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Training Nurses in the Treatment of Tobacco Use and Dependence: Pre- and Post-Training Results

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Abstract

Aim—This paper is a report of a study conducted to examine the effects of a brief training in the treatment of tobacco use and dependence on the tobacco use intervention-related knowledge and attitudes of nurses.

Background—Nurses are the largest group of healthcare providers and they have an extended reach into the population of tobacco users. Thus, increasing the number of nurses who deliver brief evidence-based interventions for tobacco use and dependence, such as that prescribed by the Public Health Service Clinical Practice Guideline in the United States of America, is likely to expose more tobacco users to evidence-based treatments and lead to more successful quit attempts. However, effective training is key to improving provider proficiency in delivering evidence-based interventions for tobacco use and dependence.

Method—A 1-hour didactic training was delivered to 359 nurses from 2006 to 2007, including 54 Advanced Practice Nurses, 250 Registered Nurses and 55 Licensed Practical Nurses. Pre- and post-training tests assessed attitudes, knowledge and behaviors. Paired samples t-tests were used to compare pre- and post-test results.

Results—Statistically significant increases on nearly all measures were achieved, with registered nurses and licensed practical nurses realizing the largest gains.

Conclusion—Given the overwhelming impact of tobacco use on patients, all nurses should be provided with training in the delivery of brief, evidence-based interventions for tobacco use. As the most trusted healthcare provider group with a strong reach into the tobacco using population, nurses would have a large potential impact on the prevalence of tobacco use if they were adequately trained to provide interventions.

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Conflict of interest:

No conflict of interest has been declared by the authors.

Author Contributions:

CS, CB & MA were responsible for the study conception and design

CS, CB & MA performed the data collection

CS & MA performed the data analysis

CS, CB & MA were responsible for the drafting of the manuscript

CS, CB & MA made critical revisions to the paper for important intellectual content

CS & MA provided statistical expertise

CS & CB obtained funding

CS, CB & MA provided administrative, technical or material support

Keywords

Training; nurses; treatment; tobacco; dependence; smoking cessation; primary health care

INTRODUCTION

Tobacco use is the leading cause of preventable death and disease in the world (CDC 2005, Mokdad et al. 2004, WHO 2008). Globally, tobacco use will kill an estimated 8 million people *annually* by 2030 (WHO 2008). Through both primary and secondary exposure, tobacco use affects every system in the body and every patient group to whom nurses provide care in every nation (NCI 1999, DHHS 2004, Malone 2006).

BACKGROUND

Tobacco use cessation provides immediate and major health benefits and is the “gold standard” in cost-effective disease prevention strategies (CDC 2007, Maciosek et al. 2006, Eddy 1992). However, tobacco users often have difficulty quitting and maintaining abstinence (Fiore et al. 2008). Nearly 80% of tobacco users report that they would like to quit and 40–60% make a quit attempt each year, but because these attempts are largely unassisted, just 3–5% are successful 12 months later (Fiore et al. 2008, Messer et al. 2007, Hughes et al. 1992, CDC 2006). Similar to the clinical practice guidelines in other countries, the United States Public Health Service (PHS) Clinical Practice Guideline recommends providing a routine, brief intervention to all patients, often called the “5A’s:” (a) ASK every patient about tobacco use at every visit; (b) ADVISE every tobacco user to quit; (c) ASSESS interest in quitting tobacco; (d) ASSIST interested tobacco users by setting a quit date and providing counseling and medication; and (e) ARRANGE for timely follow-up services. These recommendations can be implemented in many different types of busy clinical environments with minimal demands on providers (Fiore et al. 2008). Research clearly indicates that when multiple providers in healthcare settings address tobacco use, cessation rates are significantly improved, statistically and clinically, over self-help methods (Fiore et al. 2008).

A large body of evidence supports the effectiveness of systematic brief interventions for treating tobacco use and dependence implemented by healthcare providers (Fiore et al. 2008). Nurses are the largest group of healthcare providers and with the large variety of roles they play in the healthcare system, they have an extended reach into the tobacco using population (Miller 2006). Numerous randomized clinical trials have shown that nurse-delivered brief and intensive interventions are efficacious for a wide variety of patients (Rice and Stead 2008). Nurses are clearly well-positioned within healthcare to provide brief, effective treatment for tobacco dependence.

Despite the strength of the research behind this approach, patients continue to receive insufficient assistance (Applegate et al. 2008, Albert et al. 2005, Ferketich et al. 2006). The most recent US Ambulatory Medical Care Survey showed that 32% of patient charts were missing tobacco use status, 81% of smokers did not receive assistance, and fewer than 2% were prescribed cessation medications, representing little change from the early 1990s (Ferketich et al. 2006). Nurses report a number of barriers to the delivery of interventions for tobacco use, including lack of institutional support, motivation, time, self-efficacy, reimbursement and training (Ward et al. 2002, Vogt et al. 2007, Miller 2006, Sarna et al. 2001, Schroeder 2005, Wewers et al. 2004, Applegate et al. 2008). These reports, however, also suggest that nurses are receptive to training to increase their proficiency in delivering interventions to treat tobacco use.

A substantial literature demonstrates that training healthcare providers is associated with positive changes in provider intervention behaviors, although training nurses is yet to be evaluated (Silagy et al. 1994, Pbert 2003, Humair and Cornuz 2003, Applegate et al. 2008). Although nurses experience other substantial barriers to the delivery of interventions for tobacco use, education and training are necessary for them to develop competence in delivering evidence-based interventions for tobacco use and dependence (Heath and Andrews 2006). While system supports that remind and encourage nurses to perform these interventions in busy clinic environments are vital, training is still key for increasing nurse performance and proficiency in the delivery of these treatments (Heath and Andrews 2006).

Given the tremendous global burden of tobacco-related death and disease and the unambiguous evidence that providing brief treatments is effective at improving cessation success, there are clear implications for policy and practice. Increasing the number of nurses who deliver these evidence-based interventions for tobacco use and dependence is likely to expose more tobacco users to evidence-based treatments, lead more tobacco users to quit and decrease the prevalence of tobacco use and tobacco-related disease (Wewers et al. 2006, Fiore et al. 2008). Given the reach of nurses into the population that uses tobacco, the potential impact of nurses systematically delivering brief interventions for tobacco use is enormous. Although there has been discussion about the type of training that would be most effective for nurses, to date there has been limited inquiry into the effects of providing practising nurses with brief training in the treatment of tobacco use (Heath and Andrews 2006). If even a brief training is effective at improving nurses' knowledge, self-efficacy and related attitudes, then a rationale could be identified for incorporating training in nursing educational, occupational and continuing education settings, as well as incorporating these interventions into standard nursing protocols.

THE STUDY

Aim

The aim of the study was to examine the effects of a brief training in the treatment of tobacco use and dependence on the tobacco use intervention-related knowledge and attitudes of nurses.

Design

A pre-post test design was used.

Participants

Advanced Practice Nurses (APNs; n=54), Registered Nurses (RNs; n=250) and Licensed Practical Nurses (LPNs; n=55) in Arkansas, USA, who completed the 1-hour training from 2006–2007 and submitted a pre- and post-test were included in the study (n=359). The trainings were provided as part of a statewide training programme funded by Tobacco Settlement Agreement funds. Training was promoted to multiple disciplines through word-of-mouth and a postcard sent to all the nurses and primary care physicians in the state of Arkansas stating that training was available upon request. Specific training sessions were requested by healthcare provider organizations in Arkansas, including Area Health Education Centers, hospitals and medical centers, out-patient clinics and statewide conferences. The individual sites recruited participants for the training, which was generally delivered to multiple disciplines at the same time (i.e., nurses, physicians, respiratory therapists, etc.). Trainers (the authors) traveled to the facilities to deliver the training.

The Provider Training

Training objectives were to prepare nurses to 1) describe the PHS Clinical Practice Guideline interventions and how they are implemented, 2) identify FDA-approved medications for treating tobacco use, and 3) describe how these medications are used. The training also provided instructions in the use of local, state-funded tobacco cessation services, the fax-referral service, clinical system supports and billing for the provision of services. The training addressed specific factors associated with provider intervention behaviors, including motivation, knowledge, self-efficacy, importance, effectiveness, barriers and preparedness (Applegate et al. 2008, Pbert 2003, Lancaster et al. 2000, Cornuz et al. 2002, Kenney et al. 1988, Warnakulasuriya 2002). In order to attract a large number of busy practising healthcare providers, the training was targeted and succinct, conveying a “nuts and bolts” approach, and was not tailored to any specific healthcare provider group. Nurses were trained along with other healthcare providers

Data Collection

Pre-training assessment instrument—The pre-training assessment instrument was a 23-item, 2-page questionnaire that has been described elsewhere (Sheffer et al. 2009). Similar to the work of Pbert (2003), Applegate et al. (2008) and Crews et al (2008), the questionnaire gathered information about provider gender; ethnicity/race; tobacco use history (8-items); frequency with which providers followed the PHS Guidelines; frequency of seeing the effects of tobacco use on the health of patients; level of pro-activity in addressing tobacco use; and perceived success in helping patients stop using tobacco. Perceived knowledge and attitudes about the treatment of tobacco use were also assessed (7 items), including levels of 1) motivation, 2) knowledge about cessation interventions, 3) self-efficacy, 4) importance of providing tobacco use interventions, 5) effectiveness of interventions, 6) importance of barriers, and 7) preparedness. All items were assessed on a discrete analogue scale of 0 to 10 with 0 being “none or not at all” and 10 being “the most possible.” The pre-test was administered immediately prior to the training.

Post-training assessment instrument—The post-training assessment was an 18-item, 1-page questionnaire assessing the quality of the training and presentation (8-items); extent to which objectives were met (3-items); and provider knowledge, attitudes and behaviors assessed in the pre-test (7-items), including levels of 1) motivation, 2) knowledge, 3) self-efficacy, 4) importance, 5) effectiveness, 6) importance of barriers, and 7) preparedness. The post-test was administered immediately after the training.

Ethical considerations

This study was approved by the governing university institutional review board. No incentives were provided for completing the pre-and post-tests. Continuing education credits were awarded independently from the testing.

Data analysis

Data were analyzed with SPSS version 12 (SPSS 2008). Descriptive analyses, including frequencies, means, χ^2 and analysis of variance, were conducted on the demographic and pre-test items. Analysis of variance was used to test for statistically significant differences in scores between professional groups. Post-hoc testing used the Bonferroni procedure to correct family-wise error inherent in multiple comparisons. Paired samples t-tests were used to compare pre- and post-test results. Given the sample size of each paired comparison ($n=315-341$) and the absolute value of the mean differences, we expected 100% power to detect a statistically significant difference with a significance level (alpha) of 0.05 using a two-sided one-sample t-test.

RESULTS

Participant characteristics

The majority of the nurse participants were White (85.7%), 11.6% were African-American and 2.7% were Asian or American Indian. Most reported never having used tobacco regularly (63.9%), 27.3% were former tobacco users and 8.8% were current users. Their mean age was 46.7 years (SD 10.4; range 22 to 75 years) with a mean of 21.2 years of practice (SD 11.2; range 0 to 51 years). The three nursing professional groups varied on a few characteristics. A larger proportion of the LPNs were current smokers (24.0% versus 6.7% for RNs and 3.8% for APNs), APNs were older than RNs and LPNs; and LPNs had practised for fewer years than RNs. (See Table 1.)

Differences in Behaviors, Knowledge and Attitudes Pre-training and Post-training

Prior to training there were statistically significant differences among APNs, RNs and LPNs on many of the intervention, knowledge and attitude items. As in other studies, nurses engaged in some interventions more frequently than others. Although all nurses performed the 5As less than recommended, APNs tended to perform each of the 5As more frequently than RNs and LPNs. In general, nurses saw the effects of tobacco use on their patients ($M = 8.3$; $SD 2.3$) more than three-quarters of the time (i.e. $8.3/10 = 0.8$), were moderately proactive in addressing tobacco use ($M=7.0$; $SD 2.8$), and felt minimally successful in helping patients quit ($M=4.3$; $SD 2.7$). APNs reported seeing the effects of tobacco use, being proactive and being successful in helping patients to quit tobacco more frequently than RNs and LPNs. (See Table 1)

Analysis of variance (ANOVAs) prior to training revealed that APNs reported statistically higher levels of motivation, knowledge, self-efficacy, importance and preparedness than RNs and LPNs ($p < .01$). There were no differences between RNs and LPNs in perceived effectiveness and the importance of barriers. Post-training, ANOVAs revealed that APNs still reported higher levels of motivation, knowledge, self-efficacy and preparedness, but the magnitude of the differences was smaller ($p < .03$) and there were no differences among APNs, RNs and LPNs in perceived importance, effectiveness and the importance of barriers.

Paired samples t-tests revealed statistically significant differences pre- and post-training on each of the seven knowledge and attitude items, except for perceived importance for APNs (See Table 2 and Figure 1.). The mean overall increase in scores on the knowledge and attitude pre-post test items was 14.9 points, with both RNs and LPNs reporting significantly more gains, statistically, than APNs (APN: $M=9.3$; RN: $M=15.7$; LPN: $M=16.9$).

DISCUSSION

Study limitations

A limitation of this study is that the findings are based on self-report. This must be taken into consideration when interpreting the data, because healthcare providers tend to over-report the frequency with which they engage in tobacco cessation interventions (Conroy et al. 2005). Accordingly, the pre-training reports and robust post-training improvements must be interpreted cautiously. Another limitation is the lack of evidence to demonstrate that the reported increases resulted in an increase in the frequency of actual intervention behaviors. Although increases in motivation, knowledge, self-efficacy, effectiveness, preparedness and related constructs are highly correlated with higher frequency of engaging in these intervention behaviors, and this training clearly increased levels of these constructs, the study does not provide direct evidence that the training actually increased the frequency of

these clinical interventions. Further investigation is needed to provide evidence in that regard.

Training outcomes

Similar to other professional groups and reports in the literature, nurses who attended the brief, 1-hour training in the evidence-based treatment of tobacco use and dependence demonstrated statistically significant positive increases in tobacco-related knowledge and attitudes (Sheffer et al. 2009, Applegate et al. 2008, Crews et al. 2008). APNs, RNs and LPNs all appeared to benefit from the training, with increases in scores on each item moving from a minimal or moderate to a high level. Although it is known that nurses are effective at delivering treatments for tobacco dependence, there have been questions about what type of training is needed for them to become effective at delivering these interventions. This study suggests that just a brief, 1-hour training is effective at increasing motivation, knowledge, confidence, perceived importance, perceived effectiveness, perceived importance of barriers and preparedness, all of which are important in the effective delivery of these interventions.

The implications of these results are broad and far-reaching. Nurses are the largest group of healthcare providers in the world and have an extended reach into the tobacco-using population (Miller 2006). They are also effective in providing treatments for tobacco dependence. Our data suggest that a brief, 1-hour didactic training in the treatment of tobacco use and dependence can significantly increase the frequency with which nurses perform these effective interventions. Increasing the frequency with which patients receive these interventions by training nurses to deliver this important treatment routinely would have a major impact on the number of tobacco users who received professional assistance with cessation and are ultimately successful with cessation. Given the tremendous impact of tobacco use on health and the immediate and major health benefits of cessation, providing all nurses with this training could have a major impact on the health of millions of tobacco users and their families worldwide (WHO 2008). Nurses are well-positioned to deliver these effective treatments and with a brief training have the potential to have a larger impact on the prevalence of tobacco use than any other healthcare provider group.

This initiative had similar objectives to an unpublished initiative provided in Mississippi from approximately 1999–2007, in that trainers travelled to rural locations to provide training upon request, but with an important difference: the Arkansas training was considerably shorter (1 hour versus 4, 6, or 8 hours) and thus was attractive to busy providers and well-attended in a very short period of time (2006–2007). The present study is the first to demonstrate that a brief, one-hour training can be both attractive to busy providers and effective in real world applications. There have been no other studies at this time examining the outcomes from training nurses of which we are aware. Our results indicate that nurses can play a significant role in the provision of evidence-based interventions for tobacco dependence with a minimal investment in training.

CONCLUSION

If all nurses received even brief training in the treatment of tobacco use and dependence, major public health benefits would be likely to be achieved. Training nurses in these brief interventions is likely to help to stem the global epidemic of tobacco-related disease. Nonetheless, further research is needed in assessing the effects of training on actual intervention behaviors, the effects of various modes of training (i.e. didactic and/or electronic media) on intervention behaviors and effective methods for disseminating brief training to all nurses.

SUMMARY STATEMENT

What is already known about this topic

- Tobacco use is the leading cause of preventable death and disease.
- Nurses are effective at delivering interventions for tobacco use.
- The majority of patients who use tobacco are not being exposed to the recommended interventions for tobacco use.

What this paper adds

- Advanced Practice, Registered and Licensed Nurses have varying levels of baseline tobacco-related knowledge, attitudes and awareness of the effects of tobacco use
- A brief, one-hour training can increase perceived knowledge associated with providing evidence-based interventions for tobacco use for nurses.
- A brief, one-hour training can increase self-efficacy and other positive attitudes associated with providing evidence-based interventions for tobacco use for nurses.

Implications for Practice and/or Policy

- Given the overwhelming impact of tobacco use on patients, all nurses should be provided with training in the delivery of brief, evidence-based interventions for tobacco use.
- As the most trusted healthcare provider group with a significant reach into the tobacco using population, nurses would have a large potential impact on the prevalence of tobacco use if they were adequately trained to provide interventions.

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Figure 1.

Knowledge and attitudes prior to training and after training assessed on a scale of 0 to 10 with 0 = "none or not at all" and 10 = "the most possible." Paired samples t-tests revealed statistically significant increases in scores on every measure for every group of nurses ($p > .01$), except for the measure of importance for APNs. The top of the bar reflects the mean score after training. The top of the dotted portion of the bar reflects the mean score prior to training. The hashed portion of the bar reflects the mean increase in the score from pre- to post-training.

Table 1

Nurse trainee characteristics

	All Nurses N=359	APNs n=54	RNs n=250	LPNs n=55
Percent of total respondents	100	15.0	69.6	15.3
Mean age in years (SD) *	46.7 (10.4)	50.0 (9.3) ^a	46.9 (10.5) ^b	42.7 (10.5) ^{ab}
Years in practice (SD) **	21.2 (11.2)	21.2 (11.0)	22.0 (10.9) ^c	16.3 (12.1) ^c
Percent race				
White	85.7	97.6	84.6	79.5
African-American	11.6	2.4	11.5	20.5
Other	2.7	0.0	3.8	0.0
Percent tobacco use status *				
Never	63.9	64.2	65.5	56.0
Former	27.3	18.3	27.7	20.0
Current	8.8	3.8	6.7	24.0 [^]
Mean frequency of SA interventions ^I				
Ask (SD) **	7.2 (3.3)	8.3 (2.5) ^a	7.0 (3.4) ^a	7.0 (3.3)
Advise (SD) *	7.3 (3.0)	8.9 (2.0) ^{b,c}	6.9 (3.2) ^b	7.4 (2.9) ^c
Assess (SD) *	6.2 (3.2)	7.9 (2.3) ^d	5.7 (3.3) ^d	6.5 (3.1)
Assist (SD) *	5.3 (3.2)	7.3 (2.4) ^{e,f}	4.8 (3.2) ^e	5.5 (3.2) ^f
Arrange (SD) *	3.7 (3.3)	5.1 (3.3) ^g	3.3 (3.2) ^g	4.2 (3.3)
See effects ^{*I,2}	8.3 (2.3)	9.5 (1.2) ^{b,i}	8.2 (2.3) ^b	7.6 (2.6) ⁱ
Proactive ^{* I,3}	7.0 (2.8)	8.3 (2.4) ^{j,k}	6.7 (2.7) ^j	6.6 (2.9) ^k
Successful ^{* I,4}	4.3 (2.7)	5.8 (2.1) ^{l,m}	4.0 (2.7) ^l	4.1 (2.9) ^m

Values with the same superscript letter in the same category indicate the location of the statistically significant difference for that value.

APN = Advanced Practice Nurses; LPN = Licensed Practical Nurses; RN = Registered Nurses

*
p. < .01;

**
p < .02;

^ value accounts for the largest proportion of the variance in the difference

- 1 Assessed on a scale of 0 to 10 with 0 = "none or not at all" and 10 = "the most possible."
- 2 How often do you see the effects of tobacco use on the health of your patients?
- 3 How proactive are you in addressing tobacco use with your patients?
- 4 How successful are you in helping patients stop using tobacco?

Table 2

Results of paired sample t-test comparing pre-and post-tests for each nursing group.

Questions	N	Pre-test	Post-test	Mean	Paired Differences			SD
					95% CI of the Difference			
						Lower	Upper	
How motivated are you to help patients stop using tobacco?	APN	52	8.8	9.5	0.8*	0.4	1.1	1.2
	RN	241	7.6	8.9	1.4*	1.0	1.6	2.3
	LPN	48	7.1	8.7	1.6*	0.9	2.3	2.5
	All	341	7.7	9.0	1.3*	1.0	1.5	2.2
	APN	52	7.0	9.0	2.0*	1.5	2.5	1.9
How knowledgeable are you in performing tobacco cessation interventions?	RN	241	4.6	8.3	3.6*	3.3	4.0	2.6
	LPN	48	5.1	8.5	3.4*	2.8	4.1	2.3
	All	341	5.0	8.4	3.4*	3.1	3.6	2.5
	APN	51	7.3	9.0	1.7*	1.1	2.2	1.9
	RN	241	5.4	8.2	2.8*	2.5	3.1	2.4
How confident are you in your ability to assist patients with tobacco cessation?	LPN	47	5.2	8.4	3.2*	2.5	3.8	2.3
	All	339	5.6	8.3	2.7*	2.4	2.9	2.4
	APN	52	9.3	9.6	0.3	0.2	0.76	1.8
	RN	240	8.6	9.1	0.5*	0.3	0.8	2.0
	LPN	47	8.0	9.1	1.2*	0.5	1.8	2.3
How important is tobacco cessation to you in providing preventive care?								

Questions	N	Pre-test	Post-test	Mean	Paired Differences			SD
					95% CI of the Difference			
					Lower	Upper		
	All	339	8.6	9.2	0.6 *	0.4	0.8	2.0
How effective are tobacco cessation interventions?	APN	50	6.2	8.5	2.3 *	1.6	3.0	2.4
	RN	239	6.1	8.4	2.3 *	2.0	2.6	2.4
	LPN	47	6.3	8.6	2.3 *	1.7	3.0	2.1
	All	336	6.1	8.4	2.3 *	2.1	2.6	2.3
How important are the barriers to providing tobacco interventions to patients?	APN	50	7.6	8.9	1.3 *	0.7	1.9	2.1
	RN	219	7.2	8.8	1.6 *	1.3	1.9	2.4
	LPN	46	6.5	8.7	2.2 *	1.5	2.8	2.1
	All	315	7.2	8.8	1.6 *	1.4	1.9	2.3
How prepared are you to provide tobacco cessation interventions?	APN	52	7.3	9.1	1.8 *	1.3	2.4	2.0
	RN	237	5.4	8.3	2.9 *	2.6	3.3	2.7
	LPN	48	5.5	8.4	2.9 **	2.1	3.7	2.8
	All	337	5.7	8.4	2.8 *	2.5	3.1	2.6

* Pre-post difference $p < .01$ (2-tailed);

** Pre-post difference $p < .05$ (2-tailed).

APN = Advanced Practice Nurse; RN=Registered Nurse; LPN = Licensed Practical Nurse