

Title: Legs Back, Ladies: Should the Stirrup-Bar be Considered when Selecting a Saddle?

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Introduction: Conventional stirrup-bars do not allow for any horizontal repositioning, which can inflict pain on female horse-riders (Schleese, 2013). Due to this, the study aimed to explore whether the placement of the stirrup-bars affects the horse-rider's ability to achieve the perceived 'correct' alignment (Spark, 2001) to explore the perceived comfort experienced and identify which stirrup-bar position is deemed the most/least comfortable. The study also explored whether the placement of stirrup-bars is considered during a saddle purchase decision.

Materials: Seven female participants (mean age 21.1 yrs \pm 1.1 sd), who had all ridden for at least 5 years (mean 14.2 yrs \pm 5.2 sd), volunteered to complete a questionnaire and data collection. Participants rode a Racewood 3-Day Event Simulator equipped with a new Bates All Purpose SC+ Saddle incorporating adjustable ergonomic stirrup-bars. Following a standardised adjustment period, the riders completed 20s of sitting to medium trot and then the horse was halted. Immediately a 12-megapixel camera, placed in a standardised position, was used to take their picture. This was repeated three times for each of the three stirrup bar positions, with the order of these in a cross-over design to avoid sequential order effect. Following each halt the rider's perceived comfort was ascertained (rated 1-10, adapted from the Borg Scale of Perceived Exertion). Post experiment the riders completed a short questionnaire about their experience and saddle purchasing considerations. A series of lines were drawn on the recorded photographs using MacBook Air Photo Application v 2.0 'Mark-up' tool. Two lines remained constant throughout, but were unique to each participant, representing the vertical perceived 'correct' ear-shoulder-hip-ankle alignment and a horizontal line through the mid-point of the stable pelvic hip joint (Baumert, 2014). The anatomical markers were also marked-up to calculate the deviated distance from the perceived 'correct' line. The mean value was calculated to find an average position for each of the three stirrup-bar positions. Due to restricted sample size, deviaton data were analysed non-parametrically using the Friedman's Two-Way ANOVA test within IBM SPSS v24.0, with level of significance of 0.05.

Results: Visual representation shows the alignment of participants being affected differently, however, when exploring the statistical deviations there was no significant difference ($P=0.49$, $P=0.738$, $P=0.707$). The Perceived Comfort Scale found stirrup-bar Position 1 to be most comfortable, and Position 3 to be least comfortable. Also, when exploring whether the stirrup-bars were considered during the saddle purchase decisions, of equestrians, it was found that most participants had never heard of adjustable stirrup-bars prior to the study.

Discussion & Conclusion: Participants felt their perceived level of comfort and alignment were significantly affected during each change in stirrup-bar position. This may be because of the varying body-shapes that occur in humans (Spark, 2001) and or their flexibility and stage of equestrian training. Participants also expressed that they would, therefore, consider the placement of stirrup-bars in their next saddle purchase decisions. The awareness of adjustable stirrup-bars, however, was found to be low. Further research should be conducted into their influence on both horse and rider so that sponsorship schemes and advertising campaigns can be introduced to increase awareness. Also, an investigation should be conducted to explore whether severe asymmetry can be aided. Evidence may suggest that adjustable stirrup-bars should be incorporated into the mass-production of saddles, as they have a greater ability to cater to the masses.

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