

## Goal Setting to Promote a Health Lifestyle

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**Abstract.** The purpose of this parallel-group study was to determine whether a feasibility study based on newsletters and telephone counseling would improve goal-setting constructs; physical activity (PA); and fruit and vegetable (F & V) intake in a sample of older adults. Forty-three older adults (*M* age = 70 years, >70% Asian, 54% female) living in Honolulu, Hawaii were recruited and randomly assigned to either a PA or F & V intake condition. All participants completed measures of PA, F & V intake, and goal setting mechanisms (i.e., specificity, difficulty, effort, commitment, and persistence) at baseline and 8-weeks. Paired *t*-tests were used to evaluate changes across time. We found that F & V participants significantly increased F & V intake and mean scores of goal specificity, effort, commitment, and persistence (all *p* < .05). No statistically significant changes in PA or goal setting mechanisms were observed for participants in the PA condition. Overall, our results show that a short-term intervention using newsletters and motivational calls based on goal-setting theory was effective in improving F & V intake; however, more research is needed to determine whether these strategies are effective for improving PA among a multiethnic sample of older adults.

**Keywords:** Diet, Physical activity, Parallel-group, Randomized

### 1. Introduction

Goal setting is an important element in physical activity (PA) and dietary interventions. Goal-setting techniques are effective in helping individuals initiate and maintain health behavior over time (Shilts, Horowitz, & Townsend, 2004). Meta-analytic results suggest that participants in goal-setting conditions significantly increase fiber intake, report fewer dropouts in physical activity interventions, demonstrate higher exercise adherence, and reduce dietary sodium intake (Shilts et al., 2004). Setting specific and challenging goals leads to improved health behavior. Constructs of goal setting theory such as effort toward goal-related activities, persistence (i.e., time and intensity spent on goal-related tasks), and commitment (i.e., one's attachment or determination to reach a goal), have been shown to mediate and/or moderate goal setting and outcomes (Locke & Latham, 2002, 2006). In particular, the relation between goal setting and performance is strongest when people set specific challenging goals, are committed, expend effort to accomplish goals, persist despite barriers, and have higher levels of confidence.

Previous interventions based on goal-setting have not assessed whether these interventions are associated with improvements in mechanisms of the goal-setting process. Therefore, the purpose of this parallel-group intervention study was to assess whether participating in a goal-setting intervention is associated with changes in theoretically-related mechanisms that influence behavior change. Specifically, older adults aged 55 and older were randomized to a goal-setting intervention for PA or fruit and vegetable (F & V) intake to determine whether interventions produce differential effects in goal specificity (i.e., the degree of precision with which the aim is specified); goal difficulty (i.e., the degree of complexity needed to accomplish a

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specified task); effort; commitment; persistence; and task-specific (i.e., beliefs in one's ability to perform a specific task) and barrier self-efficacy (i.e., belief in one's ability to overcome barriers to a specific task).

## 2. Methods and Materials

**Study Population.** Study participants were recruited in October 2006 from a senior fair in Honolulu, HI. Eligible participants were  $\geq 55$  years of age and able to participate in physical activity  $\geq 10$  minutes at a moderate-intensity pace and consume a diet high in fiber. The Institutional Review Board of the University of Hawaii approved the study protocol.

**Study Design.** A randomized, parallel-group experimental design was used. Participants were randomized to either a PA or F & V goal-setting condition and were given \$10 gift cards as incentives for participation. Participants in both condition received telephone counselling and group tailored newsletters.

**Telephone Counseling.** Participants received calls at baseline and 4-weeks. During each call, the intervention specialist: (a) helped the participant set/evaluate a short-term goal(s); (b) discussed/reviewed the importance of specificity and difficulty in the goal-setting process; and (c) discussed/evaluated barriers and ways to overcome each barrier. The format for the second call was similar with the additional introduction of the concepts of *effort*, *commitment*, and *persistence*. Call times ranged from 15 to 25 minutes.

**Newsletters.** Newsletters were mailed out after the baseline assessment and telephone counselling in weeks 5 and 9. The initial newsletters reinforced the telephone counseling calls and provided information on the benefits of PA or F&V consumption. The second provided strategies to overcome barriers to meeting goals to PA or F&V.

**Study Measures.** All outcome measures and mechanisms of the goal-setting process were assessed by trained staff during the baseline assessment and 8-week follow-up intervention.

*PA* was measured using an adaptation of the Godin Leisure-Time Exercise Questionnaire (GLTEQ), which assessed mild (i.e., takes minimal effort), moderate (i.e., increases your heart and breathing rate a little), and strenuous activity (i.e., caused one's heart to beat rapidly) for at least 30 minutes at a time. The GLTEQ has adequate test-retest reliability and is significantly associated with objective measures of physical activity (Godin, Jobin, & Bouillon, 1986).

*F & V consumption* was assessed by asking two questions: "How many servings of fruits do you eat each day?" and "How many servings of vegetables do you eat each day?" The validity of the two-item instrument was established in a separate study by significant correlations with a longer 19-item inventory and 24-hour dietary recalls (Resnicow et al., 2000).

The original *goal specificity and difficulty* measures were designed to take into account the multi-component nature of physical activity by rating items in terms of frequency, type, duration, and intensity of PA or F&V intake per week. Each subscale was rated on a six-point, Likert-type scale. A score of zero was provided for participants who reported that they were not setting goals. The remaining scale was rated from one (strongly disagree) to five (strongly agree). The original goal specificity and difficulty measures demonstrated adequate reliability, factorial validity, and predictive validity in a previous study (Frahm-Templar, Estabrooks, & Gyurcsik, 2003).

Author-created subscales used to assess *effort*, *commitment*, and *persistence* were created for each concept based on the conceptual definitions proposed by Locke and Latham (1990). Sample items for effort, commitment, and persistence, respectively, include: "I'm going to put a lot of *effort* into reaching my goals," "I am *committed* to pursuing my exercise goals," and "Even if I don't reach my short-term exercise goals, I will continue to pursue them." Each subscale was rated on a six-point, Likert-type scale. A score of zero was provided for participants who reported that they were not setting goals. The remaining scale was rated from one (strongly disagree) to five (strongly agree). The investigator-created scales appeared to have adequate face validity (E. Locke, personal communication, 2006).

**Data Analysis.** Chi-square and t-tests were used to determine whether intervention conditions differed in terms of demographic variables. Paired t-tests were used to determine whether groups improved significantly on study outcomes and goal-setting mediators and moderators. Between-group differences over time were

examined with the nonparametric Kruskal-Wallis test. In addition, adjusted (i.e., partial) correlation coefficients were computed to determine whether changes in mechanisms (e.g., specificity and difficulty) of goal-setting theory were associated with changes in PA and F & V consumption. Correlations were adjusted for baseline measures of PA or F & V intake. These data were analyzed using SAS version 9.13 software, and statistical significance ( $p < 0.05$ ) was determined using two-sided tests.

### 3. Results

**Descriptive Characteristics.** Twenty-one participants were randomized to the PA condition, and 22 participants were randomized to the F & V condition. No significant differences were observed between study condition with respect to descriptive characteristics (all  $p > .05$ ; see Table 1).

Table 1. Demographic characteristics of older adults participating in a goal-setting intervention

Characteristic	Total <i>N</i> = 43	PA <i>n</i> = 22	F & V <i>n</i> = 21	<i>p</i> -value
Age, <i>M</i> ( <i>SD</i> )	69.8 (8.65)	71.5 (9.7)	68.2 (7.3)	0.08
Sex, <i>n</i> (%)				0.66
Male	19 (45.2)	9 (42.9)	10 (47.6)	
Female	23 (54.8)	12 (57.1)	11 (52.4)	
Ethnicity, <i>n</i> (%)				0.24
White	11 (26.2)	7 (33.3)	4 (19.0)	
Hawaiian/Pacific Islander	5 (11.9)	2 (9.5)	3 (14.3)	
Chinese	5 (11.9)	3 (14.3)	2 (9.5)	
Filipino	4 (9.5)	1 (4.8)	3 (14.3)	
Japanese	12 (28.6)	6 (28.6)	6 (28.6)	
Portuguese	2 (4.8)	1 (4.8)	1 (4.8)	
Other	3 (7.1)	1 (4.8)	2 (9.5)	
Education, <i>n</i> (%)				0.12
High school or less	8 (19.0)	2 (9.6)	6 (28.6)	
Some college or more	34 (81.0)	19 (90.5)	15 (71.4)	

*M* = mean; *SD* = standard deviation; PA = Physical Activity; F & V = Fruit and Vegetable. Sample sizes may vary due to missing data

**Change in F & V intake and PA.** F & V participants significantly increased the mean servings of fruits and vegetables consumed ( $p < .05$ ), whereas PA participants did not significantly increase physical activity ( $p > .05$ ). Interestingly, PA participants significantly improved F&V consumption ( $p > .05$ ). The treatment-by-time interactions were not significant ( $p > .05$ , see Table 2).

**Change in goal-setting mechanisms/moderators.** F&V participants significantly increased goal mechanisms throughout the study period (all  $p < 0.05$ ), whereas no significant improvements in goal mechanisms were observed among PA participants (all  $p > 0.05$ ). The change in goal effort, commitment, and persistence among participants in the F&V condition was significantly greater than that of the PA condition.

### 4. Discussion

In this study, we found that participants randomized to a F & V intervention significantly improved F & V intake and constructs related to the goal-setting process. We are reminded to say that the change in F&V intake was not significantly different between conditions. The results from our research suggest that goal setting can be an effective strategy to improve dietary intake and mechanisms of goal-setting theory in an ethnically diverse sample of older adults.

The results we observed were similar to those observed in other behavioral interventions that demonstrated improvements in dietary behavior but not PA (Resnicow et al., 2004). We believe that the reduction observed in PA could be due to participants reporting at the upper ends of the exercise scale and gradual “regression to the mean” was observed. In addition, maintaining high levels of PA or improving PA may require greater preparation and resources than that needed for increasing F & V consumption.

Interestingly, the PA participants increased their F & V consumption from baseline to follow-up, which may be due, in part, to alternate goal specification when previously set goals are thwarted.

The results among the F & V participants were similar to those observed in previous research examining goal-setting theory in health promotion studies (Kyllo & Landers, 1995; Shilts et al., 2004). For example, Gyurcsik and colleagues (2003) found that goal specificity and difficulty (e.g., setting challenging PA goals) were associated with aquatic exercise attendance, whereas Dishman and colleagues (2009) found that setting challenging goals and higher levels of self-efficacy and commitment were significantly associated with greater increases in PA. Although change in F&V intake was not significantly different from that of the PA condition, a 1.85 serving increase is large in magnitude and provides evidence that goal-setting is a consistent determinant of health behavior change.

Overall, our results indicate that the theoretical constructs of goal-setting theory are associated with changes in health behavior. Although our sample sizes were small and all of our instruments were self-report, our results show that a short-term, inexpensive goal-setting intervention using motivational calls and newsletters can be effective in significantly improving F & V intake.

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Table 2. Intervention Outcomes, Mediators, and Moderators of Older Adults Participating in a Single-Behavior Goal-Setting Intervention

	Baseline M (SD)	Follow-up M (SD)	p-value Change	p-value Difference
MET-Minutes PA per week, median (95%CI)				0.078
PA condition	990 (649, 1088)	570 (454, 907)	0.067	
F & V condition	420 (338, 737)	600 (327, 777)	0.844	
Total F & V servings				0.263
PA condition	4.07 (2.3)	5.22 (2.1)	0.048	
F & V condition	4.15 (2.5)	6.0 (2.1)	0.002	
Goal specificity				0.179
PA condition	2.6 (1.7)	3.3 (1.8)	0.165	
F & V condition	1.1 (1.8)	3.1 (1.4)	<0.001	
Goal difficulty				0.329
PA condition	1.8 (1.4)	2.3 (1.5)	0.100	
F & V condition	0.7 (1.1)	1.6 (1.0)	0.010	
Goal-setting effort				0.013
PA condition	3.2 (1.9)	3.6 (1.9)	0.434	
F & V condition	1.2 (2.0)	4.0 (1.5)	<0.001	
Goal-setting commitment				0.009
PA condition	3.3 (2.0)	3.6 (1.8)	0.526	
F & V condition	1.5 (2.1)	4.1 (1.5)	<0.001	
Goal-setting persistence				0.007
PA condition	3.4 (2.0)	3.8 (1.9)	0.492	
F & V condition	1.5 (2.1)	4.2 (1.5)	<0.001	

SD = standard deviation; MET- metabolic equivalents; PA = Physical Activity; F & V = Fruit and Vegetable. P-change represent within group change; P-difference represents between group change.

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