

Open search panel



Search

Search the Insight Hub...



Cancel

- [Insights](#)
[Rangahau](#)
- [Events](#)
[Hui](#)
- [Partnerships](#)
[Rangapū](#)
- [Impact](#)
[Whakaaweawe](#)
- About
Mō Mātou
 - [Overview](#)
 - [History](#)
 - [Support](#)
- [☆ 0 Saved](#)


[☆ 0 Saved](#)

 EN 

- [Sign in](#)
- [Submit](#) 

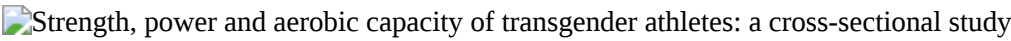


Toggle navigation

[Submit](#) 

Strength, power and aerobic capacity of transgender athletes: a cross-sectional study

Theme:
Participation



Co-authored by Blair Hamilton, Andrew Brown, Stephanie Montagner-Moraes, Cristina Comeras-Chueca, Peter G Bush, Fergus M Guppy, Yannis P Pitsiladis

Abstract

Objective: The primary objective of this cross-sectional study was to compare standard laboratory performance metrics of transgender athletes to cisgender athletes.


Methods: 19 cisgender men (CM) (mean±SD, age: 37±9 years), 12 transgender men (TM) (age: 34±7 years), 23 transgender women (TW) (age: 34±10 years) and 21 cisgender women (CW) (age: 30±9 years) underwent a series of standard laboratory performance tests, including body composition, lung function, cardiopulmonary exercise testing, strength and lower body power. Haemoglobin concentration in capillary blood and testosterone and oestradiol in serum were also measured.


Results: In this cohort of athletes, TW had similar testosterone concentration (TW 0.7±0.5 nmol/L, CW 0.9±0.4 nmol/), higher oestrogen (TW 742.4±801.9 pmol/L, CW 336.0±266.3 pmol/L, p=0.045), higher absolute handgrip strength (TW 40.7±6.8 kg, CW 34.2±3.7 kg, p=0.01), lower forced expiratory volume in 1 s:forced vital capacity ratio (TW 0.83±0.07, CW 0.88±0.04, p=0.04), lower relative jump height (TW 0.7±0.2 cm/kg; CW 1.0±0.2 cm/kg, p<0.001) and lower relative $\dot{V}O_{2max}$ (TW 45.1±13.3 mL/kg/min/, CW 54.1±6.0 mL/kg/min, p<0.001) compared with CW athletes. TM had similar testosterone concentration (TM 20.5±5.8 nmol/L, CM 24.8±12.3 nmol/L), lower absolute hand grip strength (TM 38.8±7.5 kg, CM 45.7±6.9 kg, p=0.03) and lower absolute $\dot{V}O_{2max}$ (TM 3635±644 mL/min, CM 4467±641 mL/min p=0.002) than CM.


Conclusion: While longitudinal transitioning studies of transgender athletes are urgently needed, these results should caution against precautionary bans and sport eligibility exclusions that are not based on sport-specific (or sport-relevant) research.

[Access the full study here](#)

[For a summary of the research, click here](#)


Save this Insight




Print this Insight


Download Insight assets
For use in your own documents

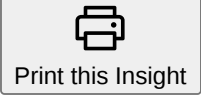
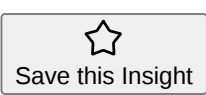
Was this Insight helpful?



Share this Insight

-  [Facebook](#)
-  [Twitter](#)
-  [Email](#)

-  Copy this page's URL



[Email this Insight](#)

 Close 'Download Insight Assets' modal

Download Insight assets

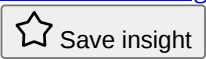
- [Strength, power and aerobic capacity of transgender athletes: a cross-sectional study.pdf](#)
- [Screenshot 2024-09-23 at 15.32.21.png 480KB PNG](#)

Was this Insight useful?



Similar Insights (77)

[Adventures doing a POWA of good](#)

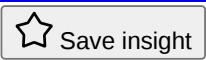


Participation

Adventures doing a POWA of good

By Angela Walker - LockerRoom

[Is Paris 2024 really achieving its goals for gender equality?](#)

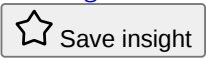


Participation

Is Paris 2024 really achieving its goals for gender equality?

By Victoria University Melbourne Australia - Victoria University | Melbourne Australia

[New legislation for gender identity and sex characteristics in Queensland sport](#)

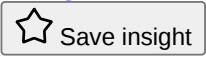


Participation

New legislation for gender identity and sex characteristics in Queensland sport

By Victoria University Melbourne Australia - Victoria University | Melbourne Australia

[Change in Action Week - Innovative Impact FINALIST - Hibiscus Coast Football](#)



Participation

Change in Action Week - Innovative Impact FINALIST - Hibiscus Coast Football

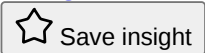
[Change in Action Week - Innovative Impact FINALIST - Active Wāhine](#)



Participation

Change in Action Week - Innovative Impact FINALIST - Active Wāhine

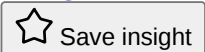
[Change in Action Week - Innovative Impact FINALIST - Kia Ora Academy](#)



Participation

Change in Action Week - Innovative Impact FINALIST - Kia Ora Academy

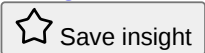
[Change in Action Week - Rangatahi FINALIST - Sylvia Brunt](#)



Participation

Change in Action Week - Rangatahi FINALIST - Sylvia Brunt

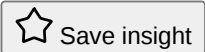
[Change in Action Week - Innovative Impact FINALIST - Wāhine Toa](#)



Participation

Change in Action Week - Innovative Impact FINALIST - Wāhine Toa

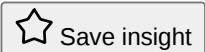
[Change in Action Week - Rangatahi Winner - Carmel College](#)



Participation

Change in Action Week - Rangatahi Winner - Carmel College

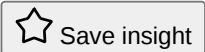
[ADIDAS BREAKING BARRIERS RESEARCH](#)



Participation

ADIDAS BREAKING BARRIERS RESEARCH

[Kiwi women take clean sweep of the Ski Podium at The North Face Frontier 4- Competition](#)



Participation


Kiwi women take clean sweep of the Ski Podium at The North Face Frontier 4- Competition
[GUIDE TO CREATING ACTIVITIES AND EVENTS FOR YOUNG WOMEN](#)

 Save insight

Participation

GUIDE TO CREATING ACTIVITIES AND EVENTS FOR YOUNG WOMEN


By Emma Evans - Sport New Zealand
[A 2024 SURVEY FOR: Women in Trail and Ultrarunning](#)

 Save insight

Participation

A 2024 SURVEY FOR: Women in Trail and Ultrarunning


By Ali Pottinger - Squadrun
[2022 IWG: Christine Young - Integrity in HP Youth Sport](#)

 Save insight

Participation

2022 IWG: Christine Young - Integrity in HP Youth Sport


[2022 IWG: David Cabello - A Gender Policy for Increasing Women’s Representation in Badminton](#)

 Save insight

Participation

2022 IWG: David Cabello - A Gender Policy for Increasing Women’s Representation in Badminton


[2022 IWG: Nicole Terril - Bruce Pulman Park – Collaborating, Connecting, Enabling Our Wāhine in Sport](#)

 Save insight

Participation

2022 IWG: Nicole Terril - Bruce Pulman Park – Collaborating, Connecting, Enabling Our Wāhine in Sport


[2022 IWG: Kirsten Spencer - Sport as a social development tool](#)

 Save insight

Participation


2022 IWG: Kirsten Spencer - Sport as a social development tool

[2022 IWG: Erin Hatton - Driving transformational change](#)

 Save insight

Participation


2022 IWG: Erin Hatton - Driving transformational change
[Understanding Period Poverty Infographic](#)

 Save insight

Participation

Understanding Period Poverty Infographic


By Cheycoda Cocks - Sport Manawatu
[Well Wāhine Week Case Study](#)

 Save insight

Participation

Well Wāhine Week Case Study


By Helayna Ruifrok - Sport Gisborne Tairāwhiti
[Netball Resources for Clubs and School Administrators](#)

 Save insight

Participation

Netball Resources for Clubs and School Administrators


By Jenna Murie - Netball New Zealand
[Girls Smash Modified Girls Only Cricket Programme](#)

 Save insight

Participation

Girls Smash Modified Girls Only Cricket Programme


By Jess Davidson - New Zealand Cricket
[Innovative approaches to encouraging women's participation in Golf](#)

 Save insight

Participation

Innovative approaches to encouraging women's participation in Golf


By Roxanna Holdworth - This is ME
[Netball Volunteer Programme](#)

 Save insight

Participation

Netball Volunteer Programme

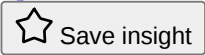
By Jenna Murie - Netball New Zealand
[Mind. Set. Engage. Rugby's mental wellbeing programme.](#)

 Save insight

Participation

Mind. Set. Engage. Rugby's mental wellbeing programme.

[Sport as a Social Development Tool](#)



Participation

Sport as a Social Development Tool

By Kirsten Spencer - Auckland University of Technology

[Netball Player Development Programme](#)

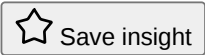


Participation

Netball Player Development Programme

By Alysha Jensen - Netball New Zealand

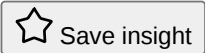
[COACHING GIRLS GUIDE: HOW TO GET \(AND KEEP\) GIRLS PLAYING](#)



Participation

COACHING GIRLS GUIDE: HOW TO GET (AND KEEP) GIRLS PLAYING

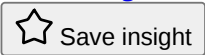
[Why Aussie women's sport needs to talk about fertility](#)



Participation

Why Aussie women's sport needs to talk about fertility

[She Belongs: Building Social Connection for Lasting Participation in Sport](#)

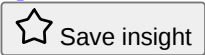


Participation

She Belongs: Building Social Connection for Lasting Participation in Sport

By Canadian Women & Sport - Canadian Women & Sport

[Sport for Sustainable Development: Designing Effective Policies and Programmes](#)



Participation


Sport for Sustainable Development: Designing Effective Policies and Programmes

[The Volunteer Capacity of Community Sports Clubs to Support Women and Girls in Sport](#)

 Save insight

Participation


The Volunteer Capacity of Community Sports Clubs to Support Women and Girls in Sport
[Huge uptick in girls and women playing football in New Zealand](#)

 Save insight

Participation

Huge uptick in girls and women playing football in New Zealand


[Resources on Male Allyship](#)

 Save insight

Participation

Resources on Male Allyship


[Rally Report Insights: Body Confidence](#)

 Save insight

Participation

Rally Report Insights: Body Confidence


[Rally Report Insights: Mental Health](#)

 Save insight

Participation

Rally Report Insights: Mental Health


[What type of uniforms do women want to wear when they referee or umpire sport?](#)

 Save insight

Participation

What type of uniforms do women want to wear when they referee or umpire sport?

[Women & Padel: Start of a love story](#)

 Save insight

Participation

Women & Padel: Start of a love story


[Empowering young women to lead their experiences - Journeys Central Otago](#)

 Save insight

Participation

Empowering young women to lead their experiences - Journeys Central Otago


By Rachel Howells - Sport New Zealand
[Creating safe environments for young women to be active their way](#)

 Save insight

Participation

Creating safe environments for young women to be active their way


By Rachel Howells - Sport New Zealand
[Kōhine māia](#)

 Save insight

Participation

Kōhine māia

By Rachel Howells - Sport New Zealand
[Yeah! Girls Move - Cricket not the way you know it](#)


 Save insight



Participation

Yeah! Girls Move - Cricket not the way you know it


By Rachel Howells - Sport New Zealand
[For young women, by young women - WORD girls-only programme](#)

 Save insight

Participation

For young women, by young women - WORD girls-only programme


By Rachel Howells - Sport New Zealand
[Not just for the "sporty", the Not-So-Sports-Club](#)

 Save insight

Participation

Not just for the "sporty", the Not-So-Sports-Club

By Rachel Howells - Sport New Zealand
[Manawatu Cricket Association case study](#)

 Save insight

Participation

Manawatū Cricket Association case study

By Cheycoda Cocks - Sport Manawatu

[Backyard Smash & Sista Smash](#)

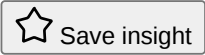


Participation

Backyard Smash & Sista Smash

By Roxanna Holdworth - This is ME

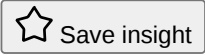
[The female-friendliness of New Zealand's tennis clubs](#)



Participation

The female-friendliness of New Zealand's tennis clubs

[Removing Period Poverty As a Barrier to Participation](#)

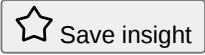


Participation

Removing Period Poverty As a Barrier to Participation

By Roxanna Holdworth - This is ME

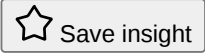
[Te Awamutu AFC starts 2024 off strong with growing demand](#)



Participation

Te Awamutu AFC starts 2024 off strong with growing demand

[Five things to know about women and sport](#)



Participation

Five things to know about women and sport

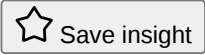
[Has the Olympics become too sexualised? How sex and gender debates drove online discourse](#)



Participation

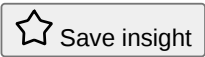
Has the Olympics become too sexualised? How sex and gender debates drove online discourse

[Pacific Women's Leadership Programme Impact - Sela Vaenuku](#)



Participation

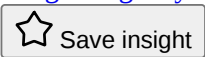
Pacific Women's Leadership Programme Impact - Sela Vaenuku
[IWG: Claire Badenhorst - Iron regulation throughout the lifespan - An active female perspective](#)



Participation

IWG: Claire Badenhorst - Iron regulation throughout the lifespan - An active female perspective

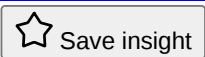
["Beginning Day 1" Checklist: How to Coach and Support Women and Teen Girl Athletes](#)



Participation

"Beginning Day 1" Checklist: How to Coach and Support Women and Teen Girl Athletes

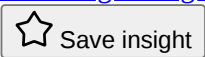
[Nutrition For Female Athletes](#)



Participation

Nutrition For Female Athletes

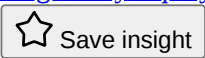
[Coaching through a Gender Lens Infographic](#)



Participation

Coaching through a Gender Lens Infographic

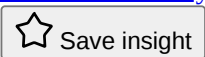
[Angel City Equity House Podcast: Myth Busters presented by Gatorade](#)



Participation

Angel City Equity House Podcast: Myth Busters presented by Gatorade

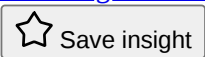
[2022 IWG: Emily Davidson - She Loves Golf Presentation](#)



Participation

2022 IWG: Emily Davidson - She Loves Golf Presentation

[Hikurangi Golf Club president Felice Croft encouraging more women into the sport](#)



Participation

Hikurangi Golf Club president Felice Croft encouraging more women into the sport

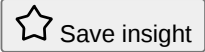
[Running and periods: The myths about exercise and your menstrual cycle, debunked](#)



Participation

Running and periods: The myths about exercise and your menstrual cycle, debunked

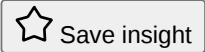
[Updated Pregnancy guidance from UK Sport](#)



Participation

Updated Pregnancy guidance from UK Sport

[IWG: Daenin Roth - Grassroots Role Models Inspiring Change](#)



Participation

IWG: Daenin Roth - Grassroots Role Models Inspiring Change

[IWG: Dr Riki Tesler: Social capital and health among participants in the cachibol league in Israel](#)



Participation

IWG: Dr Riki Tesler: Social capital and health among participants in the cachibol league in Israel

[Young Women Profile - September 2021](#)



Participation

Young Women Profile - September 2021

[IWG: Etsuko Ogasawara - New Way of Thinking to Promote Physical Activity for Girls](#)



Participation

IWG: Etsuko Ogasawara - New Way of Thinking to Promote Physical Activity for Girls

[New Zealand Football Performance & Prevention - Considerations for Female Athletes](#)



Participation

New Zealand Football Performance & Prevention - Considerations for Female Athletes


[IWG: Christine Young - Women in Taekwondo - Over 40 is not Over the Hill](#)

 Save insight

Participation

IWG: Christine Young - Women in Taekwondo - Over 40 is not Over the Hill

[Co-Designing Effective Programmes for Young Girls: Insights and Principles](#)

 Save insight

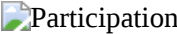
Participation

Co-Designing Effective Programmes for Young Girls: Insights and Principles

By Briana irving - Aktive - Auckland Sport & Recreation

[How To Co-Design A Programme With Participants](#)

 Save insight




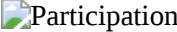
Participation

How To Co-Design A Programme With Participants

By Briana irving - Aktive - Auckland Sport & Recreation

[Empowering Disengaged Girls Through A Participant-Centered Programme](#)

 Save insight




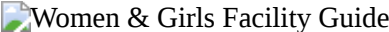
Participation

Empowering Disengaged Girls Through A Participant-Centered Programme

By Briana irving - Aktive - Auckland Sport & Recreation

[Aktive Women & Girls Facility Guide](#)

 Save insight



Participation

Aktive Women & Girls Facility Guide

[Insights to Young Women’s Participation - Webinar #1 "Rethinking the offering"](#)

 Save insight

Participation

Insights to Young Women’s Participation - Webinar #1 "Rethinking the offering"

By Rachel Howells - Sport New Zealand

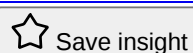
[Insights to Young Women’s Participation - Webinar #2 "Empowering young women to lead their experiences"](#)

 Save insight

Insights to Young Women's Participation - Webinar #2 "Empowering young women to lead their experiences"

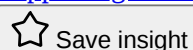
By Rachel Howells - Sport New Zealand

[IWG: Helen Parker - Transgender competitors in women's sport - Change for the better?](#)



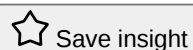
IWG: Helen Parker - Transgender competitors in women's sport - Change for the better?

[Supporting Disabled Teenage Girls to be Active](#)



Supporting Disabled Teenage Girls to be Active

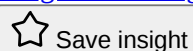
[400 Games: Melony O'Connor Reaches Refereeing Milestone in Sal's NBL](#)



400 Games: Melony O'Connor Reaches Refereeing Milestone in Sal's NBL

By Amy McClintock - Basketball New Zealand

[Insights to Young Women's Participation - Webinar #3 "Focus on Wellbeing and creating a safe environment"](#)



Insights to Young Women's Participation - Webinar #3 "Focus on Wellbeing and creating a safe environment"

By Rachel Howells - Sport New Zealand

Our Partners

- Sport NZ
- NZ Foreign affairs and trade
- US Embassy NZ

[Women in Sport Aotearoa Insight Hub](#) | [Ngā Wāhine Hākinakina o Aotearoa](#)

- [Facebook](#)
- [Instagram](#)
- [LinkedIn](#)
- [TikTok](#)

- [Contact](#)
- [FAQs](#)
- [Privacy policy](#)
- [Terms of use](#)

© 2024 Women in Sport Aotearoa


Subscribe to our newsletter

Receive the latest news, events and insights as we publish them.

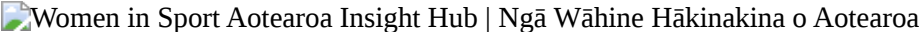
Name:

Email:

[Subscribe](#) >



Close panel



Subscribe to our newsletter

Our weekly email delivering the latest insights as we publish them, tailored to your tastes.

First name:*

Email:*

Preferences

Select those that apply to you to help us customise your Insight Hub experience.

Insight Themes

- ☒ All
- ☒ Leadership
- ☒ Social Change
- ☒ Active Lives
- ☒ High Performance
- ☒ Visibility and Voice

Insight Content Types

- ☒ All
- ☒ Research
- ☒ Case studies
- ☒ News stories
- ☒ Toolkits

Subscribe now >