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## Original Research

# Effect of a smoking cessation educational intervention on knowledge and confidence of pharmacy students versus community leaders

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### Abstract

**Background:** Training programs of various intensities and durations have been implemented to assist healthcare providers and students in leading smokers in a quit attempt. While some training programs have been developed to help community leaders provide these services, the focus for community leaders has been to assist with recruitment efforts.

**Objective:** The objective of this study was to compare knowledge and confidence of students and community members before and after a smoking cessation educational intervention.

**Methods:** After approval from the institutional review board, pharmacy students and community members were recruited for two-hour educational interventions. Topics covered included smoking health risks, benefits of quitting, behavioral, cognitive, and stress-management techniques, smoking cessation medications, and how to start a formal class. Pre- and post-intervention survey instruments were given to all participants with comparisons made via Student's or Paired T-tests, as appropriate.

**Results:** Knowledge scores increased significantly ( $p < 0.05$ ) after the educational intervention for pharmacy students ( $n=30$ ) and community members ( $n=8$ ). Confidence scores increased significantly for pharmacy students ( $p < 0.05$ ), but not for community members. Pharmacy students had significantly greater knowledge score changes (53.7%, pre-intervention; 81.8%, post-intervention;  $p < 0.05$ ) versus community members (32.1%, pre-intervention; 50.1%, post-intervention;  $p < 0.05$ ). When comparing individual confidence questions, only scores evaluating the change in confidence for providing counseling were higher for students versus community members (2.13 vs. 1.8, respectively;  $p < 0.05$ ).

**Conclusions:** Pharmacy students and community leaders exhibited increased knowledge after a smoking cessation educational intervention, and pharmacy students had increased confidence scores. All confidence scores did not change significantly for community members. Developing coalitions between healthcare providers and community leaders, focusing on the roles of each, may be productive in initiating smoking cessation programs.

### Keywords

Smoking Cessation; Smokers; Students, Pharmacy; Community Participation; Counseling; Patient Education as Topic; Surveys and Questionnaires; United States

## INTRODUCTION

Smoking remains the largest preventable cause of death in the United States, with over 480,000 people dying per year due to related disease states.<sup>1</sup> Rates have been slowly decreasing over the past decade due to population-based interventions and an increased awareness of health consequences among smokers. However, it was determined in 2016 that 15.5% of the adult population still smoke. Cigarette smoking still remains high among certain disadvantaged groups, including those with lower education, below poverty level, uninsured or on Medicaid, disabled persons, and those with serious psychological distress. In response, training programs for healthcare professionals and students to assist with tobacco cessation have increased over the past few years. Pharmacists, nurses, and physicians have undergone training sessions of various lengths and intensities to increase knowledge and confidence.<sup>2-5</sup> Training has ranged from short continuing educational sessions to day-long and multiple-day sessions. Educational topics generally include harms from nicotine

use, principles of nicotine addiction, the benefits of cessation, how to assist patients with quitting, pharmacology, and cessation aid counseling.

The need exists for strengthening cessation education in the curricula for professional healthcare programs. For example, one survey of pharmacy faculty shows that tobacco cessation education is covered for a median of 170 minutes throughout the required curricula.<sup>6</sup> In response, formalized Train-the-Trainer three-day educational interventions have been conducted for pharmacy faculty. This has increased the perceived ability of faculty to train students and has led to high curricular acceptance in many schools of pharmacy.<sup>7</sup> In turn, workshops lasting a few hours implemented for pharmacy students has resulted in increased smoking cessation knowledge.<sup>8</sup> Despite increasing emphasis for students as to their role in tobacco cessation, barriers such as a lack of confidence continue to exist.<sup>9</sup>

Recruitment for cessation interventions has also been a barrier. However, partnerships have been developed between community leaders and healthcare professionals.<sup>10-12</sup> For example, community-based participatory research has been implemented as a partnership between community members, organizations, and academic researchers.<sup>11,12</sup> These partnerships have been successful in recruiting smokers for cessation

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programs. Other programs to develop such services have involved training members of social and community service organizations and providing church-based cessation activities.<sup>13-15</sup> For community leaders to provide smoking cessation services, research has not been extensive regarding an analysis of their unique training needs to develop such services.

Training programs of various intensity, duration, and success have been implemented to assist healthcare providers, students, and community members in leading smokers in a quit attempt. Assessing the efficacy of an educational intervention through a direct comparison of healthcare students and community members has not yet been published. The objective of this study was to compare knowledge and confidence of students and community members before and after a brief smoking cessation educational intervention.

## METHODS

This study was approved by the Institutional Review Board (IRB). After a recruitment period May through September 2015, the educational interventions were conducted in Fall 2015. Educational interventions were held to train and educate pharmacy students and community leaders on leading smoking cessation classes. Interventions were designed to provide knowledge and to equip trainers to successfully start and lead their own smoking cessation classes for members of the community. A total of three 2-hour sessions were held: two for pharmacy student trainers, and one for community leader trainers. Sessions were located in three rural Mississippi communities: Belzoni, Batesville, and Yazoo City. This study was funded by the University of Southern Mississippi Service Learning Program.

### Recruitment

Recruitment for the educational intervention was open for all students in their second through fourth year at the University of Mississippi School of Pharmacy. Recruitment for the interventions occurred via email through a pharmacy student message board. Recruitment for community leaders occurred via flier, email, and other personal contact with local churches, schools, and free clinics. All respondents who identified themselves as community leaders over the age of 18 years were eligible and included in this intervention. Pharmacists and pharmacy students were excluded from recruitment of community leaders. All participants were given a USD25 gift card upon completion of the educational session.

### Description of the educational session

Educational interventions were equal in content for each session. Each discussed facts and statistics regarding smoking, including health risks, community and economic impact, and the benefit of quitting. The instructor, the lead author, is a pharmacy faculty member with extensive education and experience conducting cessation classes. The instructor reviewed behavioral, cognitive, and stress-management techniques. Smoking cessation medications and their proper use were also reviewed. The educational session discussed techniques and procedures for starting a

Table 1. Confidence statements on a Likert scale

Statement 1. I feel confident that I can/could counsel a person who wanted assistance with a smoking cessation attempt.
Statement 2. I feel confident that I can/could recommend a medication that would be most helpful in a person's smoking cessation attempt.
Statement 3. I feel confident that I can/could assist and arrange multiple smoking cessation sessions with a patient, if needed, to help in their smoking cessation attempt.

smoking cessation class. At the conclusion of the educational intervention participants were encouraged to implement smoking cessation services within the community.

### Description of the survey instrument

A survey was implemented before and after each intervention that measured knowledge and confidence levels of prospective smoking cessation trainers. The baseline questionnaire included 3 confidence items (Table 1) and 14 knowledge items. The follow-up survey contained the 3 confidence items repeated. It also contained 14 identical knowledge items from the pre-intervention questionnaire (post-intervention Part A) with an additional 14 knowledge comprehension items (post-intervention Part B). These additional knowledge items were inserted to decrease recall bias and to measure understanding of the overall concepts learned from the educational intervention. Each item in Part A was matched a conceptually similar item in Part B. A question regarding the role of pharmacists in providing smoking cessation services was included in both pre- and post-educational intervention surveys.

### Smoking cessation services

Each participant was encouraged to start a smoking cessation service for community members seeking aid regarding smoking cessation. Trainers were offered USD50.00 for each smoking cessation class member whom they recruited and successfully quit smoking by the end of the class. Trainers who conducted a class were provided with materials and funds to conduct the class appropriately, including a urine cotinine test, as applicable. Smokers who set a cessation date received a week's supply of a nicotine replacement of their choice at each subsequent session, with a maximum of 4 weeks supplied.

### Statistical analysis

Student's or paired t-tests were utilized to analyze collected data, as appropriate. Subsequent services are described using descriptive statistics. Knowledge scores were compared each for students and community leaders before and after the educational intervention. The questionnaire given after the intervention consisted of two parts: Part A that included the exact same questions as given prior to the intervention, and Part B that included 'matched' questions with the same concepts but different questions. A comparison of each was made versus the pre-interventional questionnaire. Confidence scores were compared pre- and post- educational intervention for both students and community leaders. A p-value of less than 0.05 was considered statistically significant.

Table 2. Demographics	Students (n=30)	Community leaders (n=8)
Race		
Caucasian	28	5
African American	1	3
Asian	1	0
Sex		
Male	9	5
Female	21	3
Age	23.59 (1.90)	36.88 (16.88)
Smoking History	7	1
Previous cessation training	23	2

## RESULTS

In total, 30 pharmacy student and 8 community leader trainers for smoking cessation services attended a two-hour education intervention (Table 2). The mean age of the student participants and community leaders was 23.59 (SD 1.90) and 36.88 (SD 16.88), respectively, with community leaders being significantly older. A higher percentage of the students in attendance had a smoking history (23.3% vs. 12.5%). Students were also more likely to be female and Caucasian in comparison to community leaders. Unlike the community leaders, the majority of student participants had previous smoking cessation training (76.7% vs. 25%). Students reported an average of 3.00 (SD 3.78) hours of smoking cessation training from both the Doctor of Pharmacy curriculum (66.7%) as well as a smoking cessation elective (16.7%).

## Knowledge Scores

At baseline, the pharmacy students had a significantly higher knowledge score than the community leaders ( $p < 0.05$ ; Figure 1). Scores for the identical pre- and post-intervention (Part A) knowledge items increased

Table 3. Smoking Cessation Class Demographics and Data	Class Members (n=8)
Ethnicity	African American
Gender	Male Female
Age	53.13 (9.14)
Smoking Years	28.14 (17.18)
Previous Quit Attempts	0.88 (0.99)
Classes Attended	4.13 (1.13)
Cessation Aids Chosen By Participants	Patches Gum
Cessation attempt by last session	8
Cigarettes per Day	Baseline 9 month follow-up
Cessation attempt ongoing at 9 month follow-up (n=6)	1
Length of cessation attempt (months)	3.55 (4.33)

significantly ( $p < 0.05$ ) after the educational intervention for both pharmacy students and community members. Overall, however, pharmacy students had a significantly higher post-intervention knowledge score than community members ( $p < 0.05$ ). Pharmacy students also had a significantly greater knowledge score change (53.7%, pre-intervention; 81.8%, post-intervention Part A;  $p < 0.05$ ) versus community members (32.1%, pre-intervention; 50.1%, post-intervention Part A;  $p < 0.05$ ).

Both pharmacy students' and community leaders' scores increased significantly between pre-intervention knowledge items and conceptually similar post-intervention Part B items. When comparing post-intervention Part A scores (knowledge) versus Part B scores (comprehension), pharmacy students had significantly higher post-intervention Part A knowledge scores ( $p < 0.05$ ).

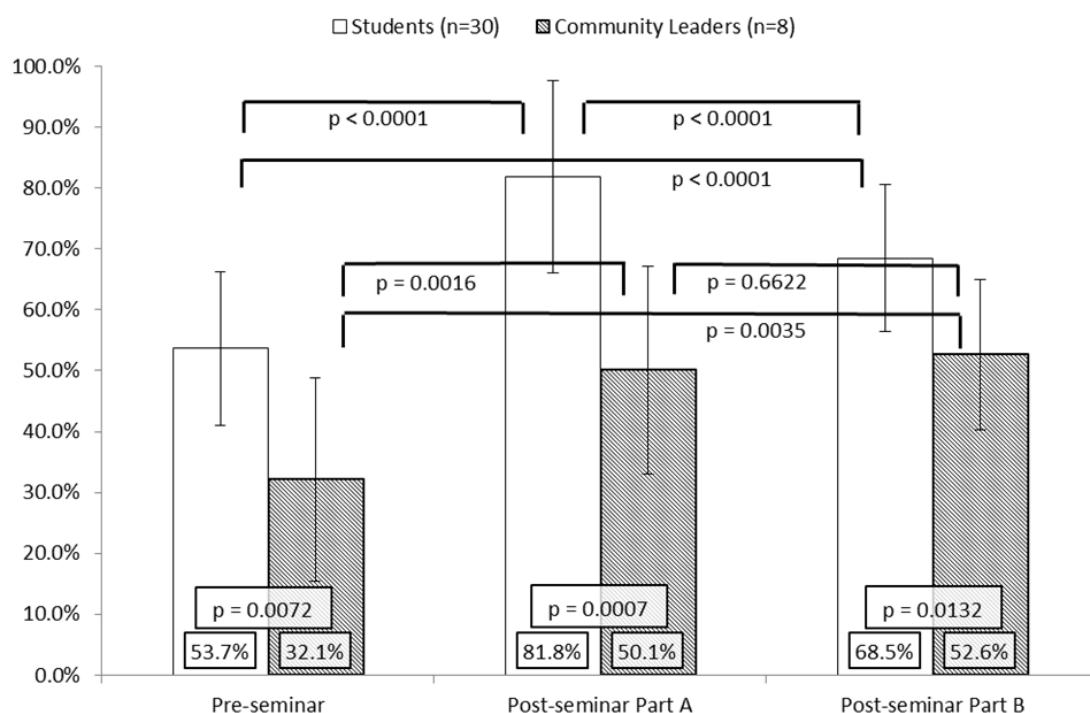


Figure 1. Mean knowledge scores – Students vs. Community leaders

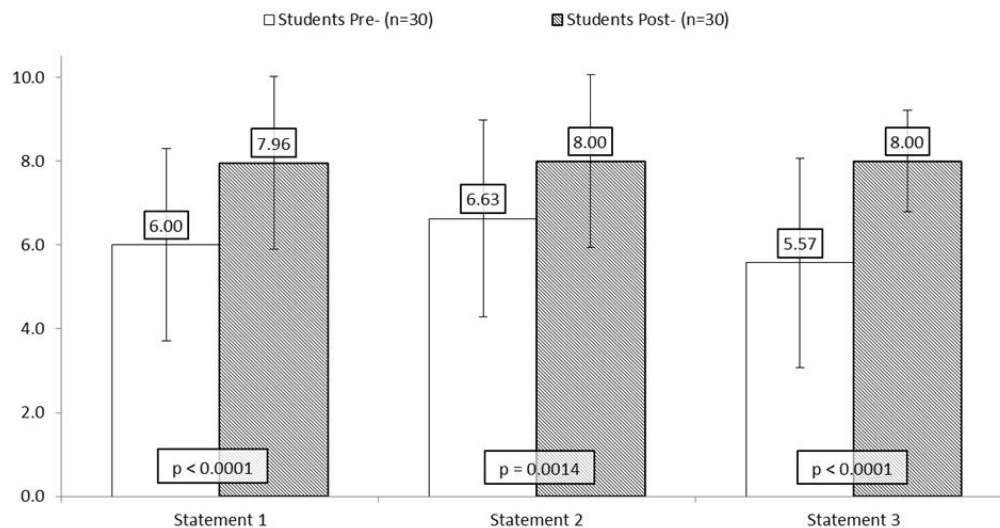


Figure 2. Student mean confidence scores – Pre-seminar vs. Post-seminar.

Community leaders did not have a significant difference between Part A knowledge and Part B comprehension scores.

#### Confidence scores

At baseline, student confidence scores versus community leader scores were not significantly higher with the exception of confidence in recommending a medication for a cessation attempt (6.63; SD=2.34 vs. 4.13; SD=2.75, for students versus community leaders, respectively; p=0.04). After the educational intervention, confidence scores for each statement increased significantly for pharmacy students (p<0.05; Figure 2). Community leader confidence scores significantly increased for only Statement 1 regarding confidence in counseling (p<0.05; Figure 3). However, there was not a significant difference between post-intervention confidence scores for students versus community leaders. There was also no significant difference in the change of confidence scores between students and community leaders, except for a more significant change in students' counseling confidence scores (p<0.05; Figure 4). Both pharmacy students' and

community leaders' scores significantly increased regarding their perception of the pharmacist's role in smoking cessation versus baseline (6.83; SD=2.46 vs. 8.13; SD=1.87, p=0.0008; 6.25; SD=3.24 vs. 7.63; SD=2.97, p=0.0038; for students and community leaders, respectively).

#### Smoking cessation services

One smoking cessation class was held as a result of the educational intervention attended by pharmacy students, while the intervention attended by community leaders did not result in any formalized cessation program. The subsequent class was held once weekly for six weeks by four pharmacy students in Yazoo City, Mississippi. A total of eight class members, recruited from a local clinic, attended at least two sessions (Table 3). The mean age of these community members was 53.13 (SD 9.14). At baseline, the members smoked an average of 13.13 (SD 7.04) cigarettes daily with an average of 28.14 (SD 17.18) smoking years between them. Four of the members had at least two past quit attempts, but the remaining four participants had never attempted to quit smoking. Each class member set a quit date and began a cessation attempt prior to the end of

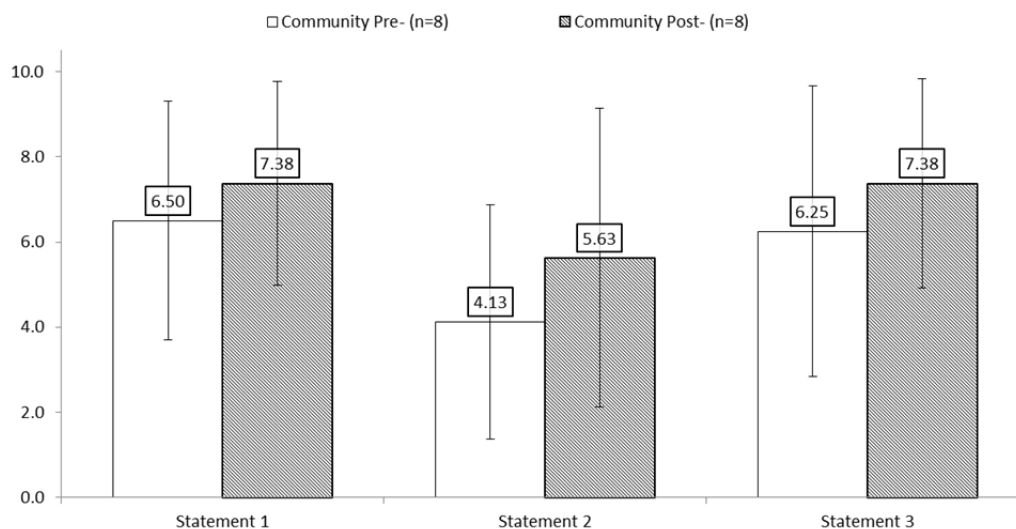
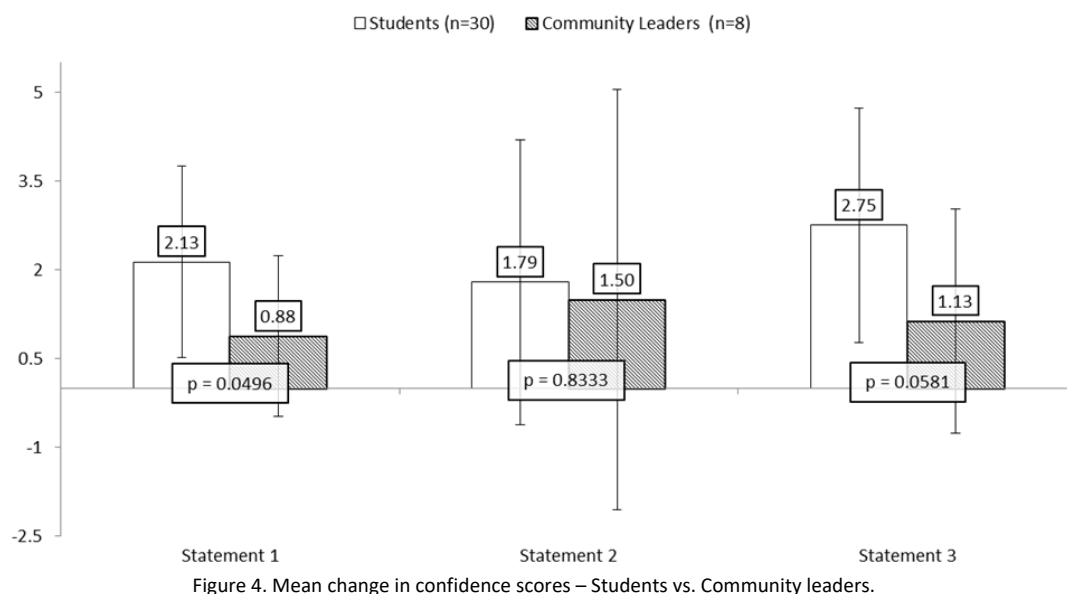


Figure 3. Community leader mean confidence scores - Pre-seminar vs. Post-seminar



the six-week class series. Six of the members used nicotine patches as a cessation aid and the remaining two members used nicotine gum. Two class members were not included in follow-up data (one lost to follow-up, one deceased). At nine-month follow-up, the class members smoked an average of 8.42 (SD 7.42) cigarettes daily. One participant still had a successful cessation attempt after nine months. All eight participants attempted to stop smoking prior to the end of the smoking cessation class series. The participants' average length of successful cessation was 3.55 (SD 4.33) months. Cessation was determined using urine cotinine tests.

## DISCUSSION

Pharmacy students and community leaders exhibited increased knowledge after a two-hour smoking cessation educational intervention. Confidence scores also increased for pharmacy students after the educational intervention with regards to counseling smokers, recommending medication for cessation, and assisting with longitudinal cessation attempts. In contrast, only confidence scores for providing counseling to smokers increased for community leaders after the intervention. Acceptance for a role for pharmacists in assisting with smoking cessation efforts increased for both groups after the intervention.

Baseline knowledge scores were higher for pharmacy students, which can be explained by the fact that students were more likely to have had previous cessation training. However, the change in pre- versus post-intervention knowledge scores was also higher for students in comparison to community leaders. For students, a significant increase in knowledge scores (i.e., post-educational intervention Part A) occurred in comparison to comprehension scores (i.e., post-educational intervention Part B). In contrast, there was no such increase in comparison of post-educational intervention Part A and post-educational intervention Part B knowledge scores for the community leaders. While questions in Part A were the same questions that were given in the pre-educational intervention questionnaire, the questions in Part B were

similar in content only. Thus, questions in Part B evaluated comprehension of the topic in the question. A reasonable explanation for this finding is that pharmacy students could be more attuned to attending presentations and discerning the most applicable information.

Confidence continues to be a significant barrier for implementing smoking cessation services by both healthcare professionals and community groups.<sup>5,9,10,16,17</sup> Thus, the finding of this study regarding the change in confidence scores between the two groups is encouraging. Pharmacy students had increased confidence for counseling smokers, recommending cessation medication, and assisting with longitudinal cessation attempts. These three items reasonably could be hypothesized to reflect an increasing skill-set needed to provide fully realized smoking cessation services. Thus, the fact that confidence scores increased for community leaders only for providing counseling, and not for the other items, is particularly meaningful.

Furthermore, both groups were encouraged to begin implementing smoking cessation services. Only the pharmacy students were able to successfully assist smokers in a cessation attempt. While the number of smokers impacted was small (i.e., eight smokers participated in a 6-week class run by the students), all the smokers attempted to stop smoking during the class. In the long-term follow-up period of nine months, participants had reduced their average nicotine consumption and one person successfully maintained abstinence.

Taken together, the data shows that a brief, two-hour educational intervention was successful in increasing the knowledge base and confidence level of pharmacy students to the point that actual smoking cessation services could be implemented. The knowledge base and confidence to provide counseling increased for the community leaders through the brief educational intervention. However, the intervention did not increase the confidence of community leaders to provide longitudinal cessation assistance, nor did it lead to provision of actual services.

Successful partnerships in the form of community-based participatory research have been formed between community members, organizations, and academic researchers.<sup>11</sup> The community members have been ideal for recruiting participants for smoking cessation. However, barriers include the time and funding needed to build and solidify partnerships within the political and social complexities of many community settings. Especially in disadvantaged communities, aggressively recruiting and training community leaders would be needed to create successful cessation programs. Such programs would also need to be able to provide nicotine replacement therapy (NRT).<sup>12</sup>

Initiatives in the community include smoking cessation interventions provided through social and community service organizations and through church-based cessation activities. In particular, one project with members of a SCSO in Australia was successful in both providing smoking cessation training, and in the members implementing such counseling services.<sup>13,14</sup> Training for the staff, who did not previously have medical experience, included a half-day of raising awareness, followed by a full day of cessation training. As a result, the attitudes and confidence levels to assist with smoking cessation for their clients increased significantly. Although the SCSO workers were not able to assist smokers in achieving total abstinence, time spent talking about cessation increased significantly. Also, smokers reduced the number of cigarettes smoked per day from 20.5 at baseline to 15 per day at six-month follow up.

Another study conducted community-based activities with individualized counseling through church coalitions in a rural, predominantly African-American county.<sup>15</sup> While interventions led to progress along the stages of behavior change, the smoking cessation rate was not significantly increased in comparison to the comparator county. For the members attending the interventions at the participating church, there was an increased awareness of and contact with smoking cessation programs.

As evidenced by the limited amount of research noted, training community leaders to provide cessation services is difficult. This current study suggests that a brief, two-hour educational intervention increases community leaders' knowledge and confidence to counsel smokers, but it is unable to provide enough confidence to provide longitudinal services. While research with SCSO workers was effective in decreasing the daily number of cigarettes smoked by their clients, training to produce this result was one and a half days.<sup>13,14</sup>

The results of this study should be taken together with previous research regarding possible strategies to provide cessation services. Training synergistically for two different groups who would provide smoking cessation services can be beneficial and cost-effective.<sup>17</sup> However, synergistic training has been provided in previous research for two different groups of healthcare providers. This study was unique in that training was targeted for both pharmacy students and community leaders who are not necessarily in or have been in the healthcare field. The results of this

study indicate that, if training time is limited, the best role for community leaders may be to concentrate on developing coalitions with healthcare providers to develop services. Training should be focused on helping community leaders understand the health consequences in their overall community, the role that healthcare providers can play in achieving tobacco abstinence, and the need of their leadership to recruit smokers to participate in cessation services. Especially with regards to recruitment, the assistance community leaders can give is vital.

A few limitations need to be discussed with this study. The groups were dissimilar in number and in several demographic areas. However, each group was a representative sample of pharmacy students and community leaders, respectively, for which a basis of comparison could be made. Pharmacy students may have had various formal training that could not be accounted for prior to participating in this study since included students were at different points of the curriculum (professional years two through four). The educational intervention was the same for both groups, as was the questionnaire. Another limitation is that a widely accepted and validated survey instrument of knowledge and confidence questions for either pharmacy students or community leaders does not currently exist. In the future, such instruments should be targeted to elicit information that would be most useful during the educational intervention. Recruitment of community leaders was difficult, with the recruitment period having to be extended from the initial three month period for another two months in order to reach out to communities through churches, schools, and free clinics in the area. Most of the resulting participants were educators or those who worked in the healthcare industry. Thus, the possibility of recruitment bias must always be factored into the final analysis.

## CONCLUSIONS

Pharmacy students and community leaders exhibited increased knowledge after a smoking cessation educational intervention, and pharmacy students had increased confidence scores. All confidence scores did not change significantly for community members. Developing coalitions between healthcare providers and community leaders, focusing on the roles of each, may be productive in initiating smoking cessation programs.

## CONFLICT OF INTEREST

Justin J. Sherman has received grants from the University of Southern Mississippi Service Learning Program.

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