

International Journal of Nursing and Health Care Research

de Gravelles PV and Barone C. Int J Nurs Health Care Res 4: 080.

DOI: 10.29011/IJNHR-080.1000080

Research Article

Findings of the Global Health Professions Student Survey (GHPSS) of Baccalaureate Nursing Programs in Arkansas

Pamela V. de Gravelles*, Claudia Barone

College of Nursing, University of Arkansas for Medical Sciences, Little Rock, Arkansas, USA

***Corresponding author:** Pamela V. de Gravelles, College of Nursing, University of Arkansas for Medical Sciences, 4301 Markham, #529, Little Rock, Arkansas 72205-7199, USA. Tel: +1-5016867967; Email: pvdegravelles@uams.edu

Citation: de Gravelles PV and Barone C (2019) Findings of the Global Health Professions Student Survey (GHPSS) of Baccalaureate Nursing Programs in Arkansas. Int J Nurs Health Care Res 4: 080. DOI: 10.29011/IJNHR-080.1000080

Received Date: 28 March, 2019; **Accepted Date:** 29 April, 2019; **Published Date:** 04 May, 2019

Introduction

Tobacco use is killing and maiming 20% of the world's population [1,2]. It is responsible for the premature death of half of all of its lifetime users, chronic illnesses of the survivors, and 1/5 of U.S. mortality [3-6]. For every person who dies from smoking, 20 will be rendered chronically ill, developing one of the world's four major Non-Communicable Diseases (NCDs): cardiovascular diseases, chronic respiratory diseases, cancers, and type II diabetes mellitus [7-9]. It is recognized as a major contributor to the world's mortality and morbidity has been a priority of the world's health organizations for decades and is most recently being recognized by the United Nations' (UN) Millennium Development Goals (MDG) as the common denominator between all NCDs and a barrier to worldwide human sustainability.

The groundwork of tobacco control programming has been laid over the past 50 years and is evidence-based and policy supported [10]. Public policy has become more sensitive to the harms of tobacco use over the years resulting in laws that have increased sales taxes on cigarettes, the initiation of statewide tobacco control programs many of which are supported by funding from the Master Settlement Agreement (MSA). These changes have resulted in decreased tobacco use and increased negative attitudes about smoking in public areas, smoking at home, the availability of tobacco products to minors, attitudes about tobacco-free promotions and tobacco product advertising [10-14]. One of the most successful and cost-effective interventions is tobacco cessation counseling with health care providers armed with a working knowledge of treating tobacco use and dependence; The Clinical Practice Guideline 2008 Update (The Guideline), the evidence-based set of tobacco control measures developed and validated by the USDHHS [15]. The Guideline is available to all

but taught by few (30%) leaving professional health care providers unprepared to enter their respective professions prepared to address the vast population of tobacco users [4,15-17]. This preparation is especially important because chronic conditions resulting from tobacco use brings 70% of all smokers to their health care providers at least once a year presenting a tremendous opportunity to affect smokers' outcomes. However, patients are not consistently being screened for tobacco use - only 50% during physician visits and even fewer (25%) during dental care [15,18,19].

Nurses are the largest group of health care providers in the world, have been proven to be effective tobacco control providers, are present during office visits and hospitalizations, have an opportunity to impact this population, but do not act on this opportunity primarily due to a lack of education and proficiency providing evidence-based tobacco control measures [20,21]. Perhaps far more problematic than being uneducated in The Guideline, is the fact that nurses and nursing students smoke - creating a personal barrier against initiating urgent and required tobacco cessation counseling. Tobacco use is harmful to the nurse and the patient and is inconsistent with the ideals of the profession [22-35]. There are 17.2 million nurses in the world and 15.9% smoke [36]. There are 2.6 million Registered Nurses (RN) in the U.S [37-39] and of those, approximately 10.7% are current smokers. This is only slightly less than the 12% tobacco prevalence goals of Healthy People 2010 and 2020. It must be noted that these numbers only reflect practicing nurses. The number of nursing students who are current smokers, other tobacco product users, or dual users, is unknown.

Given the worldwide plea to control and prevent the devastating consequences of tobacco use, and given that health care professionals are not implementing tobacco control measures

using The Guideline, and the gap in research regarding the tobacco use of nursing students in the U.S., it was necessary to begin a national survey of health professional students in the U.S. beginning with Arkansas. Tobacco prevalence in the state of Arkansas is 27% [40] and significantly higher than the national prevalence (19.3%) making it one of the highest the nation. There are 11 BSN Nursing programs representing all geographical locations in the state. Arkansas was chosen for the study because of the state's high tobacco prevalence, geographical locations of the nursing programs and lack of student surveillance about any areas of their tobacco use.

Keywords: Global Health Professional Students Survey (GHPSS); Nursing students; Tobacco control; Tobacco use

Aims

The aims of the study included determining the feasibility of using the standardized methodology of the GHPSS in Arkansas; creating a comprehensive baseline description of 3rd year BSN nursing student tobacco use as defined by the six categories of the GHPSS; and finally, examining relationships between types of tobacco product(s) used and gender, size of school - small, medium and large and types of tobacco product(s) used, tobacco use and desired nursing specialty, view of nurse as healthy role model to the patients and the public, by gender, and by tobacco product use; and degree of nicotine dependence and view of nurse's role to routinely advise tobacco users to quit.

Methods

Design and Sample

This was a cross-sectional descriptive pilot study design using the standardized sampling methodology of the GHPSS. All third-year unlicensed BSN nursing students scheduled to graduate in the next 12-24 months were eligible to participate in the study and offered the opportunity to complete the 62 question survey. Nursing students who could not read or speak English were excluded. All college or university-based BSN programs with students meeting the standardized study criteria were eligible to participate in the study which met the criteria of the survey instrument.

Instrument

The Global Health Professional Study Survey (GHPSS) was chosen because it contains a comprehensive set of questions about tobacco use by nursing students. It was developed in 2005, revised in 2007 and consists of 42 questions grouped by (a) Prevalence; (b) Exposure to second hand smoke; (c) Attitudes; (d) Behavior/Cessation; (e) Curriculum/Training; and (f) Demographics. The initial reliability study of the GHPSS was conducted in the U.S. in 2005 using two methodologies, the Question Appraisal System (QAS)

and cognitive testing. The results of this study produced the final core questions of the GHPSS. The reliability study data were analyzed at the Research Triangle Institute but the findings are no longer available (Dr. Allen, personal communication, December 7, 2011).

Global monitoring of the health professional student population began in 2004 using a school-based, self-administered, anonymous, and valid questionnaire with a standardized methodology - the Global Health Professionals Student Survey (GHPSS) [35,41,42]. The survey was designed by the World Health Organization (WHO), the U.S. Centers for Disease Control and Prevention (CDC), and the Canadian Public Health Association (CPHA) as part of the Global Tobacco Surveillance System (GTSS). This researcher could find no literature reporting its use in the U.S. which was substantiated by personal communication with the CDC Office on Smoking and Health on Dec, 13, 2011. The standardized methodology of the GHPSS remedies major weaknesses of tobacco research to date: inconsistent sampling methods, instrumentation and data collection procedures, and fosters global comparison [35]. It is imperative that nursing support the ideals of the GTSS by using the GHPSS to identify and monitor the prevalence, tobacco use behaviors, attitudes, beliefs, education in tobacco information and cessation techniques and harmful exposure to SHS. The six categories of the GHPSS provides this information and aligns with MPOWER, the primary areas of tobacco control being monitored globally by the GTSS: (a) Monitor (Tobacco Use and Prevalence Among Health Professional Students); (b) Protect (Exposure to Environmental Tobacco Smoke); (c) Offer, enforce (Attitudes); (d) Offer, Warn, Enforce (Behavior/Cessation); (e) Offer, Warn, Enforce (Curriculum/Training); and (f) Demographics.

The GHPSS has since been evaluated for internal consistency and reliability by Gualano, et al. [43]. Cronbach's coefficient alpha (α) was used where an alpha value of 0.7 was considered acceptable for this study. Cronbach's α statistic is used with items that are dichotomous or have multiple choices [44] and results range from 0 - 1. The closer the value is to 1, the more redundant the question, which qualifies it for exclusion from the survey. Each domain of the questionnaire was evaluated and Cronbach's alpha scores were excellent. The questions correlated well with each other and contributed independently yielding an overall score of $\alpha = 0.814$ for the survey.

The original question six (Q 6) clustered eight tobacco products together (chewing tobacco, snuff, snus, bidis, cigars, kreteks, pipes, and water pipes/hookah). In order to gain a more accurate description of the types of tobacco products currently being used by nursing students, the question was expanded to ask about the use of each product which added 14 questions to the survey. GHPSS guidelines allow modifications to best reflect the needs of the target population but require all 42 core questions be retained; therefore, a request for permission to modify the question

and add six more demographic questions was submitted to the survey methodology consulting group, and approval was granted. These modifications added 20 questions to the core questionnaire resulting in a 62 item survey. No other core questions were addressed. The modifications were submitted to the senior survey methodologist (McKing Consulting) in the Global Tobacco Control Branch of the CDC for approval on February 1, 2012 and the modifications were appropriate for use for this purpose (personal communication, Jeremy Morton, February 1, 2012).

Procedures

Two levels of sampling were required for this study - school and student. The researcher utilized convenience sampling for this purpose finding schools first by obtaining a list of BSN nursing programs from the Arkansas State Board of Nursing's Nurse Administrators of Nursing Education Programs (ASBN NANEP). Eleven were college or university-based BSN programs providing a convenience sample of students meeting the standardized study criteria. A cursory inquiry email was sent to all 11 schools to determine their willingness to participate. The researcher contacted the administrators of each program either by phone or email to explained the aims of the study and the standardized criteria requiring only third year BSN nursing students. Initially, nine schools responded, with a total of 563 currently enrolled third year students. Two schools did not respond and were sent a follow-up email as a reminder.

The study was approved by the University of Arkansas for Medical Sciences (UAMS) Institutional Review Board (IRB). Immediately following approval, a packet including a letter to participate, an agreement to participate form, and a copy of the UAMS IRB approval letter was mailed and emailed to the Directors of all 11 programs. If the school chose to participate, instructions requested a faculty contact person be identified, an appropriate nursing course be chosen according to the data collection protocol, and Institutional Review Board contact information be provided. Three programs declined citing time constraints and conflicts. Eight nursing programs constituted the sample. Obtaining permissions and contact information took four weeks. Permission emails or letters were saved, printed and placed in files labeled with randomly chosen numbers. Anonymity and confidentiality were maintained by storing files and cipher for the randomly chosen numbered files in two separate locations under lock and key.

Following permission to survey, five additional IRB approvals were requested and obtained as requested by each institution. Once approval was granted, the Director of the programs assigned a faculty contact person who determined which days, classes, and class rooms were appropriate. Dates and times for survey administration were scheduled. The GHPSS method requires survey administration occur during courses

required by all 3rd year nursing students. Data collection began on 10/03/2012 and extended eight weeks through November 26, 2013. In summary, 72% (n=8) of the BSN programs in the state agreed to participate and 100% (n=8) of faculty contacts agreed to participate. The schools are evenly distributed throughout the state and data collection was accomplished in eight weeks. The 62 item questionnaire contained the original core questions (38) and was distributed in person to students in classes required of all third year nursing students. The student response rate was 99.8% (n=516) where student response rate was defined as the number of 3rd year BSN students in class on day of survey meeting inclusion criteria and completing survey divided by the total number of 3rd year BSN students in class on day of survey meeting inclusion criteria.

Student Sample

A sample size of 384 was determined by the Macorr sample size calculator set at the 95% confidence level and 5% confidence interval. 517 students were present on the days of data collection and 516 consented to the study. Student sampling began following the researcher's introduction to the classroom by the faculty member. The informed consent script, survey, scan able answer sheets and like-branded #2 pencils were administered by the PI at the beginning of a class. Nursing instructors were purposefully absent during survey administration to reduce bias and the perception of coercion. The in-class procedure (introduction, informed consent script, survey administration and completion) required 20-30 minutes. Actual survey completion time took no longer than 12 minutes. No monetary gifts or incentives were offered and students were informed throughout the script that participation was voluntary and would not affect their grades. Students were assured that data would be reported in aggregate fashion to further ensure anonymity and confidentiality.

Statistical Analysis

Descriptive statistics using STATA, SPSS (v 21.0) and NCSS (v 8.0.13) were utilized to answer Aim II - demographics and survey results. Chi Square was used to test relationships with significance set at the 0.05 level. Assumptions of Chi square were met. Answering questions in Aim III required Goodness of Fit testing to further determine statistically significant relationships at the .05 level between eight items chosen from the GHPSS. Data was analyzed using Chi Square and its extension, Log Linear Modeling (LLM). The LLM was chosen for this study because it is specifically designed to address multiple associations between variables that may missed if t-tests and chi square are used alone. Significance was set at 0.05 for tests within the LLM process. However, significance was set at 0.20 to determine whether to eliminate factors in the LLM. It is set high to decrease the chance of eliminating possibly important terms from the model [45].

Findings

AIM I Feasibility

This study focused on the feasibility of executing the GHPSS according to its' standardized methodology. Two areas of feasibility were examined during this pilot study: (a) the feasibility of using the sampling and survey administration and (b) the feasibility of using the standardized data analysis. Overall, the standardized methodology guidelines for sampling and survey administration worked well. The census sample survey method of securing both nursing programs and nursing students as well as administering the survey face-to-face were extremely effective yielding a 72% school response rate, a 100% faculty response rate, and a 99.9% student response rate. Time saving techniques kept the data collection time well within the suggested timeframe. Travel in a state the geographical size of Arkansas was not a barrier but may be a problem in a larger state. The cost of traveling totaled approximately \$1,000.00 and a travel grant would have been helpful. All data was able to be collected within an eight-week timeframe.

Feasibility of Using the Standardized Data Analysis

Warren, Lee, et al. [46], cited the CDC as the WHO collaborating center for the school based GTSS surveys. This designation means that the Office of Smoking and Health (OSH) provides training in the administration and analysis of the GHPSS as well as financial and technical support of survey design and sample selection, fieldwork procedures and data management processing, including scanning forms as well as editing and weighting the data during initial data analysis. Unfortunately, time constraints prohibited utilizing these services, including data analysis.

AIM II Survey Findings

Demographics

The majority of the nursing students surveyed were female (83%; n=427) and between the ages of 19 and 24 years (74%; n=383). Two thirds of all students surveyed reported household income below \$49,000/year (66%, n=289). Eighty percent (n=409) described themselves as white, non-Hispanic with a large range of students (71-85%; n=363-436) claiming non-tobacco using households. Most students were from Arkansas (79%, n=409), 18% (n=95) from out of state, and 2% (n=11) international students. One did not declare their county/state or city/country of origin (Table 1).

Demographics		
	Total n=515	
	n	%
Gender		

Female	430	83.5
Male	85	16.5
Age		
19 -24 years	383	74
≥25 years	132	26
Annual Household Income		
<\$49,000	289	66
\$50,000 or more	160	31
Preferred not to answer	66	13
Ethnicity		
White, non-Hispanic	411	80
Black, non-Hispanic	38	7
Hispanic or Latino/a	17	3
Asian or Pacific Islander	27	5
Other	23	5
Home of Origin		
Arkansas	409	79
Out of State	95	18
International	11	2

Table 1: Demographics

Prevalence

Twenty-six percent (26.7%, n = 151) of all respondents were tobacco users. The most commonly used tobacco products by the entire sample after cigarettes (16%) were cigars (5%, n=25) and water pipes/hookah (5%, n=26). Of those, three mutually exclusive groups were identified; 48.1% (n=63) students use cigarettes only, 36.6% (n=51) use other tobacco products only, and 15.3% (n=24) were dual users of cigarettes and one other tobacco product. One student in this category stepped outside of the definition using cigarettes, cigars, hookah, and pipe (Figure 1).

Self Reported Tobacco Use

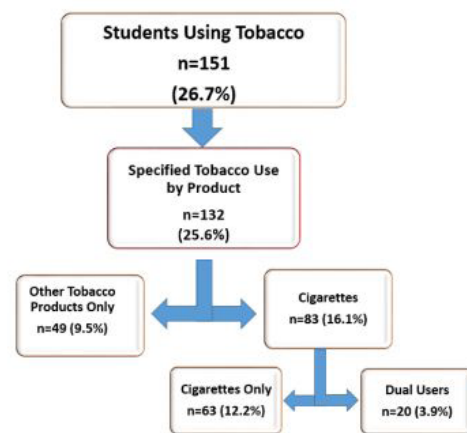


Figure 1: Self-Reported Tobacco Use by Third Year BSN Nursing Students in Arkansas

The second largest category of tobacco users were those who use other tobacco products only (37%, n=51). Hookah and cigars were the products of choice by the majority of this group and fairly evenly divided between hookah (37%) and cigars (31%). Chew and snuff comprised 24% of the category followed by a small number using snus, kreteks and pipes (8%). Dual users used the following tobacco products in the following order: Cigars (9), hookah (5), chew (2) snuff (2) and pipe (2). Five hundred and eleven students declared gender and percentages were adjusted accordingly. Categories divided by gender found 43.5% (n=57) females and 4.5% (n=6) males use only cigarettes only, 22% (n=29) females and 14.5% (n=19) males use other tobacco products only and 75% (n=15) females and 25% (n=5) males are dual users using both cigarettes and other tobacco products.

Exposure to Secondhand Smoke (SHS)

Twenty-Two percent (22%, n=115) of respondents replied yes to Q 24: “In the past 7 days, had someone smoked in their presence and their home?” and 54% (n=279) responded yes to Q 25 - “In the past 7 days, had someone smoked in their presence other than in their home?”. Most (94%, n=485) were very aware of no smoking policies in their school buildings and believed that these policies were being enforced (89%, n=457).

Attitudes of Health Professional Roles and Curricular Preparation

Attitudes were extremely positive about the nurses playing a major role in tobacco cessation counseling (99%, n=508) and 91% (n=470) desired specific training on cessation techniques however, 68% (n=352) had not received formal training in smoking cessation with patients during nursing school. In addition, 96% (n=494) believe nurses to be role models for patients but the highest negative response in this section regarded self-efficacy, with only 67% of respondents (n=344) feeling that advice given by nurses would increase a patient’s chances of quitting smoking (Figure 2).

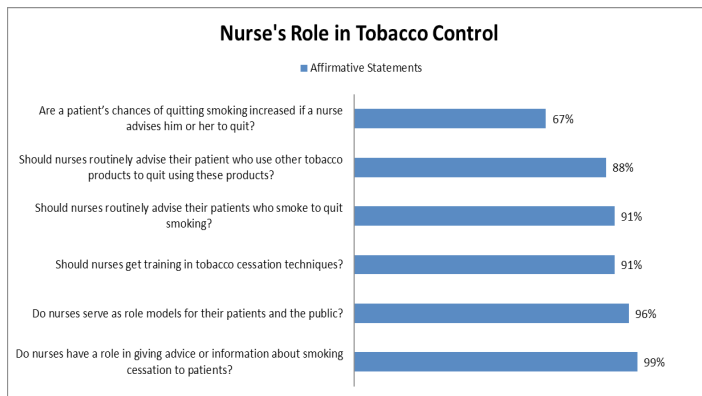


Figure 2: Attitudes about the nurse’s role in tobacco control.

Behavior/Cessation

The focus of this section was addiction and quit behaviors. Each question allowed non-tobacco users to identify themselves by marking “I have never smoked cigarettes” or “I do not smoke now”. Dependency was tested using The Fagerstrom Test for Nicotine Dependence (FTND). Less than 3% (n= 35) of the tobacco users reported having a cigarette within the first hour of waking and only 1% (n=3) smoked within 10 minutes of waking showing that only a small segment of student nurse smokers is heavily dependent.

Other behaviors included quit desire, past quit dates, length of time since quit, advice received to help or advice to help quit smoking and/or using other tobacco products. Students who classified themselves as current smokers and dual users (n=84) were asked if they wanted to quit smoking cigarettes Most (81%) wanted to quit and 68% had tried. The reverse, however, was true for users of other tobacco products - 70% of those students had no desire to quit. Thirty-four percent (n=179) reported being quit for less than one month or more. When asked about ever receiving help or advice to help you stop smoking cigarettes most (76%, n=171) said no. Almost equal numbers of students believe that tobacco use of any kind is a barrier to advising patients to stop smoking (81%, n= 416 - smokers; 78%, n=402 - other tobacco users).

Curriculum

Nursing students are being taught the dangers of smoking (94%, n=486), the reasons people smoke (71%, n=366), the importance of recording patient tobacco use in their general medical history (97%, n=501) and the importance of providing educational materials supporting smoking cessation to patients who want to quit smoking (91%, n=469). They are not, however, receiving formal training in smoking cessation (68%, n=352). Most had heard of using Nicotine Replacement Therapies (NRT) in tobacco cessation programs (96%, n= 496) but only a little more than half were familiar with the use of antidepressants such as Zyban (58%, n=299) (Figure 3).

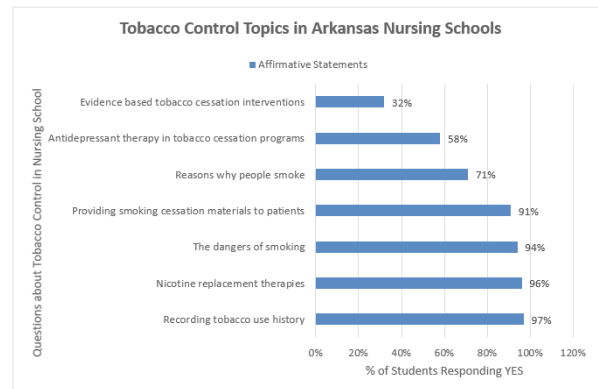


Figure 3: Tobacco Control Topics in Nursing School.

AIM III - Significant Relationships

Five questions were developed to determine the presence or absence of relationships between eight items chosen from the GHPSS: gender, cigarette use, other tobacco product use, desired nursing specialty (Emergency, Intensive Care, Medical/Surgical/Geriatrics, Obstetrics, Neonatology/Pediatrics, Psychiatric/Mental Health, Community health/Public Health, Perioperative Nursing, Oncology, Undecided), school size, nicotine dependence, nurse as healthy role model to patient and public and role of nurse to advise patients to quit. These items were chosen because these particular relationships among nursing student population are either limited or absent in the literature.

Question 1: Is there a statistically significant relationship at the .05 level between the types of tobacco product(s) used and gender among nursing students who use tobacco? Tobacco use is commonly parsed by gender with more males using tobacco than females. This question wants to know if the same is true for nursing students. More students than expected did not use tobacco. More women used other tobacco products and cigarettes than expected and fewer male nursing students used cigarettes and other tobacco products than expected.

The best combinations, or models, found were A, B, AB, C, and AC. where A= TOB PRODS, B= GENDER, C=USERS, AB is the interaction of Tobacco Products and Gender, and AC is the interaction of Tobacco Products and Tobacco Users which were significant at the 0.20 level. The Chi Square Tests Section presented details of both the Likelihood-Ratio Chi-Square (0.29) and the Pearson Chi-Square (0.31) goodness of fit tests of the model indicating that these models are not a good fit at the 0.20 level. The parameter estimation section found that the difference between all actual and predicted values were greater in absolute value than 1.96, although were not much larger (2.1-2.5), suggesting a marginal degree of association.

Question 2: The best models found at the 0.20 level (0.0000 - 0.0090) for question 2 were 3WAY associations therefore all 3WAY terms were tested for significance including ABD, BC & AC. The Chi Square Tests Section presents details of both the likelihood-ratio (0.05) and the Pearson (0.07) goodness of fit tests of the model selecting indicating that these models are a good fit at the 0.20 level.

The first part of the model, ABD, is the interaction between A= OTHER TOBACCO PRODUCTS USED and referred to one other product, two other products or three other products in addition to cigarettes. B=GENDER and D=SCHOOLSIZE. ABD found Effect Z-Values of 1.08 for one type of product being used by men from large schools. The next best association - 0.79 - was with one tobacco product being used by females from small schools followed by 0.71 for two products by women from Medium sized

schools and finally, 0.63 for three products by women from Large Schools. Overall, these associations were very weak.

The next part of the model was BC (B= GENDER and C = CIGARETTES ONLY) where the Effect Z-Value was very weak at only 0.25. The strongest model by virtue of the highest Z-Value (1.66) was AC (OTHER PRODUCTS USED and CIGARETTE USAGE). This was not surprising because it is expected that non cigarette users do not use other tobacco products and vice versa. Dual users (n=25) were identified in the study but this analysis showed a very weak association between a cigarette smoker using three other tobacco products (Z-Value = 1.32). It was interesting that there was a marginal association between a non-cigarette user and using two other tobacco products (Z-Value= 0.73). This supported the findings that very few of the dual users used more than 1 other tobacco product.

Question 3: The LLM identified the hierarchical model: AC, B (0.04) at the 0.20 level with the strongest associated terms being A= GENDER/C= TOBACCO USERS & B = ROLE_MODEL. The Z-Value of AC was 1.76 making this a fairly strong association between these terms. The term with the largest Z-Value (8.68) was Role Model because there were an overwhelming number of students (n=489) who felt that being a positive role model for the public and patients was important whether they used tobacco or not.

Question 4: Research question four asked if there was a statistically significant relationship between self -admitted dependency on tobacco users as measured by the number of minutes after waking the nursing student smoked their first cigarette (FNDDT for nicotine dependence [#39]) and whether nursing students think nurses should routinely advise their patients to quit smoking (#34) and advise patients to quit using other tobacco products (#35)? (A= GENDER [male/female] x B = DEPENDENCE (0[does not use], <10mins, 10-30mins, 31-60mins, >60mins) x C = ADVISE TO QUIT SMOKING [yes/ no] x (D = ADVISE TO QUIT USING OTHER TOBACCO PRODUCTS [yes/no]). The best models found at the 0.02 level (0.0006-0.0613) were two way terms to be tested for significance including CD, B, A. The Chi Square Tests Section presents details of both the likelihood-ratio (0.06) and the Pearson (0.00) goodness of fit tests of the mode selected indicating that these models are a good fit at the 0.20 level.

The greatest measures of effect - Z-Values (2.30), were observed with model CD - asking patients to quit smoking and quit using other tobacco products. There were four categories in this group: ask neither to quit, ask cigarette users to quit but no other tobacco users, ask other tobacco users to quit but not cigarette users, and ask both groups to quit. These categories were impacted (Z-Values) by levels dependency (0 = 5.57; 1=0.73; 2 =0.73; 3=0.86; 4=0.21). The biggest differences between actual and predicted observations was with students who were not dependent

at all (non-users) with 1/3 fewer than expected females and twice as many males than expected NOT advising tobacco users in general to quit. In the most dependent category (<10 minutes after waking), two times more females than expected did not think they should advise any tobacco users to quit their behaviors and if they did, they would not advise them to quit smoking cigarettes. The next two categories found more than expected students would advise cigarette users to quit smoking but not quit using other tobacco products. The least dependent category (>60 minutes after waking) found twice as many female users not apt to advise patients to quit and almost all males who responded stated they would not advise any users to quit.

Question 5: Is there a statistically significant relationship at the .05 level between tobacco use and the nursing specialty they desire? This question was motivated by previous research findings where more cigarette smokers are found in the ED and ICU and Psychiatric settings and fewer smokers are in pediatrics. The best models found at the 0.20 level (0.38-0.58) were AC, AB with chi square tests - likelihood of ratio (0.58) and Pearson (0.59) goodness of fit tests of the model selected indicating that neither are good fits for the data. The impact of tobacco uses by nursing students was never greater than a Z-Value of 1.59 indicating that tobacco use may not be as important as other factors when choosing a specialty. Twice as many female tobacco users than expected chose the ICU setting (Z- Value = 1.59), with as many males choosing ICU as expected. Fewer female tobacco users chose Neonatal/Pediatrics than expected (Z-Value = 0.88). Three times as many male smokers chose Oncology as a specialty (Z-Value = 1.26). More nonsmokers of both genders are choosing Psych/Mental Health than expected.

Discussion

Attitudes about the nurse's role in tobacco control were extremely positive but it was alarming that prevalence for this population was well above the national prevalence of 19.3% and two times greater than both the national percentage of registered nurses who smoke (11%) and the goal of Healthy People 2020 (12%). Prevalence of cigarette smoking was within the global range of tobacco use among nursing students (13%-48%), and barely below the state prevalence of 27%. It is unclear why the tobacco use of these nursing students mirrors the state prevalence. It is well known that rural residents with low socioeconomic status use tobacco more than urban residents of greater means. Arkansas is primarily rural and economically depressed with the third highest smoking rate in the country. We feel this is a major contributing factor in our findings. Cigarettes are the most commonly used form of tobacco product in the world (96%) so it was not surprising that the greatest number of tobacco users smoked cigarettes [1,2,47].

Most students who smoke want to quit and have tried but over 75% have received no counseling or advice to help them do so supporting the literature that patients are not being consistently

screened for tobacco use. It was surprising that those using other tobacco products only do not wish to quit this behavior which points to a specific population in need of tobacco cessation counseling while in nursing school. Most nursing students in this survey did not appear to be heavily addicted to tobacco yet offering nursing programs a window of opportunity in which to help students quit now. It is important to note that this finding should be viewed as a screening because it is based upon self-report and is not biochemically validated.

Despite smoking bans on campus, half of the nursing student population are being exposed to SHS during off campus activities thereby endangering the health of this population. Most students want to receive tobacco control education during nursing school but evidence-based tobacco cessation training is not currently being taught. This sample size (n=516) and response rate (99.8%) was more than sufficient to satisfy power (n=384 according to the Macoor Sample Size Calculator) and compared favorably with the sample sizes of other studies using the Nursing GHPSS where sample sizes ranged from 54 to 2069 per country student response rates ranged from 68.2% to 99.3% [36,48]. The sample accurately reflected national statistics of one male for every five females (5:1 ratio) attending nursing school but revealed a fairly homogenous diversity within the group (http://www.nln.org/researchgrants/slides/topic_nursing_stud_demographics.htm). Self-reported prevalence differed between questions 3 and 42 which asked "During the past 30 days (one month), on how many days did you smoke cigarettes where 84% (n= 432) declared themselves as nonsmokers, However, significantly fewer students identified themselves as never smokers in question 42 (58%, n=298). In fact, self-reported use of cigarettes ranged from 289 - 432 which begs the question, what is the student definition of being a smoker.

Limitations of the Study

Several limitations were identified. The standardized methodology of the GHPSS was unclear. Procedure had to be gleaned from reading other studies that had used the GHPSS. There were no specific instructions regarding each step of the process. Communication with the CDC OSH was necessary to confirm my interpretation of their methodology. The countries that have administered the survey participated in extensive training by OSH and all data was sent to the CDC for analysis. Being a novice researcher was an initial limitation. However, performing data collection 14 times throughout the state taught valuable lessons and provided much needed experience for the next phase of this and future studies. Travel in a state the geographical size of Arkansas was not a barrier but may be a problem in a larger state. However, all data was able to be collected within the 6-8-week timeframe. The total cost of the study was almost \$2500.00 therefore research grants would have been helpful. Smoking status based upon self-report is a limitation when not biochemically verified. Definitions

of current smoker, former smoker and ever smoker could have been provided so students could be more accurate with their responses.

Conclusions

Tobacco prevalence among nursing students in Arkansas closely mirrors that of the general population which is disturbing given their chosen profession. Alternatively, they express very positive attitudes about nurses being tobacco control advocates, desire training in tobacco control counseling, want to quit smoking and are not heavily addicted at this time. Students are not being advised to quit and are not being trained to provide evidence-based tobacco control counseling. Much was learned from piloting the GHPSS in the state and a solid description of the tobacco use of nursing students was obtained. Implications from the findings include increasing nursing faculty awareness of the desires and needs of nursing students to be trained in tobacco cessation techniques and helping them quit current tobacco use. Nursing school curricula must be modified to include more evidence-based content about the dangers and consequences of continued tobacco use, efficacy of nursing interventions and practice with population specific approaches found in The Guideline. Student health centers on college campuses of every size could offer or arrange evidence-based tobacco cessation pharmacotherapy and information about Quitlines for nursing students and faculty alike. Tobacco use is a dangerous problem for the next generation of nurses and the patients in their care. It will take a dedicated effort and multifaceted approach to end this epidemic.

Conflict of Interest

This author declares no conflict of interest.

References

1. Eriksen M, Mackay J, Ross H (2012) *The Tobacco Atlas (4th Edition)* Atlanta, GA: American Cancer Society; New York, NY:World Lung Foundation.
2. Shafey O, Eriksen M, Ross H, Mackay J (2009) *The tobacco atlas (3rd Edition)* Atlanta, GA: Bookhouse Group.
3. Centers for Disease Control and Prevention (2011) *Vital Signs: Current Cigarette Smoking Among Adults Aged ≥ 18 Years—United States, 2005-2010. Morbidity and Mortality Weekly Report* 60:1207-1212.
4. Sarna L, Bialous S, Chan SSC, Hollen P, O'Connell KA (2013) Making a difference; Nursing scholarship and leadership in tobacco control. *Nursing Outlook* 61: 31-42.
5. U.S. Department of Health and Human Services (2004) *The health consequences of smoking: a report of the Surgeon General.* Atlanta, GA: US Department of Health and Human Services, Centers for Disease Control and Prevention.
6. World Health Organization (2018) *Tobacco Fact Sheet 2018.*
7. Centers for Disease Control and Prevention (2012) *Current Cigarette Smoking among adults - United States, 2011. Morbidity and Mortality Weekly Report* 61: 889-894.
8. Alleyne G, Binagwaho A, Haines A, Jahan S, Nugent R, et al. (2013) Non-communicable diseases1: Embedding non-communicable diseases in the post-2015 development agenda. *The Lancet* 381: 566-574.
9. Smith SC, Collins A, Ferrari R, Holmes DR, Logstrup S, et al. (2012) Our time: A call to save preventable death from cardiovascular disease (heart disease and stroke). *Journal of the American College of Cardiology* 126: 2769-2775.
10. Orleans CT (2007) Increasing the demand for and use of effective smoking cessation treatments: Reaping the full health benefits of tobacco control science and policy gains in our lifetime. *American Journal of Preventive Medicine* 33: S340-S348.
11. Dilley JA, Harris JR, Boysun MJ, Reid TR (2012) Program, policy, and price interventions for tobacco control: Quantifying the return on investment of a state tobacco control program. *American Journal of Public Health* 102: e22-e28.
12. Henry BJ (2012) Impact of tobacco-control legislation. *Clinical Journal of Oncology Nursing* 17: 195-200.
13. Sung HY, Hu TW, Ong M, Keeler TE, Sheu ML (Jun 2005) A major state tobacco tax increase, the master settlement agreement, and cigarette consumption: the California experience. *Am J Public Health* (6): 1030-1035.
14. RWJF Retrospective Series: Social Norms and Attitudes About Smoking, 1991-2010.
15. Fiore MC, Jaen CR, BakerTB (2008) Treating tobacco use and dependence, *Clinical practice guideline, 2008 update.* Rockville, MD: U.S. Department of Health and Human Services. Public Health Service.
16. Durkin A (2007) Promoting smoking cessation among nursing students: How faculty can help. *Nursing Education Perspectives* 28: 150-154.
17. Heath J, Andrews J, Kelly FJ, Sorrell J (2004) Caught in the middle: Experience of tobacco-dependent nurse practitioners. *Journal of the American Academy of Nurse Practitioners* 16: 396-401.
18. Steinberg MB, Schmelzer AC, Richardson DL, Foulds J (2008) The case for treating tobacco dependence as a chronic disease. *Annals of Internal Medicine* 148: 554-556.
19. U.S. Department of Health and Human Services (2000) *Reducing Tobacco Use: A report of the surgeon General.* Atlanta, Georgia: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2000.
20. Rice VH, Stead LF (2008) Nursing interventions for smoking cessation. (Cochrane Review). In: *The Cochrane Library*, Winchester, UK: John Wiley and Sons 23: CD001188.
21. Radsma J, Bottorff J (2009) Counteracting ambivalence: nurses who smoke and their health promotion role with patients who smoke. *Research in Nursing & Health* 32: 443-452.
22. Borrello S (2013) Nurses and smoking cessation: Get on the road to success. *Nursing made Incredibly Easy* 11: 1-3.
23. Butler KM, Rayens MK, Zhang M, Maggio LG, Riker C, et al. (2009) Tobacco dependence treatment education for baccalaureate nursing students. *Journal of Nursing Education* 48: 249-254.
24. Casey FS, Haughey BP, Dittmar SS, Shea RM, Brasure J (1989) Smoking practices among nursing students: A comparison of two studies. *Journal of Nursing Education* 28: 397-401.

25. Chalmers K, Seguire M, Brown J (2002) Tobacco use and baccalaureate nursing students: A study of their attitudes, beliefs and personal behaviours. *Journal of Advanced Nursing* 40: 17-24.
26. Clark E, McCann TV, Rowe K, Lazenbatt A (2004) Cognitive dissonance and undergraduate nursing students' knowledge of, and attitudes about, smoking. *Journal of Advanced Nursing* 46: 586-594.
27. Horneffer KJ (2006) Students' self-concepts: Implications for promoting self-care within the nursing curriculum. *Journal of Nursing Education* 45: 311-316.
28. Jenkins K, Ahijevych K (2003) Nursing students' beliefs about smoking, their own smoking behaviors, and use of professional tobacco treatment intervention. *Applied Nursing Research* 16: 164-172.
29. McCann TV, Clark E, Rowe K (2005) Undergraduate nursing students' attitudes towards smoking health promotion. *Nursing & Health Sciences* 7: 164-174.
30. Rowe K, Clark JM (2000) The incidence of smoking amongst nurses: a review of the literature. *Journal of Advanced Nursing* 31: 1046-1053.
31. Sarna L, Wewers ME, Brown JK, Lillington L, Brecht ML (2001) Barriers to tobacco cessation in clinical Practice: Report from a national survey of oncology nurses. *Nursing Outlook* 49: 166-172.
32. Sejr HS, Osler M (2002) Do Smoking and Health Education Influence Student Nurses' Knowledge, Attitudes, and Professional Behavior? *Preventive Medicine* 34: 260-265.
33. Smith DR (2007) A systematic review of tobacco smoking among nursing students. *Nurse Education in Practice* 7: 293-302.
34. Stark MA, Manning-Walsh J, Vliem S (2005) Caring for self while learning to care for others: A challenge for nursing students. *Journal of Nursing Education* 44: 266-270.
35. Warren, C.W., Jones, N.R., Chauvin, J. & Peruga, A. (2008). Tobacco use and cessation counseling: cross-country. Data from the Global Health Professions Student Survey (GHPSS), 2005-7. *Tobacco Control* 17: 238-247.
36. World Health Organization (2009) WHO Report on the Global Tobacco Epidemic, 2009: Implementing smoke-free environments. Geneva, Switzerland: World Health Organization.
37. Kuehn BM (2010) IOM: Boost Nurses' Role in Health Care. *JAMA* 304: 2345-2346.
38. Sarna L, Bialous SA (2009) Why nursing research in tobacco control? In: Kasper CE (Edition). *Annual review of nursing research* 27. New York: Springer. Pg No: pp. 3-31.
39. Sarna L, Bialous SA, Sinha K, Yang Q, Wewers ME (2010) Are health care providers still smoking? Data from the 2003 and 2006/2007 tobacco use supplement-current population surveys. *Nicotine & Tobacco Research* 12: 1167-1171.
40. Arkansas Department of Health (2013) Tobacco Data Deck.
41. Warren CW, Sinha DJ, Lee J, Lea V, Jones NR (2011) Tobacco use, exposure to secondhand smoke, and cessation counseling among medical students: cross-country data from the Global Health Professions Student Survey (GHPSS), 2005-2008. *Biomedical Central Public Health* 11: 72.
42. Tobacco use and cessation counseling ---Global health professionals survey pilot study, 10 countries, 2005. *MMWR: Morbidity & Mortality Weekly Report* 20: 505-509.
43. Gualano MR, Bontempi C, Saulle R, Ricciardi W, La Torre G (2011) Validation of the Global Health Professions Students Survey questionnaire in Italy. *International Journal of Environmental Research and Public Health* 8: 392-398.
44. Portney LG, Watkins MP (2009) *Foundations of clinical research: Applications to practice* (3rd edition). Upper Saddle River, New Jersey: Pearson Prentice Hall.
45. Hintze JL (2012) 2012 is really NCSS [Computer software].
46. Warren CW, Lee J, Lea V, Goding A, O'Hara B, et al. (2009) Evolution of the global tobacco surveillance system (GTSS) 1998-2008. *Global Health Promotion* 16.
47. CDC (2006) State-specific prevalence of current cigarette smoking among adults and secondhand smoke rules and policies in homes and workplaces--united states, 2005. *MMWR: Morbidity & Mortality Weekly Report* 55: 1148-1151.
48. Warren CW, Sinha DN, Lee J, Lea V, Jones NR (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. *Int J Environ Res Public Health* 6: 2534-2549.