

HEALTH/FITNESS**Health and Fitness Courses in
Higher Education:
A Historical Perspective and
Contemporary Approach**

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Abstract

*The prevalence of obesity among 18- to 24-year-olds has steadily increased. Given that the majority of young American adults are enrolled in colleges and universities, the higher education setting could be an appropriate environment for health promotion programs. Historically, health and fitness in higher education have been provided via activities-based education (APE) courses with a shift toward conceptually based (CPE) courses. The purpose of this retrospective pre–post study was to assess health and behavioral outcomes associated with a combination APE–CPE course, an APE course, and a CPE course. The ecological model and social network theories were considered within the context of this assessment. Paired *t* tests were used to examine pre–post changes for body mass index, body composition, and self-reported physical activity behaviors using the International Physical Activity Questionnaire (IPAQ) among 61 students in the three self-selected learning conditions. No significant change in total duration of exercise was observed in any of the groups; however, significant changes were observed in specific IPAQ subscales within each of the three groups. Days spent exercising vigorously (+34%, $p = .02$) and duration*

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spent engaged in moderate exercise (+87.2%, $p = .02$) increased in APE and CPE participants. Days spent walking (+11.3%, $p = .04$) and walking time (+65%, $p = .03$) increased in CPE participants. Body fat percent (-11.8%, $p = .04$) decreased in APE participants; however, days spent engaged in vigorous exercise also significantly decreased (-31.6%, $p = .00$). Differences in outcomes between APE, CPE, and APE–CPE courses were observed. This study provides information to young adults selecting between health and fitness courses, as well as to higher education providers. Effective health promotion courses for college students can potentially reduce premature morbidity and mortality associated with obesity and a sedentary lifestyle.

The prevalence of obesity among 18- to 24-year-olds has steadily increased with overweight status exceeding 25% of the population and almost 20% of this age group meeting the criteria for obesity (Flegal, Carroll, Ogden, & Curtin, 2010). Given that the majority of young American adults are enrolled in colleges and universities, the higher education setting could be an appropriate environment for health promotion programs (American College Health Association [ACHA], 2010).

Physical education (PE) programming is among interventions used to prevent and reduce obesity in children, adolescents, and adults. PE is commonly provided in elementary, secondary, and higher education settings (Strand, Egeberg, & Mozumdar, 2010). Though most colleges provide PE courses, the effects of PE on the health of college students is underrepresented in the literature compared to children and adolescents. Researchers have pointed to health benefits associated with participation in PE among college students and have argued that more evaluation of PE in college settings is needed (Nelson, Kocos, Lytle, & Perry, 2009).

Among the debates within the context of higher education PE programming is the difference in outcomes and efficacy associated with activities-based (APE) courses and conceptually based (CPE) courses. An APE class primarily focuses on sport skill acquisition such as tennis, aerobics, and martial arts. A CPE course focuses on theoretical concepts applied to health and fitness and includes lectures about the health benefits of regular physical activity and healthy eating habits.

An examination of the history of PE courses in college settings has the potential to direct and inform contemporary programming.

The first higher education-based APE class was taught in 1860 by Hitchcock at Amhurst College (Strand et al., 2010). APE courses increased in prevalence at colleges and universities to a peak of 94% in 1972. By the year 2000, the majority of higher education students in the United States were required to complete at least one physical activity course prior to matriculation (Strand et al., 2010). Initial provision of sport and activity classes (APE) evolved between the 1960s and 1990s to include health and fitness-related CPE courses, which were provided in addition to or in lieu of APE courses on college campuses (Strand et al., 2010).

Prior to the 1970s, APE courses represented the majority of PE courses in higher education; however, by 1978, most colleges had adopted CPE courses, and by 1990, CPE courses represented 52% of all PE courses in higher education and APE courses represented 33% (Adams & Brynteson, 1995). However, though health, fitness, and wellness courses are prevalent, only one third of these courses are evaluated by college departments for their effectiveness within the context of physical and behavior change variables (Dinger, Watts, Waigandt, & Whittet, 1992). Though researchers have examined outcomes associated with APE courses and CPE courses individually and within a comparative context, Keating, Guan, Pinero, and Bridges (2005) argued that a gap in the literature exists in the assessment of health and fitness programs for college and university students. Additionally, no study has examined outcomes associated with a combination APE–CPE course.

Both APE courses and CPE courses have yielded positive health outcomes with most researchers pointing to more benefits over a longer period of time in CPE courses (Adams & Brynteson, 1995) compared to APE courses. Adams and Brynteson (1995) examined the effects of CPE and APE programs on exercise habits and health attitudes among college alumni. Seven hundred ninety-three alumni were enrolled in the APE course and 413 alumni took the CPE course. Adams and Brynteson (1995) collected demographic data, questions related to health and exercise habits and behaviors, and the value placed on their collegiate experiences with their associated PE courses. Adams and Brynteson (1995) found that alumni who took the CPE course felt their PE course was more valuable. Additionally, the alumni in this group were also more physically active compared to the APE alumni group. Adams and Brynteson (1995) argued that the more favorable outcomes observed in CPE courses were supported by previous researchers (Terry, Erickson, &

Johnson, 1977) who found that the understanding of the benefits of exercise appears to increase physical activity behaviors.

Theoretical Framework

Though the differences in outcomes associated with APE courses and CPE courses have been examined, no study has assessed the outcomes of a course that combines aspects from APE courses and CPE courses within a single course. Exposing students to a conceptual framework combined with supervised and directed physical activities may further augment the link between concepts and activities and potentially yield similar or more positive outcomes compared to CPE- and APE-exclusive courses. This theory directed and informed the combined APE–CPE course (Health, Fitness, and Recreation), which was compared with a CPE course (Exercise Physiology) and APE courses in this study.

Behavior change theoretical framework applied to physical activity guided this study design. The majority of young adults do not regularly exercise despite a large number of studies that point to direct health and quality of life benefits (Nahas, Goldfine, & Collins, 2003). Nahas et al. argued that knowledge alone of the benefits of exercise is not enough to motivate the majority of young adults to begin or adhere to exercise and that determiners of exercise behaviors need to be examined. Determiners of physical activity behaviors in young adults have been aligned with prominent learning theories including the health belief model, the social cognitive theory, and the transtheoretical model. Among theories that explain how behaviors are modified, the ecological model applies most relevantly to the present study objectives. The ecological model is supported by evidence that health promotion outcomes result from multiple influences that stem from the individual, organizations, and the government (Simmons-Morton & Ohara, 1988). A health promotion course on a college campus potentially includes all of these sources of behavior change determiners.

Implications of the Study

Possible implications of this study include the identification of a health and fitness higher education course design that promotes health among young adults. The provision of conceptual content combined with activities and skills sessions may positively impact health promotion-related outcomes such as body composition and physical activity behaviors. The combination APE–CPE course

examined in this study provides lectures that detail the benefits of exercise, proper nutrition, and stress management. This content is augmented within the course by physical activities that potentially provide applied examples of how to incorporate healthy behaviors into daily life. For example, a discussion of the health benefits of exercise is followed by a supervised hike at a regional park. This combination has the potential to provide additional relevance and context to the topics discussed within a conceptual framework during lectures. If an APE–CPE approach yields compelling data, dissemination of the findings could promote this type of course offering within and outside of the university setting.

Methods

The purpose of this study was to examine the health and health behavior outcomes of a combination APE–CPE course compared with an APE course and a CPE course at a university in Connecticut. A retrospective analysis of pre–post data that was collected in 2011, including descriptive and inferential analysis of body mass index (BMI), body composition, and responses to the International Physical Activity Questionnaire (IPAQ), among 61 participants. The IPAQ was used to assess data relative to physical activity-associated behavior within the past 7 days such as duration and intensity of exercise, as well as duration of time spent walking and sitting.

These data were analyzed in a descriptive and inferential manner using paired *t* tests to compare the mean data for all three courses. Specifically, mean changes in body composition, BMI, and IPAQ responses were retrospectively compared using data collected at the beginning and end of the semester. The duration of the semester and intervention was 14 weeks. Participants were students already enrolled in the three types of higher education courses at the university.

The independent variable consisted of 14 weeks of APE–CPE curriculum including education, supervised physical activity, and the provision of recreational activities such as sports and guided trail walks. There were two comparison groups. The first comparison group consisted of students enrolled in an APE course. The second comparison group consisted of students enrolled in a CPE course. Students were self-selected relative to their enrollment in all three types of courses and classes. The dependent variables assessed in these courses included BMI, body composition, and health behaviors assessed via responses to the IPAQ.

The university is located in Fairfield county and enrolls approximately 3,500 full-time undergraduate students and 700 part-time undergraduate students. Demographic statistics include a 60% female student population that is approximately 85% Caucasian, 5% African American, and 10% Hispanic American, with 1% of the student population representing international students. The average age of the undergraduate student body is 22 years (Chronicle of Higher Education, 2011). The CPE course (Exercise Physiology) and the APE–CPE course (Health, Fitness, and Recreation) have been offered at the university for 2 to 11 years and are taught by full-time faculty in the Department of Exercise Science. APE courses have been taught by various instructors at the university for over 15 years.

Exercise Physiology is a CPE course and is required for all majors in exercise science at the university. In addition to the physiology of exercise, this course reviews the epidemiology associated with health and fitness and includes specific recommendations for diet, exercise, and stress management. Typically, 25 to 50 students enroll in this course. APE courses have been traditionally offered to the entire university population and include weight training, spinning, aerobic dance, and others. These courses also typically have 25 to 50 students who enroll. Health, Fitness, and Recreation was designed specifically to merge a CPE approach with an APE approach for the promotion of health and fitness for university students. This course includes lectures and supervised health, fitness, and recreation activities. This course is an elective course with no prerequisites and typically 20 to 25 students enroll.

Sampling techniques applied to the study included nonprobability and/or purposive techniques (Crosby, DiClemente, & Salazar, 2009) given that these groups are self-selected. Eligibility criteria included enrollment in the APE, CPE, or APE–CPE course, age range of 18 to 24, and consent to participate in the study. The American College of Sports Medicine (ACSM, 2011) Apparently Healthy status, as determined by baseline assessment of medical history, was assessed within the context of the administration of the courses but was not related directly to the methods associated with the study.

Specific to effect size, small to medium sizes are expected to be found in health promotion studies (Lipsey & Wilson, 1993). It is generally accepted that once a sample reaches 30, the probability of a normal distribution of variables is adequately high; however, it is

recommended to systematically approach the selection of samples based on desired statistical power (Burkholder, 2011). For this study, an effect size of .3 to .5 (small to medium) with an alpha level equal to .05 (type I error) and a statistical power value at .8 in a two-tailed test of one sample required a sample size of 20 to 90 participants.

The internal review board of the university approved the study. Prior to data collection, students were provided information about the purpose of the study and how student data would be analyzed. Students who agreed to participate signed a consent form. Student participants submitted data via an anonymous data sheet including all pre- and post-data at the end of the 14 weeks. The course instructors assessed all data within the context of the courses. Height and weight were measured on the same scale and wall-mounted measuring device, and the same Tanita brand bioelectrical device was used for body composition measurement pre and post. Physical variables were assessed at approximately the same time of day pre and post for all students under similar conditions. For example, students had not exercised 6 hours prior to data collection and were not in a fasted state.

The IPAQ was used to assess physical activity behaviors. This questionnaire has been validated in several studies (Hagströmer, Oja, & Sjöström, 2006) with repeatable and comparable data with both the short- and long-form versions for 7-day recall of activities and behaviors among diverse populations between ages 18 and 65. (Craig, Marshall, Sjöström, & Bauman, 2003).

Specific research questions included the following:

1. Is there a pre–post difference in BMI and body composition among APE, CPE, and APE–CPE student participants?
2. Is there a pre–post difference in physical activity behaviors among APE, CPE, and APE–CPE student participants?
3. Is there a pre–post difference in total exercise duration among APE, CPE, and APE–CPE student participants?

Assessment of these changes is relevant to assessing the general efficacy of the courses, but changes could also provide compelling support for one or more types of PE course designs.

Results

The purpose of this study was to quantify and compare changes in BMI, body composition, and exercise-associated behaviors among young adults enrolled in three distinct courses.

There were 29 CPE participants. Twenty participants were female and nine were male. The mean age was 20.0. Mean changes pre and post for BMI, percent body fat, self-reported frequency of days, and duration of time spent engaged in vigorous exercise, moderate exercise, walking, and sitting were compared. Table 1 depicts mean changes pre and post for BMI, percent body fat, vigorous days, vigorous duration in minutes, moderate days, moderate duration in minutes, frequency of days spent walking, duration of walking in minutes, and sitting time in minutes.

Table 1

Mean Values Pre and Post for Conceptually Based Course Participants (N = 29)

Variable	Pre	Post
BMI	23.84	23.81
% Fat	21.92	21.44
VD	3.03	2.48
VT	64.14	65.90
MD	3.24	2.62
MT	61.03	53.10
WD	5.17	5.75
WT	41.90	69.14
ST	354.64	379.28

Note. BMI = body mass index; % Fat = percent body fat; VD = vigorous days; VT = vigorous duration in minutes; MD = moderate days; MT = moderate duration in minutes; WD = frequency of days spent walking; WT = duration of walking in minutes; ST = sitting time in minutes.

There were 16 APE participants. Eleven participants were female and five were male. The mean age was 20.12. Mean changes pre and post for BMI, percent body fat, self-reported frequency of days, and duration of time spent engaged in vigorous exercise, moderate exercise, walking, and sitting were compared. Table 2 depicts BMI, percent body fat, vigorous days, vigorous duration in

minutes, moderate days, moderate duration in minutes, frequency of days spent walking, duration of walking in minutes, and sitting time in minutes.

Table 2

Mean Values Pre and Post for Activities-Based Course Participants (N = 16)

Variable	Pre	Post
BMI	22.4	22.49
% Fat	19.90	17.55
VD	3.56	2.44
VT	77.19	64.69
MD	2.38	2.88
MT	53.13	51.25
WD	6.13	5.44
WT	50.94	53.44
ST	418.75	418.75

Note. BMI = body mass index; % Fat = percent body fat; VD = vigorous days; VT = vigorous duration in minutes; MD = moderate days; MT = moderate duration in minutes; WD = frequency of days spent walking; WT = duration of walking in minutes; ST = sitting time in minutes.

There were 16 APE–CPE participants. Eight participants were female and eight were male. The mean age was 20.44. Mean changes pre and post for BMI, percent body fat, self-reported frequency of days, and duration of time spent engaged in vigorous exercise, moderate exercise, walking, and sitting were compared. Table 3 depicts BMI, percent body fat, vigorous days, vigorous duration in minutes, moderate days, moderate duration in minutes, frequency of days spent walking, duration of walking in minutes, and sitting time in minutes.

Given that vigorous duration in minutes, moderate duration in minutes, and duration of walking in minutes are all variables that indicate duration of physical activity, they were summed to reflect the total duration pre and post for all three groups. Table 4 depicts the sums of vigorous duration, moderate duration, and duration of walking in minutes for the CPE, APE, and APE–CPE participants pre and post.

Table 3

Mean Values Pre and Post for Activities and Conceptually Based Course Participants (N = 16)

Variable	Pre	Post
BMI	25.40	25.22
% Fat	19.79	19.51
VD	3.81	5.13
VT	87.19	95.31
MD	3.25	3.81
MT	26.88	50.31
WD	5.69	5.81
WT	68.63	64.06
ST	345.00	371.25

Note. BMI = body mass index; % Fat = percent body fat; VD = vigorous days; VT = vigorous duration in minutes; MD = moderate days; MT = moderate duration in minutes; WD = frequency of days spent walking; WT = duration of walking in minutes; ST = sitting time in minutes.

Table 4

Mean Values Pre and Post for Total Duration of Exercise

Group	Pre	Post
CPE	4845	5455
APE	2900	2710
APE–CPE	2923	3355

The total duration of physical activity increased from 4,845 min to 5,455 min in the CPE group. Duration decreased from 2,900 min to 2,710 min among APE participants, and duration increased from 2,923 min to 3,355 min in the APE–CPE group.

Paired *t* tests were performed to identify which dependent variables significantly changed following enrollment in the APE, CPE, and APE–CPE courses. Each variable's percent change, and level of significance for a two-tailed paired *t* test is depicted for each group of participants. Table 5 depicts inferential statistics for CPE course participants, Table 6 depicts inferential statistics for APE course participants, and Table 7 depicts inferential statistics for APE–CPE course participants.

Table 5

Percent Changes for Conceptually Based Course Participants (N=29)

Variable	Percent Change	Significance
BMI	-.1	.893
% Fat	-2.2	.335
VD	-18.2	.136
VT	2.7	.835
MD	-19.1	.071
MT	13.0	.473
WD	11.3	.038*
WT	65.0	.027*
ST	6.9	.301

Note. BMI = body mass index; % Fat = percent body fat; VD = vigorous days; VT = vigorous duration in minutes; MD = moderate days; MT = moderate duration in minutes; WD = frequency of days spent walking; WT = duration of walking in minutes; ST = sitting time in minutes.

* $p < .05$.

Table 6

Percent Changes for Activities Based Course Participants (N = 16)

Variable	Percent Change	Significance
BMI	.4	.852
% Fat	-11.8	.041*
VD	-31.6	.006*
VT	-16.2	.243
MD	21.1	.472
MT	-3.5	.893
WD	-11.2	.094
WT	4.9	.855
ST	0.0	1.0

Note. BMI = body mass index; % Fat = percent body fat; VD = vigorous days; VT = vigorous duration in minutes; MD = moderate days; MT = moderate duration in minutes; WD = frequency of days spent walking; WT = duration of walking in minutes; ST = sitting time in minutes.

* $p < .05$.

Table 7*Percent Changes for Activities and Conceptually Based Course Participants (N = 16)*

Variable	Percent Change	Significance
BMI	-.7	.054
% Fat	-1.4	.558
VD	34.4	.020*
VT	9.3	.626
MD	17.3	.460
MT	87.2	.022*
WD	2.2	.728
WT	-6.6	.780
ST	7.6	.362

Note. BMI = body mass index; % Fat = percent body fat; VD = vigorous days; VT = vigorous duration in minutes; MD = moderate days; MT = moderate duration in minutes; WD = frequency of days spent walking; WT = duration of walking in minutes; ST = sitting time in minutes.

* $p < .05$.

In CPE participants, significant mean changes were observed in two variables: frequency of days spent walking and duration of walking in minutes. Frequency of days engaged in walking increased 11.3%, and duration of time spent walking increased 65%. All other changes did not reach statistical significance. Based on these observations, the CPE participants walked more frequently and for higher durations of time at the end of the intervention period compared to the beginning.

In APE participants, significant mean changes were observed in two variables: percent body fat and vigorous days. Percent body fat decreased by 11.8%, and frequency of days spent engaged in vigorous exercise decreased 31.6%.

In APE–CPE participants, significant mean changes were observed in two variables: vigorous days and moderate duration in minutes. Frequency of days spent engaged in vigorous exercise increased 34.4%, and time spent engaged in moderate intensity exercise increased 47%.

Total duration was examined descriptively (see Table 4); however, none of the changes associated with total duration pre

and post reached statistical significance in CPE, APE, or APE–CPE participants (see Table 8). The percent change in total duration in minutes and significance values are depicted in Table 8.

Table 8

Percent Change for Total Duration of Exercise (N = 61)

Group	% Change	Significance
CPE	12	.256
APE	-7	.583
APE–CPE	13.2	.278

Figure 1 depicts the percent changes for variables in APE, CPE, and APE–CPE participants that reached selected levels of statistical significance ($p < .05$).

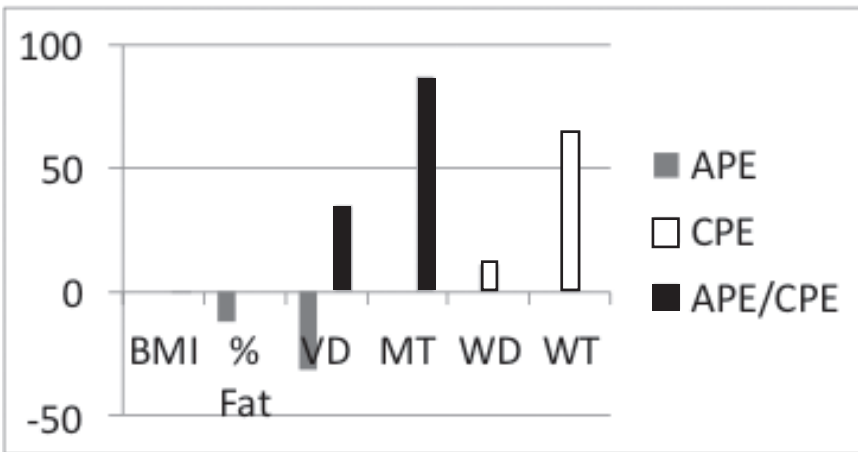


Figure 1. Percent Change for Selected Variables (N = 61)

Discussion

GutsMuths (as cited in Cazars & Miller, 2000) found that “good health is a prerequisite for a strong intellect” (p. 44). Given that over half of young adults in the United States are enrolled in colleges or universities (ACHA, 2010), health promotion courses should be provided and evaluated at college campuses. Most researchers who have compared APE and CPE courses have used retrospective alumni data (Adams & Brynteson, 1993), and no researcher to date has compared APE or CPE with a combination APE–CPE approach.

Research questions were answered via comparative analysis among APE, CPE, and APE–CPE course participants. Mean scores for BMI, body composition, and behavioral variables pre and post were assessed. Frequency of days and duration in minutes spent engaged in vigorous and moderate physical activity was measured in addition to frequency and duration of walking and sitting.

Analysis of BMI

Mean BMI scores did not change significantly among any courses. The BMI of APE participants increased by .4%, the CPE group's mean BMI was reduced by .1%, and the BMI of the APE–CPE participants decreased by less than 1%. Further research, specifically longitudinal tracking of BMI, is advised as a result.

Limitations of BMI for relatively short interventions are well documented (Seidell & Meinders, 2004). In addition to many contributing variables that could impact BMI, in the present study, participants were likely in the process of modifying their health behaviors, leading to a potential delay in changes in physical variables such as BMI and body composition. A logical question follows regarding the selection of BMI for the present study. Several reasons predominate for its selection among variables. Predominance in the related literature (ACHA, 2010) and ease of administration (Seidell & Meinders, 2004) are among reasons for assessing BMI. Though BMI changes were both insignificant and small in magnitude, long-term data collection may reveal alternative findings.

Analysis of Body Composition

Mean percent body fat among APE course participants was reduced by 11.8%, and this reduction was statistically significant. For CPE participants, percent body fat decreased 2.2%, and percent body fat scores for APE–CPE courses decreased 1.4%, but those changes did not reach statistical significance.

Several conclusions could be drawn from these data. APE courses are possibly associated with the highest calorie expenditure compared to CPE and APE–CPE courses. In addition to differences in caloric expenditure, other variables were not controlled or compared in the present study such as changes in diet. Finally, behaviors are in the process of changing among all course participants, and changes may require longer duration interventions or longer intervals between pre and post data collection as a result.

Though analysis of body composition is more specific relative to assessing overweight and obesity status compared to BMI among young active adults (Seidell & Meinders, 2004), limitations are similar to BMI in their relationship to the duration of the study.

Analysis of Physical Activity Behaviors

Because behaviors can change rapidly, numerous self-reported questionnaires and tools are available for research in health promotion (Craig et al., 2003). The IPAQ's reliability was previously discussed, and this tool was used to assess self-reported physical activity-associated behaviors among participants in all three courses. Frequency in days and duration in time spent engaged in vigorous and moderate activity was assessed in addition to frequency and duration of walking and sitting.

Vigorous duration decreased significantly by 31.6% among APE participants. This suggests that the number of days spent engaged in vigorous exercise was reduced. What is interesting is ST was identical pre and post.

For CPE participants, frequency of days spent walking and walking duration in minutes increased significantly. Frequency of days spent walking increased 11.3%, and walking duration increased by 65%. Since other researchers have identified behavior changes in CPE courses (Adams & Brynseton, 1995), enrollment in the CPE course could have played a role in modifying this behavior. However, if the general benefits of exercise led to increased walking frequency and duration, one might also expect increases in any or all of the other exercise-associated variables. Continued measurement of behavioral variables is advised to further assess the impact of CPE courses relative to APE and APE–CPE courses.

For APE–CPE participants, days spent in vigorous activity increased 34.4% and moderate duration in minutes increased 87.2%, and these changes reached selected statistical significance levels. These findings indicate that both vigorous and moderate exercise may have been impacted by the APE–CPE course.

Conclusions and Recommendations

Health and fitness promotion in higher education is prevalent. Studies indicate that APE courses or CPE courses are offered at approximately 89% of 4-year institutions and 82% of 2-year institutions (Strand et al., 2010). Though this data is encouraging and aligned with Healthy Campus 2010 and 2020 objectives (ACHA,

2010), it is concerning that only one third of these types of courses are evaluated by the college or outside evaluators for their effectiveness (Dinger et al., 1992). This study responded to a call for evaluation of higher education courses that promote health. Additionally, this study sought to provide specific preliminary outcomes associated with a combined APE–CPE approach. This study also has the potential to contribute to an argued gap in the literature relative to the assessment of health promotion programming for young adults (Delisle, Werch, Wong, Bian, & Weiler, 2010).

The previously described benefits of exercise and the possible alignment of college PE and health promotion courses with the ecological model are supported in some of the findings in this study. Future studies of the same types of courses could assess specific benefits associated with the social and behavioral variables that may contribute to changes in health and behavior variables. For example, Treiber et al. (1991) presented data that indicate both young men and young women are more likely to be active with support provided by small groups of peers. Relative to the APE–CPE course, this group was small in number (16) and all lectures and activities were conducted as a group. Anecdotal observations during this study included students with shared or emerging interests in the activities and content expressing the intention to become more active in specific ways such as returning to a walking trail or joining an adult volleyball league. Additionally, a group hike or run outside together had the potential to enhance group support. These psychosocial and group support variables could be explored quantitatively or qualitatively in future studies.

Also relevant to group support is the connectivity of the network or group. Gruber (2008) argued that larger groups and networks lack connectivity and smaller groups are associated with decreased maladaptive health behaviors and increased health-promoting behaviors including physical activity. In addition to concluding that smaller classes and groups may be optimal, Gruber added that smaller colleges may have a greater impact on health behaviors of young adults. Both of these factors are related to the present study given the smaller size of the APE–CPE course and the university.

Berkman and Kawachi (2000) pointed out that structural aspects of networks impact resources, opportunities, and barriers to physical activity. The formation of a small group functioning together for the purpose of health promotion has the potential to increase resources and opportunities and minimize barriers to exercise for the group,

as well as for individuals. Provision of conceptual information with the addition of a specific strategy within an APE–CPE course in which all students are engaged may provide more tangible benefits. A single example from the APE–CPE course is the provision of guided exercise-related field trips within a short distance from campus. The group carpooled to the local hiking area and navigated the trails in a social setting, potentially removing barriers associated with recreational exercise.

Specific to the APE course, these participants were enrolled in any number of activities classes, which potentially were larger in size and were not comprised of the same students at each class meeting. Additionally, the mean frequency of attendance to the activities courses was 2.3 times per week with highly variable attendance rates that could potentially hinder a support group-associated variable. The CPE course could potentially provide a suboptimal environment for group support and connectivity, given that the class is lecture-based, compared to APE and APE–CPE courses.

McArthur and Raedeke (2009) found that achieving optimal health and fitness was rated as the top reason for exercise participation, followed by appearance and mental health, among over 600 college students. Given that behavioral variables examined among the APE–CPE group and CPE group changed in positive ways, the conceptual information about the benefits of physical activity and health with applied activities may promote health and fitness among young adults. Additionally, young adults clearly seek information about health and fitness. The American College Health Association (2010) survey of 80,000 students at 106 colleges found that physical activity and fitness was ranked third among types of health information sought by college students, with drug and sexual assault prevention ranked second and first. There is clearly a demand for information and services related to health and fitness at college campuses and among young adults. These findings and observations align with researchers who argue that health and fitness programs and courses should be provided and evaluated on college campuses.

Researchers examining health and fitness courses in higher education largely have reported positive outcomes. A primary objective of this study was to assess efficacy of the delivery mode of three distinct courses that involve physical activity. Adams and Brynteson (1992, 1993, 1995) and Adams, Graves, and Adams (2006) have evaluated APE and CPE courses, though predominantly in a retrospective manner among alumni enrolled in both APE and

CPE courses. Desai, Miller, Staples, and Bravender (2008) argued that “best practice” in the administration of health and fitness and health promotion programs for young adults needs to be identified, and this study aligns with that process. Melton, Hansen, and Gross (2010) found in a survey of over 5,000 students that variety in programming is associated with high degrees of student satisfaction. Though these data referred to the provision of numerous classes, the APE–CPE course provides a high variety of activities within a single class.

Healthy Campus 2010 (ACHA, 2010) objectives relate to the outcomes of the study and to the need for health promotion courses in college. For example, only 6% of 87 aggregate objectives were on track for exceeding targets. Thirty-seven were on track to meet targets, 10% showed no significant change, and 43% were progressing away from specified targets. The most recent executive summary (ACSM, 2011) reported that 23% of male and female college students engage in no moderate intensity physical activity and 22.6% of males and 41.3% of females engage in no vigorous physical activity. Additionally, less than 50% of male and female college students meet the recommended frequency and duration of physical activity. Specific to BMI, 32.4% of college students surveyed are either overweight or obese. BMI and exercise behaviors were assessed in the present study, and the findings support the need for continued assessment.

Recommendations for action and further study include continued support and evaluation of APE, CPE, and combined-course approaches. Demonstrated popularity among these types of courses can ensure continued enrollment, but support from academic departments and college administrators is also needed and advised. Specific recommendations include continued critical analysis of physical variables such as BMI and body composition, which may benefit from longitudinal examination. Additionally, it is advised that researchers should be open to future findings associated with APE, CPE, and combination approaches including other novel approaches to health and fitness promotion for young adults. Several behavioral outcomes positively changed among students enrolled in a CPE or APE–CPE course. Given the novelty of the APE–CPE approach, observed positive outcomes potentially inform and direct a contemporary approach to PE and health promotion curriculum. Effective health promotion on college campuses can positively

impact the immediate and future health of young adults via behavior modification early in their lifespan.

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