

Education of Rural Community Pharmacists to Provide Nutrition Information

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Community pharmacists are a source of nutrition information to their customers. Two hundred seventy-two pharmacists with mailing addresses in rural communities of Washington State were surveyed regarding the nutrition services they provide and the adequacy of their nutrition education to prepare them for providing these services. Seventy percent of pharmacists worked in towns with five or fewer pharmacies. Ninety-eight percent indicated they were providing nutrition information to their community. However, only 20 percent indicated taking a nutrition course during their pharmacy degree program. The most frequently asked questions concern vitamin-mineral supplements/formulas (96 percent), liquid formulas (82 percent), and weight loss. Community pharmacists rely on pharmacy journals (65 percent), package inserts (64 percent) and pharmacy texts (58 percent) to answer their customers' nutrition questions. Seventy eight percent of respondents believe that more nutrition education should be incorporated into the pharmacy curriculum.

INTRODUCTION

Role of community pharmacists

Pharmacies sell many nutrition products used by the community. This includes vitamin-mineral supplements, herbal products, pediatric and adult liquid supplements, and other nutrition-related items. However, little is known about pharmacists' actual practice and perceived-adequacy of preparation for this role.

It is known that consumers take pharmacists' recommendations into consideration for purchases of over-the-counter products. Nichol *et al.* analyzed customer evaluation questionnaires after pharmacy interns offered assistance in over-the-counter (OTC) medication purchases. Consumers involved in consultations with the interns changed their purchasing decisions 40 percent of the time. On-site verbal assistance with buying vitamin-mineral supplements was reported; however specific results on changing purchasing decisions for vitamin-mineral supplements were not included (1).

Nelson and Bailie surveyed pharmacists in Detroit, Michigan (U.S.) and the United Kingdom (U.K.) (2). In the U.S., 39 percent of pharmacists recommended multivitamins to at least 5 different customers per week, compared to 29 percent of U.K. pharmacists(2). Vitamin-mineral supplements were recommended for the following top five reasons: anemia (57 percent), fatigue (57 percent), dieting (55 percent), stress (42 percent), and growth for infants and children (38 percent)(2). Benefits of vitamin-mineral supplements have been established for children to meet their needs for growth and development(3), for pregnant women(4), and to treat anemia(5). Research has not shown vitamin-mineral supplements to be beneficial to cure the symptoms of fatigue or stress. Because of only a 22 percent response rate for Nelson and Bailie's questionnaire(2), their findings may not accurately reflect the views of most pharmacists,

but the results do cause concern about appropriate recommendations by pharmacists for vitamin-mineral supplement use.

Oakland and Thomsen(6) surveyed the beliefs about and usage of vitamin-mineral supplements by older persons in communities with less than 7,500 persons in Central Iowa. Regular use of vitamin-mineral supplements was reported by 49 percent of the sample, and 18 percent of that group indicated that pharmacists provided recommendations for supplement use. Misperceptions about the use of vitamin-mineral supplements were also discovered. Respondent beliefs included "natural vitamins were better than synthetic" (72 percent), "elderly persons who feel 'run down' need vitamins and minerals" (70 percent), and "most elderly persons need vitamin and mineral supplements" (64 percent). Nearly one-quarter of the persons surveyed were not aware that over consumption of certain vitamins and minerals could be harmful (6).

Nelson surveyed why pharmacists recommend vitamin-mineral supplements(7). He concluded that pharmacists recommend vitamin-mineral supplements because pharmacists believe supplements have specific uses, in some cases due to misleading information they have received(7). For example, this includes misuses of vitamin-mineral supplements as cures for stress.

Nutrition in Pharmacy Programs

The University of Washington (UW) and Washington State University (WSU) graduate most pharmacists practicing in the state of Washington. WSU currently recommends a one semester course on nutrition during the second year of their pre-pharmacy program and nutrition information is incorporated in other courses. No other nutrition courses are required for a WSU pharmacy degree. At UW nutrition information is incorporated into required and elective courses for their program, but no nutrition courses are required².

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Study Objectives

The first objective was to assess the nutrition education that Washington State rural community pharmacists received during their pharmacy degree programs. A second objective was to summarize the pharmacists' perspectives regarding the need for nutrition education in the pharmacy curriculum based on customers' questions in their pharmacy practice. This information could then be used to develop the nutrition component of the pharmacy curriculum.

METHODS

Questionnaire Instrument

A questionnaire was designed to gather information about the nutrition services pharmacists provide to communities with 2000 or less people. The type and adequacy of nutrition education received while pursuing a pharmacy degree was also asked. Study procedures were approved by Washington State University Institutional Review Board.

The independent variables included age, gender, school where the pharmacy degree was received, highest degree received, total years of practice, job title, setting of primary pharmacy practice (and secondary pharmacy practice if applicable), the number of other pharmacies located in their town of practice, the number and types of nutrition courses taken and the need for more nutrition education. These variables were used as the basis for comparing subgroups within the population.

The dependent variables included nutrition services provided to the community, types of nutrition-related questions asked by customers, sources of nutrition information used and types of nutrition courses taken while pursuing their pharmacy degree. The respondents were asked to report the role they currently have and think they should have in providing nutrition education to their community. They were also asked about the adequacy of nutrition education received, and if more nutrition education would have been beneficial.

The Total Design Method(8) was used as a guideline to format the questionnaire questions. A peer review of the study questionnaire was performed by nutrition and pharmacy educators. Their suggestions were incorporated into the questionnaire to ensure the nutrition education questions were clear. A pretest was performed with 10 pharmacists with mailing addresses in towns with 3,000-4,000 persons to preserve the sample size of pharmacists in the targeted towns. Their suggestions led to minor changes in the questionnaire instrument. A pilot test done by 10 pharmacists in WA towns with a population less than 2000 people resulted in revisions that were made where necessary to improve the clarity and sequence of questions. A copy of the survey instrument used is available upon request.

Population

Pharmacists were selected from a member list of pharmacists from the Washington State Pharmacist Association (WSPA)³. This questionnaire targeted pharmacists with mailing addresses in communities with 2,000 persons or less (based on the 1990 census), with a total of 272 pharmacists

²Letter, Penny Evans, Program Coordinator Department of Pharmacy, Mail Stop SC-69, University of Washington, Seattle WA. 98195.

³Washington State Pharmacist Association Roster, College of Pharmacy, Washington State University, Pullman WA 99164-6510.

Table I. Population characteristics

Descriptors	All	
	n	Percent ^a
Number of Respondents	130	
Age (mean ± SD)	50 ± 11	
Total years of practice (mean ± SD)	26 ± 13	
Years in current practice (mean ± SD)	14 ± 12	
Education		
Washington State University	48	37
University of Washington	50	38
Other Pharmacy program outside of Washington	32	25
Bachelor of Science	127	98
Doctor of Pharmacy		2
Employment setting		
Privately owned	88	68
Chain Community Pharmacy	16	12
Grocery	14	11
Nursing Home	3	2
Ambulatory Care Clinic	3	2
Department Store	1	1
Home Health Care, Industry & Academic	0	0
Other (HMO, Mailorder)	4	3
Current position		
Staff Pharmacist	61	47
Owner	43	33
Manager/Supervisor	19	15
Clinical Pharmacist	2	2
Consultant Pharmacist	2	2
Other (Relief Pharmacist)	2	2
Number of other pharmacies in respondents' town of employment		
0	51	39
1	18	14
2	9	7
3-5	11	8
6-10	12	9
11-20	5	4
>20 (n = 5)	5	15

^aPercentages may not total 100 percent because of rounding.

eligible for the study (9). Pharmacists used in the pre-test and pilot test of the questionnaire were not surveyed.

Questionnaire Distribution

Eligible pharmacists were mailed the questionnaire, cover letter and a stamped return envelope. Two weeks later, a reminder card was mailed and a second questionnaire packet was mailed to non-respondents one month after the initial mailing.

One hundred eighty (180) questionnaires were returned (59 percent response rate) of which 130 were useable. Types of returned questionnaires that were determined non-useable (n = 50) included respondents who were retired (17), had a career change (two), were deceased (one), indicated they worked in a large city (five), had closed their pharmacy (two), had no forwarding address (four), or returned a blank questionnaire (seven). Twelve questionnaires from hospital pharmacists were excluded in the following analysis because the hospital pharmacists were not able to completely answer the questions about the services provided to their community. Hospital pharmacists indicated they did not work closely with the community.

Table II. Nutrition education received by respondents (n=130)

	Percent of responses ^a
Nutrition course taken during pharmacy program	15
any nutrition course	
required nutrition course	5
elective nutrition course	12
Nutrition course geared to	
health professionals	5
non-health professionals	4
pharmacists	5
nutrition majors	2
Number of nutrition lectures received in non-nutrition courses ^a :	
None	36
1-10	59
11-20	5
21-30	0
More than 30	1

^aTotal percentages exceeds 100 percent because of rounding.

Statistical Analysis

The questionnaire data were analyzed using NCSS 6.0 for Windows (Number Crunchers Statistical System, Kaysville, UT) (10). Descriptive statistics were used to analyze the data and the *t*-test and Chi-square statistics were used to determine if any differences existed between the groups. Group comparison results were not used if contingency tables yielded cells with less than five values.

RESULTS AND DISCUSSION

Population Characteristics

Forty percent of the respondents (n=51) worked in the only pharmacy in town, supporting the description of the sample as rural. Seventy percent of the respondents (n=89) represented towns with five or fewer pharmacies. The remaining respondents most likely lived in suburbs with a population of 2,000 or less and commuted from rural areas to work. Their responses were included in the analysis to determine if any differences existed in services provided or beliefs among pharmacists who work in larger and smaller communities.

Table I displays the characteristics of community pharmacists based on the 130 returned, useable questionnaires. Males respondents tended to be older than females ($P<0.05$) and also had more years of total ($P<0.01$) and current pharmacy practice ($P<0.01$). More male respondents were owners (40 percent), while more female respondents were staff pharmacists (73 percent). Similar proportions of respondents received their degree from WSU (37 percent) and UW (38 percent). 98 percent of respondents indicated they had a Bachelor of Science degree (BS) in pharmacy.

The majority of respondents worked in privately owned pharmacies (68 percent). Owners typically represented respondents in towns with only one pharmacy (50 percent) (Table I). More than half (57 percent) of staff pharmacy respondents were in towns with more than one pharmacy. Twenty-one percent of chain community pharmacies were found in towns with more than one pharmacy. In contrast, 90 percent of privately owned pharmacies were in towns with only one pharmacy.

Table III. Classification of nutrition-related questions customers typically ask

Classification	Percent ^a
ViUimin-mineral supplements/formulas	96
Liquid supplements	82
Weight loss	78
Drug-nutrient interactions	71
Basic information about good nutrition	56
Enteral feedings or TPN	11
Other (cholesterol, body -building, diabetes)	4
"Customers do not ask me nutrition-related questions."	2

^aTotal percentages exceed 100 percent because respondents chose all that applied.

Nutrition Education

Table II describes the nutrition education received by respondents during their pharmacy education. Fifteen percent indicated that they had taken a nutrition course; elective nutrition courses were taken by the majority (76 percent) of these respondents. Besides nutrition courses, nutrition information was received by over half of the pharmacists (65 percent) through lectures in non-nutrition courses. Thirty-six percent indicated they had no nutrition lectures or courses.

The perceived need for more nutrition information was not dependent on the number of nutrition courses taken. UW graduates were more likely than WSU or "other program" graduates to indicate they did not need more nutrition information ($P<0.01$). However, more pharmacists from the UW program (70 percent) took an elective nutrition course, as compared to those from WSU (50 percent) and schools outside of Washington (0 percent). UW graduates were also more likely to feel that their nutrition education was only moderately adequate ($P<0.05$). All of the women took a nutrition course, either as an elective or required course, versus only 20 percent of the men ($P<0.05$).

Nutrition Questions from Customers

Table III summarizes the type of nutrition-related questions typically asked by the respondents' customers. Most pharmacists (88 percent) responded that they needed more information to answer nutrition questions. The type of nutrition-related questions pharmacists received was not related to the perceived need for more nutrition information. Among the 20 percent that did have nutrition courses and lectures 50 percent of these still tended to feel their nutrition education was slightly inadequate. However, the pharmacists who felt they did not need more information were less likely than those who felt they did need more information to have nutrition courses or lectures during their pharmacy program ($P<0.05$). This apparent incongruent relationship may possibly be explained if pharmacists with more nutrition education were more aware of nutrition issues, which in turn created a desire for further information.

There was no significant relationship between types of questions asked to the respondents and the size of the town where the pharmacist was located. This means the curriculum of nutrition courses/lectures could be developed and used by all community pharmacists, with the assurance of meeting their nutrition education needs.

⁴American Association of Colleges of Pharmacy. Adopted policies of the 1992 House of Delegates, Washington, DC, July 15, 1992. 1426 Prince Street, Alexandria VA 22314-2841.

Table IV. Sources of nutrition information chosen by responding pharmacists

Source	Percent ^a
Pharmacy journal	65
Package inserts	64
Standard pharmacy text	58
Another pharmacist	47
Supplement suppliers	32
Dietitian	21
Nutrition journals	21
Doctor	19
Other (vitamin book, nutrition text, drug-interaction references, wall charts from supplement suppliers, television, manufacturers and wholesalers, seminars, lecture notes, therapists)	8
Nurse	7

^aTotal percentages exceed 100 percent because respondents chose all that applied.

Sources of Nutrition Information

Table IV summarizes the nutrition information resources used by the pharmacists in the study. Four of the top five resources are pharmacy publications or another pharmacist. Among rural pharmacists (those in towns with five or fewer pharmacies), the top three resources chosen were the following: pharmacy journals (63 percent), package inserts (62 percent), and another pharmacist (42 percent). In contrast, pharmacists in towns with six or more pharmacies primarily chose "another pharmacist" ($P < 0.01$) as their top source. Printed pharmacy resources should have up-to-date nutrition information since they are the most common sources being used by pharmacists in towns with few pharmacists.

Pharmacists' Role as a Nutrition Educator

Pharmacists were asked to describe their current role in dispensing nutrition information to their customers. Sixty percent of pharmacists direct their customers to physicians for guidance; ninety percent of the sample felt that this was the role they should have. Even though pharmacists refer customers to physicians, basic nutrition information such as the appropriate uses for vitamin-mineral supplements could help pharmacists educate their customers.

A small group (10 percent) felt pharmacists were the most important source of nutrition information for their customers; these primarily (66 percent) resided in towns with two or fewer pharmacies. They all had BS degrees, but the majority (82 percent) had no nutrition courses. Their primary sources for nutrition information were pharmacy texts (67 percent) and journals (50 percent) and package inserts (58 percent). Over 50 percent felt they needed more nutrition information because their nutrition education was slightly inadequate (50 percent). These pharmacists would benefit most from nutrition education because of the lack of other healthcare personnel in their communities. Their dependence on written pharmacy sources indicates their need to have access to current nutrition information in this format.

Only 21 percent of respondents gave referrals to a dietitian. Ninety percent of respondents in towns with more than one pharmacy (90 percent) refer customers to a dietitian whereas only 10 percent of respondents in towns with only one pharmacy refer to a dietitian ($P < 0.01$). Dietitians

Table V. Beliefs about the adequacy of the nutrition education received

Belief statement	Percent
Adequacy of nutrition preparation during academic phase	
Very adequate	2
Moderately adequate	13
Adequate	25
Slightly inadequate	60
Beneficial to have received more nutrition information	
Not beneficial	2
Somewhat beneficial	20
Beneficial	45
Very beneficial	33

are more available in larger towns which could explain the small referral rate compared to a greater portion of pharmacists from "other" schools who indicated they gave referrals to dietitians (58 percent). This group was working in larger towns and may have better access to dietitians for referral.

Beliefs About Nutrition Education

Table V summarizes the beliefs about the adequacy of the nutrition education received from pharmacy programs. Sixty percent felt their nutrition education was slightly inadequate and more nutrition information during their pharmacy program would have been beneficial.

Most pharmacists having no nutrition courses tended to feel their nutrition preparation was slightly inadequate (63 percent), more than the proportion taking a nutrition course(s) (50 percent). Fifty-seven percent of pharmacists in practice less than 30 years felt that more nutrition courses in the curricula were important while 63 percent of those in practice greater than 30 years or more felt it was very important. Recent pharmacy graduates may have taken courses with more nutrition information than pharmacists who graduated more than 30 years ago. The nutrition education provided 30 years ago may have been adequate for pharmacists practicing at that time, in contrast to what is perceived to be the current requirement. Also, the pharmacists' role as a source of nutrition information may have increased since that time; this increases their need for nutrition education. Also years of practice may have provided more opportunity to reflect on the need for nutrition education, thus explaining the stronger response by pharmacists with more professional pharmacy experience. Since pharmacists experience first hand customer demands regarding new knowledge about nutrition, they are in a position to directly assess customers' needs over time.

Further insight regarding nutrition education was gleaned from questionnaires ($n = 45$) that had written comments in space provided on the back of the questionnaire. A content analysis of these comments is shown in Table VI. This information provides further insight into the attitudes and beliefs about the importance and need for nutrition education in addition to questionnaire items. Examples are offered regarding the topics asked by their customers, such as vitamin/mineral supplements, cholesterol and weight loss. Several pharmacists expressed their importance as a nutrition educator in their community and their need to seek nutrition information to better serve their customers.

Table VI. Content Analysis of unsolicited comments

Summary of comments from respondents questionnaires grouped by topic headings

Nutrition-related pharmacy services

- providing enteral feedings
- recommending antioxidants. Ensure, Pedialyte
- answering vitamin-related questions
- detecting drug-nutrient interactions
- referring customers to persons with more nutrition expertise
- stocking health-related books

Barriers to providing nutrition services

- lack of nutrition education during pharmacy program
- not enough time to be better educated in the nutrition field
- good nutrition information is hard to access in rural areas (lack of dietitians)
- information available is discounted by the pharmacy and medical profession
- hard to dispel the nutrition misinformation customers believe
- many customers seeking nutrition information from pharmacists
- dietitians and nutritionists are closed mouthed unless a fee is received
- don't see a team effort in dispensing nutrition information
- hard to keep up with manufacturing regulations and claims of health products

Benefits of nutrition information included into pharmacy programs

- update information on nutrition-related products being sold
- increase patient counseling opportunities and skills with customers
- provide reliable source of nutrition information in rural areas
- explore use of nutrition to minimize the need for some medications

Suggested nutrition content for a pharmacy degree

- general nutrition course
- food-drug interactions
- therapeutic use of vitamin-mineral supplements
- efficacy of protein and amino acid powders
- efficacy of herbal medicines
- effects of cholesterol-lowering drugs and how to monitor

CONCLUSIONS AND RECOMMENDATIONS

Incorporating Nutrition Education in Degree Programs

The strongest evidence for more nutrition education in pharmacy programs relates to the roles rural community pharmacists currently have and would like to have as nutrition educators. Over two-thirds indicated they currently provide nutrition information to their customers and refer customers to physicians. Ninety percent felt they should fill this role. Since pharmacists are a readily available source of nutrition information in the community, they need to be prepared to provide appropriate nutrition information to customers. This can be achieved in pharmacy degree programs by increasing nutrition education.

Nutrition lectures and courses on responses this survey should be relevant to pharmacy practice in larger urban communities as well as rural practices. The responses obtained from pharmacists with an average of fifteen years of practice are a reliable basis for considering additions to the curriculum. Lectures and course topics have been identified (Table III). Miller (1995) reported that median contact hours of nutrition education was 12 for BS programs and 20 for the entry-level PharmD(11). Six of the eight additional hours for the PharmD were reported to be specialized nutrition support. Most alarming is the survey finding that 13 to 23 percent of pharmacy programs reported no education was required in either general nutrition or nonprescription nutritionals(11), the topics most needed by community pharmacists. More required nutrition courses could improve the pharmacists' ability to answer nutrition-related questions, thus improving the quality of nutrition information provided to their customers. If required nutrition courses are not feasible within a pharmacy program, advisors could encourage pharmacy students to take elective nutrition courses until suitable required lectures or courses could be developed. Further research may be needed to decide the depth in which the topics are covered.

The sources of nutrition information chosen by the respondents also reflects the need for more nutrition education in the pharmacy curricula. The top three sources chosen were written materials. Rural community pharmacists may not have access to other health care personnel, such as a dietitian, to make referrals for nutrition education. One limitation to these resources is that they are not always up-to-date. Supplements would need to be issued to keep current.

Most respondents indicated their dissatisfaction with the nutrition information they were provided and responded favorably when asked if they would have benefited from more nutrition information (Table V). This study did not ascertain the extent or nature of nutrition information in respondents' academic programs; however, the number of nutrition courses and lectures taken was not statistically different between recent graduates and long-time graduates

Dispensing Nutrition Information

Increasing nutrition information available to pharmacists in practice can be achieved through continuing education courses, accessing nutrition information sources, and collaborating with a Registered Dietitian (RD). Continuing education courses for practicing pharmacists could be developed by focusing on the questions customers currently ask (Table III). Nutrition education for the practicing pharmacist should first focus on vitamin-mineral supplement recommendations and common over-the-counter nutrition products stocked in pharmacies. Bertch wrote an article for pharmacy continuing education credit entitled "Vitamins and nutrition: the pharmacists' vital role" in 1987 (12). Bertch wrote the article because "Advising patients on the proper use of vitamin products is an increasingly important professional function for pharmacists" (12). This article provided information about fat-soluble and water-soluble vitamins, functions of vitamins in humans, disease states and drugs that may cause vitamin deficiencies, signs and symptoms of individual deficiencies and the clinical effects of excessive administration of vitamins. She noted that the pharmacists' role as a nutrition educator for the community

is increasing because consumers want to improve their own health (12). Many consumers associate good health with taking vitamin-mineral supplements, which are sold by pharmacists. The content analysis in Table VI also provides possible course topics to be covered.

Continuing education courses should supply the pharmacist with nutrition resources for use in their setting. Access to nutrition information could also be available to rural community pharmacists through nutrition help-lines via the telephone. A program currently in place to help health care personnel access information in the Eastern Washington Area is the Drug Information Center (DIC) at WSU, Spokane, Washington⁵. The DIC provides information via fax or telephone about nutrition-related products sold in retail pharmacy settings such as vitamin-mineral supplements and herbal products.

A local RD could help the pharmacist develop a custom list of approved resources to assist in answering nutrition-related questions. This collaboration would increase pharmacists' knowledge and ability to answer nutrition-related questions and direct their customers to RD's for further needs assessments. Registered dietitians are trained through a Bachelor of Science program and an internship to perform nutritional assessments and coordinate medical nutrition therapy and nutrition education based on individual needs. RD's can be located in hospitals, maternity support services, Department of Health services, and colleges and universities with nutrition programs.

Rural community pharmacists feel that more nutrition education in the pharmacy school curriculum would have been beneficial to them. Most also supported the inclusion of nutrition education in pharmacy programs. While the development of a specialty in nutrition support for pharmacists indicates a need for advanced nutrition education for specialty practice in nutrition support, this study shows the

need for nutrition education in the general pharmacy curriculum, especially for those graduated who intend to practice in rural communities or communities where access to a dietitian is limited.

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⁵Drug Information Center, WSU-Spokane. 601 West First Avenue, Spokane, WA 99204-0399.