

EXPLORING THE RELATIONSHIP BETWEEN COLLEGE STUDENTS' BARRIERS TO EXERCISE AND MOTIVATION

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Abstract: Background: Demographics among college students are becoming increasingly diverse and the enrollment of students who are considered “nontraditional” is on the rise. Traditional and nontraditional students are faced with numerous physical activity barriers and increased responsibilities when it comes to balancing school, work, and physical activity. The purpose of this study was to examine relationships between college students’ barriers to exercise and motivation among traditional and nontraditional students. Furthermore, the study explored the relationships between college students’ barriers to exercise and motivation among males and females. Methods: Participants (n = 217) completed the Barriers to Being Active Questionnaire, the Psychological Need Satisfaction in Exercise Questionnaire, and the International Physical Activity Questionnaire. Results: The study found there were no differences among motivational factors, barriers to exercise, and traditional and nontraditional students. Females in this study reported significantly higher ratings of barriers compared to males. However, they reported higher ratings in the competence construct of Self-Determination Theory as compared to males. Conclusions: The current study, revealed traditional and nontraditional students, as well as males and females, all reported the same top three barriers to exercise that include: lack of time, energy, and willpower. Understanding college students’ motivation and barriers to physical activity is an important step in developing strategies to help them enhance their health and well-being. With the help of health professionals, college students can learn how to overcome these barriers.

Keywords: *Physical Activity, Health, Traditional*

INTRODUCTION

The benefits of physical activity (PA) have been widely researched and reported. Benefits associated with a physically active lifestyle include: a reduction in the risk of developing high blood pressure, coronary heart disease, and diabetes, as well as reduces the symptoms of anxiety and depression [Centers for Disease Control and Prevention (CDC), 2015]. Participating in regular PA helps maintain a person’s healthy body weight, muscle and bone strength, and flexibility (CDC, 2015). However, an estimated 32.7% of adults aged 20 and over are overweight, 37.9% are obese, and 7.7% are extremely obese (Fryar, Carroll, & Ogden, 2016). Being overweight and obese can increase the risk of developing heart disease, diabetes, and certain cancers (National Institute of Diabetes and Digestive and Kidney Diseases, 2016). PA can help prevent people from becoming overweight and obese.

The CDC (2015) recommends that adults participate in at least 150 minutes of moderate-intensity aerobic activity every week to benefit from PA. However, the majority of Americans do not meet this recommendation. The surgeon general report by the CDC (2015) found that more

than 60% of Americans are not regularly active and 25% of Americans are not active at all. Additionally, it has been found that about 50% of college students do not meet PA recommendations (American College Health Association, 2012; Keating, Guan, Pinero, & Bridges, 2005). It is important to understand the barriers to PA and the motivational factors that influence college students because half of the population is not meeting PA recommendations. Developing good PA habits in college may be important in order to remain physically active throughout a persons’ lifetime (Keating, Guan, Pinero, & Bridges, 2005). College is a transitional time for those individuals who decide to pursue a higher degree and it is important for them to maintain or start healthy behaviors that include PA.

Deci and Ryan developed the self-determination theory (SDT) and they explained motivation occurs when basic psychological needs are met (Deci & Ryan, 1985, 2000, 2002). The basic psychological needs include three constructs: autonomy (power to choose), competence (mastery of skills), and relatedness (meaningful connections) (Deci & Ryan, 1985, 2000, 2002). Along with the three basic psychological needs, Deci and

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Ryan (1985) explain that intrinsic and extrinsic motivations are key concepts of the SDT as well. They define intrinsic motivation as doing an activity because of its inherent satisfactions and extrinsic motivation as doing an activity to obtain some outcome separable from the activity (Deci & Ryan 1985; Teixeira, Carraca, Markland, Silva, & Ryan, 2012). The SDT has been used in many studies to try to understand what motivational factors influence people to engage in regular PA. A conclusion from a systematic review of the literature on PA and SDT was that competence and intrinsic motivation have shown consistent support for a positive association with PA (Teixeira, Carraca, Markland, Silva, & Ryan, 2012).

Studies on what motivates college students to engage in PA have concluded that intrinsic and extrinsic motivational factors can influence a person's decision on whether to engage in PA or not (Egli, Bland, Melton, & Czech, 2011; Maltby and Day, 2001). Those who engage in sport for PA tend to do it for more intrinsic reasons and those who participate in exercise for PA tend to be more extrinsically motivated (Kilpatrick, Hebert, & Bartholomew, 2005). It has been found that males typically engage in PA for intrinsic motivational factors and women for extrinsic motivational factors (Egli, Bland, Melton, & Czech, 2011; Lauderdale, Yli-Piipari, Irwin, & Layne, 2015).

As individuals move into adulthood, their PA levels continue to decline and adults spend less time being physically active (CDC, 2015; Flegal, Graubard, Williamson, & Gail, 2005; Kwan, Cairney, Faulkner, & Pullenayegum, 2012). Research has found some of the barriers to being physically active among adults include: lack of time, energy, discipline, social support, willpower/motivation, and resources/money (Greaney et al., 2009; Kulavic, Hultquist, & McLester, 2013; Lovell, El Ansari, & Parker, 2010; Ross & Melzer, 2016). Research on college students found that lack of time is one of the most influential barriers they have to overcome (Behrens, Dinger, Heesch, & Sisson, 2005; Brown, 2005; Daskapan, Tuzun, Eker, 2006). Kulavic, Hultquist, and McLester (2013) found that time was a barrier, but college students in their study explained lack of energy and willpower were significant barriers as well. The authors also compared traditional and non-traditional students' barriers to exercise and found a significant difference among the nontraditional students perceived barriers that included fear of injury, lack of skill, and lack of resources (Kulavic, Hultquist, and McLester, 2013).

Demographics among college students are becoming increasingly diverse and the enrollment of students who are considered "nontraditional" is on the rise. According to a report by the United States Department of Education (2016), university enrollment of adults ages 25 and older has risen by 19% between 2003 and 2013. Nontraditional students have been defined as those who

are 23 years of age or older, and commute to and from campus while holding a job and managing a family (Eppler, Carsen-Plentl, Harju, 2000; Hoyt, Howell, Touchet, Young, & Wygant, 2010). Differences between nontraditional and traditional students can vary, but most commonly noted are differences in living arrangements, financial burdens, independence from parents, and time management struggles (Kulavic, Hultquist, and McLester, 2013). Nelson, Gortmaker, Subramanian, and Wechsler (2007) found that nontraditional male students engage in significantly lower amounts of vigorous PA than traditional students do. Traditional and nontraditional students are faced with numerous PA barriers and increased responsibilities when it comes to balancing school and PA. Due to the rise of a diverse student population it is important to explore the reasons that motivate and prevent students from being healthy.

Purpose

Motivation constructs and barriers to PA have been studied and data comparing PA motivation among gender has generated mixed results. There is limited research, reported in the introduction that explores the relationship between motivation and barriers of PA among traditional and nontraditional students. Therefore, the purpose of this study was to examine relationships between college students' barriers to exercise and motivation among traditional and nontraditional students. Furthermore, the study explored the relationships between college students' barriers to exercise and motivation among males and females.

METHODS

This research study was approved by the Institutional Review Board (IRB) at a Midwestern university in the United States (U.S.). With the IRB approval the researchers were granted access to student email addresses. Data were collected using a questionnaire administered through Survey Monkey. Participants were sent emails with an embedded survey link. Participants were informed that if they clicked on the link, they were consenting to participate in the research study. After survey administration, surveys were recorded and analyzed in the Statistical Package for the Social Sciences (SPSS) version 20. Only the research team had access to the electronic file that stored survey responses.

Participants

Study participants (n = 217) included college students who attended the Midwest university. Participants received an email solicitation, stating survey completion was completely voluntary and they could withdraw at any time. The email also contained a link to the informed consent and survey in Survey Monkey. Participants answered questions concerning their (a) demographics, (b) barriers to exercise, (c) physical activity motivation, and (d) physical activity levels. Participants

were encouraged to accurately answer each question before submitting survey responses electronically. To differentiate between traditional and nontraditional students, a question was added to the demographic section. An operational definition stated, "Nontraditional students are classified as those who are 23 years of age or older, and commute to and from campus while holding a job and/or managing a family." Participants were then asked whether or not they considered themselves as a nontraditional student.

Barriers to Being Active Questionnaire

The CDC developed the barriers to being active questionnaire, which consists of 21 items related to seven different barriers to PA (CDC, 2016). The following are the seven different barriers to PA: lack of time, social influence, lack of energy, lack of willpower, fear of injury, lack of skill, and lack of resources (CDC, 2016). The questionnaire uses a 4-point Likert scale ranging from: strongly agree, agree, disagree, and strongly disagree. Some questions include: "I'm getting older, so exercise can be risky", "I don't have access to jogging trails, swimming pools, bike paths...", "I'm embarrassed about how I will look when I exercise with others", and "I want to get more exercise, but I just can't seem to make myself stick to anything".

Measurement of Physical Activity Motivation

Physical activity motivation will be assessed using the Psychological Need Satisfaction in Exercise (PNSE) scale, which was developed by Wilson, Rogers, Rodgers, and Wild (2006). The PNSE scale assesses basic psychological need satisfaction based on SDT (Deci & Ryan, 1985, 2002). The PNSE consists of 18 items scaled among three constructs [autonomy ($n = 6$), competence ($n = 6$), relatedness ($n = 6$)]. The PNSE displays psychometric characteristics that render usefulness in the context of exercise and PA. Information obtained from the PNSE allowed investigators to evaluate adult psychological need satisfaction. Some questions include: "I feel confident that I can do even the most challenging exercises"(competence), "I feel like I am the one who decides what exercises I do"(autonomy), and "I feel close to my exercise companions who appreciate how difficult exercise can be"(relatedness).

Physical Activity Level Assessment

The International Physical Activity Questionnaire (IPAQ) - short form was used to examine PA over the last seven days (Maddison et al., 2007). The instrument consists of seven questions that ask participants to answer, in minutes, how much time they spend doing vigorous and moderate intensity exercise as well as the total amount of time spent walking and sitting. The IPAQ - short form is an international universally accepted PA assessment tool, which has been tested for repeat-

ed reliability and validity (Helmerhorst, Brage, Warren, Besson, & Ekelund, 2012; Maddison et al., 2007). The IPAQ – short form is commonly used in other studies and reported as a desirable measure for PA estimation (Helmerhorst et al., 2012). Specific questions include: 1. During the last 7 days, on how many days did you do vigorous physical activities (how many days)? How much time did you usually spend doing vigorous physical activities on one of those days (hours per day and minutes per day)? 2. . During the last 7 days, on how many days did you walk for at least 10 minutes at a time (how many days) 3. How much time did you usually spend walking on those days (hours per day and minutes per day)? During the last 7 days, how much time did you usually spend sitting on a week day (hours per day and minutes per day)?

Data analysis

Demographic data were analyzed per gender, ethnicity, and age. Furthermore, participants were categorized as being a traditional or nontraditional student. Pearson correlations were used to identify significant associations between barriers to exercise (time, social influence, energy, willpower, injury, skill, and resources) and retrospective 7-day PA levels [vigorous (days & minutes), moderate (days & minutes), walking (days & minutes), and total sitting time] among gender and traditional/nontraditional students. Analysis of variance (ANOVA) were used to determine significant differences in barriers to exercise and PA motivation among genders. ANOVA were also used to determine significant difference in barriers to exercise, PA motivation, and PA levels among traditional and nontraditional students. Data analyzed in the Statistical Package for the Social Sciences (SPSS) version 20. Data were deemed significant at 0.05.

RESULTS

A total of 217 participants completed the survey consisting of retrospective PA levels, barriers to exercise, and PA motivation. The current study reports student's age distribution of 18 - 20 ($n = 20$), 21 - 25 ($n = 73$), 26 - 30 ($n=39$), 31 - 35 ($n=25$), and 35+ ($n=60$) (Table 1). Significant associations were present between barriers to exercise (barriers combined) and PA levels [vigorous days ($r = -0.48$, $p = 0.01$), vigorous minutes ($r = -0.37$, $p = 0.01$), moderate days ($r = -0.38$, $p = 0.01$), and moderate minutes ($r = -0.37$, $p = 0.01$)] (Table 3). Specifically, participants who highly-rated willpower as an exercise barrier represented lower levels vigorous and moderate minutes and days of physical activity. These barriers represent modest associations that provide insight in group comparisons.

Significant differences in rating of exercise barriers were present between genders (Table 4). When barriers were combined, females noted sig-

Table 1. Participant Demographics

Gender	<i>n</i>	%
Female	157	72.4
Male	60	27.6
Ethnicity	n	%
White	99	45.6
African American	14	6.5
Hispanic/Latino	68	31.3
Middle Eastern	4	1.8
Asian	16	7.4
Multiracial	13	6
Other	3	1.4
Age	N	%
18-20	20	9.2
21-25	73	33.6
26-30	39	18
31-35	25	11.5
35+	60	27.6
Student Status	n	%
Traditional Students	157	72.4
Non Traditional Students	60	27.6

Table 2. Participant Student Status Demographics

	Traditional Students		Non-Traditional Students	
Gender	<i>n</i>	%	<i>n</i>	%
Female	157	72.4	48	80
Male	60	27.6	12	20
Ethnicity	n	%	n	%
White	99	45.6	15	25
African American	14	6.5	3	5
Hispanic/Latino	68	31.3	27	45
Middle Eastern	4	1.8	2	3.3
Asian	16	7.4	7	11.6
Multiracial	13	6	6	10
Other	3	1.4	0	0
Age	N	%	n	%
18-20	20	9.2	20	33.3
21-25	73	33.6	34	56.6
26-30	39	18	4	6.7
31-35	25	11.5	2	3.3

Table 3. Correlation Matrix between Barriers to Exercise and Physical Activity Levels

	Vigorous Physical Activity		Moderate Physical Activity		Walking	
	Days	Minutes	Days	Minutes	Days	Minutes
	r	r	r	r	r	r
Barriers to Exercise	-0.478**	-0.374**	-0.379**	-0.372**	-0.156	-0.125
Time	-0.355**	-0.217**	-0.373**	-0.280**	-0.100	-0.102
Social Influence	0.390**	-0.355**	-0.368	-0.384**	-0.164*	-0.119
Energy	-0.383**	-0.260**	-0.339**	-0.309**	-0.138*	-0.043
Willpower	-0.535**	-0.429**	-0.345**	-0.370**	-0.207**	-0.091
Injury	-0.113	-0.117	0.016	-0.104	0.025	-0.064
Skill	-0.305**	-0.252**	-0.248**	-0.215**	-0.120	-0.117
Resources	-0.146*	-0.147*	-0.087	-0.081	0.002	-0.079

Table 4. Analysis of Variance among Barriers to Exercise and Physical Activity Motivation among Genders

		<i>M</i>	<i>F</i>	<i>n</i>	<i>p</i>
Barriers to Exercise	Female	48.5987	14.89	157	**0.001
	Male	43.0167		60	
Time	Female	8.4076	14.713	157	**0.001
	Male	7.0833		60	
Social Influence	Female	7.535	10.374	157	**0.001
	Male	6.65		60	
Energy	Female	8.7962	11.103	157	**0.001
	Male	7.7		60	
Willpower	Female	8.9299	6.438	157	*0.012
	Male	8.0167		60	
Fear of Injury	Female	5.0764	0.286	157	0.594
	Male	4.9333		60	
Skill	Female	5.6752	5.05	157	*0.026
	Male	5		60	
Resources	Female	4.1783	7.02	157	**0.009
	Male	3.6333		60	
Physical Activity Motivation					
Competence	Female	13.8726	4.508	157	*0.035
	Male	12.5167		60	
Autonomy	Female	10.8344	0.604	157	0.438
	Male	10.4333		60	
Relatedness	Female	13.7962	0.402	157	0.527
	Male	13.4		60	
* Denotes significance at 0.05; ** Denotes significance at 0.01					

* Denotes significance at 0.05; ** Denotes significance at 0.01

Table 5. Analysis of Variance between barriers to exercise, PA Motivation, and PA levels among traditional and non-traditional students

		<i>n</i>	<i>M</i>	<i>F</i>	<i>p</i>
Barriers to Exercise	Traditional Students	157	47.03	0.00	0.96
	Non Traditional Students	60	47.12		
Time	Traditional Students	157	8.21	2.96	0.09
	Non Traditional Students	60	7.60		
Social Influence	Traditional Students	157	7.25	0.29	0.59
	Non Traditional Students	60	7.40		
Energy	Traditional Students	157	8.54	0.20	0.65
	Non Traditional Students	60	8.38		
Willpower	Traditional Students	157	8.61	0.51	0.47
	Non Traditional Students	60	8.87		
Fear of Injury	Traditional Students	157	5.04	0.00	0.99
	Non Traditional Students	60	5.03		
Skill	Traditional Students	157	5.44	0.34	0.56
	Non Traditional Students	60	5.62		
Resources	Traditional Students	157	3.96	1.57	0.21
	Non Traditional Students	60	4.22		
Physical Activity Motivation					
Competence	Traditional Students	157	13.38	0.42	0.52
	Non Traditional Students	60	13.80		
Autonomy	Traditional Students	157	10.60	0.77	0.38
	Non Traditional Students	60	11.05		
Relatedness	Traditional Students	157	13.69	0.00	0.97
	Non Traditional Students	60	13.67		

nificantly higher ratings of barriers ($M = 48.59$) compared to males ($M = 43.02$) [$F(1, 217) = 14.89$, $p = 0.001$]. When separated, significant differences were present among the barriers of time [$F(1, 217) = 14.71$, $p = 0.001$], social influence [$F(1, 217) = 10.37$, $p = 0.001$], and energy [$F(1, 217) = 11.10$, $p = 0.001$] (Table 4). Lastly, significant differences were present between genders among ratings of the PA motivation construct of competence [$F(1, 217) = 5.73$, $p = 0.035$] (Table 4). Ratings of exercise barriers combined and individually were not reported to be significantly different between traditional and nontraditional students (Table 5).

DISCUSSION

The study found there were no differences among motivational factors, barriers to exercise, and traditional and nontraditional students. Females in this study reported significantly higher ratings of barriers compared to males. However,

they reported higher ratings in the competence construct of SDT as compared to males. Lastly, the study revealed that people who reported lower barriers to exercise participated in vigorous and moderate PA on more days during the week and for a longer duration of time (minutes) per day.

This study found no differences in motivation or perceived barriers to exercise among traditional and nontraditional students. This contrasts the study by Kulavic, Hultquist, and McLester, (2013). The authors in that study found significant differences in the perceived barriers among traditional and nontraditional students that included lack of skills, lack of resources, and fear of injury. However, this study had similar results to the Kulavic, Hultquist, and McLester, (2013) study in that the top 3 barriers reported by traditional and nontraditional students in both studies were the same and they included lack of time, energy, and willpower.

Past research reports males and females are motivated to exercise for different reasons (Egli,

Bland, Melton, & Czech, 2011; Lauderdale, Yli-Piipari, Irwin, & Layne, 2015). It has been reported that females rated "time" as the most frequently cited barrier to exercise (Kimm, Glynn, McMahon, Voorhees, Striegel-Moore, & Daniels, 2006). Observations from the current study are similar to this study as time was rated as a prominent barrier to exercise. Males and females as well as traditional and nontraditional students reported the same top three barriers that include lack of time, energy, and willpower. This finding is similar to past research that reported time, energy, and willpower as barriers to PA among college students (Behrens, Dinger, Heesch, & Sisson, 2005; Brown, 2005; Daskapan, Tuzun, Eker, 2006; Kulavic, Hultquist, and McLester, 2013). This rating consistently suggests that these 3 barriers are present in various geographic locations, making it increasingly important for health professionals to create programs that address these barriers. Health professionals can use this information to help college students start or maintain a regular exercise regime.

Females reported higher ratings of competence as compared to males. This report suggests females had confidence in their ability to exercise and meet their desired health goals, but also recorded numerous barriers that prevented them from participating in PA as compared to males. The problem is that if individuals are unable to bridge barriers, motivation constructs are seemingly gritless. Females in this study may feel they have competence, but the numerous barriers stated are preventing them from exercising. Males and females need to understand and develop strategies to overcome these barriers.

Those who participated in more days and minutes of vigorous and moderate PA had lower ratings of barriers to exercise, which was an expected outcome of this study. College students who already engage in vigorous and moderate PA have most likely previously developed strategies to overcome the common barriers found in this study. They have self-regulation, self-efficacy, and intrinsic motivation to be physically active. This study did not look at academic success or success in other areas of health, but it would be interesting to see if these participants use similar strategies to be successful in these areas as well.

It has been found that people who participate in vigorous activity are more likely to set health-related goals, have a higher level of self-efficacy, and are more intrinsically motivated (Doerken, Umstattd, & McAuley, 2009; Lowry, Galuska, Fulton, Wechsler, Kann, & Collins, 2000; Petosa, Suminski, & Hartz, 2003; Teixeira, Carraca, Markland, Silva, & Ryan, 2012). Health professionals should help college students develop strategies that build self-regulation, self-efficacy, and intrinsic motivation. Some strategies could include learning how to set and achieve realistic PA goals, starting with moderate exercise, moni-

toring their steps and trying to achieve 10,000 steps per day, and journaling their activity. Once students develop and use these motivational skills, they will have the tools to overcome the barriers of time, energy, and willpower.

Limitations

This study is reliant on self-reported responses concerning PA levels and participants might have reported higher or lower PA levels. Data could be misleading due to whether or not participants understood the definitions of moderate/vigorous activity. Data also could be misleading due to whether or not they understood the definitions of traditional and nontraditional student. Another important limitation was location. Surveys were only emailed to participants at one mid-sized university. Lastly, potential socially desirable responses should be listed as a limitation if a participant felt uncomfortable reporting low levels of PA or motivation and barrier ratings.

CONCLUSION

As stated, the college student population is becoming more diverse and it is the responsibility of health professionals to be inclusionary to accommodate the health needs of all students. Understanding college students' motivation and barriers to PA is an important step in developing strategies to help students enhance their health and well-being. Health professionals need to educate students so they are more literate when it comes to being physically active. College students should know that PA does not have to be a continuous 30-45 minute bout of vigorous PA in order to gain the benefits associated with exercising. Students need to learn how to set and achieve realistic PA goals. Setting realistic goals is an important part of student success. They are more likely to succeed if they start with moderate exercise such as walking, biking, swimming, etc. Another strategy would include monitoring their steps and trying to achieve 10,000 steps per day. Journaling their activity and success could be another strategy as well. Lastly, health professionals on college campuses should work with other departments on campus. Providing college-wide programs and incentives for students to be physically active could increase motivation as well. Once they have established the habit of engaging in regular PA they are more likely to stick with it.

Those who participate in more days and minutes of vigorous and moderate PA presumably have established healthy behaviors that help bridge barriers that may inhibit or limit PA. Previous exposure allows individuals to recognize potential barriers because they have already established techniques to approach barriers. These coping mechanisms can carry beyond PA and extend to

various health-enhancing behaviors such as nutrition. Future research should consider looking at academic success or success in other areas of health to see if college students have similar barriers and use similar strategies to be successful in these areas as well.

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