Physical Activity Patterns and Self-Efficacy of Selected College Students

Matt Hutchins, Judy C. Drolet, and Roberta J. Ogletree

Abstract

Much attention has been given to the fact that Americans are becoming less active. This study was designed to examine the levels of exercise-specific self-efficacy and physical activity rates in a selected group of college students. Students were recruited as they entered a fitness facility. Participation consisted of completing a survey that measured exercise self-efficacy and physical activity behavior over the two-week span prior to participation. Age, sex, race, and year in school also were recorded. Exercise self-efficacy was calculated on a 0-20 scale. Mean self-efficacy scores for the group were 14.18 ± 3.50. Physical activity was measured in number of days participants reported being moderately to vigorously physically active in the two weeks prior to their participation. Mean physical activity scores for the group were 7.81 ± 3.15, and mean length of a typical physical activity session was 52.23 ± 25.99 minutes. Correlation analysis revealed positive moderate correlations between self-efficacy and physical activity (r = 0.462). Males scored significantly higher on all measures. A future research goal is to compare self-reported physical activity rates to objectively measured physical activity rates.

Introduction

Overweight and obesity rates in the United States have risen to epidemic levels. Decreasing levels of physical activity across populations have contributed to the rise in obesity rates (Corbin & Pangrazi, 2005). The corresponding result is in an increase in chronic disease among this country's population.

The Centers for Disease Control and Prevention (CDC) (2005, 2008) recommends that adults should engage in moderate-intensity aerobic activities for at least 150 minutes every week and in muscle-strengthening activities on two or more days a week. Past and present guidelines suggest that bouts of 10-15 minute exercise sessions can be added up to meet recommended physical activity levels. People of all ages who are generally inactive can improve their health and well-being, both physically and psychologically, by becoming physically active at moderate intensities on a regular basis (Landers, 1997; Melzer, Kayser, & Pichard, 2004). Relatively few Americans meet minimum recommendations and nearly one-third report no leisure-time physical activity (CDC, 2008).

Physical Activity in College Students

A 1998 survey revealed that 35-40% of college students could be classified as physically inactive. In contrast, data from Eaton, Kann, Okoro, and Collins (2007) report 66.1% of college aged students (18-24) are sufficiently physically active. Both of these studies found rates were higher for males, Caucasians, unmarried individuals, and those in their first three years of college. These data also indicate that activity patterns decline dramatically over the course of adolescence.

Factors that have been shown to influence college students' physical activity levels positively include self-efficacy, self-motivation, peer influence, perceived competence and perceptions of convenience (Bumgman, Orsak, & Chang, 1996; Dishman & Sallis, 1994; Sallis, 2005; Shen, McCaughtry, & Martin, 2008; Unger & Johnson, 1995). Lack of time and high numbers of perceived barriers have been shown to affect physical activity behavior negatively (Franklin, Whaley, & Howley, 2005; Sallis, Hovell, Hofstetter, & Barrington, 1992; Smith & Biddle, 1999; Woodard & Berry, 2001;).

Authors have theorized about differences between male and female physical activity behaviors and attitudes. Chung and Phillips (2002) state that males are more likely to have positive attitudes toward exercise, therefore, males are more likely to engage in leisure-time exercise. Treasure, Lox, and Lawton (1998) suggest that the social aspect of exercise may be an important factor affecting some females' physical activity behaviors.

Self-Efficacy and Physical Activity

Bandura (1994) described self-efficacy as a situation specific form of self-confidence. Self-efficacy beliefs determine how people feel, think, motivate themselves and behave. It is the belief that one has the power to produce a given effect. Mastery experience and vicarious experience are said to be important determinants of a person's self-efficacy. Of the two types of experience, the value of mastery experience cannot be overstated (Bandura, 1994; Gill, 2000).

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Exercise self-efficacy is defined as the conviction that one can successfully engage in physical activity and adhere to an exercise regimen (Strecher, McEvoy, Becker, & Rosenstock, 1996; Woodard & Berry, 2001). It is said to be the strongest mutable predictor of physical activity among adults in general (Clark & Notwehr, 1999). Several other authors also have shown self-efficacy to be a strong influence on physical activity behavior (Bumgman, et al., 1996; Clark & Notwehr, 1999; Shen, et al., 2008; Shen & Xu, 2008; Strecher et al., 1996; Woodard & Berry, 2001). A major difference between this study and past research efforts is the use of an exercise-specific scale. Schwarzer and Renner (2005) demonstrated that self-efficacy related to one behavior does not necessarily equate to self-efficacy in other behaviors. Their work suggests the need for use of behavior-specific scales.

Methods

Participants

Three hundred twenty-four adult male and female participants were recruited for this study. All participants were currently enrolled in college or university level coursework and at least 18 years of age. Participants were recruited as they entered a selected fitness facility and asked to complete the survey instruments. Individuals not currently enrolled in college or university level coursework were excluded from this study. Mean age of participants was 24.13 ± .04 years.

Research Design

A descriptive, correlational design was used for this study. This study used three survey instruments to collect data related to self-efficacy, physical activity behavior, and demographics. These scores were added together to yield a sum self-efficacy score. The physical activity and demographic portion of the instrument asked participants to self-report physical activity levels for the previous week and to report age, sex, year in school, and race.

Self-Efficacy Scale

The self-efficacy scale was developed by Schwarzer and Renner (2005) to examine the relationship between self-efficacy, behavioral intentions, and actual behavior. Permission to use the scale was given to the researchers prior to any data collection efforts. Five items were scored on a 4-point Likert-type scale where 1 = very uncertain, 2 = rather uncertain, 3 = rather certain, and 4 = very certain. Items were designed to assess the participants' perceived ability to overcome a variety of barriers to carry out exercise intentions. These responses were added together for a sum score with a theoretical range of 5 to 20. Higher sum scores are theorized to be associated with greater degrees of exercise self-efficacy. Internal consistency (Cronbach's alpha) for the scale was alpha = 0.88 (Schwarzer & Renner, 2005). Schwarzer and Renner also report the correlation of exercise self-efficacy with intention to exercise at .327 and with actual exercise behavior at .388. These correlations were statistically significant at the .01 level with a 2-tailed test.

Evidence for the validity of the scales is also given. Schwarzer and Renner (2005) state that behavioral intentions and reported health behaviors were chosen as criteria for construct validity. Perceived self-efficacy is regarded as a suitable predictor of behavioral intentions and reported health behaviors. Correlation of exercise self-efficacy with behavioral intentions was found to be .327. This correlation was significant at the .01 level. The authors infer construct validity based on this correlation.

Physical Activity and Demographics Survey

Physical activity survey questions included: average time in minutes of each exercise session and number of days the participant reported being moderately to vigorously active for a total of at least 30 minutes during the previous two weeks. Time in minutes of each exercise session was reported as a continuous variable. Number of days during the previous two weeks on which the participants engaged in moderate to vigorous physical activity was recorded as a continuous variable with a theoretical range of scores, from 0 to 14 days. These did not have to be consecutive days of physical activity. Demographics included age, sex, year in school, and race. A summary of demographic data is presented in Table 1.

Results

Exercise self-efficacy was shown to be predictive of physical activity behavior. Multiple linear regression analysis suggested that exercise self-efficacy statistically contributed a significant amount of variance in the frequency of physical activity (r = .462, p < .05). Exercise self-efficacy predicted

Table 1.
Summary of Categorical Demographics from the Study (N = 324)

	Number	Percent of total
Sex		
Males	196	60.49
Females	128	39.51
Race		
Caucasian	297	91.67
African-American	21	6.48
Other	6	0.02
Year in school		
Freshmen/Sophomore	83	25.62
Junior/Senior	118	36.42
Graduate school	123	37.96

Table 2.

Independent t-tests Between Male and Female Self-Efficacy and Physical Activity Scores (N = 324)

	Males	Females		
	Mean (SD)	Mean (SD)	*t*	*p*
Self-efficacy	14.53 (3.61)	13.67 (3.30)	-2.2	.032*
Physical activity Days	8.15 (2.98)	7.29 (3.33)	-2.4	.016*
Physical activity Time in minutes	55.71 (25.40)	48.75 (26.57)	-2.4	.018*

Note. **p* = .05

nearly 8% of the variance in the frequency of physical activity (R^2 = .079). Independent *t*-tests revealed that self-efficacy, physical activity in number of days, and time in minutes were significantly different for males and females at the .05 level ($p < .05$). Age of male and female participants was not significantly different at the .05 level. The results of independent *t*-test analyses are presented in Table 2.

Pearson product-moment correlations revealed low positive correlations among self-efficacy and physical activity in number of days and time in minutes. Sex of participants was significantly correlated with self-efficacy, physical activity in number of days and time in minutes. Results of the correlation analysis are presented in Table 3.

This study defined exercise self-efficacy as the ability to overcome certain barriers and manage to carry out physical activity behavior. Mean self-efficacy scores for the group were found to be 14.19 ± 3.50 on a 20-point scale. Self-efficacy scores were significantly higher among male participants compared to female participants. As stated previously, exercise self-efficacy was found to have a low positive correlation with physical activity as measured by this study.

Data analyses showed that the mean number of days participants were physically active was 7.81 ± 3.15 days of 14 days. Data suggested males were more likely to be physically active than their female counterparts. This difference was statistically significant at the .05 level. Supporting past research, physical activity rates were higher for freshmen and sophomores than for graduate students. Comparisons among various ethnic groups were difficult to make due to the low number of participants from diverse ethnic groups. A large proportion of the participants listed their race as Caucasian. Finally, participants were asked to indicate how many minutes one of their typical exercise sessions lasted. Mean

Table 3.

Summary of Correlation Analysis (N = 324)

	Self-efficacy	Physical activity Days	Physical activity Time in minutes	Age	Sex
Self-efficacy	1.00	.462**	.372**	.069	.119*
Physical activity Days		1.00	.354**	-.097	.134*
Physical activity Time in minutes			1.00	.012	.131*
Age				1.00	.084
Sex					1.00

Note. ***p* = .01 (2-tailed); **p* = .05 (2-tailed)

scores for number of minutes was found to be 52.23 ± 25.81 minutes with a mode of 60 minutes. Current findings suggest that once participants physically go to a fitness facility, they are likely to exercise according to recommendations for intensity and time. Time in minutes, in particular, may be inflated by self-reported data.

Discussion

Primary limitations were that the study relied on participant self-reports and did not address all variables that have been linked to physical activity behaviors. These results may not be generalizable to other populations. A more diverse sample is recommended for future studies. As mentioned previously, Caucasians and graduate students were overrepresented in this study. It is unclear why Caucasians were overrepresented in this study. Data collection times and days were staggered for the purposes of obtaining a more diverse population, but these measures did not achieve that goal.

A goal for health educators is to devise measures that will increase the number of Americans who meet physical activity recommendations. Part of this effort involves a greater understanding of the determinants of physical activity. It is imperative that future research efforts focus not only on these determinants, but also on the relationships among them. Several studies report the impact of self-efficacy on physical activity; however, few of these studies measured exercise-specific self-efficacy.

Self-efficacy theory suggests that those who are confident in their abilities to execute a behavior, even when confronted with barriers, are more likely to engage in that behavior (Bandura, 1986). Self-efficacy theorists go on to state that those with higher levels of self-efficacy are more likely to challenge themselves in relation to the specified behavior. This aspect was evidenced by the fact that those with higher levels of self-efficacy were more likely to be not only physically active more frequently, but were likely to be active for longer amounts of time. The results of this study are similar to those of other studies. Self-efficacy was a significant predictor of physical activity behavior in terms of both frequency and duration (Bumgman et al., 1996; Clark & Notwehr, 1999; Shen et al., 2008; Shen & Xu, 2008; Strecher et al., 1996; Woodard & Berry, 2001). Results of this study also suggest that once participants physically entered the fitness facility, they were likely to meet physical activity recommendations in relation to time. Getting people to fitness facilities on a regular basis may be a way for health educators to increase physical activity rates. This study, like others, relied on participant self-reports. Future studies should include actual measures of physical activity patterns based on caloric expenditure. Higher self-efficacy, as measured by this study, indicated a perceived ability to overcome certain barriers and still manage to carry out exercise intentions. Males, as evidenced by self-efficacy scores, appear to be more comfortable with exercise-related behaviors and in their ability to overcome barriers to exercise. As a result, males reported higher levels of physical activity, both in number of days and time in minutes. The authors of this study theorize that males scored higher on the exercise related self-efficacy scale for a variety of reasons. Societal and cultural influences on males and females likely affect self-efficacy and exercise behaviors (Chung & Phillips, 2002).

Recommendations for future research and programming would include focusing on people under the age of 21 and comparing self-reported data to objectives measures of physical activity. Behavior theory suggests that, like many behaviors, physical activity patterns are determined early in life. Increasing self-efficacy at young ages may lead to increased physical activity as a person ages. This is important because research continues to show that physical activity rates decrease as people get older (CDC, 2008). In addition, it appears that giving people choices in relation to physical activities increases motivation and self-efficacy. Shen and Xu (2008) conclude that several variables, both physical and psychological, affect physical activity motives. Therefore, greater attention should be given to ecological approaches that account for a variety of physical, psychological, and social factors. Finally, it is clear that more research needs to be done with exercise specific scales.

The implications these data have for health education are numerous. With the ever-increasing focus on obesity prevention and increasing physical activity behaviors, health educators will be asked to develop and implement programs addressing these issues. Knowledge of factors that influence physical activity behavior and contribute to obesity is crucial to planning effective programs. These type efforts may lead to increased collaboration with other health-related professionals and should place an emphasis on the overall benefits of physical activity and on increasing physical activity rates across the population.

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