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Does continuous glucose monitoring influence adherence to time-restricted eating?

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Obesity is a significant health issue in Aotearoa; effective and pragmatic strategies to facilitate weight loss are urgently required. Growing recognition of the circadian rhythm's impact on metabolism has popularised diets like time-restricted eating (TRE)[1]. The 16:8 TRE method involves limiting food intake to an 8-hour daily eating window and can lead to weight loss without other substantial changes to diet[2]. Nonetheless, TRE requires accountability and tolerating hunger for short periods. Continuous glucose monitors (CGM) are small wearable biofeedback devices that measure interstitial glucose levels scanned via smartphones. By providing immediate feedback on the physiological effects of eating and fasting, CGM use may promote adherence to TRE[3]. This pilot study aimed to 1) investigate how CGM affects adherence to TRE and 2) assess the feasibility of CGM use while undertaking TRE. This two-arm randomised controlled trial enrolled healthy adults from Dunedin, assigning them to TRE-only or TRE+CGM groups for 14 days. Successful adherence to TRE was defined *a priori* as maintaining an 8-hour eating window on 80% of days. CGM feasibility was defined *a priori* as scanning the glucose monitor thrice daily on 80% of days. Secondary outcomes included well-being, anthropometry, glucose levels, and overall TRE and CGM experiences via semi-structured interviews. Twenty-two participants were randomised into two groups: TRE-only (n = 11) and TRE+CGM (n = 11, with n = 2 excluded from analysis post-randomisation for medical reasons). Participants had a diverse range of ethnicities, the mean age was 32 (+/-14.9) years, and 55% were female. The TRE+CGM group adhered to the 8-hour eating window for an average of 10.0 days (range 2-14) compared with 8.6 days (range 2-14) in the TRE-only group. Both groups had similar mean eating window durations of 8.1 hours. Five (56%) participants in the TRE+CGM group achieved the *a priori* criteria for TRE adherence, compared to 3 (27%) in the TRE-only group. Participants in the TRE+CGM group performed an average of 8.2 (+/-5.6) daily scans, with n = 7 (78%) of participants meeting the *a priori* CGM feasibility criteria. Neither group reported consistent adverse psychological impacts in DASS-21 and WHO-5 scores. Interviews highlighted that CGM increased hunger tolerance during fasting as participants felt reassured by their normal glucose levels. CGM aided TRE accountability by acting as a biological tracker of food intake. Participants reported that TRE led to improved energy and self-efficacy, a more productive daily routine, and healthier food choices. Promisingly, 72% of participants would use CGM and undertake TRE in future. This study demonstrates that using CGM while undertaking TRE is feasible and can improve adherence by enhancing hunger tolerance and accountability. Overall, participants experienced increased awareness of eating habits and physiological mechanisms. Over the longer term, this simple and synergistic approach may be a helpful weight loss strategy.

Keywords: time-restricted eating; continuous glucose monitoring; adherence; weight loss

Ethics Declaration

Yes

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