# Review 1

Review of “Limb asymmetry characteristics amongst men’s and women’s NCAA Division II Soccer Athletes”

**General Feedback:** This is an interesting paper on a topic that is important for improving sport performance and understanding sex differences in soccer performance. I would recommend REVISE and RESUBMIT.
I have some general comments that should be addressed throughout the paper prior to publication:

1. The author(s) alternate between sex differences and gender differences. Technically, these are sex differences because they are biological. Keeping a consistent term “sex differences” should clarify.
    a. The document has been edited to use “sex” uniformly as opposed to gender.
2. Some of the language over-inflates the importance of findings—particularly near the end of the paper (discussion and conclusion). Specifically, sometimes the authors state that there is a difference, when it is not statistically significant. Maybe call this “practically significant?” (or possibly practically significant?)
    a. Thank you for the recommendation, this has been adjusted throughout the document to provide clarity.
3. In the abstract, 2nd to last sentence, you state that “male participants possessed larger magnitude of both inter and intra limb imbalance as compared to females, but I don’t think these differences were statistically significant. If that is the case, I don’t think it’s fair to state that only “males may benefit from focused training aimed at reducing interlimb asymmetries.” I believe that both would benefit. Re-examine how this information is presented and when mentioning that there is a difference in values, make sure it is “statistically” or “practically” significant.
    a. This has been changed to clarify only significant differences interlimb asymmetry of the hamstrings in the male participants.
4. The discussion needs to be re-written. It starts out with the 3 most important finding, then it jumps around with various concepts. I’d like to see each finding addressed with WHY you found what you found, and WHAT the prior research says about your findings—relative to PERFORMANCE and INJURY RISK (inc’d or dec’d). At the end of the first paragraph, a statement is made that “it appears the male participants exhibited higher levels of interlimb and intralimb asymmetry.” The problem is that this finding was NOT significant statistically (although perhaps practically). Finally, LIMITATIONS should be added to the discussion—with an intro sentence, and more than 1 limitation AND a paragraph on FUTURE RESEARCH should be added.

The discussion has been edited to include additional limitations as well as future research. Clarification was made on practically vs statistically significant differences. The order of the discussion aims to first identify the important findings, then discuss interlimb imbalances followed by intralimb imbalances, then finish with limitation, conclusion, and future research.

Additional information has been added to the discussion to touch on performance in injury risk findings, specifically as they relate to H;Q ratio.

5. While there is a conclusion, it should be captured with a subheading, and it should reflect back to the paper

This subheading has been added with future research discussed.

**Specific Feedback:**

**P 3, bottom of 2nd paragraph:** the statement is made that "…yet understanding the mechanisms that lead to this discrepancy still remain unclear." It is important to also mention that the mechanisms are likely multifactorial—which makes it difficult to study. In addition, the statement is made that "recent research suggests H:Q ratio may not be an independent risk factor or ACL injury further confusing researchers and practitioners." I'd like to see a few more things mentioned in this paragraph about other things that are predictive.

The following has been added to provide clarity on other factors that are hypothesized to lead to the differences in injury rate "Intralimb imbalances between the hamstring and quadriceps muscle groups are hypothesized to play a major role in the increased risk of knee injury in females but this is likely the result of multiple factors such as hormonal fluctuations, neuromuscular differences, developmental changes, and anatomical differences (Mancino et al., 2024)."

**p. 5, participants section:** #2 mentions "primarily outfielders;" I'm not sure what those positions are—those who play the field and not goalkeepers?

You are correct. Outfielders referrers to all players except the goalie, the wording has been changed to be clearer for readers that are unfamiliar with the sport.

**p. 5, study protocol**: I have several comments about the study protocol. There is a lot of information missing. The Seca mBCA—is that a Bioelectric Impedence Device? If so, state that. Should also mention how hydration was emphasized prior to testing as dehydration can significantly impact the results. Were the testers trained? Were they the same for all testing? How did you ensure reliability and validity?

This section has been expanded to include more information regarding specific procedures and to include the validation reference.

**p. 7, table 1**: Did you run statistical tests to determine if there were sex differences in age, height, weight, body comp, soccer experience? If not, those should be added as having statistically significant differences at the start may influence results.

Since the hypothesis was to measure differences in limb imbalances relative to absolute strength between sexes, no statistical analysis was performed on the demographic data.

**p. 9, figure 2**: To me, it seems clinically relevant that the H:Q ratio ranged from 0.50 to 0.57; that seems to be in the danger zone and should be mentioned and discussed in the results/discussion section.

These H:Q ratios have been expanded upon in the discussion p12 "One concerning finding in this project is both the men and women measured in the current study fell below a H:Q ratio of 0.60 which has been hypothesised to lead to reduced performance and increased risk of injury (Yildiz & Kale, 2017). While not uncommon amongst soccer athletes, this does warrant attention"

**Review 2 Response report**

Review 2

Editor

Concern about statistical reliability due to the number of participants… research outcomes are likely more supported when number meet the minimum of 40 or more… when the number of people we include in the study is small, the percentage from the study will be unlikely to predict the success rate of the whole population.

Furthermore, comparing 15 men to 15 women lowers this threshold of reliability between subjects. This should be put into question when reviewing the outcomes and conclusions of the study.

Author

A larger sample size would be ideal but not possible with the inclusion criteria set forth in the methods. The availability of Division II soccer players in the immediate are dictated the sample size. The low sample size is discussed in the limitations.

Editor

This statement concerns me considering the population being tested involves soccer players… why was an isometric test being used on athletes who rarely rely on isometric contractions for performance in their sport?

Wouldn't it make more sense to do a strength (or power) test involving

movement better meet the demands of these athletes?

Author

Isometric strength testing rather than isokinetic testing was chosen doe to the relationship with absolute strength as compared to dynamic strength. Our research question was focused on absolute strength therefore isometric was chosen. The following statement has been added to the last paragraph on page 12 to clarify “For the purposes of this investigation researchers were interested in maximal strength as opposed to dynamic strength, therefore, isometric contractions were chosen for testing over isokinetic.”

Editor

Should be at end of sentence and listed as first citation before the second

one shown? Author

The reference has been added to the end of the

sentence Editor

Is this accurate? How can we determine that women cover less distance at higher intensities? Is this because they are working harder to cover the same distance based on relative effort? This may need more explanation beyond simply making this statement with a citation.

Author

Sentence has been changed and an additional

reference added Editor

Can we share which university? Would this be relevant to the study based on the population targeted

Author

University name has been added

Editor

Curious as to how this is relevant to the

study? Author

Since imbalances take time to manifest, the amount of time spent performing could impact the amount/type of imbalances and individual exhibits. 5 years was chosen as the minimum to ensure that participants had sufficient prior experience with competitive soccer.

Editor

I suggest that the authors provide a section at the end stating the limitations of the study, including the number of participants and the application of testing isometric movements with athletes who rely heavily on speed and power for performance. There is a gap in the
transparency of the results and the application of this study's

findings. Author

The next to last paragraph above has been changed to include the limitations of low sample size and the use of isometric contractions.

Editor

APA formatting of reference

part. Author

Reference part fixed as per comments