
The impact of female breast size on cutaneous thermal, wetness and tactile sensitivity

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Abstract

Tactile, wetness and thermal sensations across the female breast can significantly impact bra comfort. Little is known about the impact of breast size despite breast development varying largely amongst individuals. We aimed to investigate breast-size dependent, regional differences on tactile, wetness and thermal sensations in rest and exercise. Fifteen healthy females (24±7yr) with varying breast sizes (breast surface area (BrSA) range=147.2-480.5cm²) reported on two visual analogue scales wetness and thermal sensations arising from cold- and warm-wet stimuli (±5 from local skin temperature) applied to the nipple, 3cm above and below, and bra triangle, under resting thermo-neutral conditions. Tactile thresholds were also determined at the nipple, areola edge, and 3cm below, at rest and following 50-min running in 32°C heat. Linear regression analysis was used to evaluate the association between cutaneous sensitivities and BrSA.

Cold-wetness (R²=0.32, *p*=0.03) and warm-thermal sensitivities (R²=0.46, *p*=0.01) increased with decreasing BrSA, although this applied to the nipple and above the nipple only. Tactile sensitivity increased with decreasing BrSA at all tested skin sites (nipple: R²=0.30, *p*=0.03; areola: R²=0.39, *p*=0.01; 4cm below: R²=0.36, *p*=0.02), and it also decreased post-exercise at the nipple (*p*< 0.001) and across all breast sizes.

Our findings indicate that cutaneous sensitivity increases with smaller breasts, although the consistency of this varies depending on the skin site and sensory modality (e.g. thermal vs. tactile). Variations in cutaneous innervation density amongst breast sizes may drive the observed differences, although neuro-anatomical and -physiological evidence is required to confirm this.

Keywords: Thermal sensation, Wetness perception, Tactile sensation, Breast, Female thermoregulation

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