

Gender Differences in Postural Stability among 13-Year-Old Alpine Skiers - Agnieszka D. Jastrzębska (2020)

Infographic – Jonathan Zuber – Universität Stuttgart – SPF Schneesport 2024

INFORMATION & BACKGROUND

How does **acute fatigue** affect the **postural stability** in **male & female** adolescent alpine skiers?

ACUTE FATIGUE

A temporary decrease in physical and cognitive performance that occurs immediately following intense exercise, like slalom giant skiing.



The WINGATE ANAEROBIC TEST (WAnT)

is used to simulate the characteristics of a slalom giant.



WINGATE TEST (WAnT)

A supramaximal 30-s cycling test for anaerobic performance assessments.



Postural stability & requirements



equilibrium positions



POSTURAL STABILITY

Ability of the body to maintain a **balanced and upright position** while performing skiing maneuvers. This involves the coordination of various sensory inputs, such as **visual**, vestibular and somatosensory.



METHODOLOGY

PARTICIPANTS

19 adolescents (10 girls, 9 boys; mean age: 13.50 ± 1.31) skiing within a winter sports school, blind about the aim of the investigation.

EXPERIMENTAL CONDITIONS

Eyes Open (EO), Eyes Closed (EC), Sway-Referenced Vision (SRV, testing the ability to use visual feedback to control postural sway)

MEASUREMENTS

Center of Pressure (CoP) displacement as the primary metric for assessing **postural stability** (measured via a force platform)

PROCEDURE

1. Pre-Test (EO, EC, SRV)
2. Wingate Anaerobic Test
3. Post-Test (EO, EC, SRV)

RESULTS

AT REST:

- Boys showed better postural stability than girls, indicated by lower CoP displacement values.

POST EXERCISE:

- Differences in stability between boys and girls decreased.
- Boys experience greater changes in postural control due to **fatigue impact**.



VISUAL IMPACT:

- Boys and girls showed better stability with their eyes open (EO).
- With sway-referenced vision (SRV), girls demonstrated more instability.
- Girls relied more on visual cues for maintaining balance.
- With eyes closed (EC), girls exhibited less stability.

Agnieszka D. Jastrzębska (2020)

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Conclusion

Gender Differences: Intrinsic gender differences were found in **postural stability** among young alpine skiers.

- Boys generally exhibit better **stability** at rest, which may be attributed to physiological and biomechanical differences such as muscle strength and center of mass distribution.

Fatigue Effects: Induced by a high-intensity exercise like the WAnT, **fatigue** significantly impacts physical sports performance and **postural stability**.

- While both boys and girls experienced reduced **stability** post-exercise, the effect was more pronounced in boys.

Visual Impacts affect **postural stability**.

- Girls rely more heavily on **visual** cues for maintaining balance, indicating a potential area for targeted training.

Training Implications: Incorporating **visual** feedback training could enhance **postural** control mechanisms, especially for girls.

- Considering visual feedback training and fatigue management strategies tailored to each gender could help improve overall **postural stability** and performance in young alpine skiers.