

PHYSICAL ACTIVITY BEHAVIORS, MOTIVATION, AND SELF-EFFICACY AMONG COLLEGE STUDENTS

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Despite the well documented benefits of an active lifestyle, lack of physical activity is a significant health problem in college students. The purpose of this descriptive study was to attain baseline physical activity behaviors, motivation factors, and self-efficacy levels to assist with developing tailored physical activity programs and interventions targeted for young adults on a college campus. Eight hundred and seventy-one undergraduate students completed the Godin Leisure-Time Exercise Questionnaire, Exercise Motivation Inventory-2, and an exercise self-efficacy questionnaire to assess physical activity behavior, motivation, and self-efficacy respectively. Males engaged in more minutes per session of vigorous and moderate intensity physical activity than females. Approximately 18% of the participants did not participate in any vigorous or moderate physical activity. Women were more motivated by weight management, appearance, nimbleness, positive health, and stress management, and men were motivated by performance and ego-oriented factors, such as challenge, strength and endurance, competition, affiliation, and social recognition. Males reported significantly higher levels of coping and scheduling self-efficacy for physical activity than females. The data suggests a continued need for physical activity promotion and practitioners may need to consider gender when developing physical activity interventions for college students.

Keywords: physical activity, motivation, self-efficacy, college students

Physical activity has received considerable attention for its role in the prevention and treatment of disease. To maintain health the American College of Sports Medicine and the American Heart Association recommend engaging in at least 30 minutes of moderate-intensity aerobic physical activity on five or more days per week, or 20 minutes of vigorous-intensity aerobic physical activity three or more days per week, or a combination of the two (Haskell et al., 2007). The benefits of a physically active lifestyle are well documented and can lead to improvements of physiological and psychological health [United States Department of Health and Human Services (USDHHS), 1996]. For example, engaging in

regular physical activity can lower the risk of early death, heart diseases, stroke, Type 2 diabetes, high blood pressure, adverse blood lipid profile, colon and breast cancer, prevention of weight gain, and the metabolic syndrome (USDHHS, 1996). In addition, physical activity provides positive effects on mental health and mood such as reduced depression and anxiety, positive well-being, enhanced vigor, and better cognitive function [USDHHS, 1996; Centers for Disease Control (CDC), 2011]. In summary, physical activity is considered by many national and global authorities to be one of the most important activities individuals can regularly do to improve health (National Physical Activity Plan, 2001).

In spite of the well-established benefits of physical activity, rates of everyday and planned physical activity have been on the decline (Caspersen, Pereira, & Curran, 2000; USDHHS, 2000). Research shows many American adults do not meet the recommended levels of physical activity (Caspersen et al., 2000; USDHHS, 2000). Data from the 2007 Behavioral Risk Factor Survey (BRFSS) indicated only 48.8% of the respondents met the Healthy People 2010 objectives for physical activity. Studies regarding the physical activity behaviors of college students found approximately 35% to 42% of students fail to obtain the recommended amount of physical activity (Miller, Staten, Rayens, & Nolan, 2005; Racette, Deusinger, Strube, Highstein, & Deusinger, 2005).

Physical activity participation statistics indicate a significant decline in physical activity in the 18 – 24 year old age group (Caspersen et al., 2000). The physical activity rates of high school students appear to be higher than college students (Grunbaum et al., 2002; Han et al., 2008; Nelson, Kocos, Lytle, & Perry, 2007; Wengreen & Moncur, 2009). For example, Grunbaum et al. (2002) found 65% of high school students to self-report engaging in regular vigorous activity and 26% reported regular moderate activity. In contrast, the Fall 2008 National College Health Assessment data revealed only 19.1% of respondents reported 5 or more days of moderate physical activity and 28.6% reported 3 or more days of vigorous physical activity (American College Health Association, 2008). Thus, a critical point in the decline of physical activity rates appears to be happening when young people transition from high school (adolescents) to college (young adults) (Bray & Born, 2004).

The data shows college students are not meeting the recommended levels of physical activity, although there are opportunities for physical activity on college campuses through recreation centers and intramural sports

(Crombie, Ilich, Dutton, Panton, & Abood, 2009). Reasons for this decline in physical activity may be due to the pressure on college student to perform well academically and a decline in participation in sport participation (Strong, Parks, Anderson, Winett, & Davy, 2008). Another plausible reason for the decline is due to the limited number of physical activity intervention tailored to meet the needs of young adults (Keating, Guan, Pinero, & Bridges, 2005).

The decline in physical activity in college age adults is a particularly disturbing trend because many adult health behaviors are established during the college years (Calfas et al., 2000). This trend led Healthy People 2010 to identify postsecondary education institutions as settings where young adults (aged 18-24 years) should be targeted for physical activity promotion (USDHHS, 2000). Thus, further research is needed to investigate how to increase college students' physical activity levels (Keating et al., 2005). The first step in the process of increasing physical activity levels is to gain knowledge about college students' physical activity patterns and key physical activity determinants (Keating et al., 2005).

Social cognitive theory and related physical activity research identifies the critical role of self-efficacy beliefs in guiding the self-regulation of behavior, including behaviors involved with physical activity initiation and maintenance (Fletcher & Banasik, 2001). Self-efficacy refers to individuals' situation-specific self-confidence (Bandura, 1997). It has received significant focus in the literature and it has consistently been found to be an important correlate of physical activity behavior (McAuley & Blissmer, 2000). Most investigations with college students have centered on the relationship between self-efficacy and physical activity adaption and maintenance (Keating et al., 2005). In the college student population, high self-efficacy usually

resulted in high physical activity participation levels and an increased likelihood of continuing physical activity (Sullum, Clark, & King, 2000). However, prior studies failed to examine potentially important gender, year in school, or type of self-efficacy (i.e., task, scheduling, coping) differences among college students. Thus, the current investigation addresses this gap in the literature and seeks to increase the understanding of physical activity self-efficacy among college students.

Another key cognitive factor in physical activity participation is self-motivation. The research examining motivation for physical activity is growing but still in its infancy. Initial findings indicate the motives for participation in physical activity vary greatly across the lifespan (Biddle, 1995). Surprisingly, very limited research exists with college students (Keating et al., 2005). Some researchers have found the motivation for college students' involvement in physical activity was primarily to look good (e.g. external motivation) and not health related (e.g. internal motivation) (Leslie, Owen, Salmon, Bauman, Sallis, & Lo, 1999; Lowry, Galuska, Fulton, Weshsler, Kann, & Collins, 2000). Specific physical activity motives for men were found to be muscle gain, while the motives for women were weight loss or control (Leslie et al., 1999; Lowry et al., 2000). Similarly, Kilpatrick, Hebert, Bartholomew (2005) found women to report a higher level of motivation than men for weight management, and men rated challenge, competition, social recognition, and strength higher than did women. With such limited research in the area of motivation for physical activity in college aged adults, more investigations are needed. A deeper understanding of college students' motives for engaging in physical activity would assist in the development of tailored physical activity interventions to meet the needs of these young adults (Kilpatrick et al., 2005). The current study adds to the existing motivation literature by examining gender and year in school differ-

ences among college students. Previous studies failed to examine potentially important year in school differences in motivation for physical activity.

Additional knowledge and understanding regarding college students' physical activity behavior and its determinants can provide a fundamental basis for changing their physical activity and improving the overall health of this population (Keating et al., 2005). A focus on college students is important due to the multiple transitions and development faced during the college and young adult years (Gokey-LaRose, Gorin, & Wing, 2009). Thus, the purposes of this study were to assess baseline physical activity levels and psycho-social determinants of physical activity in college students. The following research questions supported the overall purposes of this investigation: (1) What are the physical activity patterns of college students; (2) Do physical activity levels differ by gender and class level; (3) Do the motives for physical activity differ by gender and class level; and (4) Does self-efficacy for physical activity differ by gender and class level?

This information was collected to assist in the development of a campus-wide health intervention and was the first phase of a multi-phase intervention to increase physical activity on a college campus. It is also important to note the cohort of students included in this study will be followed for four years. This longitudinal approach will examine physical activity changes and corresponding key cognitive factors over four years in higher education and into adulthood. The absence of longitudinal studies has been identified as a shortcoming in the physical activity literature involving college students (Keating et al., 2005). Furthermore, the results from this investigation may be useful to educators and practitioners who design and implement physical activity programs to improve the health of college student populations.

Method

Participants

Participants were drawn from a private comprehensive institution located in the Northeastern United States. A total of 871 (48.3% female, 51.7% male) undergraduate students (age $M = 19.73$ years, $SD = 1.27$) volunteered to participate in the study. Participants included 24.7% first year students, 26.2% sophomores, 24.3% juniors, and 24.8% seniors. The majority of the participants were Caucasian (65.0%) followed by African-Americans (14.4%), Hispanics (9.6%), Asians (8.6%), and other (2.4%). Most of the students were not employed (60.5%), some worked part-time (35.6%), less than 30 hours per week, and very few worked full-time (3.9%), 30 or more hours per week.

Instrumentation

Physical Activity Behavior. Current physical activity levels were assessed using the Godin Leisure-Time Exercise Questionnaire (GLTEQ, Godin & Shephard, 1985). The GLTEQ is a self-report instrument designed to estimate an individual's frequency of strenuous, moderate, and mild exercise during a typical week. Previous research suggests the GLTEQ is easy to administer and understand, responsive to changes in exercise behavior, and has demonstrated acceptable reliability and validity (Godin & Shephard, 1985; Jacobs, Ainsworth, Hartman, & Leon, 1993).

The GLTEQ was modified to also assess duration of physical activity by asking participants how long (minutes), on average, did he or she participate in strenuous, moderate, and mild exercise during a typical week. For this study, frequency of physical activity was defined as the number of occurrences of an exercise bout (i.e., exercise session) over a typical 7-day period and it was calculated by summing the number of exercise sessions. Duration of physical activity was defined as

the number of minutes recorded per exercise bout during a usual 7-day period and this was determined by summing the number of minutes engaged in exercise (strenuous, moderate, and mild) during a typical seven day period. This study defined intensity of physical activity as the sum of the metabolic equivalent (MET) values of the activities in which the participant engaged during a typical 7-day period, multiplied by the number of minutes per activity. This can be interpreted as how long (minutes) the individual participated at the different MET levels 9, 5, and 3 METS for strenuous, moderate, and mild exercise, respectively (i.e., 1 MET = rest/sitting; 3 = walking, minimal effort; 5 = jogging, moderate breathing, light sweating, 9 = running, heart beats rapidly) (Godin & Shephard, 1985). The total physical activity (TPA) score was determined by multiplying the MET values by the frequencies of activity for each level of exercise (strenuous, moderate, and mild) and then summing the three categories. A modified version of the GLTEQ, which was similar to the current study, was found to have acceptable reliability and validity (Reed & Philips, 2005).

Physical Activity Motivation. The Exercise Motivation Inventory-2 (EMI-2) (Markland & Ingledew, 1997) was used to identify patterns of motivation for participants in this study. The EMI-2 is a 51-item self-report questionnaire capable of measuring a broad range of exercise motives in adult males and females. It has 14 subscales: (1) stress management, (2) revitalization, (3) enjoyment, (4) challenge, (5) social recognition, (6) affiliation, (7) competition, (8) health pressures, (9) ill-health avoidance, (10) positive health, (11) weight management, (12) appearance, (13) strength and endurance, and (14) nimbleness. The subscales were calculated by summing the numerical equivalents for each item related to the subscale and then divided by the number of items that make up each subscale.

The EMI-2 instructions asked participants to indicate whether or not each item statement is true for them if they did exercise. The item stem read, "Personally, I exercise (or might exercise)" followed by specific reasons one might have to exercise. The responses for each question were made on a 6-point Likert-type scale ranging from 0 (*not at all true for me*) to 5 (*very true for me*). The EMI-2 has satisfactory psychometric properties with support for the scale's internal consistency with alpha coefficients ranging from .68 to .95 (Markland & Ingledew, 1997). Confirmatory factor analysis has indicated the EMI-2 was able to discriminate between men and women with respect to their exercise motives (Markland & Ingledew, 1997).

Physical Activity Self-Efficacy. Three types of exercise self-efficacy (task, coping, and scheduling) were assessed by a 12 item inventory created by Rodgers and Sullivan (2001). They developed this measure based on the recommendations made by Bandura (1997). Each item was rated on a 10-point Likert-type scale ranging from 1 (*no confidence*) to 10 (*complete confidence*). The three subscales were calculated by summing the numerical equivalents for each item related to the subscale and then divided by the number of items that make up each subscale. Confirmatory factor analysis has supported the three factor structure of the questionnaire (Rodgers & Sullivan, 2001).

Procedures

The study protocol was approved by the institutional review board (IRB) for human subjects. Following IRB approval, participants were then recruited from various campus locations throughout the university (i.e., classrooms, dining halls, student center, libraries, outside gathering places). Potential participants were approached by an investigator, informed of the nature of the study, and invited to participate. Potential partic-

ipants were screened to be at least 18 years old, currently enrolled as an undergraduate student at the university, and not a member of a varsity sport team at the university. The majority (>75%) of individuals approached agreed to take part. After informed consent was obtained, the participants completed the multi-section questionnaire in approximately 15-20 minutes. The investigator waited while each participant completed the multi-section questionnaire to answer any questions and to verify all components were completed.

Design and Statistical Analyses

This study utilized a descriptive survey design. The independent factors were Gender (male and female) and Class standing (first-year, sophomore, junior, or senior). The dependent variables were the GLTEQ scale scores, EMI-2 subscale scores, and Exercise Self-Efficacy scale scores. SPSS for Windows (v17.0, Chicago, IL) was used for all statistical analyses. A series of four 2 X 4 (Gender X Class) Multivariate Analysis of Variance (MANOVA) were employed to determine if there were significant differences in physical activity, the GLETQ subscales, physical activity motivation and self-efficacy in college students. The level of significance was set at $p < .05$ for all analyses.

Results

Physical activity

Forty-seven percent of the women, 51.8% of the men, and 49.4% of the overall students engaged in 20 or more minutes of vigorous physical activity 3 or more days per week. Only 17.6% percent of the women, 13.3% of the men, and 15.4% of the overall students participated in 30 minutes or more of moderate physical activity 5 or more days per week. Furthermore, 20.4% of the women and 15.8% of the men, and 18.2% of the overall students did not engage in any moderate or vigorous physical activity.

Table 1. Mean and Standard Deviation Scores for Frequency, Duration, Intensity, and Total Physical Activity (TPA) by Gender and Year in School (N = 871)

Variable	FR	SO	JR	SR	Male	Female	Total
Frequency							
<i>M</i>	9.10	10.08	9.01	9.07	8.89	9.84	9.35
<i>SD</i>	5.25	10.54	5.68	5.46	5.23	8.83	7.15
Duration							
<i>M</i>	500.80	557.16	490.39	518.67	531.44	502.51	517.45
<i>SD</i>	858.45	842.40	920.23	713.46	804.97	867.90	835.62
Intensity							
<i>M</i>	1,940	1,917	1,979	1,968	2,011	1,886	1,950
<i>SD</i>	1,870	1,560	1,734	1,910	1,615	1,918	1,768
TPA							
<i>M</i>	49.94	52.74	50.66	52.87	51.47	51.69	51.57
<i>SD</i>	28.72	30.05	32.29	48.36	35.22	36.15	35.65

Note. Frequency = occurrence of an exercise bout; Duration = number of minutes of exercise for 7 days; Intensity = MET values X duration; TPA = Total physical activity = MET values X frequency; MET = metabolic equivalent. FR = freshmen; SO = sophomore; JR = junior; SR = senior

A 2 X 4 MANOVA revealed no significant main effect for Gender, Wilks's $\Lambda = .991$, $F(4, 860) = 1.97$, $p = .098$, Class, Wilks's $\Lambda = .994$, $F(12, 2586) = .44$, $p = .948$, or the Gender X Class interaction, Wilks's $\Lambda = .984$, $F(12, 2586) = 1.157$, $p = .309$ for the GLTEQ subscales. These results indicate there were no significant difference for frequency, duration, intensity, or total physical activity between the genders and class standing. The mean and standard deviation values for the GLTEQ subscales are reported in Table 1.

The 2 X 4 MANOVA revealed a significant main effect for Gender, Wilks's $\Lambda = .957$, $F(6, 858) = 6.374$, $p < .001$, but not by Class, Wilks's $\Lambda = .988$, $F(18, 2527) = .572$, $p = .922$, or the Gender X Class interaction, Wilks's $\Lambda = .949$, $F(18, 2527) = 1.525$, $p = .058$ for the type of physical activity. These results indicate males and females differed on the type and amount of physical activity. The tests of between-subjects effects showed males ($M = 42.98$, $SD = 32.73$) to significant-

ly engage in more strenuous exercise minutes per session, $F(1, 863) = 17.340$, $p < .001$, than females ($M = 34.19$, $SD = 29.25$) and males ($M = 35.22$, $SD = 27.27$) to significantly engage in more moderate exercise minutes per session, $F(1, 863) = 11.549$, $p = .001$, than females ($M = 29.37$, $SD = 23.55$). The test of between-subjects effects also showed females ($M = 3.66$, $SD = 2.88$) to significantly engage in more mild exercise session per week, $F(1, 863) = 9.875$, $p = .002$, than males ($M = 3.05$, $SD = 2.77$).

Motivation

The 2 X 4 MANOVA revealed a significant main effect for Gender, Wilks's $\Lambda = .687$, $F(14, 850) = 27.634$, $p < .001$, but not by Class, Wilks's $\Lambda = .934$, $F(42, 2522) = 1.404$, $p = .054$, or the Gender X Class interaction, Wilks's $\Lambda = .936$, $F(42, 2522) = 1.365$, $p = .060$ for exercise motivation. These results indicate males and females differed on motivational factors for physical activity. The mean

Table 2. Mean and Standard Deviation Scores for EMI-2 Subscales by Gender (N = 871)

Subscale	Mean Score (Standard Deviation)	
	Male	Female
Stress Management	2.98 (1.12)	3.17 (1.13)*
Positive Health	3.69 (0.97)	3.92 (0.92)**
Weight Management	3.04 (1.19)	3.79 (1.09)**
Appearance	3.17 (0.96)	3.44 (0.93)**
Nimbleness	2.92 (1.19)	3.19 (1.05)*
Challenge	2.98 (0.98)**	2.69 (1.13)
Social recognition	2.64 (1.17)**	2.12 (1.22)
Affiliation	2.66 (1.10)**	2.19 (1.27)
Competition	3.16 (1.25)**	2.30 (1.43)
Health pressures	1.98 (1.27)*	1.75 (1.28)
Strength	3.73 (0.96)**	3.28 (1.10)
Revitalization	3.13 (1.01)	3.14 (1.13)
Enjoyment	3.17 (1.08)	3.05 (1.22)
Ill health avoidance	3.15 (1.09)	3.29 (1.12)

* $p < .05$, ** $p < .001$

and standard deviation values for the EMI-2 subscales by gender are reported in Table 2.

The tests of between-subjects effects showed males, compared to females, to be more motivated by challenge, $F(1, 863) = 17.055$, $p < .001$, social recognition, $F(1, 863) = 44.816$, $p < .001$, affiliation, $F(1, 863) = 35.596$, $p < .001$, competition, $F(1, 863) = 94.101$, $p < .001$, health pressures, $F(1, 863) = 7.387$, $p = .007$, and strength, $F(1, 863) = 43.338$, $p < .001$. The tests of between-subject effects also showed females, compared to males, to be more motivated by stress management, $F(1, 863) = 5.646$, $p = .018$, positive health, $F(1, 863) = 12.755$, $p < .001$, weight management, $F(1, 863) = 91.277$, $p < .001$, appearance, $F(1, 863) = 16.997$, $p < .001$, and nimbleness, $F(1, 863) = 11.630$, $p = .001$.

Self-Efficacy

The 2 X 4 MANOVA revealed a significant main effect for Gender, Wilks's $\Lambda = .985$, $F(3, 861) = 3.343$, $p = .005$, but not by Class,

Wilks's $\Lambda = .984$, $F(3, 861) = 1.593$, $p = .112$, or the Gender X Class interaction, Wilks's $\Lambda = .991$, $F(3, 861) = .831$, $p = .587$ for exercise self-efficacy. These results indicate males and females differed on their levels of exercise self-efficacy. The mean and standard deviation values for the exercise self-efficacy subscales by gender are reported in Table 3. The tests of between-subject effects revealed significant differences between males and females on coping self-efficacy, $F(1, 863) = 7.432$, $p = .007$, and scheduling self-efficacy, $F(1, 863) = 4.452$, $p = .035$. Males, compared to females, had significantly higher coping self-efficacy and scheduling self-efficacy for exercise.

Discussion

Physical Activity

The results of this study indicate a need for physical activity promotion at the college level. Approximately 50% of the total sample met the American College of Sports Medi-

Table 3. Mean and Standard Deviation Scores for Exercise Self-Efficacy Subscales by Gender (N = 871)

Mean Score (Standard Deviation)		
Subscale	Male	Female
Task self-efficacy	7.21 (2.02)	7.41 (1.83)
Coping self-efficacy	5.92 (2.56)**	5.50 (2.34)
Scheduling self-efficacy	6.11 (2.28)*	5.76 (2.45)

* $p < .05$, ** $p < .01$

cine (ACSM) and American Heart Association (AHA) recommendations for vigorous physical activity (Haskell et al., 2007). This outcome is similar to the 46.7% found by Nelson, Gortmaker, Sabramanian, and Wechsler (2007). Only, 15% of our sample met the ACSM and AHA recommendations for moderate physical activity (Haskell et al., 2007). The remaining participants (35%) failed to meet the recommended guidelines for physical activity and 18% of the overall sample did not engage in any vigorous or moderate intensity physical activity. The current rates of inactivity observed in this study are similar with earlier investigation in the general adult population (USDHHS, 2000) and college student populations (Wallace et al., 2000; Leslie et al., 1999). Specifically, female college students displayed higher rates of physical inactivity than male college students. This is an indication the rates of inactivity are related to gender. This suggests health promotion professionals should consider gender differences when designing physical activity programs for college aged adults.

Surprisingly, differences in physical activity behaviors based on year in school were not found in the present study. On the other hand, male participants engaged in significantly more vigorous and moderate minutes per session of physical activity than the females. Nelson et al. (2007) also found male

to engage in more vigorous physical activity than females. The female participants in the current study did engage in significantly more mild exercise sessions per week than males. These findings indicate the type and amount of physical activity may differ by gender. Other studies have reported similar findings with female college students engaging in less strenuous physical activity than male students (Keating et al., 2005). The findings further support the notion that health promotion professionals should consider gender differences when designing physical activity programs for college aged adults. Specifically, they should target female college students to engage in more vigorous and moderate intensity activities.

Motivation

The analysis for participant motivation in physical activity differed by gender but not by year in school. The gender-based analyses revealed some interesting findings. Women were found to be more motivated by weight management, appearance, nimbleness, positive health, and stress management. The findings suggest college women have greater concerns related to about maintaining positive health, wellbeing, and specifically their body weight than college men. Women's greater concern for health, appearance, and weight appears appropriate based on previous data indicating young women are more likely to be overweight than similar aged males (USDHHS, 2000). These findings may be due to the pressures females often experience early in life due to contemporary societal standards of the female body size and shape (Field, Austin, Taylor, et al., 2003; Hill, Draper, & Stack, 1994). The importance of physical activity providing stress relieve for these young women would assist with not only weight management but also assist with the management of stress related to body image expectations (CDC, 2011).

Other findings related to gender indicated men are more motivated than women by performance and ego-oriented factors, such as challenge, strength and endurance, competition, affiliation, and social recognition. This outcome parallels the findings of previous research with men being more motivated by activity that includes some performance factor (Ashford, Biddle, & Goudas, 1993). Furthermore, this supports the notion that men are more likely to view physical activity as an opportunity to pursue and achieve ego-related goal outcomes (Kilpatrick, Bartholomew, & Riemer, 2003). Thus, men's tendency to seek out a challenge, such as highly strenuous physical activity, can provide them the opportunity to demonstrate mastery, competence, and gain social recognition (Kilpatrick et al., 2005).

Self-Efficacy

Prior research had not addressed the comparative value of different types of self-efficacy for physical activity for different groups (i.e., gender or year in school) (Rodgers & Sullivan, 2001). The analysis of self-efficacy for physical activity differed by gender but not by year in school. The gender-based analyses revealed some noteworthy findings. Males reported significantly higher levels of coping and scheduling self-efficacy for physical activity than females. Thus, male students had higher confidence in their ability to engage in physical activity under challenging conditions (e.g., confidence in the ability to exercise while in a bad mood) than female students. Male students also had higher confidence in their ability to plan for physical activity regardless of obstacles (e.g., not enough time). This finding has direct implications for physical activity interventions and programs for college students. Females may need interventions designed to educate and show how to build physical activity into their schedule. They may also require programming to assist with engaging in physical activity even when the conditions are not ideal.

Limitations

This study had some important limitation, particularly with respect to the measurement of physical activity. Estimates of physical activity can vary and depend on the type of measures employed (Sarkin, Nichols, Sallis, & Calfas, 2000). Survey measures have only moderate correspondence with objective measures of physical activity (Westerterp, 2001). However, the expense of objective measures can make them impractical for investigations with limited funding (LaPorte, Montoye, & Caspersen, 1985). Another limitation was the cross-sectional design. Physical activity, motivation, and self-efficacy data was collected at only one time point and this may influenced the results. Finally, this study was limited to full-time college students attending a four year college in the Northeastern United States. The results of this study may have limited generalizability to students who attend community college, colleges outside the United States, colleges with different admission and demographic profiles, or other young adults who do not attend college.

Conclusion and Future Directions

Given the decrease in physical activity rates from adolescents to young adulthood, health promotion specialists within higher education are faced with the daunting challenge of increasing physical activity participation among college students. The data from this study suggests a continued need for physical activity promotion due to the current levels of inactivity. Furthermore, physical activity practitioners may need to consider gender when developing physical activity interventions for college students. Specifically, to motivate male students to engage in physical activity ego-orientated factors such as competition and challenge should be the theme of the intervention. When motivating female students, factors related to positive health, weight or stress management should be the

focus of the program. Targeting interventions based on year in school does not appear to be as important as gender.

The next step in this multiphase investigation is to utilize the information garnered from this study to develop tailored physical activity programs and promotions to meet the needs of young adults. For example, point-of-decision prompts, e-mail or text messages tailored toward specific physical activities, exercise motives, or self-efficacy of males or females should be utilized to positively influence physical activity behavior. Campus recreation centers can utilize the study's finding to better design and implement programs to meet to specific motives, needs, and desires of young adults who attend college. Also, administrators and health promotion faculty can create physical activity interventions with an increased likelihood of positively enhancing physical activity behavior.

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