

PROMOTING PHYSICAL ACTIVITY AMONG FEMALE COLLEGE STUDENTS: IDENTIFYING POSSIBLE RACIAL DIFFERENCES

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Abstract: Physical inactivity increases the prevalence of diseases. A significant decline is noted among female college students. This study identified factors that could be used to develop campus-wide physical activity (PA) initiatives to promote better health. Participants were diverse female students (N = 233, that completed an on-line PA survey. Logistic regression analysis with post-hoc pair-wise t-test comparisons revealed significant differences between racial/ethnic groups regarding moderate and vigorous PA. College represents a major transition period for young adults, and colleges and universities could promote more PA among female students, leading to better health well beyond graduation.

Keywords: *Physical Activity, Females, College students, Physical inactivity, racial/ethnic*

INTRODUCTION

Rates of physical inactivity has risen significantly, contributing to an increase of heart disease, diabetes, colon cancer, and high blood pressure (American Heart Association [AHA], 2013; Centers for Disease Control and Prevention [CDC], 2008; U.S. Department of Health and Human Services [DHHS], 2010). Physical inactivity a major public health problem associated with increased morbidity and mortality, accounting for 1.9 million deaths each year (World Health Organization, 2018), and declines in physical activity (PA) is especially evident among females as they age (Benjamin et al., 2017; Laura Kann et al., 2014). A ground breaking study in 2005 by Kimm et al. revealed that PA in adolescent girls declined significantly between pre-teen and teen years (Kimm et al., 2005), and only 45.8% of female college students in the United States meet recommended levels of PA (American College Health Association, 2016). In addition, national data in the United States shows that physical inactivity prevalence differs between racial/ethnic groups, for example, non-Hispanic Whites were more likely than non-Hispanic Blacks and Hispanics to meet the PA aerobic guidelines with leisure-time activity (Benjamin et al., 2017; Laura Kann et al., 2016).

Participating in regular PA supports a healthy lifestyle and reduces the incidence of many chronic illnesses. The physical activity guidelines (PAG) established in 2008, was recently updated (2018) and the physical activity recommendation for adults (≥ 18 years of age) remained the same. These guidelines recommend a minimum of 150 minutes of aerobic activity of moderate intensity

(e.g., brisk walking) every week; or 75 minutes of aerobic activity at vigorous intensity (e.g., jogging or running) every week; or an equivalent mix of both (DHHS, 2008; 2018). Many of the changes in the new PAG (2018) guidelines reflects science-based guidance that was included to assist American adults set and meet goals for regular physical activity. In addition to the aerobic activities, 2 or more days of muscle strengthening (MS) activities that work all major muscle groups (legs, hips, back, abdomen, chest, shoulders, and arms) should also be done each week (DHHS, 2018). These recommendations fall into the category of leisure time physical activity (LTPA), which are physical activities not associated with work, school, routine house work or other sports related activities (CDC, 2011).

In the fall of 2017, an estimated 20.4 million students attended American colleges and universities, with a majority of them being female (US Department of Education, 2016). The health habits of this substantial portion of the population could be influenced through effective health promotional programs. A college campus may be the ideal place to educate and motivate young adults to adopt a healthier lifestyle such as engaging in regular daily LTPA.

College has traditionally offered young adults an opportunity to expand their perception of the world, with exposure to experiences that may not have been previously available to them; on a college campus students' have several opportunities to engage in regular PA (walking and biking to class, intramural sports, club sports and use of a recreational center). Furthermore, data from Healthy People 2020 (HP 2020) shows that the

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higher the education level (4-years or more of college) a person has, the more likely the individual will meet the PAG (HP 2020, 2018).

Therefore, the primary purpose of this cross-sectional study is to explore female college students' behavior and perceptions of PA as it relates to the federal PAG, and to explore for any racial/ethnic differences among female students. A secondary purpose is to identify strategies that could be used to strengthen or develop PA programs on college campuses that consider racial/ethnic differences. The information obtained from this study could be used to develop and promote culturally relevant initiatives for adopting and maintaining regular PA among female college students that helps them to meet and maintain PAG. Culturally relevant is defined as "the extent to which ethnic/cultural characteristics, experiences, norms, values, behavioral patterns and beliefs of a target population as well as relevant historical, environmental, and social forces are incorporated in the design, delivery, and evaluation of targeted health promotion interventions" (Resnicow, Braithwaite, Dilorio, & Glanz, 2002, p. 493). Studies have shown that incorporating cultural components into programs improves their effectiveness (Apiyo & Obeng, 2015; Liu et al., 2012; Thind, Goldsby, Dulin-Keita, & Baskin, 2015).

METHODS

A cross-sectional research design was used to explore the following questions among female college students at a small urban campus: 1) Are students aware of the minimum physical activity guidelines (PAG)? 2) How many students are meeting the minimal of 150 minutes of moderate physical activity (MPA) per week, and does race or ethnic background affect MPA levels? 3) How many students engage in 75 minutes of vigorous physical activity (VPA) per week, and does race or ethnic background affect VPA levels? 4) Do class rankings affect PA levels? 5.) What are the top three reasons given by female college students for not meeting PAG? A qualitative question was also asked to obtain students' suggestions or opinions on how the university could help foster or encourage more physical activity.

The Institutional Review Board (IRB) at Rutgers University, Camden approved the study, which was conducted from September to November of 2017. Using the university's LISTSERV, the Rutgers Office of Student Affairs sent a university wide email requesting all students identifying as female, aged 18 – 24, to complete a survey regarding their current PA level and behavior characteristics regarding PA. Participation in the study was strictly voluntary, and consent was assumed if the student decided to participate after reading the study details in the email. No identifiable information associated with the student was collected or reported. The students accessed the survey through Qualtrics—a secure web-based survey

platform—via a link embedded in the email. Participants were asked to provide demographic information regarding their age, class ranking and racial/ethnic designation. Those who completed the survey were eligible for an incentive drawing.

Physical Activity Questions

The survey consisted of 23 questions based on the 2008 Physical Activity Guidelines (PAG) for Adults (age ≥ 18) recommended by the Department of Health and Human Services (2008) and designed to elicit information about students' perceptions and beliefs regarding PA, their time spent being physically active, and types of PA in which they engaged. Specific PA questions were: 1.) In a typical week, how many days do you engage in MPA? 2.) In a typical week, how many days do you engage in VPA? 3.) During your leisure-time or down time, how often do you engage in any regular physical activity? Other questions explored what physical activities were most appealing or acceptable to female college students. To avoid missing data, the Qualtrics program was set to force completed responses before participants could move to the next question.

All analyses were considered exploratory and conducted using SAS, version 9.4 (SAS Institute Inc, 2013), with the statistical significance level set at an alpha of 0.05. Thus, any significant findings should be considered preliminary and useful for informing hypotheses for larger follow-up confirmatory studies with a more rigorous study design. Both moderate physical activity (MPA) and vigorous physical activity (VPA) per week were analyzed separately and assessed as follows: 1) average minutes of PA per day (continuous); 2) whether the student engaged in PA three or more days per week (yes/no); 3) whether the student met the minimum recommended minutes per week of PA (yes/no). Per the PAG, 150 minutes of MPA and 75 minutes of VPA were used as the minimum recommended minutes per week of physical activity.

Once the analysis dataset was composed, initial descriptive statistics were generated for participants' demographic and PA levels. The summary statistics consisted of means, standard deviations (for continuous variables), and frequency counts and percentages (for categorical variables). Next, the association between race and the various physical activity outcomes was assessed. Specifically, the mean number of minutes per day students reported participating in MPA or VPA was generated for each race and class-level variable. The ANOVA F-test and the non-parametric Kruskal-Wallis test were used to test the association between minutes of physical activity per day and race. When overall statistical significance was detected, post-hoc pair-wise t-test comparisons among the race groups were generated.

Frequencies and percentages were calculated for the binary physical activity outcomes

across the race and class categories. Chi-squared and Fisher's exact tests were used to test the general associations among these variables. When overall statistical significance was detected, a logistic regression analysis was conducted to obtain the post-hoc pair-wise comparisons among the race and class categories. Lastly, frequencies were calculated to assess the questions designed to determine barriers to exercising among the students, overall, and by race. With several exploratory hypotheses tested, the chances of a type 1 error is high, but the results may help to inform larger studies.

RESULTS

At the time of the survey, Rutgers University Camden had 6,853 students enrolled; 53.6% of whom were women. A total of 233 diverse female college students participated in this study, yielding a margin of error rate of 0.323% based on a 95% confidence range. The students ranged in ages from 18 to 24 (mean: 21.3; SD: 2.2). The students were mostly juniors (33%) and seniors (35%), Table 1 shows a more detailed description of the study participants, and descriptive statistics of physical activity levels among participants are shown in Table 2.

Fifty-three percent of participants indicated they were more physically active prior to college, with 88 % responding that they were aware of the PAG recommendation to participate in at least 150 minutes of physical activity each week. Thirty-seven percent of students met 150 minutes of moderate physical activity (MPA) each week. There was no significant difference between White (38%) and Black (29%) students who participated in at least 150 minutes of MPA ($p=0.280$), nor in any of the other groups when it was expanded to include all races (White, Black, Hispanic and Asian; $p=0.406$). There was also no significant difference in the minimum 150 minutes participation each week for MPA ($p=0.612$) between the different class ranks.

Preliminary descriptive statistics between race and the physical activity variables (MPA and VPA) can be seen in Table 3. Participants who indicated their race as "Other" were not included in this analysis. The superscript letters (a, b) in Table 3 are used to show which variables are significantly different at the alpha 0.05 level: if the superscript letters are different from another variable, then these variables are statistically different from one another; if the superscript letters are the same, then these variables are not statistically different from one another. The findings in Table 3 are described below.

Fifty-four percent of students responded that they engage in MPA three or more days a week. There was no statistical difference between Black (47%) students and White (61%) students participating in three or more days a week of MPA ($p=0.106$). When the race group was expanded to also include Hispanic students (31%)

and Asian (55%) students, there was a significant difference between the groups ($p=0.023$) due to the significant difference between Hispanic students and White students ($p=0.004$) and the difference between Hispanic students and Asian students ($p=0.046$). There was no significant difference between the different class ranks for those who responded participating in MPA 3 or more days a week.

Of the students who engaged in vigorous physical activity (VPA), 31% participated in a minimum of 75-minutes of VPA each week. VPA was higher in White students (41%) than in Black students (18%), which is statistically significant ($p=0.007$). There is also a significant difference between all of the race groups' response to VPA ($p=0.0110$): 40.5% of White students responded to participating in a minimum of 75 minutes of VPA each week compared to 18% of Black students, 18% of Hispanic students, and 33% of Asian students (White vs. Black: $p = 0.008$, White vs. Hispanic: $p=0.018$).

White students (25%) responded that they participated in 3 or more days a week of VPA compared to 9% of Black students, which is statistically significant ($p=0.022$). When both Hispanic (12%) and Asian (19%) students are included, overall, the participation in VPA 3 or more days a week across the groups is no longer significantly different ($p=0.073$). In class ranking (freshman, sophomore, juniors, seniors and graduate students) alone, the average minutes of MPA per day ($p=0.413$) and the average minutes of VPA per day ($p=0.711$) are not significantly different between the classes. In addition, how many days per week the students engaged in physical activity was not significantly different between the five classes for both VPA ($p=0.6370$) and MPA ($p=0.1092$).

The following analyses were based on frequency of responses to selected items. Although the following rankings were not based on statistical significance, they still provide an overall view of students' preferences and any potential racial differences (see Table 4). The participants were asked to rank the top three reasons that they felt prevented them from being physically active with number one being the top choice. The number one reason, regardless of race was "Don't have time." The second most ranked reason given by all participants, except for Hispanic female students, was "Studying." Hispanic female students ranked "Not motivated" as number two. The third ranked reason showed more racial differences in the responses among participants. Overall, "Not motivated" was ranked number three; however, when the participants' responses were separated by race, the third choice changed. The third reason indicated by Blacks and Asians was "Not motivated," while Whites indicated "My job/working" as their third reason; and Hispanic gave "Studying" as their third reason for not being physically active.

Racial differences were also observed with the question regarding what physical activity the participant felt would be fun and engaging. Dancing was the top activity, ranked at number one for all participants except White female students, who ranked swimming as number one. The findings that dance was ranked as the top activity is consistent with empirical literature that reveals dance is a favorable and fun form of physical activity among females (Huang, Hogg, Zandieh, & Bostwick, 2012; Robinson et al., 2010; Schroeder et al., 2017).

Overall, swimming was ranked as number two; however, when the participants' responses were separated by race, the second ranked choice varied. The second activity viewed as fun and engaging by Whites was "hiking," for Blacks it was "Zumba classes," and for Hispanics and Asians it was "bicycling." The activity indicated for number three varied as well: for Whites it was "aerobics/cardio," for Blacks it was "walking," for Hispanics "swimming and volleyball" tied, and Asians ranked "swimming" as their third choice. Participants were also asked to rank strategies that they felt would help them to become more physically active. "Better time management" was ranked number one by all participants except Blacks, who ranked "exercising with a partner" as number one. Coincidentally, the exact opposite was seen with the number two ranking, all participants ranked "exercising with a partner" as second except Blacks, who ranked "Better time management." The most selected third strategy was "a cost-free

alternative," except for Asians, who selected "being more organized."

DISCUSSION

The purpose of this descriptive cross-sectional study was to explore female college students' behavior and perceptions of physical activity and to identify strategies/initiatives that colleges and universities can use to strengthen or develop physical activity programs to increase participation among students, especially females. Racial/ethnic differences among female college students were identified that influenced physical activity preferences.

The racial differences noted among participants are consistent with the literature indicating that White females are usually more physically active than females from other racial groups (Benjamin et al., 2017; Centers for Disease Control and Prevention, 2007; Leung et al., 2016) and that Asians are among the least physically active when compared to other racial/ethnic groups (Kao, Carvalho Gulati, & Lee, 2016; Leung et al., 2016; Sun et al., 2016). Prior to college attendance, the level of physical activity noted between Whites and minorities may be related to their home life. A study by Suminski and colleagues (2009) shows that Whites were more physically active than Blacks due to more exposure to physical activity; for example, White families tend to have more exercise equipment available in the home (Suminski, Pyle, & Taylor, 2009). Consequently, the college environment may be a major influence on chang-

Racial / Ethnic	Frequency (%)
White or Caucasian	111 (45%)
Black or African American	45 (18%)
Hispanic or Latino	34 (14%)
Asian / Pacific Islander	43 (17%)
Other (*)	13 (6%)
*Other was not included in the descriptive statistics between races in Table 3.	
Class ranking	
Freshman	35 (14%)
Sophomore	34 (14%)
Junior	83 (33%)
Senior	87 (35%)
Graduate	7 (3%)

Table 2
Descriptive Statistics of PA Levels

In a typical week, how many days do you engage in MPA?	
Responses	Frequency (%)
None	9 (4%)
1 day per week	33 (13%)
2 days per week	68 (29%)
3 or more days per week	126 (53%)
In a typical week, how many days do you engage in VPA?	
None	96 (39%)
1 day per week	51 (21%)
2 days per week	52 (21%)
3 or more days per week	47 (19%)
During your leisure-time or down time, how often do you engage in any regular activity?	
Never	56 (23%)
1 day per week	65 (26%)
2 days per week	50 (20%)
3 or more days per week	75 (30%)

PA = Physical Activity
MPA = Moderate Physical Activity
VPA = Vigorous Physical Activity

ing behavior among Black females. Suminski’s study underscores the impact that college life can have on students’ behavior when they are exposed to opportunities not available in their homes or neighborhoods.

A study by Farren et al. (2017) examined psychosocial factors associated with PA participation in college students. The results revealed that colleges and universities could increase the likelihood of meeting any and all PAG in students if administrator developed physical activity strategies that considered psychosocial factors, such as, self-efficacy and belief to achieve set PA goals.

This study did not find any difference between class status or academic years, but other studies have found that students tend to be less physically active as they progress through college (Staten, Miller, Noland, & Rayens, 2005). In these cases, the decline in physical activity was due to more study time associated with more dif-

ficult course work. “Don’t have time” or “lack of time” are the predominant reasons for physical inactivity reported in most studies (Heesch & Mâsse, 2004; Im et al., 2013; Sun et al., 2016). Not surprising, “Better time management” was a strategy that received the most responses from participants in this study. Therefore, strategies to help students be more physically active must involve time-management.

Suggested Strategies to Improve Physical Activity among College Females

The participants’ responses to what physical activity they felt was fun and engaging also showed racial difference, with activities ranging from hiking (Whites) to dancing (Blacks) to bicycling (Hispanics and Asians); These findings suggest that colleges and universities could offer a more diverse range of physical activity programs that would reach or appeal to different racial

Table 3
Preliminary Descriptive Statistics between Race and the Physical Activity Variables.

	Total (n=233)	White/Cau- casian (n=111)	Black/African American (n=45)	Hispanic or Latino (n=34)	Asian/Pacific Islander (n= 43)	Overall P-value
Moderate Activity (MPA)						
Number of minutes per day [Mean (SD)]	50.8 (38.4)	49.4 (34.2)a	51.0 (38.6)a	45.5 (37.9)a	58.6 (47.8)a	0.4638
3 or more days per week. [N (%)]	118 (52.7%)	64 (61.0%)a	21 (46.7%)ab	10 (31.3%)b	23 (54.8%)a	0.0233
Minimum 150 minutes per week [N (%)]	80 (35.7%)	40 (38.1%)a	13 (28.9%)a	9 (28.1%)a	18 (42.9%)a	0.4060
Vigorous Activity (VPA)						
Number of minutes per day [Mean (SD)]	30.8 (36.6)	35.5 (40.4)a	21.4 (26.5)b	20.3 (30.9)b	36.6 (37.0)a	0.0323
3 or more days per week. [N (%)]	44 (18.9%)	28 (25.2%)a	4 (8.9%)b	4 (11.8%)ab	8 (18.6%)ab	0.0727
Minimum 75 minutes per week [N (%)]	73 (31.3%)	45 (40.5%)a	8 (17.8%)b	6 (17.7%)b	14 (32.6%)ab	0.0107

Note: Means or frequencies follow by different superscript letters (a, b) are significantly different at the $\alpha=0.05$ level

PA = Physical Activity; MPA = Moderate Physical Activity; VPA = Vigorous Physical Activity.

In this Table, n does not include participants whose race was "Other"

groups. Some participants in this study suggested Zumba, kick boxing, or fencing. Studies show that activities that are considered fun and enjoyable promote more engagement in regular PA (Lewis, Frayeh, Williams, & Marcus, 2016; Schroeder et al., 2017), offering more diverse and fun activities may, therefore, also increase a student's motivation to be more physically active.

The study allowed participants to suggest how the university could help promote more physical activity among students. The students' suggestions were arranged into the following categories: PA courses/credits, increased awareness, scheduling, incentives and more group or club activities. Table 5 provides a sampling of some of the participants suggestions under these categories.

The first category comprised physical activity as credit courses or required classes. Students in a study by Milroy (2010) indicated that offering some kind of physical activity course for credit could help increase physical activity among college students (Milroy, 2010). The second category involved increased awareness. Students suggested that more publicity of physical activity programs, classes or events was needed. The third category involved time/scheduling. Participants suggested that the gym or fitness center should be open 24-hours or have longer hours and offer more

physical activity programs during "free period." The fourth category was incentives, offering incentives such as scholarships or discounted health insurance for time spent engaging in physical activity. The final category was more groups or clubs suggestions for clubs that were geared toward physical activity, such as dance or hiking; and offering of more intramural sports. Studies show that participating in group sessions can encourage women, especially from minority backgrounds, to be more physically active (Im et al., 2012; Im et al., 2013).

Making PA initiatives a top priority benefits the university, students and community. Studies indicate that engaging in regular PA can decrease students' stress and improve performance in the classroom (Barney, Benham, & Haslem, 2014; Sharp & Barney, 2016); therefore, universities or colleges that offer and/or support physical activity programs could potentially help students to be more successful in their studies. Being more physically active also contributes to decreased morbidity and mortality associated with chronic diseases like hypertension or diabetes (Benjamin et al., 2017; CDC, 2015). Campuses' student health services should screen student's level of PA and make recommendations for keeping the federal PAG.

Table 4
Frequency of Top 3 Responses (n; %)

Reasons you think prevent you from being physically active:			
Total (n=233)	Don't have time (194; 83%)	Studying (164; 70%)	Not motivated (119; 51%)
White or Caucasian (n=111)	Don't have time (93; 84%)	Studying (78; 70%)	My job (working) (68; 61%)
Black or African American (n=45)	Don't have time (37; 82%)	Studying (26; 58%)	Not motivated (24; 53%)
Hispanic or Latina (n=34)	Don't have time (22; 65%)	Not motivated (22; 65%)	Studying (18; 53%)
Asian/Pacific Islander (n=43)	Don't have time (32; 74%)	Studying (32; 74%)	Not motivated (23; 53%)
Physical activities you feel are fun and engaging:			
Total (n=233)	Dancing (82; 35%)	Swimming (80; 34%)	Zumba classes (69; 30%)
White or Caucasian (n=111)	Swimming (41; 37%)	Hiking (36; 32%)	Aerobics (cardio workout) (34; 31%)
Black or African American (n=45)	Dancing (20; 44%)	Zumba classes (19; 42%)	Walking (13; 29%)
Hispanic or Latina (n=34)	Dancing (18; 53%)	Bicycling (11; 32%)	Swimming (9; 26%);
Asian/Pacific Islander (n=43)	Hiking (18; 42%)	Volleyball (9; 26%)	
What would help you become more physically active:			
Total (n=233)	Better time management (212; 91%)	Exercising with a partner (207; 89%)	Being more organized (125; 54%)
White or Caucasian (n=111)	Better time management (97; 87%)	Exercising with a partner (90; 81%)	A cost-free alternative (59; 53%)
Black or African American (n=45)	Exercising with a partner (41; 91%)	Better time management (37; 82%)	Being more organized (22; 49%)
Hispanic or Latina (n=34)	Better time management (28; 82%)	Exercising with a partner (27; 79%)	Being more organized (19; 56%)
Asian/Pacific Islander (n=43)	Better time management (40; 93%)	Exercising with a partner (37; 86%)	Being more organized (24; 56%)

Note: Participants had multiple options to rank, therefore the % will not equal 100%

Limitations

This study has some limitations. This study used a convenience sampling of female students in a small urban university in the north, therefore our findings may not be generalizable to other college populations of similar age and make-up. Another potential issue with convenience sampling is selection bias. PA levels are based on self-reported data, in which participants could over or under

estimate their PA levels; however, self-reported PA data is acceptable and used frequently in PA studies (Ainsworth, Cahalin, Buman, & Ross, 2015). Given the mostly descriptive nature of the study and the difficulty in ascribing preferred activities by racial group. Without a more rigorous design approach to better understand the trends associated with preference, a potentially erroneous take away ascribes activities related to certain ethnic groups. This is further compounded by the small

Table 5
A Sampling of Participant Suggestions for Ways the University Could Promote Physical Activity

Credit course PA Elective	Improved or increased advertising or publicizing PA options	Time / Scheduling	Offer incentives	Group activities / Clubs Sports
<p>“Have a gym elective”</p> <p>“Offer it as a credit course”</p> <p>“A course that teaches how to properly lift weights and do exercises correctly.”</p> <p>“Having gym class mandatory for every semester.”</p>	<p>“Offer more events or advertise more classes at the gym. I’ve never heard if they have them or not.”</p> <p>“Advertise gym hours”</p> <p>“Promote workout classes more.”</p> <p>“I think the university should post more when some of the classes are offered. Maybe if people saw that the Zumba class was at a certain time while going about their day, they’d be more inclined to take time out and go.”</p>	<p>“Gym can possibly have longer hours.”</p> <p>“Provide 24-hour gym time.”</p> <p>“Have several PA classes during free period.”</p> <p>“More physical activities during free period, gym groups at specific times throughout the day.”</p> <p>“Sports activities/ athletic hobbies during free period. This allows for those who can’t commit a quick and easy alternative.”</p> <p>“More walking groups during free period.”</p> <p>“Have more group exercises at different times.”</p> <p>“Have a day dedicated to Exercise and Healthy Eating.”</p>	<p>“Offer incentives for time spent in the gym, such as scholarships or discounted health insurance.”</p> <p>“Offer a grade credit for been PA.”</p>	<p>“The University can offer more group exercise classes at the gym.”</p> <p>“There should be more (free) outdoor clubs and activities to participate in.”</p> <p>“Offer different types of exercises (yoga, cardio, boot camp)”</p> <p>“Offer more diverse types of PA (Zumba, kick boxing, fencing).”</p> <p>“More club sports like soccer, softball or volleyball. Along with intermural that are more often.”</p> <p>“More intramural sports would be nice.”</p> <p>“They could have more clubs that focus on PA Such as: Dancing, bicycling club, hiking club etc.”</p>

Note: PA=Physical Activity

sample size of the nonwhite racial groups which makes a subgroup analysis difficult to draw definitive conclusions from. However, these results provide valuable pilot findings that may help to shape the design of larger more rigorous studies.

CONCLUSION

The findings from this cross-sectional study could be used to help develop or strengthen physical activity programs offered on college campuses. Significant differences between racial groups regarding moderate and vigorous PA were identified and should be considered when establishing PA programs on campuses. This study supports that racial differences related to physical activity behav-

ior among female college students may need to be considered when developing PA programs at the college level.

College represents a major transition period in a young adult’s life. Several studies suggest that colleges and universities can play a significant role in increasing physical activity among students (Beville et al., 2014; Filipkowski, Heron, & Smyth, 2016; Leung et al., 2016). Colleges can implement physical activity policies and programs to promote better health habits among their students and play a major role in the reduction of future health problems. A meta-analysis by Keating et al. (2005) that examined studies on college students’ PA behaviors identified that colleges

and universities must address PA promotion on multiple-levels. Developing PA habits as a young adult can transition into on-going participation as a person ages (Price, Whitt-Glover, Kraus, & McKenzie, 2016; Sun et al., 2016). Therefore, colleges and university administrators can play a major role in fostering better health habits among college students.

In addition to helping their students ensure healthy and prosperous careers, colleges and universities could likewise help them establish healthy lifestyles. By addressing the decline of physical activity that occurs during the college years, colleges and universities can promote better health habits beyond graduation.

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