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Prevalence of Potentially Unnecessary Bimanual Pelvic Examinations and Papanicolaou Tests Among Adolescent Girls and Young Women Aged 15-20 Years in the United States

Jin Qin, ScD; Mona Saraiya, MD, MPH; Gladys Martinez, PhD; George F. Sawaya, MD

Invited Commentary page 281

IMPORTANCE Pelvic examination is no longer recommended for asymptomatic, nonpregnant women and may cause harms such as false-positive test results, overdiagnosis, anxiety, and unnecessary costs. The bimanual pelvic examination (BPE) is an invasive and controversial examination component. Cervical cancer screening is not recommended for women younger than 21 years.

OBJECTIVES To estimate prevalence of potentially unnecessary BPE and Papanicolaou (Pap) tests performed among adolescent girls and women younger than 21 years (hereinafter referred to as young women) in the United States and to identify factors associated with receiving these examinations.

DESIGN, SETTING, AND PARTICIPANTS A cross-sectional analysis of the National Survey of Family Growth from September 2011 through September 2017 focused on a population-based sample of young women aged 15 to 20 years (n = 3410). The analysis used survey weights to estimate prevalence and the number of people represented in the US population. Data were analyzed from December 21, 2018, through September 3, 2019.

MAIN OUTCOMES AND MEASURES Receipt of a BPE or a Pap test in the last 12 months and the proportion of potentially unnecessary examinations and tests.

RESULTS Responses from 3410 young women aged 15 to 20 years were included in the analysis with 6-year sampling weights applied. Among US young women aged 15 to 20 years represented during the 2011-2017 study period, 4.8% (95% CI, 3.9%-5.9%) were pregnant, 22.3% (95% CI, 20.1%-24.6%) had undergone STI testing, and 4.5% (95% CI, 3.6%-5.5%) received treatment or medication for an STI in the past 12 months (Table 1). Only 2.0% (95% CI, 1.4%-2.9%) reported using an IUD, and 33.5% (95% CI, 30.8%-36.4%) used at least 1 other type of hormonal contraception in the past 12 months. Among US young women aged 15 to 20 years who were surveyed in the years 2011 through 2017, approximately 2.6 million (22.9%; 95% CI, 20.7%-25.3%) reported having received a BPE in the last 12 months. Approximately half of these examinations (54.4%; 95% CI, 48.8%-59.9%) were potentially unnecessary, representing an estimated 1.4 million individuals. Receipt of a BPE was associated with having a Pap test (adjusted prevalence ratio [aPR], 7.12; 95% CI, 5.56-9.12), testing for sexually transmitted infections (aPR, 1.60; 95% CI, 1.34-1.90), and using hormonal contraception other than an intrauterine device (aPR, 1.31; 95% CI, 1.11-1.54). In addition, an estimated 2.2 million young women (19.2%; 95% CI, 17.2%-21.4%) reported having received a Pap test in the past 12 months, and 71.9% (95% CI, 66.0%-77.1%) of these tests were potentially unnecessary.

CONCLUSIONS AND RELEVANCE This analysis found that more than half of BPEs and almost three-quarters of Pap tests performed among young women aged 15 to 20 years during the years 2011 through 2017 were potentially unnecessary, exposing women to preventable harms. The results suggest that compliance with the current professional guidelines regarding the appropriate use of these examinations and tests may be lacking.

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Author Affiliations: Epidemiology and Applied Research Branch, Division of Cancer Prevention and Control, Centers for Disease Control and Prevention, Atlanta, Georgia (Qin, Saraiya); Reproductive Statistics Branch, National Center for Health Statistics, Division of Vital Statistics, Centers for Disease Control and Prevention, Hyattsville, Maryland (Martinez); Department of Obstetrics, Gynecology, and Reproductive Sciences, University of California, San Francisco (Sawaya); Center for Healthcare Value, University of California, San Francisco (Sawaya).

Corresponding Author: Jin Qin, ScD, Epidemiology and Applied Research Branch, Division of Cancer Prevention and Control, Centers for Disease Control and Prevention, 4770 Buford Hwy, Mail Stop S107-4, Atlanta, GA 30341 (jqin@cdc.gov).

The annual pelvic examination has long been performed in asymptomatic women as part of the well-woman visit.[1,2] The bimanual pelvic examination (BPE) is palpation of the internal pelvic organs with the insertion of 2 fingers into the vagina accompanied by simultaneous abdominopelvic pressure. The Papanicolaou (Pap) test is a procedure used for cervical cancer screening by placing a speculum inside the vagina to collect cells from the cervix.

Screening for cervical cancer is not recommended for women younger than 21 years, a consensus reached by the US Preventive Services Task Force, the American College of Obstetricians and Gynecologists, and American Cancer Society.[3-5] Leading professional organizations (ie, American College of Physicians, American Academy of Family Physicians) recommended against performing pelvic examinations in asymptomatic, nonpregnant women.[6,7] In 2017, the US Preventive Services Task Force concluded that current evidence is insufficient to assess the balance of benefits and harms of performing screening pelvic examinations in asymptomatic, nonpregnant adult women.[8] In 2018, the American College of Obstetricians and Gynecologists recommended that pelvic examinations be performed only when indicated by the medical history or symptoms.[9] In addition, current recommendations agree that a pelvic examination is not necessary before initiating or prescribing contraception except for an intrauterine device (IUD) or to screen for sexually transmitted infections (STIs).[9-12] Potential harms associated with unindicated tests include anxiety, false-positive findings, overdiagnosis, and unnecessary treatment. These harms are magnified in the screening setting when the tests in question have limited evidence of benefit, such as the BPE and Pap tests in women younger than 21 years. The objectives of this study were to estimate the prevalence of and examine factors associated with receipt of BPE and Pap tests among women younger than 21 years in the United States and to estimate the proportion of these examinations and tests that are potentially unnecessary.

Key Points

Question What is the prevalence of potentially unnecessary bimanual pelvic examinations and Papanicolaou tests among US women aged 15 to 20 years?

Findings In this population-based, cross-sectional study using data from 2011 to 2017, an estimated 2.6 million women aged 15 to 20 years in the United States (22.9%) received a bimanual pelvic examination in the past year, and 54.4% of these examinations were potentially unnecessary. An estimated 2.2 million young women (19.2%) received a Papanicolaou test in the past year, and 71.9% of these tests were potentially unnecessary.

Meaning The findings suggest that many young women receive potentially unnecessary bimanual pelvic examinations and Papanicolaou tests.

Methods

We analyzed public use data from the National Survey of Family Growth (NSFG), a multistage, probability-based, nationally representative sample of men and women aged 15 to 44 years in the US household population for this cross-sectional analysis.[13] The NSFG is conducted by the National Center for Health Statistics and supported by cosponsoring agencies. The NSFG gathers information on family life, marriage and divorce, pregnancy, infertility, use of contraception, and general and reproductive health. The survey is conducted in person by trained female interviewers using the computer-assisted personal interviewing system on laptop computers and the audio computer-assisted self-interviews that respondents completed on their own. The sample design and methods have been described elsewhere.[14-16] Following procedures and forms approved by the National Center for Health Statistics research ethics review board, written informed consent was obtained from all adult survey participants, and signed parental permission and minor assent were obtained for all minor respondents aged 15 to 17 years. To ensure confidentiality, interviews were conducted in a room with only the respondent and the interviewer. This study followed the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) reporting guideline.

The population of this study included adolescent girls and young women (hereinafter referred to as young women) aged 15 to 20 years in the United States. The analysis combined NSFG data files for September 2011 to September 2013; September 2013 to September 2015; and September 2015 to September 2017. After excluding 7 individuals with a personal history of gynecologic cancers (cervical, endometrial, or ovarian), the final sample size for the analysis was 3410 respondents. The NSFG response rate for women was 70.4% in 2011 to 2017. The survey asked female respondents, "In the past 12 months, have you received a pelvic examination—where a doctor or nurse puts one hand in the vagina and the other on the abdomen?" As the question indicated, this analysis focused on the bimanual component of the pelvic examination, because it is the most invasive of the pelvic examination components and less likely to be confused with a speculum examination for cervical cancer or STI screening. Among those who reported not having a BPE in the past 12 months, a subsequent question asked about timing of their last BPE. We used both questions to determine whether a female respondent ever had a BPE. Receipt of a Pap test was determined using the question, "In the past 12 months, have you received a Pap test—where a doctor or nurse put an instrument in the vagina and took a sample to check for abnormal cells that could turn into cervical cancer?" The same method used for the BPE was used to determine whether a female respondent ever had a Pap test. Females who had ever received a BPE or a Pap test were asked about the main reason for their most recent BPE or Pap test, and the respondents could choose "part of a routine exam," "because of a medical problem," or "other reason." Another question asked respondents whether the BPE was performed at the same visit as the Pap test.

We classified BPE into medically indicated or potentially unnecessary types. Discernable medical indications for a BPE in the past 12 months were defined as (1) pregnancy in the past 12 months, (2) IUD use in the past 12 months, (3) receipt of a

BPE because of a medical problem or other reason, and (4) receipt of treatment for STIs (chlamydia, gonorrhea, syphilis, or genital herpes) in the past 12 months. If a female respondent had 1 or more of the indications above and received a BPE in the past 12 months, the examination was considered medically indicated; otherwise, the examination was considered potentially unnecessary. In other words, potentially unnecessary BPEs were those performed as part of a routine examination among female respondents who were not pregnant, did not use an IUD, and did not have STI treatment in the past year. Cervical cancer screening is not recommended for women younger than 21 years (except those who are HIV infected and sexually active[17]). Most Pap tests performed in this age group, therefore, will be unnecessary. Because HIV infection status is not available in the NSFG, we estimated prevalence of Pap tests performed as part of a routine examination and considered them potentially unnecessary.

We estimated the prevalence of receiving a BPE or a Pap test in the past 12 months among young women aged 15 to 20 years overall, by medical indication, and by selected characteristics. Besides the respondent's age, race/ethnicity, and health insurance type, we analyzed the following variables in the past 12 months: pregnancy, STI testing, STI treatment, IUD use, and use of other hormonal contraception methods. In the self-administered portion of the survey, respondents were asked whether they have been tested for an STI such as chlamydia, gonorrhea, herpes, or syphilis and have been treated or received medication from a physician or other health care professional for an STI in the past 12 months. In addition, respondents answered questions about birth control methods used in the past 12 months. We analyzed 2 types of contraception that need a prescription using 2 separate variables: IUD use (a BPE is indicated) and other hormonal contraception use, including pills, hormonal implants, medroxyprogesterone acetate (Depo-Provera), contraceptive patch, and contraceptive ring (a BPE is unnecessary unless medically indicated).

To generate statistically valid results that represent young women aged 15 to 20 years in the United States, we used the 6-year sampling weights representing the female US population in 2014 and design variables to account for the NSFG's complex sample design and differential response rates.[15,16] Analyses were performed in SAS, version 9.4 (SAS Institute Inc) and SUDAAN, version 11.0 (RTI International). We examined the association between selected respondent characteristics and receipt of a BPE in the past 12 months using multivariable logistic regression models and estimated adjusted prevalence ratios (aPR) with 95% CIs. Similar multivariable analysis was performed for receipt of a Pap test as the outcome. Data were analyzed from December 21, 2018, through September 3, 2019.

Results

Responses from 3410 young women aged 15 to 20 years were included in the analysis with 6-year sampling weights applied. Among US young women aged 15 to 20 years represented during the 2011-2017 study period, 4.8% (95% CI, 3.9%-5.9%) were pregnant, 22.3% (95% CI, 20.1%-24.6%) had undergone STI testing, and 4.5% (95% CI, 3.6%-5.5%) received treatment or medication for an STI in the past 12 months (**Table 1**). Only 2.0% (95% CI, 1.4%-2.9%) reported using an IUD, and 33.5% (95% CI, 30.8%-36.4%) used at least 1 other type of hormonal contraception in the past 12 months.

The prevalence of ever having received a BPE was 29.1% (95% CI, 26.7%-31.7%), representing an estimated 2.6 million individuals (**Table 2**). Nearly one-fourth (22.9%; 95% CI, 20.7%-25.3%) of young women aged 15 to 20 years in the United States, or an estimated 2.6 million individuals, received a BPE in the past 12 months. More than half of these examinations (54.4%; 95% CI, 48.8%-59.9%) were potentially unnecessary, representing an estimated 1.4 million individuals. One-fifth (19.2%; 95% CI, 17.2%-21.4%), or an estimated 2.2 million young women aged 15 to 20 years, received a Pap test in the past 12 months. About three-quarters (71.9%; 95% CI, 66.0%-77.1%) of all Pap tests performed in the past 12 months were potentially unnecessary, representing approximately 1.6 million young women in the United States. Almost all (97.7%; 95% CI, 94.8%-99.0%) potentially unnecessary BPEs were performed at the same visit with a screening (potentially unnecessary) Pap test.

In multivariable analysis (**Table 3**), receipt of a BPE (regardless of medical indications) in the past 12 months was associated with being older (aPR, 1.25; 95% CI, 1.08-1.45). Young women who had a Pap test were 7 times more likely to also report receiving a BPE (aPR, 7.12; 95% CI, 5.56-9.12). Young women who had a pregnancy (aPR, 1.70; 95% CI, 1.33-2.17), had STI testing (aPR, 1.60; 95% CI, 1.34-1.90), and used an IUD (aPR, 1.61; 95% CI, 1.12-2.33) in the past 12 months were more likely to report receiving a BPE. In addition, those who used hormonal contraception methods other than an IUD were 31% more likely to receive a BPE compared with those who did not use those methods (aPR, 1.31; 95% CI, 1.11-1.54). Young women with public insurance (aPR, 0.87; 95% CI, 0.78-0.97) or no insurance (aPR, 0.83; 95% CI, 0.72-0.97) were less likely to report receiving a BPE than those with private health insurance. Race/ethnicity and STI treatment were not found to be associated with receipt of BPE when adjusting for other covariates.

Similarly, receipt of a Pap test in the past 12 months was found to be associated with being older (aPR, 1.54; 95% CI, 1.21-1.96), having a pregnancy (aPR, 2.31; 95% CI, 1.71-3.11), and using an IUD (aPR, 1.54; 95% CI, 1.01-2.35). The prevalence of receiving a Pap test among young women who had STI testing was 4 times higher compared with those who did not have testing (aPR, 3.77; 95% CI, 2.87-4.95). Young women who used hormonal contraception other than an IUD were 75% more likely to receive a Pap test compared with those who did not use those methods (aPR, 1.75; 95% CI, 1.42-2.16).

Findings were similar in a sensitivity analysis among young women who did not have discernable medical indications for a BPE. Receiving a potentially unnecessary BPE in the past 12 months was associated with being older (aPR, 1.37; 95% CI, 1.09-1.72), having a Pap test (aPR, 12.44; 95% CI, 8.34-18.57), having STI testing (aPR, 1.77; 95% CI, 1.37-2.30), and using hormonal contraception methods (other than IUD) in the past 12 months (aPR, 1.41; 95% CI, 1.07-1.87).

Table 1. Selected Characteristics of Young Women Aged 15-20 Years in the United States, 2011-2017 National Survey of Family Growth

Characteristic	Frequency, No.[a]		Prevalence, % (95% CI)
	Sample (n = 3410)	Weighted Population (×1000)	
Age, y			
15-17	1744	5439	48.0 (45.6-50.4)
18-20	1666	5893	52.0 (49.6-54.4)
Race/ethnicity			
Hispanic	1004	2644	23.3 (20.1-26.9)
White non-Hispanic	1392	5760	50.8 (47.5-54.1)
Black non-Hispanic	666	1623	14.3 (12.4-16.4)
Other non-Hispanic	348	1306	11.5 (8.9-14.8)
Health insurance[b]			
Private	1630	6112	53.9 (50.8-57.0)
Public	1379	3882	34.3 (31.7-36.9)
None	401	1338	11.8 (9.8-14.2)
Factor in past 12 mo			
Pregnancy			
No	3216	10 790	95.2 (94.1-96.1)
Yes	194	542	4.8 (3.9-5.9)
STI testing			
No	2630	8740	77.7 (75.4-79.9)
Yes	753	2506	22.3 (20.1-24.6)
STI treatment			
No	3218	10 774	95.5 (94.5-96.4)
Yes	174	502	4.5 (3.6-5.5)
IUD use			
No	3346	11 101	98.0 (97.1-98.6)
Yes	64	231	2.0 (1.4-2.9)
Hormonal contraception use other than IUD			
No	2315	7532	66.5 (63.6-69.2)
Yes	1095	3800	33.5 (30.8-36.4)

Abbreviations: IUD, intrauterine device; STI, sexually transmitted infection.

[a] Sample frequencies for some variables do not total 3410 owing to answers of "not ascertained," "refused," or "don't know."

[b] Respondents covered by private health insurance or Medi-Gap at the time of the survey were categorized as having private health insurance. Respondents covered by Medicaid, Children's Health Insurance Program, state-sponsored health plans, Medicare, military health care, or other government health care were categorized as having public health insurance. Uninsured women and women with only a single-service plan or only the Indian Health Service coverage were considered uninsured.

Discussion

We estimated that almost one-quarter (22.9%), or 2.6 million, of young women aged 15 to 20 years in the United States received a BPE in the past year, and more than half (54.4%), or 1.4 million, of these examinations were potentially unnecessary. In addition, 3 in 4 young women who had a Pap test in the past year, or an estimated 1.6 million individuals, received potentially unnecessary Pap tests. The Medicare payment was $37.97 for a screening pelvic examination and $44.78 for a screening Pap smear in 2014.[18] Thus, assuming the Medicare payment roughly approximates cost, the potentially unnecessary BPEs and Pap tests cost more than $123 million in 1 year.

The American College of Obstetricians and Gynecologists recognizes that no evidence supports routine speculum examination or BPE in healthy, asymptomatic women younger than 21 years and recommends that these examinations be performed only when medically indicated. Our results showed that, despite the recommendation, many young women without discernable medical indication received potentially unnecessary BPE or Pap tests, which may be a reflection of a long-standing clinical practice in the United States.[19] A 2013 nationwide survey among obstetricians and gynecologists[20] found that 87% of them would perform a BPE in an asymptomatic 18-year-old woman. Many young women associate the examination with fear, anxiety, embarrassment, discomfort, and pain.[21-24] Women with a history of sexual violence may be more vulnerable to these harms than those without such history.[25] This factor is relevant to adolescent girls because 1 in 16 reproductive-aged women had a forced first sexual encounter (82% of females had ever had sexual intercourse by 21 years of age in NSFG),[26] and there have been media reports about inappropriate gynecologic examinations in young women.[27] In addition, studies have shown that adolescent girls may delay starting hormonal contraception or being screened for STIs because of fear of the pelvic examination. The traditional practice of conducting a pelvic examination for these purposes may act as a barrier to contraceptive use to prevent unintended pregnancies and may increase overall health risks.[21,28,29]

Professional organizations recommend starting cervical cancer screening with Pap test at 21 years of age regardless of sexual behaviors and risk factors.[3-5] Nonetheless, we found that

Table 2. Prevalence and Frequency of BPE and Pap Test Among Young Women Aged 15-20 Years in the United States, 2011-2017 National Survey of Family Growth[a]

Outcome	Prevalence, % (95% CI)	Frequency, Weighted Population (×1000)
BPE		
Ever	29.1 (26.7-31.7)	3300
In the past 12 mo	22.9 (20.7-25.3)	2591
Medically indicated	45.6 (40.1-51.2)	1182
Potentially unnecessary	54.4 (48.8-59.9)	1409
Pap test		
Ever	25.4 (23.2-27.8)	2864
In the past 12 mo	19.2 (17.2-21.4)	2173
Part of a routine examination	71.9 (66.0-77.1)	1563
Because of a medical problem	15.3 (11.5-19.9)	332
Other reason	12.8 (9.6-16.9)	278

Abbreviations: BPE, bimanual pelvic examination; Pap test, Papanicolaou test.

[a] Includes 3410 respondents. Discernable medical indications for a BPE in the past 12 months included pregnancy, intrauterine device use, received the examination because of a medical problem or other reason, and treatment for a sexually transmitted infection. If a female respondent had 1 or more of these indications and received a BPE in the past 12 months, the examination was considered medically indicated; otherwise, the examination was considered potentially unnecessary.

19.2% of women younger than the recommended age had a Pap test within the past year, and 71.9% of them were potentially unnecessary. The proportion of unnecessary Pap tests was likely to be higher than the estimates because of our conservative definition. Young women aged 15 to 20 years who received a Pap test were 7 times more likely to receive a BPE compared with those who did not receive a Pap test, and potentially unnecessary BPEs were almost always performed in conjunction with an unnecessary Pap test. Gynecologic cancers (cervical, ovarian, uterine, vaginal, or vulvar cancer) are rare among young women—in 2015, there were 152 cases (rate of 1.5 per 100 000 persons) among young women aged 15 to 19 years in the United States.[30] Guidelines do not recommend pelvic examinations for cancer screening[31-33]; however, many health care professionals believe that the pelvic examination is a useful tool to screen for gynecologic cancers.[20,34]

Pelvic examination has traditionally been performed among asymptomatic women to screen for STIs in the United States.[35] Our findings suggest that this outdated practice may still be performed. Young women who had STI testing were more likely to receive a BPE or a Pap test compared with those who were not tested, and most young women who had STI testing also had a BPE in the past 12 months. Professional bodies agree that a pelvic examination is not necessary to screen for STIs among sexually active adolescents.[9,11,36] Screening for STIs can be performed through highly sensitive and specific nucleic acid amplification tests using first-pass urine samples or self-collected vaginal swab specimens,[10,11] obviating the need for a pelvic examination in asymptomatic women. These less intrusive options are preferred by adolescents and young women over pelvic examination.[37,38]

We found that 42.4% of young women aged 15 to 20 years in the United States who used hormonal contraception (other than an IUD) received a BPE within the past year. Furthermore, hormonal contraception use (other than an IUD) was independently associated with receiving a BPE after adjusting for Pap test, IUD use, and other covariates. Historically, pelvic examination has often been performed as a prerequisite before initiation or receipt of hormonal contraception. However, guidelines from several health organizations, including the Centers for Disease Control and Prevention[12] and American College of Obstetricians and Gynecologists,[9] emphasized that most methods of hormonal contraception, with the exception of IUDs, can be safely prescribed without requiring a pelvic examination. Our findings suggest a lag in clinical practice following the recommendations and guidelines. For example, the notion linking access to hormonal contraception (other than an IUD) and pelvic examination is still common among obstetricians and gynecologists.[39]

Studies examining women's attitudes and beliefs regarding routine pelvic examination showed that one-half of the women 21 years or older did not know the purpose of the pelvic examination, and yet most women believed that routine pelvic examinations were necessary for STI screening, contraception initiation, and cancer detection and have value in reassuring the patient that she is in good health, particularly among older women.[40,41] After education on the American College of Physicians' recommendation advising against routine pelvic examinations, substantially fewer women wanted to have one.[40,42] When asked about how often they think they will need to have a pelvic examination or a Pap test in the 2011-2017 NSFG, more than 71% of young women aged 15 to 20 years thought they need to have a BPE or a Pap test at least once every 2 years, contrary to guideline recommendations.

Limitations

This study has limitations. First, responses to these survey questions were reported to an interviewer or through a computer-assisted self-interviewing system, and answers may be subject to recall or social desirability bias. Further, as with many surveys, we could not verify the accuracy of the information reported. However, the survey questions included a distinct description of a BPE and Pap test and limited the time frame to 12 months before the date of survey, which could have helped reduce information bias. Second, female respondents were not asked directly about their symptoms. We considered female respondents symptomatic if they received their most recent BPE because of a medical problem or other reason. However, the question did not ask about specific problems, and the symptom status was unknown among female respondents who never received a BPE. Having such information could help better identify low-risk women who do not need a BPE. Last, this study focused on the bimanual component of the pelvic examination and did not examine external and speculum examinations. Because most health care professionals believe that pelvic examinations include a bimanual examination,[34] the prevalence of overall pelvic examination is likely to be similar to our estimates if not higher.

Table 3. Prevalence and Association of BPE and Pap Test in the Past 12 Months With Selected Characteristics Among Young Women Aged 15-20 Years in the United States, 2011-2017 National Survey of Family Growth[a,b]

Characteristic	BPE		Pap Test	
	Prevalence (95% CI), %	aPR (95% CI)	Prevalence (95% CI), %	aPR (95% CI)
Age, y				
15-17	11.2 (8.9-14.1)	1 [Reference]	9.9 (7.8-12.5)	1 [Reference]
18-20	33.7 (30.4-37.1)	1.25 (1.08-1.45)	27.8 (24.5-31.4)	1.54 (1.21-1.96)
Race/ethnicity				
Hispanic	19.6 (15.5-24.3)	0.98 (0.83-1.15)	16.4 (13.1-20.3)	0.84 (0.65-1.09)
White, non-Hispanic	22.6 (19.2-26.5)	1 [Reference]	18.7 (15.8-22.1)	1 [Reference]
Black, non-Hispanic	30.5 (24.6-37.2)	0.94 (0.79-1.11)	28.9 (23.5-35.1)	1.08 (0.83-1.39)
Other, non-Hispanic	21.4 (14.9-29.7)	1.12 (0.90-1.39)	15.0 (10.1-21.8)	0.83 (0.60-1.13)
Health insurance[c]				
Private	21.3 (18.3-24.6)	1 [Reference]	15.9 (13.4-18.9)	1 [Reference]
Public	26.3 (22.9-30.0)	0.87 (0.78-0.97)	24.6 (21.5-28.1)	1.21 (0.99-1.46)
None	20.4 (15.4-26.5)	0.83 (0.72-0.97)	18.4 (13.6-24.5)	1.01 (0.77-1.34)
Factor in past 12 mo				
Pap test				
No	7.1 (5.5-9.1)	1 [Reference]	NA	NA
Yes	89.2 (84.8-92.4)	7.12 (5.56-9.12)	NA	NA
Pregnancy				
No	19.9 (17.8-22.3)	1 [Reference]	16.6 (14.7-18.8)	1 [Reference]
Yes	82.0 (74.3-87.7)	1.70 (1.33-2.17)	71.0 (61.7-78.8)	2.31 (1.71-3.11)
STI testing				
No	11.1 (9.2-13.5)	1 [Reference]	8.7 (7.0-10.7)	1 [Reference]
Yes	64.0 (58.2-69.4)	1.60 (1.34-1.90)	56.1 (50.2-61.7)	3.77 (2.87-4.95)
STI treatment				
No	20.9 (18.7-23.4)	1 [Reference]	17.4 (15.4-19.7)	1 [Reference]
Yes	64.9 (54.1-74.3)	1.08 (0.87-1.35)	57.6 (46.7-67.8)	1.13 (0.85-1.51)
IUD use				
No	21.9 (19.7-24.2)	1 [Reference]	18.5 (16.6-20.7)	1 [Reference]
Yes	71.4 (55.7-83.2)	1.61 (1.12-2.33)	52.0 (37.1-66.5)	1.54 (1.01-2.35)
Hormonal contraception use (other than IUD)				
No	13.1 (10.9-15.7)	1 [Reference]	11.1 (9.0-13.6)	1 [Reference]
Yes	42.4 (38.1-46.9)	1.31 (1.11-1.54)	35.3 (31.2-39.6)	1.75 (1.42-2.16)

Abbreviations: aPR, adjusted prevalence ratio; BPE, bimanual pelvic examination; IUD, intrauterine device; NA, not applicable; Pap test, Papanicolaou test; STI, sexually transmitted infection.

[a] Includes 3410 respondents. For BPE, variables in the model included age group, race/ethnicity, health insurance, Pap test, pregnancy, STI testing, STI treatment, IUD use, and hormonal contraception use (other than IUD) in the past 12 months. For Pap test, variables in the model were the same except Pap test.

[b] Analysis included female respondents aged 15 to 20 years without a personal history of gynecologic cancers regardless of medical indications for a BPE.

[c] Respondents covered by private health insurance or Medi-Gap at the time of the survey were categorized as having private health insurance. Respondents covered by Medicaid, Children's Health Insurance Program, state-sponsored health plans, Medicare, military health care, or other government health care were categorized as having public health insurance. Uninsured women and women with only a single-service plan or only the Indian Health Service coverage were considered uninsured.

Conclusions

This study found that a substantial number of US young women aged 15 to 20 years had received potentially unnecessary BPEs and Pap tests. In addition, our results indicated that the traditional clinical practices linking a pelvic examination or a Pap test with STI screening and prescription of hormonal contraception may still exist. These findings suggest the need for education for health care professionals, parents, and young women themselves to improve awareness of professional guidelines and the limitations and harms of routine pelvic examination and Pap test and to ensure that these tests and examinations are performed only when medically necessary among young women.

ARTICLE INFORMATION

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