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Feasibility of ecological momentary assessment to characterize adolescent postoperative diet and activity patterns after weight loss surgery

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Abstract

Background: Adherence to postoperative lifestyle recommendations may be associated with weight outcomes among weight loss surgery (WLS) patients, but it is difficult to objectively assess and has not been reported among adolescents. Methods of assessment that are ecologically valid and provide important contextual information related to adherence are needed. The objective of this pilot study was to demonstrate the feasibility of using a form of ecological momentary assessment (i.e., daily phone diaries; DPD) to assess postoperative diet and activity patterns among a sample of adolescent WLS patients to determine adherence to best-practice lifestyle recommendations.

Setting: University Hospital.

Methods: Eight adolescent WLS patients completed 3 consecutive DPDs at 12 and 18 months postsurgery.

Results: Ninety-four percent of DPD's were completed with an average 20.9 ± 5.0 activities/day. Although adolescents engaged in recommended lifestyle behaviors (e.g., ≥30 min moderate physical activity/d; duration of meals/snacks ≥20 min) some of the time, few were adherent to postoperative physical activity and dietary recommendations the majority of the time.

Conclusion: The DPD provides a feasible and informative methodology for assessing adherence behaviors among adolescent WLS patients. It is a relatively low burden method that may be useful in identifying behavioral targets for postoperative intervention. Adherence to postoperative lifestyle recommendations may be a serious concern among this cohort. These preliminary data shed light on potential targets for postoperative intervention. Targeting nonadherence is essential in not only improving health outcomes but in deciphering the true potential effectiveness of WLS in this at-risk population. (Surg Obes Relat Dis 2014;▮:00–00.)

Keywords: Adolescent; Bariatric; Adherence; Physical activity; Diet; Daily phone diary

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Adherence to postoperative eating and physical activity recommendations may be important in determining sustained weight loss or weight maintenance after weight loss surgery (WLS). This may prove especially critical after energy homeostasis involving hormonal, neuronal, and nutrient signals becomes more assimilated after the first year [1,2]. Within the WLS literature, few studies have examined adherence to recommended postoperative lifestyle behaviors [3–11]. The majority of patients in these adult-focused studies self-report nonadherence to at least 1 postoperative recommendation, with insufficient physical activity and snacking predominating [4,9]. Among adolescents, 1 retrospective study revealed poor self-reported adherence with exercise and dietary recommendations approximately 6 years postoperatively [10], with another prospective study revealing low rates of electronically monitored postoperative multivitamin adherence (27–37%) [11]. Accurately assessing adherence is essential, with evidence-based assessment recommendations including use of innovative technologies that provide a window into "real time" behaviors and detection of barriers to adherence [12].

One such innovative methodology recommended for use with WLS patients is ecological momentary assessment (EMA) [9]. EMA involves a range of methods that allow participants to report on symptoms, effect, behavior, and cognitions in close to real time in their natural environment with repeated sampling over time [13]. EMA has been found to be feasible and informative in assessing postoperative adherence among adult bariatric patients, revealing greater adherence for simple (e.g., taking medication) versus complex (e.g., exercising 30+ min/d) behaviors [9].

Daily phone diaries (DPD) are "a special case" of EMA that utilize a fixed interval, retrospective, coverage strategy to provide a fine-grain snapshot of time allocation across a 24-hour period. DPDs are sensitive to contextual influences (e.g., social and environmental persuasions), providing information that elucidates barriers to adherence. A small number of studies have utilized DPD with adolescents but, to the authors' knowledge, no DPD studies have been conducted with an adolescent WLS cohort [14–16].

To begin to address this gap, this pilot study seeks to demonstrate the feasibility of using DPD to assess postoperative diet and activity patterns among a sample of adolescent WLS patients. Based on prior DPD studies with adolescents with cystic fibrosis, we hypothesize adolescents will be amenable to this methodology as indicated by high completion rates of DPD [15]. Secondly, we aim to broadly characterize activity patterns (e.g., work, school, food-related activities) and engagement in active and sedentary behaviors in WLS patients at 12 and 18 months postoperatively. Finally, we aim to estimate rates of adherence with clinically-determined postoperative lifestyle recommendations (i.e., $\geq$30 min moderate physical activity/d) and dietary recommendations (i.e., duration of meals/snacks $\geq$20 min, 3–6 meals/d, eating within 1 hr of waking and $\geq$1 hr before bed) [9]. We hypothesize few adolescents will be adherent to recommendations based on the adult WLS literature and evidence of low adherence in this developmental cohort [9,11,17].

Methods

The present study is a single-site ancillary study executed within the multisite prospective observational Teen Longitudinal Assessment of Bariatric Surgery (Teen-LABS) Consortium. Teen-LABS inclusion criteria included: 1) approval by multidisciplinary clinical team to undergo WLS, 2) age $\leq$19 years at time of surgery, and 3) ability to provide informed consent/assent to study procedures, as described elsewhere [18]. Participants in Teen-LABS completed baseline study procedures, including anthropometric measures, medical and surgical assessments, and psychosocial and adherence measures within 1 month before surgery, 6-months, and annually after the date of WLS.

A trained research coordinator approached Teen-LABS participants who were time-eligible after completion of their 12-month study visit and during the study enrollment window (July 2009–January 2011) to assess interest and obtain consent/assent. DPDs were scheduled within 4 weeks of study enrollment and again at 18 months postoperatively. The lead author (M.R.) completed 3 consecutive (2 weekday, 1 weekend) calls, each oriented to the prior 24 hours. Calls were scheduled at the same time every day to ensure contiguous reporting across consecutive days. Lifestyle recommendations consistent with published guidelines were reinforced during participants' postoperative clinical appointments (scheduled at 2 and 4 wk, 3, 6, and 12 mo postoperatively). Institutional Review Board approval was obtained, and gift cards ($30) were provided.

Measures

Daily phone diary. The DPD facilitates individuals' recall of activities over the previous 24 hours to provide a detailed analysis of activity patterns. While guiding participant using structured prompts, the interviewer records activities lasting $\geq$5 minutes using a computer interface. Participants' report the type of activity they engaged in, duration of activity, who was present, and their mood. For example, "At 6:15 pm, I ate dinner with my mom and brother in the kitchen. My mood was positive." Prompts are provided to aide recall (e.g., "after dinner, what did you do next?"). The DPD has reliable stability coefficients over a 3-week period (rs = .61–.71, $P < .01$) and high levels of inter-rater reliability (>90%) in cystic fibrosis samples [19]. The DPD has been identified as a "well-established" measure of adherence [12,20]. The first author received >20 hours of