Statistical Analysis Plan

Study Title: StandUPTV: Reducing Sedentary Screen Time in Adults
NCT: 04464993

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Statistical Design and Power

Study Design. Table C4.1-1 outlines each experimental condition in this factorial experiment. All participants will be provided with the "core" intervention (i.e. education and basic STANDUPTV app) and randomized to none (i.e., app-based self-monitoring only), one, two, or all three of the intervention components. For example, a participant randomized to experimental condition 1 would get all intervention components, whereas a participant randomized to experimental condition 5 would receive only the TEXT and EARN components. This design should <u>not</u> be viewed as an 8-arm RCT where adequate power is required to detect all between-arm differences. Instead, in a factorial experiment, conditions are combined in highly efficient ways to produce estimates of main effects and interactions (i.e., synergistic/antagonistic responses to different combinations of components). Our design will test three main effects (LOCKOUT, TEXT, EARN), three 2-way interactions (LOCKOUT x TEXT, LOCKOUT x EARN, TEXT x EARN), and one 3-way interaction (LOCKOUT x TEXT x EARN).

Table C4.1-1. Experimental conditions for optimization trial.

Exp Condition	n	LOCKOUT	TEXT	EARN
1	25	YES	YES	YES
2	25	YES	NO	YES
3	25	YES	YES	NO
4	25	YES	NO	NO
5	25	NO	YES	YES
6	25	NO	NO	YES
7	25	NO	YES	NO
8	25	NO	NO	NO

Power Analysis. We aim to <u>enroll 240 participants to achieve a final sample of 200 (20% dropout; n=25 per condition)</u> for the 16-week intervention period. For ANCOVA models under the **Primary Aim**, N=200 will afford power of .80 to detect moderate main effects (d = 0.4) for each of the intervention components (LOCKOUT, TEXT, and EARN) and resultant two- and three-way interactions, assuming a modest baseline to post-intervention correlation (r=.3) and α =.05. We have chosen to power this study on a Cohen's d effect size = 0.4 as this represents a 60 min/day reduction in sedentary behavior observed in a previous using the activPAL (**C2.2**). This effect size estimate is conservative compared to much large effects (d > 1.0) from previous SST trials; however, our power is representative of achieving our statistical power to detect our optimization criteria of reducing SST by 60 min/day.