RESEARCH

# Pharmacy Students Teaching Prescribers Strategies to Lower Prescription Drug Costs for Underserved Patients

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## ABSTRACT

BACKGROUND: The rising costs of health care and, in particular, prescription drugs remains a challenge. Health professionals' ability to promote cost-effective prescription drug use is critical, yet this subject is not included consistently in the curriculum of most health professional schools. As experts in prescription drug selection, use, and cost, pharmacists are in a unique position to help manage prescription drug regimens for the best therapeutic outcome, while also helping to keep patients' out-of-pocket (OOP) prescription drug costs low. In addition to promoting interprofessional collaboration, pharmacy student-led lectures may provide an effective means to teach prescription drug cost-savings strategies to other health professional students and current prescribers.

OBJECTIVE: To describe and evaluate the impact of a 60- to 90-minute standardized, case-based lecture on prescribers' attitudes and knowledge about drug cost-containment strategies.

METHODS: Four trained pharmacy students delivered a lecture that focused on strategies to help underserved patients with their OOP prescription drug costs. This lecture was given to health professional students and prescribers across disciplines. For purposes of this study, underserved patients included those with no drug insurance, those with limited financial resources who were unable to pay for their prescription drugs, and those whose drug insurance had significant gaps in coverage (e.g., Medicare Part D patients). Lectures targeted future and current prescribers and were delivered in multiple settings (e.g., residents' seminars, medical grand rounds, required health policy courses for medical and nursing students). Pretest/posttest surveys were administered to assess the impact of the lecture on learners' (a) knowledge of strategies to improve underserved patients' access to needed prescription drugs; (b) willingness to address and discuss cost issues with patients; (c) likelihood of collaborating with other health care professionals; and (d) perception of pharmacists as patient advocates. The survey collected demographic information about learners and assessed their knowledge through 5 case-based, multiple-choice questions. The survey also asked learners to rate their agreement with 5 statements using a 4-point Likert rating scale (4 = strongly agree to 1 = strongly disagree). To control for potential test-retest bias for the case-based knowledge questions, an alternate version of the pretest/posttest survey was developed without the pretest knowledge questions included. Learners received either 1 of the 2 surveys randomly before the lecture began and were instructed to complete the pretest portion of the survey before the start of the lecture and to complete the posttest portion of the survey at the conclusion of the lecture.

RESULTS: From October 2010 to June 2012, trained pharmacy students delivered 19 presentations to 626 learners from other health professions. Compared with the baseline, there was a statistically significant increase in the proportion of correct answers for each knowledge-based question after delivery of the lecture (overall significance $P < 0.001$). Furthermore, there was a significant increase in the proportion of learners responding that they were more confident in their ability to select prescription drug cost-saving strategies; more likely to consult with other providers to lower OOP prescription drug costs; more likely to consider costs when making prescribing decisions; and more likely to ask their patients about prescription drug affordability (overall significance of $P < 0.05$). In addition, after the lecture, more learners felt that pharmacists were patient advocates. Finally, 96% of learners felt that the lecture promoted interprofessional collaboration and would recommend it to other health care professionals.

CONCLUSIONS: This study demonstrates that a single lecture given by pharmacy students to other health care professional students and current prescribers can improve knowledge of prescription drug cost-saving strategies targeted toward vulnerable patient populations and may increase the likelihood of collaboration between prescribers and pharmacists. The format of this lecture is an efficient and effective way to disseminate important and timely policy information to health care professionals.

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### What is already known about this subject

- Cost-related nonadherence to prescription drug therapy remains an important public health challenge, particularly for underserved patients. The ability to keep patients' out-of-pocket (OOP) prescription drug costs low is important for enhancing patients' adherence to a drug regimen, improving clinical outcomes, and reducing patients' use of expensive emergency and inpatient care services. However, the skills needed for prescribers to lower patients' prescription drug costs are not routinely taught or addressed in the health professional curriculum.
- Two previous studies showed that pharmacy student-led lectures on Medicare Part D significantly increased (a) self-assessed knowledge of Medicare Part D; (b) intent of current and future prescribers to collaborate with pharmacists to reduce patients' OOP prescription drug costs; and (c) awareness of cost-saving strategies to reduce patients' OOP drug costs. Limitations with these studies include the narrow focus of the lecture (Part D only content) and reliance on self-assessment of knowledge rather than objective measures.

### What this study adds

- A single, structured lecture designed to address medication cost issues for underserved populations of all ages that is delivered by trained pharmacy students can significantly improve learners' (a) knowledge of strategies to lower OOP prescription drug costs for underserved patients; (b) confidence in their ability to lower patients' OOP prescription drug costs; (c) likelihood to consider drug costs when making prescribing decisions; (d) likelihood of asking patients about cost as a potential barrier to adhering to drug regimens; and (e) likelihood of collaborating with pharmacists, social workers, or case managers to lower patients' OOP prescription drug costs.

**What this study adds *(continued)***

- Passage of the Affordable Care Act in 2010 has put an increased focus on the need for health policy education in health professional schools. This lecture provides a timely and efficient method of communicating health policy information between professionals. This format can be a model for dissemination of important and timely information that can help prepare health professionals as they begin to practice in the new health care delivery models under health reform.

The rising cost of health care, including patient out-of-pocket (OOP) prescription drug costs, continues to be a challenge, especially for the uninsured, underinsured, and/or low-income patients.[1,2] Despite efforts to improve access to needed prescription drugs, cost-related nonadherence to prescription drug therapy remains an important public health problem, as it may result in poor clinical outcomes and increased costs.[2-4] Physicians and other prescribers may not be aware of high drug costs for specific patients, have time to address those costs in patient visits, or have an efficient manner in which to address high drug costs for their patients. Physicians may not be familiar with, or have easy access to, an individual patient's formulary and extent of OOP drug costs.[5] Results from a recent study reveal that medical fellows, attending physicians, physician assistants, and nurse practitioners identified the cost of prescription drugs correctly less than half of the time.[6] Even if the provider is aware of the prescription costs, the skill of helping patients manage OOP prescription drug costs is not consistently taught in health professional educational programs and is not routinely addressed during patient encounters.[4,7-15]

While a more informed, cost-conscious health care workforce is one step toward improvement in patient adherence with prescription drug therapy, recent health policy legislation is changing the way the health care workforce engages patients. Medical institutions have attempted to keep pace so that future health care providers are prepared and can effectively adapt to the evolving changes in health policy.[16] The Affordable Care Act, passed in 2010, includes many of these new policies, including the patient-centered medical home, medication therapy management services, and transitions in care, all of which employ the use of multidisciplinary teams to deliver care to patients.[17]

Interprofessional teams use the expertise of each team member to achieve the best health outcomes for their patients. As experts in prescription drug selection, use, and cost, pharmacists are in a unique position to help manage patients' prescription drug therapy to achieve maximal therapeutic benefit while keeping patients' OOP prescription drug costs low.[11] Prior research has shown that Medicare Part D lectures delivered by trained pharmacy students led to a statistically significant improvement in learners' self-assessed Medicare Part D knowledge, perceptions of pharmacists' contributions to the health care team, and intent to collaborate with pharmacists on specific patient activities.[18,19] These data were limited, however, to self-assessed knowledge acquisition related to Medicare Part D.

The purpose of this study was to describe and systematically evaluate the impact of a lecture on improving prescribers' knowledge about OOP medication cost reduction strategies. The lecture focused on strategies to help underserved patients with their OOP prescription drug costs and was delivered by pharmacy students to health professional students and prescribers across disciplines. For purposes of this study, underserved patients included those with no drug insurance, those with limited financial resources who were unable to pay for their prescription drugs, as well as those whose drug insurance had significant gaps in coverage (e.g., Medicare Part D patients).

## Methods

### Design

This study used a pretest/posttest survey design to measure the impact of the lecture on learners' (a) knowledge of cost-saving strategies to lower OOP drug costs for underserved patients; (b) confidence in their ability to lower patients' OOP drug costs; (c) likelihood to consider costs when making prescribing decisions; (d) likelihood of asking patients whether they are experiencing problems with the costs of their medications; and (e) likelihood of collaborating with pharmacists, social workers, or case managers to lower patients' OOP prescription drug costs.

This study used an incomplete Solomon four-group design: one group received the pretest, intervention, and posttest, while the other group received the intervention and posttest. As all learners attended the lecture (intervention), the pretest sensitization effect could be measured. Since the surveys were given immediately before and after the intervention, the potential for a temporal effect was not examined. This design did not determine a general testing effect bias. This simplified design was used to ensure that the lecture content was disseminated to as many learners as possible in a short time frame.

### Setting, Intervention, and Participants

Based on the success of 2 previous studies using student pharmacists to teach other health professionals, a similar methodology was applied to this study. Additionally, students, rather than existing faculty, were chosen as the lecturers to increase concordance with audiences of other health care professional students and to allow greater flexibility in scheduling lectures. Four pharmacy students from a California pharmacy school were selected in both 2010 and 2011 through a competitive application process and were subsequently trained to deliver a standardized, case-based lecture to interprofessional audiences. Faculty from the schools of pharmacy and medicine at the University of California San Francisco (UCSF) educated

the pharmacy students in prescription drug cost-containment strategies for uninsured, underinsured, low-income, and Medicare Part D patients. These faculty members also provided public speaking coaching for each of the presenters.

The lecture content focused on content domains that could help clinicians use drug cost-savings strategies to lower their underserved patients' OOP prescription drug costs. The presentation was divided into 4 sections, 1 for each student lecturer. Content for each lecture is described in Figure 1. The lecturers discussed specific facts about the types of patients who may need help affording their OOP prescription drug costs, the programs available to help each of these populations, the benefits and limitations of these programs, and the types of outcomes that may be avoided by helping patients afford their medications. The lecturers focused on practical take-away messages that could be immediately implemented by prescribers. Students also emphasized the benefit of collaborating with pharmacists given their expertise with OOP prescription drug costs and experience in helping underinsured patients access available programs. Lecturers highlighted ways for prescribers to collaborate with pharmacists to implement drug cost-containment strategies for patients.

The target audiences for these lectures were current and future prescribers, including medical students, resident physicians, nurse practitioner students, and medical faculty. Lectures were scheduled as part of required and voluntary events and were delivered in a variety of settings, including medical grand rounds at major academic medical centers in California and across the country, national research meetings, required health policy courses and seminars for physician residents in internal medicine and family medicine, and clinic-based interdisciplinary team conferences. The lecture was designed to be 60 minutes in length. When time permitted, audience questions were discussed for up to 90 total minutes.

**FIGURE 1** Lecture Description

| |
|---|
| **Lecture Objectives** |
| • Characterize the underserved population |
| • Describe drug cost-savings strategies for the insured and underinsured |
| • Explain 3 types of drug cost-saving programs |
| • Explain the low-income subsidy for Medicare Part D patients |
| • Provide practical resources that can be used to help lower patients' true out-of-pocket drug costs |
| **Speaker 1: Characterization of the Underserved Population** |
| • Describe the underserved population and differentiate between uninsured and underinsured patients |
| • Describe the characteristics of the uninsured population (employment status, income, age, immigration status, race, and ethnicity) |
| • Discuss the impact of lack of insurance on clinical outcomes and mortality |
| • Discuss federal and state drug cost-saving programs for patients with pre-existing conditions |
| **Speaker 2: Prescription Drug Cost-Saving Strategies & Programs for Uninsured Patients** |
| • Describe patient-assistance programs: how to apply, program limitations, and advantages |
| • Describe generic prescription drug programs (Wal-Mart, Target, Costco, RxOutreach™): how to apply, program limitations, and advantages |
| **Speaker 3: Prescription Drug Cost-Saving Strategies & Programs for Underinsured Patients** |
| • Characterize underinsured patients |
| • Describe copayment-assistance programs and how to access them (RxAssist.org): how to apply, program limitations, and advantages |
| **Speaker 4: Prescription Drug Cost-Saving Strategies for Medicare Part D Patients** |
| • Describe eligibility criteria and enrollment process for the low-income subsidy program for Medicare Part D patients |
| • Describe how to switch patients to lower-cost Medicare Part D prescription drug plans |
| • Discuss how to prevent or delay Part D patients from reaching the coverage gap |

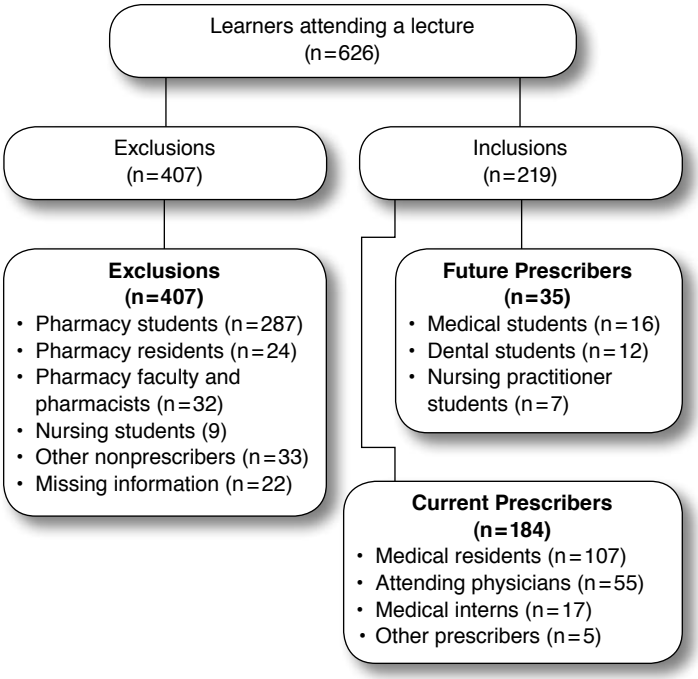
## Survey

Pretest/posttest surveys were administered to assess the impact of the lecture on learners' (a) knowledge of strategies to improve underserved patients' access to needed prescription drugs; (b) willingness to address and discuss cost issues with patients; (c) likelihood of collaborating with other health care professionals; and (d) perception of pharmacists as patient advocates. The pretest survey collected demographic information about learners and assessed their knowledge through 5 case-based multiple-choice questions. Four of these questions asked learners to select the correct prescription drug cost-saving strategy for a given patient. The 4 prescription drug cost-saving strategies in each question were (1) applying for the low-income subsidy (LIS) for Medicare patients; (2) avoiding the Medicare Part D coverage gap; (3) applying for patient-assistance programs sponsored by pharmaceutical manufacturers; and (4) applying for copayment-assistance programs. The fifth question assessed learners' knowledge of the percentage of U.S. households without health insurance, in which 1 or more adults were employed.

The pretest survey also asked learners to rate their agreement with the following 5 behavioral statements using a 4-point Likert rating scale (4 = strongly agree to 1 = strongly disagree). A 4-point Likert rating scale was selected to encourage participants to offer an opinion rather than select a "neutral" category. The behavioral statements used were as follows:

- I think of pharmacists as patient advocates.
- I have confidence in my ability to help my low-income patients lower their medication costs.
- I consult with pharmacists, social workers, and/or case managers about prescription drug cost-saving strategies for patients.
- I consider medication costs when making prescribing decisions.
- I ask my patients if they are having problems with their medication costs.

**FIGURE 2** Description of Learners




To control for a potential pretest sensitization effect for the case-based knowledge questions, an alternate version of the survey was developed without the pretest knowledge questions included (learners who received this version were considered the control group). The 2 versions of the survey were distributed to learners at random before the lecture began, and learners were instructed to complete the pretest portion of the survey before the start of the lecture and to complete the posttest portion of the survey at the conclusion of the lecture (Appendices A and B, available in online article).

The same postlecture survey was given to all learners. The posttest survey asked participants to rate their agreement with the same 5 behavioral variables as the pretest survey, using the same 4-point Likert scale. Additional Likert-scale questions were included in the postlecture survey to assess learners' opinions of the lecture's quality; the effectiveness of pharmacy student lecturers; the utility of the information provided; the ability of this lecture format to promote interprofessional collaboration; and their willingness to recommend the lecture to other health professionals. All learners were asked 5 multiple-choice knowledge questions to assess their actual understanding of specific drug cost-containment strategies and information provided in the lecture. These cases assessed understanding of the same drug cost-saving strategies used in the pretest but used slightly different patient vignettes. The final 2 questions were open-ended and invited participants to share their views regarding what they liked about the lecture, as well as their suggestions for improvement.

The pretest and posttest surveys were tested for face, content, and external validity by 2 different groups of medical residents prior to the start of the study. All learners were told that survey completion was voluntary.

### Statistical Analysis

Learners' demographic characteristics were summarized with descriptive statistics and assessed for independence using chi-squared tests. Differences in response to behavioral variables, as defined above, and to knowledge questions were assessed using t-tests between proportions with stepwise Sidak adjustment to correct for multiple comparisons using an overall 5% significance level for all comparisons required for each research question. For knowledge questions, control group posttest surveys were compared with experimental group pretest surveys to test knowledge acquisition due to the lecture without confounding from test-retest bias. Results to questions regarding quality, utility, and effectiveness of the lecture and learners' willingness to recommend the lecture to other health care providers were summarized with descriptive statistics. Data and statistical analysis were completed using Microsoft Excel (2011; Microsoft Corp., Redmond, WA).

## Results

Between October 2010 and June 2012, pharmacy students from a California school of pharmacy gave 19 presentations to 626 learners. Audiences ranged in size from 7 to 98 participants. As shown in Figure 2, a total of 626 learners attended a lecture and completed a survey. As the target audience was current and future prescribers, 407 learners not meeting these criteria were excluded from the analysis, leaving 219 learners. Regardless of discipline, all current or future prescribers who attended the entire lecture and completed the pretest/posttest survey were included in the analysis. Based on the random distribution of the pretest survey, learners were randomly assigned to be in the experimental group (n = 108) or control group (n = 111). The majority of learners were female (61%). Overall, learners were largely affiliated with medicine (87%) and were medical residents (50%). Learners' ages ranged from aged 22 to 73 years, with a mean age of 35 [21]. There were no significant differences in demographic characteristics of learners receiving the test or control survey ($\chi^2$, $P > 0.05$), including health professional school affiliation, level of training, gender, and age.

The primary objective of this lecture was to improve learners' knowledge of specific prescription drug cost-saving strategies. Analysis showed that there was no test-retest bias, meaning there was no statistical difference in the proportion of correct answers for case-based questions after the lecture between the control and experimental groups. This allowed

**TABLE 1** Learners' Responses to Case-Based Knowledge Questions[a]

| Topic | Presurvey | | Postsurvey | |
|---|---|---|---|---|
| | # Correct Responses (%)[b] | # Incorrect Responses (%) | # Correct Responses (%) | # Incorrect Responses (%) |
| Percentage of those working and without insurance | 24 (22) | 84 (78) | 112 (51) | 107 (49) |
| Low-income subsidy eligibility | 14 (13) | 94 (87) | 142 (65) | 77 (35) |
| Eligibility for industry sponsored patient-assistance programs | 41 (38) | 67 (62) | 168 (77) | 51 (23) |
| Eligibility for copay-assistance programs | 26 (24) | 82 (76) | 169 (77) | 50 (23) |
| Strategies to avoid the Medicare coverage gap | 24 (22) | 84 (78) | 170 (78) | 49 (22) |

[a]*Assessment showed significant increases in correct responses after the lecture, $P<0.05$.*

[b]*Percentages may not equal 100% as learners could answer "I don't know" to questions.*

both groups of postlecture surveys to be combined. A statistically significantly higher proportion of learners gave the correct answer on the knowledge-based questions after the lecture (overall $P<0.001$, Table 1). The greatest change in proportion of correct answers was observed in the question addressing the recognition of strategies to avoid the coverage gap in the Medicare Part D population and use of copayment-assistance programs for underinsured patients (56% increase), followed by the recognition of enrollment in a low-income subsidy for Medicare Part D patients that meet financial criteria (52% increase). The proportion of correct answers for the question assessing the use of patient-assistance programs for uninsured patients increased 39% from baseline, and learners' ability to correctly recognize the percentage of uninsured Americans who have at least 1 employed family member increased 29% from baseline.

The lecture changed learner's perception of their behaviors and attitudes (Figure 3). There was a significant increase ($P<0.05$) after the lecture in the proportion of learners who "agreed" or "strongly agreed" that they consult with other health care providers about prescription drug cost-saving strategies (27% increase); ask their patients about drug cost problems (30% increase); consider costs when making prescribing decisions (13% increase); and are confident in their ability to help patients lower their prescription drug costs (52% increase; $P<0.05$ for all 4 preceding tests). While the percentage of learners who felt pharmacists were patient advocates increased by 4%, this result did not reach statistical significance.

When asked about the quality and utility of the information and effectiveness of this lecture style, learners responded positively: 90% of learners felt the quality of the lecture was "good" or "very good;" 91% of learners felt that the lecture was "very" or "extremely" useful; 96% of learners "somewhat" or "strongly" agreed that the lecture format was effective in promoting interprofessional collaboration. Ninety-six percent of learners stated that they "somewhat" or "strongly" agreed that they would recommend this style of lecture to other health care professionals.

Finally, learners were asked to provide additional comments about what they liked best about the lecture, and more than half (n = 109, 54%) provided written feedback. The authors identified thematic categories based on learners' responses, and 3 major themes emerged regarding what the learners liked best about the lecture: (1) the clarity and/or organization of the content presented (n = 82, or 75% of learners who provided written feedback to this question); (2) the practical, clinically relevant strategies provided (n = 36, 33%); and (3) the use of case-based examples to illustrate key points (n = 18, 17%). Forty-six learners (23%) also provided written feedback to the open-ended question that asked "How can this lecture be improved?" A review of these comments found that the majority of those learners providing suggestions for improvement wanted the lecture expanded, either through the addition of more content (n = 21, or 46% of learners who provided written feedback to this question) or dissemination of the presentation to additional audiences (n = 8, 17%).

## Discussion

This study builds off of preliminary research supporting the use of student pharmacists to teach the application of important health policy to current and future prescribers.[18,19] However, these studies relied on self-assessment of knowledge and focused only on Medicare Part D. This new lecture provided broader information on drug cost-containment strategies for underserved patients of all ages, focusing on practical strategies prescribers can use to promote underserved patients' access to needed medications. This study adds to the literature by demonstrating 3 important findings. First, a single structured lecture given by trained pharmacy students, on a topic other than Medicare Part D, may increase the likelihood that prescribers feel confident in their ability to help their underserved patients lower their OOP prescription drug costs. In addition, prescribers reported being more likely to ask their patients if they are having trouble paying for their prescription drugs and to consider costs when making prescribing decisions, which may have implications on patient adherence to medications. Second, prescribers may be more likely to collaborate with pharmacists, case managers, or social workers to help patients afford their prescription drugs when collaboration is encouraged throughout a single lecture. Finally, this study demonstrated that pharmacy student-led lectures delivered to health professionals can significantly and objectively improve knowledge of a variety of drug cost-containment strategies targeted to underserved populations.

**FIGURE 3** Change in Proportion of Positive Response to Behavioral Questions Before and After Lecture (N=219[a])

| Statement | Strongly Agree (%) | Somewhat Agree (%) | Somewhat Disagree (%) | Strongly Disagree (%) |
|---|---|---|---|---|
| ***Before the lecture*** | | | | |
| I think of pharmacists as patient advocates. | 93 (43) | 109 (50) | 11 (5) | 5 (2) |
| I have confidence in my ability to help my low-income patients lower their drug costs. | 15 (7) | 78 (36) | 91 (41) | 34 (16) |
| I consult with pharmacists, social workers, and/or case managers about drug cost-saving strategies for patients. | 54 (25) | 97 (45) | 51 (24) | 14 (6) |
| I consider drug costs when making prescribing decisions. | 72 (33) | 102 (47) | 35 (16) | 7 (3) |
| I ask my patients whether they are having problems with their drug costs. | 42 (20) | 103 (47) | 64 (30) | 8 (4) |
| ***After the lecture*** | | | | |
| I think this type of peer-to-peer lecture, where students teach other health professionals, is an effective way to provide education. | 165 (75) | 46 (21) | 3 (1) | 0 (0) |
| I think this type of peer-to-peer lecture promotes collaboration among health professionals. | 167 (76) | 45 (21) | 2 (1) | 0 (0) |
| I would recommend this lecture to other health professionals. | 175 (80) | 36 (16) | 3 (1) | 0 (0) |
| I am more likely to think of pharmacists as patient advocates. | 141 (67) | 63 (30) | 6 (3) | 1 (0.4) |
| I have more confidence in my ability to help my low-income patients lower their drug costs. | 116 (54) | 88 (41) | 10 (5) | 0 (0) |
| I am more likely to consult with pharmacists, social workers, and/or case managers about drug cost-saving strategies for patients. | 141 (67) | 64 (30) | 6 (3) | 1 (0.4) |
| I am more likely to consider drug cost when making prescribing decisions. | 129 (61) | 70 (33) | 13 (6) | 0 (0) |
| I am more likely to ask my patients whether they are having problems with their drug costs. | 141 (67) | 65 (31) | 7 (3) | 0 (0) |

| Quality | Poor | Fair | Good | Very Good | Excellent |
|---|---|---|---|---|---|
| What did you think of the overall quality of instruction in today's lecture? | 0 (0) | 2 (1) | 14 (6) | 55 (25) | 142 (65) |
| **Utility** | **Not At All** | **A Little** | **Moderately** | **Very** | **Extremely** |
| How useful was the information you learned today? | 0 (0) | 4 (2) | 12 (6) | 78 (36) | 120 (55) |

[a]*Numbers may not equal 219 because of incomplete responses.*

The current study is methodologically stronger than prior studies[18,19] in which knowledge acquisition was measured via learners' self-report. In this study, case-based questions were used to assess the extent to which learners improved their knowledge of specific drug cost-saving programs and strategies. Using objective measures to assess knowledge acquisition reduces responder bias and provides a more accurate and valid assessment of actual knowledge acquired from the lecture. Further, to reduce test-retest bias, an alternative version of the pretest survey was distributed in which specific knowledge questions were omitted.

The increasing cost of health care and prescription drug cost-related nonadherence continue to be issues of national importance.[4] Employing prescription drug cost-saving strategies are an important mechanism to help patients reduce their OOP drug cost burden. Though physicians may consider drug costs when determining effective therapy, they face the barriers of insufficient time, discomfort with the topic, lack of available cost information, and insufficient knowledge of solutions when considering addressing cost with their patients.[8,20] In addition, physicians who address cost may use strategies that are not ideal for every patient, such as providing office samples, tablet splitting, and discontinuation of nonessential prescription drugs.[8,21] If health care professionals had heightened awareness that the cost of a patient's prescription drugs was leading to nonadherence, they could employ cost-saving strategies to improve adherence. One way to make health professionals more aware of cost-related barriers affecting patients' use of health services is to introduce cost-consciousness into the health professional curriculum and postgraduate education.[12] Our lecture was designed to address this issue, providing information on drug cost-containment programs targeted toward uninsured and underinsured patients (e.g., patient-assistance programs, copayment-assistance programs, statewide programs for patients denied coverage for pre-existing conditions, generic drug programs, etc.). In addition, we chose pharmacy students, rather than faculty, as the lecturers to increase concordance with audiences that were mainly composed of health care professional trainees, such as medical students and resident physicians. This approach allowed pharmacy students to showcase the strengths of their training to interprofessional audiences, which in turn may heighten awareness of collaborative opportunities in the future.

The increase in patient-centered collaborative practice models, such as patient-centered medical homes, are designed to improve access and coordination of health care services for patients, while decreasing costs by reducing length of hospital stay, clinical errors, and patient complications.[22] With the advent of team-based care initiatives, health professional educators and current practitioners have found an

increasing need to promote interprofessional collaboration through innovative teaching models.[18,22,23] These patient care models require that health care professionals work together effectively. However, evidence suggests that they do not always collaborate well together.[24] Transforming the education process to mirror current practice reform efforts can be the key to preparing leaders in affordable and sustainable health care delivery models. While some changes in health policy education have occurred, more instruction should still be considered.[25,26] The findings from this study showed an increased intent by prescribers to collaborate with pharmacists after a single lecture. Other new lectures given by providers outside of pharmacy may also increase the likelihood of collaboration among health care professionals. An example may be a lecture given by a nurse case manager regarding discharging patients with appropriate oversight of care transitions, which may increase confidence in the ability of the providers to coordinate transitions in care and increase their likelihood of collaborating with nurse case managers for difficult patient cases.

The potential for improved collaboration through efficient professional-to-professional lectures is important in order to reach the health care goals expected from health care reform. If health care teams are able to help patients afford their prescription drugs and adhere to therapy, the full benefit of improved health outcomes may be realized.[3,4]

### Limitations

There are 2 important limitations to this study. First, long-term follow-up data were not collected; as a result, it is unknown whether learners retained changes in knowledge and attitudes over time; if any prescription drug cost-saving strategies were used on behalf of patients; and whether the application of such strategies reduced patients' OOP drug costs. However, this lecture did show significant improvements in knowledge and attitude immediately following the lecture. Second, while our study design controlled for test-retest bias, there is no true control group; therefore, the effectiveness of this student-led presentation could not be compared with more typical, faculty-led lectures. In this case, the widespread dissemination of the information took precedence, allowing this information to be shared with as many learners as possible.

## Conclusions

Cost-related nonadherence to prescription drug therapy remains an important public health challenge. This issue is compounded by the problem that even if providers are aware of the prescription costs their patients face, the strategies used to help patients manage OOP prescription drug costs are not consistently taught in health professional educational programs. In addition, the issue of cost-related nonadherence is not routinely addressed during patient encounters.[4,7-15] This study demonstrated that a single lecture given by pharmacy students to other health care professional students and current prescribers can improve knowledge of prescription drug cost-containment strategies targeting vulnerable patient populations and can increase the likelihood of collaboration between prescribers and pharmacists. While future studies should determine if this intervention changes clinical practice and reduces patients' actual OOP prescription drug costs, these results show that this lecture format is an efficient way to disseminate important and timely information to health care professionals as they begin to practice in the new health care delivery models outlined in health care reform.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## APPENDIX A Test Survey

1. In which school/program do you belong?
   - ❍ Medicine
   - ❍ Nursing
   - ❍ Pharmacy
   - ❍ Physician Assistant
   - ❍ Dentistry
   - ❍ Osteopathic Medicine
   - ❍ None
   - ❍ Other (specify): _____

2. What best describes your affiliation with the school/program? (Bubble in all that apply)
   - ❍ 1st year Student
   - ❍ 2nd year Student
   - ❍ 3rd year Student
   - ❍ 4th year Student
   - ❍ 5th year Student or Higher
   - ❍ Nurse Practitioner Student
   - ❍ Masters Student
   - ❍ PhD Student
   - ❍ Intern
   - ❍ Resident
   - ❍ Faculty (with prescribing authority)
   - ❍ Faculty (without prescribing authority)
   - ❍ Other (specify): _____

3. What is your age? _____ years

4. What is your gender? ❍ Female ❍ Male

Please fill in the correct bubble indicating how much you **agree** or **disagree** with the statements:

| | Strongly Agree | Somewhat Agree | Somewhat Disagree | Strongly Disagree |
|---|---|---|---|---|
| 5. I think of pharmacists as patient advocates. | ❍ | ❍ | ❍ | ❍ |
| 6. I have confidence in my ability to help my low-income patients lower their drug costs. | ❍ | ❍ | ❍ | ❍ |
| 7. I consult with pharmacists, social workers and/or case managers about drug cost-saving strategies for patients. | ❍ | ❍ | ❍ | ❍ |
| 8. I consider drug costs when making prescribing decisions. | ❍ | ❍ | ❍ | ❍ |
| 9. I ask my patients whether they are having problems with their drug costs. | ❍ | ❍ | ❍ | ❍ |

The next 5 questions will help us determine how much is known about the topics we are covering in the lecture today. In order for us to get the most accurate assessment, if you aren't sure about the answer to a question please don't guess – choose "I don't know" instead. Thank you!

10. Approximately what percentage of uninsured individuals in the United States come from a working family (i.e., have at least one part-time worker in the household)?
    - ❍ a. 10%
    - ❍ b. 40%
    - ❍ c. 60%
    - ❍ d. 80%
    - ❍ e. I don't know

11. Which patient might be able to lower his drug costs with the low-income subsidy?
    - ❍ a. 35 year old who is employed but underinsured
    - ❍ b. 50 year old who is homeless and uninsured
    - ❍ c. 50 year old who is employed but uninsured
    - ❍ d. 75 year old with Medicare Part D
    - ❍ e. I don't know

12. A 62-year-old woman with diabetes has been laid off from work and is now uninsured and low-income (<200% of Federal Poverty Level). She is on a new medication, Januvia, which does not have a generic form. What is the best strategy to explore in order to lower her drug cost?
    - ❍ a. Patient-assistance programs
    - ❍ b. Copay-assistance programs
    - ❍ c. Generic drug programs (e.g., Walmart, Target, Rxoutreach.org)
    - ❍ d. Low-income subsidy through Social Security
    - ❍ e. I don't know

13. A 60-year-old man is unable to afford his oral chemotherapy drug for cancer. He is employed, but is underinsured and has a very high copayment for this medication. What is the best strategy to explore in order to lower his drug cost?
    - ❍ a. Patient-assistance programs
    - ❍ b. Copay-assistance programs
    - ❍ c. Generic drug programs (e.g., Walmart, Target, Rxoutreach.org)
    - ❍ d. Low-income subsidy through Social Security
    - ❍ e. I don't know

14. A patient with a Part D prescription drug plan may delay entering the coverage gap by:
    - ❍ a. Only taking medications on the Part D plan formulary
    - ❍ b. Applying for copay-assistance programs
    - ❍ c. Using $4 generic programs available at some retail pharmacies instead of Part D coverage
    - ❍ d. Having all medications prescribed in 90-day supplies
    - ❍ e. I don't know

## APPENDIX A Test Survey *(continued)*


**Please complete the next page of the questionnaire**
**AFTER**
**the presentation has concluded**
**Thank you!**

**POSTPRESENTATION SURVEY**

1. What did you think of the overall quality of instruction in today's lecture?
❍ Poor ❍ Fair ❍ Good ❍ Very Good ❍ Excellent

2. How useful was the information you learned today?
❍ Not at all ❍ A little ❍ Moderately ❍ Very ❍ Extremely

Please fill in the correct bubble indicating how much you **agree** or **disagree** with the statements:

| | Strongly Agree | Somewhat Agree | Somewhat Disagree | Strongly Disagree |
|---|---|---|---|---|
| 3. I think this type of peer-to-peer lecture, where students teach other health professionals, is an effective way to provide education. | ❍ | ❍ | ❍ | ❍ |
| 4. I think this type of peer-to-peer lecture promotes collaboration among health professionals. | ❍ | ❍ | ❍ | ❍ |
| 5. I would recommend this lecture to other health professionals. | ❍ | ❍ | ❍ | ❍ |
| ***As a result of this lecture…*** | | | | |
| 6. I am more likely to think of pharmacists as patient advocates. | ❍ | ❍ | ❍ | ❍ |
| 7. I have more confidence in my ability to help my low-income patients lower their drug costs. | ❍ | ❍ | ❍ | ❍ |
| 8. I am more likely to consult with pharmacists, social workers, and/or case managers about drug cost-saving strategies for patients. | ❍ | ❍ | ❍ | ❍ |
| 9. I am more likely to consider drug cost when making prescribing decisions. | ❍ | ❍ | ❍ | ❍ |
| 10. I am more likely to ask my patients whether they are having problems with their drug costs. | ❍ | ❍ | ❍ | ❍ |

Again, if you aren't sure about the answer to a question please don't guess – choose "I don't know" instead. Thank you!

11. The low-income subsidy may help lower drug costs for which one of the following patients?
❍ a. 28 year old who is employed but underinsured
❍ b. 80 year old with Medicare Part A and B only
❍ c. 80 year old with Medicare Part D
❍ d. 40 year old who is homeless and uninsured
❍ e. I don't know

12. A patient with a Part D prescription drug plan is interested in learning about how to minimize the chance she will end up in the "donut hole." What can you advise?
❍ a. Switching to a Part D plan with lower prescription co-pays
❍ b. Using $4 generic programs available at some retail pharmacies instead of Part D coverage
❍ c. Having all medications prescribed in 90-day supplies
❍ d. Applying for copay-assistance programs
❍ e. I don't know

13. Approximately what percentage of uninsured individuals in the United States come from families that include at least one part-time or full-time worker?
❍ a. 10%
❍ b. 40%
❍ c. 60%
❍ d. 80%
❍ e. I don't know

14. A 42-year-old man is uninsured and low-income (<200% of Federal Poverty Level). He has been on a brand-name medication, Cymbalta, which is the only drug that controls his neuropathic pain and depression. What is the best strategy to explore in order to lower his drug cost?
❍ a. Patient-assistance programs
❍ b. Copay-assistance programs
❍ c. Generic drug programs (e.g., Walmart, Target, Rxoutreach.org)
❍ d. Low-income subsidy through Social Security
❍ e. I don't know

15. Although she has health insurance, a 45-year-old woman is unable to afford the copayment for her oral cancer chemotherapy. What is the best strategy to explore in order to lower her drug cost?
❍ a. Patient-assistance programs
❍ b. Copay-assistance programs
❍ c. Generic drug programs (e.g., Walmart, Target, Rxoutreach.org)
❍ d. Low-income subsidy through Social Security
❍ e. I don't know

16. What did you like best about this lecture?

17. How can this lecture be improved?

## APPENDIX B Control Survey

1. In which school/program do you belong?

❍ Medicine ❍ Physician Assistant ❍ None
❍ Nursing ❍ Dentistry ❍ Other (specify):
❍ Pharmacy ❍ Osteopathic Medicine _____

2. What best describes your affiliation with the school/program? (Bubble in all that apply)

❍ 1st year Student ❍ Nurse Practitioner Student
❍ 2nd year Student ❍ Masters Student
❍ 3rd year Student ❍ PhD Student
❍ 4th year Student ❍ Intern
❍ 5th year Student or Higher ❍ Resident
❍ Faculty (with prescribing authority)
❍ Faculty (without prescribing authority)
❍ Other (specify): _____

3. What is your age? _____ years

4. What is your gender? ❍ Female ❍ Male

Please fill in the correct bubble indicating how much you **agree** or **disagree** with the statements:

| | Strongly Agree | Somewhat Agree | Somewhat Disagree | Strongly Disagree |
|---|---|---|---|---|
| 5. I think of pharmacists as patient advocates. | ❍ | ❍ | ❍ | ❍ |
| 6. I have confidence in my ability to help my low-income patients lower their drug costs. | ❍ | ❍ | ❍ | ❍ |
| 7. I consult with pharmacists, social workers, and/or case managers about drug cost-saving strategies for patients. | ❍ | ❍ | ❍ | ❍ |
| 8. I consider drug costs when making prescribing decisions. | ❍ | ❍ | ❍ | ❍ |
| 9. I ask my patients whether they are having problems with their drug costs. | ❍ | ❍ | ❍ | ❍ |

10. Why are you interested in this lecture?

11. What do you hope to get out of today's lecture?


**Please complete the next page of the questionnaire**
**AFTER**
**the presentation has concluded**
**Thank you!**

## APPENDIX B Control Survey *(continued)*

**POSTPRESENTATION SURVEY**

1. What did you think of the overall quality of instruction in today's lecture?
❍ Poor ❍ Fair ❍ Good ❍ Very Good ❍ Excellent

2. How useful was the information you learned today?
❍ Not at all ❍ A little ❍ Moderately ❍ Very ❍ Extremely

Please fill in the correct bubble indicating how much you **agree** or **disagree** with the statements:

| | Strongly Agree | Somewhat Agree | Somewhat Disagree | Strongly Disagree |
|---|---|---|---|---|
| 3. I think this type of peer-to-peer lecture, where students teach other health professionals, is an effective way to provide education. | ❍ | ❍ | ❍ | ❍ |
| 4. I think this type of peer-to-peer lecture promotes collaboration among health professionals. | ❍ | ❍ | ❍ | ❍ |
| 5. I would recommend this lecture to other health professionals. | ❍ | ❍ | ❍ | ❍ |
| ***As a result of this lecture…*** | | | | |
| 6. I am more likely to think of pharmacists as patient advocates. | ❍ | ❍ | ❍ | ❍ |
| 7. I have more confidence in my ability to help my low-income patients lower their drug costs. | ❍ | ❍ | ❍ | ❍ |
| 8. I am more likely to consult with pharmacists, social workers, and/or case managers about drug cost-saving strategies for patients. | ❍ | ❍ | ❍ | ❍ |
| 9. I am more likely to consider drug cost when making prescribing decisions. | ❍ | ❍ | ❍ | ❍ |
| 10. I am more likely to ask my patients whether they are having problems with their drug costs. | ❍ | ❍ | ❍ | ❍ |

The next 5 questions will help us determine the clarity of our lecture. In order for us to get the most accurate assessment, if you aren't sure about the answer to a question please don't guess – choose "I don't know" instead. Thank you

11. The low-income subsidy may help lower drug costs for which one of the following patients?
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❍ c. 80 year old with Medicare Part D
❍ d. 40 year old who is homeless and uninsured
❍ e. I don't know

12. A patient with a Part D prescription drug plan is interested in learning about how to minimize the chance she will end up in the "donut hole." What can you advise?
❍ a. Switching to a Part D plan with lower prescription co-pays
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❍ c. Having all medications prescribed in 90-day supplies
❍ d. Applying for copay-assistance programs
❍ e. I don't know

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❍ c. Generic drug programs (e.g., Walmart, Target, Rxoutreach.org)
❍ d. Low-income subsidy through Social Security
❍ e. I don't know

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❍ c. Generic drug programs (e.g., Walmart, Target, Rxoutreach.org)
❍ d. Low-income subsidy through Social Security
❍ e. I don't know

16. What did you like best about this lecture?

17. How can this lecture be improved?