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Association Between Forced Sexual Initiation and Health Outcomes Among US Women

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IMPORTANCE The #MeToo movement has highlighted how frequently women experience sexual violence. However, to date, no recent studies have assessed the prevalence of forced sex during girls' and women's first sexual encounter or its health consequences.

OBJECTIVE To estimate the prevalence of forced sexual initiation among US women and its association with subsequent reproductive, gynecologic, and general health outcomes.

DESIGN, SETTING, AND PARTICIPANTS A cross-sectional analysis of the 2011-2017 National Survey of Family Growth was conducted, including a population-based sample of 13 310 US women. The study was conducted from September 2011 to September 2017.

EXPOSURES Self-reported forced vs voluntary first sexual intercourse.

MAIN OUTCOMES AND MEASURES Prevalence of forced sexual initiation, age of woman and partner/assailant at first sexual encounter, and odds ratios (ORs) (adjusted for sociodemographic characteristics) for having an unwanted first pregnancy or abortion, development of painful pelvic conditions, and other reproductive and general health measures.

RESULTS A total of 13 310 women between the ages of 18 and 44 years were included in the study. After survey weights were applied, 6.5% (95% CI, 5.9%-7.1%) of respondents reported experiencing forced sexual initiation, equivalent to 3 351 733 women in this age group nationwide. Age at forced sexual initiation averaged 15.6 (95% CI, 15.3-16.0) years vs 17.4 (95% CI, 17.3-17.5) years for voluntary sexual initiation ($P < .001$). The mean age of the partner/assailant at first sexual encounter was 6 years older for women with forced vs voluntary sexual initiation (27.0; 95% CI, 24.8-29.2 years vs 21.0; 95% CI, 20.6-21.3 years). Compared with women with voluntary sexual initiation, women with forced sexual initiation were more likely to experience an unwanted first pregnancy (30.1% vs 18.9%; adjusted OR [aOR], 1.9; 95% CI, 1.5-2.4) or an abortion (24.1% vs 17.3%; aOR, 1.5; 95% CI, 1.2-2.0), endometriosis (10.4% vs 6.5%; aOR, 1.6; 95% CI, 1.1-2.3), pelvic inflammatory disease (8.1% vs 3.4%; aOR, 2.2; 95% CI, 1.5-3.4), and problems with ovulation or menstruation (27.0% vs 17.1%; aOR, 1.8; 95% CI, 1.4-2.3). Survivors of forced sexual initiation more frequently reported illicit drug use (2.6% vs 0.7%; aOR, 3.6; 95% CI, 1.8-7.0), fair or poor health (15.5% vs 7.5%; aOR, 2.0; 95% CI, 1.5-2.7), and difficulty completing tasks owing to a physical or mental health condition (9.0% vs 3.2%; aOR, 2.8; 95% CI, 2.0-3.9).

CONCLUSIONS AND RELEVANCE Forced sexual initiation in women appears to be common and associated with multiple adverse reproductive and general health outcomes. These findings highlight the possible need for public health measures and sociocultural changes to prevent sexual violence, particularly forced sexual initiation.

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Numerous recent high-profile allegations of sexual violence and the social movements that gained momentum in response to those events (eg, #MeToo, #TIMESUP) have increased public awareness of the high frequency of sexual violence against girls and women in the United States. Sexual violence is defined by the National Institute of Justice as a constellation of crimes including sexual harassment, nonpenetrative sexual assault, and rape.[1] More than 40% of women have experienced some form of sexual violence in their lifetime, of whom half have been raped.[2] Exposure to sexual violence has been associated with a wide range of adverse health outcomes.[3-7]

The World Health Organization has recognized forced sexual initiation—an unwanted first sexual intercourse that is physically forced or coerced—as a distinct form of sexual violence.[8] Forced sexual initiation is a worldwide problem whose reported prevalence varies widely from 0.8%[9] to 38%.[10] Studies conducted predominantly outside the United States suggest that experiencing forced sexual initiation, which occurs at a time of heightened physical and psychological vulnerability, may place girls and women at unique risks for adverse reproductive health outcomes, such as increased sexual risk behaviors, increased rates of HIV and other sexually transmitted infections, and unwanted first pregnancies.[9-16] Several US studies have examined the association between forced sexual initiation and health outcomes, but most focused narrowly on elevated rates of sexually transmitted diseases,[17-19] are outdated,[17-20] or used measures that combined forced sexual initiation with subsequent experiences of forced sex.[19]

To our knowledge, no recent data are available on the prevalence of forced sexual initiation, the sociodemographic characteristics of women who experience it, or the association between forced sexual initiation and reproductive, gynecologic, and general health outcomes among American women. We analyzed data from a nationally representative US survey to address these questions.

Key Points

Question What is the prevalence of forced sexual initiation among women and girls in the United States and its association with reproductive, gynecologic, and general health outcomes?

Findings In this cross-sectional, nationally representative study of 13 310 American women aged 18 to 44 years, 6.5% reported forced sexual initiation (mean age at forced sexual initiation, 15.6 years). Forced sexual initiation appeared to be associated with multiple adverse reproductive, gynecologic, and general health outcomes after adjustment for demographic confounders.

Meaning These findings could help clinicians improve the medical care of women and girls and inform the development of public health policies aimed at reducing forced sexual initiation in the United States.

Methods

Data Source and Study Population

We analyzed data on 13 310 adult (age, 18-44 years) women respondents to the 2011-2017 National Survey of Family Growth. The National Survey of Family Growth is a cross-sectional, multistage, household-based nationally representative survey conducted by the Centers for Disease Control and Prevention that collects data on family life, marriage and divorce, pregnancy, infertility, use of contraception, and general and reproductive health.[21] The Cambridge Health Alliance Institutional Review Board, Cambridge, Massachusetts, deemed this study exempt from review because the data are deidentified and publicly available.

Surveys were conducted during in-person interviews, with sensitive questions, including those about forced sex, asked using Audio Computer-Assisted Self-Interviewing.[22] Our data included the 3 most recent 2-year waves of the female respondent survey (September 2011-September 2013; September 2013-September 2015; and September 2015-September 2017). Detailed information on survey design and sampling procedures is available elsewhere.[23] Response rates ranged from 67% to 73% for the included years. We excluded women with no history of vaginal intercourse, as well as respondents younger than 18 years at the time of survey completion, who were not asked questions about sexual history.

Study Variables

Forced Sexual Initiation and Method of Coercion

We categorized women as having experienced forced sexual initiation if they responded "not voluntary" to the question, "Would you say that this first vaginal intercourse [with a male] was voluntary or not voluntary, that is, did you choose to have sex of your own free will or not?" We categorized women responding "voluntary" to this question as having experienced voluntary sexual initiation.

All respondents who reported that their first sexual encounter was not voluntary were then asked the following questions regarding the method of sexual coercion. "Were you given alcohol or drugs?" "Did you do what he said because he was bigger than you or a grown-up, and you were young?" "Were you told that the relationship would end if you didn't have sex?" "Were you pressured into it by his words or actions, but without threat of harm?" "Were you threatened with physical harm or injury?" "Were you physically hurt or injured?" "Were you physically held down?" Participants could report more than 1 type of coercion.

Reproductive, Gynecologic, and General Health Outcomes

Reproductive outcomes included the number of pregnancies, age at first pregnancy, number of lifetime sexual partners, abortion, unwanted first pregnancy, never using birth control, or using fertility services. Gynecologic outcomes included having undergone routine cervical cancer screening (for women aged ≥21 years) or not ever having an HIV test or having received a diagnosis of fibroids, pelvic inflammatory disease, endometriosis, or problems with ovulation or menstruation. General health outcomes included having a diagnosis of diabetes, obesity (defined as body mass index >30 [calculated as weight in kilograms divided by height in meters

squared]), current smoking, binge drinking (defined as consuming ≥4 alcoholic beverages on ≥1 occasion in the past month), illicit drug use (defined as self-reported use of cocaine, crack, methamphetamine, or injectable drugs in the past 12 months), self-reported health (fair or poor vs good, very good, or excellent), and difficulty completing tasks outside of the home owing to a physical or mental condition.

All outcomes were prospectively selected based on past studies of the health sequelae of sexual violence. The gynecologic health outcomes (uterine fibroids, pelvic inflammatory disease, endometriosis, and problems with ovulation and menstruation) were selected because these conditions may be diagnosed in the workup of pelvic pain, which has been associated with sexual violence.[7,24] Although no mental health diagnoses were available in the survey data, we included responses to the question, "In the past month, have you experienced difficulty completing tasks outside the home due to a physical or mental condition?" as an outcome that may reflect mental health problems.

Sociodemographic Variables

Sociodemographic characteristics included the respondent's age at the time of interview, race/ethnicity (white, black, or other), current poverty status (at/below federal poverty level vs above), and whether the respondent was born outside the United States (yes/no).

Statistical Analysis

We estimated the number and proportion of women in the United States aged 18 to 44 years who reported experiencing forced sexual initiation. We then compared the sociodemographic characteristics of respondents who experienced forced and voluntary sexual initiation using a 2-tailed, unpaired *t* test for continuous variables and χ^2 test for categorical variables. For women who experienced forced sexual initiation, we tabulated the proportions of those reporting each type of coercion during sexual initiation.

We then examined the association between having experienced forced vs voluntary sexual initiation and reproductive, gynecologic, and general health outcomes in unadjusted and adjusted analyses. For the adjusted analyses of the 3 continuous outcomes, we estimated the mean adjusted difference between women who experienced forced vs voluntary sexual initiation using multivariable linear regression models that controlled for age, race/ethnicity, poverty level, and place of birth, similar to other studies assessing outcomes of sexual assault.[25-27] For categorical outcomes, we estimated adjusted odds ratios (aORs) using multivariable logistic regression models that included the same set of control variables. We included 1 negative control variable—ever diagnosis of cancer (excluding cervical cancer)—to test for unmeasured confounders.

All analyses were conducted with Stata, version 15.1 (StataCorp LLC), using the complex survey design command procedures that account for the National Survey of Family Growth's sampling strategy and weights provided by the Centers for Disease Control and Prevention that allow extrapolation to the US population as a whole.

We performed subsidiary analyses to explore whether characteristics associated with forced sexual initiation, such as early sexual initiation or multiple sexual assaults, might account for our findings of adverse outcomes associated with forced sexual initiation. First, we repeated our analyses of the association between forced sexual initiation and adverse outcomes stratified by age at first intercourse (<18 or ≥18 years). Second, we identified women who experienced forced sexual initiation and no other forced vaginal intercourse. We then repeated the analysis assessing associations between forced sexual initiation and adverse outcomes using only women reporting forced sexual initiation and no other forced intercourse.

We performed additional subsidiary analyses to investigate whether potential confounding covariates not included in the main analyses would affect our findings. First, because the interval since sexual initiation might affect the likelihood of experiencing adverse outcomes, we conducted the main analyses with the additional covariate time since first sexual encounter. The covariate current age was removed from this model because it was colinear with time since first sexual encounter. Second, we added a covariate that captures the respondent's mother's level of education, which reflects childhood socioeconomic conditions that may be associated with health outcomes.[28] Third, to control for assaults subsequent to sexual initiation, we added a covariate in the main model for later sexual assault. Findings were considered significant at an α level of .05.

Results

The total unweighted sample included 13 310 women aged 18 to 44 years with a history of vaginal intercourse. After applying survey weights, 6.5% (95% CI, 5.9%-7.1%) of respondents reported experiencing forced sexual initiation, equivalent to 3 351 733 women in this age group nationwide.

The mean age at first intercourse for women with forced sexual initiation was almost 2 years younger than for those with voluntary sexual initiation (15.6 years; 95% CI, 15.3-16.0 years vs 17.4 years; 95% CI, 17.3-17.5 years) (**Table 1**). The mean age discrepancy between study participants and their male partners/assailants at the time of sexual initiation was 6 years greater among those for whom sexual initiation was forced (27.0 years; 95% CI, 24.8-29.2 years vs 21.0 years; 95% CI, 20.6-21.3 years). Nearly three-fourths (74.7%) of women who experienced forced sexual initiation were younger than 18 years at the time of sexual initiation vs 60.5% of women with voluntary sexual initiation ($P < .001$); 6.8% of women reporting forced sexual initiation were aged 10 years or younger vs 0.1% of women with voluntary sexual initiation ($P < .001$).

Compared with women with voluntary sexual initiation, women with forced sexual initiation were less likely to be white (65.3% vs 74.7%; $P < .001$). Women who experienced forced sexual initiation were somewhat more likely to be born outside the United States (21.5% vs 16.1%; $P = .01$) and have incomes below the poverty level (35.1% vs 24.9%; $P < .001$) and

Table 1. Sociodemographic Characteristics of US Women Aged 18 to 44 Years According to Forced vs Voluntary Sexual Initiation

Characteristic	Sexual Initiation, %		*P* Value
	Forced	Voluntary	
Unweighted No.	993	12 317	
Age, mean (95% CI), y	32.6 (31.8-33.3)	31.4 (31.2-31.6)	.003
Age at first sexual encounter, mean (95% CI), y	15.6 (15.3-16.0)	17.4 (17.3-17.5)	.003
First sexual partner/assailant mean age, mean (95% CI), y	27.0 (24.8-29.2)	21.0 (20.6-21.3)	<.001
Age group at first sexual encounter, y			
≤10	6.8	0.1	<.001
11-14	29.0	12.2	
15-17	39.0	48.1	
≥18	25.3	39.5	
Race/ethnicity			
White	65.3	74.7	<.001
Black	20.7	15.8	
Other	13.8	9.5	
Poverty level or below	35.1	24.9	<.001
Born outside the United States	21.5	16.1	.01
Language spoken			
English	88.4	89.7	.59
Spanish	8.9	7.7	
Other	2.7	2.6	
Marital status			
Married	34.2	45.2	<.001
Widowed	0.5	0.6	
Divorced	14.1	8.6	
Separated	7.3	3.4	
Never married	43.8	42.2	
Educational level			
Less than high school	14.6	10.3	.002
High school or equivalent	28.0	25.1	
Some college	33.5	32.9	
College or beyond	23.9	31.7	
Received cash assistance in the past year	14.8	9.8	.001
Family structure			
No children	39.6	39.9	.002
2 Parents with children	37.7	44.2	
Single parent with children	22.8	16.0	
Characteristics in childhood			
Did not always live with 2 parents	51.7	41.8	<.01
Ever lived in foster care	11.3	5.9	
Age of mother at birth, y			
≤18	18.7	16.5	.12
19-24	54.5	55.1	
25-29	17.7	19.7	
≥30	6.7	7.7	
Unknown	2.3	1.0	
Mother's educational level			
Less than high school	26.6	21.7	.02
High school	26.2	30.3	
Some college	24.5	24.5	
College degree or beyond	20.7	22.6	
Unknown	2.1	0.9	

less likely to be college educated (23.9% vs 31.7%; $P = .002$); however, as presented in these data, all demographic groups reported substantial rates of forced sexual initiation.

Type of Coercion Used by Assailant

Among women who reported forced sexual initiation, 50% (n = 1 670 892) reported coercion by a partner who was larger or older, 56.4% described experiencing verbal pressure, and 46.3% were held down (**Table 2**). Women with forced sexual initiation also commonly reported being given a drug (22.0%) and experiencing a physical threat (26.5%) or physical harm (25.1%).

Table 2. Type of Coercion Used by Assailant to Force Sex Among Women Who Experienced Forced Sexual Initiation[a]

Type of Coercion Used	Estimated Women in United States, No. (%)
Any form	2 800 642 (83.6)
Verbal pressure	1 868 474 (56.4)
Partner larger or older	1 670 892 (50.0)
Physically held down	1 544 475 (46.3)
Physical threat	885 850 (26.5)
Physically harmed	837 366 (25.1)
Given a drug	736 554 (22.0)
Threatened to end relationship	539 475 (16.2)

[a] Respondents could provide multiple answers.

Association of Forced Sexual Initiation With Health Outcomes

Women who experienced forced sexual initiation were more likely to have experienced an unwanted first pregnancy (30.1% vs 18.9%; aOR, 1.9; 95% CI, 1.5-2.4), ever had an abortion (24.1% vs 17.3%; aOR, 1.5; 95% CI, 1.2-2.0), and to not have used birth control in their lifetime (2.6% vs 0.9%; aOR, 2.6; 95% CI, 1.6-4.4). Women with forced sexual initiation were not more likely to have used fertility services (10.5% vs 9.5%; aOR, 1.0; 95% CI, 0.7-1.4 (**Table 3**).

Forced sexual initiation appeared to be associated with having received a diagnosis of pelvic inflammatory disease (8.1% vs 3.4%; aOR, 2.2; 95% CI, 1.5-3.4), endometriosis (10.4% vs 6.5%; aOR, 1.6; 95% CI, 1.1-2.3), and problems with ovulation or menstruation (27.0% vs 17.1%; aOR, 1.8; 95% CI, 1.4-2.3). There was no association between forced sexual initiation and reporting recent cervical cancer screening (27.4% vs 25.4%; aOR, 95% CI, 1.1 [0.9-1.4]) or never undergoing HIV testing (16.0% vs 18.6%; aOR, 0.9; 95% CI, 0.7-1.2) (Table 3).

Women who reported forced sexual initiation more frequently reported being in fair or poor health rather than in good, very good, or excellent health (15.5% vs 7.5%; aOR, 2.0; 95% CI, 1.5-2.7), having difficulty completing tasks outside the home owing to a physical or mental condition (9.0% vs 3.2%; aOR, 2.8; 95% CI, 2.0-3.9), and, although rates for this outcome were low in both groups, having past-year illicit drug use (2.6% vs 0.7%; aOR, 3.6; 95% CI, 1.8-7.0) (Table 3). The negative control analysis found no association between forced sexual initiation and ever diagnosis of cancer (aOR, 1.1; 95% CI, 0.6- 2.2).

Subsidiary Analyses

In the subsidiary analysis assessing the association between forced vs voluntary sexual initiation and health outcomes after stratification by age at first intercourse, all outcomes remained significantly associated with forced sexual initiation among those who reported first sexual intercourse when younger than 18 years except for ever had an abortion. Among women whose reported first sexual intercourse occurred at age 18 years or older, forced sexual initiation was significantly associated with 4 adverse outcomes: ever having an abortion (aOR, 4.6; 95% CI, 2.5-8.7), pelvic inflammatory disease (aOR, 3.8; 95% CI, 1.5-10.1), problems with ovulation or menstruation (aOR, 1.8; 95% CI 1.0-2.9), and difficulty completing tasks outside the home (aOR, 3.5; 95% CI, 1.2-9.9). All other outcomes showed similar nonsignificant trends with wide 95% CIs, suggesting lack of power. eTable 1 in the Supplement displays the details of the findings.

In the subsidiary analysis that compared women reporting forced sexual initiation but no subsequent sexual assault with women with voluntary sexual initiation, forced sexual initiation was significantly associated with 4 adverse outcomes: first pregnancy unwanted (aOR, 1.8; 95% CI, 1.3-2.4), never using birth control (aOR, 2.2; 95% CI, 1.2-3.8), pelvic inflammatory disease (aOR, 1.8; 95% CI, 1.1-2.8), and problems with ovulation or menstruation (aOR, 1.7; 95% CI, 1.2-2.3). Similar trends and wide 95% CIs were noted for all other adverse outcomes (eTable 2 in the Supplement). The subsidiary analyses evaluating additional potential confounders, including time since sexual initiation, respondent's mother's educational level attainment, and experience of forced intercourse at a time other than sexual initiation, yielded closely similar results to our main analysis. For example, pelvic inflammatory disease was significantly associated in all 3 analyses: aOR, 2.0 (95% CI, 1.3-3.0) (eTable 3 in the Supplement); aOR, 2.2 (95% CI, 1.6-44) (eTable 4 in the Supplement); and aOR, 1.9 (95% CI, 1.3-2.9) (eTable 5 in the Supplement).

Discussion

For more than 3.3 million reproductive-age women (1 in 16 women in this age group), the first experience with intercourse was involuntary. A practicing physician is likely to see several patients each week who have experienced this form of trauma. Forced sexual initiation was reported by women of all racial and ethnic groups and varied modestly by poverty status, level of educational attainment, or place of birth. The male partner/assailant was usually much older than the girl or woman, which was an age discrepancy not present for those reporting voluntary sexual initiation. In addition, women who had experienced forced sexual initiation had elevated rates of subsequent adverse reproductive, gynecologic, general health, and functional outcomes.

United States studies have found elevated rates of sexually transmitted diseases and HIV risk behaviors associated with forced sexual initiation.[17-19] Studies conducted predominantly outside the United States have suggested a link between forced

Table 3. Association Between Forced Sexual Initiation and Reproductive, Gynecologic, and General Health Outcomes

Variable	First Sexual Experience, %		Odds Ratio (95% CI)	
	Forced (n = 3 351 733)	Voluntary (n = 48 250 002)	Unadjusted	Adjusted[a]
Reproductive health measures, mean (95% CI)				
No. of pregnancies	2.40 (2.2 to 2.6)	1.90 (1.8 to 2.0)	0.5 (0.3 to 0.7)[b]	0.3 (0.1 to 0.5)[b]
Age at first pregnancy, y	20.6 (20.0 to 21.2)	22.2 (22.0 to 22.4)	−1.6 (−2.2 to −1.0) [b]	−1.6 (−2.2 to −1.0)[b]
No. of lifetime sexual partners	9.6 (8.3 to 10.9)	7.4 (7.0 to 7.8)	2.2 (0.9 to 3.5)[b]	2.2 (0.5 to 3.5[b]
1st Pregnancy unwanted	30.1	18.9	1.8 (1.5 to 2.3)	1.9 (1.5 to 2.4)
Ever had abortion	24.1	17.3	1.5 (1.2 to 2.0)	1.5 (1.2 to 2.0)
Never used birth control	2.6	0.9	3.1 (1.8 to 5.2)	2.6 (1.6 to 4.4)
Use of fertility services	10.5	9.5	1.1 (0.8 to 1.6)	1.0 (0.7 to 1.4)
Gynecologic health measures				
Recent cervical cancer screening[c]	27.4	25.4	1.1 (0.9 to 1.4)	1.1 (0.9 to 1.4)
Never had HIV testing	16.0	18.6	0.8 (0.6 to 1.1)	0.9 (0.7 to 1.2)
Fibroids	8.0	6.8	1.2 (0.9 to 1.7)	1.0 (0.7 to 1.4)
PID	8.1	3.4	2.5 (1.7 to 3.8)	2.2 (1.5 to 3.4)
Endometriosis	10.4	6.5	1.7 (1.2 to 2.4)	1.6 (1.1 to 2.3)
Problems with ovulation or menstruation	27.0	17.1	1.8 (1.4 to 2.3)	1.8 (1.4 to 2.3)
General health measures				
Diabetes	8.7	6.5	1.4 (1.0 to 1.8)	1.1 (0.8 to 1.5)
BMI>30	43.1	39.0	1.2 (0.98 to 1.4)	1.1 (0.9 to 1.4)
Current smoking	25.5	22.8	1.2 (0.96 to 1.4)	1.2 (0.9 to 1.4)
Binge drinking alcohol use[d]	12.5	12.5	1.0 (0.7 to 1.4)	1.1 (0.7 to 1.5)
Illicit drug use[e]	2.6	0.7	3.8 (2.0 to 7.3)	3.6 (1.8 to 7.0)
Fair or poor health	15.5	7.5	2.3 (1.7 to 3.1)	2.0 (1.5 to 2.7)
Difficulty completing tasks outside the home	9.0	3.2	3.0 (2.2 to 4.1)	2.8 (2.0 to 3.9)

Abbreviations: BMI, body mass index (calculated as weight in kilograms divided by height in meters squared); PID, pelvic inflammatory disease.

[a] Adjusted odds ratios were controlled for age, poverty level, race/ethnicity, and place of birth.

[b] Difference between groups measured.

[c] Analyzed only for women aged 21 years and older.

[d] Defined as consuming 4 or more drinks on 1 occasion during the past month.

[e] Defined as self-reported cocaine, crack, methamphetamine, or injectable drug use in the past 12 months.

sexual initiation and earlier age of first intercourse, risk of future sexual assault, number of lifetime sexual partners, and likelihood of experiencing unwanted pregnancy.[9,11-13,15,16] One study from Ireland, which reported low rates of forced sexual initiation (0.8%), suggested worse self-reported general and mental health among women with forced sexual initiation.[9] Our findings are generally consistent with these earlier studies but extend them by demonstrating that forced sexual initiation is associated with a broader range of adverse health outcomes in a contemporary sample of US women.

The mechanisms through which forced sexual initiation may be associated with adverse health outcomes is not clear. Our findings are compatible with the hypothesis that experiencing sexual violence at a time of heightened psychological and physical vulnerability may have long-term deleterious sequelae. In subsidiary analyses, our main results were minimally affected by controlling or stratifying for age at forced sexual initiation, having experienced repeated sexual assaults, the respondent's mother's educational attainment, or follow-up interval.

Some previous investigators have equated forced sexual initiation with childhood sexual abuse, which is known to be associated with adverse mental and physical health outcomes.[3-5] However, our first subsidiary analysis suggests that adverse outcomes are associated with forced sexual initiation regardless of the age at which it is experienced.

Women who experience early sexual violence are at increased risk of repeated sexual victimization later in life, which may suggest that our findings reflect the composite outcomes of repeated sexual assault.[29] However, our second subsidiary analysis suggests that forced sexual initiation is associated with adverse outcomes, even among women who experience no further sexual violence. Although our study was not designed to assess whether forced sexual initiation confers different or greater harms than subsequent forced intercourse, the subsidiary analyses support the view that forced sexual initiation may be an important independent risk factor for adverse physical and mental health outcomes.

The rate of forced sexual initiation that we identified is somewhat lower than in a study that analyzed data from the 1995 National Survey of Family Growth, in which 9.1% of women aged 15 to 24 years described their first intercourse as nonvoluntary.[20] This finding may reflect a changing preva-

lence of forced sexual initiation, although the younger age range in the earlier study and slight changes in question wording make direct comparisons difficult.

The ubiquity and apparent clinical outcome of forced sexual initiation should encourage those providing clinical care to women to develop tools to identify and treat the sequalae of trauma while avoiding actions that might contribute to retraumatization. The Agency for Healthcare Research and Quality recommends trauma-informed care "that recognizes the presence of trauma symptoms and acknowledges the role that trauma has played in their lives."[30] Medical organizations, including the American Academy of Family Physicians and American College of Obstetricians and Gynecologists, have advocated trauma-informed care, but such care has not been widely adopted in clinical practice.[31-33]

Our findings also underscore the need for public health strategies to prevent forced sexual initiation and other forms of sexual violence. A Centers for Disease Control and Prevention report recommended disseminating local programs that address sexual culture and violence prevention skills, enhancing educational and job opportunities for women and girls, and creating protective environments within schools and work places.[34] However, as the report acknowledges, the evidence supporting these recommendations is scant.

The efficacy of the current criminal justice system in facilitating recovery among victims of sexual crimes is controversial.[35] Hence, alternative forms of justice may be appropriate in some circumstances. The model of restorative justice, a conferencing model focusing on the experience of the victim and guided by a trained facilitator, may have a role in gendered crimes and warrants further research.[35] Efforts should be devoted to the development of evidence-based public health approaches to sexual assault prevention and their effective dissemination.

Limitations

Our study has several limitations. First, its cross-sectional design precludes causal inference. Owing to the survey design, we were unable to adjust for some potentially important confounders, such as sexual experiences prior to or following sexual initiation. Although the associations that we identified do not establish causation, they may be important for clinicians to consider. Second, women who experienced forced sexual initiation may have experienced or begun experiencing some of the adverse health outcomes that we analyzed before their assault. However, the young age at which forced sexual initiation often occurred makes it likely that most outcomes followed the assault. An unknown proportion of US boys and men experience forced sexual initiation, a phenomenon that has been poorly studied; however, the survey did not collect data from men regarding forced sexual initiation. As with all survey data, responses may be subject to recall bias, and it is possible that some health outcomes, such as those related to chronic pain, may influence women to recall sexual experiences differently. However, the negative control analysis provides some support that confounding and recall bias are not likely to be very large in our study.

Conclusions

A substantial proportion of American women may experience forced sexual initiation, and the individual and public health implications of this exposure are far reaching. Although additional research is needed, physicians should incorporate trauma-informed measures into their practices while advocating for the reduction of structural causes of sexual violence.

ARTICLE INFORMATION

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Invited Commentary

Forced and Coerced Sexual Initiation in Women
New Insights, Even More Questions

Alison J. Huang, MD, MAS; Carolyn J. Gibson, PhD, MPH

The #MeToo movement has opened a national conversation about nonconsensual sexual experiences among women, highlighting the prevalence of problematic sexual behaviors that have historically been normalized or not discussed. More women are now speaking openly about forced or coerced sexual activity, but there is much we still do not know about the long-term effect of these experiences on women's health. As screening and recognition of the range of situations and interactions that encompass sexual assault expand, we also should determine the consequences of these experiences for women across their lifespan.

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In this issue of *JAMA Internal Medicine*, Hawks et al[1] present data from a national household-based survey to determine the proportion of reproductive-age US women who considered their first sexual encounter with a male partner to be involuntary by virtue of being forced or coerced. Building on prior research that reported increased risk for sexually transmitted infections after involuntary sexual initiation,[2] the researchers also assess whether these women were more likely to experience a wide array of reproductive, gynecologic, and general medical conditions important to women's functioning and well-being.

Among US women aged 18 to 44 years with a history of vaginal sexual intercourse, the investigators found that 6.5%, or approximately 1 in 16 women, experienced a first sexual encounter that was forced or coerced. Compared with women whose first sexual experience was voluntary,