



Educating Pharmacy Students About Nutrition and Physical Activity Counseling

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ABSTRACT

The current study provides measures of association between self-reported beliefs of currently practicing pharmacists and pharmacy students' beliefs about, willingness to provide, and preparedness to provide counseling on nutrition and physical activity following completion of a health education unit. A 3-week health education unit focusing on the pharmacists' role in nutrition and physical activity counseling was developed and implemented in a required nonprescription drug therapy pharmacy course for fifth-year doctor of pharmacy students. As expected, the majority of pharmacy students postintervention believed that diet and physical activity health-related behaviors were very important for the average adult. Furthermore, significantly more pharmacy students believed that it was their professional responsibility to educate patients about diet and physical activity, felt more prepared to educate on diet modification and physical activity, and felt more comfortable with implementing behavioral-modification strategies to help patients achieve change than currently practicing pharmacists. The importance pharmacy students assigned to diet and physical activity health-promoting behaviors indicates that a similar health education program may help currently practicing pharmacists sharpen their skills in these areas.

Unhealthy eating and physical inactivity are major contributing factors to many chronic medical conditions, including cardiovascular disease, cancer, obesity, hypertension, dyslipidemia, and diabetes mellitus (Centers for Disease Control and Prevention [CDC], 2002). Each of these diseases is associated with prolonged illness and disability that decrease the quality of life for millions of Americans annually. The current recommendations/guidelines from many national organizations and expert panels (e.g., American Heart Association, American Cancer Society, Expert Panel on Detection, Evaluation, and Treatment of

High Blood Cholesterol in Adults [ATP III], Joint National Committee Report on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure [JNC-6]) advise that the first-line approach (before drug therapy) for treating these chronic diseases is making lifestyle modifications related to nutrition and physical activity (Byers et al., 2002; CDC, 2002 Krauss et al., 2000).

The need for patient counseling on nutrition therapy and physical activity has been recently promoted by the American Pharmaceutical Association (APhA) as an excellent opportunity for pharmacists to expand their provision of pharmaceutical

care services (Dombrowski, 1999; Dombrowski & Ferro, 1999). In fact, for the past three decades the pharmacy profession has been broadening its role to include a range of patient-centered services beyond the traditional product-oriented functions

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of dispensing and distributing medications (APhA, 1998). More specifically, counseling with the objective of providing patients with information to assist them in making lifestyle changes to improve their health is viewed as a task particularly well suited to pharmacists. Because they are recognized as credible sources of health information, accessible, and in frequent contact with the public (Americans on average visit a pharmacy once every month), community pharmacists could provide an important channel for delivery of counseling on proper diet and physical activity (Cooper, 1999; Dombrowski, 1999; Dombrowski & Ferro, 1999). Despite these seemingly favorable conditions, little is known about the extent to which pharmacists believe in the importance of healthy food choices and physical activity in promoting the health of their patients.

In one of the few studies reported to date, Kotecki and colleagues recently surveyed a random sample of 522 community pharmacists in Indiana regarding their beliefs and practices related to 23 health-promoting behaviors (Kotecki, Elanjian, & Torabi, 2000). Their findings revealed that pharmacists were in strong agreement that eliminating cigarette smoking, always wearing automobile safety belts, and practicing safe sex were very important health-promoting behaviors. There was, however, considerably less agreement among pharmacists about the importance of diet and physical activity as health-promoting behaviors. Furthermore, pharmacists' involvement, preparation, and confidence in dealing with patients' habits related to diet, physical activity, and weight management was extremely low.

Among the more notable findings from Kotecki and his colleagues was that pharmacists did not feel it was their responsibility to be involved in diet and physical activity counseling. They also felt ill equipped to provide instruction on these health-promoting behaviors due to a lack of information and training.

To further the role of community pharmacists in diet and physical activity coun-

seling, faculty from two Indiana universities, the Department of Pharmacy Practice at Butler University and the Department of Health Science at Ball State University, collaborated on developing and implementing coursework related to the latest thinking about healthful diet and physical activity guidelines. Despite the emphasis placed on educating pharmacists in diet and physical activity by the APhA, there is no literature on implementing and measuring the effectiveness of this type of education. The purpose of this current study was twofold. First, the study was designed to determine pharmacy students' self-reported beliefs about, willingness to provide, and preparedness to provide counseling on nutrition and physical activity following completion of a coordinated and concentrated health education unit. Second, the study was designed to compare these results with the self-reported beliefs of currently practicing pharmacists.

METHODS

Subjects

A convenience sample of 78 doctor of pharmacy students enrolled in a nonprescription drug therapy course during the 2002 spring semester at Butler University participated in the study. The course, titled Self-Care and Health Promotion, is required for all fifth-year doctor of pharmacy students. The overall focus of the course is health and wellness, but it concentrates exclusively on over-the-counter drug therapy and alternative remedies such as herbal products and other dietary supplements as self-care treatment options. To meet the study purposes, an immediate posttest (IPT) and a delayed posttest (DPT) design were employed. The IPT was conducted at the conclusion of the intervention and the DPT was conducted 5 weeks later.

The currently practicing pharmacists (CPP) self-reported health promotion beliefs originated from a recent research study conducted in Indiana (Kotecki et al., 2000). Five hundred twenty-two randomly selected community pharmacists participated in a cross-sectional mail survey of community pharmacies in Indiana. Respondents ranged

in age from 22 to 70 years, with a mean age of 41.12 and a standard deviation of 10.98. The majority of pharmacists were men (65.6%) between 30 and 49 years of age (59.1%) who had practiced for 10 or more years (67.8%). The descriptive characteristics of this sample are similar to those observed in other research (Kotecki, 2002).

Intervention

A series of seven 1-hour lecture sessions focusing on national dietary and physical activity guidelines and practical and reliable behavior change techniques were implemented in the nonprescription drug therapy course. Three 2-hour laboratories providing experiential-learning opportunities supported the lecture and classroom discussions.

The lecture material was primarily based on assigned readings from the APhA's Dynamics of Pharmaceutical Care Continuing Education monograph series *The Pharmacist's Role in Nutrition and Physical Activity Counseling* (APhA, 2000) and *Managing Obesity as a Chronic Disease* (APhA, 2001). In addition, recently updated diet and physical activity recommendations from expert panels on managing hypertension (Vollmer et al., 2001), hypercholesterolemia ("Executive Summary," 2001), and diabetes mellitus (American Diabetes Association, 1998, 1999) were also assigned readings. Finally, articles related to the transtheoretical model of behavior change and its stages-of-change construct (Berger & Hudmon, 1997; Prochaska & Velicer, 1997) were also assigned as readings to inform pharmacy students about the importance of assessing a patient's motivational readiness and the need for tailoring interventions accordingly.

The experiential-learning laboratories provided pharmacy students the opportunity to display their comprehension of the lecture material and implement strategies based on the stages-of-change approach to assist in health-related behavior change. This opportunity was facilitated largely through simulated one-on-one patient consultations and group presentations. The seven lectures and three laboratories



were implemented during the first 3 weeks of the course by the visiting professor of health education. The assigned pharmacy professor of the course assisted in the implementation of this health education material.

Instrument

A survey questionnaire used to measure Indiana pharmacists' health promotion beliefs and practices served as the basis for the data collection instrument (Kotecki et al., 2000). Items relating to the nutrition and physical activity health areas were selected from the questionnaire; those that did not apply were discarded. In addition, six new items were added to measure students' attitudes toward prevention. The questionnaire was subsequently provided to three community pharmacists and two survey researchers to assess content validity. Minor changes in wording were incorporated into the final structured questionnaire, which consisted of 34 multiple-choice items designed to yield scaled responses.

The nutrition and physical activity beliefs were measured by listing 14 health-related behaviors and asking respondents to indicate on a 5-point Likert scale (*very unimportant, somewhat unimportant, equally unimportant and important, somewhat important, very important*) the importance of each behavior in promoting the health of an average adult. Ten items dealt directly with the *Dietary Guidelines for Americans*, three items related to maintaining normal blood pressure, cholesterol, and glucose levels, and one item with taking a multivitamin/mineral supplement daily (Table 1).

A 5-point Likert scale (*very uninvolved, somewhat uninvolved, equally uninvolved and involved, somewhat involved, very involved*) was used to measure whether pharmacy students believed pharmacists should be responsible for counseling patients with regard to four habits: diet modification, weight management, physical activity, and alcohol use.

Pharmacy students' confidence in their ability to help future patients change behavior was measured in two ways using

5-point Likert scales. For each of the four health promoting habits, students were asked to indicate the extent to which they felt prepared to counsel patients (*very unprepared, unprepared, equally unprepared and prepared, prepared, very prepared*) and their level of comfort with implementing behavioral modification strategies in helping patients achieve changes in their behavior for each health promoting behavior (*very uncomfortable, mildly uncomfortable, equally uncomfortable and comfortable, somewhat comfortable, very comfortable*).

Finally, students' attitudes toward prevention were measured by listing six items (Table 2) using a 5-point Likert scale (*strongly disagree, somewhat disagree, equally disagree and agree, somewhat agree, strongly agree*). Test-retest reliability was assessed on the responses following the IPT and DPT using Pearson's correlation coefficient and was found to be 0.78. Internal reliability was assessed on the DPT responses using Cronbach alpha and

was found to be 0.83. The questionnaire took 10–15 minutes to finish and was completed under conditions of anonymity. The Institutional Review Boards at Ball State University and Butler University approved the research methodology and survey instrument.

Data Analysis

The collected data were analyzed using SPSS 10.0. The Pearson chi-square and descriptive statistics were used to examine relationships between self-reported beliefs of currently practicing pharmacists and pharmacy students' self-reported beliefs about, willingness to provide, and preparedness to provide counseling on nutrition and physical activity post intervention. The alpha level was set at $p < .05$.

RESULTS

Of the 78 students who participated in the course, all completed IPT questionnaires, and 68 completed DPT questionnaires. Of the DPT participants, 52 (76%) of the

Table 1. Percentage of Respondents Perceiving Health-Promoting Behaviors as "Very Important" for the Average Adult

Behavior	IPT ^a	DPT ^b	CPP ^c
1. Aim for a healthy weight	89	85	39 ^d
2. Maintain normal blood pressure	89	82	70 ^d
3. Choose a diet low in saturated fat and cholesterol and moderate in total fat	87	82	51 ^d
4. Maintain normal blood cholesterol level	86	82	58 ^d
5. Maintain normal blood glucose level	86	83	nm ^f
6. Be physically active each day	76	71	29 ^d
7. Choose a variety of fruits and vegetables daily	74	74	51 ^d
8. Keep food safe to eat	74	68	nm ^f
9. If one drinks alcoholic beverages, do so in moderation	64	59	52 ^e
10. Choose a variety of grains daily, especially whole grains	63	61	51 ^e
11. Choose and prepare foods with less salt	61	52	34 ^d
12. Let the Food Pyramid guide food choices	60	56	48 ^d
13. Choose beverages and foods to moderate intake of sugars	59	55	33 ^d
14. Take a multivitamin/mineral supplement daily	14	18	nm ^f

^aIPT=immediate posttest ($n=78$).

^bDPT=delayed posttest ($n=68$).

^cCPP=current practicing pharmacists ($n=522$); published data from Kotecki et al., 2000.

^dChi-square tests for differences among DPT and CPP= $p < .05$.

^eChi-square tests for differences among IPT and CPP= $p < .05$.

^fnm=not measured.



respondents were women and 16 (24%) were men. Forty-two (62%) of the participants planned on working in a community pharmacy setting, 20 (29%) in a hospital setting, and 6 (9%) indicated "other."

Beliefs About Health Promotion

Table 1 presents the results of the rating of the 14 health-related behaviors concerning diet and physical activity beliefs, based on the proportion of pharmacy students and currently practicing pharmacists (CPP) who stated that these items were "very important." Of the 14 items, 13 received a 50% or higher student rating of "very important" at both the IPT and DPT. These items included aim for a healthy weight (89 and 85%); maintaining normal blood pressure (89 and 82%); choosing a diet that is low in saturated fat and cholesterol and moderate in total fat (87 and 82%); maintaining normal blood glucose level (86 and 83%); maintaining normal blood cholesterol level (86 and 82%); being physically active each day (76 and 71%); choosing a variety of fruits and vegetables daily (74 and 74%); keeping food safe to eat (74 and 68%); drinking alcohol in moderation (64 and 59%); choosing a variety of grains daily, especially whole grains (63 and 61%); choosing and preparing foods with less salt (61 and 52%); letting the Food Pyramid guide food choices (60 and 56%); and choosing beverages and foods moderate in sugar (59 and 55%). The only item receiving less than a 50% response as "very important" was taking a multivitamin/mineral supplement daily (14 and 18%). No statistically significant associations ($p > .05$ by the chi-square test) were found between pharmacy students' IPT and DPT items. When matching the pharmacy students DPT and CPP beliefs, it was found that statistically significant differences existed for 9 of the 11 comparable behaviors ($p < .05$ by the chi-square test) (Table 1). Significant statistical differences ($p < .05$) existed on each of the 11 comparable behaviors tested with IPT and CPP. In other words, immediately following the intervention the pharmacy students were more likely to believe in the

Table 2. Percentage of Respondents Stating Pharmacists Should Be "Very Involved" in Counseling Patients on Specific Health Behaviors

Behavior	IPT ^a	DPT ^b	CPP ^c
1. Weight management	44	39	7 ^d
2. Alcohol use	39	30	21 ^e
3. Diet modification	37	33	7 ^d
4. Physical activity	37	30	6 ^d

^aIPT=immediate posttest ($n=78$).

^bDPT=delayed posttest ($n=68$).

^cCPP=current practicing pharmacists ($n=522$); published data from Kotecki et al., 2000.

^dChi-square tests for differences among DPT and CPP= $p < .05$.

^eChi-square tests for differences among IPT and CPP= $p < .05$.

Table 3. Percentage of Respondents Feeling "Very Prepared" to Educate Patients on Specific Health Promotion Areas

Behavior	IPT ^a	DPT ^b	CPP ^c
1. Physical activity	59	52	17 ^d
2. Diet modification	54	47	11 ^d
3. Weight management	54	42	12 ^d
4. Alcohol use	42	39	31

^aIPT=immediate posttest ($n=78$).

^bDPT=delayed posttest ($n=68$).

^cCPP=current practicing pharmacists ($n=522$); published data from Kotecki et al., 2000.

^dChi-square tests for differences among DPT and CPP= $p < .05$.

Table 4. Percentage of Respondents Feeling "Very Comfortable" Implementing Behavioral-Modification Strategies in Helping Patients Achieve Changes

Behavior	IPT ^a	DPT ^b	CPP ^c
1. Physical activity	28	23	2 ^d
2. Weight management	26	21	2 ^d
3. Diet modification	23	20	4 ^d
4. Alcohol use	20	17	5 ^d

^aIPT=immediate posttest ($n=78$).

^bDPT=delayed posttest ($n=68$).

^cCPP=current practicing pharmacists ($n=522$); published data from Kotecki et al., 2000.

^dChi-square tests for differences among DPT and CPP= $p < .05$.

importance of each of the health-promoting behaviors than were the current practicing pharmacists.

Beliefs About Pharmacist Involvement

At least 3 of every 10 pharmacy students at both IPT and DPT believed that pharmacists should be "very involved" in counseling patients on weight management

(44 and 39%), alcohol use (39 and 30%), diet modification (37 and 33%), and physical activity (37 and 30%) (Table 3). The figures reflect significant increases for the DPT over the CPP group in the proportions of respondents who thought pharmacists should be very involved on three (weight management, diet modification, and physi-



cal activity) of the behaviors ($p < .05$).

Confidence in Dealing with Behavioral Change

As shown in Table 4, more than half of the pharmacy students perceived themselves as “very prepared” to educate patients on physical activity (59%), diet modification (54%), and weight management (54%) at the IPT. However, statistically significant ($p < .05$) differences did exist among the pharmacy students’ DPT and the CPP when it came to feeling very prepared to counsel patients on physical activity, diet modification, and weight management. Further, pharmacy students reported statistically significant higher levels of confidence at both the IPT and DPT compared with the CPP for helping patients achieve behavior changes regarding physical activity, weight management, diet, and alcohol habits (Table 5).

Attitudes Toward Prevention

Pharmacy students’ attitudes toward prevention, as measured by a series of six closed-ended items, show that they thoroughly en-

dorse the pharmacists’ role in the prevention of disease (Table 2). More than four-fifths of the pharmacy students agreed that pharmacists should devote more time to providing preventive services to their patients and that keeping patients healthy by influencing the adoption of healthy lifestyles is very important. However, less than half (35%) agreed that they would find the preventive aspects of medicine more interesting or gratifying than treating ill patients. Nonetheless, the majority of pharmacy students agreed that preventive medicine should be a required part of the pharmacy school curriculum. Finally, more than four-fifths of the pharmacy students thought they would find educating patients a challenging and pleasing part of pharmacy practice. Attitudes toward prevention were not measured on currently practicing pharmacists; thus, no comparisons could be made.

DISCUSSION

Trends data from the Behavioral Risk

Factor Surveillance System in the decade of the 1990s reveals that Indiana adults exceeded the rest of the United States in disease-promoting behaviors, including not consuming enough fruits and vegetables, no leisure time physical activity, overweight and obesity, chronic drinking of alcohol, binge drinking, and not being checked for hypertension and hypercholesterolemia (CDC, 2001). These conditions have contributed to Indiana’s higher rates of cardiovascular disease, cancers, and diabetes mellitus compared with the rest of the United States (CDC, 1999).

The *Healthy People 2010* goals for Indiana acknowledge the need for actively involving health care professionals in counseling and patient education when it comes to improving lifestyles among the populace (ISDH, 2001). Therefore, health education must be practiced in a variety of settings and by various health care professionals. One prominent health care provider in Indiana is the community pharmacist. In fact,

Table 5. Percentage of Responses by Pharmacy Students to Attitudes About Prevention (N=68)

Item	Strongly agree	Somewhat agree	Equally disagree/agree	Somewhat disagree	Strongly disagree
1. Pharmacists should devote more time to providing preventive services to their patients.	64	27	8	2	0
2. The most important thing a pharmacist can do to keep patients healthy is to influence them to adopt healthy lifestyles.	39	44	14	3	0
3. In general, I think I would get a greater sense of gratification from diagnosing and treating ill patients than I do from preventive care.	12	23	20	33	12
4. In general, the preventive aspects of medicine—educating and counseling patients on healthy lifestyles—are not very interesting to me as a pharmacist.	8	12	15	32	33
5. More formal instruction on preventive medicine should be a required part of the curriculum in pharmacy school.	21	35	27	14	3
6. In general, I think I would find educating patients to be a challenging and enjoyable part of pharmacy practice.	33	52	11	3	2



pharmacists are the third most prevalent licensed health care professionals in Indiana, for a statewide pharmacist-to-population ratio of 1:1,085 or 95 per 100,000 (ISDH, 1999).

Pharmacists, like most health care professionals, are more willing to devote time and energy to counseling patients in areas in which they feel they have a reasonable possibility of success. One area in which pharmacists feel very successful in helping patients change behavior is with the proper use of medication (Kotecki et al., 2000), which is consistent with their academic curriculum. However, in many chronic medical conditions nutrition therapy and increased physical activity serve as the foundation of treatment (Byers et al., 2002; CDC, 2002; Krauss, et al., 2000:). Drug therapy is intended as an adjunct to, not a substitute for, proper diet and physical activity. Additionally, changing fundamental and ingrained behaviors, such as behaviors related to diet and physical activity, are extremely difficult and time-consuming and require different counseling techniques. Therefore, it is not surprising that pharmacists do not feel successful or believe they should be involved in these areas (Kotecki et al, 2000).

Still, when it comes to counseling on diet and physical activity, pharmacists should be involved. This conclusion is consistent with the emerging trend that recognizes the importance of an interdisciplinary team effort by all health care providers in helping Americans follow national diet and physical activity guidelines (Byers et al., 2002; CDC, 2002; Krauss et al., 2000). Pharmacists, as members of this team, can be a readily accessible source of information on the importance of nutrition and physical activity in chronic disease management (Cooper, 1999; Dombrowski, 1999; Dombrowski & Ferro, 1999). However, pharmacists who fail to adopt this unifying philosophy of practice related to the recommendations for healthful food choices and physical activity are missing an opportunity to respond to a profound public health need.

The modification of program curricula

for pharmacists can contribute to creating an established norm for pharmacists practicing nutrition and physical activity counseling, as well as teach pharmacists the skills they need to have a reasonable possibility of success in assisting patients in achieving these behavior changes. This study demonstrates that a well-designed and well-supported health education program taught by a health educator can significantly impact the depth of professional commitment and skill that is necessary for pharmacists. Findings of this study indicate that pharmacy students were more likely to believe in the importance of diet and physical activity in promoting the health of adults following the educational intervention than current practicing pharmacists (Kotecki et al., 2000). The pharmacy students were also more likely to believe that it was their professional responsibility to educate patients on these matters, and felt more prepared and comfortable in counseling patients about diet and physical activity than did current practicing pharmacists.

Of particular interest was the retention for each of these important beliefs 5 weeks after the educational program (no statistically significant changes occurred between IPT and DPT). Consequently, these pharmacy students, on entering their clinical rotations and subsequent professional practices, might be more able or more likely to provide patient counseling on such issues as a routine component of pharmaceutical care. In fact, instilling patient counseling skills related to health promotion and disease prevention are key elements of a new mission and curriculum for doctor of pharmacy students (American College of Clinical Pharmacy, 2000). Success in this area is critical if the pharmacy profession is going to play an active role in patient counseling related to health promotion.

To enhance the adoption of this pharmacist counseling role related to healthy lifestyles, pharmacy academia and professional organizations are developing collaborative relationships with other health professionals to help shape this new model of pharmacy practice (American College of

Clinical Pharmacy, 2000). This ambition is comparable to a similar drive for the health education profession, in which the profession has been encouraged to collaborate with a broad range of individuals and organizations outside their close-knit academic society (Seffrin, 1997). In fact, health education professionals can lend support in convincing pharmacists of the effectiveness of well-designed state-of-the-art behavioral interventions when it comes to diet and physical activity counseling. Moreover, health educators, by the nature of their skills and required professional competencies (National Commission for Health Education Credentialing, 1996) are ideally suited to assist in the education of pharmacists for health promotion counseling. To accomplish this, health educators will need to become familiar with pharmacy practice issues and to provide pharmacists with perspectives on how to counsel on health education and assist them to shape the broadening health promotion agenda.

Not only is there a need for educating preservice pharmacists, but there also appears to be a need to educate practicing pharmacists if this role is to be expanded. Although the samples are not equivalent in all characteristics, and self-reported data must be viewed cautiously, the considerable importance pharmacy students assigned to the diet and physical activity health-promoting behaviors indicates that a similar educational program may help currently practicing Indiana pharmacists sharpen their skills in these areas. Most of the currently practicing pharmacists surveyed in 2000 were eager to participate in continuing education to improve their health promotion expertise (Kotecki et al., 2000). Of course, like anything else health education is more valuable when done correctly. At a minimum, it is important that future health education efforts for pharmacists are comprehensive, coordinated, and concentrated.

Although the suggestions provided in this article are informative and useful, they should be viewed in light of a number of study constraints that might influence the generalizability of the results. The design of



the study was driven by (1) needing to limit the evaluation to an intact group; (2) needing to minimize the response burden to participants who were finishing their final semester of full-time pharmacy course work, while at the same time scheduling their 10 required experiential rotations for the upcoming year; and (3) needing to utilize similar items that measured currently practicing pharmacists self-reported beliefs from the 2000 study. Finally, various factors influence the environments in which community pharmacists are educated and employed; therefore, the generalizability of the results outside of Indiana might be limited by differences in education, laws, and practices in other states or countries.

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