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# Exploring the Impact of Yoga on Postural Control: An Interventional Study in Healthy Adolescents and Young Adults

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## Résumé

### Abstract

Background: Postural control, essential for maintaining balance, undergoes significant maturation from adolescence to adulthood. Yoga, a holistic practice, has shown promise in enhancing postural stability, yet its effects across different age groups remain understudied. This study aimed to assess the impact of an 8-week yoga intervention on postural control in healthy adolescents and adults.

Method: Eighteen adolescents ( $13 \pm 0.19$  years) and 18 adults ( $19.7 \pm 0.64$  years) completed eight 2-hour Hatha yoga sessions, one per week. Postural control was assessed using a stabilometric platform to measure center of pressure (CoP) parameters, including 90% confidence ellipse surface area, velocity, and mediolateral (ML) and anteroposterior (AP) amplitudes. Those parameters were assessed under eyes-open (EO) and eyes closed (EC) conditions. Mixed-effects ANOVA evaluated time (pre/post), group (adolescents/adults), and interaction effects.

Results: Under EO, the yoga intervention demonstrated significant main effects, with improvements in surface area ( $p = 0.005$ ), CoP velocity ( $p < 0.001$ ), and ML ( $p = 0.003$ ) and AP ( $p = 0.008$ ) amplitudes. Adolescents showed greater baseline instability than adults (CoP velocity:  $p < 0.001$ ; amplitudes:  $p \leq 0.005$ ). A significant group  $\times$  time interaction for CoP velocity ( $p = 0.045$ ) revealed larger reductions in adolescents ( $-1.2$  mm/s) than adults ( $-0.5$  mm/s). No significant time effects were observed under EC. However, a significant group effect for AP amplitude ( $p = 0.045$ ) indicated greater postural instability in adolescents compared to adults in this condition.

Conclusions: An 8-week yoga program significantly improves postural stability in healthy individuals (adults and adolescents), only under EO conditions, with adolescents showing pronounced gains in stability with a greater reduction of CoP velocity. Given the intervention's reduced effectiveness in EC, future protocols should incorporate proprioceptive training strategies, for example, deliberate practice under visual deprivation. These findings advocate for integrating yoga into physical education to support postural development, especially during adolescence. Future research should explore multisensory training and longitudinal designs to elucidate yoga's role in balance adaptation across the lifespan.

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\*Intervenant