



Impact of a Smoking Cessation Educational Program on Nurses' Interventions

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Abstract

Purpose: To evaluate a brief educational program about smoking cessation on the frequency of nurses' interventions with smokers, and impact of nurses' smoking status on outcomes.

Design: Prospective, single group design with prestudy and 3 months post-study data.

Methods: Nurses in the Czech Republic attended hospital-based 1-hr educational programs about helping smokers quit. They completed surveys about the frequency (i.e., always, usually, sometimes, rarely, never) of their smoking cessation interventions with patients using the five A's framework (i.e., ask, advise, assess, assist, arrange), and their attitudes prior to and 3 months after the course. Demographic data included smoking status.

Findings: Among the 98 nurses with prestudy and post-study data, all were female, mean age was 43 years, 33% were current smokers, and 64% worked in a medical or surgical or oncology settings. At 3 months, compared to baseline, significantly ($p < .05$) more nurses assessed patients' interest in quitting, assisted with quit attempts, and recommended the use of the quitline for cessation. At 3 months after the program, nurses who smoked were less likely to ask about smoking status (odds ratio [OR] = 4.24, 95% confidence interval [CI: 1.71, 10.53]), advise smokers to quit (OR = 3.03, 95% CI [1.24, 7.45]), and refer patients to a quitline (OR = 2.92, 95% CI [0.99, 8.63]) compared to nonsmokers, despite no differences in delivery of interventions at baseline.

Conclusions: Three months after attendance at an educational program focused on the nurses' role in supporting smoking cessation efforts, more nurses engaged in interventions to help smokers quit. However, the program was less effective for nurses who smoked.

Clinical Relevance: This program demonstrated promise in building capacity among Czech nurses to assist with smoking cessation, but nurses' smoking poses a challenge.

The World Health Organization Framework Convention on Tobacco Control (WHO FCTC), the first global health treaty, focuses on reducing the health consequences of tobacco use worldwide (WHO, 2013). Article 14 of the treaty addresses the need for treatment of tobacco dependence and recommends capacity building of all healthcare professionals to meet this need (WHO, 2013). In order for the goals of the WHO FCTC to be realized, nurses, the largest group of healthcare professionals worldwide, need to be educated about tobacco dependence treatment.

Similar to statistics about preventable death worldwide, tobacco use is the main cause of preventable disease and death in the Czech Republic. Approximately 16,000 deaths a year are attributed to tobacco (Peto, Lopez, Boreham, & Thun, 2012); 36.9% of the population ages 15 to 64 years use tobacco (41.3% of men and 32.3% of women), and 24.5% of the population over the age of 15 years are daily smokers (WHO, 2013). This study describes the impact of efforts to educate nurses in the Czech Republic about implementing smoking cessation interventions in clinical practice using a train-the-trainer approach.

Background

Relatively few of the over 1 billion smokers worldwide receive evidence-based assistance with quitting (WHO, 2013). The majority of smokers in the Czech Republic (60%) express a desire to quit, but few healthcare providers are adequately prepared to assist (Sovinova, 2013; Sovinova, Sadilek, & Csemy, 2012). Involving the over 100,000 Czech nurses (Czech Nurses Association, 2013) in delivering smoking cessation interventions could accelerate national efforts to address this major health risk. The importance of the role of nurses in addressing tobacco dependence to reduce non-communicable diseases is supported by policy statements from the 2012 WHO Global Forum for Government Chief Nursing and Midwifery Officers and the fourth triad meeting of the International Council of Nurses, WHO, and the International Confederation of Midwives (WHO, 2012). Nursing intervention to help smokers quit can be effective. A review of 49 randomized trials (Rice, Hartmann-Boyce, & Stead, 2013) found that smokers who receive even minimal intervention from nurses are more likely to quit smoking than those who receive no assistance (relative risk [RR] 1.29, 95% confidence interval [CI] 1.20, 1.39). Similar to the United States (Fiore et al., 2008), a guideline for addressing tobacco dependence treatment in the Czech Republic recommends a five A's approach (i.e., asking about a patient's smoking status, advising smokers to quit, assessing interest in quitting, assisting with cessa-

tion, arranging follow-up) for smoking cessation interventions utilizing social support and pharmacotherapy (Králíková et al., 2005).

Additionally, Czech nurses have a guideline supporting their role and responsibilities in smoking cessation (Malá, Felbrová, Kulovaná, Králiková, & Štěpánková, 2009). Nurses are involved in interventions at the 40 cessation centers in the country (www.slzt.cz/centralecby), a website is available to support quit efforts (www.stop-koureni.cz, www.odvykanikoureni.cz), and smokers have access to a national telephone quitline (paying half-tariff) that provides counseling and support during quit attempts. Nonetheless, support for smoking cessation is still unusual in hospital settings, and nurses are rarely involved, even in providing a brief intervention and referring smokers to the quitline.

Over 70% of third-year nursing students in the Czech Republic believed that health professionals have a role in providing cessation intervention, but only 7.4% received training in nursing school (Warren, Sinha, Lee, Lea, & Jones, 2009). Healthcare providers who receive training about tobacco cessation are more likely to intervene with patients who smoke than those who do not. A meta-analysis of eight studies confirmed that educational programs for healthcare professionals had a positive impact on patients' quitting as assessed by 7-day point prevalence and continuous abstinence (odds ratio [OR] = 1.60, 95% CI [1.26, 2.03]; Hartmann-Boyce, Stead, Cahill, & Lancaster, 2013). The majority of these studies were conducted in the United States, with three in Europe (Scotland, United Kingdom, and Germany), and none in Eastern Europe. None were conducted in hospital-based settings. The analysis did not consider the impact of the healthcare providers' smoking status on outcomes.

A review of 17 randomized trials (three studies included nurses but none focused solely on nurses) evaluating training of health professionals in smoking cessation on patient smoking outcomes at least 6 months after intervention found that those who received education were significantly more likely to intervene with smokers (Carson et al., 2012). Several other studies provide a foundation for educational programs to foster capacity building with nurses. After hospital-based nurses' receipt of a 1-hr educational session based on the five A's, more patients who smoked reported receiving an intervention and quitting 30 days after discharge (Vick, Duffy, Ewing, Rugen, & Zak, 2012). A study targeting hospital-based nurses (Matten et al., 2011) using a 3-hr course based on the Rx for Change[®] program (Corelli et al., 2005) reported improvement in attitudes, knowledge, cessation counseling, and referrals up to 1 year after the program. Nurse-initiated interventions with patients who smoked and received care in an emergency room increased

after an educational program involving 20-min face-to-face training and a 45-min online tutorial focused on brief interventions (Katz et al., 2012).

Smoking among nurses is a barrier to delivery of smoking cessation interventions (WHO, 2012). Smoking among nurses varies worldwide (Smith, 2007), and it is estimated that 40% of female nurses in the Czech Republic smoke, a prevalence that is higher than the female population (E. Králíková, personal communication, June 23, 2011, regarding unpublished data from Králíková, Kmetova, & Rames). The prevalence of smoking among nursing students in the Czech Republic is 33.2%, similar to rates in the region (e.g., Lithuania, 36.6%; Slovakia, 41.8%), and is a serious concern that must be addressed as part of capacity-building efforts to address patients' smoking cessation needs (Warren et al., 2009). Smoking among nurses has been associated with more negative attitudes and decreased involvement in smoking cessation (Lenz, 2008). However, there are minimal data about the impact of healthcare providers' smoking on the outcomes of educational programs on tobacco dependence treatment.

Purpose

The aim of this study was to evaluate a brief hospital-based educational program focused on increasing nurses' delivery of smoking cessation interventions according to the five A's and referral to a quitline, and promoting positive attitudes about their involvement in smoking cessation. We also examined the impact of the nurses' smoking status on program outcomes.

Methods

Design

A prospective design was used to assess changes in self-reported frequency of nursing interventions to support patients' quit efforts in their nursing practice, prestudy and 3 months after a brief educational program. The study was approved by the institutional review board of the principal investigator's institution and the Charles Hospital in Prague, which served as the ethics approval body for all participating hospitals in the country.

Participants and Recruitment

Participants in this study included a convenience sample of nurses from the Czech Republic who attended 1 of 10 educational programs about brief smoking cessation interventions for hospitalized smokers. Nurses at each hospital were invited to attend the educational program

and were recruited to participate in this study by the nurse faculty member who had received special education through a train-the-trainer program. Attending the educational program was not contingent on participation in the study, which was voluntary.

Measures

A survey administered before and after the educational intervention, which included items based on a previously developed and validated questionnaire, "Helping Smokers Quit" (Sarna, Bialous, Ong, Wells, & Kotlerman, 2012a), was used to assess nursing interventions in smoking cessation. Native speakers translated the Czech Republic Helping Smokers Quit (CR-HSQ) survey. Reliability was reestablished by test-retest (93% of the K values were in the acceptable range, i.e., $>.7$). A nine-item subscale evaluated nurses' frequency ("always, usually, sometimes, rarely, or never") of self-reported delivery of smoking cessation interventions using the five A's, plus items about recommending use of a telephone quitline for cessation, recommending tobacco cessation medications, reviewing barriers to quitting for patients unwilling to make a quit attempt, and recommending a smoke-free home. A three-item subscale assessed attitudes about nurses' smoking, involvement in helping patients stop smoking, and need for additional skills or training (rated on a 5-point scale from *strongly agree* to *strongly disagree*). A 13-item subscale evaluated attitudes and confidence in counseling patients to quit smoking (responses on a 5-point scale ranged from *strongly disagree* to *strongly agree*), and a six-item subscale evaluated level of counseling proficiency (responses on a 5-point scale ranged from *poor* to *excellent*) (Corelli et al., 2005). Additional items asked about nurses' sex, age, and smoking status. Nurses were asked if they ever smoked 100 or more cigarettes in their lifetime, and if they smoked now and were classified as current, former, or never smokers. Professional characteristics included work setting and years since their basic nursing educational program. The survey administered before and after the educational program contained the same items.

Educational Program

The 1-hr educational program on the nurses' role in smoking cessation was based on the abbreviated Rx for Change[®] program (Corelli et al., 2005) tailored to nurses in the Czech Republic. The program was delivered by nurses who participated in a 1-day train-the-trainer workshop, developed by the authors, using PowerPoint slides (Microsoft, Inc., Redmond, WA, USA). Content included tobacco epidemiology; principles of dependence;

assessing tobacco dependence and withdrawal symptoms; treatment of tobacco dependence using the five A's; role of the nurse in tobacco dependence treatment; community resources, including the tobacco cessation centers and the telephone quitline; role playing with motivated and unmotivated smokers; and practical steps for implementing the educational program for hospital-based nurses. Subsequently, each workshop attendee received a 46-slide PowerPoint set with a script for each slide based on the content described in the preceding sentence, educational materials such as pamphlets, and informed consent and pre- and postevaluation questionnaires. Trained nurse faculty in eight hospitals throughout the Czech Republic delivered educational programs to their staff nurses (two hospitals ran two programs).

Data Collection

The nurse faculty collected the pretests of the nurses who agreed to participate in the evaluation at each facility. At the time of the 3-month post-test, the nurse faculty sent notices to participants about the need to complete the survey and provided a secure location for submitting the anonymous surveys. After completion, the surveys were sent to a central data collection address in Prague and then to the investigators in the United States.

Data Analysis

Data entry was performed at the University of California at Los Angeles by one of the authors (Brook). All analyses used SAS 9.2 (SAS Institute, Inc., Cary, NC, USA). Descriptive statistics were used to characterize study variables. The primary outcome used to evaluate the program was the change in the nurses' self-reported frequency of cessation interventions and referral of patients to the quitline. Differences between responses about clinical practice before and after the educational intervention were examined using nonparametric sign tests. We used the McNemar test to examine the increase, from baseline to 3 months, in the proportion of nurses who consistently ("always" or "usually") intervened using the five A's and referral to the quitline. Additionally, we compared the frequency of those who consistently ("always" or "usually") intervened with smokers using the five A's, and referred smokers to a quitline by the nurses' smoking status (dichotomized as current vs. former/never smoker). Baseline and 3-month data were analyzed separately for smokers versus nonsmokers using chi-square tests. Subsequently, proportional differences of pre-post change in frequency of use of the various elements of the intervention by smoking status were examined with nested analysis of participants within hos-

Table 1. Demographic and Professional Characteristics of the Nurses (N = 98)

	M (SD)
Age (years)	42.78 (11.49)
Years since graduated from nursing school	24.11 (11.62)
	n (%)
Sex	
Female	98 (100)
Smoking status	
Never	44 (45.36)
Former	21 (21.65)
Current	32 (32.99)
Clinical practice setting	
Medical	27 (27.55)
Oncology	28 (28.57)
Urgent care	14 (14.29)
Intensive care/emergency room	15 (15.31)
Surgical	8 (8.16)
Psychiatric	1 (1.02)
Rehabilitation	3 (3.06)
Obstetrics	2 (2.04)

pitals using generalized estimating equation modeling for dichotomous outcomes. We calculated the OR for the difference in performance between the smokers and nonsmokers at baseline and 3 months.

Results

One hundred fifty-seven nurses completed the baseline survey and 106 completed the 3-month survey. Of these, 98 (62.4% of 157) had both pre- and posttest data and are the subject of this analysis. **Table 1** displays the demographics of the sample. Participants were female, average 43 years of age, and had over 20 years of practice. Almost a third were current smokers. There were no significant differences in demographic characteristics between nurses who completed the 3-month survey and those who dropped out after the baseline.

Three months after the educational program, there was significant improvement in the overall frequency of assessment of a smoker's readiness to quit, the provision of assistance with quitting, recommendations for use of the quitline, and recommendations about medications for cessation. Additionally, significantly more nurses reported reviewing patients' barriers to quitting and recommending a smoke-free home after discharge (**Table 2**). An analysis showed that after the educational program, there was an increase in the percentage of nurses who consistently ("always/usually") assessed smoking status (22.68%, $p = .02$) and referred smokers to the telephone quitline (15.63%, $p = .04$). Nurses reported improved confidence in their overall ability to help smokers

Table 2. Changes in Nurses' Delivery of Smoking Cessation Interventions Before and 3 Months After Attendance of an Educational Workshop

Nurses' tobacco dependence interventions	Baseline <i>n</i> (%)	3 months <i>n</i> (%)	Sign test
Ask a patient's smoking status			.57
Always	49 (50.00)	46 (47.42)	
Usually	12 (12.24)	16 (16.49)	
Sometimes	22 (22.45)	19 (19.59)	
Rarely	9 (9.18)	9 (9.28)	
Never	6 (6.12)	7 (7.22)	
Advise a patient to quit smoking			.21
Always	17 (17.71)	27 (27.55)	
Usually	26 (27.08)	22 (22.45)	
Sometimes	33 (34.38)	33 (33.67)	
Rarely	16 (16.77)	12 (12.24)	
Never	4 (4.17)	4 (4.08)	
Assess patients interest in quit smoking			.002
Always	12 (12.24)	22 (22.68)	
Usually	23 (23.47)	26 (26.80)	
Sometimes	34 (34.69)	28 (28.87)	
Rarely	17 (17.35)	15 (15.46)	
Never	12 (12.24)	6 (6.19)	
Assist a patient quit smoking			.007
Always	13 (13.27)	15 (15.79)	
Usually	13 (13.27)	21 (22.11)	
Sometimes	19 (19.39)	14 (14.74)	
Rarely	26 (26.53)	29 (30.53)	
Never	27 (27.55)	16 (16.84)	
Arrange smoking cessation follow-up			.10
Always	8 (8.16)	5 (5.26)	
Usually	4 (4.08)	6 (6.32)	
Sometimes	6 (6.12)	13 (13.68)	
Rarely	8 (8.16)	11 (11.58)	
Never	72 (73.47)	60 (63.16)	
Recommend the telephone quitline			.03
Always	8 (8.16)	7 (7.29)	
Usually	11 (11.22)	22 (22.92)	
Sometimes	20 (20.41)	23 (23.96)	
Rarely	20 (20.41)	16 (16.67)	
Never	39 (39.80)	28 (29.17)	
Refer to community resources			.03
Always	14 (14.29)	15 (15.96)	
Usually	14 (14.29)	16 (17.02)	
Sometimes	19 (19.39)	26 (27.66)	
Rarely	22 (22.45)	16 (17.02)	
Never	29 (29.59)	21 (22.34)	
Provide medication recommendations			.0007
Always	4 (4.08)	11 (11.96)	
Usually	8 (8.16)	13 (14.13)	
Sometimes	26 (26.53)	24 (26.09)	
Rarely	19 (19.39)	19 (20.65)	
Never	41 (41.84)	25 (27.17)	
Review barriers to quitting			.005
Always	6 (6.12)	8 (8.42)	
Usually	15 (15.31)	22 (23.16)	
Sometimes	29 (29.59)	29 (30.53)	
Rarely	25 (25.51)	21 (22.11)	

*Continued***Table 2.** *Continued*

Nurses' tobacco dependence interventions	Baseline <i>n</i> (%)	3 months <i>n</i> (%)	Sign test
Never	23 (23.47)	15 (15.79)	
Recommend smoke-free home			.02
Always	9 (9.18)	10 (10.31)	
Usually	16 (16.33)	22 (22.68)	
Sometimes	22 (22.45)	23 (23.71)	
Rarely	22 (22.45)	21 (21.65)	
Never	29 (29.59)	21 (21.65)	

quit after the program and assisting patients with quitting (Table 3).

The nurses' smoking status made a difference in the impact of the educational program on delivery of smoking cessation interventions. There were no statistically significant differences in the consistent ("always/usually") delivery of the five A's prior to the educational program between nurses who were current smokers and those who were not. When comparing changes in consistent intervention between smokers and nonsmokers at 3 months, we see significant differences (Table 4). Four times more nonsmokers reported consistently asking about a patient's smoking status. Three times as many nurses who were nonsmokers consistently advised smokers to quit. None of the nurses who smoked consistently arranged for follow-up. Almost three times as many nurses who were nonsmokers consistently recommended use of the telephone quitline as compared to current smokers.

Discussion

This study demonstrates that a brief educational program about nurses' role in smoking cessation can have a positive impact on nursing practice in the Czech Republic. Three months after the program, nurses' self-reported frequency of interventions to help smokers quit and confidence to assist smokers significantly increased. To our knowledge, this is the first study to report the efficacy of such a program for nurses in the Czech Republic. There is over a decade of evidence to support the positive impact of educational programs on clinical practice (Carson et al., 2012), and more recently, on patient outcomes (Hartmann-Boyce et al., 2013). However, few studies have addressed the impact on nursing practice.

In order for tobacco dependence treatment to increase in Eastern Europe, the expansion of educational programs for healthcare professionals is essential. One third of the parties to the WHO FCTC reported that they had no specialized services to assist smokers to quit (Piné-Abata et al., 2013; WHO, 2013). Even a small increase in

Table 3. Changes in Attitudes About Nurses' Ability to Assist Patients With Smoking Cessation Before and 3 Months After an Educational Program on Smoking Cessation

	Baseline n (%)	3 months n (%)	Sign test
Overall ability to help patients quit smoking			.02
Poor	35 (36.08)	28 (29.17)	
Fair	28 (28.87)	21 (21.88)	
Good	30 (30.93)	39 (40.63)	
Very good	4 (4.12)	6 (6.25)	
Excellent	0 (0)	2 (2.08)	
Ability to ask about smoking			.13
Poor	16 (16.49)	15 (15.46)	
Fair	25 (25.77)	22 (22.68)	
Good	30 (30.93)	30 (30.93)	
Very good	17 (17.53)	18 (18.56)	
Excellent	9 (9.28)	12 (12.37)	
Ability to advise patients to quit smoking			.32
Poor	16 (16.49)	17 (17.71)	
Fair	32 (32.99)	29 (30.21)	
Good	37 (38.14)	32 (33.33)	
Very good	9 (9.28)	12 (12.50)	
Excellent	3 (3.09)	6 (6.25)	
Ability to assess patients' readiness to quit			.14
Poor	38 (39.58)	31 (32.98)	
Fair	24 (25.00)	19 (20.21)	
Good	25 (26.04)	38 (40.43)	
Very good	9 (9.38)	3 (3.19)	
Excellent	0 (0)	3 (3.19)	
Ability to assist patients in quitting			.01
Poor	42 (43.30)	28 (29.79)	
Fair	23 (23.71)	22 (23.40)	
Good	23 (23.71)	35 (37.23)	
Very good	7 (7.22)	6 (6.38)	
Excellent	2 (2.06)	3 (3.19)	
Ability to arrange for follow-up			0.86
Poor	62 (63.92)	55 (59.78)	
Fair	13 (13.40)	17 (18.48)	
Good	14 (14.43)	12 (13.04)	
Very good	2 (2.06)	2 (2.17)	
Excellent	6 (6.19)	6 (6.52)	

nursing intervention following attendance at a brief educational program could have a profound impact on helping smokers quit. For example, the over 10% improvement in nurses consistently referring patients to the telephone quitline for cessation support could result in 10 additional smokers out of 100 receiving treatment.

In this study, the cost of the educational program was relatively low, but depended on the support of the hospital administration to release time for the nurses. With rapidly advancing technology, web-based programs focused on smoking cessation may provide nurses easier access to educational programs. A quasi-experimental

study of nurses in the United States demonstrated the efficacy of a webinar in significantly improving referral to the quitlines compared to print materials alone 6 months after participation in the program (Sarna et al., 2012b). A randomized clinical trial of a web-based program tailored for pediatric nurses and respiratory therapists also demonstrated efficacy in improving interventions and attitudes 3 months after the program (Gordon, Mahabee-Gittens, Andrews, Christiansen, & Byron, 2013).

Smoking status of healthcare providers is rarely reported, or considered, in evaluations of educational programs focused on smoking cessation interventions, but it was an important factor in this study. As recommended by the WHO (2012), these data should be collected and analyzed in future studies. Future educational programs could also include support for quitting among healthcare providers. Our findings are similar to findings reporting the negative impact of smoking among nurses on their clinical practice (e.g., Raupach et al., 2012). In countries where smoking prevalence among nurses is high, smoking status should be given special attention.

Limitations

In addition to the convenience sample and the small sample size, there are a number of factors that should be considered in the interpretation of these findings. Without a comparison group, we are unable to confirm if the improvement in the frequency of nurses' interventions was due to attendance at the educational program or other factors. The nurses who attended these programs and completed the surveys may have been more interested in tobacco control than nurses who did not participate, and thus provided more positive responses. The sample size did not allow for subgroup analysis such as the comparison of never, former, and current smokers. Although each nurse faculty who led the workshop was provided with a packet of educational materials, we were not able to guarantee the fidelity of the delivery of the program at each of the hospitals. This study did not assess increases in knowledge per se, or link nurses' self-reported frequency of cessation interventions with changes in the number of smokers who received interventions. Similar to the protocol by Katz et al. (2012), future studies might consider providing a direct feedback loop to nurses about their performance.

Including smoking cessation interventions as a core part of day-to-day nursing care may be a role change for nurses in the Czech Republic, with competing demands on nurses' time. In order to attend the program, nurses

Table 4. Differences in Consistent Interventions^a by the Nurses' Smoking Status Before and After an Educational Program on Smoking Cessation (N = 98)

	Prestudy rate among smokers n (%)	Prestudy rate among nonsmokers n (%)	OR [95% CI]	p	Post-study rate among smokers n (%)	Post-study rate among nonsmokers n (%)	OR [95% CI]	p
Ask	16 (50.00)	44 (67.69)	2.10 [0.88, 4.98]	.09	13 (41.94)	49 (75.38)	4.24 [1.71, 10.53]	.002
Advise	9 (30.00)	33 (50.77)	2.41 [0.96, 6.04]	.06	10 (32.26)	39 (59.09)	3.03 [1.24, 7.45]	.02
Assess	8 (25.00)	26 (40.00)	2.00 [0.78, 5.13]	.15	11 (35.48)	36 (55.38)	2.26 [0.93, 5.46]	.08
Assist	8 (25.00)	17 (26.15)	1.06 [0.40, 2.81]	.90	11 (35.48)	25 (39.06)	1.17 [0.48, 2.84]	.74
Arrange	1 (3.13)	11 (16.92)	6.32 [0.78, 51.30]	.08	1 (3.33)	10 (15.63)	5.37 [0.66, 44.06]	.12
Quitline	3 (9.38)	16 (24.62)	3.16 [0.85, 11.80]	.09	5 (16.13)	23 (35.94)	2.92 [0.99, 8.63]	.05

Note. OR = odds ratio; CI = confidence interval. ^aNested analysis of participants within hospitals using generalized estimating equation modelings for dichotomous outcomes for frequency of interventions: "always/usually" versus "sometimes, rarely, never."

needed to be released from patient care, which might have limited the reach of the program. Additionally, although reported in other studies, validation of the nursing education on patient outcomes in terms of actual quit attempts and abstinence with biochemical verification is warranted.

Conclusions

This positive evaluation of an educational program about smoking cessation for nurses in the Czech Republic is encouraging and enhances our understanding of the potential of brief programs to address this critical health issue. Further study is needed to determine if this or other educational programs should be disseminated to nurses throughout the country and the region. Future research might examine the value added of more comprehensive programs as well as the impact of web-based programs on changing clinical practice. The fact that there was a significant difference in outcomes by nurses' smoking status suggests that educational programs about how to help patients quit smoking implies the need to include efforts to support cessation among healthcare providers as part of capacity-building efforts.

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Clinical Resources

- Tobacco Free Nurses:
<http://www.tobaccofreenurses.org/>
- Smoking Cessation Leadership Center:
<http://smokingcessationleadership.ucsf.edu/>

References

- Carson, K. V., Verbiest, M. E., Crone, M. R., Brinn, M. P., Esterman, A. J., Assendelft, W. J., & Smith, B. J. (2012, May 16). Training health professionals in smoking cessation. *Cochrane Database of Systematic Reviews*, Article no. CD000214. doi:10.1002/14651858.CD000214.pub2
- Corelli, R. L., Kroon, L. A., Chung, E. P., Sakamoto, L. M., Gundersen, B., Fenlon, C. M., & Hudmon, K. S. (2005). Statewide evaluation of a tobacco cessation curriculum for pharmacy students. *Preventive Medicine*, 40, 888–895. doi:10.1016/j.ypmed.2004.10.003
- Czech Nurses Association. (2013). *About our organization*. Retrieved from <http://www.cnaa.cz/en/about-the-company>
- Fiore, M. C., Jaén, C. R., Baker, T. B., Bailey, W. C., Benowitz, N. L., Curry, S. J., . . . Wewers, M. E. (2008, May). *Treating tobacco use and dependence: 2008 update. Clinical practice guideline*. Rockville, MD: U.S. Department of Health and Human Services, Public Health Service.
- Gordon, J. S., Mahabee-Gittens, M., Andrews, J. A., Christiansen, S. M., & Byron, D. J. (2013). A randomized clinical trial of a web-based tobacco cessation education program. *Pediatrics*, 131, e455. doi:10.1542/peds.2012-0611
- Hartmann-Boyce, J., Stead, L. F., Cahill, K., & Lancaster, T. (2013). Efficacy of interventions to combat tobacco addiction: Cochrane update of 2012 reviews. *Addiction*, 108(10), 1711–1721. doi:10.1111/add.12291
- Katz, D. A., Weg, M. W. V., Holman, J., Nugent, A., Baker, L., Johnson, S., . . . Titler, M. (2012). The emergency

- department action in smoking cessation (EDASC) Trial: Impact on delivery of smoking cessation. *Academy of Emergency Medicine*, 19, 409–420.
doi:10.1111/j.1553-2712.2012.01331.x
- Králíková, E., Býma, S., Cífková, R., Češka, R., Dvořák, V., & Hamanová, J. (2005). Doporučení pro léčbu závislosti na tabáku [Guidelines for treatment of tobacco dependence]. *Časopis lékařů českých*, 144, 327–333.
- Lenz, B. K. (2008). Beliefs, knowledge, and self-efficacy of nursing students regarding tobacco cessation. *American Journal of Preventive Medicine*, 35(Suppl.), S494–S500.
- Malá, K., Felbrová, V., Kulovaná, S., Králíková, E., & Štápanková, L. (2009). *Guidelines for smoking cessation*. Czech Association of Nurses and Society for Treatment of Tobacco Dependence. Retrieved from <http://www.slzt.cz/odborna-doporuceni>
- Matten, P., Morrison, V., Rutledge, D. N., Chen, T., Chung, E., & Wong, S-F. (2011). Evaluation of tobacco cessation classes aimed at hospital staff nurses. *Oncology Nursing Forum*, 38, 67–73.
- Peto, R., Lopez, A. D., Boreham, J., & Thun, M. (2012). *Mortality from smoking in developed countries 1950–2000 or later, updated March 2012*. Retrieved from www.ucts.ox.ac.uk/~tobacco/
- Piné-Abata, H., McNeill, A., Murray, R., Bitton, A., Rigotti, N., & Raw, M. (2013). A survey of tobacco dependence treatment services in 121 countries. *Addiction*, 108, 1476–1484. doi:10.1111/add.12172
- Raupach, T., Falk, J., Vangeli, E., Schiekirka, S., Rustler, C., Grassi, M. C., . . . & West, R. (2012, September 24). Structured smoking cessation training for health professionals on cardiology wards: A prospective study. *European Journal of Preventive Cardiology*. doi:10.1177/2047487312462803
- Rice, V., Hartmann-Boyce, J., & Stead, L. F. (2013). Nursing interventions for smoking cessation. *Cochrane Database of Systematic Reviews*, Issue 8, Art. No.: CD001188. doi:10.1002/14651858.CD001188.pub4
- Sarna, L., Bialous, S., Ong, M., Wells, M., & Kotlerman, J. (2012a). Nurses' treatment of tobacco dependence in hospitalized smokers in three states. *Research in Nursing and Health*, 35, 250–264. doi:10.1002/nur.21476
- Sarna, L., Bialous, S. A., Ong, M. K., Wells, M., & Kotlerman, J. (2012b). Increasing nursing referral to telephone quitlines for smoking cessation using a web-based program. *Nursing Research*, 6, 433–440. doi:10.1097/NNR.0b013e3182707237
- Smith, D. (2007). A systematic review of tobacco smoking among nursing students. *Nurse Education in Practice*, 7, 239–302. doi:10.1016/j.nepr.2006.09.003
- Sovinova, H. (2013). *Czech Republic 2011 country report: Global health professions student survey (GHPSS)*. Retrieved from http://www.szu.cz/uploads/documents/czpz/zavislosti/koureni/2013/GHPSS_Country_Report.CR.pdf
- Sovinova, H., Sadilek, P., & Csemy, L. (2012). Smoking prevalence in the adult population of the Czech Republic and opinions and attitudes to smoking in the population (1997–2011). National Institute of Public Health. Retrieved from <http://www.szu.cz/tema/podpora-zdravi/studie-kuractvi?highlightWords=koureni>
- Vick, L., Duffy, S. A., Ewing, L. A., Rugen, K., & Zak, C. (2012). Implementation of an inpatient smoking cessation programme in a Veterans Affairs facility. *Journal of Clinical Nursing*, 22, 866–880. doi:10.1111/j.1365-2702.2012.04188.x
- Warren, C. W., Sinha, D. N., Lee, J., Lea, V., & Jones, N. R. (2009). Tobacco use, exposure to secondhand smoke, and training on cessation counseling among nursing students: Cross-country data from the Global Health Professions Student Survey (GHPSS), 2005–2009. *International Journal of Environmental Research and Public Health*, 6, 2534–2549. doi:10.3390/ijerph6102534
- World Health Organization. (2012). Enhancing nursing and midwifery capacity to contribute to the prevention, treatment, and management of noncommunicable diseases. *Human Resources for Health Observer*, Issue No. 12. Retrieved from <http://www.who.int/hrh/resources/observer12/en/index.html>
- World Health Organization. (2013). *WHO report on the global tobacco epidemic*. Retrieved from http://www.who.int/tobacco/global_report/2013/en/