INSTRUCTIONAL DESIGN AND ASSESSMENT

Incorporating Hypertensive Patient Education on Salt Intake Into an Introductory Pharmacy Practice Experience

Kimberly B. Garza, PharmD, PhD, MBA, Salisa C. Westrick, PhD, Benjamin S. Teeter, MS, T. Lynn Stevenson, PharmD

Harrison School of Pharmacy, Auburn University, Auburn, Alabama

Submitted April 8, 2013; accepted June 13, 2013; published November 12, 2013.

Objective. To evaluate the impact of the Salt Education Program for hypertensive adults on student pharmacists' knowledge, behaviors, and attitudes regarding sodium consumption.

Design. As part of the introductory pharmacy practice experience program in community pharmacies, student pharmacists assessed patients' sodium intake knowledge and behaviors, taught them how to read nutrition labels, and obtained information about their hypertensive conditions. Students completed pre-and post-intervention questionnaires in April and August 2012, respectively.

Assessment. One hundred thirty student pharmacists (70% female, 78% white) completed pre- and post-intervention questionnaires. Students demonstrated significant improvements in knowledge scores ($p<0.001$) and perceived benefit of a low-salt diet ($p=0.004$). Further, there were significant improvements in the self-reported frequency of looking at sodium content of foods when shopping ($p<0.001$) and purchasing low-salt foods ($p=0.004$).

Conclusion. Changes in students' knowledge, behaviors, and attitudes after participating in the Salt Education program suggested that the program was effective in improving student knowledge, behaviors, and attitudes.

Keywords: salt, sodium, patient education, knowledge, dietary behaviors

INTRODUCTION

Sodium intake and its direct relation to hypertension are widely cited throughout the literature.¹⁻³ As a result, the US Department of Agriculture and US Department of Health and Human Services have published dietary guidelines that recommend restricting sodium intake to 2,300 mg per day in healthy adults younger than 51 years of age.⁴ For hypertensive or diabetic patients, African-Americans, patients with chronic kidney disease, or anyone age 51 years or older, guidelines recommend restricting sodium intake to 1500 mg per day. Reducing sodium intake to recommended levels significantly reduces blood pressure by 1% in normotensive individuals and 3.5% in patients with hypertension.⁵ Sodium reduction can significantly reduce the risks associated with a diet high in sodium, which include increased risk of stroke and other negative cardiovascular outcomes.^{6,7} Although much of the population may be aware of the detrimental effects of a high-salt diet, many are not knowledgeable about

recommended dietary sodium limits, do not use food labels to evaluate salt content of foods, and underestimate their own salt intake.^{8,9} Pharmacists are in a unique position to provide patient education because of their accessibility and training, provision of which can help alleviate some of the issues related to high sodium intake and improve public awareness about salt and its negative health consequences.

Colleges and schools of pharmacy are responsible for educating student pharmacists on the importance of their role as part of the healthcare team. Experiential learning is an effective method of preparing students to provide patient care, and patient education is an integral part of experiential learning in colleges and schools of pharmacy. In 2006, the Accreditation Council for Pharmacy Education established Accreditation Standards and Guidelines for the Professional Program in Pharmacy Leading to the Doctor of Pharmacy Degree that became effective in 2007.¹⁰ Within these standards, pharmacy practice experience guidelines are explained. Participation in service-learning activities can impact student learning and development.¹¹⁻¹⁴ The purpose of these activities is to allow student pharmacists to interact with patients as practitioners, thereby gaining experience providing education, reviewing medications, and performing other professional duties.

Corresponding Author: Kimberly B. Garza, PharmD, MBA, PhD, Assistant Professor of Pharmacy Care Systems, 037 James E. Foy Hall, Auburn University, AL 36849-5506. Tel: 334-844-8360. Fax: 334-844-8307. E-mail: kbl0005@auburn.edu

Through the introductory pharmacy practice experience (IPPE) program in community pharmacies, student pharmacists at the Auburn University Harrison School of Pharmacy had opportunities to provide one-on-one counseling with hypertensive adults regarding sodium intake. Participation in the IPPE Salt Education Program was expected to change student pharmacists' knowledge, behaviors, and attitudes associated with sodium intake. The objective of this study was to evaluate the impact of this education program on student pharmacists' sodium-intake knowledge and behaviors as well as attitudes toward dietary sodium reduction.

DESIGN

The Salt Education Program for Hypertensive Patients was developed for several reasons. First, most Americans exceed the daily recommended limit for sodium intake,¹⁵ which raises an important question regarding whether consumers are aware of sodium intake recommendations and the effect of sodium on their health. Second, because salt has a direct effect on blood pressure, healthcare providers should pay extra attention to patients with hypertension.¹⁶ Third, patient counseling is a crucial part of the IPPE program and is consistent with Harrison School of Pharmacy's curricular outcomes and Center for the Advancement of Pharmacy Education outcomes.¹⁷ Through this Salt Education Program, student pharmacists who had completed their first academic year were given opportunities to interview and educate hypertensive patients about salt intake and its effect on their hypertensive condition.

This program was conducted in the summer of 2012 as part of the IPPE program in community pharmacies. Stakeholders of this program included hypertensive patients and student pharmacists. For patients, this program's goal was to increase hypertensive patients' knowledge related to salt intake, which may lead them to select lower-salt dietary options. For student pharmacists, the goals of the program were to increase their salt-related knowledge and improve their behaviors and attitudes concerning salt intake. This particular study focuses on reporting student pharmacists' outcomes as a result of their engagement in the Salt Education Program.

In this program, student pharmacists (1) assessed patient behaviors and knowledge related to sodium intake, (2) educated hypertensive patients on how to read nutritional labels for sodium content and how to select lower-sodium options, (3) obtained additional information related to their hypertensive conditions and adherence to antihypertensive medications, and (4) measured each patient's blood pressure. A structured interviewer-administered questionnaire and a patient education

handout were used during the patient-student interactions. Materials used to develop the patient questionnaire, patient handout, and student training materials were obtained from the Centers for Disease Control and Prevention Web site.¹⁸⁻²⁰ Using the patient questionnaire as a guide, specific questions were asked by student pharmacists to assess patients' salt-related knowledge and behaviors as well as their general hypertensive conditions. The patient handout provided tips regarding how to choose lower-salt options, and the handout was given to patients at the end of the interactions. These 15-minute interactions took place in a respective community pharmacy where student pharmacists had been assigned as part of their 2-week summer IPPE. Student pharmacists were instructed to interview at least 5 patients as part of the requirements for completion of their IPPE experience. Pharmacist supervisors signed off at the end of the IPPE program, indicating that the student pharmacists had completed the patient interviews.

Participating patients were recruited from 45 community pharmacies, including 20 (44%) chain pharmacies, 12 (27%) independently owned pharmacies, 9 (20%) mass merchandise/grocery store pharmacies, and 4 (9%) outpatient pharmacies associated with medical clinics and pharmacies for specific employer groups (Table 1).

Prior to participating in the Salt Education Program, student pharmacists had not received any formal instruction in their coursework regarding sodium intake as it relates to hypertension. To prepare them for this program, they were required to attend a 1-hour orientation in April 2012, complete the assigned reading materials, and watch a demonstration video. In the orientation, the instructors discussed the 2010 Dietary guidelines,⁴ statistics related to sodium consumption,¹⁵ the effect of salt on blood pressure,¹⁶ and steps to recruit, interview, and educate patients. Assigned reading materials relating to sodium,^{18,19} a video clip demonstrating a patient-student encounter, the patient questionnaire, and the patient handout were available in the course management site. Student

Table 1. Types of Pharmacies Used for Patient Recruitment in a Study Incorporating Hypertensive Patient Education About Salt Intake Into an Introductory Pharmacy Practice Experience (n=45)

Type of Pharmacy	No. (%)
Chain	20 (44.4)
Independently owned	12 (26.7)
Mass merchandise/grocery store	9 (20.0)
Outpatient pharmacies associated with medical clinics and pharmacies for specific employers	4 (8.9)

pharmacists were instructed to be familiar with the interview questions prior to their scheduled IPPE. To document their interactions with patients, student pharmacists were instructed to submit patients' responses to the questionnaire electronically and to submit hardcopies of completed questionnaires.

EVALUATION AND ASSESSMENT

The study protocol received an expedited review status from Auburn University's Institutional Review Board. The Salt Education Program was determined by Auburn University's Institutional Review Board (IRB) to be an outreach project and learning activity. Subsequently, permission to use the collected information as research was obtained from the IRB, eliminating the need to obtain patient or student consent for participation in the study. To assess the extent to which student pharmacists' knowledge, behaviors, and attitudes pertaining to salt consumption changed after participating in this program, they completed pre- and post-intervention questionnaires, which were administered in class at the beginning of the orientation in April 2012 and at the beginning of the fall semester in August 2012, respectively. Both questionnaires had the same items measuring the constructs of interest. Student pharmacists were not exposed to the questionnaires or other training materials before completing the preintervention questionnaire. The results of these questionnaires did not impact their grades.

Twelve items were used to assess student pharmacists' knowledge related to sodium intake. Two items assessed if they were aware of the relationship between high sodium intake and high blood pressure and between high sodium intake and stroke.⁸ The next 9 items were obtained from the Centers for Disease Control and Prevention's (CDC's) Sodium Intake Quiz, which was available on the CDC Web site.²⁰ For each item, student pharmacists identified whether the statement was true or false. For example, 1 statement read, "It can take years to lower your blood pressure from reducing salt intake." Student pharmacists were also asked to identify the recommended daily intake of sodium for healthy people by choosing from among the following choices: 1 teaspoon, 1 tablespoon, $\frac{1}{4}$ cup, and $\frac{1}{2}$ cup of salt. A correct answer was coded "1" while an incorrect or missing answer was coded "0." The overall knowledge score was then calculated by summing the scores for all 12 items.

Student pharmacist behaviors related to sodium or salt were assessed. One item, modified from a questionnaire in previous research was "How often do you or the person who shops for your food look for the sodium content on food products when shopping?"⁸ The second item, taken from the National Health Interview Survey, asked,

"How often do you or the person who shops for your food buy items that are labeled 'low salt' or 'low sodium?'"²¹ Response categories for these 2 items included always, often, sometimes, rarely, and never. Subsequently, a score from 0 to 4 was assigned, on which 0=never and 4=always.

Attitudes toward salt intake consisted of 3 aspects: benefit of lowering dietary salt, barriers to committing to a low-salt diet, and self-efficacy in dietary sodium reduction. A single-item measure of benefit, "Lowering salt in my diet may lessen my chance of high blood pressure,"²² and a 1-item measure of barrier, "Low-salt diets are too unappetizing to follow for long periods," contained 4 response categories, ranging from strongly disagree (0) to strongly agree (3). Student pharmacists' self-efficacy was measured by asking how confident they were to engage in the following behaviors consistently for at least 6 months: adding less salt than the recipe calls for, eating unsalted snacks, avoiding adding table salt, eating unsalted/unbuttered popcorn, and eating low-fat/low-salt food items.²³ Scores ranging from 0 to 4 were assigned to each of the 5 self-efficacy items, ranging from 0="I know I cannot" to 4="I know I can." These scores were summed to create a total confidence score ranging from 0 to 20, with 20 representing the highest level of self-efficacy for following a low-salt diet.

Data were analyzed using IBM SPSS Statistics (IBM Corp., Armonk, NY) for Windows, version 20. Descriptive statistics were used to describe student pharmacists' characteristics and their knowledge, behaviors, and attitudes related to sodium intake. Paired *t* tests were used to investigate the degree of change in knowledge, behavior, and attitudes among the student pharmacists from pre- to post-intervention. An *a priori* alpha of <0.05 was chosen for significance testing.

One hundred thirty-five student pharmacists completed either the pre- or post-intervention questionnaire, with 130 completing both. Of these, the majority of student pharmacists were female (70%) and white (78%). As shown in Table 2, there was a significant increase in the mean number of correctly answered questionnaire items from preintervention (10.2 ± 1.1) to postintervention (11.7 ± 0.5 ; $p < 0.001$). The most frequently missed item in the pre-intervention questionnaire was "The maximum recommended daily intake of sodium for healthy adults is contained in which of the following: 1 teaspoon of salt, 1 tablespoon of salt, $\frac{1}{4}$ cup of salt, or $\frac{1}{2}$ cup of salt?"; fewer than half of student pharmacists correctly responded to this item. In the postintervention questionnaire, 91% of student pharmacists answered this item correctly. The next most frequently missed item in the preintervention questionnaire was related to the amount of salt in a muffin

Table 2. Student Pharmacists' Knowledge of Sodium/Salt Intake Prior to and Following the Educational Intervention^a

Questionnaire Item	Students Who Provided a Correct Answer	
	Pretest (N=131), No. (%)	Posttest (N=134), No. (%)
Are you aware of the relationship between a high sodium intake and high blood pressure?	128 (97.7)	132 (98.5)
Are you aware of the relationship between a high sodium intake and stroke?	116 (88.5)	132 (98.5)
The word "salt" and "sodium" are not exactly the same.	103 (78.6)	125 (93.3)
Most of the salt we eat is added to our foods from the salt shaker during cooking or during a meal.	111 (84.7)	131 (97.8)
Canned vegetables such as green beans, corn, and tomatoes have more salt per serving than fresh or frozen vegetables.	123 (93.9)	133 (99.3)
A muffin can have more salt than a bag of potato chips.	81 (61.8)	134 (100.0)
Foods can have high salt content and not even taste salty.	131 (100.0)	134 (100.0)
People who have high blood pressure should consume no more than 1500 milligrams of sodium per day.	112 (85.5)	128 (95.5)
Reducing the amount of salt in your diet can reduce your blood pressure.	131 (100.0)	133 (99.3)
It can take years to lower your blood pressure from reducing salt intake.	107 (81.7)	131 (97.8)
You can lower your salt intake by comparing food labels while shopping and choosing foods lower in salt.	131 (100.0)	133 (99.3)
The maximum recommended daily intake of sodium for healthy adults is contained in one teaspoon of salt	62 (47.3)	122 (91.0)

^a Mean (SD) score on the 12 questions on pretest = 10.2 ± 1.1 , and on posttest = 11.7 ± 0.5 . Paired *t* test assessing the differences between pre- and post-intervention scores: $p < 0.001$.

compared with a bag of potato chips; only 62% of student pharmacists correctly identified this statement as true. In the postintervention questionnaire, 100% correctly responded to this item.

Student pharmacists' self-reported behaviors pertaining to how often they (or the person who does the food shopping in the household) look for sodium content on labels when shopping for food and buy foods low in salt

are reported in Table 3. There was a significant improvement in the frequency with which student pharmacists look for sodium content on labels from preintervention (1.4 ± 1.1) to postintervention (2.0 ± 1.1 ; $p < 0.001$). Likewise, there was a significant improvement in the frequency with which student pharmacists buy foods low in sodium from preintervention (1.7 ± 0.9) to postintervention (2.0 ± 1.0 ; $p = 0.004$).

Table 3. Student Pharmacists' Self-Reported Behaviors Related to Salt/Sodium Intake

Behavior	Responses ^a					Mean (SD)
	Always, No. (%)	Often, No. (%)	Sometimes, No. (%)	Rarely, No. (%)	Never, No. (%)	
Look for sodium content on food products ^b						
Preintervention (n=131)	3 (2.3)	20 (15.5)	27 (21.0)	44 (34.1)	35 (27.1)	1.35 (1.10)
Postintervention n=134)	10 (7.5)	31 (23.3)	56 (42.1)	17 (12.8)	19 (14.3)	1.96 (1.14)
Buy low-salt or low-sodium products ^c						
Preintervention (n=131)	3 (2.4)	17 (13.5)	55 (43.7)	42 (33.3)	9 (7.1)	1.74 (0.89)
Postintervention (n=134)	7 (5.3)	32 (24.2)	53 (40.2)	28 (21.2)	12 (9.1)	1.98 (1.01)

^a Based on 5-point response scale on which 4=always, 3=often, 2=sometimes, 1=rarely, and 0=never.

^b Paired *t* test assessing the differences between pre- and post-intervention scores; $p < 0.001$.

^c Paired *t* test assessing the differences between pre- and post-intervention scores; $p = 0.004$.

Table 4. Student Pharmacists' Perceptions Related to Benefits of and Barriers Related to Salt/Sodium Intake

	Responses ^a				Mean (SD)
	Strongly Agree, No. (%)	Agree, No. (%)	Disagree, No. (%)	Strongly Disagree, No. (%)	
Benefits: Lowering salt in my diet may lessen my chance of high blood pressure ^b					
Preintervention (n=131)	68 (51.9)	58 (44.3)	2 (1.5)	3 (2.3)	2.46 (0.65)
Postintervention (n=134)	99 (73.9)	29 (21.6)	1 (0.7)	5 (3.7)	2.69 (0.64)
Barriers: Low-salt diets are too unappetizing to follow for long periods ^c					
Preintervention (n=131)	5 (3.8)	33 (25.2)	80 (61.1)	13 (9.9)	1.23 (0.68)
Postintervention (n=134)	6 (4.5)	40 (29.9)	72 (53.7)	16 (11.9)	1.27 (0.73)

^a Based on 4-point response scale on which 3=strongly agree, 2=agree, 1=disagree, and 0=strongly disagree.

^b Paired *t* test assessing the differences between pre- and post-intervention scores; *p*=0.004.

^c Paired *t* test assessing the differences between pre- and post-intervention scores; *p*=0.614.

Table 4 reports student pharmacists' perceived benefit of and barriers to a low-salt diet. There was a significant improvement in these perceptions of benefit from preintervention (2.5 ± 0.7) to postintervention (2.7 ± 0.6 ; *p*=0.004), but no significant change in perceptions of barriers from preintervention (1.2 ± 0.7) to postintervention (1.3 ± 0.7 ; *p*=0.614). As for self-efficacy for

following a low-salt diet, Table 5 shows that confidence scores did not change significantly from preintervention (13.9 ± 4.0) to postintervention (12.9 ± 4.0 ; *p*=0.709).

DISCUSSION

The Salt Education Program was implemented as part of the IPPE program in community pharmacies at

Table 5. Student Pharmacists' Self-Efficacy Related to Salt/Sodium Intake

	Responses, No. (%) ^{a,b,c}				
	I Know I Can 4	3	2	1	I Know I Cannot 0
Add less salt than the recipe calls for					
Preintervention (n=131)	1 (0.8)	5 (4.0)	22 (17.3)	37 (29.1)	62 (48.8)
Postintervention (n=134)	1 (0.8)	6 (4.5)	29 (21.8)	31 (23.3)	66 (49.6)
Eat unsalted peanuts, chips, crackers and pretzels					
Preintervention (n=31)	6 (4.7)	26 (20.3)	42 (32.8)	23 (18.0)	31 (24.2)
Postintervention (n=134)	10 (7.5)	26 (19.5)	37 (27.8)	32 (24.1)	28 (21.1)
Avoid adding salt at the table					
Preintervention (n=131)	3 (2.3)	7 (5.5)	21 (16.4)	29 (22.7)	68 (53.1)
Postintervention (n=134)	5 (3.8)	10 (7.5)	13 (9.8)	35 (26.3)	70 (52.6)
Eat unsalted, unbuttered popcorn					
Preintervention (n=131)	15 (11.9)	39 (31.0)	29 (23.0)	15 (11.9)	28 (22.2)
Postintervention (n=134)	29 (22.0)	24 (18.2)	31 (23.5)	28 (21.2)	20 (15.1)
Stick to your low fat, low salt foods when the only snack close by is available from a vending machine					
Preintervention (n=131)	3 (2.3)	28 (21.9)	41 (32.0)	23 (18.0)	33 (25.8)
Postintervention (n=134)	8 (6.2)	17 (13.1)	46 (35.4)	28 (21.5)	31 (23.8)

^a Based on 5-point response scale ranging from 4=I know I can, to 0=I know I cannot.

^b Total confidence score preintervention = 13.9 (4.0); postintervention = 13.0 (4.0). Total confidence score was a summation of 5 self-efficacy items.

^c Paired *t* test assessing the differences between pre- and post-intervention scores; *p*=0.709.

the Harrison School of Pharmacy. The impact of this program was positive. Significant improvements in student pharmacists' knowledge scores, the reported frequency of looking for sodium content of foods when shopping, the reported frequency of purchasing low-salt foods and perceived benefits of a low-salt diet were found.

The design process of this program can be incorporated into the development of a student pharmacist learning activity to improve outcomes. The time and resources used to develop the student training materials and the patient handout are minimal because the program developers used previously developed materials obtained from a credible organization (ie, the Centers for Disease Control and Prevention). This program required student pharmacists to follow a structured process and use the patient handout, helping to ensure similar education experiences across students and practice sites. Specific information regarding practice site facilities and conditions was not collected (eg, presence of a private counseling area) as these may vary from site to site. As an opportunity to strengthen student pharmacists' communication skills, this program is appropriate and can be easily incorporated into an IPPE program early in the pharmacy school curriculum. Regardless of the patient education topic, program developers should consider the above characteristics during their design process to ensure success of the program implementation.

Through this experience, student knowledge related to sodium and sodium's impact on heart disease risk factors improved significantly, although it is difficult to determine the resultant clinical or educational significance of this improvement. Ability to effectively educate patients must be preceded by an educator's own mastery of the content, allowing transmission of valid information from educator to patient. Additionally, the educator must also be able to effectively transmit the information to the patient. Thus, development of good communication skills is a vital component of education for healthcare providers in training. Early exposure to patient-counseling encounters gives student pharmacists a foundation upon which to develop these skills. The Salt Education Program provided an opportunity for student pharmacists who had just completed their first year of classes to practice patient communication skills using a structured guide in a defined area of focus.

Self-reported behaviors, including looking for sodium content on food labels and buying foods low in salt, improved significantly from preintervention to postintervention. The question was framed by asking how often the respondent or person who shops for food in the household participates in these behaviors. However, given that the vast majority of student pharmacists reported that they

were responsible for food shopping in their household, these improvements likely reflect a change in the student pharmacist's own behavior, affected by improvement in awareness gained through the service-learning activity. Although the perceived benefit of lowering salt intake to lessen the risk of hypertension improved from preintervention to postintervention, there was no appreciable change in perception regarding unappetizing taste as a barrier to a low-salt diet, nor was there any change in level of confidence regarding sticking to a low-salt diet. The improvement in perception of benefit likely results from an increase in awareness following participation in the learning activity. As expected, perception of barriers and self-efficacy did not change following participation in this activity. Barriers such as dietary taste preferences are not addressed simply by improving knowledge related to the healthfulness of food but must be overcome by appealing to emotional aspects, such as fondness for certain foods,²⁴ and by altering dietary taste preferences through gradual, repeated exposure to more healthful foods.²⁵ Likewise, confidence in ability to make such dietary changes is often unaffected by the knowledge that the changes would be beneficial. Perception of barriers and self-efficacy are intertwined in this way. On the other hand, perceptions of benefits can sometimes outweigh perceptions of barriers, bringing about the desired behavior change. Addressing these barriers and helping individuals overcome the tendency to fail at attempted dietary changes involves not only education but also a mental cost-benefit analysis and problem solving.

SUMMARY

Through participation in this patient education program on salt intake, student pharmacists improved their knowledge related to dietary sodium guidelines and how it relates to blood pressure, their own behaviors related to looking for and purchasing low-salt foods, and their perceptions of the benefit of limiting salt in their diet. Taken together, these changes have the potential not only to improve the health of student pharmacists but also to provide an opportunity for them to hone their patient communication skills. Student pharmacists must realize that to bring about change in patients' knowledge, behaviors, and attitudes, healthcare providers must first look to themselves as models of desirable health behaviors.²⁶ The improvements seen in the student pharmacists and the benefit of standardization of the program across practice sites support the utility of this activity in positively impacting student learning and potentially improving patients' knowledge, behaviors, and attitudes regarding salt intake and hypertension.

REFERENCES

1. Frisoli TM, Schmieder RE, Grodzicki T, Messerli FH. Salt and hypertension: is salt dietary reduction worth the effort? *Am J Med.* 2012;125(5):433-439.
2. He J, Ogden LG, Vupputuri S, Bazzano LA, Loria C, Whelton PK. Dietary sodium intake and subsequent risk of cardiovascular disease in overweight adults. *JAMA.* 1999;282(21):2027-2034.
3. Karppanen H, Mervaala E. Sodium intake and hypertension. *Prog Cardiovasc Dis.* 2006;49(2):59-75.
4. U.S. Department of Agriculture and U.S. Department of Health and Human Services. *Dietary Guidelines for Americans 2010, 7th edition.* Washington, DC: U.S. Government Printing Office; 2010.
5. Graudal NA, Hubeck-Graudal T, Jurgens G. Effects of low-sodium diet vs. high-sodium diet on blood pressure, renin, aldosterone, catecholamines, cholesterol, and triglyceride (Cochrane Review). *Am J Hypertens.* 2012;25(1):1-15.
6. Strazzullo P, D'Elia L, Kandala NB, Cappuccio FP. Salt intake, stroke, and cardiovascular disease: meta-analysis of prospective studies. *Br Med J.* 2009;339:b4567.
7. Cook NR, Cutler JA, Obarzanek E, et al. Long term effects of dietary sodium reduction on cardiovascular disease outcomes: observational follow-up of the trials of hypertension prevention (TOHP). *Br Med J.* 2007;334(7599):885-888.
8. Grimes CA, Riddell LJ, Nowson CA. Consumer knowledge and attitudes to salt intake and labelled salt information. *Appetite.* 2009;53(2):189-194.
9. Webster JL, Li N, Dunford EK, Nowson CA, Neal BC. Consumer awareness and self-reported behaviours related to salt consumption in Australia. *Asia Pac J Clin Nutr.* 2010;19(4):550-554.
10. Accreditation Council for Pharmacy Education. Accreditation standards and guidelines for the professional program in pharmacy leading to the doctor of pharmacy degree. 2006. https://www.acpe-accredit.org/pdf/ACPE_Revised_PharmD_Standards_Adopted_Jan152006.pdf. Accessed April 5, 2013.
11. Falter RA, Pignotti-Dumas K, Popish SJ, Petrelli HM, Best MA, Wilkinson JJ. A service learning program in providing nutrition education to children. *Am J Pharm Educ.* 2011;75(5): Article 85.
12. Johnson JF. A diabetes camp as the service-learning capstone experience in a diabetes concentration. *Am J Pharm Educ.* 2007; 71(6):Article 119.
13. Kearney KR. Impact of a service-learning course on first-year pharmacy students' learning outcomes. *Am J Pharm Educ.* 2013; 77(2):Article 34.
14. Zagar M. Preparing PharmD students to participate in Medicare Part D education and enrollment. *Am J Pharm Educ.* 2007;71(4): Article 77.
15. Centers for Disease Control and Prevention. Usual sodium intakes compared with current dietary guidelines — United States, 2005-2008. *MMWR Morb Mortal Wkly Rep.* 2011;60(41):1413-1417.
16. He FJ, MacGregor GA. How far should salt intake be reduced? *Hypertension.* 2003;42(6):1093-1099.
17. Medina MS, Plaza CM, Stowe CD, et al. Center for the Advancement of Pharmacy Education (CAPE) Educational Outcomes 2013. *Am J Pharm Educ.* 2013;77(8):Article 162.
18. Centers for Disease Control and Prevention. Sodium: the facts. http://www.cdc.gov/salt/pdfs/Sodium_Fact_Sheet.pdf. Accessed November 20, 2012.
19. Centers for Disease Control and Prevention. Get the facts: sodium reduction tips. http://www.cdc.gov/salt/pdfs/Sodium_Tip_Sheet.pdf. Accessed November 20, 2012.
20. Centers for Disease Control and Prevention. Salt intake widget. <http://www.cdc.gov/widgets/SaltIntake/alt/>. Accessed April 10, 2012.
21. Minnesota Population Center and State Health Access Data Assistance Center. Integrated Health Interview Series [home page]. <https://www.ihis.us>. Accessed April 4, 2013.
22. Murdaugh CL, Verran JA. Theoretical modeling to predict physiological indicators of cardiac preventive behaviors. *Nurs Res.* 1987;36(5):284-291.
23. Sallis JF, Pinski RB, Grossman RM, Patterson TL, Nader PR. The development of self-efficacy scales for health-related diet and exercise behaviors. *Health Educ Res.* 1988;3(3):283-292.
24. Eertmans A, Baeyens F, Van den Bergh O. Food likes and their relative importance in human eating behavior: review and preliminary suggestions for health promotion. *Health Educ Res.* 2001;16(4):443-456.
25. Institute of Medicine (US) Committee on Strategies to Reduce Sodium Intake. Taste and flavor roles of sodium in foods: a unique challenge to reducing sodium intake. In: Henney JE Taylor CL, Boon CS, eds. *Strategies to Reduce Sodium Intake in the United States.* Washington, DC: National Academies Press; 2010.
26. Maffeo C, Chase P, Brown B, Tuohy K, Kalsekar I. My First Patient Program to introduce first-year pharmacy students to health promotion and disease prevention. *Am J Pharm Educ.* 2009;73(6):Article 97.