

Female Athlete Voice Project Round 2 Report

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Analytical Review

Below is an overview of the results of our data analysis from the Round 2 (R2) as well as the means and overall ranking of Round 1 (R1) topics for easy comparison. Please reference the user guide below the table to help orient you to the information within the table. (Reminder: topics were rated on a 1-5 scale)

Topics	<i>N</i>	Mean R1	Mean R2	Median	Mode	<i>SD</i>	<i>R1</i>	<i>R2</i>
New Area I: The impact of periods and phases of the menstrual cycle on health, performance, and well-being								
Topic 1: How best to fuel at different stages NEW TOPIC	40	na	4.65	5	5	0.57	na	1
Topic 2: Symptoms (before, during, and after) NEW TOPIC	40	na	4.53	5	5	0.84	na	3
New Area II: Team Dynamics and Coaching								
Topic 1: Male dominated spaces NEW TOPIC *	40	na	4.28	5	5	0.89	na	9
Topic 2: Team Dynamics NEW TOPIC *	40	na	4.38	5	5	0.80	na	6
Area 1: Female Physiology and Performance, Health, and Well-Being								
Topic 1: Female physiology on performance outcomes	40	4.40	3.98	4	4	0.82	3	18
Topic 2: Strength training (optimize performance) *	40	4.28	4.05	4	4	0.84	6	17
Topic 3: During pregnancy & postpartum REWRITTEN	40	4.12	4.30	5	5	1.08	9	8
Topic 4: Birth control options REWRITTEN	40	4.40	4.63	5	5	0.80	4	2
Topic 5: Low-energy availability REWRITTEN	40	3.86	4.28	4	5	0.81	13	10
Topic 6: Recovery NEW TOPIC	40	na	4.40	4.5	5	0.66	na	5

Area 2: Female-Specific Considerations for Injury and Illness Prevention and Recovery								
Topic 1: Strength training (injury risk reduction) *	40	4.05	4.18	4	4	0.92	11	13
Topic 2: Injury management *	40	4.21	4.15	4	5	0.91	7	14
Area 3: Female-Specific Considerations for Mental Health and Mental Training								
Topic 1: Tools & strategies	40	4.53	4.50	5	5	0.74	1	4
Topic 2: Programs & interventions	40	4.37	4.05	4	5	1.00	5	16
Topic 3: Understanding similarities & differences NEW TOPIC	40	na	4.25	4	5	0.86	na	11
Area 4: Female-Specific Considerations for Nutrition, Fueling, and Hydration								
Topic 1: Supplementation (optimize performance)	40	4.16	4.15	4	4	0.88	8	15
Topic 2: Strategies (injury and illness risk reduction)	40	4.09	4.35	4	4	0.69	10	7
Topic 3: Sport-specific strategies (stages of training)	40	4.05	4.23	4	5	0.88	12	12
Area 5: Technologies and Tools								
Topic 1: Equipment needs & design REWRITTEN *	40	3.79	3.88	4	5	1.14	14	19

*Starred practices denote those in which there was statistical difference between comparison groups in responses to that topic.

Table User Guide

Term	Definition
N	The number of athletes who participated and completed the surveys.
Mean	The average ranking.
Median	The middle ranking.

Mode	The highest ranking.
SD	Standard Deviation - The measure of the amount of variation relative to the mean.
Ranking (a)	Within ranking - Topics ranked by mean and then mode in descending order <u>within</u> each area.
Ranking (b)	Overall ranking - Topics ranked by mean and then mode in descending order <u>across all areas</u> .

Notable Report Themes

- 1) One thing we noted was that participants rated two topics that were kept the same from Round 1 to Round 2 as less important in Round 2 compared to Round 1 (a significant reduction in means): Female Physiology (Round 1: 4.40; Round 2: 3.98) and Strength Training (Round 1: 4.28; Round 2: 4.05). For Round 3, we rewrote these topics with hopes of raising the mean as an indication of better matching the athlete voice. We look forward to your justifications related to your ratings for these topics in this round.
- 2) Instead of adding any new topics this round, we used the new topics feedback to rewrite a number of topics. The new topics feedback from both Rounds 1 and 2 included sleep (added to recovery topic), travel (added to sports specific strategies for stages of training topic), interpersonal relationships (added to team dynamics area/topic), and age of peak performance (added to female physiology area/topic)
- 3) We also merged quite a few topics based on your ratings, justifications, and new topics feedback. We did this instead of deleting some of the lower ranked topics that we felt fit in with some of the higher ranked topics of similar categories. The merged topics included: 1) Strength training considerations to optimize performance & The role of strength training in injury risk reduction, 2) Sport-specific fueling and hydration strategies & Sport-specific supplementation, 3) Tools and strategies that support mental skills, training, and performance & Programs and interventions that can strengthen mental health, 4) Nutrition and hydration strategies to decrease injury and illness risk & Injury management.
- 4) As we analyzed the data and made modifications we relied heavily on your justifications, mean scores of each topic, new topic suggestions and overall topic ranking. We then went over the mean comparisons based on the pre-established groups to see if there were any additional changes that we could make based on these. In some cases, the topics that had significant differences were already being removed, combined, or rewritten. In some cases, we think the rewrites/mergers may help address the significant differences; where that is the case, we have mentioned it in the reasoning for changes of that topic. In other cases, the topic still ranked very high overall so no further changes were made. In Round 2, there were more significant mean differences in topic ratings between Paralympians and Olympians. There were no significant differences between these groups in Round 1. Throughout this report we reference the mean comparisons if applicable and how they factored into our edits. While the mean comparisons were not used as a primary driver of modifications, they give us a lot of valuable information to consider as we move forward.

New Topics

Round 2 analysis of your insights and suggestions did not lead to the creation of any additional topics. As you will see, we did make a number of changes to already existing topics based on

your expertise and feedback. We compiled new topic suggestions and took note of the ones that showed up in Round 1 as well. In this case, we were able to incorporate many of those new topic suggestions by rewriting other topics to be more encompassing.

Removed Topics

<p>Removed topic 1: Equipment needs & design</p> <p>Female-specific sport, training, and equipment needs or equipment designed for female athletes (e.g., wheelchair, sports bra, rowing seat).</p>
<p>Topic rating: Round 1: 14 out of 17 (mean score = 3.79) Round 2 (rewritten): 19 out of 19 (mean score = 3.88)</p>
<p>Reason for removal: This topic ranked the lowest of all and based on dissenting comments pointing to other topics being more important or this topic not being relevant to their sport, we have decided to remove it. Additionally, despite a significant difference in means between winter (4.70) and summer (3.62) athletes and individuals (4.21) and teams (3.40), we decided based on this topic's ranking and justifications to remove it.</p>
<p>Illustrative justifications (direct quotes):</p> <ul style="list-style-type: none"> • <i>I think there are so major differences, however I think there are other issues that are more critical to address first.</i> • <i>I think for my sport this isn't particularly useful. Our main equipment is swimsuits that are specifically tailored to us.</i> • <i>This isn't something that relates to my sport.</i> • <i>I think there is already enough, or not enough difference between men and women - though maybe that is just for my sport and body.</i>
<p>Dissenting justifications (direct quotes):</p> <ul style="list-style-type: none"> • <i>SO important, everything is modeled after male's bodies/needs. For example, there are already few fencing shoes on the market, and they are definitely not adapted to women's feet and fencing styles.</i> • <i>Agree with many of the statements on the first report - most equipment/clothing is made for men, not women. It would be nice to have specific knowledge around products made for females.</i> • <i>I believe that this is a topic that isn't spoken about, due to the coaches trying to make everyone seem as equals.</i>

Combined Topics

*Underlined words and phrases indicate new language.

Combined topic 1: Strength training (optimize performance and reduce injury)

Female specific and individualized strength training considerations to optimize performance and reduce injury risk in female athletes.

Combined topics:

1. Female specific strength training considerations to optimize performance.
2. The role of strength training in injury risk reduction in female athletes.

Topic 1 rating:

Round 1: 6 out of 17 (Mean score = 4.28)

Round 2: 17 out of 19 (Mean score = 4.05)

Topic 2 rating:

Round 1: 11 out of 17 (Mean score = 4.05)

Round 2: 13 out of 19 (Mean score = 4.18)

Reason for combining: Participants rated both of these topics lower in Round 2 compared to Round 1. For this reason, and due to the overlap between the two topics, we combined them. There were also significant differences in the mean scores for these topics (topic 1: difference between summer and winter sports; topic 2 between olympians and paralympians). We think the addition of the term “and individualized” may help address this discrepancy. Several justifications pointed to the importance of an individualized approach to strength training.

Illustrative justifications (direct quotes):

Topic 1: Strength training (optimize performance)

- *Would love a female specific training regimen created to get me to my best performance.*
- *Any percentage gain that can be made in strength training would be extremely valuable and taking female specifics into consideration seems like a great place to find some of those*
- *Again I love strength training so understanding how my body works and how to gain and maintain as much muscle/strength as I can would be awesome.*

Topic 2: Strength training (injury reduction)

- *All of my injuries could have been prevented by strength training I believe.*
- *The training regimen that I go through is the same as all athletes in our High performance program (male and female). Would love to see a difference for females if that would help injury risk.*
- *Strength training is almost non-existent in my sport, but recently I've seen how it can benefit performance. There is a conception that strength training leads to bulky muscles and that muscle gain is not ideal for certain sports. But I think cross-training itself has so many benefits and I have been wishing for more access to that so the stigma can start going away.*

Illustrative dissenting justifications (direct quotes):**Topic 1: Strength training (optimize performance)**

- *I have my needs met and also know enough in this space.*
- *I am not sure if this information should be female-specific vs athlete-specific*
- *After reading the report, I tend to agree with the sentiment that strength training is pretty specific to individuals anyway, and having female specific strength training may not add all that much information. However, if this is wrong, I would like to know more!*
- *I have received good information on this from my trainers at USA*

Topic 2: Strength training (injury reduction)

- *This is important but I feel that our athletic trainer is very thorough with this.*
- *Injury risk reduction is important and if there are any female specific recommendations it would be good to understand them*
- *I have my needs met by my strength and conditioning staff, and athletic training staff.*
- *I don't necessarily see a need for more research on female specific strength training in injury risk reduction. I feel as though existing research and knowledge is adequate and resources should be devoted/prioritized to address bigger gaps in research.*

Combined topic 2: Sport Specific Fueling Strategies

Sport-specific fueling, supplementation, and hydration strategies (timing, macro/micronutrients) while traveling and during different stages of training (in competition, out of competition) and competition (pre-, during, and post-competition).

Combined topics:

1. Sport-specific fueling and hydration strategies (timing, macro/micronutrients) during different stages of training pre-season, within-season, off-season) and competition (pre-competition, during competition, post-competition/recovery).
2. Sport-specific supplementation (vitamins, minerals, other performance enhancing foods/drinks like coffee) strategies to optimize female athlete performance.

Topic 1 rating:

Round 1: 10 out of 17 (Mean score 4.05)

Round 2: 12 out of 19 (Mean score = 4.23)

Topic 2 rating:

<p>Round 1: 8 out of 17 (Mean score = 4.16) Round 2: 15 out of 19 (Mean score = 4.15)</p>
<p>Reason for combining: Round 2 included several (4) topics related to nutrition and fueling. In an effort to reduce redundancy, we combined the above topics, including supplementation as part of fueling and hydration strategies. Additionally, new topics suggestions in both Rounds 1 and 2 mentioned strategies to optimize performance, fueling, and recovery while traveling. As such, travel was added to this topic.</p>
<p>Illustrative new topic suggestions (direct quotes):</p> <ul style="list-style-type: none"> • <i>Female physiology and considerations to be made in travel</i> • <i>Travel related stress (rooming with teammates, nutrition and sleep while traveling, strength training a recovery when limited access to equipment, mental health while in unfamiliar places)</i> • <i>It may be tied in to the recovery topics, but to be a bit more specific, I would find it interesting to know more about how travel and sleep are related and/or affected by female physiology - and how best to combat it.</i>
<p>Illustrative justifications (direct quotes):</p> <p>Topic 1: Sport-specific fueling</p> <ul style="list-style-type: none"> • <i>As I mentioned above, anything that can help with performance related to nutrition would lead me at least to feel like I have more control and effect on my athletic performance and rehabilitation.</i> • <i>I 100% strongly agree. This will help so much in my performance. During off season I eat the same amount as during season which causes me to gain weight and get injured.</i> • <i>I know almost nothing about this and I feel like it would be hugely beneficial!</i> <p>Topic 2: Supplementation</p> <ul style="list-style-type: none"> • <i>I use supplements, but it would be game changing to have more information on how to optimize performance with my body. I feel like with each phase of my cycle my nutrition needs change.</i> • <i>I'd be really interested in this topic as I prefer to take the least amount of supplements. So I would be interested in which ones would have the most effectiveness and bring the most value in my training and racing while adhering to the anti-doping rules and regulations.</i>
<p>Illustrative dissenting justifications (direct quotes):</p> <p>Topic 1: Sport-specific fueling</p> <ul style="list-style-type: none"> • <i>Not very important in my sport.</i> • <i>I already have my needs met here.</i>

- *I don't know that there is a real need for female-specific information on this topic.*

Topic 2: Supplementation

- *I don't know enough about this and very rarely take supplements which I assume would be the bigger difference (Calcium, Magnesium, etc).*
- *I believe i have received this info already from sports dietitian*
- *Our nutritionist does a really good job explaining to us what vitamins are important for us, what foods we can get those from, when we need to supplement, do I believe I have good knowledge in this area*

Combined topic 3: Mental Training Tools & strategies

Tools, strategies, and interventions that support and strengthen mental skills, training, and performance for female athletes with or without potential mental health diagnoses (e.g., anxiety, depression, eating disorder, OCD, PTSD).

Combined topics:

1. Tools and strategies that support mental skills, training, and performance for female athletes with or without potential mental health diagnoses (e.g., anxiety, depression, eating disorder, OCD, PTSD).
2. Programs and interventions that can strengthen mental health among female athletes with specific mental health concerns (e.g. anxiety, depression, eating disorder, OCD, PTSD), including for those with mental health diagnoses.

Topic 1 rating:

Round 1: 1 out of 17 (Mean score = 4.53)

Round 2: 4 out of 19 (Mean score = 4.50)

Topic 2 rating:

Round 1: 5 out of 17 (Mean score = 4.37)

Round 2: 16 out of 19 (Mean score = 4.05)

Comments/Reason for combining: Participants continued to rate *tools and strategies for mental skills* relatively high while *programs and interventions for mental health* rated relatively low again. Participants justified the lower ratings of *programs and interventions for mental health* by explaining that they believe mental health should be addressed at the individual level and not at the program level. The way this topic reads now, it is more focused on mental skills training (for folks with or without mental health diagnoses). There is no separate topic exclusive to interventions for mental health.

Illustrative new topic suggestions (direct quotes):

- *How to get female athletes to buy in to the mental side of things. Even with the growing popularity of mental health I feel like there's still a stigma around it, and that if there's one bad experience athletes write it off as not working.*

Illustrative justifications (direct quotes):**Topic 1: Tools and strategies**

- *SUPER IMPORTANT, mental health should be taken as seriously as all other facets of athletic training, and there should be an emphasis on female-specific mental health topics.*
- *Personally working with a sports psyche was extremely important to my own training, more information about this would do a lot of good.*
- *Not all athletes who experience symptoms of the mentioned have the resources or ability to get a medical diagnosis, but still need assistance or access to help. Making this more accessible will allow these athletes to learn strategies when they otherwise may have had to endure on their own.*

Topic 2: Programs and interventions

- *Again, super important just not sure this would vary much from the approaches that already exist*
- *As a team sport athlete, I'm not a big fan of programs. These issues are personal, I think smaller, trustworthy settings are better than groups.*
- *I've gotten a lot of information regarding this and coping strategies from my sports psychologist. However, if there are different/more/female specific strategies i would like to know about them.*

Illustrative dissenting justifications (direct quotes):**Topic 1: Tools and strategies**

- *I have just gotten into the realm of dealing with this, and have found that resources do exist, but I am not sure of the gender disparity in those resources.*
- *I believe this should be handled more by Sports Medicine*
- *I am provided with a sports psychologist through my sport who provides information regarding this topic frequently. Have been given mental skills training tools for decreasing heart rate when feeling anxious, and how to deal with the pressure of sport, etc.*

Topic 2: Programs and interventions

- *This is so huge. We need programs from registered and qualified health professionals to help build programs to diagnose, treat, and follow-up with mental health diagnoses.*
- *It's a taboo topic that more and more people are finally able to discuss with more and more information coming out from specific high-level athletes.*

- *There are a lot of problems like the ones mentioned here in my sport and having more resources and knowledge about them would really help athletes.*
- *I feel like informational sessions or preventative programs might be helpful, but actual treatment or interventions for athletes with specific concerns might be more effective if they're individualized.*

Combined topic 4: Strategies (injury and illness risk reduction)

Effective strategies - including those related to fueling, physical and mental training, and rehabilitation - for female athletes to decrease injury and re-injury risk, and safely return to play post injury.

Combined topics:

1. Nutrition and hydration strategies for female athletes to decrease injury and illness risk such as bone stress injury.
2. Injury management (prevention, detection, recovery) in female athletes (e.g., concussion, overuse injury, ACL, bone stress injury).

Topic 1 rating:

Round 1: 10 out of 17 (Mean score = 4.09)

Round 2: 7 out of 19 (Mean score = 4.35)

Topic 2 rating:

Round 1: 7 out of 17 (Mean score = 4.21)

Round 2: 14 out of 19 (Mean score = 4.15)

Reason for rewrite: These topics were combined to address a number of issues. First, participants rated topic 2 (injury management) lower in Round 2 (4.15) than in Round 1 (4.21). Furthermore, the injury management topic (topic 2) overlaps with the nutrition and hydration strategies for injury/illness prevention topic (topic 1). Lastly, the injury management topic (topic 2) continued to have a significant difference in mean score between individual sport athletes (Round 1: 4.44 ; Round 2: 4.50) and team sport athletes (Round 1: 3.82 ; Round 2 3.60), and in Round 2, topic 2 had significant differences in mean score between Olympians (4.36) and Paralympians (3.00). To cover both fueling strategies to reduce injury and illness risk and injury management in one statement, we combined the two topics. Additionally, new topic suggestions pertaining to injury management and returning to play post injury were taken into consideration and included in this rewrite.

Illustrative new topic suggestions (direct quotes):

- *How do female athletes need to alter training after repeated injuries. What treatments are effective to stop the injury cycle from continuing? Can you reverse damage already done? Is there a point when the body can't withstand the training load anymore and the damage done is irreversible?*
- *Coming back from injury/surgery... resources for that and how it affects the athlete both physically and mentally. The stress that comes with having to race against the clock*

Illustrative justifications (direct quotes):

Topic 1: Strategies to decrease injury/illness risk

- *Nutrition and hydration are huge impacts, especially in my sport. Changing these are in the details and could have a lasting impact if implemented correctly.*
- *The culture in my sport is very weak around nutrition due to cultural influences and slow changing discussion on how food and water can benefit the body. Therefore, most of the athletes in this sport growing up do not know what to do in terms of nutrition and hydration or understand how all of that can help reduce injuries.*
- *Same as above. All of the information I have received has been more general and likely based off of studies on men*

Topic 2: Injury management

- *Having recently had a concussion, I have heard a lot about how concussions may be different for men vs women, but it is not information easily found or followed up on.*
- *It'd be so helpful to have more research on all things injury management as this can end up being an endless cycle for athletes I've observed with injury after injury. I personally have been relatively injury free besides a few minor things so I don't have as much personal interest. I just think it would be helpful for those who do struggle with injuries.*
- *Women's bodies operate differently than mens. I think we do have a lot of information on these topics already but if there are things that I can be doing to stay healthy then I would like to know about them.*

Illustrative dissenting justifications (direct quotes):

Topic 1: Strategies to decrease injury/illness risk

- *Most of my needs are met by my dietician.*
- *I rated this as neither agree or disagree as I feel as though I have a good understanding of hydration and nutrition when it comes to decreasing injury risk and illness risk. I also know strength training really helps with bone density and we do alot of that in our sport.*

Topic 2: Injury management

- *Again, I feel like I have a good understanding on how to mitigate risk for a lot of these. I know concussions are a big part of our sport and understand what the*

symptoms are to look for etc. I'm also very aware of over training and really pay attention to my body to listen to that and avoid an overuse injury.

- *I don't necessarily see a need for more research on female specific injury management. I feel as though existing research and knowledge is adequate and resources should be devoted/prioritized to address bigger gaps in research.*
- *I would just think that for injury management, you should consult a professional or trainer. So, I think the info for athletes is less important. After something has happened, ask a professional and get multiple opinions.*

Topics Rewritten for the Next Round

*Underlined words and phrases indicate new language.

Rewritten topic 1: Recovery

The impact of female physiology, including menstrual cycle, on the recovery process and the effectiveness of various recovery modalities and approaches, including passive recovery and sleep.

Original topic: The impact of female physiology, including menstrual cycle, on the recovery process and the effectiveness of various recovery modalities and approaches.

Topic rating:

Round 1: NA

Round 2: 5 out of 19 (mean = 4.40)

Reason for rewrite: Despite ranking high, this item was rewritten to include passive recovery and sleep based on new topic suggestions from Round 1 and Round 2.

Illustrative new topic suggestions (direct quotes):

- *Hours of sleep during menstrual cycle*
- *I would like to know more about your menstrual cycle tied to your sleep cycle. The importance of sleep based on what part of your cycle you are on.*

Illustrative justifications (direct quotes):

- *I touched on this earlier but I agree this is super important and is not implemented in youth sports. This is why i feel women sports are under developed*

- *It would be so interesting to know more about how recovery changes based on where a female is at in her cycle and what the best modes of recovery are. To be able to be specific would increase the efficiency of recovery.*
- *I do not have much knowledge about this topic and would enjoy knowing more. Knowing how the female body responds to things is important in recovery.*

Illustrative dissenting justifications (direct quotes)

- *I've had no exposure and understanding on this so I'm not able to comment.*
- *I don't know if i know enough to have an opinion.*

Rewritten topic 2: Team Dynamics

The impact of team dynamics and interpersonal relationships between and among athletes, coaches, and support staff on performance, physical and mental health, and well-being.

Original topic: The impact of team dynamics and interpersonal relationships between athletes on performance, health, and well-being.

Topic rating:

Round 1: NA

Round 2: 6 out of 19 (Mean score = 4.38)

Reason for rewrite: Participants rated this topic highly with many comments expressing the importance and high impact of team dynamics on overall team atmosphere and well-being. Some new topic ideas suggested that information about dynamics beyond just athlete-athlete (e.g., athlete-coach, athlete-clinician, coach-clinician) would be helpful and more representative of participants' lived experiences. These new topic suggestions revolved around 1) team dynamics between coaches and support staff or coaches and athletes and 2) dynamics and the impact of an athlete's or teammate's mental health concerns or condition on relationships between teammates. Not surprisingly, there was a significant difference in the mean scores for this item between individual sport athletes (4.13) and team sport athletes (4.80). The rewrite to include support staff and coach-athlete relationships may also help lessen this difference.

Illustrative new topic suggestions (direct quotes):

- *dynamics of training with other high level female athletes and how their mental health (and things like eating disorders) affects the entire group of women. Ive noticed in my sport that the women not directly suffering from the issue are often overlooked and*

having a different mental battle than the one struggling with an eating disorder. So maybe research into team dynamics affect individual women or how training as a team for individual sport (like gymnastics) has an effect on well-being.

- *A topic I think would be interesting is the relationship between athletic trainer and coaches. Specifically, how coaches may or may not empower their athletic trainer in decision making around female athlete's health.*
- *Impact of coach-athlete relationships on well-being, performance, and health.*

Illustrative justifications (direct quotes):

- *I play a team sport and I think team dynamics is the most important area when it comes to how we perform as women.*
- *I believe connections with teammates have the biggest impact on mental well being.*
- *I believe any extra information on this is beneficial. To neglect the impact of interpersonal relationships between athletes and performance I think is naïve.*

Illustrative dissenting justifications (direct quotes):

- *I think this is too hard to study and try to figure out. Every person and athlete are different and i do not think this would be very helpful.*
- *I think this is important, but fairly well-known already.*
- *Similar to my answer above, this really hasn't personally affected me in my career. However, I think this has a lot to do with the fact that I am in an individual sport - I can see how it would be extremely impactful in a team sport. In addition, I can see scenarios where it would impact individual athletes greatly as well - i.e. vying for the same spot on a team, competing against one another in practice, etc.*

Rewritten topic 3: Female physiology and performance outcomes

The influence of female physiology on strategies for optimizing training and analyzing performance in order to attain peak physical performance outcomes over the course of a season or athletic career.

Original topic: The influence of female physiology on performance outcomes (VO2 max, resting metabolic rate, heart rate variability, resting heart rate, glucose, substrate utilization, movement mechanics)

Topic rating:

Round 1: 3 out of 17 (mean score = 4.40)

Round 2: 18 out of 19 (mean score = 3.98)

Reason for rewrite: Despite this topic ranking 18 out of 19, most dissenters cited a lack of knowledge in this area or lack of use of the performance analysis/testing tools named in the topic. Because of this, we felt it necessary to rewrite this topic to be more encompassing of what female physiology includes and make the topic more broadly applicable. New topic suggestions pertaining to peak performance also informed incorporation of that language into this topic. Also, this topic rated 3rd in Round 1, with a mean score of 4.40. The dramatic decrease in mean score, despite no changes to the language of the topic, is notable and could be due to the fact that it was listed at the top of the survey in Round 1 and at the bottom of the survey in Round 2; therefore, we want to leave the topic in and see if some changes will influence its rating.

Illustrative new topic suggestions (direct quotes):

- *I would like to know more about the age where women "peak" physically and how that changes as you get closer to menopause.*
- *How does tapering need to be adjusted for women and aiming for peak performance? (Hormonal contribution for male vs. female)*
- *When is the female athlete typically peaking in their sport performance, and training. I know every sport is specific to when athletes may peak, but in general, when do female athlete bodies peak? When should a female athlete stop elite sports to preserve their health?*

Illustrative justifications (direct quotes):

- *I guess i've never really had any of these tests done and analyzed before for me and my ideal performance levels so i believe this would be helpful for me*
- *I am curious about this as I have never really been exposed to this side of physiology. I wonder how it can maybe be helpful to athletes with varying levels of exertion in their sports- I need to vary how much energy and strength at different points in time and don't understand the mechanics of that.*
- *Yes! Most of my information on this is research done in the context of a male standard and I would be curious to know what particular mechanisms of female physiology influence performance outcomes.*
- *This is all more technical information that is harder to easily conceptualize. But, for instance, in cycling, the shape of the women's pelvis would differ how a woman produces power while sitting on a bike saddle in an aerodynamic position compared to a man. There are hundreds of examples of this that have received no research at all.*

Illustrative dissenting justifications (direct quotes):

- *This feels less important to me in strength/skill sport.*
- *Just not relevant to what I do*
- *I've had no exposure to this so I'm not able to comment.*

- *I dont think i know enough to have an opinion. I think the female physiology is important to performance i just dont know specifically how.*

Remaining Topics from Round Two

These topics from Round 2 will appear unchanged in Round 3 as feedback did not indicate a need for rewrites or removal. In other words, these remaining topics, based on our analysis, remain relevant and influential as we move toward creating a sports science research agenda for elite female athletes.

Area: The impact of periods and phases of the menstrual cycle on health, performance, and well-being.

Topic: How best to fuel at different stages of the menstrual cycle to enhance performance, health, and well-being.
Topic rating: Round 1: NA Round 2: 1 out of 19 (mean score =4.65)
Comments: This topic ranked high and all but two justifications pointed to an increased need for more readily accessible information pertaining to this topic. No rewrite.
Illustrative justifications (direct quotes): <ul style="list-style-type: none"> • <i>I learned very late in my athletic career as to how my period affects my recovery. I still don't know all that much on how to fuel and recovery leading up to or during that time. What I know now is that our hormones vary each week and that is why leading up to my period I feel so strong in the gym. Regardless, I think this is an understudied topic that can benefit all women, not just athletes.</i> • <i>This topic would be very useful to me, as I am strongly affected by cravings at certain phases of my cycle. Understanding which cravings are related to actual nutritional deficiencies and should be addressed by fueling for performance would be very helpful.</i> • <i>I feel so drained and heavy when I have my period, and prior to that, also have really intense cravings and find it really hard to find food or want food that fuels me properly. When this happens during competition, it has always been a struggle being able to execute to the fullest of my abilities due to the effects of the menstrual cycle.</i>
Illustrative dissenting justifications (direct quotes):

- *I think fueling in this area is less important than knowing injury risk/emotions/etc during different times of the cycle.*
- *I still think that there is already a lot of information about this. My menstrual cycle is very light and while it does affect my performance it is often just for a day or two. It does affect my mental health more than my physical health. Having experienced an eating disorder in the past, I am just also not interested in changing my diet for any reason. I like to follow an intuitive eating plan and having to change that for my menstrual cycle is not something I am willing to do at this point in my athletic career.*

Topic: How the symptoms before, during, and after the bleeding phase of a menstrual cycle impact training and performance.

Topic rating:

Round 1: NA

Round 2: 3 out of 19 (mean score = 4.53)

Comments: Due to its high ranking, majority of justifications pointing out the importance and relevance of this topic, and minimal dissenting comments, no rewrite is necessary.

Illustrative justifications (direct quotes):

- *I definitely feel hormonal shifts that have a large effect on my mental health and overall performance. I often feel depressed before the bleeding phase, not to mention the weight gain and overall aches. During the bleeding phase, I seem to be able to perform fine and love the week after.*
- *I get pretty strong cramps the first two days of my cycle now that I am off of birth control, and generally feel lethargic and bloated, so anything to help manage those symptoms would be amazing.*
- *I have noticed differences in my own training and how i feel during my menstrual cycle. I don't understand the phases and would benefit from more info.*
- *The menstrual cycle affects all aspects of a woman: mental state, inflammatory responses, sleep, etc. If there were a better way to avoid or mitigate disruptions in performance, that would be fantastic.*

Illustrative dissenting justifications (direct quotes):

- *I feel like this could be interesting to know, but not sure if knowing more about this would affect how I train or have to train.*
- *Once again, I think there is already a lot of research on this topic. I think in terms of mental health there are probably dietary recommendations that would be useful, regardless of the phase of the menstrual cycle.*

Area: The impact of interpersonal relationships and contextual factors on health, performance and well-being.

<p>Topic: The impacts of institutionalized sexism and/or male dominated coaching and support staff on female athlete mental health and performance.</p>
<p>Topic rating: Round 1: NA Round 2: 9 out of 19 (mean score = 4.28)</p>
<p>Comments: Most dissenting comments were from those who personally have not experienced this or feel they are part of a predominantly female sport. However, for those who felt like they have experienced institutionalized sexism and/or male-dominated coaching and support staff, the majority of athletes reported that this topic is very important. There was a significant difference in the mean scores between olympians (4.18) and paralympians (5.0). Because both groups still rated this topic quite high, no rewrite.</p>
<p>Illustrative justifications (direct quotes):</p> <ul style="list-style-type: none"> ● <i>A male dominated high performance staff hired by USOPC and in turn male contract coaching staff has massively negative effects on my mental health and physical performance.</i> ● <i>I am very passionate about this, and believe it is so so so important. I have 2 male coaches, and we have 2 trainers, 1 male and 1 female. I believe our coach does not understand how to connect and relate to female athletes. He has hinted at tthe fact he tthinks we are too emotional or sensative at times. He has made unintentional comments that are no body positive, and could be harmful. I would love all male coaches to sit through workshops on learning more about their female athletes, and how to beter connect and understand them.</i> ● <i>This is something that has affected me my entire career, being from a male dominated sport that suffers with eating disorders. Men continually dismiss it and justify it and its severely impacted my mental health since I was a kid.</i>
<p>Illustrative dissenting justifications (direct quotes):</p> <ul style="list-style-type: none"> ● <i>I've only had great relationships and have only been coached by male figures so I am bias, but open to hearing other athletes experiences</i> ● <i>I am in a female dominated sport with not a lot of male representation.</i> ● <i>While I have primarily been coached my males my entire career (exception of two female assistant coaches), I personally have never felt it impacted my mental health or performance. That being said, I have had teammates who have had issues and/or felt</i>

reason for concern regarding this topic, and thus could see why it may be important to study.

Area: Female Physiology and Performance, Health, and Well-Being - Aspects of female physiology as they relate to performance, health, and well-being measures and outcomes.

<p>Topic: Training, performance, physical health and mental health considerations during pregnancy and postpartum return to sport.</p>
<p>Topic rating: Round 1: 9 out of 17 (mean score = 4.12) Round 2 (rewritten): 8 out of 19 (mean score = 4.30)</p>
<p>Comments: Most dissenters pointed to this not being relevant to them personally <i>but</i> still recognizing the importance of such a topic and several justifications provided overwhelming support for the topic. No rewrite.</p>
<p>Illustrative justifications (direct quotes):</p> <ul style="list-style-type: none"> • <i>Yes to this! So much yes! I think pregnancy and competition is still such an unknown. Can you return to competition postpartum? What will you lose? What will you risk? Can you even get pregnant?</i> • <i>Currently pregnant and will be experiencing return to sport and would like to know the science behind best practices in the return phase.</i> • <i>I am not pregnant nor have I ever been pregnant, but this is SO under-researched and not cared enough about. We need more information on this topic for returning female athletes post-pregnancy.</i>
<p>Illustrative dissenting justifications (direct quotes):</p> <ul style="list-style-type: none"> • <i>Right now I would say neither agree or disagree because I'm not in this stage of my life where this is a concern. However, if I am still continuing in sport and this phase of my life, this could be super helpful and important.</i> • <i>I've never been pregnant, but more information is needed in this field. I know plenty of ladies that have gone through this. Fearing what they could lose if they don't return soon.</i> • <i>This is not something that I personally am interested in and many athletes leave sport prior to starting a family, while all female athletes deal with these other effects during their career</i>

- *I've had no exposure to this so I'm not able to comment. However, I do think that this is an important topic to research and understand.*

Topic: The short- and long-term effects of specific types of birth control options including different oral hormonal contraceptive pills, IUDs, the patch, etc on health, performance, and well-being.

Topic rating:

Round 1: 4 out of 17 (mean score = 4.40)

Round 2 (rewritten): 2 out of 19 (mean score = 4.63)

Comments: Athletes rated this rewrite, which was informed by Round 1 feedback, higher in Round 2. Based on very few dissenting comments and the majority of comments pointing to a need or desire for more information on this topic, no rewrite is necessary.

Illustrative justifications (direct quotes):

- *I am someone who was on birth control for six years and got off of it because I did not feel comfortable continuing to take something that impacted me mentally/hormonally so strongly, and again, I don't think this is studied enough because it only affects women.*
- *I would love to know more information on this. It is something I'm actively trying to understand and decide for myself.*
- *have taken birth control pills for 10 years and have no idea how it affects my training and performance. This would be extremely helpful. I've just come up with conjectures based on how my body feels at different times taking them.*

Illustrative dissenting justifications (direct quotes):

- *At the current moment this does not affect me.*
- *I do not take any sort of birth control so this topic is not of value to me.*

Topic: The symptoms and potential health and performance consequences of low energy availability which is when the body doesn't have enough calorie intake to account for exercise and the caloric needs of daily life. (This can be inadvertent from an eating disorder or disordered eating, aka Relative Energy Deficiency in sport (REDs) or female athlete triad).

Topic rating:

Round 1: 13 out of 17 (mean score = 3.86)

Round 2 (rewritten): 10 out of 19 (mean score = 4.28)

Comments: After a rewrite informed by Round 1 responses for Round 2, this topic rose from a mean score of 3.86 to a mean score of 4.28. Athletes provided supporting justifications expressing that low energy availability is an important and prevalent issue. A few dissenting comments pointed to some participants having enough information on the topic or noting a lack of personal relevance. No rewrite.

Illustrative justifications (direct quotes):

- *I struggled with this seriously this past season and found it very difficult to find data or information on how to help.*
- *This is a huge problem in my sport that is often overlooked, especially by men in powerful roles.*
- *I think this is one of the single most important things for endurance athletes in particular. This is probably the biggest area I see in my sport that coaches/administrators/teammates pressure athletes to be lean rather than healthy which over time leads to major health and injury problems.*

Illustrative dissenting justifications (direct quotes):

- *I think there is a ton of information on this topic already.*
- *doesn't affect me*

Area: Female-Specific Considerations for Mental Health and Mental Training - The tools, information, and resources female athletes have or should have to support and enhance mental health and mental training.

Topic: Understanding similarities and differences between sports performance support and mental health support and how/when/where to seek care for each.

Topic rating:

Round 1: NA

Round 2: 11 out of 19 (mean score = 4.25)

Comments: Athletes rated this new Round 2 topic relatively high with supporting justifications pointing to a need for this information. More specifically, athletes noted the importance of defining the differences between sports performance and mental health support. Dissenters pointed to this not being relevant to them as their needs are met and they have the information they need. No rewrite.

Illustrative justifications (direct quotes):

- *Often sports performance is put over mental health. The team might send the athlete to a sports psychologist instead of a clinical psychologist because of the fear, anxiety, etc., that is affecting the athletes' performance when the core of the issue is actually a mental health diagnosis.*
- *Yes- these two should be defined. Someone who seeks mental health support would not always be someone who is looking for sports performance support and improving the mental game in training. To me, I would like to understand the difference as we are starting to better do with physical wellbeing- for instance, I at least am able to understand when PT is used for injury care and rehabilitation, whereas there are certain strengthening and conditioning exercises that are used to improve my abilities in my sport.*
- *This is something I've struggled with. I have a sports psychologist but when I experienced loss I didn't really know who to talk to. Since I'd only been talking to a sports psych I just continued to talk to her, but could tell it wasn't exactly her area of expertise. However even knowing that, that seemed better than starting a relationship with someone new.*

Illustrative dissenting justifications (direct quotes):

- *I believe this is already known of where the seek services and how.*
- *I understand this difference well. I recently started therapy because I was trying to use my sports psychologist as a generic mental health therapist and she told me that her job was to help me with ways to continue competing at a high level through my mental health issues. Sports psych is for working on how to be a better athlete and mental health support is for help with everything else.*

Mean Comparisons based on Seven Pre-established Groups

Seven participant groups were established prior to analysis in order to see if differences arose in ratings depending on the subgroup, as this could indicate different needs for different subpopulations among elite athletes. The subgroups include:

1. Non-white and white athletes
2. Summer and winter sport athletes
3. Individual and team sport athletes
4. Olympian and Paralympian
5. *Ever* pregnant and *never* pregnant athletes
6. *Ever* injured and *never* injured athletes
7. Athletes who *ever* received mental health diagnosis and *never* received mental health diagnosis

*To note, topics below are sorted by ranking (higher ranking to lower ranking) within each area

Area: Team Dynamics and Coaching - The impact of interpersonal relationships and contextual factors on health, performance and well-being.

Topic: The impact of team dynamics and interpersonal relationships between athletes on performance, health, and well being

- **There was a significant mean difference between individual ($M = 4.13$) and team sport athletes ($M = 4.80$)**

Topic: The Impacts of institutionalized sexism and/or male dominated coaching and support staff on female athlete mental health and performance.

- **There was a significant mean difference between Olympian ($M = 4.18$) and Paralympian athletes ($M = 5.00$).**

Area: Female Physiology and Performance, Health, and Well-Being - Aspects of female physiology as they relate to performance, health, and well-being measures and outcomes

Topic: Female specific strength training considerations to optimize performance.

- **There was a significant mean difference between summer ($M = 3.86$) and winter sport athletes ($M = 4.60$).**

Area: Female-Specific Considerations for Injury and Illness Prevention and Recovery - Specific prevention of injury and illness as well as recovery from injury and illness in female athletes

Topic: The role of strength training in injury risk reduction in female athletes

- **There was a significant mean difference between Paralympian ($M = 3.17$) and Olympian athletes ($M = 4.36$).**

Topic: Injury management (prevention, detection, and recovery) in female athletes (e.g. concussion, overuse injury, ACL, bone stress injury)

- **There was a significant mean difference between team ($M = 3.60$) and individual sport athletes ($M = 4.50$).**
- **There was a significant mean difference between Paralympian ($M = 3.00$) and Olympian athletes ($M = 4.36$).**

Area: Technologies and Tools - Technologies/tools, including adaptive technologies, to improve health, performance, and wellbeing for female athletes.

Topic: Female-specific sport, training, and equipment needs or equipment designed for female athletes (e.g. wheelchair, sports bra, rowing seat)

- There was a significant mean difference between **team (M=3.40) and individual team sport athletes (M = 4.21).**
- There was a significant mean difference between **summer (M = 3.62) and winter sport athletes (M= 4.70).**

Complete List of Areas and Topics for Round Three

Round 3 Areas and Topics

Topics	Topic Status
Area: Female Physiology and Performance, Health, and Well-Being	
Topic 1: Female physiology	<i>Rewritten</i>
Topic 2: Strength training (optimize performance)	Rewritten with Area 2, Topic 1
Topic 3: Hormonal contraception & replacement	Unchanged
Topic 4: Low-energy availability	Unchanged
Topic 5: Pregnancy	Unchanged
Topic 6: Recovery	<i>Rewritten</i>
Area: Female-Specific Considerations for Injury and Illness Prevention and Recovery	
Topic 1: Strength training (injury risk reduction)	<i>Merged into Area 1, Topic 2</i>
Topic 2: Injury management	Rewritten with Area 4, Topic 2
Area: Female-Specific Considerations for Mental Health and Mental Training	
Topic 1: Tools & strategies	Rewritten with Area 3, Topic 2
Topic 2: Programs & interventions	<i>Merged into Area 3, Topic 1</i>
Topic 3: Sports performance vs. mental health	Unchanged
Area: Female-Specific Considerations for Nutrition, Fueling, and Hydration	
Topic 1: Supplementation (optimize performance)	<i>Merged into Area 4, Topic 3</i>
Topic 2: Strategies (injury and illness risk reduction)	<i>Merged with Area 2, Topic 2</i>
Topic 3: Strategies (stages of training)	Rewritten with Area 4, Topic 1
Area: Technologies and Tools	
Topic 1: Equipment needs and design	<i>Removed</i>
Area: Periods and Menstrual Cycle Phases	
Topic 1: Menstrual cycle & nutrition	Unchanged
Topic 2: Menstrual cycle symptoms & performance	Unchanged
Area: Team Dynamics & Coaching	
Topic 1: Male dominated institutions/spaces	Unchanged
Topic 2: Team dynamics	<i>Rewritten</i>