Beliefs, Knowledge, and Self-Efficacy of Nursing Students Regarding Tobacco Cessation

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Introduction: Evidence-based clinical interventions for smoking cessation have proven to be effective in reducing smoking rates among patients who use tobacco. Ensuring that registered nurses (RNs) are knowledgeable and have the self-efficacy to provide such clinical interventions can contribute to declines in tobacco use among their patients who smoke. The aim of this study was to determine if baccalaureate nursing (BSN) students in Minnesota received training in the clinical treatment of tobacco dependence and to identify perceived barriers that may limit their ability to intervene with their patients.

Methods: Quantitative descriptive, with data collected in spring of 2007. The sample was 675 senior BSN students enrolled in ten Minnesota private and public institutions. The survey questionnaire included demographics, knowledge about tobacco treatment, personal tobacco-use history, beliefs about smoking, self-efficacy, and behavioral application of cessation intervention.

Results: BSN students generally reported that they were comfortable assessing tobacco use among their patients and referring tobacco users to cessation resources. Nursing students who considered themselves smokers (7.9%) and who reported using tobacco in the last 30 days but did not consider themselves smokers (17.5%) indicated more agreement regarding the positive aspects of smoking, and were less likely to view it as their professional responsibility to help smokers quit, than did non-smoking nursing students (74.6%).

Conclusions: Nursing students' personal smoking behaviors affected their beliefs about smoking and their view about the professional role in helping smokers quit. These findings have implications for undergraduate nursing programs regarding professional role socialization and education about clinical smoking cessation interventions.

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Introduction

Expanding tobacco dependence treatment efforts to include a variety of healthcare providers has the potential to increase the numbers of smokers receiving such treatment.[1,2] Registered nurses constitute the largest group of health professionals in the U.S. and are employed in variety of settings such as schools, colleges, community and mental health settings, and others.[3] Nurses typically spend more direct time with patients, and their legal scope of practice includes the performance of assessment, case finding, health teaching, counseling, and referral to resources; necessary functions to intervene in tobacco dependence treatment.

Registered nurses are in pivotal positions to provide tobacco-cessation interventions, but to intervene effectively they need to be knowledgeable about tobacco use, dependence, and its treatments. Nurses must perceive that the benefits outweigh the barriers of taking action and have the belief that they are capable of providing cessation interventions. Nursing programs provide the opportunity to develop in students the requisite knowledge, belief system, and self-efficacy regarding tobacco dependence treatment.

Nursing curricula related to tobacco-cessation content has been limited. Researchers using an Illinois sample[4] and a national sample[5] found that the majority of curricula in nursing programs focused on the health effects of tobacco. Undergraduate students lacked content regarding clinical tobacco treatment techniques. These findings were similar to a study of Kansas nursing programs,[6] and a related study[7] that reported that students who smoked provided less frequent counseling than the nonsmoking students and many had misperceptions about tobacco dependence interventions.

Although curriculum is an essential component, there may be additional barriers that affect the role

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nurses make in the provision of tobacco treatments, including smoking by nurses. In a survey of 4000 randomly selected practicing oncology nurses in the U.S., among the 39% who responded, 7% were current smokers, 30% were former smokers, and 63% never smoked.[8] Nurses who were current smokers reported significantly different attitudes toward involvement in tobacco-control activities. Importantly, fewer smokers (81%) thought that nurses should set a good example for their patients by not smoking as compared to nonsmokers (89%).

Another potential barrier may be the students' own beliefs regarding tobacco-cessation treatment and its benefit, as well as their self-efficacy in providing effective interventions. A convenience sample of 424 undergraduate nursing students was used at Ohio State University to describe their beliefs about cigarette smoking and use of evidence-based tobacco treatment interventions.[7] From the 200 surveys returned, a common inaccurate perception was found: that brief tobacco treatment counseling did not have an effect on improving smoking quit rate (61.2%). The highest level of confidence expressed by students regarded informing smokers of the general health risks of smoking (86.2%). The lowest confidence levels regarded giving advice about medications at 63.7%.

The purpose of this descriptive research study was to examine nursing students' beliefs about smoking, knowledge about tobacco use and tobacco dependence interventions, self-efficacy to intervene with their patients who use tobacco, and perceived barriers and benefits to delivering tobacco-cessation interventions.

Methods

The theoretical framework was based on the health belief model, which provides a framework to examine perceived barriers, perceived benefits, and self-efficacy for exploring why some nurses take action and others fail to provide tobacco-cessation interventions.[9,10] Four main constructs of the health belief model (perceived threat, knowledge, perceived barriers and benefits, and self-efficacy) were used to select specific variables as conceptualized within the model.

Setting and Sample

All Minnesota Baccalaureate Nursing (BSN) programs that had students in their senior year of coursework during spring semester 2007 were eligible to participate. This included seven private and four public higher education institutions (N=11); they have no affiliation and independently develop and implement their curriculum. Recruitment was done via e-mail with a follow-up phone call to program directors inviting them to participate. All but one (n=10) agreed to participate. IRB approval was obtained from the principal investigator's institution and additional approval of participating institutions when required.

Site visits were made to each institution. After informed consent was received, the paper survey was administered to senior nursing students in their classroom during or immediately following a required course. Excluded from the sample were BSN programs that are mobility or career laddering programs that advance associate degree (AD) nurses to baccalaureate degrees (BS/BA).

The survey consisted of a 46-item questionnaire on knowledge about tobacco treatment, tobacco-use history, beliefs about smoking, self-efficacy and behavioral application of cessation interventions, and demographic items.

Demographic characteristics are described in Table 1; other collected data included highest level of education, previous licensure, employment and income, and marital status. Tobacco-use history was measured using the National College Health Risk Behavior Survey tobacco questions including age of acquisition, numbers of previous quit attempts, current level of use, and perception of peer use.[11]

Beliefs about smoking were measured using eight of the 18 items from the Attitudes Towards Smoking Scale (ATS-18).[12] The ATS-18 uses a 5-point Likert scale to measure positive and negative beliefs about cigarette smoking (totally disagree to fully agree). Five negative and three positive aspects were chosen and included: smoking is extremely dangerous to one's health, leaves an unpleasant smell, gives one very bad breath, is bad for one's skin, calms a person down when upset, makes one able to concentrate better, feels good, and secondhand smoke is dangerous to those around the smoker. Etter et al.[12] validated the scale for current and former

Table 1. Frequencies of demographic variables (n=657)

Variable	Percentage
Gender	
Female	90.9
Male	9.1
Ethnicity	
Caucasian	92.5
Black (non-Hispanic)	1.7
American Indian	0.8
Hispanic	0.9
Asian/Pacific Islander	2.9
Other	0.5
Age (years)	
18–25	82.5
26–35	12.6
36–45	4.4
≥46	0.3
Type of college	
Public	50.4
Private	49.3
Location of college	
Minneapolis/St Paul	68
Outside Minneapolis/St Paul	32
Age of first tobacco use	
<17	33
17–20	16.7
≥21	3.6
Do you consider yourself a smoker	
No	91.8
Yes	8.2
Tobacco use in the last 30 days	
No use	82.5
1–9 days	10.4
Use on 10 or more days	7.0

smokers with reference to criteria of content, construct, and predictive validity.

Knowledge of tobacco treatment was measured using a seven-item tool developed and implemented by Fried et al.[13] to measure students in medicine, dentistry, and nursing; it was adapted for this study. Items were measured using a 5-point Likert scale (totally disagree to fully agree) and include: my program contains content about the health effects of tobacco-related diseases, effects of secondhand smoke, symptoms of withdrawal from nicotine, content about my role in helping patients quit, prepared me to help smokers quit, gave me an opportunity to practice cessation counseling skills during a clinical experience, and help spit tobacco users quit.

Self-efficacy and application of cessation interventions was measured using the Modified 5A's Training Program Survey.[14] Content was validated by a panel of experts prior to pilot testing and administering the tool. Items were measured on a 5-point Likert scale (not at all comfortable/confident, somewhat comfortable/confident, moderately comfortable/confident, very comfortable/confident, and extremely comfortable/confident) and included how comfortable are you in regards to asking your patient on admission if they smoke, if they are exposed to secondhand smoke, advise a patient who smokes to quit, assess readiness to quit smoking, set a quit date, provide cessation literature, assist patient with nicotine replacement, arrange for follow-up support. In addition, three items were added to the scale that asked about the nurse's role using a 4-point Likert scale (strongly agree to strongly disagree). These included: if it is a nurse's professional responsibility to help smokers quit, if the nurse benefits a patient by taking action to help them quit, and if there are too many barriers to prevent the nurse from helping the patient quit.

Statistical analysis was completed with SPSS. Descriptive statistics were performed on all variables. Inferential procedures included ANOVA between and within subgroups, followed by post-hoc tests using the Levine's test to determine the appropriate test. Games-Howell test was completed where equal variances could not be justified and the Tukey honestly significant difference (HSD) when variances were assumed to be equal when indicated. Results were considered statistically significant when $p<0.05$. Due to the large sample size, drawn from the total population, adjustment in statistical tests for multiple unplanned comparisons was not necessary.

Results

From the ten participating institutions, a total of 675 (87%) senior nursing students were recruited with 102 (13%) choosing not to take part or absent from class. There were seven institutions for which the participation rate was 91%–100%, and three had rates of 83%, 70%, and 66%. Following data cleaning, the total number was 657 (Table 1).

Two items asked about smoking: *do you consider yourself a smoker*, and *during the past 30 days how many days did you use* (Table 1). Responses to these two items became the dependent variable and divided participants into three groups: Group 1: smokers who said *yes* they used and reported use within the past 30 days; Group 2: occasional smokers who said *no* they didn't use but reported use within the past 30 days; and Group 3: nonsmokers who said *no* they didn't use and did not report use. Three-way ANOVAs were completed on responses to tobacco-related knowledge, attitudes, beliefs, and self-efficacy variables.

Beliefs About Smoking

Table 2 shows the mean scores and standard deviations among the three groups; smokers, occasional smokers, and nonsmokers for their *beliefs about smoking* items. Mean scores for the negative aspects, for all groups, were above 4.0, which indicated that the groups agreed with the negative aspects. The scores on the three positive aspects of smoking, in comparison, differed by group. The smoking group means ranged between 3 and 4, which indicated that they more or less agreed with the statements, whereas the nonsmoker group

Table 2. Beliefs about tobacco: distribution of variables

	Smoker (n=50)		Occasional (n=64)		Nonsmoker (n=538)		ANOVA variable	Post-hoc analysis		
Variables	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**	p	**Smoker**	**Occasional smoker**	**Nonsmokers**
Negative aspects										
Smoking is extremely dangerous to one's health	4.64	0.56	4.72	0.519	4.86	0.45	0.001		−0.079	**−217**
Leaves an unpleasant smell	4.70	0.61	4.88	0.33	4.91	0.46	0.011		−0.175	−0.205
Gives one bad breath	4.36	0.90	4.72	0.68	4.83	0.53	0.000		−0.359	**−0.471**
Secondhand smoke is dangerous to those around	4.68	0.55	4.69	0.56	4.85	0.49	0.006		−0.008	−0.169
Smoking is bad for one's skin	4.35	0.78	4.48	0.73	4.67	0.67	0.001		−0.137	**−0.325**
Positive aspects										
Smoking calms a person	3.86	0.90	3.35	0.94	2.96	1.0	0.000		**0.511**	**0.901**
After smoking one is able to concentrate	3.10	0.98	2.41	0.79	2.24	0.96	0.000		**0.696**	**0.857**
It feels good to smoke	3.73	0.93	2.47	1.0	1.97	1.1	0.000		**1.266**	**−1.766**

Note: Boldface numbers indicate significant difference.

Table 3. Knowledge about tobacco: distribution of variables

Variables	Smoker (n=50) Mean	SD	Occasional (n=64) Mean	SD	Nonsmoker (n=538) Mean	SD	ANOVA variable p	Post-hoc analysis: Smoker	Occasional smoker	Non-smoker
My nursing program contains content about the health effects of tobacco-related diseases.	4.36	0.898	4.38	0.792	4.35	.812	0.945		0.021	0.014
My nursing program contained content on the effects of secondhand smoke.	3.74	1.139	3.92	1.112	3.87	1.049	0.639		−0.181	−0.134
My nursing program contained content of symptoms of withdrawal from nicotine.	3.00	1.309	3.60	1.212	3.56	1.115	0.004		**−0.603**	**−0.557**
My health professional program contained course content about my role in helping tobacco-using patients quit.	3.48	1.129	3.71	1.038	3.59	1.095	0.518		−0.234	−0.110
I feel that my program adequately prepared me to help smokers quit.	2.64	1.174	2.97	1.116	2.97	1.066	0.120		−0.328	−0.328
My program gave me the opportunity to practice tobacco-use cessation counseling skills during a clinical experience.	2.20	1.143	2.59	1.173	2.54	1.198	0.137		−0.387	−0.342
I feel that my program adequately prepared me to help spit tobacco users quit.	2.20	1.088	2.35	1.194	2.28	1.045	0.758		−0.149	−0.076

Note: Boldface numbers indicate significant difference between groups.

means were consistently below 2, which indicated that they did not agree with the positive aspects of smoking.

All eight variables were identified as significant from the ANOVA analysis. Table 2 depicts the mean differences found in the post-hoc analysis. Significant differences were found between the smokers and nonsmokers, for three of the five negative aspect variables: smoking being extremely dangerous for one's health, smoking gives one bad breath, and smoking being bad for one's skin. For all of the positive aspects, significant differences were found among the groups: smoker, occasional smoker, and nonsmoker.

Knowledge About Tobacco

Table 3 shows the means and standard deviations for the three groups on these items on the *knowledge about tobacco* scale. The item, my program contained contents about the health effects of tobacco-related disease, had the highest mean at 4.3, which indicated that participants agreed. The lowest means ranged between 2 and 3 and indicated that participants did not agree that: the program adequately prepared me to help smokers quit, gave me an opportunity to practice during clinical, and prepared me to help spit tobacco users quit.

One item was significant in the ANOVA analysis. The post-hoc test, as shown in Table 3, indicated that the smokers compared to nonsmokers differed in their perception that their programs contained content about the symptoms of withdrawal from nicotine.

Self-Efficacy and Behavioral Application of Tobacco

Table 4 depicts both the mean and standard deviations for the self-efficacy and behavioral application scale. The highest means were on the two items regarding how comfortable students were about asking their patients' smoking status and about patient's exposure to secondhand smoke. Participants were very comfortable asking these questions. The remaining items had means in the range of 3 to 4, which indicated that participants were moderately comfortable with these activities.

Results for the items about the role of the professional nurse as well as the benefits and barrier are shown in Table 4. The item about the role of the professional nurse to help smokers quit had a mean of 3.44, which indicated that participants agreed that it was a nurse's role. The lowest mean was 2.0: there are too many barriers to prevent me from helping my patients to quit. This indicates that participants did not agree that there were too many barriers.

The ANOVA p-values and post-hoc test results are shown in Table 4. Two of the group means differed significantly in regards to: it is a nurse's professional responsibility to help smokers quit. Smokers were less likely to indicate agreement, as compared to nonsmokers.

Discussion

The students as a whole indicated that their programs provided tobacco-cessation education and established a baseline for future evaluation. Additionally, the results validated the assumption that the smoking status of students was a perceived barrier in providing cessation intervention.

The student demographics from the ten sampled institutions were primarily Caucasian, female, and aged <26 years, and included 87% of the BSN student total population in Minnesota at the time of the survey.

Table 4. Self-efficacy tobacco variables

Variables	Smoker (n=50) Mean	Smoker (n=50) SD	Occasional (n=64) Mean	Occasional (n=64) SD	Nonsmoker (n=538) Mean	Nonsmoker (n=538) SD	ANOVA variable p	Post-hoc analysis: Smoker	Post-hoc analysis: Occasional smoker	Post-hoc analysis: Nonsmoker
How comfortable are you in regards to asking your patient on admission if they smoke.	4.58	0.642	4.49	0.716	4.44	0.710	0.356		0.088	0.142
In regards to asking your patient on admission if they are exposed to secondhand smoke.	4.44	0.760	4.52	0.759	4.49	0.661	0.807		−0.084	−0.051
Advise your patient who smokes to quit.	3.55	1.08	3.43	0.911	3.32	0.991	0.240		0.122	0.229
Assess your patient who smokes readiness to quit smoking in the next 2 weeks.	3.43	1.16	3.32	0.964	3.14	1.03	0.091		0.111	0.291
Assist your patient who is ready to stop smoking set a quit date in the next 2 weeks.	3.61	1.12	3.35	0.936	3.25	1.02	0.053		0.263	**0.360**
Assist your patient who smokes by providing smoking cessation literature.	4.12	0.781	3.83	0.908	3.82	0.948	0.101		0.297	0.297
Assist your patient who wants to quit smoking by using nicotine patches, lozenges, or gum.	3.82	0.950	3.73	1.02	3.64	0.957	0.402		0.086	0.175
Encourage your patient who has set a smoking quit date to arrange follow-up support with a friend, family member, or your doctor.	3.98	0.829	3.76	0.979	3.67	0.963	0.084		0.218	**0.309**
As a nurse, it is my professional responsibility to help smokers quit.	3.18	0.565	3.39	0.613	3.44	.606	0.019		−0.210	**−0.253**
I benefit my patient by taking action to help them quit smoking.	3.43	0.540	3.45	0.563	3.57	.525	0.071		−0.023	−0.140
There are too many barriers that prevent me from helping patients to quit smoking.	2.10	0.692	2.16	0.700	2.03	.635	0.246		−0.055	0.078

Note: Boldface numbers indicate significant difference.

These demographics are similar to other studies from northcentral U.S. and Canada.[15–17]

The majority were nonsmokers with 7.9% smokers. When asked about tobacco use in the past 30 days, 17.5% reported use, with 40% of those reporting use on 10 or more days in the past 30 days. This is similar to findings reported by Chalmers et al.[17] According to Caraballo et al.,[18] the occasional smokers do not smoke daily; or smoke just a few per day when they do smoke.

The students were comfortable with assessing patients for smoking or exposure to secondhand smoke, and referring patients to resources. Students reported that their programs did not provide an opportunity to practice cessation counseling skills, and their programs had not prepared them adequately to help smokers or spit-tobacco users quit.

Nonsmokers and occasional smokers agreed that their programs provided content about nicotine withdrawal, but smokers did not. This difference may be associated with one's belief rather than knowledge. Nicotine withdrawal is a negative aspect of smoking, and smokers may deny or disbelieve the negative aspect. A major finding was the significant differences among the three groups of students regarding their beliefs about smoking. Smokers and occasional smokers, as compared to nonsmokers, reported more agreement with the positive aspects of smoking typically associated with the psychoactive benefits or pleasures of smoking. Regarding the significant negative aspects of smoking, the differences were found between the smokers and nonsmoker, which may be attributed to the nonsmokers' motivation to not use, whereas smokers, in choosing to use tobacco, may deny these negative aspects. More research regarding students' smoking beliefs is needed for comparison of results.

The last major finding was the significant difference between smokers and nonsmokers regarding the item: as a nurse, it is my professional responsibility to help smokers quit. Smokers disagreed. Similar findings were reported in a study of 1256 oncology nurses.[8] Smokers were less likely to endorse tobacco-control resolutions and the concept of the nurse as a nonsmoking role model. The average age of the respondent was 44.1 years old (SD=9); the majority of these nurses were

found to have initiated tobacco use at aged <18 years (57%), with 36% initiating between 18 and 21 years, and 7% initiating over 21 years.

The health belief model,[9,10] used as the framework, identifies knowledge about a disease or health condition as an essential element of perceived susceptibility. The students, regardless of their own smoking behavior, reported similar knowledge preparation and agreed that their programs provided this content, and they felt comfortable with this. What was perceived as lacking was the application of these skills in the clinical setting. As nursing is a practice profession, the skill element of learning is considered an essential component of nursing education.

A second component of the health belief model, are the perceived benefits and barriers individuals perceive to taking action. Potential barriers include one's own attitude or belief system and/or personal experience with the disease or behavior. Nonsmokers demonstrated consistent viewpoints between their professional role and personal beliefs about smoking whereas the smokers' beliefs supported their personal smoking behaviors. Beliefs, which are learned in both conscious and unconscious ways, become part of a person's makeup and these beliefs influence choices and behavior whether or not one is conscious of the values guiding the choices.[17] It can be extrapolated these students will continue to make the same choices upon entry into practice.[9,19] This tenet is supported by Sarna et al.[8] in her study of practicing nurses. Nurses who smoked did not place the same value on the importance of tobacco control and were less likely to support intervention.

The findings of the study have implications for undergraduate nursing education. Nurse educators should strive to reduce the perceived barriers which limit students from taking action with their smoking patients.[9,10] Teaching strategies cannot be based solely on imparting knowledge or information,[14] one's belief system or attitude needs to be addressed. Unhealthy lifestyle choices, such as smoking, are part of students' and nurses' lives. These choices color nurses' perception when promoting health for their patients.

The more an individual internalizes the professional role, the more likely will be that nursing interventions will be based on what is in the best interest of the patient rather than responding from personal motivations. The role of the professional requires one to transcend the individual belief system to provide standardized, effective, patient-centered care. The process of student self-discovery and reflection on their values and choices could potentially socialize students to a closer fit to "walk the talk" of professional role responsibility despite personal held beliefs.[19]

Professional organizations and state boards of nursing need to develop minimal competencies and standards. Competencies or standards ensure consistent quality. Through professional regulation, quality improvement could be incorporated into nursing curriculum changes as well as healthcare agencies.

There is a need for future research regarding effective methods for teaching students about tobacco cessation including clinical or simulated practice situations, as well as setting aside one's own belief system as a professional. Research regarding students who quit smoking and their view is needed.

Limitations of this study include the potential for respondent bias. The survey was completed in the presence of the researcher and this may have affected the social acceptability. Measurement validity could be a limitation as only eight of the 18 items were used from the ATS-18 validated instrument. There was only one psychometric measurement tool used, which does not allow for validation of responses. While each nursing program is nationally accredited, there is variability in teaching methods, content emphasis, faculty expertise, and clinical experiences. Finally, there may be potential sampling error in regards to the higher rate of nonparticipants from three of the ten institutions.

In summary, this study demonstrates that smoking behavior influences the future nursing workforce. Young adults, although smoking for only a few years, perceive the role as a nurse in providing patient smoking cessation intervention differently than nonsmokers. Nurse educators must acknowledge this disparity and incorporate this into their teaching methods. Opportunities to practice these interventions skills during clinical experiences, while they are still in the student role, should be included as part of the nursing education experience.

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