



Viewpoint

Making competent decisions in sport and exercise science and sports medicine: Preliminary practical guidelines on sex and gender

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Sport and exercise science, allied health and sports medicine (SAMS) professionals make daily decisions when designing research and implementing interventions. It is unclear, however, to what extent SAMS professionals consider clients' or research participants' intersectionality (social and political identities) within their approach. Whilst the Sex and Gender Equity in Research (SAGER) guidelines¹ increase researchers' awareness of sex and gender in research and provide a useful checklist,² they lack clarity and practicality regarding *when*, *how* and *why* constructs of sex and/or gender should be addressed. Nor are we aware of practical guidelines helping SAMS professionals create welcoming environments. This may result in a lack of knowledge, skills and confidence to meaningfully engage with a client's sex and gender and avoid inaccurate research³ and subsequent practice.

Therefore, we provide preliminary guidelines on how the constructs of sex and gender could be implemented in SAMS based on existing empirical⁴ and professional literature.⁵ We recognise the need to create more inclusive spaces where individuals can express their authentic selves without fear of direct or indirect discrimination. To do so, we need to continually review emerging understanding based on new evidence. These initial guidelines may help SAMS professionals who lack confidence or have little experience with transgender or gender-diverse clients or research participants, and for academics and educators to inform SAMS curriculum and pedagogy.

1. Sex and gender: problem and definitions

Biological sex or sex (recorded at birth as a binary option – male or female – based on visual inspection of external reproductive organs),⁶ gender (a complex sociocultural construct regarding the roles, behaviours and norms associated with one's sex)⁶ and gender identity (the personal sense of one's gender, which can correspond with or differ from their sex)⁷ are often used interchangeably as a social practice or

in attempt to develop 'inclusive language'. This often leads to errors when assessing, reporting and/or communicating a client's sex and/or gender identity. For instance, surveys often ask about one's gender but provide answer options related to both sex (male or female) and gender identity (non-binary) creating confusion for the recipient and collecting inaccurate data.^{8–10} However, not everyone presents/expresses their true gender identity as some may feel uncomfortable, judged, or pressured to conform to prescribed norms.

Without accurate records of sex and gender identity (and other possible sociocultural factors such as ethnicity or relevant opportunity), it is impossible to determine what types of oppression and support one has experienced that might be masked by biological attributes (e.g., hormone levels).¹¹ Consequently, aggregation by sex disregards these sociocultural realities and ignores the accumulated effects of gendered expectations. It widens the gender gap by collecting and implementing partial, biased evidence (e.g., female rugby players report poor tackling coaching experiences constrained by men's rugby as a norm¹²).

Often these errors are adopted as 'common practice' without questioning what is right given newly developed knowledge, shifted norms and changed gendered expectations. In essence, making assumptions about one's sex and/or gender identity based on partial evidence may further exacerbate negative experiences for researchers, participants, practitioners and clients. Therefore, we offer a brief review of existing empirical^{3,4,13} and professional literature^{5,7,14} resulting in the decision-making flowchart (Fig. 1) aimed at helping SAMS professionals to make better decisions, create an inclusive environment and move towards evidence-based research and practice reflective of our modern society.

2. Research

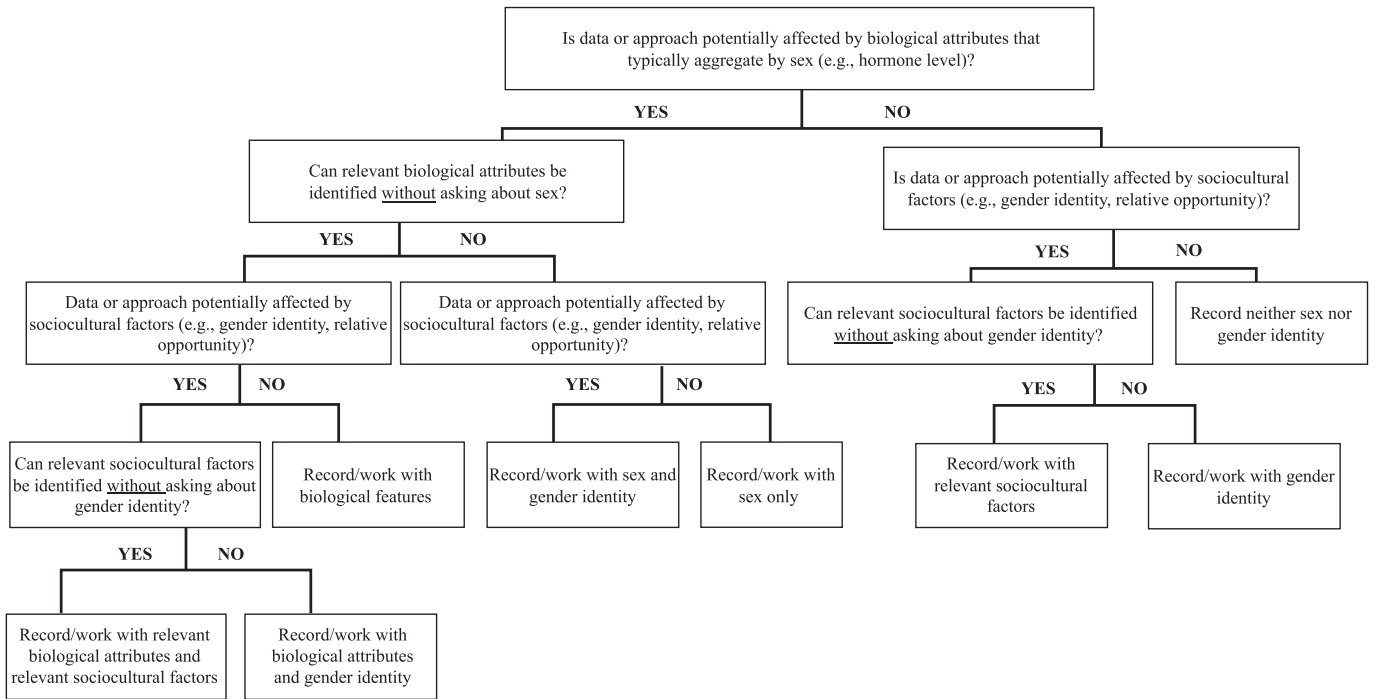
The World Medical Association's Declaration of Helsinki¹⁵ provides the ethical framework for the conduct of all scientific research involving humans, including SAMS. Paragraphs 7–8 state that, although the primary research aim is to generate new knowledge, the rights and interests of research participants must always be prioritised, and research participants must always be treated with respect. Consistent with these goals, new knowledge can only be generated, and the interests

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A



B

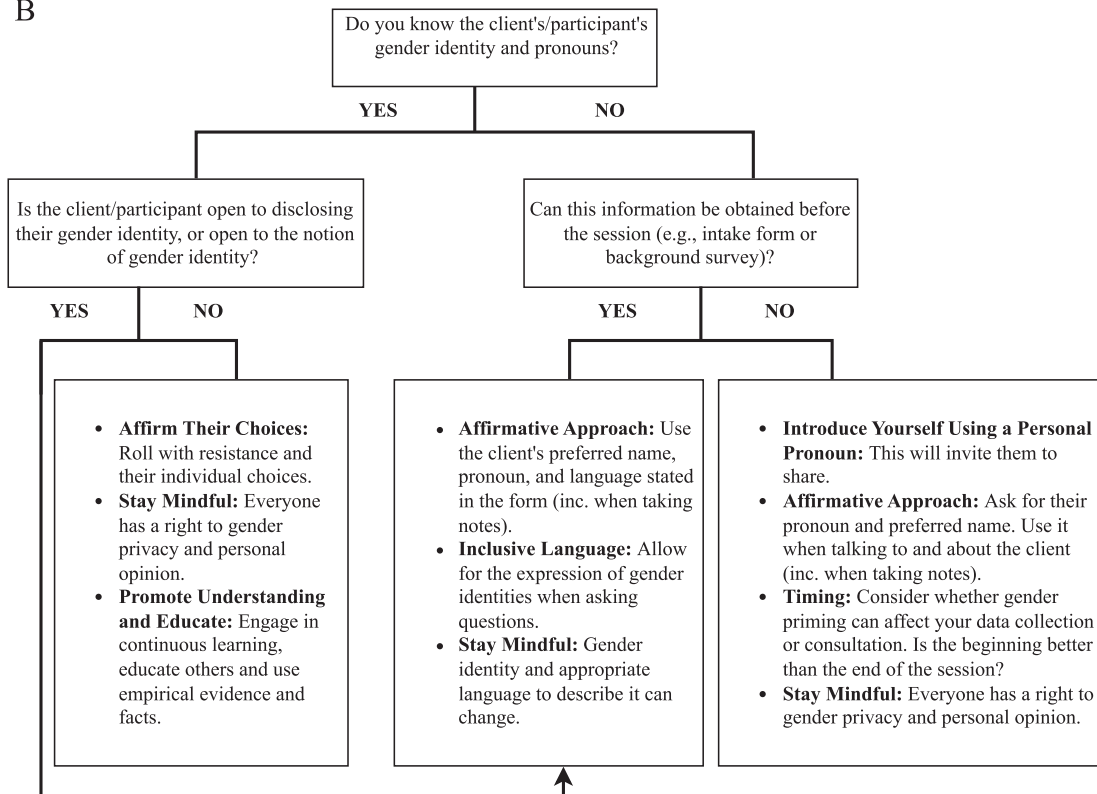


Fig. 1. Making decisions on sex and gender identity in SAMS research and practice. Part A. Deciding whether sex and gender identity should be recorded. Part B. Working with gender identity of research participants and clients.

of research participants upheld, when all data collection is accurate and relevant to the research question.

Sex is invariably relevant to research questions within SAMS. If researchers can confidently rule out any association with sex a priori,

then it would be inappropriate to record sex. Consequently, as appears common practice in SAMS research literature, sex should be recorded and reported in most research studies, using accurate language and without confusing sex with gender identity.

Similarly, if researchers can confidently rule out any association with gender identity, then it would be inappropriate to record it. However, SAMS professionals typically measure anatomical, physiological, biomechanical and psychosocial characteristics, most of which adapt to environmental stimuli such as physical activity or coaching. Those stimuli and an individual's response frequently differ in nature and magnitude according to a gendered environment and/or attitudes.¹⁶ For instance, a gendered environment may contribute to a higher risk of ACL injuries among female athletes because resources, facilities and knowledge are prioritised for male athletes leading to better conditioned bodies.^{11,16}

Therefore, as most measured variables are (directly or indirectly) potentially affected by gender identity, it would seem remiss not to record a known confounding factor when doing so requires no specialist equipment and little time. A two-step approach to collecting data on sex and gender identity is current best practice.^{8,17} However, SAMS professionals should respect a person's privacy (i.e., "prefer not to say") and acknowledge the possibility of missing data.

The most likely and frequent approach in SAMS research – recording sex and gender identity, when appropriate (Fig. 1 Part A) – is broadly consistent with guidance from other similar fields, including National Academies of Sciences, Engineering, and Medicine⁷ because it commonly involves measurements (physiological, psychological, etc.) in vivo in human participants, or in vitro using tissue obtained from them.

In each case, most research studies are arguably strongest when sex and gender identity – as the proxy for relevant environmental and sociocultural factors that disaggregate by gendered environments and/or attitudes – are considered to create "gender-inclusive medicine"¹³ in SAMS. To maximise data accuracy, participants should always be clear what information is being recorded and why.

3. Practice

The increased diversity and awareness of one's intersectionality highlight the need for a more culturally competent workforce in SAMS.¹⁴ Nonetheless, our current approaches are based on English-speaking, mostly White and educated populations that often dismiss different views of gender identity (e.g., Indigenous peoples such as Māori have multiple expressions of gender). Furthermore, few SAMS professional bodies provide tangible guidance on sex and gender identity or call for culturally competent practitioners despite emerging evidence of gendered experiences in SAMS and their effects on injury,¹⁶ coaching¹² and involvement.¹⁸ Consequently, there is a need for structural change in the way we understand and deal with notions of sex and gender identity. A more aligned, organisational approach would help SAMS professionals develop the language, skills and confidence needed to create welcoming environments and engage with culturally appropriate practices.

A good starting point is adapting existing psychological guidelines (e.g., New Zealand Psychologists Board⁵) to create a client-centred environment. Inclusive and respectful language can mitigate the pressure of fitting into heteronormative standards dominant in sport.¹⁹ SAMS professionals should allow their clients to self-identify their gender identity or maintain gender privacy.²⁰ Therefore, SAMS professionals should *never assume* a client's gender identity but should ask about it (via intake forms) including preferred language (Fig. 1 Part B).

Conversely, deeply embedded cultural and gendered norms may inhibit a client's ability to express themselves in their mother tongue (e.g., French uses binary descriptions and masculine as a default gender) or negatively affect their mental wellbeing due to expectations to conform. Others may avoid engaging in such discussion as they reject the notion of gender identity or feel incompetent/illiterate to contribute. Consequently, SAMS professionals should self-reflect and self-educate first before challenging unconscious biases and providing culturally competent services, whilst remaining cognisant of the language and approaches with which clients feel most comfortable.

4. Decision-making in research and practice: practical implications

SAMS professionals can minimise negative experiences by respecting clients' and participants' intersecting identities and compiling more accurate research evidence that leaves no one behind. We offer preliminary practical guidelines to aid sound decision-making and enhance researchers' and practitioners' competence/confidence when working with notions of sex, and gender (Fig. 1). Part A helps SAMS professionals identify which concept is most relevant and thus should be addressed: sex or specific biological attributes, gender identity or specific sociocultural factors. Part B offers more practical tips on how to approach a client's or research participant's gender identity, which is also applicable for (qualitative) researchers when describing participants.

5. Conclusion

Sport and exercise science, allied health and sports medicine professionals need to be equipped with the knowledge and skills to enable inclusive sporting environments. We acknowledge that our understanding of sex and gender is constantly evolving and thus, care is required regarding definitions and practical guidelines. However, adopting small but important changes develops shared understanding and mutual respect, and our preliminary guidelines help the SAMS professional to build confidence and awareness. We recommend SAMS professionals engage in continuous professional development to uphold our responsibility to ensure respectful, compassionate, and equitable interactions with the diverse community we serve. This will help enhance the quality of research evidence, develop client-centred support, and cultivate a welcoming environment where people feel safe, accepted and cared for.

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Confirmation of ethical compliance

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CRediT authorship contribution statement

All authors contributed equally to the conceptualisation, methodology, searching and reviewing of the literature, and reviewing and editing of the draft, including the figures. KKF, AW and TdS completed the writing of the original draft, including the figures. KKF and AW completed revisions suggested by the reviewers.

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All authors declare no competing interests.

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References

1. Heidari S, Babor TF, De Castro P et al. Sex and gender equity in research: rationale for the SAGER guidelines and recommended use. *Res Integr Peer Rev* 2016;1(2). doi:10.1186/s41073-016-0007-6.
2. Van Epps H, Astudillo O, Del Pozo MY et al. The Sex and Gender Equity in Research (SAGER) guidelines: implementation and checklist development. *Eur Sci Ed* 2022;48: e86910. doi:10.3897/ese.2022.e86910.
3. Garcia-Sifuentes Y, Maney DL. Reporting and misreporting of sex differences in the biological sciences. *eLife* 2021;10:e70817. doi:10.7554/eLife.2021.e70817.

4. Palmer-Ross A, Ovseiko PV, Heidari S. Inadequate reporting of COVID-19 clinical studies: a renewed rationale for the Sex and Gender Equity in Research (SAGER) guidelines. *BMJ Glob Health* 2021;6(4):e004997. doi:10.1136/bmjgh-2021-004997.
5. New Zealand Psychology Board. *Te Poari Kaimatai Hinengaro a Aorearoa. Best practice guideline: working with sex, sexuality, and gender diverse clients Aotearoa New Zealand New Zealand Psychology Board Te Poari Kaimatai Hinengaro a Aorearoa*, 2019.
6. Canadian Institutes of Health Research. What is gender? What is sex? Available at: <https://cihr-irsc.gc.ca/e/48642.html> 2023.
7. American Psychological Association. Understanding transgender people, gender identity and gender expression. Available at: <https://www.apa.org/topics/lgbtq/transgender-people-gender-identity-gender-expression> 2023.
8. Bauer GR, Braimoh J, Scheim AI et al. Transgender-inclusive measures of sex/gender for population surveys: mixed-methods evaluation and recommendations. *PloS One* 2017;12(5):e0178043. doi:10.1371/journal.pone.0178043.
9. Suen LW, Lunn MR, Katuzny K et al. What sexual and gender minority people want researchers to know about sexual orientation and gender identity questions: a qualitative study. *Arch Sex Behav* 2020;49(7):2301–2318. doi:10.1007/s10508-020-01810-y.
10. National Academies of Sciences, Engineering and Medicine. *Measuring sex, gender identity, and sexual orientation*, Washington, The National Academies Press, 2022.
11. Parsons JL, Coen SE, Bekker S. Anterior cruciate ligament injury: towards a gendered environmental approach. *BJSM* 2021;55(17):984–990. doi:10.1136/bjsports-2020-103173.
12. Dane K, Foley G, Hendricks S et al. "It's always the bare minimum" - a qualitative study of players' experiences of tackle coaching in women's rugby union. *JSAMS* 2023;26(2):149–155. doi:10.1016/j.jsams.2023.01.002.
13. DiMarco M, Zhao H, Boulicault M et al. Why "sex as a biological variable" conflicts with precision medicine initiatives. *Cell Rep Med* 2022;3(4):100550. doi:10.1016/j.xcrm.2022.100550.
14. Quartiroli A, Vosloo J, Fisher L et al. Culturally competent sport psychology: a survey of sport psychology professionals' perception of cultural competence. *Sport Psychol* 2020;34(3):242–253. doi:10.1123/tsp.2019-0075.
15. The World Medical Association. WMA Declaration of Helsinki - ethical principles for medical research involving human subjects. Available at: <https://www.wma.net/policies-post/wma-declaration-of-helsinki-ethical-principles-for-medical-research-involving-human-subjects/> 2013. Accessed 13 July 2023.
16. Fox A, Bonacci J, Hoffmann S et al. Anterior cruciate ligament injuries in Australian football: should women and girls be playing? You're asking the wrong question. *BMJ Open Sport Exerc Med* 2020;6(1):e000778. doi:10.1136/bmjsem-2020-000778.
17. Schier HE, Gunther C, Landry MJ et al. Sex and gender data collection in nutrition research: considerations through an inclusion, diversity, equity, and access lens. *J Acad Nutr Diet* 2023;123(2):247–252. doi:10.1016/j.jand.2022.09.014.
18. Capranica L, Piacentini MF, Halson S et al. The gender gap in sport performance: equity influences equality. *Int J Sports Physiol Perform* 2013;8(1):99–103. doi:10.1123/ijspp.8.1.99.
19. Braumüller B, Menzel T, Hartmann-Tews I. Gender identities in organized sports—athletes' experiences and organizational strategies of inclusion. *Front Sociol* 2020;5:578213. doi:10.3389/fsoc.2020.578213.
20. Martínková I, Knox T, Anderson L et al. Sex and gender in sport categorization: aiming for terminological clarity. *J Philos Sport* 2022;49(1):134–150. doi:10.1080/00948705.2022.2043755.