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Short-Term Changes in Phase Angle as a Marker of Early Response in a Workplace Obesity Programme

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Introduction:

In obesity management, early response to lifestyle intervention is often assessed by changes in body weight. However, short-term weight change may not reflect meaningful improvements in metabolic or muscle-related health. Whole-body phase angle, derived from bioelectrical impedance analysis, reflects cellular integrity and body fluid balance and may provide an early signal of beneficial adaptation. This study examined short-term changes in phase angle and related body composition indices in adults participating in a workplace obesity programme.

Methods:

This longitudinal analysis used paired body composition data from adults enrolled in *Commit 2 Fit: 12 Months to a Healthier, Happier You* at the Faculty of Medicine, Universiti Malaya. Participants assessed at two time points—October and December 2025—were included. A total of 44 adults with complete paired data underwent assessment using multi-frequency bioelectrical impedance analysis (InBody 970). Measures included whole-body phase angle (50 kHz), body weight, visceral fat area, body cell mass, and extracellular water to total body water ratio. Paired comparisons and correlation analyses were performed.

Results:

Mean whole-body phase angle increased from $5.49 \pm 0.96^\circ$ to $5.63 \pm 0.94^\circ$ over two months ($p = 0.01$), despite modest and variable changes in body weight. Improvements in phase angle were associated with increases in body cell mass ($r = 0.46$, $p < 0.01$) and reductions in extracellular water proportion ($r = -0.49$, $p < 0.001$). Approximately 35% of participants showed improved phase angle despite minimal weight loss or slight weight gain.

Conclusions:

Whole-body phase angle appears to be a sensitive early marker of beneficial metabolic and cellular changes during obesity intervention. Its use may help clinicians identify positive responses beyond weight loss alone and support more individualised obesity management strategies.