

# 'Force strength' could indicate bone health in ballet dancers

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“Dance instructors and choreographers welcome research illuminating any correlation between bone density and force generation that has the potential to increase long-term health in dancers”—Mr Weidemann. Credit: Judith Garcia

Ballet dancers' bone health is under investigation in an attempt to understand the long associated risk of bone stress injury—responsible for shattering the careers of many talented performers.

The study, by ex-professional ballet dancer Penelope Blanco of Edith Cowan University's School of Exercise and Health Sciences, assessed bone health in local ballet [dancers](#) across age and performance levels.

"Previous studies have been done on the relationship between bone health and injury occurrence, however little research has investigated the

effect of bone health in ballet dancers across age and performance level," Ms Blanco, who is also a Masters candidate, says.

Ms Blanco says young [ballet dancers](#) can eat very little to stay thin, overtrain, suffer decreased hormone levels, amenorrhea and risk low [bone density](#), stress fractures and osteoporosis.

Western Australian Academy of Performing Arts (WAAPA) classical dance lecturer Andries Weidemann shares similar concerns.

He says the skills required of dancers demands that they train intensely from a very young age, across the growth spectrum into adulthood.

"Many dancers' careers are curtailed by injuries that involve bones and since bone density [or lack thereof] seems to be a contributing factor, the scientific exploration and possible preventative action is of immense interest to dance teachers and practitioners," Mr Weidemann says.

The cross-sectional study involved a comparison between fulltime ballet students (~16 years-old), university students (~20.4 years-old) and professional dancers (~23.8 years-old) assessing their [bone mineral content](#) (BMC) and [bone mineral density](#) (BMD) values.

Physiological characteristics such as body composition, isometric strength (muscle strength), anaerobic and aerobic capacity were measured.

Isometric peak force (IPF) was assessed as this is known to influence dancers jump ability. This was quantified by rate of force development (RFD).

"We know that to achieve greater force a dancer must have greater muscular strength," says Ms Blanco.

Dual energy x-ray absorptiometry scans measured the BMC and BMD of the three groups.

Results found a positive correlation between a ballet dancer's strength values (IPF) and their BMC and BMD scores and rate of force development.

The most significant difference was noted between the adolescent full time students and the young adult university group.

Ms Blanco says the practical application of the research would involve measuring a dancer's isometric strength as a predictor of [bone health](#).

"Dance instructors and choreographers welcome research illuminating any correlation between bone density and force generation that has the potential to increase long-term health in dancers," Mr Weidemann says.

Provided by Science Network WA

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