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Challenges Associated With Cervical Cancer Screening and Management in Obese Women: A Provider Perspective

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Objectives: Obese women are at increased risk of cervical cancer, partly due to missed detection of cervical precancers during routine cervical cancer screening. We administered a clinician survey to better understand specific challenges and identify potential solutions to performing cervical cancer screening and management in obese women.

Materials and Methods: We administered a web-based survey to 2,319 members of the American Society of Colposcopy and Cervical Pathology including questions related to challenges associated with cervical sampling and visualization in obese compared with normal weight women and potential strategies for improvement. We summarized providers' responses using descriptive statistics and used Fisher exact tests to evaluate associations between provider characteristics and challenges with cervical sampling, visualization, and biopsy.

Results: Of the 240 providers that completed the survey, 89% and 93% reported that cervical sampling and visualization are more challenging in obese women, respectively, whereas 80% reported that taking a biopsy was more challenging. Commonly reported barriers included vaginal prolapse, difficulty visualizing and accessing the cervix, and lack of long enough sampling devices and large enough speculums. Frequently used techniques to improve sampling and visualization included use of a condom or examination glove finger to sheath a speculum and using a tenaculum. Most providers identified training for cervical sampling and colposcopy in obese women as a learning gap, and only 8% reported receiving such training.

Conclusions: Cervical cancer screening and management are more challenging in obese compared with normal weight women. Major barriers to cervical sampling and visualization included lack of adequately sized equipment and lack of education and training.

Key Words: cervical cancer, obesity, screening, management, cervical sampling, colposcopy, biopsy, provider perspective, survey, disparity

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Obesity (defined as a body mass index of ≥ 30 kg/m²)¹ is highly prevalent among women in the United States (U.S.), affecting more than 40% of those aged 20 years and older in 2016.² Although obesity is a well-established risk factor for several hormone-related malignancies, such as endometrial, ovarian, and postmenopausal breast cancer, its influence on cervical cancer risk has been poorly understood.^{3–6} Some previous studies have shown modest associations of obesity with cervical cancer risk,^{3,7} and others have suggested that there is lower participation in screening among obese compared with normal weight women.^{8–11} However, until recently, no well-powered study had evaluated the effect of obesity on cervical cancer risk in a screening population, permitting the evaluation of this association while controlling for adherence to screening and follow-up. In a recent analysis of nearly 1 million women undergoing routine cervical cancer screening, we demonstrated that obese women had a higher 5-year risk of cancer compared with normal weight women (0.083% vs. 0.056%, respectively), whereas the 5-year risk of precancer was lower (0.51% vs. 0.73%, respectively). This unexpected finding suggests that obese women's higher cancer risk may be partly explained by missed detection of cervical precancers during screening and management, possibly accounting for up to 20% of cancers occurring among a screened population.¹²

To follow-up this observation, it is critical to understand how and to what extent cervical screening and management (i.e., colposcopy and biopsy) are more challenging in obese women. Gaining insight into the specific challenges faced by providers will help inform strategies for improving cervical cancer prevention and gynecologic care for obese women. As a first step toward this goal, we developed a survey to evaluate how obesity affects cervical cancer screening and management from a provider perspective. The goals of this study were to assess the extent to which providers experience challenges while performing cervical sampling, colposcopy, and biopsy in obese women, to identify specific reasons for these challenges, and to assess potential strategies (e.g., specialized equipment and techniques) used by providers to improve cervical sampling and visualization in obese women.

MATERIALS AND METHODS

Survey Development and Administration

Before survey development, we conducted in-depth, semistructured interviews with 5 clinicians with expertise in cervical cancer screening and colposcopy from a range of diverse practice specialties at the ASCCP (formerly known as the American Society of Colposcopy and Cervical Pathology) annual meeting in April 2018. The purpose of these interviews was to maximize survey

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This study was approved by the institutional review board at the University of Pittsburgh.

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validity through insight into the extent of challenges related to cervical cancer screening and management in obese women from the provider perspective. From these discussions, we identified relevant topic areas that were used to develop survey questions with additional input from clinician experts. We pilot tested the survey with a diverse group of clinicians ($n = 5$) to assess potential errors in the questions and skip patterns, survey logic, and timing. The final survey consisted of 28 questions related to demographic and practice information, potential challenges associated with cervical sampling, visualization, and biopsy in obese women (compared with normal weight women [$BMI = 18.5$ to $<25 \text{ kg/m}^2$]¹; Supplemental Data, <http://links.lww.com/LGT/A133>), specific equipment or techniques used to care for obese women, and potential barriers to providing optimal care for obese women. Providers were also given the opportunity to provide open-ended feedback on each of these topics. In this study, obesity is defined according to clinical standards as a body mass index of 30 kg/m^2 or greater and normal weight is defined as a body mass index of 18.5 to 24.9 kg/m^2 .

An e-mail invitation to complete the electronic survey was sent to all 2,319 current ASCCP members; no members were excluded from participating. This group represents a range of providers with special interest in cervical cancer screening, colposcopy, and treatment including clinicians, nurse practitioners, physician assistants, and other providers from specialties including gynecologic oncology (Gyn Onc), obstetrics and gynecology (OB/Gyn), women's health, family medicine, and internal medicine. The link to the anonymous electronic survey was initially sent out to ASCCP members on August 27, 2018, with 2 additional reminders sent on September 17 and October 19. Potential participants were informed that the purpose of the survey was to evaluate current clinical practice as it relates to managing women of different weights with regard to cervical cancer screening and the evaluation of abnormal screening results. Participation was voluntary, and survey completion served as the participant's informed consent. Participants were instructed to only complete the survey once and were not contacted after completion. Based on prior surveys conducted in this population, we anticipated around a 10% response rate, which would provide a margin of error of 6%.¹³ This study was approved by the institutional review board at the University of Pittsburgh.

Statistical Analysis

We used descriptive statistics to summarize providers' responses and Fisher's exact tests to evaluate associations between provider characteristics and challenges with cervical sampling, visualization, and biopsy (combining responses of somewhat and much more challenging vs. not more challenging). We explored differences by practice specialty (dichotomized as OB/Gyn, Gyn Onc, or women's health vs. family and internal medicine combined) and years of experience since residency (≤ 20 years vs. >20 years) using Fisher's exact tests. We considered $p < .05$ statistically significant. All analyses were conducted using Stata Version 14.

Role of the Funding Source. The funding source had no role in study design, data collection, analysis, interpretation, or writing of the report. The corresponding author had full access to the data in the study and had final responsibility for the decision to submit for publication.

RESULTS

Characteristics of Survey Participants

A total of 2,319 ASCCP members were invited to participate in this study. Of these, 240 completed the survey (12%). Most members were female (81.7%), were physicians (57.3%) or nurse

practitioners (26.8%), and were specialized in OB/Gyn (42.5%) or women's health (33.7%; Table 1). Providers practiced in a range of settings including academic institutions (27.9%), private practice (27.5%), and community clinics (19.6%), and approximately half reported having more than 20 years of experience since residency (45.0%). Participant characteristics were generally similar to those of the overall ASCCP membership, except that survey respondents were more likely to be female (64% in ASCCP membership), less likely to practice in family medicine (13.8% vs. 28% in ASCCP membership), and more likely to practice in academic settings (19% in ASCCP membership) (data not shown). When asked about their patient population, 34.6% of providers reported that more than 50% of their patients were obese. Only 19 providers (7.9%) reported receiving focused training on providing clinical examinations and/or gynecological care for obese women; of these, 79% practiced in OB/Gyn, Gyn Onc, or women's health specialties and 52% had more than 20 years of experience since residency.

Cervical Sampling, Visualization, and Biopsy in Obese Women

Eighty-nine percent and 93% of providers responded that cervical sampling and visualization are somewhat or much more challenging in obese compared with normal weight women, respectively, and 80% responded that taking a cervical biopsy is somewhat or much more challenging (Table 1). Provider characteristics that were significantly associated with reporting that cervical sampling and visualization are more challenging in obese women included: being male ($p < .0001$ for both sampling and visualization) and practicing in OB/Gyn or women's health specialties ($p = .040$ and $.014$, respectively). Having a patient population composed of 50% or few obese women was marginally significantly associated with sampling and visualization challenges ($p = .089$ and $p = .085$, respectively). Providers working in private practice and academic settings (compared with hospital, community clinics, government, and other settings) and those with more than 20 years' experience (compared with those with <5 years or 5–20 years) were significantly more likely to report that cervical visualization is more challenging in obese women ($p = .010$ and $p = .037$, respectively), and male providers were more likely to report that taking a cervical biopsy is more challenging in obese women ($p < .0001$).

Specific Barriers to Cervical Cancer Screening, Visualization, and Biopsy

We asked providers to indicate their levels of agreement with various statements describing potential barriers to cervical sampling and/or visualization in obese women. The most commonly reported barriers included the following: vaginal prolapse (91.3% agree or strongly agree), difficulty visualizing the cervix (77.1%), difficulty accessing the cervix (76.2%), sampling devices that are not long enough (60.9%), speculums that are not large enough (58.6%), difficulty positioning the patient on the examination table (52.9%), and difficulty visualizing the squamocolumnar junction (51.9%) (see Figure 1). Among providers who indicated that not having large enough speculums was a barrier to cervical sampling and visualization ($n = 140$), only 36% were aware that larger speculum blades (ranging from extra-large to 4XL) have been designed to facilitate examinations in obese women ($p = .008$; data not shown). We asked participants to indicate their level of agreement with 3 statements describing why taking a cervical biopsy may be more challenging in obese women. Of these, the most commonly reported challenge was difficulty visualizing lesions (66.1% agree or strongly agree), followed by difficulty using biopsy forceps (43%), and that biopsy forceps are not long enough (43%) (see Figure 2).

TABLE 1. The ASCCP Provider Characteristics and Challenges With Cervical Sampling, Visualization, and Biopsy (N = 240)

	Cervical sampling, n (%)				Cervical visualization, n (%)				Biopsy, n (%)				
	Total, n (%)	Not more difficult	Somewhat more difficult	Much more difficult	p ^a	Not more difficult	Somewhat more difficult	Much more difficult	p ^a	Not more difficult	Somewhat more difficult	Much more difficult	p ^a
Total	240	27 (11.3)	159 (66.3)	54 (22.5)		17 (7.1)	156 (65.0)	67 (27.9)		35 (15.5)	147 (65.0)	44 (19.5)	
Sex													
Female	196 (81.7)	22 (11.2)	131 (66.8)	43 (21.9)		13 (6.6)	131 (66.8)	52 (26.5)		29 (15.9)	121 (66.5)	32 (17.6)	
Male	40 (16.7)	1 (2.5)	28 (70.0)	11 (27.5)		0 (0.0)	25 (62.5)	15 (37.5)		2 (5.0)	26 (65.0)	12 (30.0)	
Prefer not to say	4 (1.6)	4 (100.0)	0 (0.0)	0 (0.0)	<.0001	4 (100.0)	0 (0.0)	0 (0.0)	<.0001	4 (100.0)	0 (0.0)	0 (0.0)	<.0001
Degree													
MD	137 (57.3)	17 (12.4)	90 (65.7)	30 (21.9)		10 (7.3)	93 (67.9)	34 (24.8)		24 (17.9)	87 (64.9)	23 (17.2)	
DO	7 (2.9)	2 (28.6)	4 (57.1)	1 (14.3)		2 (28.6)	4 (57.1)	1 (14.3)		1 (14.3)	4 (57.1)	2 (28.6)	
PA	9 (3.8)	1 (11.1)	5 (55.6)	3 (33.3)		0 (0.0)	6 (66.7)	3 (33.3)		0 (0.0)	6 (75.0)	2 (25.0)	
CNM/RN	22 (9.2)	2 (9.1)	15 (68.2)	5 (22.7)		1 (4.6)	14 (63.6)	7 (31.8)		2 (9.5)	16 (76.2)	3 (14.3)	
NP/DN	64 (26.8)	5 (7.8)	44 (68.8)	15 (23.4)	.451	4 (6.3)	38 (59.4)	22 (34.4)	.287	7 (12.7)	34 (61.8)	14 (25.5)	.692
Specialty													
OB/Gyn	102 (42.5)	8 (7.8)	68 (66.7)	26 (25.5)		4 (3.9)	69 (67.7)	29 (28.4)		16 (16.0)	67 (66.0)	17 (17.0)	
Gyn Onc	22 (9.2)	1 (4.6)	18 (81.8)	3 (13.6)		0 (0.0)	15 (68.2)	7 (31.8)		2 (9.1)	16 (72.7)	4 (18.2)	
Women's health	81 (33.7)	9 (11.1)	53 (65.4)	19 (23.5)		6 (7.4)	51 (63.0)	24 (29.6)		10 (14.1)	45 (63.4)	16 (22.5)	
Family/internal medicine	35 (14.6)	9 (25.7)	20 (57.1)	6 (17.1)	.040	7 (20.0)	21 (60.0)	7 (20.0)	.014	7 (21.2)	19 (57.6)	7 (21.2)	.858
Practice setting													
Hospital	31 (12.9)	4 (12.9)	20 (64.5)	7 (22.6)		1 (3.2)	20 (64.5)	10 (32.3)		8 (27.6)	16 (55.2)	5 (17.2)	
Private practice	66 (27.5)	4 (6.1)	47 (71.2)	15 (22.7)		2 (3.0)	45 (68.2)	19 (28.8)		7 (11.3)	41 (66.1)	14 (22.6)	
Community clinic	47 (19.6)	10 (21.3)	29 (61.7)	8 (17.0)		9 (19.2)	25 (53.2)	13 (27.7)		9 (20.9)	21 (48.8)	13 (30.2)	
Government	13 (5.4)	2 (15.4)	8 (61.5)	3 (23.1)		2 (15.4)	7 (53.9)	4 (30.8)		1 (8.3)	9 (75.0)	2 (16.7)	
Academic	67 (27.9)	6 (9.0)	46 (68.7)	15 (22.4)		2 (3.0)	50 (74.6)	15 (22.4)		9 (14.1)	47 (73.4)	8 (12.5)	
Other	16 (6.7)	1 (6.3)	9 (56.3)	6 (37.5)	.181	1 (6.3)	9 (56.3)	6 (37.5)	.010	1 (6.3)	13 (81.3)	2 (12.5)	.301
Years since residency													
<5 y	42 (17.5)	7 (16.7)	28 (66.7)	7 (13.0)		5 (11.9)	24 (57.1)	13 (31.0)		7 (18.4)	23 (60.5)	8 (21.1)	
5-20 y	90 (37.5)	9 (10.0)	64 (71.1)	4 (7.4)		9 (10.0)	60 (66.7)	21 (23.3)		14 (17.1)	56 (68.3)	12 (14.6)	
>20 y	108 (45.0)	11 (10.2)	67 (62.0)	30 (27.8)	.484	3 (2.8)	72 (66.7)	33 (30.6)	.037	14 (13.2)	68 (64.2)	24 (22.6)	.645
Percent of patient population that is obese ^b													
≤50%	157 (65.4)	14 (8.9)	107 (68.2)	36 (22.9)		8 (5.1)	107 (68.2)	42 (26.8)		24 (16.6)	92 (63.5)	29 (20.0)	
>50%	83 (34.6)	13 (15.7)	52 (62.7)	18 (21.7)	.089	9 (10.8)	49 (59.0)	25 (30.1)	.085	11 (13.6)	55 (67.9)	15 (18.5)	.584
Screens per year ^c													
≤100	28 (11.8)	5 (17.9)	19 (67.9)	4 (14.3)		2 (7.1)	19 (67.9)	7 (25.0)		7 (25.9)	14 (51.9)	6 (22.2)	
>100	210 (88.2)	22 (10.5)	138 (65.7)	50 (23.8)	.335	15 (7.1)	136 (64.8)	59 (28.1)	.999	27 (13.7)	132 (67.0)	38 (19.3)	.188

Colposcopies per year ^c	139 (62.3)	20 (14.4)	88 (63.3)	31 (22.3)	13 (9.4)	87 (62.6)	39 (28.1)	21 (15.9)	84 (63.6)	27 (20.5)
≤100	84 (37.7)	7 (8.3)	57 (67.9)	20 (23.8)	4 (4.8)	58 (69.1)	22 (26.2)	14 (16.9)	58 (69.9)	11 (13.2)
>100										

^aFisher exact *p* value comparing somewhat and much more challenging with not more challenging for sampling, visualization, and taking a biopsy in obese compared with normal weight women.

^bProviders were asked to estimate the percentage of obese patients they see in their practice.

^cProviders were asked to estimate the number of screens and colposcopies they perform per year.

Abbreviations: CNM, certified nurse midwife; Col % indicates column percent; DN, doctorate of nursing; DO, doctor of osteopathic medicine; MD, doctor of medicine; NP, nurse practitioner; PA, physician's assistant; RN, registered nurse.

Specialized Equipment and Techniques

Most providers reported using metal (stainless steel) speculums most often with their obese patients (51.9%) with the remaining 34.7% and 13.4% reporting using plastic or both metal and plastic, respectively. When asked about use of various speculum types/sizes with their obese patients, the most commonly used were large (94.5% have access and use), Graves Long View (78.2%), and Wide View (65.4%) speculums (Supplemental Figure 1, <http://links.lww.com/LGT/A133>). Most providers responded that they do not have access to other types of specula such as Euro-Med Snowman and ExpandaView Integrated Speculum and Lateral Retractor that are specifically designed to enhance visualization in obese or multiparous women. The OB/Gyn, Gyn Onc, and women's health providers were more likely to report using metal ($p < .0001$), Snowman ($p = .036$), and endocervical speculums ($p = .034$) compared with providers from family/internal medicine specialties (see Table 2). Providers with more than 20 years' experience were more likely to report using ExpandaView ($p = .012$), large weighted ($p = .030$), and endocervical speculums ($p < .0001$) compared with providers with fewer years of experience (see Table 2). Both OB/Gyn, Gyn Onc, and women's health providers and those with more than 20 years of experience were significantly more likely to be aware of the availability of extra-large speculum sizes for use in obese patients ($p = .025$ and $p = .017$, respectively).

Providers were asked about how often they perform specific techniques to aid in cervical visualization, sampling, and/or taking a biopsy in obese women (Supplemental Figure 2, <http://links.lww.com/LGT/A133>). The most commonly reported techniques included using condoms or glove fingers to sheath speculums for vaginal sidewall retraction (72.7% sometimes or always perform/use), using tenacula (71.2%), having women place their hands or fists under their lower back (62.0%), and using sidewall retractors (58.5%). The OB/Gyn, Gyn Onc, and women's health providers were more likely to report using tenacula ($p = .020$) or tongue depressors to manipulate the cervix ($p = .065$), and having women put their knees to their chest ($p = .019$) compared with family/internal medicine providers. Providers with more than 20 years' experience were more likely to report using sidewall retractors ($p = .012$) and were significantly less likely to have women put their hands or fists under their back ($p < .0001$) compared with those with 20 years or less experience (see Table 3).

When asked what would make cervical sampling and/or visualization easier to perform in obese women, 83.4% of providers agreed that having adequate equipment available was important, 55.8% agreed that more training would be helpful, and 46.7% indicated having a second person in the room for assistance. The OB/Gyn, Gyn Onc, and women's health providers were significantly more likely to respond that having a second person in the room would be helpful compared with providers from family/internal medicine specialties (57.6% vs. 28.6%, respectively, $p = .001$), whereas providers from family/internal medicine specialties (65.7%) and those with less than 20 years of experience (49.2%) were more likely to respond that having additional training would be helpful compared with OB/Gyn, Gyn Onc, and women's health providers (40.5%, $p = .006$) and those with more than 20 years of experience (38.0%, $p = .05$), respectively (data not shown).

DISCUSSION

Cervical cancer screening relies on the ability of providers to adequately sample and completely visualize the cervix and transformation zone to identify and treat cervical precancers before they may progress to cancer. Findings from our survey of providers from diverse specialties indicate that most have experienced

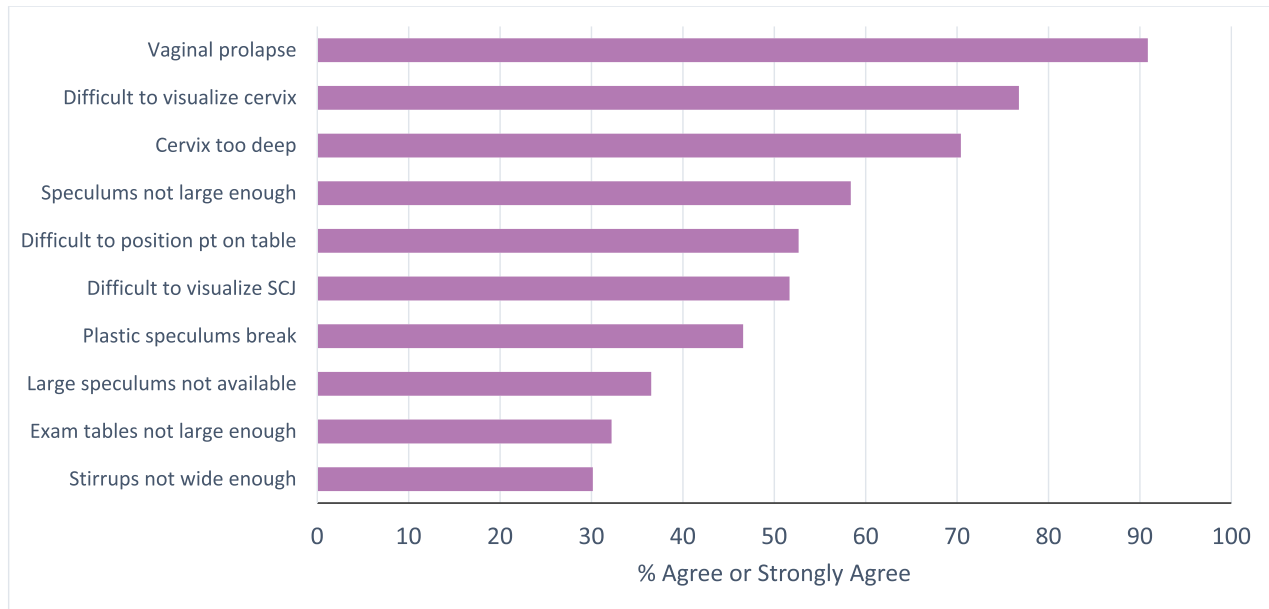


FIGURE 1. Reasons why cervical sampling and visualization are more challenging in obese compared with normal weight patients.

that cervical sampling and visualization and taking a cervical biopsy are more challenging in obese compared with normal weight women. In a recent screening population of nearly 1 million women, we demonstrated that obese women's higher cancer risk may be partly explained by missed detection of cervical precancers during screening and management of obese women, possibly accounting for up to 20% of cancers in that study.¹² Results from our provider survey lend support to this epidemiologic observation, providing an important perspective concerning the challenges faced by providers while performing cervical cancer screening and management in obese women.

The most commonly reported challenges associated with cervical sampling and visualization in obese women included vaginal prolapse, difficulty accessing and visualizing the cervix, and a lack of adequately sized medical equipment (including speculums

and examination tables). With respect to taking a cervical biopsy, most providers reported that the greatest barrier was difficulty visualizing lesions. Many providers, particularly those that practiced in family or internal medicine specialties, were unaware of the existence of extra-large and specialized speculums specifically designed to optimize visualization in larger women. Even among providers who were aware of these options, nearly a third still reported that currently available speculums are not large enough. Collectively, these findings emphasize the importance of educating providers about the availability of specialized equipment for larger women and ensuring access to these tools. More research is required to address whether existing tools and equipment are adequate for cervical sampling and visualization in all women or whether the development of new tools (e.g., speculums) is needed. Furthermore, more research is needed to optimize indications for

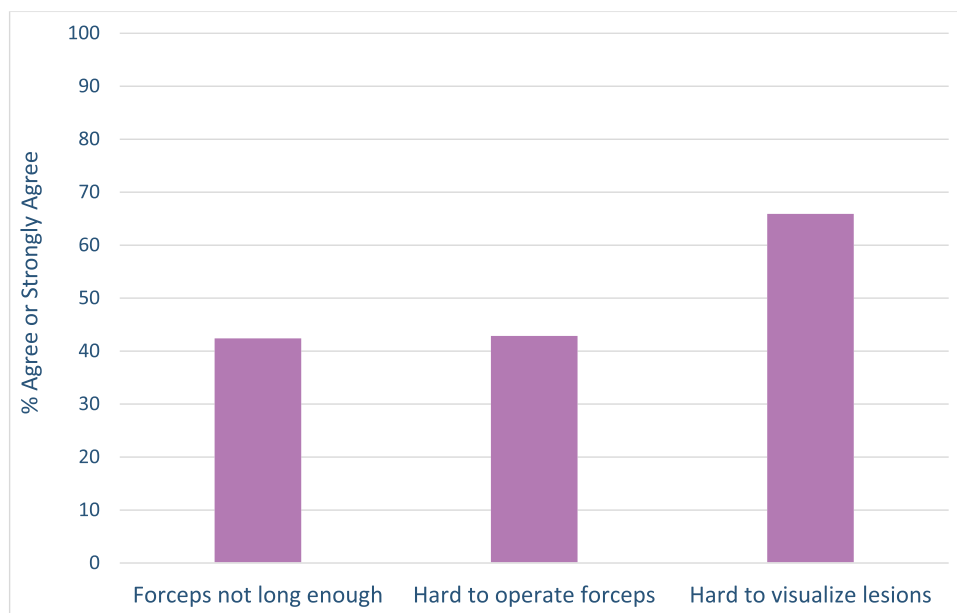


FIGURE 2. Reasons why taking a cervical biopsy is more challenging in obese compared with normal weight patients.

TABLE 2. Use of Different Speculum Types With Obese Patients by Provider Specialty and Years of Experience

	Provider specialty, <i>n</i> (%) ^a			Years of experience, <i>n</i> (%)		
	OB/Gyn, Gyn Onc, women's health	Family or internal med.	<i>p</i> ^b	>20 y	≤20 y	<i>p</i> ^b
Total	205 (85.4)	35 (14.6)		108 (45.0)	132 (55.0)	
Speculum type						
Metal	117 (57.1)	7 (20.6)		59 (55.1)	65 (49.2)	
Plastic	63 (30.7)	20 (58.8)		36 (33.6)	47 (35.6)	
Both	25 (12.2)	7 (20.6)	<.0001	12 (11.2)	20 (15.2)	.578
Large						
Use	191 (96.5)	33 (97.1)		102 (97.1)	122 (96.1)	
Do not use	7 (3.5)	1 (2.9)	.668	3 (2.9)	5 (3.9)	.470
Longview						
Use	159 (84.6)	24 (80.0)		82 (82.7)	101 (84.2)	
Do not use	29 (15.4)	6 (20.0)	.343	16 (16.3)	19 (15.8)	.533
Large weighted						
Use	19 (11.8)	2 (6.7)		14 (15.6)	7 (6.4)	
Do not use	151 (88.2)	28 (93.3)	.358	76 (84.4)	103 (93.6)	.030
Wide View						
Use	133 (74.3)	18 (64.3)		68 (73.1)	83 (72.8)	
Do not use	46 (25.7)	10 (35.7)	.188	25 (26.9)	31 (27.2)	.544
Snowman						
Use	26 (23.9)	1 (4.8)		13 (22.4)	14 (19.4)	
Do not use	83 (76.1)	20 (95.2)	.036	45 (77.6)	58 (80.6)	.420
ExpandaView						
Use	22 (13.9)	3 (9.7)		17 (20.0)	8 (7.7)	
Do not use	136 (86.1)	28 (90.3)	.381	68 (80.0)	96 (92.3)	.012
Endocervical						
Use	119 (62.6)	19 (55.9)		77 (76.2)	57 (46.3)	
Do not use	71 (37.4)	19 (55.9)	.034	24 (23.8)	66 (53.6)	<.0001
Aware of XL–4XL speculum blade sizes						
Yes	92 (44.9)	9 (25.7)		54 (50.0)	47 (35.6)	
No	113 (55.1)	26 (74.3)	.025	54 (50.0)	85 (64.4)	.017

^aProvider specialty compares combined specialties of OB/Gyn, Gyn Onc, and women's health with combined specialties of family practice and internal medicine.

^bFisher exact *p* value comparing have access, always or sometimes use to have access but never use, and do not have access to different speculum types.

different types of equipment. Currently, it is not known whether self-collection or urine sampling for HPV testing would be equally affected by obesity.

Providers from OB/Gyn, Gyn Onc, and women's health specialties and those with more than 20 years' experience were more likely to report that sampling and visualization are more challenging in obese women, which may reflect their increased level of experience with providing gynecologic examinations in larger women or in women in whom cervical visualization is more challenging. Use of metal, ExpandaView, and endocervical specula were more common among these experienced providers; however, our study was not designed to evaluate the effectiveness of these approaches for improving sampling and visualization in obese women. Among all providers, the most commonly used techniques for aiding in cervical sampling and visualization in obese women included placing condoms or examination glove fingers around speculums for vaginal sidewall retraction, using tenacula, and having women put their fists under their lower back to tilt their pelvis upward. Although most of these techniques have not been formally evaluated, the ability of a speculum modified with a polyurethane sheath (similar to the effect of a condom or examination glove finger) to improve cervical visualization was assessed

in a randomized study of 135 women and demonstrated significantly improved cervical visualization compared with a standard medium Graves speculum.¹⁴ More research is needed to determine whether this approach, as well as other techniques evaluated in this survey, is effective for improving visualization in obese women.

An important finding from our study is that most providers indicated that they would like to receive training for cervical sampling and colposcopy in obese women, but only 8% reported receiving such training. The need for additional training was more commonly reported by providers practicing in family and internal medicine specialties (65.7%) compared with those practicing in OB/Gyn, Gyn Onc, and women's health specialties (40.5%). These findings are in line with results from a previous survey of providers who reported wanting more evidence-based approaches for caring for obese women and expressed dissatisfaction with the lack of resources and referral options available.¹⁰ Other studies have suggested that many physicians report lacking confidence, knowledge, and/or skills to incorporate evidence-based guidelines for obesity care into their practice.^{15,16} Despite the availability of resources for providers that address counseling obese patients on how to achieve or maintain a healthy body weight,¹⁷ the prevalence of obesity has been increasing, and similar guidance for

TABLE 3. Use of Techniques to Aid in Cervical Sampling and Visualization in Obese Patients by Provider Specialty and Years of Experience

	Provider specialty, <i>n</i> (%) ^a			Years of experience, <i>n</i> (%)		
	OB/Gyn, Gyn Onc, women's health	Family or internal Medicine	<i>p</i> ^b	>20 y	≤20 y	<i>p</i> ^b
Total	205 (85.4)	35 (14.6)		108 (45.0)	132 (55.0)	
Take speculum apart						
Sometimes/always	96 (47.8)	15 (44.1)		48 (45.7)	63 (48.5)	
Never	105 (52.2)	19 (55.9)	.419	57 (54.3)	67 (51.5)	.387
Use sidewall retractors						
Sometimes/always	119 (58.9)	19 (55.9)		63 (48.5)	71 (67.0)	
Never	83 (41.1)	15 (44.1)	.440	67 (51.5)	35 (33.0)	.012
Use tenaculum						
Sometimes/always	151 (75.1)	19 (55.9)		80 (75.5)	90 (69.8)	
Never	50 (24.9)	15 (44.1)	.020	26 (24.5)	39 (30.2)	.205
Use condoms						
Sometimes/always	147 (72.1)	8 (23.5)		82 (76.6)	91 (69.5)	
Never	57 (27.9)	26 (76.5)	.380	25 (23.4)	40 (30.5)	.138
Use ultrasound probes						
Sometimes/always	6 (3.0)	0 (0.0)		3 (2.9)	3 (2.3)	
Never	194 (97.0)	34 (100.0)	.386	101 (97.1)	127 (97.7)	.548
Use tongue depressors						
Sometimes/always	101 (49.8)	23 (65.7)		55 (51.9)	58 (43.9)	
Never	102 (50.2)	12 (34.3)	.065	51 (48.1)	74 (56.1)	.138
Invert speculum						
Sometimes/always	65 (32.0)	8 (24.2)		35 (33.0)	38 (29.2)	
Never	138 (68.0)	25 (75.8)	.247	71 (67.0)	92 (70.8)	.314
Have patient put knees to chest						
Sometimes/always	75 (37.0)	6 (17.7)		36 (34.0)	45 (34.4)	
Never	128 (63.0)	28 (82.3)	.019	70 (66.0)	86 (65.6)	.530
Have patient put fists under back						
Sometimes/always	124 (61.1)	23 (67.7)		52 (49.1)	95 (72.5)	
Never	79 (38.9)	11 (32.3)	.298	54 (50.8)	36 (27.5)	<.0001

^aProvider specialty compares combined specialties of OB/Gyn, Gyn Onc, and women's health with combined specialties of family practice and internal medicine.

^bFisher exact *p* value comparing have access, always or sometimes use to have access but never use, and do not have access to different speculum types.

cervical cancer screening and management in obese women does not currently exist. Traditionally, pelvic examination skills have been taught through the use of textbooks, didactic lectures, inanimate pelvic models, and/or trained standardized patients, with practice varying widely by specialty.¹⁸ To our knowledge, most programs do not specifically address performing these skills in obese patients, representing a critical learning gap in medical training.¹⁹

We sampled a population of providers from a diverse range of specialty areas, years of experience, and practice settings, which enabled us to collect a diverse range of responses and perspectives on this topic. However, ASCCP members are likely to have a greater interest and/or clinical focus on cervical cancer screening and colposcopy, and results from this survey may not be generalizable to all US providers. Moreover, respondents to this survey may not entirely reflect the opinion of the ASCCP membership and it is possible that participation in this survey was more likely among providers who clearly see a problem with cervical cancer screening and management of obese women. Obesity is influenced by multiple physical, emotional, and societal issues that may make adherence to cervical cancer screening and management more difficult.²⁰ Therefore, going forward, it will also be important

to conduct research to understand the cervical cancer screening and management experience from the patients' perspective.

CONCLUSIONS

Results from our study suggest that providers find cervical sampling, visualization, and biopsy more challenging in obese compared with normal weight women. These findings support our previous epidemiologic observations, suggesting that cervical precancers may be harder to detect in obese women undergoing cervical cancer screening, leading to an increased risk of cancer compared with normal weight women.¹² Currently, evidence regarding effective approaches for cervical cancer screening and management in obese patients is lacking. More research is needed to evaluate the effectiveness of equipment and techniques for optimizing cervical sampling and visualization in obese women, and education and training should be adapted to ensure that adequate gynecologic care is provided to women of all body sizes. With more than 40% of women in the US currently classified as obese, it is essential to ensure that all providers are equipped with proper

training and equipment for cervical sampling and visualization to provide equitable care for all women.

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REFERENCES

1. Organization WH. *Obesity: Preventing and Managing the Global Epidemic. Report of a WHO Consultation*. Geneva: World Health Organization; 2000.
2. Hales CM, Fryar CD, Carroll MD, et al. Trends in obesity and severe obesity prevalence in US youth and adults by sex and age, 2007-2016. *JAMA* 2018;319:1723–5.
3. Bhaskaran K, Douglas I, Forbes H, et al. Body-mass index and risk of 22 specific cancers: a population-based cohort study of 5.24 million UK adults. *Lancet* 2014;384:755–65.
4. Poorolajal J, Jenabi E. The association between BMI and cervical cancer risk: a meta-analysis. *Eur J Cancer Prev* 2016;25:232–8.
5. Arnold M, Pandeya N, Byrnes G, et al. Global burden of cancer attributable to high body-mass index in 2012: a population-based study. *Lancet Oncol* 2015;16:36–46.
6. Renehan AG, Soerjomataram I. Obesity as an avoidable cause of cancer (attributable risks). *Recent Results Cancer Res* 2016;208:243–56.
7. Lacey JV Jr, Swanson CA, Brinton LA, et al. Obesity as a potential risk factor for adenocarcinomas and squamous cell carcinomas of the uterine cervix. *Cancer* 2003;98:814–21.
8. Wee CC, Huang A, Huskey KW, et al. Obesity and the likelihood of sexual behavioral risk factors for HPV and cervical cancer. *Obesity (Silver Spring)* 2008;16:2552–5.
9. Wee CC, McCarthy EP, Davis RB, et al. Screening for cervical and breast cancer: is obesity an unrecognized barrier to preventive care? *Ann Intern Med* 2000;132:697–704.
10. Amy NK, Aalborg A, Lyons P, et al. Barriers to routine gynecological cancer screening for white and African-American obese women. *Int J Obes (Lond)* 2006;30:147–55.
11. Wee CC, Phillips RS, McCarthy EP. BMI and cervical cancer screening among white, African-American, and Hispanic women in the United States. *Obes Res* 2005;13:1275–80.
12. Clarke MA, Fetterman B, Cheung LC, et al. Epidemiologic evidence that excess body weight increases risk of cervical cancer by decreased detection of precancer. *J Clin Oncol* 2018;36:1184–91.
13. Survey Monkey Sample Size Calculator. Available at: <https://www.surveymonkey.com/mp/sample-size-calculator/>. Accessed August 1, 2018.
14. Hill DA, Cacciatore ML, Lamvu G. Sheathed versus standard speculum for visualization of the cervix. *Int J Gynaecol Obstet* 2014;125:116–20.
15. Petrin C, Kahan S, Turner M, et al. Current attitudes and practices of obesity counselling by health care providers. *Obes Res Clin Pract* 2017;11:352–9.
16. Ferrante JM, Fyffe DC, Vega ML, et al. Family physicians' barriers to cancer screening in extremely obese patients. *Obesity (Silver Spring)* 2010;18:1153–9.
17. American College of Obstetricians and Gynecologists. Obesity and women's health: resource overview. 2016. Available at: <https://www.acog.org/Womens-Health/Obesity?IsMobileSet=false>. Accessed September 15, 2019.
18. Everett EN, Forstein DA, Bliss S, et al. To the point: the expanding role of simulation in obstetrics and gynecology medical student education. *Am J Obstet Gynecol* 2019;220:129–41.
19. Silk AW, McTigue KM. Reexamining the physical examination for obese patients. *JAMA* 2011;305:193–4.
20. Maruthur NM, Bolen SD, Brancati FL, et al. The association of obesity and cervical cancer screening: a systematic review and meta-analysis. *Obesity (Silver Spring)* 2009;17:375–81.