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Differences in Static Postural Control Performance Between Athletes who are Hearing and Athletes who are Deaf or Hard-of-Hearing

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OBJECTIVE
To determine if differences exist in static postural control performance between athletes who are hearing and athletes who are deaf or hard-of-hearing (D/HoH).

DESIGN AND SETTING
Cross-sectional design. Athletic training facilities.

PARTICIPANTS
Varsity athletes who are D/HoH (n=41, 20.56±1.90 yrs., 1.73±0.08 m., 79.29±18.67 kg.) and university club-level athletes who are hearing (n=103, 20.08±1.62 yrs., 1.76±0.09 m., 78.20±12.26 kg.) volunteered to participate in the study.

INTERVENTION
Participants completed static postural control assessments in double-limb stance with feet together and hands crossed over the chest under the following conditions: 1) eyes open (EO) on firm surface, 2) eyes closed (EC) on firm surface, 3) EO on foam surface, and 4) EC on foam surface.

MAIN OUTCOME MEASURE
Center of pressure (CoP) data were collected on a tri-axial force plate. Total, anterior-posterior (AP), and medial-lateral (ML) CoP excursion, AP and ML CoP range, AP and ML amplitude root-mean square (RMS), and sway area were calculated. Mixed-model ANOVAs were performed to test the effects of hearing status and condition on postural control. Alpha level was set *a priori* at $p<0.05$.

RESULTS
There was a main effect of condition on total, AP, and ML excursion, ML range, AP and ML RMS, and sway area ($p<0.01$). There was a main effect of hearing status on total ($p=0.03$) and ML ($p=0.01$) CoP excursion, ML range ($p<0.01$), ML RMS ($p<0.01$), and sway area ($p<0.01$). There was an interaction effect on AP range ($p=0.02$).

CONCLUSION
Athletes who are D/HoH were less stable compared to athletes who are hearing. These differences may suggest implications of sensory deficits, specifically vestibular stimuli, between athletes who are hearing and athletes who are D/HoH. Baseline assessments of static postural control performance of athletes who are D/HoH may be necessary rather than using normative data from athletes who are hearing to evaluate performance and guide return-to-play decision making following injury.

KEY WORDS: *Balance, mCTSIB, Disability*