

Auditing the Representation of Female Athletes in Sports Science and Sports Medicine Research: Hip Labral Repair

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INTRODUCTION: Historically, female athletes have been underrepresented in sports science and sports medicine (SSSM) research. Repair of hip labral tears is a common arthroscopic procedure that is more likely to affect women. The purpose of this study was to systematically review and audit the current literature regarding the representation of female athletes in studies examining arthroscopic hip labral repair procedures and outcomes.

METHODS: This was systematic audit performed according to the methods outlined in Smith et al.⁴ We conducted a standardized audit of the literature regarding arthroscopic hip labral repair procedures and outcomes. Studies identified were analyzed regarding seven factors: study population, athletic caliber, menstrual status, research theme, sample of males and females, journal impact factor, and paper altmetric score.

RESULTS: We identified 1,156 studies for screening of which 62 were included in this audit. Females made up 55% of the total population of participants. Female-only and male-only studies represented 5% and 14% of studies respectively. No studies investigated female participants at the highest athletic caliber, Tier 5 or world class, while three male-only studies at this level were examined. Menstrual status was not considered or included as a variable in any study. Participants within an athletic performance, indirect association and health research theme had 32.8%, 61.1%, and 58.6% female representation respectively. Median impact factor was similar among study population classifications. Study altmetric score was highest among male-only studies and studies of Tier 5 athletic caliber.

DISCUSSION: The results of this audit concluded that the gross representation of females in hip labral repair research is comparable to males with a 55% vs 45% female to male ratio in the studies included in this review. However, even though overall female representation in hip labral repair studies was greater than that of males, there is a lack of high-quality research surrounding female athletes and their performance outcomes. As seen in the results above, females made up a majority of all subjects in this audit, yet only accounted for 32.8% of performance-based study participants. Additionally, of the 1,390 subjects classified as tier 3-5 athletes, only 435 (31.3%) were female, with no female representation in tier 5 studies. Instead, most participants, and specifically females, in hip labral repair research were found in health themed studies, focusing on outcomes related to pain and activities of daily living, rather than performance outcomes related to sport. Another outcome of interest in this audit was the inclusion of menstrual status consideration among female participants. Interestingly, none of the 62 studies around hip labral repair included information on menstrual status, even with a 55% representation of female participants. This is significant in sports medicine research as the female menstrual cycle has been shown to affect aspects of athletic performance due its impact on metabolism,³ affect wound healing in the setting of surgical reconstruction,¹ and affect joint laxity, strength, and neuromuscular control.² These factors would likely impact postoperative return to sport and performance-based metrics. Finally, the quality of research as measured by study altmetric score poses an interesting discussion. Male only studies along with studies of higher athletic caliber had consistently higher scores. Mean male only studies received over twice the attention score than either female only or mixed-sex cohort studies. These were similar results to athletic caliber tier 4 and 5 studies, which lacked female representation. This may represent a lack of female participation in the most discussed areas of sports medicine research.

SIGNIFICANCE: This study highlights the lack of high-level female athlete participants and performance-based metrics for female athletes in hip labral repair medical research. It additionally demonstrates the need for future research to incorporate menstrual status into study design.

REFERENCES:

1. Lopez MM, Castillo AC, Kaltwasser K, Phillips LG, Moliver CL. Surgical Timing and the Menstrual Cycle Affect Wound Healing in Young Breast Reduction Patients. *Plast Reconstr Surg.* 2016;137(2):406-410.
2. Martínez-Fortuny N, Alonso-Calvete A, Da Cúña-Carrera I, Abalo-Núñez R. Menstrual Cycle and Sport Injuries: A Systematic Review. *Int J Environ Res Public Health.* 2023;20(4).
3. Oosthuyse T, Bosch AN. The effect of the menstrual cycle on exercise metabolism: implications for exercise performance in eumenorrhoeic women. *Sports Med.* 2010;40(3):207-227.
4. Smith ES, McKay AKA, Ackerman KE, et al. Methodology Review: A Protocol to Audit the Representation of Female Athletes in Sports Science and Sports Medicine Research. *Int J Sport Nutr Exerc Metab.* 2022;32(2):114-127.

TABLES: **Table 1:** Results from the audit of hip labral repair research

	Number of Studies	Total Sample Size	Sample of Males	Sample of Females	Mean Impact Factor	Mean Altmetric Score
All Studies	62	11461	5143	6318	5.645	6.4
Population						
Mixed-sex cohort	48	10425	4413	6012	5.588	5.5
Males only	9	419	419	0	5.711	11.1
Females only	3	100	0	100	5.461	5.0
Male vs Female Design Features	1	96	54	42	7.010	2.0
Male vs Female Subanalysis	1	421	257	164	7.010	16.0
Athletic Caliber						
Unclassified	38	9609	4030	5579	5.584	5.4
Tier 0	0	0	0	0	0.000	0.0
Tier 1	7	357	90	267	5.414	6.1
Tier 2	3	105	68	37	4.916	1.0
Tier 3	5	736	437	299	5.000	5.0
Tier 4	6	527	391	136	6.527	10.5
Tier 5	3	127	127	0	7.010	18.7
Menstrual Status						
Unclassified	62	11461	5143	6318	5.645	6.4
Research Theme						
Health	41	9841	4070	5771	5.637	5.5
Indirect Associations	2	54	21	33	2.877	1.0
Performance	19	1566	1052	514	5.956	8.9