

Brief Commentary

The Effect of a Postpartum Smoking Relapse Prevention Education Program on Perinatal Nurses' Counseling Behavior

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Introduction

In the United States, smoking is the largest preventable risk factor for pregnancy-related mortality and morbidity [1, 2]. While evidence-based, pregnancy specific, smoking cessation interventions increase the rate of quitting, half of those who quit will resume smoking within a few weeks of delivery and 90% will be smoking within 12 months [3, 4]. The unique pregnancy specific factors motivating women to abstain from cigarettes while pregnant are time limited and diminish after giving birth [5]. Assisting women to remain tobacco free after childbirth is a high priority in healthcare [6]. Quitting long term improves life expectancy, reduces health risks in future pregnancies, and protects children from second-hand smoke (SHS) exposure.

The U.S. Public Health Service (USPHS) clinical practice guidelines recommend that health care providers assess patients' tobacco use at each clinical encounter using a five-step strategy referred to as the 5A's: *ask* about tobacco use, *advise* smokers to quit, *assess* interest in quitting, *assist* with treatment, and *arrange* follow-up [7]. This method has proven effective in increasing cessation rates and is a standard component of prenatal care [8]. However, continuity during the postpartum hospital period is limited.

There is little research on perinatal nurses providing relapse prevention interventions for postpartum women during the hospital stay. Nurses' role in the postpartum period is to ensure new mothers have the education they need to care for themselves and their babies. By helping them remain tobacco free, nurses can reduce women's health risks associated with smoking and provide lifelong benefits for newborns, allowing them to grow up in tobacco free environments [1, 8]. The aim of this study, therefore, was to explore the effectiveness of a smoking cessation and relapse prevention education program on perinatal nurses' knowledge, attitude, self-efficacy and behavior regarding tobacco use counseling.

Methods

Design

This study used a one group pretest-post-test design exploring the effectiveness of the education program "Helping Patients Stop Smoking During Pregnancy and Beyond." Nurses who care for women in the postpartum period attended the program.

Sample

The study was conducted at four hospitals in New York and Pennsylvania. The obstetrical (OB) department of each hospital in the study had more than 1200 deliveries a year, had a neonatal intensive care unit (NICU), and employed over 100 nurses. The final sample consisted of 162 nurses.

Intervention

The intervention was developed to promote nurses' awareness and utilization of evidence-based treatments. The theoretical perspective underlying this research draws on Ajzen's Theory of Planned Behavior and Bandura's Social Cognitive Theory. These theories supported the study's assumption that, for nurses to learn and practice new behaviors, they need to have: knowledge of effective counseling behavior, an attitude or belief that the counseling will have positive consequences and self-efficacy in their ability to provide the counseling.

"Helping Patients Stop Smoking During Pregnancy and Beyond" was the education program developed specifically for this study [9]. It was based on: 1) a review of the literature; 2) the Tobacco Use Clinical Guidelines [7], results of focus group research with pregnant smokers and their health care providers [10], and 4) interventions used in the Forever Free for Baby and Me booklet series [11, 12]. The significance of the problem was highlighted by a review of health effects that tobacco use during pregnancy has on the entire life cycle. Prevalence rates of smoking in pregnancy, postpartum relapse rates and the unique circumstances in the postpartum period that make relapse likely were reviewed. Counseling interventions presented were based on the tobacco cessation clinical practice guidelines [7]. The 5A's were outlined with information on quit-line referral as an option for the 5th A: arranging follow up. Basic mental and behavioral coping mechanisms from the Forever Free booklet series were also outlined [12].

Measures

The questionnaires were based on two previously tested surveys, the *Helping Smokers Quit* (HSQ) survey and the *Smoking Cessation Counseling* (SCC) survey with minor changes made to reflect use with postpartum women [13–15]. The pre-test consisted of 35 questions;

the first 17 were related to demographics and nurses' characteristics. The remaining 18 questions were divided into construct subscales: knowledge, attitude, self-efficacy, and behavior. The questions were answered on an 11-point Likert scale ranging from 0 (not at all) to 10 (most possible). The post-test consisted of the subscales of knowledge, attitude, and self-efficacy. The one-month follow-up test included all 4 subscales, since it was postulated that by this point nurses would have had a chance to change their counseling behavior. Cronbach's alpha values on the adapted surveys were robust: five item knowledge scale (.88 - .91), four item attitude scale (.73-.81), four item self-efficacy scale (.89 - .95), and five item behavior scale (.87-.91).

Procedure

The study protocol was approved by the institutional review board of each hospital and the authors' University. Recruitment of nurses was done through flyers and an announcement letter. Verbal and written consents were obtained from all participants. The principal investigator offered the education program several times at each institution. Completion of demographic information and the pre-test questionnaire took approximately 10 minutes. The program lasted 45 minutes, and completion of the post-test took 5 minutes. Follow-up questionnaires were mailed to participants 1 month after completing the education program.

Data Analysis

Data were analyzed using descriptive statistics to characterize respondents. One-way repeated ANOVAs were used to evaluate differences in scores on attitude, self-efficacy, and knowledge. Paired sample t tests were used to evaluate differences in behavior and quit-line referrals. Analysis of data were performed using SPSS for Windows 20 (IBM Corp. Armonk, NY).

Results

Sample Characteristics

One hundred and sixty-two participants attended the education program and completed pre and post-tests. Seventy-one percent returned one-month follow-up tests. Demographic and professional characteristics of participants are listed in (Table 1).

Knowledge, attitude and self-efficacy changes

There was a significant effect on knowledge, $F(2, 111) = 76.75, p < .001$, and on self-efficacy, $F(2, 111) = 75.38, p < .001$. Pairwise post-hoc comparisons indicated a significant increase in knowledge and self-efficacy from pretest to the one-month follow-up test ($p < .001$). A significant effect was also noted for attitude, $F(2, 111) = 30.17, p < .001$, but the increase in mean attitude score of 4.5 points from pre- to post-test was not maintained at the one-month follow-up. Listed in (Table 2).

Counseling Behavior

One-month follow-up counseling behavior test score ($M = 30.99, SD = 13.34$) was significantly greater than the pre-test score ($M =$

$25.30, SD = 13.35$), $t(113) = -4.96, p < .001$, and the specific behavior of referring to the quit-line also showed a significant increase from pre-test ($M = 1.76, SD = 2.67$) to one-month follow-up ($M = 4.0, SD = 3.61$), $t(113) = -6.91, p < .001$. However, initial scores were low and remained low and are listed in Table 2.

Table 1: Demographic and Professional Characteristics of Participants.

Variable	Category	Total	Percentage
Level of nursing education	Associate	39	24.1
	Diploma	47	29
	Bachelors	55	34
	Masters	15	9.3
	Doctorate	0	0
Years of experience	0-5	38	23.8
	6-10	25	15.6
	11-15	10	6.3
	16-20	11	6.9
	20+	76	47.5
Nursing position	Staff nurse	140	86.4
	Nurse manager	6	3.7
	Nurse practitioner	7	4.3
	Educator	9	5.5
Unit	Obstetrics	88	54.3
	Neonatal	74	45.7
Tobacco cessation training	Yes	37	22.8
	No	125	77.2
Tobacco cessation training in past 24 months	Yes	15	9.3
	No	147	90.7
Ever smoked	Yes	43	26.5
	No	119	73.5
Current smoke	Yes	6	3.7
	No	156	96.3

Associations among participant characteristics and scores

There were no significant correlations among age, education, years of nursing experience, place of residence (rural vs. urban) and pretest scores for attitude, knowledge, self-efficacy or behavior at baseline (pre-test). Although there were only six nurses who reported they currently smoked, they had significantly higher pre-test knowledge scores than those who did not smoke. Nurses who worked on obstetric units (labor and delivery, postpartum and nursery) had significantly higher pre-test scores on all constructs than nurses who worked in

Table 2. Mean Scores of Construct Subscales at Each Time Point.

	Pre-test		Post-test		Significance Pre to Post	Follow-up		Significance Pre to F/U
	M	(SD)	M	(SD)		M	(SD)	
Knowledge	14.54	(9.9)	26.55	(8.80)	p < .001	25.48	(8.82)	p < .001
Attitude	36.27	(7.68)	40.74	(7.20)	p < .001	37.18	(7.43)	p = .20
Self-efficacy	18.40	(9.28)	18.40	(9.28)	p < .001	25.27	(8.38)	p < .001
Behavior	25.30	(13.35)				30.99	(13.34)	p < .001
Quit-line Referral	1.76	(2.67)				4.00	(3.61)	p < .001

NICU as well as significantly higher change in scores than NICU nurses in: knowledge, $F(1, 111) = 8.821, p = .004$, self-efficacy, $F(1, 111) = 8.250, p = .005$, and behavior scores, $F(1, 111) = 10.925, p = .001$.

Discussion

Results of this study indicated a significant improvement in all constructs immediately after the education program, and a significant improvement in knowledge, self-efficacy and behavior scores, but not in attitude at one month follow up.

Knowledge

According to the Theory of Planned Behavior, knowledge precedes action and clinical education programs are a first step in knowledge translation, the complex process of applying knowledge to practice [16]. The significant improvement in knowledge scores from pre-test to one-month follow-up test indicates that the education intervention was effective in improving perinatal nurses' perceived knowledge toward smoking cessation and relapse prevention counseling. These results are consistent with other studies done with other types of health care providers in which smoking cessation counseling education improved perceived knowledge.

The significant association found between unit where nurse worked and knowledge could be related to a lack of educating NICU nurses about the USPHS's "Treating Tobacco Use and Dependence: Clinical Practice Guideline". A large percentage of participants (77%) reported that they had never had any tobacco cessation training, and before participating in this study were unaware that tobacco use assessment and intervention was an expected part of NICU nursing care.

Attitude and self-efficacy

According to Puffer and Rashidian [17], who explored the utility of the Theory of Planned Behavior in explaining the variance in community nurses use of clinical guidelines, if a person feels that a behavior will produce a desired effect, they will have a positive attitude about performing the behavior. Attitude towards a behavior is closely related to the value a person places on the behavior [18]. Pre-test attitude scores were high, indicating participants started out with positive attitudes towards smoking cessation counseling. This finding is important in that the non-significant increase in attitude score from pre-test to follow-up may be related to the fact that nurses already had positive attitudes toward smoking cessation counseling. This confirms

results of a survey of 387 staff nurses from four hospitals, in which most nurses had positive attitudes regarding their role in providing smoking cessation interventions [18]. Likewise, the significant improvement in self-efficacy scores among these perinatal nurses is consistent with other studies involving nurses employed in other specialties [19].

Behavior

The goal of improving perinatal nurses' knowledge, attitude and self-efficacy toward smoking cessation and relapse prevention counseling is to increase the behavior of counseling postpartum women. Like other health care provider groups, perinatal nurses who attended the brief smoking cessation education program demonstrated significant increases in counseling behavior [20]. Use of the interventions outlined in the HSS "Treating Tobacco Use and Dependence, Smoking Cessation Clinical Practice Guideline" needs to be a standard of care for all postpartum women [7]. However, our results show that few nurses adhere to the 5th A, especially referral to the Quit Line.

Strengths and Limitations

The strength of this study is that it focused on the importance of the postpartum period, a critical time for nurses to take advantage of "teachable moments" to help prevent smoking relapse. The education intervention, although brief, was evidenced based and proved to be easily delivered and well received by nursing administration and staff.

A major limitation of the study was the use of self-reported data with nurses possibly misreporting their level of counseling behavior. Health care providers may over-report the amount of counseling they engage in representing hoped-for rather than actual behavior. There is no objective evidence that the intervention resulted in an actual increase in smoking cessation counseling. Verification of the nurses' self-report with patient interviews or chart audits would have increased the validity and accuracy of self-report, but this was not feasible due to logistical and budgetary constraints.

Implications for future research

This study's findings suggest that the program "Helping Patient's Stop Smoking in Pregnancy and Beyond" improved perinatal nurses' knowledge, self-efficacy and behavior. Additional research is needed to evaluate long term effectiveness of the educational program by assessing change in number of documented quit-line referrals. Results also indicate a need for education developed specifically for NICU

nurses. Finally, long-term patient outcome studies are needed to evaluate the effectiveness of nurse counseling and utilization of quit-lines in the immediate postpartum period.

Conclusion

Perinatal nurses are in the perfect position to provide postpartum women with effective strategies to help them remain tobacco free. The findings in this study are preliminary, but a first step in developing an effective continuing care approach to help women maintain smoking cessation. Reducing postpartum relapse rates not only ensures improvement of women's and their children's health, but also changes the culture of tobacco use being passed on to the next generation.

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