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Original Research

Pharmacy residents and students as an adjunct to current smoking cessation education

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ABSTRACT*

Objective: The purpose of this study was to evaluate the impact of individualized tobacco cessation counseling provided by pharmacy residents and students to patients in the inpatient setting at an academic medical center.

Methods: Documented tobacco users were evaluated for study inclusion. The intervention group received counseling specific to their readiness to quit. After discharge, patients in the intervention group received weekly phone calls for additional counseling and data collection. One month after discharge, the standard therapy group received one phone call for data collection.

Results: No significant differences were found between groups for demographic variables or number of years smoking. At baseline, the intervention group reported significantly fewer quit attempts and more packs per day than the control group. The odds ratio (OR) for the primary outcome, abstinence, was 1.68 [95%CI=0.29:9.748] favoring the intervention group. The OR for patients using outpatient pharmacotherapy was 3.20 [95%CI=0.484:21.167] for the intervention group compared to the control group. The percentage of patients using outpatient treatment programs was 5.26% in the control group vs. 0% in the intervention group.

Conclusions: Results showed a trend toward significance for abstinence and increased use of outpatient pharmacotherapy; however, our sample size and study period limit conclusions that may be drawn. Further study is warranted for definitive results.

Keywords: Smoking Cessation. Health Education. Students, Pharmacy. United States.

RESIDENTES Y ESTUDIANTES DE FARMACIA COMO ADJUNTOS EN LA ACTUAL EDUCACIÓN PARA LA CESACIÓN TABÁQUICA

RESUMEN

Objetivo: El propósito de este estudio fue evaluar el impacto del asesoramiento individualizado para la cesación tabáquica proporcionado por residentes y estudiantes de farmacia a los internos de un centro médico universitario.

Métodos: Para la inclusión en el estudio, se evaluó a usuarios documentados de tabaco. El grupo intervención recibió asesoramiento específico sobre su disponibilidad a abandonar. Después del alta, los pacientes en el grupo intervención recibieron llamadas telefónicas semanales para asesoramiento adicional y recogida de datos. Un mes después del alta, el grupo de tratamiento estándar recibió una llamada de teléfono para la recogida de datos.

Resultados: No se encontraron diferencias significativas entre las variables demográficas de ambos grupos o en cuanto a los años fumando. Al inicio, el grupo intervención reportó significativamente menos voluntad de abandonar y más paquetes por día que el grupo control. El odds ratio (OR) para el resultado primario, la abstinencia, fue de 1,68 [IC95%=0,29:9,748] a favor del grupo intervención. El OR para pacientes que usaban medicación externa fue de 3,20 [IC95%=0.484:21.167] para el grupo intervención comparado con el control. El porcentaje de pacientes que usaba programas de tratamiento externo fue de 5,26% en el grupo control contra 0% en el grupo intervención.

Conclusiones: Los resultados mostraron una tendencia hacia la significación para la abstinencia y el uso aumentado de farmacoterapia ambulatoria; sin embargo, nuestro tamaño de muestra y periodo de estudio limitaron las conclusiones que pueden extraerse. Se necesitan estudios adicionales para obtener resultados definitivos.

Palabras clave: Cesación tabáquica. Educación en Salud. Estudiantes de Farmacia. Estados Unidos.

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INTRODUCTION

Tobacco use causes premature death and profound morbidity. The cost of cigarette smoking to society is estimated at 193 billion USD each year due to lost productivity and direct healthcare costs.¹ Additionally, smoking causes about 30% of all cancer deaths and 80% of Chronic Obstructive

Pulmonary Disease (COPD) deaths.¹ Smoking is such a costly problem that it is a focus of many government sponsored programs. Smoking cessation education is mandated by the Joint Commission for certain disease states when a patient is admitted to the hospital.² It is also a goal for Healthy People 2020 to decrease the cigarette smoking percentage to 12% by 2020.³

Recent literature describes the use of pharmacists and student pharmacists to educate inpatients about smoking cessation to fulfill Joint Commission requirements and to help patients achieve smoking cessation long term.^{4,5} The Transtheoretical Model of Change describes states of behavioral change.⁶⁻⁸ Based on this model, patients should be counseled differently depending on their quit stage to make counseling effective.⁶⁻⁸ For example, a patient may be unwilling to listen to counseling on how to quit if he is not even willing to consider quitting at that point. Moving a patient forward in their stage of change is considered an important step to long term behavioral change.

Currently the respiratory therapy department at our institution provides education in the form of an information packet with general information about the consequences of cigarette use and strategies for smoking cessation. The purpose of this study was to evaluate the impact of individualized tobacco cessation counseling provided by pharmacy residents and students compared to the standard of care for patients in the inpatient setting at an academic medical center.

METHODS

Design, Setting, and Population

This was a prospective, non-randomized, cohort study approved by the University of Tennessee Graduate School of Medicine Institutional Review Board. The study population included patients who identified themselves as being either current cigarette smokers or as a smoker within the last year. Recruitment for the study was from January 1 through February 28, 2010. Patients were first screened for inclusion and exclusion criteria. To be included patients had to be 18 or older, English speakers, and admitted to the Family or Internal Medicine teaching services at the University of Tennessee Medical Center. Patients were excluded if they were admitted to the intensive care unit, had suspected or confirmed tuberculosis, were mentally incapacitated, or were receiving only comfort measures.

Study Procedures

Individuals who met inclusion and exclusion criteria were interviewed and medical records were reviewed to obtain demographic data (age, sex, race, level of education). During the interview, self-reported smoking history (how long he/she smoked, how many packs per day, previous quit attempts) were obtained, and the patient was staged according to the Transtheoretical Model of Change.^{7,8} The Fagerström test for nicotine dependence was also administered to each

subject.⁹ Patients admitted to the control group, the Internal Medicine service, received no additional education. Patients admitted to the intervention group, the Family Medicine service, received individualized counseling by pharmacy students and residents on tobacco cessation strategies and pharmacologic interventions and were provided with an outpatient cessation program referral. Outpatient programs for referral included the telephone quit line which is free for Tennessee residents at 1-800-QUIT-NOW or the Freedom from Smoking program offered by the American Lung Association at the University of Tennessee Medical Center. The smoking cessation class required a small deposit which was refunded upon completion of the curriculum regardless of smoking status making this a free resource as well.

Prior to providing counseling, students and residents were educated about smoking cessation and cessation strategies by a pharmacist faculty member who had completed the Rx for Change® program.⁷ Therapy was individualized based on each patient's quit stage assessed using the Ask, Advise, Assess, Assist, and Arrange system recommended in the current clinical practice guidelines⁸ and materials from the Rx for Change® program.⁷ Educational handouts and worksheets from Rx for Change® focused counseling on areas appropriate to a patient's quit stage (Table 1). These interventions were provided in addition to the informational packet provided by respiratory therapy, the current standard of care. Patients on Internal Medicine service were the control group receiving only the standard education provided by respiratory therapy staff. In addition, all patients had access to educational videos while in the hospital.

The pharmacy students, preceptor, and resident attempted four weekly follow-up telephone calls to each intervention patient. Data collected during those calls included self-reported smoking cessation status, participation in an outpatient treatment program, quit stage, counseling by another healthcare provider, and pharmacologic therapy being used. The follow-up calls also allowed for further counseling including relapse prevention strategies, discussion of medication use, and encouragement. For non-intervention patients, the same data was recorded, but those patients received only one follow-up call approximately four weeks after discharge. If patients could not be reached by phone after 5 attempts at different times of the day, they were excluded from data collection.

After four weeks, a comparison was made between the two groups for rates of self-reported smoking cessation, participation in an outpatient cessation program, receiving counseling from another healthcare provider, change in quit stage, and use

Table 1: Definitions of Quit Stages ^{6,7,8}	
Stage 1: Precontemplative	Not ready to quit within 30 days
Stage 2: Contemplative	Ready to quit within 30 days
Stage 3: Action	Recent quitter within the last 6 months
Stage 4: Maintenance	Former smoker who quit six months to one year ago

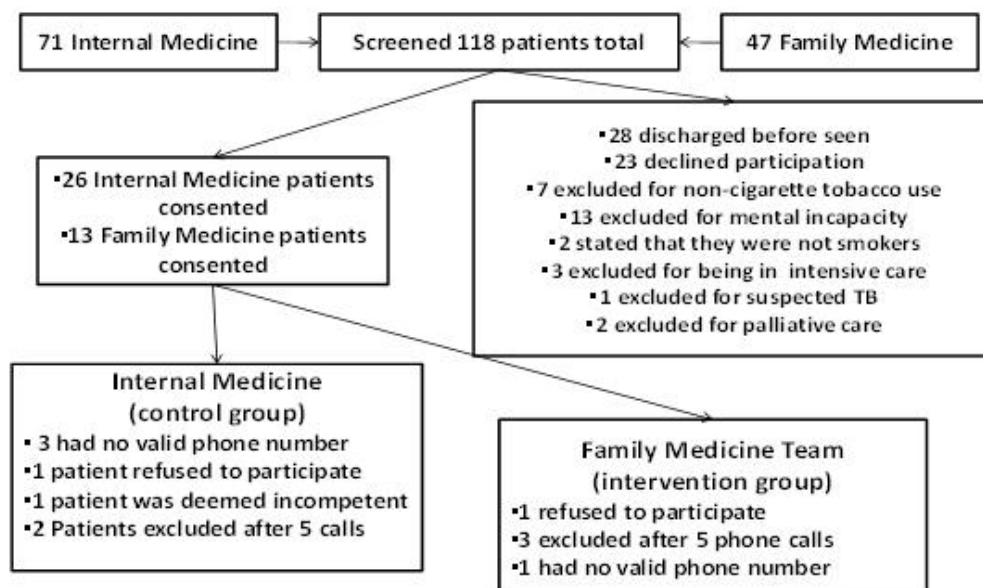


Figure 1 Patient Recruitment and Exclusion

of pharmacotherapy. These criteria were used to assess whether utilizing pharmacy residents and students to provide individualized counseling and medication education is effective as an adjunct to standard therapy.

Data Analysis

The alpha value for all statistical tests was established as 0.05. The demographics of age, years as a smoker, Fagerström score, and packs per day were compared using independent samples t-test. Previous quit attempts were compared between groups using the Mann-Whitney U test due to the violation of Levene's test for homogeneity of variances when using the independent samples t-test. Pearson chi squared analysis was used to compare sex and education, and the Fisher's exact test was used to determine if race was equitably distributed between the two groups. The Fisher's exact test was needed due to the sample size of one of the populations being less than five. Odds ratios with 95% confidence intervals were used to compare groups for abstinence and use of pharmacotherapy. The evaluation of quit stage change, utilization of an outpatient treatment program, and provision of counseling by another healthcare professional was a comparison of percentages between groups.

RESULTS

Initially, we screened 118 patients from both the

intervention and control groups. We obtained informed consent for 26 control group patients and 13 intervention group patients. Due to the study design, we could only evaluate the results on a per protocol basis and not intention to treat. Follow up data was available for 19 control group patients and 8 intervention group patients (See Patient Recruitment and Exclusion flowsheet, figure 1). No significant differences were found between the intervention and control groups for age, sex, race, education, number of years smoking, or Fagerström score (Tables 2 and 3). At baseline, there were significantly fewer quit attempts and greater packs per day smoked in the intervention group.

For the primary objective, continuation of cessation, the odds ratio was 1.68 [95%CI=0.290:9.748] favoring the intervention group (23% vs. 19%).

The odds ratio for the secondary objective of using outpatient pharmacotherapy was 3.20 [95%CI=0.484:21.167] again favoring the intervention group (23% vs. 12%). However, no statistical significance can be inferred. One of the 19 patients available for follow up in control group (5.26%) and zero from the intervention group reported participation in an outpatient cessation program. One patient from the control group received counseling from another healthcare provider after discharge.

When change in quit stage was evaluated, 36.8% control patients vs. 0% intervention patients regressed in quit stage, 36.8% control patients vs.

	Intervention Group n=13		Control n=26		P-value
Age (years) mean	53.6 (SD=12.3)		51.8 (SD=13.8)		0.705
Race	Caucasian	African American	Caucasian	African American	0.439
	13	0	21	2	
Sex	Male	Female	Male	Female	1
	6	7	12	14	

Age was calculated using the independent samples t-test. Race was evaluated using the Fisher's exact test. Pearson chi squared analysis was used to evaluate sex and education.

Table 3: Smoking History			
	Intervention Group	Control Group	P-value
Years smoking (mean)	38.46 (SD=15.79)	34.85 (SD=12.00)	0.430
Packs per day (mean)	1.138 (SD=0.577)	0.792 (SD=0.394)	0.033†
Previous quit attempts (mean)	1.08 (SD=0.494)	3.81 (SD=4.733)	0.018†
Fagerström score (mean)	4.3 (SD=2.06)	3.92 (SD= 2.43)	0.668

SD = Standard Deviation. †Indicates a significant P-value

87.5% intervention patients had no change in quit stage, and 26.3% control patients vs. 12.5% intervention patients improved their quit stage. No patients from either group called the quit line or participated in the tobacco cessation support group at our academic medical center.

DISCUSSION

High morbidity, mortality, and monetary costs are associated with smoking.¹ To prevent these costs to patients and the healthcare system, any opportunity for educating and counseling patients on smoking cessation should be optimized. In addition, tobacco abuse often takes multiple attempts to quit. Therefore, it is important to assess a patient with each healthcare system encounter and offer counseling where appropriate.⁸

There has been an increased interest in educating healthcare professionals and encouraging them to offer counseling to smokers and recent quitters. Several trials have assessed the effectiveness of pharmacist-provided smoking cessation counseling in the inpatient, community, or clinic setting.^{4,5,10-13} Our study focused on providing smoking cessation counseling to patients in the acute care setting on the teaching services usually staffed with pharmacy students, residents, and preceptors. We hoped to show benefit for patients while implementing this counseling program as part of the resident and student learning experience. These groups were also chosen due to the similarity of the patient populations. Although the demographic information between groups was very similar, at baseline, the intervention patients smoked more packs per day and had fewer previous quit attempts. This difference would seem to make it more difficult to show a benefit in the intervention group. Despite this, the results trend toward benefit in the intervention group for pharmacologic therapy use and abstinence; however, they are not statistically significant. An additional finding is that none of the patients in the intervention group regressed in their quit stage, compared to 36.8% of control patients.

These results are encouraging, especially since the intervention group had a more significant smoking history than the controls. Future studies in this area should include a larger study sample with a longer period for recruitment and follow-up.

There are several limitations to the study. The sample size in both groups was prohibitively small, and the sample size between groups was inequitable. Furthermore, the short time frame for recruitment and follow-up limited our study population, and recruitment was slower than expected. Another confounder is that smoking status was self reported and not verified by laboratory means. These issues may have limited our ability clearly to demonstrate a statistically significant difference in the intervention group.

CONCLUSIONS

Results showed a trend toward significance for abstinence and increased use of outpatient pharmacotherapy in patients provided Transtheoretical Model of Change-based smoking cessation counseling conducted by pharmacy students and residents. However, our sample size and study period limit conclusions that may be drawn. While the initial findings of this pilot study are encouraging, more extensive study should be conducted to show definitive benefit. Smoking cessation counseling by resident and student pharmacists is mutually beneficial as it provides a valuable learning experience for patients, students, and residents.

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CONFLICT OF INTEREST

None of the authors have conflicts of interest to disclose. No funding was obtained for this study.

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