excess of 31,000 riders
34 compete in British Dressage and British Eventing affiliated competitions each year [5,6], with
35 each organisation setting strategic goals to increase participation. These strategic aims to
36 increase participation could be adversely impacted by any potential barriers to non-competitive
37 riders taking up the sport.

38

39 The Sport England Active Lives Adult survey (2020) reported that 88% of horse riders are
40 women [7] and horse riding is reported to be beneficial for improving cardiovascular fitness,
41 stamina, balance, core and body strength [8]. Horse riding in all its forms increases feelings of
42 happiness [9,10] and has a stress relieving effect, contributing to improved mental health [11-
43 13]. Research has investigated the positive aspect of sports in relation to self-perception of
44 body image [14,15] finding that those with a higher level of body appreciation participate more
45 in physical activity [16]. Female athletes, however, have lower levels of positive body image
46 perceptions than male athletes [17]. Although body image in females differs between sport
47 types [18], participants in aesthetically focused sports where leanness is prominent e.g.
48 gymnastics, figure skating and long-distance running, are associated with more body image
49 disturbances [19,20]. Athletes that tend to identify an ideal BI close to their own are more
50 satisfied with their BI than non-athletes [21-23], however, horse riders often do not consider
51 themselves as athletes [24]. In contrast, the British Telecom (BT) Sport Body Image Survey in
52 2014 found that 79.6% of elite female athletes, para- and retired athletes felt under pressure to
53 conform to a certain type of body image, with 76.1% stating this had influenced their eating
54 and training behaviour [25]. These negative associations have mental and physical health
55 implications [26] and may be influenced by media sexualisation and objectification of female
56 athletes performing in sports considered to be more feminine [27,28]. Media pressure
57 influences body image, with publications portraying unrealistic depictions of a thin and toned
58 physique [29]. Social media use and the thin ideal are linked [30], triggering body
59 dissatisfaction in women [31].

60

61 In equestrianism synchrony between horse and rider creates a visually pleasing picture, with
62 communication from the rider being as subtle as possible [4], however, dressage judging can
63 be problematic due to subjectivity of scoring and judge bias [32,33]. Privette [1] identified

64 impacts of rider attire and rider physique in coach and judge opinions, the desired physique
65 being tall and thin, influencing final ranking of riders. The coach is an instrumental part of an
66 athlete's life influencing fitness, body ideals and weight-related pressures [34] and have
67 leadership responsibility towards their athletes' self-perception of body image [35]. In
68 equestrian sport, however, the coach must also consider horse welfare which may lead to
69 sensitive topics regarding rider weight being addressed [36,37] but as Sabiston *et al.* [38] state
70 there is a paucity of research on coaches' views and responsibilities for endorsing positive body
71 image for athletes.

72

73 Equestrian athletes were found to perceive themselves as larger than their physical size but
74 desire a smaller physique [39] and Torres-McGehee *et al.* [40] stated the pressures on female
75 equestrian athletes to be thin, could potentially lead them to resort to drastic weight control
76 methods. This study, however, may not represent the true age demographic of equestrians, a
77 sport where career longevity can far exceed that in non-equestrian sports [41].

78

79 Rather than body image in its entirety, specific areas of the athlete's body may be of specific
80 concern [28] and female breast size plays an important role in body image [42]. Swami *et al.*
81 [43] found that females dissatisfied with their breast size were dissatisfied with their weight
82 and appearance, and breast size is a barrier to sport participation due to both pain and negative
83 body image in non-equestrian sports [44]. Burnett *et al.* [45] found breast size and movement
84 was a barrier to participation due to embarrassment, a finding mirrored in female horse riders
85 [46]. Burbage and Cameron [24] found that 40% of female riders experience breast pain when
86 horse riding, related to breast size and body mass. Therefore, riders with larger breasts may
87 feel less confident when riding due to a combination of breast support and negative BI.

88

89 Horse riders or potential riders who do not conform to the 'ideal' body image for equestrianism
90 may avoid or reduce participation. Body self-consciousness in horse riders may be a barrier to
91 participation, impact rider performance, influence judge perception, and may even impact
92 communication between horse and rider horse through unnecessary rider tension and anxiety
93 [47,48]. The aims of this study were to investigate body image in female equestrians,
94 perceptions of other equestrian stakeholders' views and opinions, associations between rider's
95 body image and self-consciousness while riding and competing, and to evaluate the effects of
96 breast size on BI and self-consciousness when riding.

97 **2. Material and methods**

98 Following institutional ethical approval, a 4-part, 27 question online survey on Google
99 Forms™ was distributed to establish current rider body image perception in female equestrians
100 aged 18 and over in the UK, accessible from October 2020 to December 2020, with no incentive
101 offered to participants. It was widely distributed via specialist equestrian social media sites
102 (e.g. UK Equine Student Network) to recruit respondents currently participating in equestrian
103 activities and respondents were encouraged to share the survey with other potential respondents
104 to facilitate snowball sampling. Following an introduction to the survey, completion was
105 considered consent to take part.

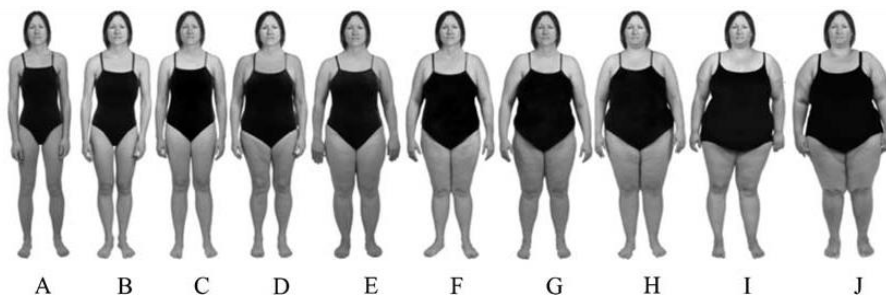
106

107 Questions included closed multiple-choice, multiple-choice grid, Likert scale and open free
108 text format taking approximately 5-10 minutes to complete. Part one of the study gathered
109 participant demographics. Part two focused on equestrian activities, normal horse-riding
110 commitment (by competitive level i.e. “do not compete”, “unaffiliated”, “affiliated”,
111 “national”, “international”) and participant confidence whilst riding. Clothing and bra size
112 (multiple choice of all UK clothing and bra sizes), usual level of breast support and breast pain
113 associated with riding (10-point Likert scale) were also gathered. Part three questioned
114 participant perception of the ideal female equestrian rider BI, self-perception of their BI using
115 a validated scale [49] (Figure 1) and levels of self-consciousness when horse riding. Part four
116 concerned participant perception of the impact of their body shape on riding ability and their
117 perception of coach, spectator and judge views of their self-selected BI. Finally, a free text
118 question allowed participants to add their own "story" and was analysed using both inductive
119 and deductive content analysis.

120

121 In total, there were subsequently 493 survey responses and data from Google Forms™ were
122 downloaded to a Microsoft Excel spreadsheet.

123



124

125 *Figure 1 Body image scale used in questionnaire (Harris et al. [49]).*

126

127 *2.1 Data Analysis*

128 Minitab (V20) for PC was the chosen statistical software was used to complete statistical
129 analysis. Data were assessed for normality using an Anderson Darling test. Pearson's chi-
130 squared (X^2) goodness-of-fit tests were utilised to assess the association of body image
131 perceptions, perceptions of judge views and coach's comments on fitness. Analysis of
132 qualitative data on specific areas of the rider's body perceived to be detrimental to judge
133 perception were recoded and placed into specific categories (the category 'other' included the
134 length of arms; general shape; back; shoulders; ankles; lack of muscle tone; and length of the
135 torso) and was analysed using Pearson's chi-squared (χ^2) goodness-of-fit test. Pearson's chi-
136 squared (χ^2) tabulated statistics were utilised to assess associations between participants'
137 perceptions of own BI and self-consciousness levels when riding and competing, bra size and
138 breast pain associated with riding, bra size (cup size \geq DD - large, cup size \leq D - small, [24])
139 and self-consciousness levels, body image perceptions and coach's comments on weight loss.
140 Riders' self-perceived BI and their stated ideal female equestrian BI were recoded and those
141 who placed the ideal BI two or more images smaller than themselves were categorised as
142 dissatisfied with their own BI. Wilcoxon Signed-Rank (W) analysis was utilised to assess
143 associations between BI dissatisfaction and self-consciousness levels when riding. Qualitative
144 data were analysed by identifying key words and frequency of appearance in free text answers
145 recorded. Any key words that were referenced two times or less were placed in the 'other'
146 category and included lack of muscle, length of torso, posture, stiff ankles, broad backed, top
147 heavy, large hips, crooked, curved spine, back fat, and apple shaped.

148

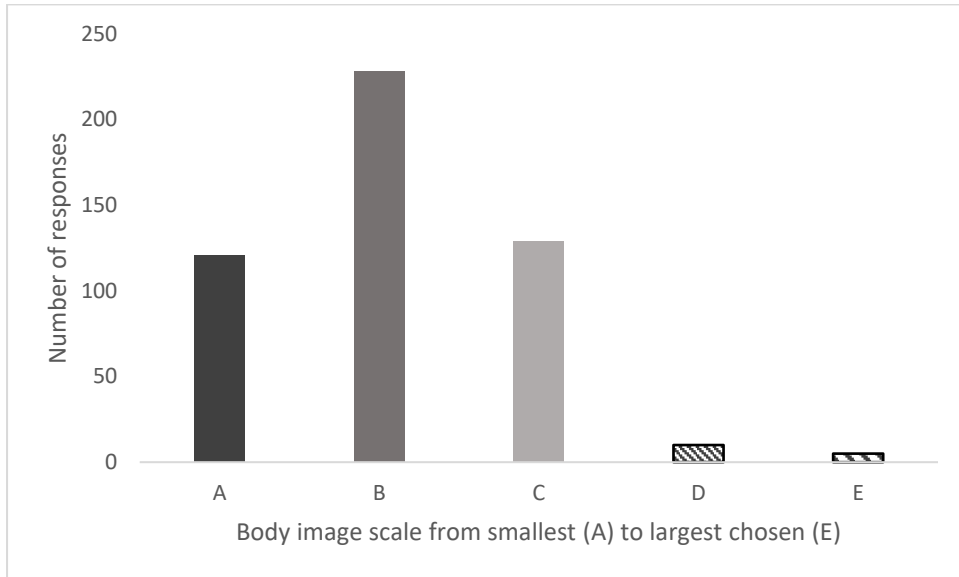
149 **3. Results**

150 All responses were suitable for analysis (n=493). The modal age range of the participants was
151 18-29 years (36.7%), 54.6% of participants rode one horse per day, 56.8% were competitive
152 riders of which 35.7% competed in dressage, and 43.2% were non-competitive riders.

153 *3.1 Ideal Body image perception*

154 There was a significant preference in ideal equestrian BI for the second smallest (B) (Figure 1)
 155 ($\chi^2 = 352.751$, $P < 0.001$), (Figure 2). There were no significant effects of rider age, perception
 156 of own BI, or level of riding commitment on this body image preference.

157

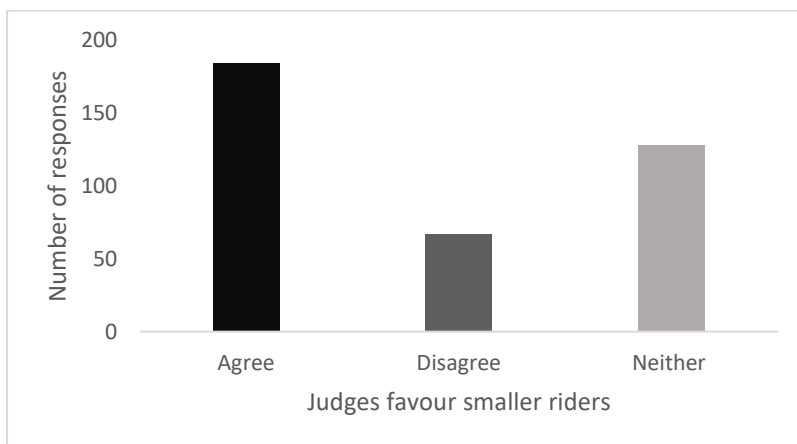


158

159 *Figure 2 Participants perceived ideal BI for the equestrian rider, starting with the smallest image (A), and showing the*
 160 *number of responses for each image (Figure 1).*

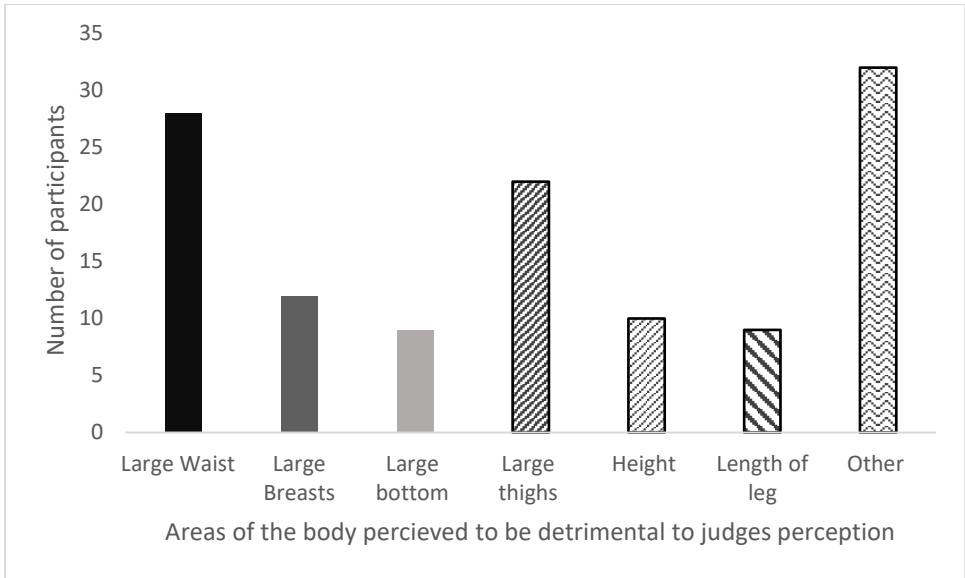
161 3.2 Perception of Judge views

162 There was a significant perception that judges favour riders with a smaller frame ($\chi^2 = 54.2111$,
 163 $P < 0.001$), (Figure 3) regardless of participants age, discipline and own perceived body image.
 164 A significant difference was found when comparing specific areas of the body that riders
 165 perceive to be detrimental to judge perception ($\chi^2=32.8033$, $P < 0.001$), (Figure 4) with large
 166 waist (22.95%) and large thighs (18.03%) being considered most influential.



167

168 *Figure 3 The number of participants who agreed that judges do favour riders with a smaller frame.*

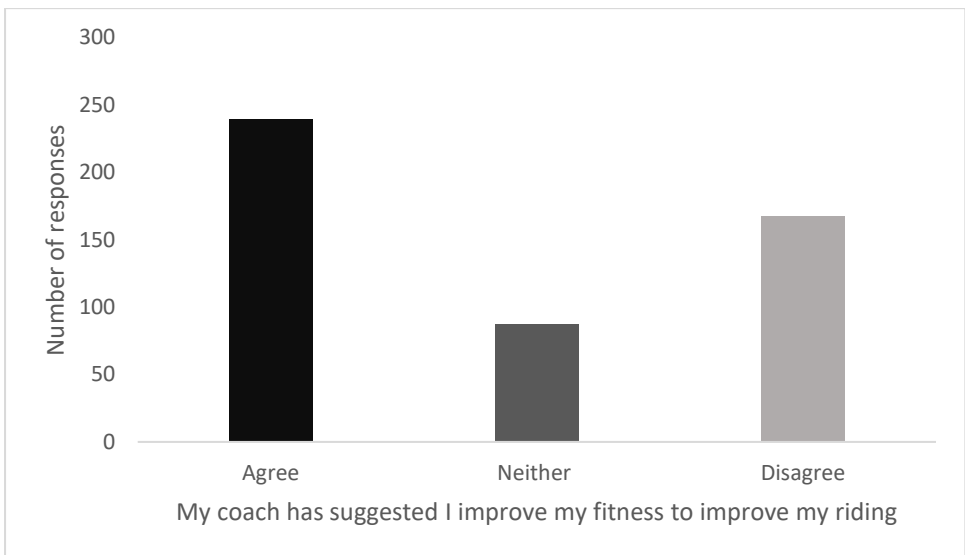


169

170 *Figure 4 Specific areas of the body participants perceived to be detrimental to judge's perception.*

171 **3.3 Coaches reported comments**

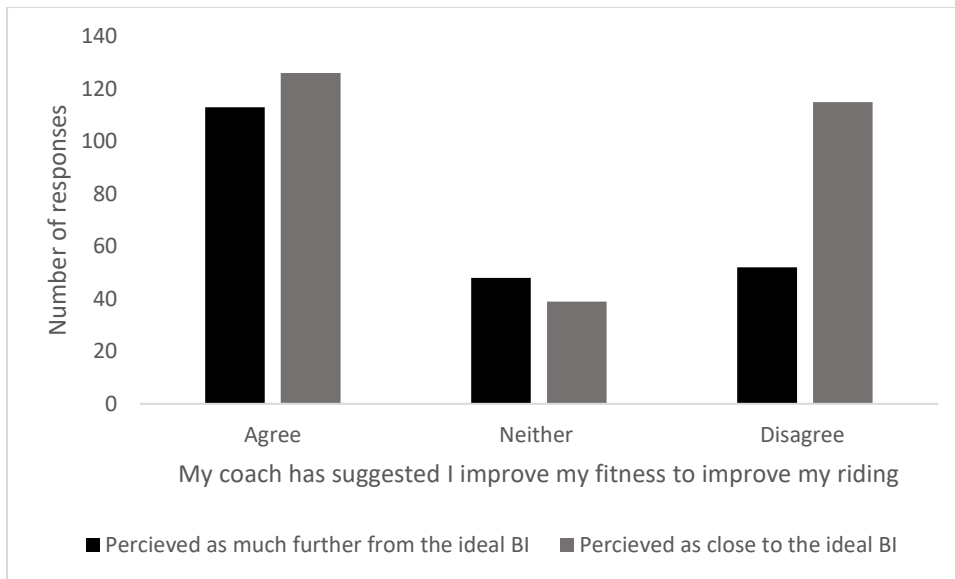
172 A significant association between riders perceiving their own BI as larger and their coach
 173 suggesting weight loss to improve riding ability ($\chi^2 = 64.248$, $P < 0.001$) was identified.
 174 Significantly more respondents had been told to improve their fitness by their coach ($\chi^2 =$
 175 70.3611 $P < 0.001$), (Figure 5) and a significant association between those categorised as
 176 dissatisfied with their BI and being told by their coach to improve their fitness ($\chi^2 = 16.606$,
 177 $P < 0.001$), (Figure 6).



178

179 *Figure 5 Number of participants who agreed that their coach had suggested to improve fitness to improve their riding*
 180 *ability.*

181

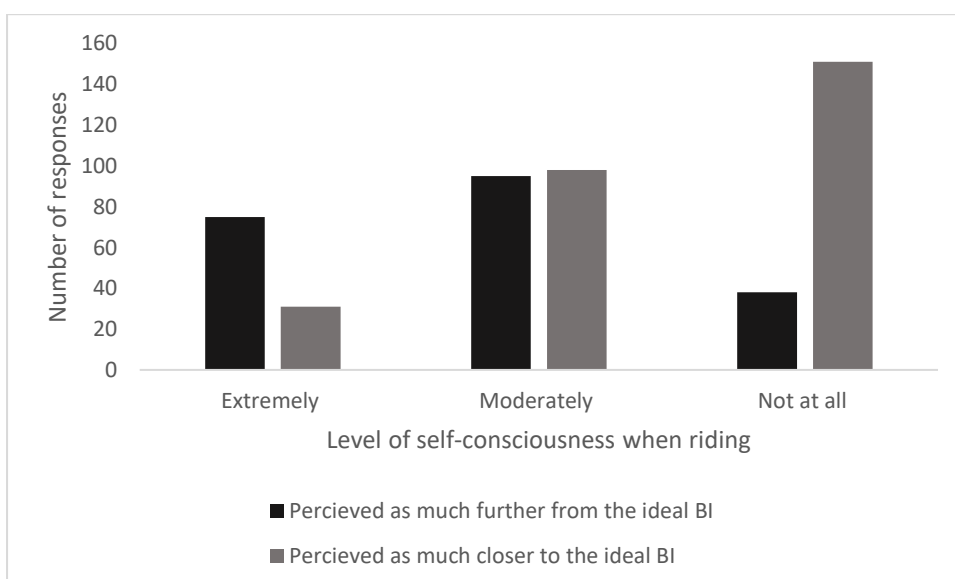


182

183 *Figure 6 Comparison between the number of participants stating their coach had suggested to improve fitness to improve*
 184 *their riding ability, and BI dissatisfaction (categorised as perceived BI to be 2 images larger or smaller than what they*
 185 *perceive to be the ideal BI)*

186 **3.4 BI effect on rider confidence**

187 A larger BI perception was significantly associated with self-consciousness when riding (χ^2
 188 =87.514, $P<0.001$) and competing ($\chi^2=73.251$, $P<0.001$) with those respondents with a larger
 189 BI perception feeling more self-conscious when riding and competing. Significantly more
 190 respondents perceived the ideal BI to be smaller than their own BI by one or more category
 191 (Median= -1.5, $W=7777.00$, $P<0.001$). There was a significant association between those
 192 categorised as dissatisfied with their BI and greater self-consciousness when riding ($\chi^2=$
 193 83.649, $P<0.001$), (Figure 7). Only a very small number of respondents (2.03%) perceived
 194 themselves as two or more categories smaller than their perceived ideal BI.

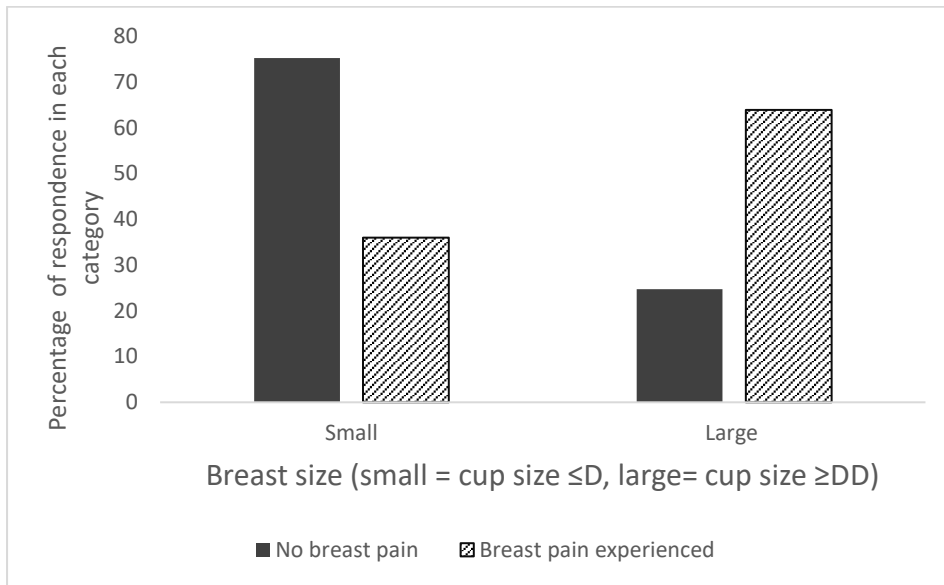


195

196 Figure 7 A comparison of the levels of self-consciousness when riding to BI dissatisfaction (categorised as perceived BI to be
 197 2 images larger than what they perceive to be the ideal BI).

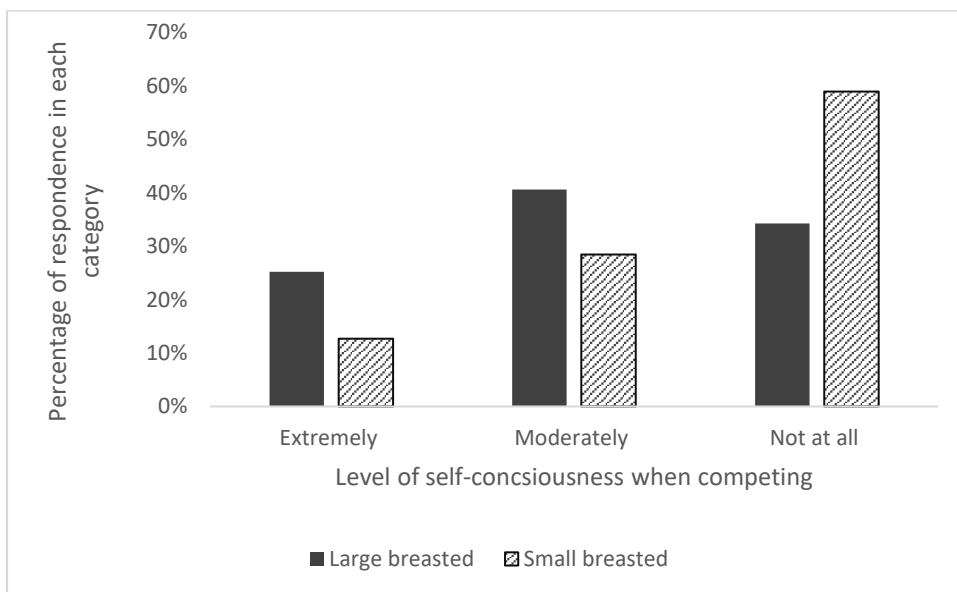
198 3.5 Effects of breast size

199 There was a significant association between riders with larger breasts (cup size \geq DD) and
 200 greater reporting of breast pain whilst riding ($\chi^2 = 39.336$, $P < 0.001$), (figure 8). Larger breast
 201 size was also significantly associated with more self-consciousness whilst competing
 202 ($\chi^2 = 25.850$, $P < 0.001$), (Figure 9).



203

204 Figure 8 Comparison of breast size (small - \leq D, large - \geq DD) and breast pain associated with horse riding.



205

206 Figure 9 Comparison of breast size (small - \leq D, large - \geq DD) and level of self-consciousness when horse riding.

207

208

209 **4. Discussion**

210 *4.1 Ideal Body image perception in female horse riders*

211 The perception that the ideal female equestrian body shape is located towards the smaller end
212 of the body image scale (Figure 1) corresponds with other sports' physique perceptions. No
213 effect was found of riders age and perception of own BI, although it should be noted that the
214 majority of respondents were aged 18-29 years and this may not be representative of the age
215 range within the female riding population, a sport where Olympic medals are still being won
216 by athletes in their 50s and 60s. Crissey and Honea [19] found that girls participating in
217 "feminine" sports are more conscious of their physique and perceive the sport's ideal image to
218 be smaller than their own, yet it is unclear if equestrianism is considered "feminine" despite
219 the large female bias in participation. The ideal female equestrian body image being at the
220 smaller end of the scale may be due to media influence encouraging unrealistic body imagery
221 [30] and equestrian clothing brands continuing to promote products using models of this size
222 [1]. Although the general media now tend to portray the ideal image of woman to be strong,
223 slender and muscular, but this may then place additional pressure on equestrian athletes to
224 conform to these changing body image ideals [31]. Equine welfare concerns may also
225 contribute to the perception that female riders should have a smaller body shape with recent
226 research on the adverse effects of overweight riders on the equine musculoskeletal system and
227 gait kinematics [36,37] garnering much current interest within the equestrian press.

228 The results of this study are however based on participants' perceptions of other people's
229 opinions and of their own BI which may not be wholly accurate. Requiring respondents to
230 report parameters such as body weight and height may have been desirable [39] however there
231 is a lack of accuracy within self-reporting of body weight and Body Mass Index (BMI), often
232 not corresponding to self-perception [50,51], which may be more influential on self-confidence
233 that the actuality of appearance, size or shape.

234 *4.2 Perception of Judge views*

235 There was a perception that judges in disciplines requiring subjective judging favour riders
236 with a smaller frame across all respondent groups regardless of age and BI. Hawson *et al.* [33]
237 suggested this is due to a supposed bias of people's opinions of judge's views and may not be
238 the case. However, as this may be based on respondents' lived experience, future research

239 should consider exploring this experience, possibly requesting examples rather than relying on
240 rider perception. Perceived judge bias has also been suggested in branding of clothing and
241 equipment in equestrianism. This can have a negative effect on rider confidence [52,1] and
242 indeed rider size and body shape may have even greater influence on judge's marking. An
243 overweight rider may be deemed a distraction to the judge and, therefore, impair their ability
244 to accurately assess the rider's influence on the horse. Ideally a judge should be evaluating the
245 horse's way of going and the ease and harmony of the movements and not be influenced by the
246 rider body size [4], but this may not be the case. Dressage judges may not be biased against
247 larger body sizes, but these rider perceptions may contribute to respondents identifying the
248 body images at the smaller end of the scale as ideal for the female equestrian. Moreover, this
249 perceived judge bias may undermine rider confidence in their own appearance when competing
250 and could be a barrier to non-competitive respondents taking part in competitive dressage.

251 The areas of the body perceived to be most prone to judge perception included large waist or
252 large thighs (40.98%). Other comments included large breasts, large bottom, height and length
253 of the leg. Many of these comments specified the detrimental area to be large, with very few
254 comments mentioning lack of muscle. However, responses did include rider morphology (i.e.
255 body segment proportions) rather than just body weight, showing that judges are not only
256 perceived as bias to rider weight but also rider body proportions, yet a typical body morphology
257 for equestrians is yet to be established [53]. Osório [54] states there is limited research in
258 perceived judge bias of BI and physique in both equine and other sports and that this judge bias
259 warrants further investigation.

260 *4.3 Coach comments*

261 A significant association was found between riders perceiving their own BI as larger and their
262 coach suggesting weight loss to improve riding ability, but significantly more had been told to
263 improve their fitness than control their weight. Christensen *et al.* [34] stated that the coach is
264 influential in an athlete's life, and their words and advice are taken seriously by riders. Coaches
265 should, however, choose their words carefully when referring to rider weight as this may
266 negatively impact coach – athlete partnerships [35]. Coaches may use “fitness” as a less
267 contentious term to initiate these conversations, but this cloaked communication may leave
268 riders unaware of the detrimental effect of an overweight rider on the horse. However, it could
269 be argued that someone can be of a larger size and have more core strength compared to a
270 smaller framed rider who is unfit and rides with less horse-rider synchrony being less able to

271 support themselves [55]. As the equestrian coach has responsibility for the welfare of both
272 horse and rider and recommending rider weight loss may be essential to ensure adequate horse
273 welfare, this could be at the expense of rider well-being, leading to conflicting priorities for the
274 coach. However, it is possible that rider body size, either weight, height, or proportions, could
275 be performance limiting [56] and the honesty of the coach's comments could be vital for both
276 horse and rider welfare and success.

277 *4.4 BI effect on rider confidence*

278 Riders who perceived themselves to have a larger BI and those dissatisfied with their physique
279 experienced feeling self-conscious when riding more than those of a smaller BI and satisfied
280 with their BI. Riders lacking in confidence when riding may result in added body tension,
281 potentially negatively effecting communication, such as application of cues or release of
282 pressure, between horse and rider [48]. Additionally, rider tension can cause uneven weight
283 distribution, potentially causing discomfort to the horse [36]. Keeling *et al.* [47] found that a
284 nervous rider can increase the likelihood of the startle reaction from the horse and although
285 McKinney *et al.* [57] found no evidence for increased transfer of anxiety from the rider to the
286 horse, Wolframm and Micklewright [48] found that riders' self-confidence is a crucial factor
287 in equestrian performance. Self-confidence relates to athletic success in non-equestrian sports
288 [58] and a lack of self-confidence is closely associated with athletic failure [59]. Therefore,
289 rider weight management, BI and its impact on rider self-confidence requires further
290 investigation to identify the impact on performance and horse welfare.

291 Other than physical benefits to riding, participating in riding enhances mental well-being [10].
292 Gabriels *et al.* [11] found that riders diagnosed with autism spectrum disorder benefitted from
293 therapeutic horse-riding. Consequently, the smaller ideal equestrian physique may have an
294 adverse effect on the positive effects of riding for those who do not believe they conform to
295 these expectations. Overall, riders lacking in confidence or feeling self-conscious when riding
296 may experience barriers to participation at both elite and non-elite levels.

297 *4.5 Effects of breast size*

298 A significant correlation was found between riders with larger breasts (cup size \geq DD) and
299 breast pain associated with horse riding. This is likely to due to a lack of appropriate breast
300 support as Burbage and Cameron [24] found that only 19% of riders with large breasts chose
301 to ride in a sports bra, possibly due to marketing focus on sports such as running. Burbage *et*

302 *al.* [46] found that breast pain was significantly reduced in a sports bra compared to a daily bra,
303 however those with low BI self-esteem may be reluctant to seek out advice on sports bras or
304 sports bra fit and this may be a barrier to participation for riders at all levels [42,44].

305 A significant association was found between riders with larger breasts feeling self-conscious
306 when competing. If breast size impacts rider confidence to this extent it suggests that body
307 image dissatisfaction may not only be related to body size or body weight [45]. As equestrian
308 sports have more female participants with larger breasts compared to sports such as running
309 [24] and improved rider position is seen with appropriate breast support, especially in larger
310 breasted riders [60] further research in this area is warranted. The importance of this has been
311 recognised by over one hundred British Olympic and Paralympic athletes receiving bespoke
312 sports bras for the Tokyo games due to enhanced performance being linked to appropriate
313 breast support [61]. Further studies should investigate the impact improved breast support has
314 on not only equestrian performance, but body image of female riders.

315 *4.6 Limitations*

316 The survey was distributed for two months, although receiving 493 responses, a larger sample
317 size may have been achieved if the survey was distributed for longer. Additionally, the survey
318 was only distributed via the social media site Facebook possibly excluding older riders for the
319 sample in a sport with acclaimed athlete longevity. However, body dissatisfaction decreases
320 with age, and therefore, older females may have been less attracted to participate in this study
321 [62,63]. Additional questioning could have been included regarding perceived judge bias
322 against specific areas of the rider's body to inform future studies on judge perception, but these
323 may prove challenging to substantiate.

324 **5. Conclusion**

325 The perception of the ideal female equestrian BI was found to be a smaller frame and was
326 smaller than many riders' own BI. A larger BI negatively impacted rider self-confidence and
327 warrants further research. Female riders with larger breasts experienced riding associated
328 breast pain and felt more self-conscious when competing; therefore, breast size may also be a
329 barrier to participation. Previous research has found females with larger breasts are commonly
330 larger in body size, thus potentially lowering self-confidence when riding. Female riders with
331 a larger frame felt they were perceived negatively by judges and further study is indicated to
332 investigate the extent these influences may have on the subjective judging of equestrian sport.

333

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337 **CRedit authorship contribution statement**

338 **Sofia Forino:** Methodology, Investigation, Data curation, Formal analysis, Visualization,
339 Writing, Original Draft; **Lorna Cameron:** Conceptualization, Methodology, Writing, Review
340 & Editing, Supervision, Project administration, Formal analysis, Visualization; **Natalie**
341 **Stones:** Conceptualization, Methodology, Review & Editing, Supervision; **Marianne**
342 **Freeman:** Methodology, Review & Editing, Supervision, Formal analysis, Visualization.

343 **Author contributions**

344 All authors participated equally in designing and executing the study, including data collection,
345 data analyses, and writing the paper. All authors approved the final version of the manuscript
346 for submission.

347 **Data availability statement**

348 Data available on request from the authors.

349 **Declaration of Competing Interest**

350 The authors report no competing interests.

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352 This research was funded by the British Horse Foundation. The funding source had no role in
353 the study design; in the collection, analysis and interpretation of data; in the writing of the
354 report and in the decision to submit the article for publication.

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