

Smoking cessation education and training in obstetrics and gynecology residency programs in the United States

Liz Nims¹, Timothy R. Jordan², James H. Price³, Joseph A. Dake², Jagdish Khubchandani⁴

¹Department of Nursing, Lourdes University, Sylvania, Departments of ²Public Health and ³Health Education, The School of Population Health, The University of Toledo, Toledo, OH, ⁴Department of Health Science, College of Health, Ball State University, Muncie, IN, USA

ABSTRACT

Background: OB/GYN physicians should be involved in providing smoking cessation counseling to their patients who smoke, especially pregnant patients. However, the smoking cessation practices of OB/GYN physicians seem to be dependent on their education and training and not much is known about their training during medical school. Therefore, the purpose of this study was to assess the smoking cessation education provided by OB/GYN residency training programs in the United States. **Methods:** The investigators developed and mailed a valid and reliable survey to all allopathic and osteopathic OB/GYN Residency Directors in the US ($n = 275$). The internal reliability coefficients (Cronbach alpha) for the four major subscales ranged from 0.63 to 0.90. Best practices in survey research were used to achieve a final response rate of 58%. **Results:** The majority of residency programs (60%) did not have a formal, structured curriculum in tobacco topics and/or smoking cessation. In contrast, 40% of programs reported having a formal, structured tobacco education curriculum. Sixty-five percent of programs did not formally evaluate residents' competence in providing smoking cessation counseling to patients. A range of 42% to 57% of residency programs reported spending less than one hour/year on teaching various basic science and clinical science topics related to tobacco use. The majority of residency programs spent no time teaching residents about the socio-political aspects of tobacco use cessation. Lack of teaching time was identified by the majority (51%) of the residency directors as a barrier to teaching smoking cessation. **Conclusion:** Although OB/GYN physicians are expected to provide smoking cessation counseling to their patients, the majority of OB/GYN residency programs in the United States provide minimal education and training in this area. Therefore, continuing medical education on smoking cessation counseling should be broadly implemented for OB/GYN physicians.

Keywords: Addiction, medical education, obstetrics and gynecology, prevention, smoking, tobacco

Introduction

Smoking during pregnancy is a significant health risk for the mother, the developing child, and for family members who live with the smoker.^[1-3] Smoking during pregnancy significantly increases the risk of ectopic pregnancy, spontaneous abortion, placenta previa, preterm labor, low birth weight, stillbirth, and infant death. According to various estimates, 15%–20% of

American women in the reproductive age group are current smokers and nearly 10% smoke during pregnancy.^[3-5]

Compared to women who smoke throughout pregnancy, women who quit during the first trimester experience the same lower risk of adverse birth outcomes as women who never smoked during pregnancy. In addition, compared to women who smoke, those who never smoked are healthier and have better birth outcomes.^[2,3,6] Hence, the American College of Obstetricians and Gynecologists (ACOG) has stated that smoking cessation

Address for correspondence: Dr. Jagdish Khubchandani, Department of Health Science, College of Health, Ball State University, Muncie, IN, USA.
E-mail: jkhubchandani@bsu.edu

Access this article online

Quick Response Code:



Website:
www.jfmpc.com

DOI:
10.4103/jfmpc.jfmpc_451_18

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: reprints@medknow.com

How to cite this article: Nims L, Jordan TR, Price JH, Dake JA, Khubchandani J. Smoking cessation education and training in obstetrics and gynecology residency programs in the United States. J Family Med Prim Care 2019;8:1151-8.

and preventing smoking relapse are important goals for OB/GYN physicians and their patients. For patients who are willing to make a quit attempt, ACOG recommends the 5A's method of smoking cessation counseling as a best practice (i.e., Ask, Advise, Assess, Assist, and Arrange). When clinicians use the 5A's method as recommended, it has proven to be efficacious.^[7] For smokers who are not ready or unwilling to make a quit attempt, ACOG recommends the 5R's method of smoking cessation counseling: Relevance, Risks, Rewards, Roadblocks, and Repetition.^[8-10]

Past research has demonstrated that most OB/GYN physicians either do not assist their pregnant patients with smoking cessation or at best, use only part of the recommended 5A's smoking cessation counseling method. The most frequently cited reasons for this are lack of expertise and time.^[8-13] When asked about their training, 77% of practicing OB/GYN physicians in a US study reported receiving no formal training in smoking cessation and 85% reported that the techniques they use in practice were self-taught.^[12] In a state-wide study of practicing OB/GYN physicians in Ohio, physicians reported that they lacked confidence in their ability to carry out the various steps of the 5A's.^[10] Similarly, only 25% of physicians working in prenatal care programs perceived that they were doing enough to help pregnant women stop smoking.^[13]

It is possible that the challenges reported by OB/GYN physicians are in part due to insufficient education and training in smoking cessation counseling.^[8-14] Thus, we conducted a comprehensive review of the published literature to find out what OB/GYN residency programs in the US were teaching their residents in smoking cessation. However, we could not find any national studies of this nature. Therefore, the purpose of the current study was to survey directors of OB/GYN residency programs in the United States to answer the following research questions: (1) What proportion of OB/GYN residency programs have a formal tobacco curriculum? (2) What tobacco-related topics are taught during residency training? (3) How much time is devoted to instruction on various tobacco-related topics? (4) How are these topics taught to residents? (5) How do residency programs evaluate residents' competence to provide smoking cessation counseling to patients? (6) What are the most common barriers to providing comprehensive tobacco education to residents?

Methods

We developed a valid and reliable survey instrument to assess OB/GYN residency directors' practices and perspectives on smoking cessation training for residents. To ensure adequate face validity, we developed the survey from a comprehensive review of literature on the topics of smoking during pregnancy, smoking cessation counseling, residency education, and clinical guidelines for smoking cessation. We consulted existing questionnaires from past published studies along with current ACOG guidelines for smoking cessation training. Content validity of the questionnaire was established by sending it to an expert panel (i.e., based on publication record) of five reviewers with expertise in

survey research, smoking cessation, and post-graduate medical education.^[9,10,15] The recommended revisions from these five experts were incorporated into the survey. To establish the internal reliability of the four major subscales, we used the final data set ($n = 158$) and Cronbach alpha testing. The internal reliability coefficients of the four subscales were: clinical science (.90), basic science (.83), outcome expectations (.72), and socio-political (.63).

In the final questionnaire (44 items), OB/GYN residency directors were asked to identify the following: the tobacco-related teaching methods used by their residency program; the methods they used to evaluate residents' competence to provide smoking cessation counseling to patients; barriers to teaching tobacco-related issues; and preferred methods for expanding smoking cessation training during residency. The directors were also asked to identify how much time during a typical year their program invested in teaching specific topics in three tobacco-related curricular areas: (1) basic science, (2) clinical science and, (3) socio-political. For each curricular topic listed, directors were asked to select one of four possible responses: (1) covered briefly - less than one hour, (2) covered moderately - one hour, (3) covered in detail - more than one hour or, (4) not covered at all. An additional subscale assessed directors' perceptions of the potential outcomes if their residents used the 5A's method of cessation counseling with residency patients (i.e. outcome expectations).

Participants for the current study included the entire population of allopathic ($n = 250$) and osteopathic ($n = 25$) OB/GYN Residency Directors in the United States. Program directors' names and contact information were obtained from American Medical Association Graduate Medical Education program electronic data base and were cross referenced with the names and addresses listed on the website of the Accreditation Council for Graduate Medical Education (ACGME). After approval from the University Human Subjects Research Review Committee, a four-wave postal mailing was conducted. Recommended best practices in survey research methods were used to maximize the return rate (e.g., dollar bill incentive, postage paid return envelopes, use of colored paper, unique stamps, and personalized hand signed cover letter).^[9,10,15]

Data entry and analysis were done using SPSS version 23. Descriptive statistics such as frequencies, means, and standard deviations were used to describe the respondents, residency program characteristics, and tobacco-related teaching. Independent samples t-tests, Pearson correlation coefficients, and Chi-square tests were used to answer the research questions. To reduce the chances of Type 1 error, the *a priori* alpha level was set at 0.05 (for statistical significance).

Results

Demographic, background, and residency program characteristics

Two questionnaires were undeliverable and 158 were completed and returned ($158/273 = 58\%$). The respondents can be described

as: allopathic physicians (88%); Caucasian (83%); served as Director for less than nine years (78%); male (65%); with an average age of 51 years (S.D = ±8). Most residency programs were located in urban settings (72%); averaged 5 graduates or less for the past three years (70%); were an academic/university type program (62%); and had 10 or fewer full-time physician faculty members (39%) [Table 1].

Teaching techniques

The three most prevalent teaching techniques used by residency programs to teach tobacco-related content were didactic classroom/conference style teaching (28%), one-on-one teaching by a preceptor or attending physician (25%), and patient-centered counseling (15%). The least prevalent teaching techniques were the use of standardized patients (5%) and role-play (3%) [Table 2].

Residency Directors were asked to select from a list of instructional methods and materials they believed would be helpful for improving tobacco education curricula in residency programs [Table 2]. The top five methods/materials perceived as most useful were: a pre-packaged curriculum that could be used by faculty (70%); specific educational print materials to give to residents (47%); website and/or Internet based educational resources (47%); hotline phone number (Quit Line) to give to patients (28%); and a CME conference or seminar for faculty members (25%).

Evaluation of residents' knowledge and skills

The majority of residency programs (65%) did not formally evaluate residents' learning or competence to provide smoking cessation counseling to patients. Of the programs that did, informal verbal feedback from preceptors was the most common method of resident evaluation (15%). In the inpatient setting, 4% of programs had attending physicians complete written evaluation forms that assessed residents' tobacco counseling skills. Very few programs (7%) provided residents with formal written evaluations regarding smoking cessation counseling or used audio or video recordings of patient encounters for teaching and evaluation purposes.

Perceived barriers to providing tobacco-related teaching

Directors reported that the most prevalent barriers to providing tobacco-related teaching to residents included lack of faculty time/insufficient time in the teaching schedule (51%); the belief that smoking cessation counseling had already been taught in medical school (34%); and a belief that learning how to provide smoking cessation counseling was not important for future OB/GYN physicians (27%) [Table 2].

A barrier score was created by summing all perceived barriers selected by directors (score range 0-10). Independent samples t-tests revealed there was a statistically significant difference in the number of perceived barriers identified by the residency

Table 1: Characteristics of the Directors and their Residency Programs

Variable	n (%)
Sex	
Male	103 (65)
Female	55 (35)
Age of Director in years (M=51, SD=8)	
35-39	12 (8)
40-49	64 (42)
50-59	46 (30)
≥60	29 (19)
Race/Ethnicity	
Caucasian/Non-Hispanic White	133 (83)
African American/Non-Hispanic Black	9 (6)
Hispanic	8 (5)
Other	6 (4)
Training type	
M.D.	139 (88)
D.O.	19 (12)
Years as OB/GYN residency director (M=6, SD=6)	
0 to 9	121 (78)
10 to 19	30 (19)
≥20	5 (4)
Years in practice after residency (M=20, SD=9)	
0 to 9	12 (8)
10 to 19	70 (46)
20 to 29	42 (28)
30 to 39	26 (17)
40 and above	3 (2)
Professional time spent seeing patients (M=44%, SD=22)	
25% or less	41 (26)
26% to 50%	75 (48)
51% to 75%	23 (15)
Over 75%	19 (12)
Never Smoked	111 (71)
Had a family member/close friend die from a smoking-related illness	63 (40)
Institution has a policy prohibiting tobacco use on residency property	
Yes	143 (91)
No or Do Not Know	13 (9)
Residency type	
Academic/University Sponsored	98 (62)
Community Based Program	61 (38)
Number of full-time physician faculty members (M=16, SD=12)	
0-10	61 (39)
11-20	57 (36)
≥21	40 (25)
Location	
Urban	113 (72)
Suburban	38 (24)
Rural	6 (4)
Graduates per year for past three years (M=5, SD=3)	
0-5	111 (70)
≥6	47 (30)
Estimated Proportion of residency patients that smoke (M=25%, SD=18)	
0-10%	37 (26)
11-20%	36 (25)
21-30%	36 (25)
31-40%	14 (10)
41-70%	18 (12)
>70%	4 (3)

Contd...

Table 1: Contd...

Variable	n (%)
Estimated proportion of faculty and staff that use tobacco	
0%	64 (40)
1-5%	20 (13)
≥6%	21 (13)

n=158, Percentages may not equal 100% due to rounding and data not reported by respondents

director's type of training (allopathic vs. osteopathic) ($t = -3.561$, $df = 154$, $P = <0.001$). Directors with osteopathic training reported on average one more barrier than did directors with allopathic training. Pearson correlation analyses indicated that there were no other statistically significant relationships between the number of perceived barriers reported and the other director and residency program variables.

Tobacco-related teaching content

Half of OB/GYN residency programs in the United States did not have a structured, formal tobacco curriculum. An additional 10% of programs reported providing informal teaching in the area of tobacco. In contrast, 40% of directors reported that they had a formal, structured tobacco-related curriculum.

To identify what OB/GYN residency programs were teaching, the directors were asked to report how much instructional time their program invested in three curricular content areas: basic science topics, clinical science topics, and socio-political topics [Table 3]. Slightly more than half (54%) of directors reported that all six basic science topics on the survey were covered by their programs. A range of 42%–56% of residency programs spent less than an hour of instruction per year on each of the basic science topics [Table 3]. There was a statistically significant, inverse relationship between time spent on basic science topics and the number of full-time faculty ($r(77) = -0.345$, $P = 0.002$). The greater the number of full-time faculty, the less time was spent teaching basic science topics related to tobacco use.

Sixty percent of directors reported their programs covered all seven clinical science topics listed on the survey. However, 1 in 4 residency programs offered no teaching on the 5R's and 10% offered no teaching on the 5A's. Nearly half of the programs (46%) spent less than one hour on the 5A's. Very few programs (range of 1%–8%) invested more than one hour in tobacco-related clinical science topics [Table 3]. Pearson correlation analyses revealed a statistically significant, inverse relationship between time invested in teaching tobacco-related clinical science topics and the number of full-time faculty members ($r(77) = -0.250$, $P = 0.028$) (i.e., the greater the number of full-time faculty members, the less likely clinical science topics were taught). There was also a statistically significant, positive relationship between time spent on clinical science topics and the number of years the director had been practicing medicine after his/her residency ($r(73) = 0.29$, $P = 0.01$). The longer the residency director had been practicing medicine, the more time his/her residency program invested in teaching clinical science topics related to tobacco.

Of the three curricular content areas, sociopolitical topics received the least amount of instructional time. Only 10% of directors reported covering all six socio-political topics in their programs [Table 3]. A range of 63% to 89% of Residency Directors reported investing no time teaching the sociopolitical aspects of tobacco use and cessation. Moreover, there were no residency programs that invested more than one hour in any of the six sociopolitical topics. Independent samples t-tests revealed a statistically significant difference in time spent covering sociopolitical topics by residency type (academic vs. community). Community-based residency programs spent slightly more time teaching sociopolitical topics than did academic center programs ($t = -2.16$, $df = 35.5$, $P = 0.04$).

Outcome expectations regarding using the 5A's smoking cessation counseling method

Directors were asked to rate the likelihood (Unlikely to Likely) of pregnant smokers quitting smoking if their residents were to use the best practice 5A's method of cessation counseling as recommended [Table 4]. The majority (>50%) of the directors were "unsure" about the potential effects of residents using the 5A's method of cessation counseling. However, 25% of directors believed that if their residents asked patients about their smoking status at each visit and recommended behavior therapy, the result would likely be increased smoking cessation among patients. Even more directors believed that if residents prescribed NRT or other pharmacological treatments (34%) and referred their smoking patients to smoking cessation programs (39%), that it would result in increased smoking cessation among patients.

The investigators used a Pearson's correlation analysis to detect a statistically significant, inverse relationship between directors' outcome expectations and their perceived proportion of residency patients that smoked ($r(67) = -0.318$, $P = 0.009$). The higher the number of perceived smokers among residency patients, the lower the director's outcome expectations that residents using the 5A's method would result in successful smoking cessation.

Discussion

Past research has demonstrated that a significant proportion of OB/GYN physicians have difficulty using recommended best practices in smoking cessation with their patients. The difficulty that OB/GYN physicians experience is likely associated with insufficient education, training, and practice with patients in medical school and residency.^[9-14] As we identified in the current study, 60% of OB/GYN residency programs did not have a formal, structured tobacco education curriculum. Nearly half of the residency programs spent less than one hour per year on the 5A's and 25% offered no teaching on the 5R's. Furthermore, 65% of programs did not formally evaluate residents' competence in providing smoking cessation counseling to patients.

Table 2: Current Residency Practices and Directors' Perceptions

	<i>n</i> (%)
Current Teaching Methods in Tobacco-Related Topics	
Classroom/conference style teaching	44 (28)
One-on-one teaching by preceptor or attending physician	39 (25)
Patient-centered counseling	23 (15)
Chart reviews with residents	18 (11)
Web-based instruction	9 (6)
Role play	5 (3)
Use of standardized patients	3 (2)
Other (e.g, ACOG resources and nurses educating residents, provide feedback via recordings of patient encounters)	6 (4)
Evaluation of Residents' Competence in Smoking Cessation	
We do not evaluate residents' competence in smoking cessation counseling	102 (65)
Preceptors give informal verbal feedback	23 (15)
Attending physicians formally evaluate residents on in-patient rotations	6 (4)
Observed clinical skills evaluation (OSCE) for smoking cessation counseling techniques	6 (4)
Other (e.g. Preceptors fill out formal evaluation forms, formal evaluation of audio-taped encounters with patients/ standardized patients, video evaluation)	11 (7)
Perceived Barriers to Increasing Teaching Time in Tobacco Topics/Cessation	
Lack of faculty time/insufficient time in the teaching schedule	80 (51)
This topic has already been covered in medical school	53 (34)
Not a curricular priority for future medical practice	43 (27)
Insufficient teaching materials	39 (25)
Accrediting body does not require us to cover this topic	29 (18)
Physicians can obtain this type of training on their own	29 (18)
Insufficient number of rotation sites/preceptors to teach	21 (13)
Residents do not show much interest in this topic	20 (13)
Such topics are not covered on the board exam	12 (8)
Preferred Methods to Expand Smoking Cessation Training in the Future	
A pre-packaged curriculum that could be used by faculty	111 (70)
Specific educational print materials to give to residents	74 (47)
Website and/or Internet based educational resources	74 (47)
Hotline phone number (e.g. Quit Line) to give to patients	45 (28)
CME Conference or Seminar	40 (25)
"One-on-one" education done in person with residents	18 (11)
E-mail consultation with experts in this field	13 (8)
A day-long workshop	11 (7)
Other (e.g, interactive website, comprehensive articles covering all aspects of tobacco education/prevention counseling Telephone consultation with experts in this field)	10 (6)

n=158, Percentages may not equal 100% due to rounding and data not reported by respondents

One plausible explanation for the lack of tobacco-related education provided by OB/GYN residency programs is that 34% of the responding residency directors believed that new, incoming residents had already received adequate tobacco education in medical school. However, past research clearly indicates that medical students receive inadequate training in smoking cessation.^[14,15] For example, during obstetrical training in medical school, the majority of the 4th year students received no instruction on tobacco cessation counseling during OB clerkships.^[16-18] When asked if they had observed a clinical OB/GYN faculty member provide smoking cessation counseling to a pregnant patient at least 4 times, only 7% of 2nd year students and 46% of 4th year students replied affirmatively. Further, only 8% of 2nd year students and 16% of 4th year students believed that there was too much tobacco education in their medical school training and education.

Another plausible reason for the lack of tobacco-related education during OB/GYN residency programs was that 27% of residency directors in the current study believed that teaching residents about smoking cessation was not important for their future clinical practice. Considering the copious amount of evidence that strongly links tobacco use during pregnancy with deleterious health and birth outcomes and considering ACOG's clearly stated position on the importance of OB/GYN physicians providing smoking cessation counseling, it was surprising that more than 1 in 4 residency directors would hold such a belief.^[18-12]

Residency is an excellent time to shape the future practices of physicians. Physicians who report using best practices in smoking cessation during residency are much more likely to do so in their future clinical practices.^[17-20] However, if residents' knowledge and competence in smoking cessation are not evaluated during residency training, it is likely that residents will view smoking

Table 3: Tobacco-Related Topics Covered and Teaching Time Invested

Common Tobacco/Cessation Topics	Not covered (0 h)	Covered briefly (<1 h)	Moderately covered (1 h)	Covered in detail (> 1 h)
Basic Science Topics	n (%)	n (%)	n (%)	n (%)
Cancer risks associated with tobacco use	4 (5)	33 (42)	32 (41)	9 (12)
Other tobacco related diseases	4 (5)	38 (49)	26 (34)	9 (12)
Risks of using smokeless tobacco	28 (36)	44 (56)	6 (8)	0 (0)
Health effects of environmental tobacco smoke	11 (14)	40 (52)	24 (31)	2 (3)
Chemicals in cigarette smoke	26 (33)	36 (46)	13 (17)	3 (4)
Nicotine withdrawal symptoms	8 (10)	42 (54)	25 (32)	3 (4)
Clinical Science Topics	n (%)	n (%)	n (%)	n (%)
The 5 A's method of cessation counseling	8 (10)	35 (46)	28 (36)	6 (8)
Relapse prevention techniques	14 (18)	44 (57)	16 (21)	3 (4)
How to use/prescribe pharmacologic agents in smoking cessation	6 (8)	34 (44)	31 (40)	6 (8)
The 5 R's of cessation counseling	19 (25)	36 (47)	17 (22)	5 (7)
How, when, and where to refer smokers for smoking cessation programs	8 (10)	44 (56)	22 (28)	4 (5)
Health behavior change theories and models	21 (27)	36 (47)	18 (23)	2 (3)
Socio-Political Topics	n (%)	n (%)	n (%)	n (%)
How to provide information to the public about proposed tobacco policies	49 (63)	27 (35)	2 (3)	0 (0)
How to lobby a public policy-making body on tobacco issues	61 (78)	13 (17)	4 (5)	0 (0)
How to contact public officials to ask them to support a specific position on tobacco policy issues	66 (86)	10 (13)	1 (1)	0 (0)
How to provide written reports, consultations, or research to public officials about tobacco issues	69 (89)	7 (9)	2 (3)	0 (0)
How to organize people for action on a tobacco policy issue	66 (85)	11 (14)	1 (1)	0 (0)
How to explain the economic consequences of tobacco to the public and policy makers	63 (81)	13 (17)	2 (3)	0 (0)

Percentages may not equal 100% due to rounding. Numbers may not add to 158 as only those who reported teaching in certain areas were included in the sample of respondents

Table 4: Directors' Outcome Expectations Regarding Residents' Using the 5A's Method

If your residents were to implement each action below, how likely is it that there would be a decrease in smoking among your residency patients?	Unlikely n (%)	Likely n (%)	Not Sure n (%)
Asking patients about their smoking status at each visit	30 (19)	36 (23)	92 (58)
Explaining the dangers of smoking to patients	21 (13)	47 (30)	90 (57)
Asking the patient who smokes to set a quit date	15 (9)	44 (28)	99 (63)
Referring pregnant patients to smoking cessation programs	8 (5)	61 (39)	89 (56)
Prescribing NRT or other pharmacological treatment	12 (8)	53 (34)	93 (59)
Arranging follow-up visit for smoking cessation	12 (8)	48 (30)	98 (62)
Recommending behavior therapy	20 (13)	39 (25)	99 (63)

n=158. Percentages may not equal 100% due to rounding and data not reported by respondents

cessation as a minor priority. Put simply, what is evaluated is what residents view as being important. If improvement in residents' competence to provide smoking cessation counseling is desired, then regular, formal feedback from preceptors and attending physicians is essential.^[18-20]

Asking preceptors and attending physicians to provide OB/GYN residents with detailed growth feedback regarding smoking cessation presents a challenge. If preceptors, residency faculty members, and attending physicians were not adequately trained in smoking cessation themselves, how will they properly instruct and evaluate residents? The lack of tobacco-related education and training in medical school and residency programs points to the need for effective and comprehensive continuing medical education on tobacco-related topics such as the 5A's and the 5R's counseling methods especially with pregnant women.^[9,10,12,19] As clinicians who provide various primary care services, OB/GYN

physicians are uniquely situated to help their patients stop smoking. Many women during their reproductive years enter the health care system by seeing an OB/GYN. Continuity of care often begins at the OB/GYN's office as the clinician encourages routine screening and preventive care. Office visits are excellent opportunities for OB/GYN physicians to educate and counsel their patients about risk factors and lifestyle issues such as smoking.^[21,22]

While this study was limited to one specialty area in a particular country (i.e., OB/GYN trainees in the US), there are broader implications for other disciplines of medical education (e.g., primary care) in countries worldwide. For example, in a comprehensive review of literature, we did not find any national studies assessing the training or practice of primary care physicians regarding smoking cessation in the Indian subcontinent. However, regional and local facility based studies

in the Indian subcontinent suggest that the majority (>50%) of the primary care practitioners are not trained enough and do not routinely provide smoking cessation services or counseling. Studies from India alone suggest that majority (>50%) of the physicians may be practicing “ask” component of 5As, they do not routinely “assist” in quitting smoking or “arranging” follow-up counseling with smokers. In addition, primary care practice on smoking cessation is mostly reactive and not proactive (i.e. clients suffering from respiratory diseases are more likely to be screened compared to others).^[23,24] Opportunities for screening for smoking and for providing smoking cessations advice and services in primary care practice are a critical need for countries such as India and in the Indian subcontinent due to the high rates of smoking and tobacco use. There are ample opportunities to implement evidence-based cost-effective brief interventions (e.g., 5As) in primary care and OB/GYN practice that have been found to be effective in helping individuals quit smoking, prevent chronic diseases such as cancers, and have better health outcomes and quality of life.^[20,21,23,24]

Strengths and potential limitations

The results of the current study should be interpreted with its strengths and potential limitations in mind. In terms of potential limitations, self-reporting inaccuracy from residency directors may have impacted the internal validity of the results. Second, it is likely that some directors may have provided socially desirable responses to portray their residency programs in a more positive light. If so, the amount of tobacco-related education provided by residency programs may have been over stated. Third, the monothematic nature of the survey (i.e., focused only on tobacco) may have caused a response set bias among some residency directors. Fourth, the use of a closed format questionnaire did not allow the investigators to elicit any additional information from participants. If significant concepts were missing from the questionnaire, the internal validity of the study may have been attenuated. However, this was likely minimized through expert review of the questionnaire. Fifth, the cross-sectional nature of the data collection did not allow for any cause and effect inferences.

In terms of its strengths, this was the first national study of OB/GYN residency programs in the United States. It was conducted at a time when the US infant mortality is higher than many other industrialized nations. Therefore, this study is timely, relevant, and very important to both clinicians and public health experts.^[7-12,18-21] Another strength of this study was its 58% return rate. Many published survey research studies of physicians have featured much lower return rates which thereby threatened the external validity of those authors’ results.

Conclusion

Although OB/GYN physicians are expected to adhere to recommended best practices and provide effective smoking cessation counseling to their patients, the majority of OB/GYN residency programs in the United States provide minimal education and training in this area.

Financial support and sponsorship

The authors would like to thank Lourdes University, Sylvania Ohio, USA for awarding a research scholarship to fund this study.

Conflicts of interest

There are no conflicts of interest.

References

1. Hyland A, Piazza KM, Hovey KM, Ockene JK, Andrews CA, Rivard C, *et al.* Associations of lifetime active and passive smoking with spontaneous abortion, stillbirth and tubal ectopic pregnancy: A cross-sectional analysis of historical data from the Women’s Health Initiative. *Tob Control* 2015;24:328-35.
2. Banderali G, Martelli A, Landi M, Moretti F, Betti F, Radaelli G, *et al.* Short and long term health effects of parental tobacco smoking during pregnancy and lactation: A descriptive review. *J Transl Med* 2015;13:327.
3. Pineles BL, Hsu S, Park E, Samet JM. Systematic review and meta-analyses of perinatal death and maternal exposure to tobacco smoke during pregnancy. *Am J Epidemiol* 2016;184:87-97.
4. Alshaarawy O, Anthony JC. Month-wise estimates of tobacco smoking during pregnancy for the United States, 2002-2009. *Matern Child Health J* 2015;19:1010-5.
5. Tong VT, Dietz PM, Morrow B, D’Angelo DV, Farr SL, Rockhill KM, *et al.* Trends in smoking before, during, and after pregnancy- Pregnancy Risk Assessment Monitoring System, United States, 40 sites, 2000-2010. *MMWR Surveill Summ* 2013;62:1-19.
6. Ross EJ, Graham DL, Money KM, Stanwood GD. Developmental consequences of fetal exposure to drugs: What we know and what we still must learn. *Neuropsychopharmacol Rev* 2015;40:61-87.
7. Olaiya O, Sharma AJ, Tong VT, Dee D, Quinn C, Agaku IT, *et al.* Impact of the 5As brief counseling on smoking cessation among pregnant clients of Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) clinics in Ohio. *Prev Med* 2015;81:438-43.
8. American College of Obstetrics and Gynecology. ACOG Committee Opinion: Smoking cessation during pregnancy. Retrieved from: <https://www.acog.org/Clinical-Guidance-and-Publications/Committee-Opinions/Committee-on-Obstetric-Practice/Smoking-Cessation-During-Pregnancy?IsMobileSet=false>.
9. Price JH, Jordan TR, Dake JA. Perceptions and use of smoking cessation in nurse-midwives’ practice. *J Midwifery Womens Health* 2006;51:208-15.
10. Jordan TR, Dake JR, Price JH. Best practices for smoking cessation in pregnancy: Do obstetrician/gynecologists use them in practice? *J Womens Health* 2006;15:400-41.
11. Grimley D, Bellis J, Raczynski J, Henning K. Smoking cessation counseling practices: A survey of Alabama obstetrician-gynecologists. *South Med J* 2001;94:297-303.
12. Chapin J, Root W. Improving obstetrician-gynecologist implementation of smoking cessation guidelines for pregnant women: An interim report of the American College of Obstetricians and Gynecologists. *Nicotine Tob Res* 2004;6(Suppl 2):S253-7.
13. Klerman L, Spivey C. Smoking-related activities in prenatal

- care programs. *Am J Prev Med* 2003;25:129-35.
14. Clinical Practice Guideline Treating Tobacco Use and Dependence 2008 Update Panel, Liaisons, and Staff A clinical practice guideline for treating tobacco use and dependence: 2008 update. A US Public Health Service report. *Am J Prev Med* 2008;35:158-76.
 15. Jordan TR, Khubchandani J, Wiblishauser M, Glassman T, Thompson A. Do respiratory therapists receive training and education in smoking cessation? A national study of post-secondary training programs. *Patient Educ Couns* 2011;85:99-105.
 16. Geller AC, Brooks DR, Powers CA, Brooks KR, Rigotti NA, Bogner B, *et al.* Tobacco cessation and prevention practices reported by second- and fourth-year students at US medical schools. *J Gen Intern Med* 2008;23:1071-6.
 17. Ferry L, Grissino L, Runfola P. Tobacco dependence curricula in U.S. undergraduate medical education. *J Am Med Assoc* 1999;282:825-9.
 18. Hartmann KE, Espy A, McPheeters M, Kinsinger LS. Physicians taught as residents to conduct smoking cessation intervention: A follow-up study. *Prev Med* 2004;39:344-50.
 19. Okoli CT, Greaves L, Bottorff JL, Marcellus LM. Health care providers' engagement in smoking cessation with pregnant smokers British Columbia. *J Obstet Gynecol Neonatal Nurs* 2010;39:64-77.
 20. Stead LF, Buitrago D, Preciado N, Sanchez G, Hartmann-Boyce J, Lancaster T. Physician advice for smoking cessation. *Cochrane Database Syst Rev* 2013;5:CD000165.
 21. US Preventive Services Task Force. Final Recommendation Statement: Tobacco Smoking Cessation in Adults, Including Pregnant Women: Behavioral and Pharmacotherapy Interventions. U.S. Preventive Services Task Force. September 2017. Retrieved from <https://www.uspreventiveservicestaskforce.org/Page/Document/RecommendationStatementFinal/tobacco-use-in-adults-and-pregnant-women-counseling-and-interventions>.
 22. Rayburn WF. Are obstetrician-gynecologists primary care physicians? *Obstet Gynecol Clin* 2016;43:xiii-v. doi: 10.1016/j.ogc.2016.03.002.
 23. Panda R, Persai D, Venkatesan S. Missed opportunities for brief intervention in tobacco control in primary care: Patients' perspectives from primary health care settings in India. *BMC Health Serv Res* 2015;15:50.
 24. Panda R, Persai D, Venkatesan S, Ahluwalia JS. Physician and patient concordance of report of tobacco cessation intervention in primary care in India. *BMC Public Health* 2015;15:456.