

An Elective Course in Healthy Living in a Doctor of Pharmacy Program

James Boyd
Antoine Al-Achi

ABSTRACT. An elective course in healthy living was introduced for the first time in our program in the fall semester of 1999. The students were introduced to various healthy styles of living that included diet, exercise, and monitoring tools. A survey was given by the end of each semester to probe the depth of students' understanding of the material. The survey focused on the following areas: exercise, diet, assessment, lifestyle changes, and the ability of students to counsel patients about several of these topics. On average, the weight and body mass index (BMI) of students upon enrollment in the course were 169.2 lbs. and 24.4, respectively. Their average blood pressure was 125/78, and their cholesterol level was 178.3 mg/dl. Upon completion of the course, the students reported in the survey that they lost, on average, 3.07 lbs. ($p = 0.0455$) and reduced their cholesterol level by 6.89 mg/dl ($p = 0.0377$). There was also an average decrease in the systolic blood pressure by 5.0 mm Hg ($p = 0.011$). No effect on the diastolic blood pressure was observed ($p = 0.3216$). The average BMI was also reduced by 0.69 ($p = 0.0279$). The frequency, duration, and intensity of exercise performed by students were all improved following the course ($p < 0.0001$). The students were also better in monitoring their diet ($p < 0.0001$) and eating a healthier diet after the course ($p < 0.0001$). In terms of overall lifestyle changes in exercise and diet, the majority of students noticed an improvement. The

James Boyd, Pharm.D., M.B.A., is Associate Professor, Department of Pharmacy Practice, and Antoine Al-Achi, Ph.D., is Associate Professor, Department of Pharmaceutical Sciences at the Campbell University School of Pharmacy.

Address correspondence to: James Boyd, Pharm.D., M.B.A., Associate Professor, Department of Pharmacy Practice, School of Pharmacy, Campbell University, P.O. Box 1090, Buies Creek, NC 27506.

Journal of Pharmacy Teaching, Vol. 9(4) 2002
<http://www.haworthpress.com/store/product.asp?sku=J060>
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10.1300/J060v09n04_04

students also felt better prepared to counsel patients in areas of exercise, diet, BMI calculation, blood pressure monitoring, and cholesterol monitoring upon completion of this course. [Article copies available for a fee from The Haworth Document Delivery Service: 1-800-HAWORTH. E-mail address: <docdelivery@haworthpress.com> Website: <<http://www.HaworthPress.com>> © 2003 by The Haworth Press, Inc. All rights reserved.]

KEYWORDS. Healthy living, body mass index, exercise, blood pressure, cholesterol, student health, pharmacy

INTRODUCTION

An elective course in healthy living was introduced during the fall semester of 1999 and was offered the second time in spring of 2000 to third-year students of a four-year entry-level Pharm.D. program. The purpose of the course was to provide students with the opportunity to design an individual wellness program, to explore components of a healthy lifestyle, to apply related materials covered in other courses like biochemistry, therapeutics, nonprescription drugs as related to diet, exercise, and healthy choices, and to become competent in the use of devices commonly integrated into pharmaceutical care wellness programs.

The objectives of the course by completion of the semester included design of an individual program to improve wellness; to monitor blood pressure, cholesterol, and blood sugar and integrate the results to determine cardiac risk; to develop a nutritional self-assessment of current diet, identify healthy and unhealthy foods, develop a physical fitness plan, and describe the effects of alcohol, tobacco, and drug use; and to transfer these individual skills to patients within the scope of pharmaceutical care.

The course consisted of four areas: exercising a minimum of four times a week; recording and evaluating all foods consumed one week out of each month; performing and recording blood pressure, cholesterol, body mass index (BMI) calculations, weight, and measurements at required intervals; and successful completion of quizzes on the eight practice-related review articles focusing on related subjects. The topics included: "Pharmacist Counseling on Nutrition 1 and 2," "Therapeutic Options for Treating Obesity," "Review of Therapy for Hypertension," "A Review of HMG CoA Reductase Inhibitors," "Diabetes and Lipid Management," "Weight Management and the Pharmacist's Role," and "The Pharmacotherapy of Lipid Disorders" (1-8).

The students had an initial meeting with the instructor at the beginning of the semester. During that initial lecture, the instructor distributed the syllabus for the course, discussed the objectives of the course, and then demonstrated the use of different devices to students (e.g., glucometer). During the first week of the semester, students were required to meet individually to discuss their exercise plan and goals. At the beginning of the semester, an invited dietitian addressed the class with more specific information on healthy diets and meal plans. Toward mid-semester, students met again individually with the instructor to discuss their progress with the plan. At the end of the semester, the instructor met with the students in a classroom to evaluate their progress toward a healthy lifestyle. Videotapes on how to use the devices were available to students throughout the semester.

The grade was based on the number of weeks in the semester that the student met his or her required wellness plan (total weeks in semester = 15). For example, a student wishing to obtain an "A" in the course had to submit 15 weekly exercise logs that met the minimum requirements of exercise goals, food journal, and assessments; no partial credit was allowed. For students completing 14 weeks, a letter grade of "B" was awarded; for 13 weeks, a letter grade of "C"; and less than 13 weeks, a grade of "F." Students not passing the quizzes for the review articles with a 70% score or better received an incomplete for the course.

METHODS

Study Design

The initial individual exercise plan was determined by type, duration, and intensity of current level of activity and individual discussion with the course instructor. Student physical activity at the start the course varied significantly. Some students came into the program exercising five or more times per week, while others had not exercised while enrolled in pharmacy school. The course instructor tended to reduce lofty initial goals to help students avoid injury and burnout. The minimum goal was walking 30 minutes, while the maximum goal was jogging 30 to 45 minutes (9, 10). Students were provided comparable physical activities in terms of caloric burn and cardiovascular exercise and were encouraged to engage in a variety of activities such as swimming, tennis, basketball, and other activities (11). Students then were required to record in the weekly exercise log the type of exercise, as well as dura-

tion and intensity, each day that they exercised. Students were encouraged to go to the student infirmary for a physical exam prior to initiation of the exercise program.

The nutritional information component of the course provided required readings in weight management, obesity, counseling on nutrition and physical activity, treatment of hyperlipidemia, and a lecture by a registered clinical dietitian (12-17). The students were given examples of four different types of food journals or logs. Students were required to record all food consumed in one week each month for the four months during the semester. The amount of each food consumed was recorded in addition to an assessment of each food in terms of grams of fat, calories, and food type. Students were provided information to modify their diets to coincide with current recommendations of the Dietary Guidelines Advisory Committee on the Dietary Guidelines for Americans (12-15). Students were required to analyze their diet rather than change it.

Manufacturer's information on the proper use of the devices was available to the students along with instructor demonstration. During the first week of the course, the instructor demonstrated how to use the cholesterol monitoring device. Because of the expense of cholesterol tests, students were required to check their cholesterol at the beginning and end of the semester. Students also had the option to participate in a health fair that was offered in conjunction with the university's homecoming to obtain more experience with cholesterol and blood glucose monitoring.

Arrangements were made with the university's infirmary for individual assessments. The infirmary allowed students to check their weight and blood pressure any time. The infirmary staff was instructed to make the students responsible for the individual assessments. Students were allowed to go to the infirmary in pairs to assist one another.

Statistical Methods

Students were given a survey to complete at the end of the course (Figure 1). A 6-point scale of 0 to 5 was used throughout the survey, with 0 signifying the minimum and 5 the maximum level. Data collected from the survey were analyzed using JMP[®] statistical software (SAS Institute, Cary, NC). A paired *t* test was used to compare the scores from before the course and after completion of the course. A $p \leq 0.1$ was considered significant.

FIGURE 1

Healthy Choices 569
End of Course Assessment
Survey # _____

Age _____
Gender _____

Please rank the following questions from 0 to 5 by circling or checking the most appropriate number.

Exercise

Frequency before the course

0---1---2---3---4---5

(0 = 0 times per week; 5 = 4 or more times per week)

Frequency at the end of the semester

0---1---2---3---4---5

(0 = 0 times per week; 5 = 4 or more times per week)

Duration of exercise before the course

0---1---2---3---4---5

(0 = 0 minutes per week; 5 = 60 minutes or more)

Duration of exercise at the end of the semester

0---1---2---3---4---5

(0 = 0 minutes per week; 5 = 60 minutes or more)

Intensity of exercise before the semester

0---1---2---3---4---5

(0 = 0 intensity; 5 = very intense)

Intensity of exercise at the end of the semester

0---1---2---3---4---5

(0 = 0 intensity; 5 = very intense)

Diet

Recording food consumed prior to the course

0---1---2---3---4---5

(0 = Never monitored; 5 = Monitored almost every item consumed)

Recording food consumed at the end of the course

0---1---2---3---4---5

(0 = Just on required days; 5 = Monitor almost all foods consumed)

Types of diet

Before the course my diet was:

0---1---2---3---4---5

(0 = not healthy; 5 = very healthy)

After the course my diet is:

0---1---2---3---4---5

(0 = not healthy; 5 = very healthy)

Assessment

Compare the following "before" the course and "after" the course

Blood pressure

Before

After

FIGURE 1 (continued)

Measurements		
Before		After
Weight		
Before		After
Cholesterol		
Before		After
BMI		
Before		After

Lifestyle Changes

How beneficial will this course be in making lifestyle changes in:

Exercise		
0----1----2----3----4----5		(0 = no help; 5 = tremendous help)
Diet		
0----1----2----3----4----5		(0 = no help; 5 = tremendous help)

Your Ability to Counsel Patients About:

Please use the following scale:	0 = not change; 5 = tremendous improvement, no additional resources necessary
Exercise	
0----1----2----3----4----5	
Diet	
0----1----2----3----4----5	
Calculating BMI	
0----1----2----3----4----5	
Blood pressure monitoring	
0----1----2----3----4----5	
Cholesterol monitoring	
0----1----2----3----4----5	

Comments:

RESULTS AND DISCUSSION

Over the course of 2 semesters, 35 students (11 males and 23 females, 1 undetermined) were enrolled to take Healthy Choices. Students had, on average, an age of 24.8 years, a weight of 169.2 lbs., a cholesterol level of 178.3 mg/dl, a blood pressure of 125/78 mm Hg, and a body mass index (BMI) of 24.4 (Table 1). On average, students had lost 3.07 lbs. by the end of the course ($p = 0.0455$). Their cholesterol concentration dropped by almost 7 mg/dl ($p = 0.0377$). Although diastolic blood pressure did not drop significantly from the baseline, the systolic blood pressure readings were lower (by 5.0 mm Hg) at the completion of the course ($p = 0.0110$). BMI was reduced by 0.69 units ($p = 0.0279$) (Table 2). There was a definite improvement in the frequency, duration, and intensity of exercise at the end of the semester as compared to the start of the course ($p < 0.0001$) (Table 3). Also, it appears that students kept better food records and ate a healthier diet by following the Healthy Choices program ($p < 0.0001$) (Table 4).

The majority of students indicated that the Healthy Choices program helped them in exercise and diet choices (Table 5). Most students indicated that when they were required to complete the journal, they ate less. Students also tended to modify their diet to a healthier one, and most students completed the food journal daily rather than the one week

TABLE 1. Sample Descriptive Statistics.

	Male ^a	Female	Undefined ^b	Overall
Number	11	23	1	35
Age (Mean \pm S.D.) (yr.)	24.9 \pm 4.3 (11)	24.8 \pm 2.7 (22)	-	24.8 \pm 3.2 (33)
Weight (lbs.) ^c	189.9 \pm 53.1 (8)	141.7 \pm 25.0 (6)	-	169.2 \pm 48.7 (14)
Cholesterol (mg/dl) ^c	159.0 \pm 29.7 (8)	192.4 \pm 88.6 (11)	-	178.3 \pm 70.7 (19)
Blood Pressure (mm Hg) (Diastolic) ^c	82.4 \pm 7.2 (8)	73.7 \pm 8.9 (9)	-	77.8 \pm 9.1 (17)
Blood Pressure (mm Hg) (Systolic) ^c	128.4 \pm 10.2 (8)	121.9 \pm 7.2 (9)	-	124.9 \pm 9.1 (17)
Body Mass Index (BMI) ^c	24.3 \pm 4.6 (8)	24.5 \pm 3.6 (7)	-	24.4 \pm 4.0 (15)

^aValues in parentheses are the number of respondents.

^bUndefined = the respondent did not specify gender.

^cValues are mean \pm s.d.; initial values are reported when the course started.

TABLE 2. Effect of the Healthy Choices Program on Different Parameters (Assessment).

Parameter	Before	After	Difference	p^a
Weight (lbs.)	169.2 ± 48.7 (14)	166.1 ± 47.3 (14)	3.07	0.0455
Cholesterol (mg/dl)	178.3 ± 70.7 (19)	171.4 ± 70.0 (19)	6.89	0.0377
Blood Pressure (mm Hg) (Diastolic)	77.8 ± 9.1 (17)	76.4 ± 6.5 (17)	1.35	0.3216
Blood Pressure (mm Hg) (Systolic)	124.9 ± 9.1 (17)	119.9 ± 6.5 (17)	5.00	0.0110
Body Mass Index (BMI)	24.4 ± 4.0 (15)	23.7 ± 3.3 (15)	0.69	0.0279

^aStatistically significant if $p \leq 0.10$, based on a paired t test

TABLE 3. Effect of Healthy Choices Program on Exercise.

	Average Difference in Units (After – Before)	p^b
Frequency of Exercise	2.28	< 0.0001
Duration of Exercise	1.11	< 0.0001
Intensity of Exercise	1.23	< 0.0001

^aBased on a 6-point scale of 0 to 5 (0 indicates the least amount and 5 signifies the most)

^bStatistically significant at $p \leq 0.10$, based on a paired t test

TABLE 4. Effect of Healthy Choices Program on Diet.

	Average Difference in Units (After – Before)	p^a
Recording Food ^b	1.74	< 0.0001
Type of Diet ^c	1.17	< 0.0001

^aStatistically significant at $p \leq 0.10$, based on a paired t test

^bA 6-point scale was used (from 0 to 5): 0 indicates never or minimum monitoring of food consumption, and 5 signifies almost complete monitoring of all items consumed.

^cA 6-point scale was used (from 0 to 5): 0 equals not healthy diet and 5 means very healthy diet.

per month. Students were more confident at the completion of this course in counseling patients concerning exercise, diet, blood pressure monitoring, cholesterol monitoring, and BMI estimation (Table 6). Table 7 lists some of the comments that students have made upon completion of the survey. We anticipate that students who take this course will experience a lifelong change in their healthy habits that will contribute to better health and more enjoyment in life.

TABLE 5. Effect of Healthy Choices Program on Lifestyle Changes.

Scale	Number of Respondents					
	0	1	2	3	4	5
Exercise ^a	0	0	4	6	13	12
Diet ^a	1	1	5	9	10	9

^aA 6-point scale was used (from 0 to 5): 0 indicates no help and 5 signifies tremendous help.

TABLE 6. Effect of Healthy Choices Program on the Perceived Ability of Student to Counsel Patients.

Counseling Area ^a	25th Percentile	50th Percentile	75th Percentile
Exercise	4.0	4.0	4.0
Diet	3.0	4.0	4.0
Calculating BMI	4.0	4.0	5.0
Blood Pressure Monitoring	3.0	4.0	5.0
Cholesterol Monitoring	3.0	4.0	5.0

^aScale used (from 0 to 5): 0 = not changed; 5 = tremendous improvement (no additional resources necessary)

TABLE 7. Comments Made by Students Upon Completion of the Course.

1. "Great course to help 'teach' people about effects diet and exercise play on health."
2. "This class has proven to be very important because I have lost weight and it has helped me to establish an exercise program and a better diet even in the middle of a very hectic schedule."
3. "Very helpful thank you. . . . Recommend it to everyone!"
4. "This was a great class and I really enjoyed it. It made me much more aware of my eating and exercising habits. Even though I did not see any changes in my weight or measurements, I noticed that I feel better mentally and physically."
5. "I really enjoyed this class. It kept me motivated to exercise and to eat better."
6. "I thoroughly enjoyed the course. I am looking forward to continuing this semester with the same enthusiasm because it did help me a great deal. Thank you."
7. "I enjoyed this course because it encouraged me to exercise more and continue watching my diet. I am glad I was able to check my cholesterol because it had not been done prior to this course. I've decided to take this course next semester."
8. "I think this class is very beneficial to pharmacy students to learn more about diet and exercise and how to manage diet and exercise. I am glad that I got to use a blood cholesterol meter because I had never used one before. I think this class should continue to be offered as an elective for upcoming P-3 students."
9. "I saw improvement in all areas. This course was definitely a motivating factor. Not only can I improve myself personally, but I am better prepared to counsel patients."

CONCLUSION

The Healthy Choices elective course offered to pharmacy students was shown to be a useful instrument for modifying some of the health habits of those who participated in the course. An overall improvement in diet, exercise, and perceived ability by the student to counsel patients on these issues was noted after completion of the course. The skills gained in taking this course will contribute to a lifelong healthy experience for its participants.

RECEIVED: 06/21/00

REVIEWED: 08/31/00

REVISED: 10/31/00

REVIEWED: 03/13/01

REVISED: 06/15/01

REVISED AND ACCEPTED: 03/27/02

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