

Physical Activity Behaviors among College Students Enrolled in Online Fitness Courses: An Application of Ajzen's Theory of Planned Behavior

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Received December 10, 2024; Revised January 11, 2025; Accepted February 18, 2025

Abstract Despite numerous studies linking physical and emotional well-being to exercise, more than 50% of U.S. adults and approximately 37% of college students are physically inactive. As college demographics shift to include more non-traditional students (ages 25 and older), it becomes significant to understand their physical activity behaviors. In addition, the surge in online education due to the COVID-19 pandemic underscores the need to study physical activity behaviors among diverse populations, including both traditional and non-traditional students in online settings. This study examines the physical activity behaviors among college students enrolled in an online fitness course at a historically black college and university (HBCU). Participants included twenty non-traditional and twenty traditional college students from a southeastern HBCU, who completed the Theory of Planned Behavior and Godin Leisure-Time questionnaires over two semesters. One-way ANOVA analysis found a significant difference between non-traditional and traditional college students in their intentions ($p = .003$) and attitudes ($p = .003$) toward engaging in physical activity. Specifically, non-traditional students demonstrated higher intentions and more positive attitudes compared to traditional peers, even though both groups showed similar levels of actual physical activity participation. Universities should consider revising Physical Activity curricula to enhance the motivation of non-traditional students and foster greater participation through targeted interventions and ongoing research. This approach aims to bridge the gap between students' intentions and their actual physical activity participation and create a supportive environment that fosters sustained physical activity among diverse college populations.

Keywords: college students, physical activity behaviors, online fitness classes, HBCU, exercise

Cite This Article: Amy D. Linder, Jerono Rotich, and Andrea Woodson-Smith, "Physical Activity Behaviors among College Students Enrolled in Online Fitness Courses: An Application of Ajzen's Theory of Planned Behavior." *Journal of Physical Activity Research*, vol. 10, no. 1 (2025): 1-6. doi: 10.12691/jpar-10-1-1.

1. Introduction

With the increasing usage of technology along with living a sedentary lifestyle, among college students, the lack of physical activity has been linked to major life crises such as chronic diseases (i.e., cancer, diabetes, hypertension) and changes related to living an independent life [1]. According to a 2016 study, conducted by the American College Health Association (ACHA), approximately 47.2% of enrolled college students engaged in the recommended moderate and vigorous exercise [2]. Moreover, the statistical rates of irregular physical activity along with the increasing technology use among college students are disturbing and expected to continue into life post-college [1]. A previous study conducted by Linder, Liu, Woodson-Smith, & Jung, revealed that engaging in the recommended amount of exercise and physical activity is important as far as contributing to positive well-being and longevity among

traditional and non-traditional college students [3]. However, the use of technology (i.e., internet and distance education) has increased among traditional and non-traditional college students, resulting in a lack of physical activity [4].

The Popularity of Online Distance Education (ODE)

The National Center for Education (1999) conducted a study that stated online distance education (ODE) is "education or training classes provided via remote (off-campus) location (s) via audio, video (live or recorded), or computer technologies such as synchronous and asynchronous instruction" (p. 2) [5]. In fact, ODE courses and programs can allow a large population of college students, nationally and internationally, to attend a class opposed to that of a traditional classroom or higher education program [4]. Since the implementation of ODE in higher education, 1.9 million students enrolled in the fall of 2003, 2.3 million in the fall of 2004, 3.2 million in the fall of 2005 semester, and 4 million students enrolled in higher education ODE courses during the fall of 2007 semester, the number of college students, enrolling in

higher education ODE classes, continues to accelerate in growth [6]. Furthermore, in the year 2016, over 7 million or 33.5% of college students were enrolled in at least one ODE course while 12.5% of college students were enrolled exclusively in ODE courses [7]. In addition, new online college student enrollment numbers may continue to increase in growth while colleges and universities must continue to respond to the demand [7].

The purpose of this study is to examine the physical activity behaviors among college students (gender, race) enrolled in an online fitness course at a Historically Black College and University (HBCU). With the occurrence of ODE courses and programs, especially since the unprecedented Covid-19 pandemic of 2020, understanding the determinants of physical activity behaviors among non-traditional and traditional college students while enrolled in an ODE fitness course or program warrants more research [8].

Background of Ajzen's Theory of Planned Behavior (TPB)

According to previous studies, Ajzen's Theory of Planned Behavior (TPB) model has been incorporated to identify multiple ethnic-specific variables that are interconnected with low exercise participation among college students [3]. In addition, the TPB model has been commonly used to study the efficacy of predicting and elucidating both physical activity intentions and behaviors between college students who are studying online and adults [9]. Moreover, research has shown that an individual's intention to engage in exercise is determined by three TPB determinants: attitude, subjective norms, and perceived behavior control [10]. Also, another study identified descriptive norms as linked to impacting one's engagement in physical activity [11]. According to Sok, Borges, Schmidt, and Ajzen (2021), "a person's attitude is described as a generated evaluation of the behavior's desirability" [12]. The intention to engage in exercise by a person is typically the most immediate determinant as well as the best clairvoyant of genuine behavior performance [12]. Authors La Barbera and Ajzen (2020) stated that the TPB determinant, subjective norm, is referred to as recognized social pressure to engage in a specific behavior [13]. An example statement regarding the subjective norm determinant would include, "people who are important to me would disapprove or approve of me engaging in moderate or vigorous physical activity over the next two weeks." The perceived behavior control (PBC) determinant often associated with a person's intention towards exercising is defined as an individual's insights of their ability to perform a specified behavior [12]. Another

study revealed that the PBC has been used as a surrogate for authentic control, with blended results [13]. However, researchers have revealed that the descriptive norm determinant has been linked to the intention to engage in physical activity [11]. The descriptive norm is defined as an individual's perceptions of the primacy of other's behaviors, while those perceptions can oscillate a person's behaviors [11].

2. Methodology

Upon approval from the Institutional Review Board (IRB), this study examines the physical activity behaviors among traditional and non-traditional college students enrolled in an online fitness course at a historically black college and university (HBCU) (3-White or Caucasian; 30-Black or African American; 1-Hispanic or Latino; 2-Asian or Asian American; 1 Middle Eastern or Middle Easterner; and 3-Biracial or Multiracial). The participants included twenty non-traditional and twenty traditional college students from a southeastern HBCU, who completed the Theory of Planned Behavior and Godin Leisure-Time questionnaires over two semesters. One-way ANOVA analysis found a significant difference between non-traditional and traditional college students in their intentions

($p = .003$) and attitudes ($p = .003$) toward engaging in physical activity. Specifically, non-traditional students demonstrated higher intentions and more positive attitudes compared to traditional peers, even though both groups showed similar levels of actual physical activity participation.

3. Participants

Participants in the study were 40 non-traditional and traditional college who were enrolled in an online fitness course at an HBCU in the southeastern portion of the United States. Twenty of the students were classified as non-traditional students (ages 25 and up) and twenty as traditional students (ages 18-24 years) ($n = 40$). While five of the students were male, 35 of the students were classified as female. 30 of the students were labeled as Black or African American while three were classified as White or Caucasian and two represented the Asian or Asian American population. Table 1, Table 2, and Table 3 show the demographic breakup of non-traditional and traditional college students enrolled in online fitness courses.

Table 1. Demographics of Participants (non-traditional and traditional students)

		Frequency	Percent	Valid Percent	Cumulative Percent
	Traditional Student (18-24)	20	50.0	50.0	50.0
	Non-Traditional Student (25+)	20	50.0	50.0	100.0
	Total	40	100.0	100.0	

Table 2. Demographics of Participants (Gender)

		Frequency	Percent	Valid Percent	Cumulative Percent
	Male	5	12.5	12.5	12.5
	Female	35	87.5	87.5	100.0
	Total	40	100.0	100.0	

Table 3. Demographics of Participants (Race)

		Frequency	Percent	Valid Percent	Cumulative Percent
	White or Caucasian	3	7.5	7.5	7.5
	Black or African American	30	75.0	75.0	82.5
	Hispanic or Latino	1	2.5	2.5	85.0
	Asian or Asian American	2	5.0	5.0	90.0
	Middle Eastern or Middle East	1	2.5	2.5	92.5
	Biracial or Multiracial	3	7.5	7.5	100.0
	Total	40	100.0	100.0	

4. Interventions

The college students who were classified as traditional and non-traditional students who were enrolled in the online fitness courses volunteered to complete the online survey which comprised questions from Ajzen's TPB model as well as Godin Leisure-Time Exercise Questionnaire (GLTEQ). The researcher contacted the online fitness instructors via email at the HBCU in the southeast area of the United States, which included the online survey link that would be used in the study. Moreover, the online survey was administered using surveymonkey.com to the non-traditional and traditional students enrolled in the online fitness course.

5. Measures

The researcher explored the determinants of Ajzen's Theory of Planned Behavior (i.e., attitude, intention, subjective norm, descriptive norm, and perceived behavior control (PBC) amongst the traditional and non-traditional students according to race and gender when it came to their viewpoint towards physical activity and exercise while in an online fitness course [14]. The one-way ANOVA correlation analysis was used to regulate whether there was any correlation between Ajzen's TPB determinants scores as well as GLTEQ's vigorous intensity (VI) and moderate intensity (MI) scores among the traditional and non-traditional college students according to race and gender, within an online fitness course at an HBCU in the Southeast region of the United States.

Similarly, the additional component of the survey comprised two items from the GLTEQ which evaluates the amount of time each participant in physical activity during a week (i.e., seven days). The researcher evaluated each person's weekly exercise activities by including the VI and MIs which were also identified as cut points.

6. Statistical Analyses

The data analysis included using the statistical test one-way ANOVA correlation. One-way ANOVA is used to determine whether there are statistically significant differences between the means of three or more independent (unrelated) groups [15]. Moreover, one-way ANOVA compares the variance within groups to the variance between groups to see if any of the group means are significantly different from one another [16]. All the traditional (ages 18 to 22 years) and non-traditional

college students (ages ranging from 23 to 45 years) enrolled in an online fitness class at a HBCU in the Southeast region of the United States were encouraged to complete the online survey.

7. Results

The motivation for this quantitative study was to evaluate the data collected regarding the physical activity behaviors among traditional and non-traditional college students enrolled in an online fitness course at a historically black college and university (HBCU) (3 White or Caucasian; 30 Black or African American; 1-Hispanic or Latino; 2-Asian or Asian American; 1 Middle Eastern or Middle Easterner; and 3-Biracial or Multiracial). This investigation included participants identified as non-traditional (20) and traditional (20) college students from a southeastern HBCU, who completed the Theory of Planned Behavior and Godin Leisure-Time questionnaires over two semesters.

Tables 4 and 5 display the analysis by using One-way ANOVA to find any significant difference between non-traditional and traditional college students' intentions ($p = .003$) and attitudes ($p = .003$) toward engaging in physical activity. Specifically, non-traditional students demonstrated higher intentions and more positive attitudes than traditional peers, even though both groups showed similar levels of physical activity participation when engaging in moderate physical activity twice a week.

Table 4. IntentionMVEx

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	9.808	5	1.962	4.456	.003
Within Groups	14.967	34	.440		
Total	24.775	39			

Table 5. AttitudeMVEX2wks

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	10.808	5	2.162	4.546	.003
Within Groups	16.167	34	.475		
Total	26.975	39			

Table 6 displays the TPB determinant (descriptive norm) by using one-way ANOVA analysis and discovered a very highly significant difference between the non-traditional and traditional college students, in particular, gender among the groups (female-34; male-6) when choosing to engage in either moderate or vigorous physical activity

($p < .001$). Table 7, the gender category, indicated “that the people most important to them would also engage in the exercises.” Moreover, Table 6 displays descriptive statistics for the TPB determinant descriptive norm.

Table 6. Gender

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	2.875	3	.958	23.000	<.001
Within Groups	1.500	36	.042		
Total	4.375	39			

Table 7. Gender (Descriptive Norm #1)

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
disagree	3	1.00	.000	.000	1.00	1.00	1	1
somewhat disagree	8	1.75	.463	.164	1.36	2.14	1	2
somewhat agree	18	2.00	.000	.000	2.00	2.00	2	2
agree	11	2.00	.000	.000	2.00	2.00	2	2
Total	40	1.88	.335	.053	1.77	1.98	1	2

Table 8. Race (Engaging in Moderate PA within a week (7 days))

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	119.375	7	17.054	54.571	<.001
Within Groups	10.000	32	.313		
Total	129.375	39			

Table 9. Race (Engaging in Moderate PA within a week (7 days))

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
never	4	1.50	.577	.289	.58	2.42	1	2
once a week	5	2.00	.000	.000	2.00	2.00	2	2
twice a week	7	2.00	.000	.000	2.00	2.00	2	2
three times a week	13	2.00	.000	.000	2.00	2.00	2	2
four times a week	3	2.00	.000	.000	2.00	2.00	2	2
five times a weeks	4	4.50	1.732	.866	1.74	7.26	3	7
six times a week	3	8.00	.000	.000	8.00	8.00	8	8
seven times a week	1	1.00	.	.	.	.	1	1
Total	40	2.63	1.821	.288	2.04	3.21	1	8

Table 8 displays how frequently the non-traditional and traditional college students, in particular, the different races among the groups (White-3; Black-30; Hispanic-1; Asian- 2; Biracial or Multiracial-3) when choosing to engage in **moderate** physical activity within a week (7 days); while using one-way ANOVA analysis to find any significant difference between the races ($p < .001$). Also,

Table 9 displays descriptive statistics for the engagement in moderate physical activity (P) for one week.

Table 10 displays the significant differences between non-traditional and traditional college students, particularly race and gender, using the TPB determinant (intention) when engaging in **vigorous** physical activity within a week (7 days). Also, one-way ANOVA analysis was used to find any significant difference between gender ($p < .001$), race ($p < .001$), and the TPB determinant intention ($p < .001$).

Table 10. Race, Gender, Intention, Engaging in Vigorous PA within a week (7 days)

		Sum of Squares	df	Mean Square	F	Sig.
Gender	Between Groups	2.500	6	.417	7.333	<.001
	Within Groups	1.875	33	.057		
	Total	4.375	39			
Race	Between Groups	118.500	6	19.750	59.931	<.001
	Within Groups	10.875	33	.330		
	Total	129.375	39			
IntentionMV Ex	Between Groups	14.025	6	2.338	7.176	<.001
	Within Groups	10.750	33	.326		
	Total	24.775	39			

Table 11. Race, Gender, Attitude, Engaging in Moderate PA within a week (7 days)

		Sum of Squares	df	Mean Square	F	Sig.
Gender	Between Groups	3.575	7	.511	20.429	<.001
	Within Groups	.800	32	.025		
	Total	4.375	39			
Race	Between Groups	119.375	7	17.054	54.571	<.001
	Within Groups	10.000	32	.313		
	Total	129.375	39			
AttitudeM VEX2wks	Between Groups	24.758	7	3.537	51.059	<.001
	Within Groups	2.217	32	.069		
	Total	26.975	39			

Table 11 displays the significant differences between non-traditional and traditional college students, particularly race and gender, while using the TPB determinant (attitude) when engaging in **moderate** physical activity within a week (7 days). Also, one-way ANOVA analysis was used to find any significant difference between gender ($p < .001$), races ($p < .001$), and the TPB determinant attitude ($p < .001$).

Table 12 displays a very highly significant difference between non-traditional and traditional college students, in particular, the gender while using the TPB determinant (perceived behavior control-PBC) as it relates to self-efficacy when choosing to engage in either moderate or

vigorous physical activity ($p = .002$). The genders indicated “if I wanted to, engaging in moderate or vigorous physical activity over the next two weeks would be unlikely, somewhat unlikely, somewhat likely, or likely” in Table 13.

Table 14 displays the question, “If I wanted to, I could easily engage in moderate or vigorous physical activity over the next two weeks,” there were highly significant differences between non-traditional and traditional college students, in particular, the gender while using the TPB determinant (perceived behavior control) as it relates to

self-efficacy when choosing to engage in either moderate or vigorous physical activity ($p < .001$) in Table 15.

Table 12. Gender (perceived behavior control-SE)

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1.264	2	.632	7.516	.002
Within Groups	3.111	37	.084		
Total	4.375	39			

Table 13. Gender (Perceived Behavior Control #1) Self-Efficacy

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
somewhat unlikely	1	1.00	.	.	.	.	1	1
somewhat likely	18	1.78	.428	.101	1.57	1.99	1	2
likely	21	2.00	.000	.000	2.00	2.00	2	2
Total	40	1.88	.335	.053	1.77	1.98	1	2

Table 14. Gender (PBC-SE) #2

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
minimum control	4	1.25	.500	.250	.45	2.05	1	2
moderate control	18	1.89	.323	.076	1.73	2.05	1	2
complete control	18	2.00	.000	.000	2.00	2.00	2	2
Total	40	1.88	.335	.053	1.77	1.98	1	2

Table 15. Gender (PBC-SE) #2

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1.847	2	.924	13.519	<.001
Within Groups	2.528	37	.068		
Total	4.375	39			

8. Discussion and Conclusions

The results from this study revealed significant differences in physical activity behaviors between traditional and non-traditional college students enrolled in an online fitness course at an HBCU, particularly when analyzed using Ajzen's Theory of Planned Behavior (TPB). The data suggest that non-traditional students demonstrate higher intentions and more positive attitudes toward engaging in physical activity compared to their traditional counterparts. The one-way ANOVA analysis indicated a significant difference in both intentions ($p = .003$) and attitudes

($p = .003$) between the two groups, implying that non-traditional students may possess a stronger intrinsic motivation to maintain physical activity, even though both groups exhibited comparable levels of actual physical activity participation.

Gender and race also emerged as significant factors influencing physical activity behaviors. The ANOVA results highlighted a highly significant effect of gender ($p < .001$) on the descriptive norms for physical activity, suggesting that social expectations or perceived support

differ between male and female participants. The female students, who comprised the majority of the participants in this study, indicated that the views of significant others played an important role in their decision to participate in physical activity. Thus, social support may be a critical component to consider when developing physical activity interventions.

The findings suggest that racial differences greatly impact physical activity participation, with notable differences in participation ($p < .001$). Although the Black or African American students represented the largest racial group in this study, the significant differences in physical activity behaviors among the racial groups indicated that cultural factors or various challenges related to access to resources may impact these behaviors. The impact of race participation in moderate and vigorous physical activities is noteworthy. This implies that personalized and targeted interventions, mitigating cross-cultural and social determinants, could significantly enhance physical activity participation rates across all diverse groups. Addressing the unique cultural, social, and psychosocial determinants that influence physical activity participation among different racial and ethnic groups can significantly increase physical activity participation behaviors.

Recommendations and Implications

The incorporation of Ajzen's TPB model has provided valuable insights into physical activity behaviors among traditional and non-traditional online fitness courses at a historically black college and university (HBCU). The study highlights key differences in physical activity behaviors among traditional and non-traditional college students enrolled in an online fitness course at an HBCU. Non-traditional students showed higher intentions and more positive attitudes toward physical activity than their traditional counterparts. Gender and race also significantly impacted engagement in physical activity, with females and different racial groups experiencing varying levels of social influence and participation frequency. These findings suggest that incorporating programs tailored to the needs of all students and those that mitigate the social and psychosocial determinants may be effective in improving physical activity participation among diverse college populations enrolled in online fitness courses.

Universities and colleges that offer programs for traditional and non-traditional students should consider revising their curricula and interventions to harness the motivations of non-traditional students. Continually conducted research is essential to understanding the barriers and motivators that traditional and non-traditional students face regarding physical activity participation. By leveraging the insights gained from ongoing research, institutions can be better informed on how to bridge the gap between students' intentions and their actual physical activity participation and create a supportive environment that fosters sustained physical activity among diverse college populations.

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