

Teaching Goal-Setting for Weight-Gain Prevention in a College Population: Insights from the CHOICES Study

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ABSTRACT

Purpose: This article describes the effectiveness of goal setting instruction in the CHOICES (Choosing Healthy Options in College Environments and Settings) study, an intervention evaluating the effectiveness of weight gain prevention strategies for 2-year college students. **Methods:** Four hundred and forty-one participants from three community colleges were recruited. Participants randomized into the intervention (n=224) enrolled in a course that taught strategies to help maintain or achieve a healthy weight. Participants were instructed in SMART (Specific, Measurable, Attainable, Realistic, Time-based) and behavioral goal-setting practices. Throughout the course, participants set goals related to improving their sleep, stress-management, exercise, and nutrition." **Results:** Intervention participants set four hundred eighteen goals. Each goal was carefully evaluated. The efforts to teach behavioral goal-setting strategies were largely successful; however efforts to convey the intricacies of SMART goal-setting were not as successful. **Conclusions:** Implications for effective teaching of skills in setting SMART behavioral goals were realized in this study. The insights gained from the goal-setting activities of this study could be used to guide educators who utilize goals to achieve health behavior change. **Recommendations:** Based on the results of this study, it is recommended that very clear and directed instruction be provided in addition to multiple opportunities for goal-setting practice. Implications for future interventions involving education about goal-setting activities are discussed.

INTRODUCTION

Obesity is a significant national health concern. More than two-thirds of adults and one-third of youth are overweight or obese (Flegal, Carroll, Kit & Ogden, 2012; Ogden, Carroll, Kit & Flegal, 2012). Among the subset of young adults in the United States, National Health and Nutrition Examination Survey (NHANES) data indicate that 67.1% of 20-39 year old men and 55.8% of 20-39 year old women were overweight or obese in 2010-2011 (Flegal et al., 2012; Ogden et al., 2012). Furthermore, a recent study by Robinson and colleagues found that cohorts born in the 1980s had increased propensity to obesity versus those born in the late 1960's (Robinson, Keyes, Utz, Martin, & Yang, 2012). Thus, evidence suggests that young adulthood can be a time of significant weight gain.

Young adulthood is a time of transition. Many people begin college during these years and experience major life changes as well as profound differences in daily life. They move from dependence to independence, from a structured existence to greater autonomy (Smith & Renk, 2007). For many college students these transitions and changes may have significant influences on health behaviors, thus influencing their propensity to gain weight.

While research on the rates of obesity among college students is rather sparse, several studies have investigated this phenomenon. Notably, in a 2007 study of Minnesota college

students, Nelson and colleagues found that 35.2% were overweight or obese (Nelson, Gortmaker, Subramanian, Cheung, & Weschler, 2007). Another study indicated that 2-year college students, when compared to 4-year students, were twice as likely to be obese (Laska, Pasch, Lust, Story, & Ehlinger, 2011).

Many factors contribute to weight gain during college, but a review of the literature indicates that changes in physical activity, dietary patterns, stress, and sleep habits may explain much of this trend. In regards to physical activity, the National Longitudinal Study of Adolescent Health (Gordon-Larsen, Adair, Nelson, & Popkin, 2004) indicated that approximately 35% of adolescents participated in five or more sessions of vigorous activity per week. However, after transition to young adulthood, only 4.4% of these same individuals exercised that often. Similarly, a study by Driskell, Kim and Goebel (2005) indicated that only 50% of all college students met American College of Sports Medicine guidelines for physical activity (being active for 20-30 minutes most days of the week). Other studies have noted this reduction in physical activity among college students as well (Nelson, Gortmaker, Subramanian, Cheung, & Weschler, 2007). This decline in physical activity from adolescence to young adulthood likely contributes to weight gain in the college population.

Dietary patterns of college students are also a concern. Data from the American College Health Association National College Health

Assessment II indicate that only 5.6% of college students consume five or more servings of fruits and vegetables per day (2013). Other studies comparing college students' dietary habits to national guidelines have found that college students' diets have very low rates of adherence to the national guidelines (Nelson, Story, Larson, Neumark-Sztainer, & Lytle, 2008). In fact, young adults exhibit some of the poorest dietary habits of all age groups (Pelletier and Laska, 2013).

Increased perceptions of stress are also common for college students (Hunt & Eisenberg, 2010; Eisenberg, Golberstein, & Hunt, 2009; Smith & Renk, 2007). This stress is due to a variety of factors, ranging from significant life transitions to concerns about academics, time management, relationships, and other daily hassles (VonAh, Ebert, Ngamvitroj, Park, & Kang, 2004; Hunt & Eisenberg, 2010; Eisenberg, Golberstein, & Hunt, 2009; Smith & Renk, 2007). Perceptions and experiences of stress can lead to depression (Hunt & Eisenberg, 2010; Eisenberg, et al., 2009), declines in mental health, overeating, and, ultimately, obesity (Greeno & Wing, 1994; Dallman, et al., 2003; Stunkard & Allison, 2003).

Sleep has been shown to also influence a person's risk of weight gain and obesity. Several studies have demonstrated that a reduction in sleep correlates with an increased risk for obesity (Lumeng, Somashekar, Appugliese, Kaciroti, Corwyn, & Bradley, 2007; Gangwisch, Malaspina, Boden-Albala, & Heymsfield, 2005; Hasler, et al., 2004). Additionally, lack of sleep is an often-reported phenomenon among college students (Pilcher, Ginter, & Sadowsky, 1997; Eliasson, Lettieri, & Eliasson, 2010). Thus, it appears that lack of sleep may be another important factor contributing to weight gain experienced by many college students.

There is very little research on interventions to prevent weight gain in college-age students. However, results from recent studies indicate that interventions involving educational or behavioral approaches show the most promise in preventing weight gain in college students (Stice, Orjada, & Tristan, 2006; Hivert, Langlois, Berard, Cuerrier, & Carpentier, 2007; Gow, Trace, & Mazzeo, 2010). Other studies of adult populations have demonstrated that some of the most effective nutrition interventions are theory-

driven and behaviorally-focused (Shilts, Horowitz, & Townsend, 2004).

Goal setting is an important strategy in many behavior change theories and it has been demonstrated to be an effective component of behavior change interventions, including weight-gain prevention approaches (Werch et al., 2007; Shilts, et al., 2004). Several recent studies have suggested that successful weight gain prevention interventions instill skills in goal setting, planning, and self-monitoring (Strong, Parks, Anderson, Winett, & Davy, 2008; Donaldson & Normand, 2009; Werch et al., 2007). In a review of the literature on goal setting as a strategy for dietary and physical activity behavior change, Shilts, Horowitz, and Townsend found that those studies that fully supported goal setting were more likely to produce positive results (2004) than studies which merely introduced goal-setting. These same authors concluded that full support for goal setting involves education about setting effective goals, contracting, identifying barriers, and self-monitoring. Effective goals are characterized as being challenging yet attainable, clear, feasible, and timely (Shilts et al., 2004). This characterization correlates with findings from Olson and Paul, in which higher quality goals (defined as appropriate and realistic by the investigators) were associated with significantly reduced odds of excessive weight gain during pregnancy when compared to lower quality goals (2012). In a review of the literature on self-monitoring in weight loss, Burke, Wang, and Sevick found that self-monitoring and support from significant others also translated to achievement of goals (2011).

PURPOSE

Several studies have highlighted the importance of goal setting in weight loss interventions. However, few have explored the effectiveness of detailed goal-setting instruction in helping participants operationalize their goals. Furthermore, investigations of the effectiveness of these activities with two-year college students are rare. The purpose of this study is to describe the effectiveness of goal setting instruction seen in the CHOICES (Choosing Healthy Options in College Environments and Settings) study, an intervention trial with the goal of evaluating the effectiveness of weight gain prevention strategies in 2-year college students (CHOICES, 2012). Specifically, this article reports on: 1) the quality of goals set by students, as indicated by

a behavioral (rather than outcome) focus and adherence to the SMART (specific, measurable, attainable, realistic, time-based) criteria; 2) the sources of support and forms of support students reported as helpful in meeting their goals; and, 3) preferred methods for setting and tracking goals. Differences in goal setting activities and preferences noted among the types of behavior (stress, sleep, nutrition, physical activity) were also reviewed. Insights gained here will be valuable to educators, researchers, and practitioners.

METHODS

The purpose of the CHOICES study is to develop and test innovative strategies to help prevent unhealthy weight gain among students attending 2-year community or technical colleges in a randomized controlled trial. CHOICES was funded by the National Heart, Lung and Blood Institute of the NIH and is one of seven trials participating in the EARLY (Early Adult Reduction of weight through LifestYle intervention) trials (NHLBI, 2010; www.earlytrials.org). The CHOICES study was approved by the Institutional Review Board at the University of Minnesota and informed consent was obtained for all participants. The CHOICES sample is composed of 441 students from three community colleges in the Minneapolis-St. Paul area; students were randomly assigned to either an intervention or control condition following baseline data collection. The primary outcome for the CHOICES study was change in body mass index at the end of a 24-month intervention period. This manuscript, however, focuses on instructional strategies utilized in the first four month intensive phase of the intervention.

The CHOICES intervention is based on a social ecological model. Participants randomized into the intervention condition (n=224) participated in a 1-credit course, Sleep, Eat, and Exercise (SEE) (Kjolhaug, 2009) offered through their 2-year college that focused on eating, physical activity, sleep and stress management as ways to help maintain or achieve a healthy weight. Three course sections (online, face-to-face, and hybrid) were offered to accommodate participants' scheduling needs and learning preferences, and participants were allowed to choose which section of the course they preferred. A web-based social network and support component was introduced as part of

this course and continues as the intervention channel for 20 months following completion of the 1-credit SEE course (CHOICES, 2012).

A major focus of the semester-long college course was instruction in effective, high-quality goal setting, as this has been shown in other studies to be an important behavior change strategy (Olson & Paul, 2012; Burke, Wang, & Seveck, 2011). Specifically, SMART goal setting has been shown to be a key component in successful health behavior change interventions (Cannito, 2010). SMART goals are characterized as specific, measurable, attainable, realistic, and time-based. All intervention participants were instructed in SMART goal-setting strategies for various health behaviors including: nutrition/dietary habits, physical activity, stress, and sleep. Participants in the hybrid and online sections of the class created their SMART goals as part of graded assignments in three domains: nutrition, physical activity, and sleep. In the face-to-face course sections, participants set SMART goals for nutrition, physical activity, sleep, and stress during an ungraded in-class activity. In the instruction on goal-setting, interventionists encouraged participants to set behavioral goals, rather than outcome goals. In addition to writing a SMART goal for each health behavior, participants were also prompted to state 1) an action plan for achieving their goal; 2) a support person who could help them achieve their goal, 3) the form of support they would like to receive (giving encouragement or reminders, performing a specific action, holding the participant accountable, or providing information); and 4) the form of monitoring they planned to use to track their goal (tracking in a notebook or journal, tracking on a calendar, or monitoring in some other way).

Two coders were trained to evaluate the goals. Each student goal was reviewed carefully by the coders to determine: 1) whether the goal was behavioral or outcome-focused; 2) whether or not the goal met SMART criteria; 3) the preferred support person identified and how he or she could best support the student in achieving that goal; and 4) how the student planned to monitor or track goal progress. Ninety percent of the codes were evaluated independently by the coders, with random comparisons conducted to ensure uniformity in coding and minimal bias. Totals for each goal attribute were then calculated.

RESULTS

The mean age of the CHOICES participants at baseline was 22.9 years. Approximately two-thirds of the participants were female (67.0%). Seventy-six percent of the participants were white and 7.6% were Hispanic. Sixty-eight percent reported income of \$12,000 per year or less. The median BMI at baseline was 25.4. Slightly over half of the students were single (53.6%), and 55.4% lived with their parents. In terms of instructional preference, the online course was the most popular, chosen by one hundred nine participants (48.7%). Seventy-three (32.6%) participants choose face-to-face instruction, while twenty (8.9%) enrolled in the hybrid course. Sixteen (7.1%) participants did not indicate a preference and were enrolled in an online section of the course.

A total of 418 goals were set by intervention participants during their coursework. Examples of participant goals are shown in TABLE 1. Overall, 96.6% (n = 405) were behavioral (rather than outcome-focused) and 67.2% (n = 281) met SMART criteria. The behavioral goal results were consistent across all behaviors (nutrition, sleep, physical activity, and stress), as 95% of nutrition goals, 98% of sleep goals, 98% of physical activity goals, and 94% of stress goals were determined to be behaviorally focused. There was more variability in the goals meeting SMART criteria when categorized by lifestyle behavior. While 83% of the activity goals and 76% of the sleep goals met SMART criteria, only 50% of the nutrition goals and 45% of the stress goals met SMART criteria (TABLE 2).

When goal characteristics were compared by type of instruction, some differences in achievement of SMART and behavioral criteria were noted. All of the courses resulted in high success in participants setting behavioral goals. All of the 34 goals (100%) set in the hybrid sections met behavioral criteria, while 191 of 200 goals (95.5%) set in the face-to-face sections met the criteria. Of 184 goals set in the online sections, 180 (97.8%) met behavioral criteria. In terms of goals meeting SMART criteria, the online instruction yielded the greatest compliance. One hundred forty-nine of 184 goals (81.0%) met SMART criteria in the online sections, while 25 of 34 goals (73.5%) met the criteria in the hybrid sections and 107 of 200 goals (53.5%) met the criteria in the face-to-face instructional sections (TABLE 3).

Most participants identified either a friend or roommate (47.5%) or a family member (53.5%) as their primary support person. These preferences were consistent across all behaviors. Twelve percent of participants did not specify a support person, while 4% chose their course instructor and 5% identified a person other than a friend, roommate, family member or course instructor, such as a co-worker (TABLE 4).

Performing specific actions (providing help in meal preparation, exercising with the participant, etc.) was the most common form of support requested by participants (47.3%). A slightly lower percentage of participants (36.6%) desired reminders or encouragement. Being held accountable for working towards their goals was preferred by 18.8% of participants, while only 3% requested that their support persons provide information. Nineteen percent of participants did not specify what type of support they would like to receive. Preferences for type of support were fairly consistent across all four behaviors (TABLE 5).

Preferred method of goal monitoring was fairly evenly split between tracking on calendars (50.5%) and tracking in a notebook or journal (55.5). Ten percent of participants indicated that they would like to use a form of technology (iPhone, online program, etc.) to track their goals. Interestingly, this preference was not prompted in the questions, but was nevertheless indicated by some participants. It should be noted that participants could choose to track their goals in multiple ways. Ten percent of participants did not indicate how they planned to monitor their goal progress.

DISCUSSION

Upon review of participant goals, plans for monitoring those goals, and the support they desired, it is possible to conclude that the efforts to teach SMART, behavioral goal-setting strategies were largely successful. Overall, most students grasped the concept of setting behavioral goals, rather than outcome goals. This was true across all types of goals (nutrition, sleep, physical activity, and stress). It is interesting to note, however, that the efforts to convey the intricacies of SMART goal-setting were not quite as successful. While a majority of the sleep and physical activity goals met SMART criteria, only 45% of the stress goals

and 50% of the nutrition goals met the criteria. There are possible explanations for this. It could be that nutrition and stress are more complex topics, with more confounding factors to consider, thus making SMART goal setting in these areas more challenging than in the areas of physical activity and sleep. Similarly, given that physical activity and sleep behaviors are more easily quantified than are aspects of nutrition habits and stress, setting SMART goals in these areas may have been more feasible for participants.

When type of instruction (online, face-to-face, or hybrid) was considered, all appeared equally as effective in resulting in participants setting behavioral goals. The online course sections, however, resulted in a higher percentage of goals meeting SMART criteria, when compared to hybrid or face-to-face instruction. One explanation for this is that, in the online course, understanding of goal setting concepts was assessed by a required quiz and reflection on goal progress was incorporated into written assignments, whereas in the face-to-face sections, reflection was undertaken in the class discussions. Participants in the hybrid sections also took the quiz on goal-setting essentials, but were not required to complete the written reflections. Rather, the hybrid sections also engaged in in-class discussions for reflection on goal-setting. Given that classroom discussion in a face-to-face environment is naturally less prescribed and controlled, it could be that online participants benefited from receiving concrete messages about SMART goal setting from the pre-established lesson content and assignment instructions as well as more opportunity to monitor and reflect upon their goal progress. They also received more individualized feedback on the goals that they set because they submitted their goals for grading. It is also important to note that seventy-three percent of goals set by hybrid section participants met SMART criteria. Thus, it could be that the goal-setting quiz taken by both the online and hybrid section participants played a key role in promoting the success of setting SMART goals.

Most participants indicated that either a friend, roommate, or family member would be an ideal support person. It is interesting to note that family members were most often cited as support persons for nutrition and sleep behaviors (62.3% and 58.2%, respectively), while friends and roommates were cited less

frequently for these behaviors (42.5% and 44.9%, respectively). It is possible that among two-year college students, family members have more influence on eating and sleeping behaviors than friends. This is understandable, given that many two-year students live at home with parents or a spouse/partner, rather than in campus or student housing.

With regard to stress, family members were preferred support persons by only 40% of participants, while 50% of participants indicated they would seek support from a friend or roommate for stress issues. Perhaps friends or roommates of similar ages and interests are perceived as providing more understanding and help with stress. In terms of physical activity, family members and friends were identified as preferred support persons at fairly similar rates, 53.3% and 46.7%, respectively.

For all behaviors, participants most often desired specific actions from support persons, as opposed to encouragement, reminders, or being held accountable. Reminders and encouragement were the second most common form of support requested across all behaviors. Interestingly, an average of 21.6% of participants did not indicate any type of support desired, even though they may have identified a support person. It is not clear why this occurred; it could be that some participants had difficulty conceptualizing exactly how they would prefer to be supported in their efforts to achieve various goals.

CONCLUSIONS AND RECOMMENDATIONS

The insights gained from the goal-setting activities of the CHOICES study could be very helpful in guiding future interventions that utilize goals to achieve health behavior change. CHOICES participants seemed to have a good grasp of the difference between behavioral and outcome-focused goals, but even with very guided instruction, many seemed to struggle with setting SMART goals. It may be that instruction needed to be even more clear and directive, or that participants needed more practice in SMART goal-setting, particularly in the face-to-face course sections. The results indicate that one or both of these instructional modifications may be needed to help people set achievable and realistic behavioral goals. It is recommended that, in order to better teach goal-setting, very clear and directed instruction be

provided in conjunction with multiple opportunities for goal-setting practice with feedback.

In our courses, participants were more likely to set high-quality SMART goals when the goals were part of a graded assignment. This may indicate that when participants perceive a goal involves some sort of "higher stakes" consequence (such as an association with graded work), they are more likely to attempt to set a goal meeting all SMART criteria. Participants were also more likely to set high-quality SMART goals if they were enrolled in the online sections of the course, where individualized feedback and reflection on goals were more assured. Future interventions should consider how to achieve this thoughtful approach to goal setting among participants. Perhaps linking the goals to meaningful incentives or discussing the importance and implications of goal achievement in explicit detail is warranted. Setting high-quality, realistic goals has been shown to facilitate higher levels of goal achievement (Olson & Paul, 2012; Burke, et al., 2011). It would be valuable to evaluate the use of SMART, behavioral goal-setting strategies in achievement of health goals across a variety of interventions, environments, and instructional methods with different populations and age groups. Perhaps providing more instruction on how social support can be useful in goal setting, as well as how the social environment can be a barrier would be warranted as well. Since 21.6% of our participants did not indicate the type of support desired, perhaps, as stated above, they could benefit from some training in these aspects of goal setting. Behavior change is difficult for many people; thus, identifying strategies that are more likely to yield success in goal achievement is imperative.

These results also indicate that future researchers should look more closely at technology's role in providing support for and tracking of goals. Approximately ten percent of participants in this study indicated, with no prompting, that they would like to use some sort of technology (iPhones, social networking site, online tools, etc.) to track their goal progress. Given that applications for phones, computers, and other electronic devices are constantly evolving, this warrants further investigation as well. Identifying exactly how these devices can be utilized to help people more readily achieve

their goals will greatly benefit researchers, practitioners, and clients.

The results from this intervention have yielded valuable insights regarding effective teaching of goal-setting for health behaviors. It appears that participants are more likely to set SMART behavioral goals when they are provided with detailed instruction in the goal-setting process and motivated by a meaningful incentive such as a grade. Additionally, they appear to be more successful in SMART goal-setting if given individualized feedback and opportunities for reflection. Practitioners and researchers should also consider strategies for incentivizing or motivating participants to set meaningful SMART goals. Finally, future research should investigate how technology can be used in goal monitoring, goal support, and even goal-setting instruction.

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TABLE 1: Examples of SMART, non-SMART goals

SMART goal examples
Do 3 – 5 minutes of stretching when I wake up in the morning.
Do my homework in between my classes on Monday, Wednesday, and Friday.
Do a 20-minute pilates video in the morning, 3 times per week.
Maintain a more consistent sleep schedule to achieve about the same amount of sleep (8 hours) each night.
Non-SMART goal examples
Eat more vegetables.
Try to get a little more sleep on the weekends.
Go to the gym.
Keep my negative thoughts to a minimum.

TABLE 2: Goals Meeting SMART and Behavioral Criteria by Type of Goal

Type of Goal	% SMART	% Behavioral
Nutrition (n = 118)	50.9% (n = 60)	94.9% (n = 112)
Sleep (n = 117)	76.1% (n = 89)	98.3% (n = 115)
Activity (n = 132)	82.6% (n = 109)	98.5% (n = 130)
Stress (n = 51)	45.1% (n = 23)	94.1% (n = 48)

TABLE 3: Goals Meeting SMART and Behavioral Criteria by Type of Instruction

Type of Instruction	% SMART	% Behavioral
Hybrid (n = 34)	73.5% (n = 25)	100% (n = 34)
Face-to-Face (n = 200)	53.5% (n = 107)	95.5% (n = 191)
Online (n = 184)	81.0% (n = 149)	97.8% (n = 180)

TABLE 4: Preferred Support Persons by Type of Goal*

Type of Goal	Support Person				
	Friend / Roommate	Family	Instructor	Other	None
Nutrition N = 118	42.5%	62.3%	4.8%	6.6%	10.2%
Sleep N = 117	44.9%	58.2%	5.1%	1.0%	16.2%
Activity N = 132	53.3%	46.7%	3.3%	6.6%	7.6%
Stress N = 51	50.0%	40.0%	7.5%	5.0%	21.6%

* Participants could specify more than one support person and form of support for each goal

TABLE 5: Form of Support Desired by Type of Goal

Type of Goal	Form of Support				
	Reminder / Encouragement	Accountability	Action	Info	None
Nutrition N = 118	34.0%	20.8%	45.3%	2.8%	19.8%
Sleep N = 117	39.8%	12.2%	66.3%	1.0%	19.4%
Activity N = 132	36.9%	22.1%	53.3%	5.7%	14.8%
Stress N - 51	35.0%	20.0%	45.0%	0	32.5%