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Physical activity and quality of life among university students: exploring self-efficacy, self-esteem, and affect as potential mediators

Rodney P. Joseph,

University of Alabama at Birmingham School of Public Health, Birmingham, AL, USA

Kathryn E. Royse,

University of Alabama at Birmingham School of Public Health, Birmingham, AL, USA

Tanya J. Benitez, and

University of Alabama at Birmingham School of Public Health, Birmingham, AL, USA

Dorothy W. Pekmezi

University of Alabama at Birmingham School of Public Health, Birmingham, AL, USA

Abstract

Purpose—Physical activity (PA) has been shown to enhance quality of life (QOL) in older adults. Findings from these studies indicate that the relationship between PA and QOL is indirect and likely mediated by variables such as physical self-esteem, exercise self-efficacy, and affect. As PA varies greatly by age, the purpose of the current study is to extend this area of research to young adults and explore the complex relationship between PA and QOL in this target population.

Methods—Data were collected via anonymous questionnaire from $N = 590$ undergraduate students. PA was assessed with the Godin Leisure Time Exercise Questionnaire, and QOL was assessed by the Satisfaction with Life Scale. Path analysis was used to test the relationship between PA and QOL, with mediators of exercise self-efficacy, physical self-esteem, and affect.

Results—The PA model (RMSEA = .03, CFI = .99) accounted for 25 % of the variance in QOL. PA had positive direct effects on exercise self-efficacy ($\beta = .28, P < .001$), physical self-esteem ($\beta = .10, P < .001$), positive affect ($\beta = .10, P < .05$), and negative affect ($\beta = .08, P < .05$). Physical self-esteem was found to be the most powerful mediating variable on QOL ($\beta = .30, P < .001$), followed by positive affect ($\beta = .27, P < .001$) and negative affect ($\beta = .14, P < .001$).

Conclusion—Physical self-esteem and, to a lesser extent, positive affect emerged as integral components in the link between PA and QOL. Findings suggest that health education programs designed to promote regular PA and increase physical self-esteem may be effective in improving QOL in young adults.

Keywords

Physical activity; Quality of life; Life satisfaction; Young adults; College; Affect; Self-esteem

Introduction

The adverse health consequences associated with being physically inactive are numerous and include the increased risk of various diseases such as diabetes, breast and colon cancers, stroke, hypertension, and coronary heart disease [1]. Recent estimates indicate that approximately 3.2 million deaths per year are attributed to health issues associated with physical inactivity, making it the fourth leading risk factor for global mortality [1]. Performing regular physical activity (PA) cannot only protect against the development of chronic diseases, but also improve one's quality of life (QOL) [2]. QOL refers to how individuals subjectively view the positive and negative aspects of their lives [3] and encompasses both psychological and physical factors that collectively influence an individual's perception of the overall satisfaction with his/her life [4, 5].

Previous studies have reported positive relationships between PA and various QOL indicators [6–9]. However, participants in many of these studies have been older adults [6, 10] or individuals with chronic diseases [11, 12]. Few published studies have investigated the relationship between PA and satisfaction with life among healthy, young adults and college students [8, 13–16]; of these few, most have examined the psychological outcomes immediately after performing a single bout of exercise [15, 16]. Accordingly, little is known about the psychological and QOL outcomes associated with the performance of varying PA levels among the young adult and college populations.

The college population is of particular interest because this group of emerging adults is known to experience a number of stressors during the transition from high school to college, including change of residence [17], increased responsibility, peer pressure, coursework management, and difficult schedules [18]. During this transition, there is also a risk for decreased PA, increased emotional and psychological stress [14, 18], and the initiation of negative health behaviors such as illicit drug use and alcohol abuse [19]; all of which may negatively impact QOL. Therefore, additional research is warranted to examine the potential protective factors that may enhance and preserve high QOL in the college population.

Past research has proposed that PA may influence QOL through the mediating effects of exercise self-efficacy, physical self-esteem, and affect [6]. Elavsky et al. [6] evaluated this conceptual model in older adults at two time periods following a 6-month structured exercise program. At the 1 year post-baseline follow-up, results showed that exercise self-efficacy and affect significantly mediated the relationship between PA and QOL. At the 5-year follow-up, participants who remained at high levels of PA reported higher physical self-esteem and affect. However, affect was the only mediating variable consistent with increased QOL.

The purpose of our study was to explore the conceptual model proposed by Elavsky et al. [5] (Fig. 1) in a young adult/college population, as this population is frequently at risk for decreased PA and QOL [14, 18]. Specifically, the objectives of the study were to (a) evaluate the mediation model proposed by Elavsky et al. (Fig. 1) [6] in our sample of young adults, and (b) explore additional and non-recursive relationships between these model

constructs (Fig. 2). Exploration of additional pathways among the model's mediating variables was based upon the positive correlations among these variables in the Elavsky et al. study and from the literature supporting associations among these variables [7, 20–24]. The application of this model to a younger population appears to be timely and relevant as several studies have indicated positive relationships between PA and exercise self-efficacy, physical self-esteem, and affect in this population [13, 15, 16, 23]; however, few studies have examined the influence of these variables on overall satisfaction with life [13]. Given that we, along with other researchers [4–6, 25], conceptualize QOL as a global psychological construct that reflects a conscious, cognitive judgment of one's current satisfaction with his/her own life [4] and view the psychological constructs of exercise self-efficacy, physical self-esteem, and affect as potential influences on QOL among young adults, the application of this model to young adults presents an interesting study worthy of exploration. The cross-sectional design and exploratory nature of our study aimed to add to the limited body of research examining the relationship between PA and QOL in young adults.

Methods

Participants

Participants were 604 English-speaking volunteers recruited from undergraduate classes at a large ($n > 45,000$) university located in the southwestern United States. Eligibility for the study included being between the ages of 18 and 30 and attending class the day the study staff distributed the study questionnaire. No further inclusion or exclusion criteria were established for the study.

Procedures

Participants were recruited from courses offered by the university's School of Education after permission from class instructors was obtained. Not all instructors were accommodating with approximately 30 % refusing to participate. In undergraduate classes where instructors provided approval to recruit, trained project staff introduced themselves to students during scheduled class meeting times throughout the final 2 weeks of the Spring 2008 semester. After the introduction, project staff explained the premise of the research study and that participation was anonymous, voluntary, and that participation, or lack of, would have no bearing on their course grades. Participants were provided with a cover letter explaining the study, informed that no personal identifying data would be collected during study procedures, and that completing the survey indicated their consent to participate in the study. Therefore, written informed consent was not obtained. The survey took 5–10 min to complete and no compensation (extra credit, bonus points, etc.) was offered for study participation; however, participants were able to enter their name into a drawing for one of ten, \$10 restaurant gift cards. Individuals wishing to be included in the gift card drawing recorded their contact information on a separate form. All study procedures were approved by University's Institutional Review Board (IRB) for the Protection of Human Subjects.

Measures

The data collection questionnaire was comprised of five demographic variables (age, sex, race, height, and weight), and 42 items taken from previously published scales representing the constructs in our hypothesized model. A description of each of the measures is provided below.

Physical activity—Physical activity was measured by the Godin Leisure Time Exercise Questionnaire [26], a 4-item scale that assesses episodes, intensity, and duration of PA during a typical 7-day period. Each respondent was asked to report “How many times on average do you do the following kinds of exercise for more than 15 min during your free time?” Various kinds of PA including strenuous (e.g., jogging), moderate (e.g., fast walking), and mild (e.g., easy walking) were then listed. Activity counts were converted to metabolic equivalents (METs) by multiplying episodes of strenuous activity by 9, moderate activity by 6, and mild activity by 3. Total activity scores were calculated by adding the MET calculations for each PA intensity level. Good test–retest reliability has been found in past studies, with coefficients ranging between .74 and .80 [26, 27]. This measure has also been validated with objective measures of PA such as accelerometers [11, 28, 29] as well as other subjective PA measures such as the 7-day physical activity recall [19, 22, 27, 29].

Quality of life—The 5-item Satisfaction with Life Scale (SWLS) [30] was used to assess QOL. The SWLS assesses global cognitive judgments regarding one’s overall satisfaction with his or her own life. Participants were asked to indicate their level of agreement with life satisfaction statements (e.g., “In most ways my life is ideal” and “I am satisfied with my life”) using Likert-type response options ranging from 1 (lowest agreement) to 7 (highest agreement). Previous studies have shown high test–retest reliability [30] and internal consistency estimates (alphas of 0.66–0.87) [9, 31]. The SWLS demonstrated an internal consistency of 0.80 in the current study.

Physical self-esteem—Physical self-esteem was measured by the 6-item Physical Self-Worth Scale (PSWS) from Fox and Corbin’s Physical Self-Perception Profile [32]. Sample items from the PSWS include “I am extremely proud of who I am and what I can do physically” and “I always have great respect for my physical self.” This scale has previously shown internal consistencies (Cronbach’s alpha) ranging from 0.80 to 0.88 [6, 33]. In the current study, the PSWS demonstrated a reliability estimate of .88 (Cronbach’s alpha).

Exercise self-efficacy—Self-efficacy was assessed using the Exercise Self-Efficacy Scale [34]. This 18-item scale asks respondents to indicate their level of confidence for performing PA a minimum of 3 times per week despite potential barriers (e.g., feeling tired). Respondents rate their confidence for performing PA using 10-point increments on a 100-point scale (0 = cannot do at all and 100 = certainly can do). This scale has established reliability [35] and demonstrated a Cronbach’s alpha of 0.89 in the current study.

Positive and negative affects—The 10-item Bradburn Affect Balance Scale (ABS) [36] was used to assess both positive and negative affects. The scale lists a number of feeling states and asks respondent to indicate using a “yes/no” format if they have experienced

certain feelings over the past few weeks. Sample questions include, “Were you pleased to have accomplished something?” and “Upset because someone criticized you?” In the current study, the positive subscale demonstrated an internal consistency of .53 and the negative subscale .61. These low reliability estimates are comparable to those in other studies using the scale (i.e., 0.37–0.47 for the positive scale and 0.50–0.67 for the negative scale) [37, 38]. However, despite the low reliabilities of the ABS, the scale has shown great promise in terms of test–retest coefficients ranging from acceptable to strong [36], is well established in the subjective well-being literature, and is often used to evaluate convergent validity with newly developed affect measures [38]. Additionally, in our model testing, we selected not to combine positive and negative affects into a single affective balance measure. Instead, based on our empirical data, along with the recommendations of other researchers [39], we viewed positive and negative affects as independent from each other and were evaluated in the model accordingly.

Data analysis

SAS version 9.2 was used for all data analysis in this investigation [40]. Mantel–Haenszel chi-square ($P < .05$) was used to test the linear association between race and gender. Independent t tests ($P < .05$) were used to compare means for continuous variables, and then race and body mass index (BMI) were dichotomized [(White vs. Other) and (>25 vs. ≤ 25), respectively] for all further analysis. Pearson and Spearman rank correlation matrices were computed to assess the strength of association between PA, QOL, demographic variables, and psychosocial variables. All psychosocial and significant ($P < .10$) biometric and descriptive variables from correlation matrices or independent t tests were considered for path analysis.

Model specification and fit—Path analysis with diagrammatic representation was performed using PROC CALIS version 9.2 [41] to estimate the direct and indirect effects and assess fit in the model between PA, mediating variables, and QOL. We first evaluated the path model proposed by Elavsky et al. (Fig. 1) [6] and then explored additional saturated non-recursive models with variables selected ($P < .10$) from correlation matrices and t tests. Saturated non-recursive model paths were evaluated and trimmed one at a time after examining change in multiple model data fit indices, including the chi-square statistic, the root mean square error of approximation (RMSEA), and the comparative fit index (CFI). Specifically, model fit was assessed using the following criteria: (a) chi-square statistic: a reduction in the absolute index chi-square value and a nonsignificant P value ($P > 0.05$) corresponded to model improvement; (b) RMSEA: <0.05 = a close fit, >0.05 – 0.08 = a fair fit, >0.08 to 0.10 = a mediocre fit, and >0.10 = a poor fit [42]; and (c) CFI: best if above 0.95 [42]. Additionally, Lagrange multiplier indices were examined as confirmatory or supplemental information when judging model improvement. Parameter estimates were judged to be statistically significant based on a t statistic of 1.96 ($P < .05$). There were no model constraints and only standardized coefficients are reported. Patterns in missing data were explored, and the full information maximum likelihood (FIML) method in PROC CALIS was used to account for missing data [41].

Results

The total number of registered students for the sampled classes was 1,076. Participation in the study among those attending class the day of data collection ranged from approximately 80–100 %. Of the 604 individuals (56 %) who completed the survey, seven were excluded post hoc from the analysis since they were over the age of 30 and therefore did not meet the eligibility criteria. Of the remaining 597 questionnaires, complete data were available for 590 questionnaires (99 %). Based on patterns, it was determined that psychosocial variables were missing at random (MAR). Only one participant was missing data on PA (.2 %). Missing data for other variables were as follows: positive affect (2.2 %), negative affect (1.2 %), exercise self-efficacy (2.0 %), physical self-esteem (.7 %), QOL (0.0 %), BMI (.8 %), and race (.3 %).

The sample had a mean age of 20.4 ($SD \pm 1.7$) and a BMI of 23.6 ($SD \pm 6.5$). The majority of the respondents were male (52 %), White (51 %), and the only significant difference between males and females was BMI ($P < .001$) (Table 1). Independent t tests for differences in means among the scales for PA and psychosocial variables were examined by gender, race (white vs. other), and BMI (>25 vs. <25) (Table 2). Males reported significantly higher ($P < .001$) physical self-esteem (males = 18.4 ± 3.7 and females = 16.9 ± 3.7) and exercise self-efficacy (males = 6.1 ± 1.6 , females = 5.3 ± 1.6) when compared to females (Table 2). Participants self-identifying as White reported lower exercise self-efficacy (White = 5.5 ± 1.7 and Other = 5.9 ± 1.7 , $P < .01$), physical self-esteem (White = 24.9 ± 5.5 and Other = 26.3 ± 5.1 , $P < .01$), and PA (White = 48.1 ± 1.5 and Other = 52.1 ± 1.3 , $P = .02$) when compared to other races. Lastly, participants with a healthy BMI reported higher physical self-esteem than overweight or obese participants (16.8 ± 4.0 BMI >25 = 16.8 and BMI ≤ 25 = 18.1 ± 3.6 , $P = 0.001$).

There were many significant ($P < .001$) correlations between the psychosocial and demographic variables (Table 3). Physical self-worth was significantly correlated ($P < .001$) with all 5 model variables. Negative affect had the fewest significant correlations among the 5 model variables. Among the demographic variables, there were far fewer significant correlations and age was not significantly correlated ($P < .05$) with any of demographic or model variables. Tests for normality of residuals were performed on selected variables using QQPlots, and non-normal variables were transformed using a log-linear scale. Due to the high degree of significant correlation among the psychosocial variables, tests of collinearity were performed using variance inflation factors and no substantial multicollinearity overall ($P = .06$) was found.

Model testing

Model fit indices—The recursive model based on Elavsky et al. [6] (Fig. 1) had a poor fit with the study data (absolute index $\chi^2 = 123.90$, $DF = 10$, $P < .001$; RMSEA = .26 (90 % CI .22–.30); CFI = .63); therefore, it was rejected in favor of exploring a non-recursive model based on significant variables ($P < .10$). Only direct paths were tested with BMI, race, and gender while non-recursive paths were tested for all five scale variables. The most parsimonious and theoretically sound model (Fig. 3) had an absolute index $\chi^2 = 4.59$ ($DF = 3$, $P = .33$), RMSEA = .03 (90 % CI 0.00–0.08), and CFI = .99. No demographic or bio-

metric variables were included in the final model since they fit poorly with the five outcome variables of the model.

Path analysis—Figure 3 illustrates our final model. Results showed that college students with higher PA levels reported greater exercise self-efficacy ($\beta = .28, P < .001$), physical self-esteem ($\beta = .10, P < .001$), positive affect ($\beta = .10, P < .01$), and negative affect ($\beta = .08, P < .01$). In return, enhanced physical self-esteem ($\beta = 0.30, P < .001$), greater positive affect ($\beta = 0.27, P < .001$), and lower negative affect ($\beta = -0.14, P < .001$) were significantly associated with increased QOL. Among the mediating variables, participants with higher exercise self-efficacy reported greater physical self-esteem ($\beta = .29, P < .001$) and positive affect ($\beta = .14, P < .001$), and those with higher physical self-esteem reported greater positive affect ($\beta = .18, P < .001$) and negative affect ($\beta = .27, P < .001$). We also note that in preliminary model tests, we evaluated a non-recursive relationship between self-esteem and exercise self-efficacy; however, this relationship was ultimately excluded from the final model due to problems with collinearity.

Discussion

The current study examined the mediating effects of exercise self-efficacy, physical self-esteem, and affect on the relationship between PA and QOL in a young adult population. The model evaluated in the study was an expansion of a previous conceptual model proposed by Elavsky et al. [6]. Findings from our study add to the paucity of research on the psychosocial influences that PA has on QOL in young adults.

Results of our study demonstrate that some of the relationships found in Elavsky et al.'s study with a sample of older adults were supported in a much younger, college-aged population, while others were not. For instance, the strongest pathway between PA and QOL in our sample of young adults was through physical self-esteem, which was not the case in the study of an older population, where the most powerful mediator was affect [6] (combined positive and negative affects). Perhaps, this difference in findings related to changes in individual values that occur throughout the life span. For example, research suggests that life aspiration can vary with age [31] and that younger individuals tend to pay more attention to values such as their image and material success than older individuals [43].

Another difference found between our study and the Elavsky et al. study involved the variable of exercise self-efficacy. Immediately following Elavsky et al.'s structured exercise program, exercise self-efficacy was a significant mediator between the PA and QOL. However, at the 5-year follow-up, the path from self-efficacy to QOL failed to maintain significance. In our study, PA was directly associated with exercise self-efficacy ($\beta = .28, P < .001$). However, exercise self-efficacy was not directly associated with QOL, a finding that parallels the results of several recent studies with older adults [25, 44]. Instead, exercise self-efficacy was indirectly associated with QOL through the variables of physical self-esteem, positive affect, and negative affect.

Our results also indicated that PA was only weakly related to positive and negative affects ($\beta = .10, P < .01$ and $\beta = .08, P = .05$, respectively). These findings were somewhat surprising

given the body of research that supports the relationship between PA and positive affective outcomes [45, 46]. A possible explanation for these discrepant findings could be measurement issues (e.g., the low reliability estimates demonstrated by the Affect Balance Scale). The significant pathways from physical self-esteem to positive ($\beta = .18, P < .001$) and negative affects ($\beta = -.27, P < .001$) suggest that PA directly influences physical self-esteem, which in turn, influences affective outcomes. Further, the significant path from exercise self-efficacy to positive affect ($\beta = .14, P < .001$) supports the assumption that perceived self-efficacy is one of many mechanisms that influence the mood altering effects associated with exercise [34]. The direct relationship between positive affect and QOL ($\beta = .27, P < .001$) provides evidence to support the role of affective responses when assessing subjective QOL [5, 34, 36].

Yet, the most important findings of the current study were associated with the relationships between physical self-esteem and other variables in the model. Physical self-esteem was the only variable that demonstrated a significant association with all of the model variables. Moreover, physical self-esteem ($\beta = .30, P < .001$) and, to a lesser extent, positive affect ($\beta = .27, P < .001$) provided the strongest link between PA and QOL. The statistically nonsignificant pathway from exercise self-efficacy to QOL indicates that while PA influences both exercise self-efficacy and physical self-esteem, exercise self-efficacy may not be a criterion young adults use to evaluate their QOL. In contrast, exercise self-efficacy was significantly associated ($\beta = .17, P < .05$) with QOL (at the 1-year follow-up) in Elavsky et al.'s [6] older adult sample. Thus, as people grow older, they may place more importance on their beliefs in the ability to perform various physical tasks.

Strengths, limitations, and recommendations for future research

The current study has several limitations. First, participants were conveniently sampled from courses in the School of Education and were mostly of healthy weight ($M \text{ BMI} = 23.6 \pm 6.5$). Therefore, we are unable to generalize the findings to those not enrolled in college, to students in other fields of study, or to young adults that are either overweight or underweight. Another limitation is that the cross-sectional nature of the data provides only a snapshot evaluation of the relationship between PA and QOL among this group; longitudinal studies are needed to further investigate how individuals subjectively evaluate QOL throughout the life span. A third limitation is that data were collected during the last 2 weeks of the semester; which may have negatively influenced some of the model variables due to increased stress associated with semester assignments and final examinations. Other limitations include the use of a self-report questionnaire to assess PA, which may have led to participants either over or under reporting their PA levels, and the fact that our model included only a few aspects that can potentially influence satisfaction with life in a young adult population. Research has shown various other factors that may potentially influence QOL and subjective well-being in college-aged/young adult populations (i.e., financial stress [47, 48], academic pressure [49], and social influences [50]). Future studies should incorporate the assessment of these factors in investigations assessing the relationship between PA and QOL in young adults.

Lastly, we note that our conceptualization and assessment of QOL focused exclusively on a subjective well-being perspective. We acknowledge that other QOL perspectives (i.e., applied health-related QOL) and assessment measures (i.e., SF-36 [51], Health Days Core Module [52], and World Health Organization Quality of Life (WHOQOL)—BREF [53]) exist in the literature and that our study outcomes may have differed if another perspective and/or assessment measure was used to assess QOL. However, given that the majority of young adults are relatively healthy individuals with few physical limitations [54], the use of a subjective well-being/life satisfaction measure to assess QOL (as opposed to a health-related QOL/physical functioning measure) provides a unique opportunity to capture QOL outcomes based on young adults' own subjective criteria, rather than imposing and/or focusing on a more health-related or physical functioning standpoint.

Despite these limitations, the study has several strengths. First, the sample was relatively large, consisted of approximately equal numbers of males and females, and fairly racially diverse. Second, the PA measure was fairly comprehensive and included various modes and intensities of PA, not just structured activities, thus providing a comprehensive assessment of PA levels. Third, the current study is one of a few studies in which the relationship between PA and QOL has been examined in reasonably large, healthy college population and extends the Elavsky et al. [6] model on the influence of PA and overall QOL in older adults to this younger age group. Examining potential influences on QOL in this population is warranted due the increased stress and possible negative psychological outcomes, such as depression and anxiety, associated with the pressures of attending college [55]. Finally, given that the variables with the strongest associations with QOL differed between the older adults in Elavsky et al.'s [6] study and the younger adults in our study, additional studies should be conducted comparing young with older adults.

Overall, our final model accounted for 25 % of the variance in QOL (as measured by the Satisfaction with Life Scale) and showed that PA was indirectly associated with QOL through the variables of exercise self-efficacy, physical self-worth, and affect. Results indicated that physical self-esteem, as well as affect, was the integral components in the subjective evaluation of QOL in our sample of young adults and these elements may positively influenced by PA as well as cognitive/affective factors. Findings suggest that health education programs focused at promoting regular PA and enhancing physical self-esteem may be effective in improving QOL in young adult and college-aged populations.

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Fig. 1.
Physical activity and quality of life model proposed by Elavsky et al. [6]

Fig. 2.
Hypothesized path model

Fig. 3. Final path model showing mediated relationships between physical activity and quality of life. *Note* Betas represent direct effects among model variables. *Solid lines* represent significant parameter estimates and *dotted lines* represent nonsignificant parameter estimates. * $P < .01$, ** $P < .001$

Table 1

Study population demographic and biometric characteristics by gender

	<u>Male N = 307</u>		<u>Female N = 289</u>		
	<i>N</i>	%	<i>N</i>	%	<i>P</i>
Descriptive factors					
Race ^a					0.05
Caucasian	150	49.2	151	52.3	
African American	11	3.6	17	5.9	
Hispanic	53	17.4	62	21.5	
Asian	70	22.9	41	14.1	
Other	21	6.8	18	6.2	

	Mean	SD	Mean	SD	P value
Biometric factors					
Age	20.4	1.9	20.2	1.4	0.35
BMI ^a	24.4	3.4	22.8	3.4	<.001

Data missing on sex for one participant

^aContains missing variables

Table 2

Tests for difference in means for the measures of physical activity, quality of life physical self-esteem, exercise self-efficacy, and affect by gender, race, and BMI

Measure	Range	Gender		Race		BMI		P
		Male N = 307	Female N = 289	White N = 301	Other N = 293	<25 N = 420	>25 N = 167	
		Mean ± SD		Mean ± SD		Mean ± SD		
Godin Leisure Time Exercise	0–178	51.2 ± 25.6	49.9 ± 24.1	48.1 ± 1.5	52.1 ± 1.3	51.3 ± 2.0	50.5 ± 1.2	0.75
Questionnaire								
Satisfaction With Life Scale	5–35	25.5 ± 5.2	25.8 ± 5.5	24.9 ± 5.5	26.3 ± 5.1	25.1 ± 5.2	25.8 ± 5.4	0.14
Physical Self-Worth Scale	6–24	18.4 ± 3.7	16.9 ± 3.7	17.8 ± 3.8	17.6 ± 3.6	16.8 ± 4.0	18.1 ± 3.6	<0.01
Exercise Self-Efficacy Scale *	0–100	60.1 ± 10.6	50.3 ± 10.6	50.5 ± 10.7	50.9 ± 10.7	50.6 ± 10.8	10.6 ± 10.6	0.48
Bradburn affect scale								
Positive affect	1–5	3.9 ± 1.0	4.0 ± 1.1	3.9 ± 1.1	4.9 ± 0.9	3.9 ± 1.1	3.9 ± 1.0	0.56
Negative affect	1–5	2.0 ± 1.3	2.1 ± 1.3	2.0 ± 1.3	2.1 ± 1.3	2.1 ± 1.3	2.1 ± 1.3	0.81

BMI body mass index

* Percentile

Physical activity, quality of life, physical self-esteem, exercise self-efficacy and affect were assessed using Godin Leisure Time Exercise Questionnaire, Satisfaction With Life Scale, Physical Self-Worth Scale, Exercise Self-Efficacy Scale and Bradburn affect scale, respectively

Table 3

Correlation coefficients among the measures of physical activity, quality of life, physical self-worth, exercise self-efficacy, positive affect, negative affect, age, BMI, race, gender

	1	2	3	4	5	6	7	8	9	10
1. GLTEQ	1									
2. SWLS	0.10	1								
3. PSWS	0.17***	0.41***	1							
4. ExSES	0.26***	0.17***	0.32***	1						
5. Pos. affect	0.17***	0.34***	0.25***	0.23***	1					
6. Neg. affect	0.03	-0.21***	-0.25***	-0.04	0.02	1				
7. Age	-0.10	-0.10	-0.02	0.03	-0.04	-0.01	1			
8. BMI	-0.01	-0.06	-0.15**	-0.04	-0.02	-0.01	0.05	1		
9. Race	-0.12**	-0.13**	0.01	-0.13*	-0.03	-0.03	-0.06	0.13**	1	
10. Gender	0.02	-0.02	0.21***	0.22***	-0.01	-0.05	0.00	0.18***	0.03	1

Negative affect is coded, so a higher value represents a greater negative affect

BMI = (>25 vs. 25); race = (white vs. other)

BMI body mass index, *GLTEQ* Godin Leisure Time Exercise Questionnaire, *SWLS* Satisfaction With Life Scale, *PSWS* Physical Self-Worth Scale, *ExSES* Exercise Self-Efficacy Scale, *Pos. affect* positive affect, *Neg. affect* negative affect

*** Correlation is significant at the 0.0001 level (two-tailed)

** Correlation is significant at the 0.001 level (two-tailed)

* Correlation is significant at the 0.01 level (two-tailed)