Research and Professional Briefs

Weight Gain Prevention: Identifying Theory-Based Targets for Health Behavior Change in Young Adults

KATHRYN A. STRONG, MS; SERENA L. PARKS; EILEEN ANDERSON, EdD; RICHARD WINETT, PhD; BRENDA M. DAVY, PhD, RD

ABSTRACT

Young adults attending college are more vulnerable to weight gain than the general population. We sought to identify health behavior change targets related to weight management in college students. Based on the Social Cognitive Theory model for health behavior change, we investigated the health-related lifestyle behaviors and physiological characteristics of this population. Forty-three college students (18.3±0.1 years) completed a series of quantitative assessments (eg, body weight and composition, cardiorespiratory fitness, and diet and activity habits) and structured qualitative assessments (ie, structured interview or focus group). Participants were predominantly normal weight (mean body mass index 22.2±0.4) and fit (maximal oxygen consumption 50.5±1.5 mL/kg/minute). However, healthful eating and physical activity were not considered high priorities, despite having ample free time, high exercise self-efficacy, positive outcome expectations for exercise, and a desire to exercise more. Participants reported that regularly engaging in exercise was difficult. This may have been due to poor planning/time management, satisfaction with body image, lack of accountability, and feelings of laziness. Dietary patterns generally met recommendations but were low in fruits, vegetables, and whole grains. Social support for exercise and healthful dietary habits were important factors associated with health behaviors. Students reported a decline in exercise and dietary habits relative to high school, which may have contributed to college weight gain. Our results suggest that this population may not have adequate self-regulatory skills, such as planning and self-monitoring, to maintain healthful behaviors in the college environment. Food and nutrition professionals working with young adults attending college may use these findings to guide the behavioral therapy component of their weight management medical nutrition therapy goals and outcomes.

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K. A. Strong and S. L. Parks are research assistants and B. M. Davy is an associate professor with the Department of Human Nutrition, Foods, and Exercise; E. Anderson is a research assistant professor and R. Winett is the Heilig Meyers Professor of Psychology with the Department of Psychology, Center for Research in Health Behavior, Virginia Polytechnic Institute and State University, Blacksburg.

Address correspondence to: Brenda M. Davy, PhD, RD, 221 Wallace Hall (0430), Department of Human Nutrition, Foods and Exercise, Virginia Tech, Blacksburg, VA 24061. E-mail: bdavy@vt.edu

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The increasing prevalence of obesity has led to public health initiatives for preventive action (1-3). Trends in adults indicate that obesity develops through gradual weight gain during early adulthood (4,5), with most obese individuals becoming so before age 35 years (4). Between 1991 and 1998, the greatest increases in the prevalence of obesity were among young adults (aged 18 to 29 years) and those with higher education levels (6). Hill and colleagues (7) estimated that the average American adult gains weight at a rate of approximately 2 lb (0.9 kg) per year. However, young adults attending college appear to gain weight more rapidly than the general population, with a mean weight gain of approximately 4 to 9 lb during their first year at college (8-10), without evidence of compensatory weight loss in later years (9). Perpetual weight gain yielding a body mass index (BMI) increase of >2 over 15 years places young adults at markedly increased cardiovascular disease risk compared to those with a stable or decreased BMI (11). These effects persist independently of baseline BMI, suggesting that weight stability in early adulthood may be an important factor in chronic disease risk reduction for both normal and overweight individuals.

The college environment, which many young adults will experience (12,13), is one that may be conducive to overconsumption due to factors such as readily available energy-dense foods. Academic pressures may lead to increased time studying and computer use while devaluing exercise and organized sports participation. Because previous work has demonstrated that college students are particularly vulnerable to weight gain, preventing weight gain in this population may have important implications for long-term weight management.

Investigations of weight gain prevention have examined selected constructs within a behavior change theory (10,14-16) or implemented interventions based on components of behavior change (17,18). However, the relative influence of theoretical factors underlying health behaviors and health behavior change among young adults

attending college remains elusive. This is relevant to dietetics practice because behavior therapy is recognized as an important component of medical nutrition therapy for adult weight management (19).

Our objective was to identify potential targets to improve health behaviors in young adults attending college through an empirical investigation of lifestyle factors related to body weight, based on the social cognitive model for health behavior change (20). We investigated modifiable lifestyle factors that could mediate college weight gain, and identified psychosocial correlates of health behaviors, including self-regulation, social support, self-efficacy, and outcome expectations (20).

METHODS

Participants were first- and second-year college students, living on campus, and aged ≥18 years. Students majoring in human nutrition, foods, and exercise (eg, dietetics, exercise, and health promotion) were excluded because their health habits may not be representative of the general college population. Eligible participants did not have depression, eating disorders, or major chronic diseases. The Center for Epidemiological Studies Depression Scale (CES-D) (21) and the Eating Attitudes Test (EAT-26) (22) were used to assess symptoms of depression and disordered eating, respectively. Participants with scores ≥35 on the CES-D and ≥20 on the EAT-26 were excluded. Women were not pregnant during the course of the study. Participants were recruited via campus advertisements, but were kept naïve as to the exact purpose of the study to reduce the likelihood of attracting only those with significant health interests. Of those recruited (n=63), four were ineligible based on CES-D or EAT-26 scores and 16 were not able to complete all study procedures. The final sample included 43 individuals. For each participant, completion of all study procedures took place during a 3- to 4-week period, after which time they were compensated $20. Participants provided informed consent before participating in the investigation; the protocol and consent form were approved by the Institutional Review Board at Virginia Tech.

Procedures

All participants completed a series of questionnaires and laboratory-based measurements. Questionnaires included the Health Beliefs Survey (23), which assessed Social Cognitive Theory (SCT) determinants of eating behaviors; assessments of theory-based determinants for physical activity behaviors (24); the Three-Factor Eating Questionnaire (25); and a questionnaire to prioritize activities of college students (interview participants only, n=30). Laboratory measurements included assessment of body weight and composition, waist circumference, resting blood pressure, and cardiorespiratory fitness. Height was measured using a wall-mounted stadiometer, and body weight was measured using a digital scale (Scaletronix, White Plains, NY). Waist circumference was measured to the nearest 0.5 cm at the umbilicus (Gulick tape measure, Country Technology, Inc, Gays Mill, WI). Blood pressure was measured using an automated Dinamap XL vital signs monitor (model 9300, Johnson & Johnson Medical, Tampa, FL) using recommended measurement procedures (26). Maximal oxygen consumption (VO_2max) was used to assess cardiorespiratory fitness, which was determined during graded treadmill running to exhaustion using indirect calorimetry (TrueMax 2400, ParvoMedics, Salt Lake City, UT). VO_2max measurements were used to determine age- and sex-specific American College of Sports Medicine VO_2max percentile ranking (27). Body composition was measured using dual-energy X-ray absorptiometry (GE Lunar Prodigy Advance, Madison, WI). Habitual physical activity was measured with 7-day activity logs of time spent engaged in physical activity and verified 7-day pedometer (Accusplit Eagle 120XL, San Jose, CA) step counts. Activity logs also included minutes spent watching television and playing video games, minutes spent on the computer, bed time (time of day), wake time (time of day), minutes spent napping, and types of physical activity with intensity ratings. For this study, physical activity refers to activities that involve muscle movement, like walking around campus, and exercise refers to specific structured activities that improve cardiorespiratory fitness, such as running, team sports, or gym-based physical activities. To determine habitual dietary intake, food intake records were obtained for four consecutive days including one weekend day and three weekdays; records were analyzed using the Nutrient Data System for Research software (University of Minnesota Nutrition Coordinating Center, Minneapolis) with food group servings determined according to the Dietary Guidelines for Americans (28). Two 4-day records averaging <1,200 kcal/day were excluded due to suspected underreporting (29).

Participants then took part in either an elicitation interview or a focus group. A series of 30 elicitation interviews (one interview with each of 30 students; 1 to 2 hours per student) followed by two focus groups (n=13; 1.5 hours per group) were conducted. All interactions were conducted by one investigator (K.S.), with a second investigator (B.D. or S.P.) present to observe and take notes. Upon participant authorization, the sessions were recorded and written transcripts were generated.

Semistructured interviews elicited information about students' daily routine and dietary and physical activity habits. Participants responded to questions about their usual activities and experiences related to psychosocial correlates of health behavior change, for example: "Do you keep track of how much physical activity you do?" Psychosocial correlates included self-efficacy, self-regulation, social support, and outcome expectations for diet and physical activity behaviors.

Conducting 30 elicitation interviews allowed the investigators to reach a point of response saturation (ie, no new revealing information from participants; informational redundancy). Following the completion of the elicitation interviews and determination of themes in each topic area, two focus groups for peer validation and discussion of major interview findings (n=8 and n=5 participants, respectively) were conducted with students who did not participate in an interview (30). The focus group sample size was determined according to recommended guidelines (30,31). These groups were used to provide insight into the authenticity and credibility of the interview findings (30).