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**Abstract:**

**Title:** Assessing the Psychological Processes Impacted by a Technology-Assisted Weight Loss Maintenance Program (NULevel Trial)

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**Background:** NULevel was a registered randomized control trial to evaluate a technology-assisted weight loss maintenance (WLM) program in the UK (Evans et al., 2015). The program included: (1) a face-to-face goal-setting session; (2) an internet platform, a pedometer, and a wirelessly connected scale to monitor and report diet, physical activity, and weight, and; (3) regular automated feedback delivered by mobile phone, tailored to participants' goal progress. Components were designed to target psychological processes linked to weight-related behaviours; however, Sniehotta et al. (2019) found no difference in weight gain between the intervention and control groups after 12 months. It is unclear whether the program failed to alter the targeted psychological processes, or whether changes in these processes failed to influence WLM outcomes.

**Objective:** We evaluate whether the program influenced 16 key psychological processes (e.g., self-efficacy and automaticity towards dietary & physical activity behaviours), and whether these processes (at 6 months) were associated to successful WLM (at 12 months).

**Methods:** 288 adults were randomized to the intervention or control groups. The control group only received a wireless scale and standard advice via quarterly newsletters. Assessments were at 0, 6, and 12 months.

**Results:** The intervention significantly altered 10 of the 16 psychological processes, compared to the control group. However, few processes were associated with WLM (i.e., weight regain), leading to a lack of indirect effects of the intervention via the processes on WLM.

**Conclusion:** The targeted psychological processes were insufficient to elicit changes in WLM. Future efforts should consider alternate processes to target.