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Association Between Symptoms of Depression and Contraceptive Method Choices Among Low-Income Women at Urban Reproductive Health Centers

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Abstract Among adult women of reproductive age, research has focused on depression symptoms after unintended pregnancy, or associated with hormonal contraceptive method use, with little focus on depression as a predictor of unintended pregnancy. This study was conducted to identify mental and behavioral health characteristics associated with use of less effective contraceptive methods. Choosing a less effective method of contraception places sexually active women who are not seeking pregnancy at increased risk of unintended pregnancy. Analysis was conducted using administrative data from family planning visits of 2,476 predominantly Latina and black women who received standardized behavioral and mental health screening as part of clinical care at eight reproductive health centers in New York City serving low-income women. Sociodemographic characteristics, method choice, and behavioral and mental health characteristics were compared between patients who screened positive for depression (using the PHQ-9) and those who did not. The primary outcome measure, contraceptive method choice, was dichotomized into two groups: more effective method or less effective method. In a multivariate logistic regression model adjusting for all behavioral health characteristics (binge drinking, illicit drug use, smoking, anxiety, and childhood or adult physical or sexual abuse) and birthplace, women screening positive for depression had significantly lower odds of choosing a more effective method of contraception (adjusted OR = 0.56, 95% CI: 0.36–0.87). These findings suggest that screening positive for depression may have an effect on contraceptive choice. Contraceptive counseling strategies should be individually tailored to promote decision-making and appropriate contraceptive choice, particularly among women with depression.

Keywords Family planning · Contraception · Method choice · Depression · Screening · Latina · Black

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Introduction

Previous research among adolescents has shown that depressive symptoms, as measured by the Center for Epidemiologic Studies-Depression scale (CES-D), are associated with sexual risk behavior including condom non-use and birth control non-use [1] and subsequent pregnancy [2]. Studies of adolescents using other screening tools have confirmed the association between depressive symptoms and sexual behaviors that place teens at risk for HIV infection, other sexually transmitted infections (STIs), and unintended pregnancy [3–6]. However, among adult women of reproductive age, research has focused on depression symptoms after unintended pregnancy [7–10], or associated with hormonal contraceptive method use, [11] with little focus on depression or anxiety as predictors of unintended pregnancy or sexual risk behavior. One large retrospective survey among suburban low-income women

found an association between depressive symptoms (measured by the Beck Depression Inventory) and lifetime history of high risk sexual behavior, including greater number of sexual partners, younger onset of sexual activity, and non-use of contraception at last intercourse [12].

In a network of eight reproductive health centers in New York City, behavioral and mental health screening of patients seeking family planning and prenatal care services was integrated into clinical care. Using a standardized screening tool administered by a clinician, the screening program identifies patients in need of further assessment and/or treatment for depression or anxiety as well as behavioral health risks—smoking, alcohol and drug use, and past and current physical and sexual abuse. This secondary analysis, which relied on data from the clinical administrative database, was conducted to identify behavioral and mental health factors related to contraceptive choice. In contrast to previous research, this study examines contraceptive choice and behavioral and mental health screening conducted at the same visit, without relying on self-report. The clients included in this analysis are low-income, urban, predominantly Hispanic and black women, population subgroups previously found to be at increased risk for low rates of contraceptive use and high rates of unintended pregnancy [13, 14]. The sample includes a substantial proportion (44%) of foreign-born Hispanic women of diverse nationalities, population groups that are rapidly growing in the US and whose sexual and reproductive health behaviors and needs are only beginning to be documented [15].

Materials and Methods

Study Population

This secondary analysis included clinical administrative data of 2,476 new patients seeking reproductive health services at eight reproductive health centers in New York City during an 18-month time period (January 2005–June 2006), all of whom received behavioral and mental health screening (BRF Screening). New family planning patients who were pregnant, possibly pregnant or currently seeking pregnancy; those who reported infertility; those relying on sterilization/tubal ligation or partner's vasectomy; those who reported being abstinent or not sexually active; and patients with missing or incomplete data on method choice were not included in this analysis.

Data Sources

The protocol for this secondary analysis was reviewed and approved by the Institutional Review Board of Public Health Solutions (formerly known as Medical & Health Research Association of New York City, Inc.). Patient care data for all new, unduplicated patients in the time period of interest were exported from the electronic patient care database without any individually identifying information, and were analyzed with SPSS Version 14.0 (SPSS Inc., Chicago, IL).

Outcome Measure: Contraceptive Method Choice

Contraceptive method choice was determined from two underlying variables relating to contraceptive choice. The first variable lists the method chosen (1-month hormonal injection; 3-month hormonal injection; abstinence; contraceptive patch; contraceptive sponge; diaphragm; emergency contraception; female condom; implant; intrauterine device (IUD); periodic abstinence; no contraceptive method; oral contraceptive method; other contraceptive method; spermicide & condom; sterilization (tubal ligation)). For patients who do not choose one of the methods listed above, a second variable indicates the reason no method was chosen: relying on male method (male condom), relying on male method (vasectomy), infertility, seeking pregnancy, and pregnant/possibly pregnant. In cases where the method chosen after counseling was missing, none, "other," abstinence, or periodic abstinence (natural family planning or rhythm method), the reason for no method chosen was used for categorization.

The primary outcome measure, contraceptive method choice, was dichotomized into two groups: more effective method, less effective method. This categorization relied on published contraceptive method failure rates over 12 months of use [16, 17]. The group of more effective methods includes: hormonal, barrier with or without spermicide, or IUD. The reference group (less effective methods) includes periodic abstinence or choosing no method. Contraceptive method choice group was also presented in some analyses, categorized as: hormonal methods (oral contraceptives, patch, injectable, implant); male condoms; other barrier methods (diaphragm, female condom); spermicide with or without condoms; IUD; periodic abstinence; no method chosen.

Behavioral and Mental Health Screening

Behavioral and mental health characteristics were identified using the BRF Screening Program that was newly integrated into existing clinical practices starting in January 2005. As part of clinical practice, new patients were screened for six factors (smoking, alcohol use, drug use, symptoms of anxiety, symptoms of depression, and history of physical and sexual violence) by the nurse at the start of their visits using a standardized screening tool. With the

exception of intimate partner violence (IPV), the screening questions were developed using existing, validated tools. Depression symptoms were assessed using the Patient Health Questionnaire (PHQ-9) [18] and anxiety symptoms were assessed using the Primary Care Evaluation of Mental Disorders (PRIME-MD) [19, 20]. The wording of the alcohol screening was adapted from the AUDIT-C (Alcohol Use Disorders Identification Test) [21]. Weekly or more frequent binge drinking (four or more drinks on one occasion) was a positive screen. For smoking, the "5 A's" screening and brief intervention was used; patients who reported quitting smoking in the last 3 months were considered a positive screen [22]. For IPV, screening questions assessed childhood and adult experience of physical and/or sexual violence; history of any violence was considered a positive screen. Any use of illicit drugs ("marijuana, cocaine, pills and other street drugs") in the last month was considered a positive screen. Any patient screening positive for one or more factors was offered a referral to an on-site social worker for additional assessment and referral, if appropriate.

Data Analysis

Sociodemographic characteristics, contraceptive method choice (dichotomized and grouped), and screening results for the other behavioral and mental health characteristics were compared between patients who screened positive for depression and those who did not; Pearson's Chi Square was used to assess statistical differences. Bivariate odds ratios and 95% confidence intervals were calculated for the association of the dichotomous outcome with the following predictors: age group (age 19 or younger, age 20–29, age 30 and older), ethnicity (Non-Hispanic Black, Hispanic of any race, all others), birthplace (US, other countries), nulliparity (yes, no), and positive screen on each of the behavioral and mental health factors (depression, anxiety, smoking, alcohol, drugs, IPV). Multivariate analyses were conducted for the outcome of interest, controlling for all BRF screening results and variables that were significant in bivariate analyses.

Results

Among the patients included in the analysis, 63% were Hispanic (of any race), 56% were foreign-born representing 55 countries of birth, and 67% had at least one live birth (Table 1). Among foreign-born women, the most common countries of birth were Mexico (19% of foreign-born women), Ecuador (19%), and the Dominican Republic (16%). Less than one-fifth of the patients (19%) were teenagers.

Nearly one-third (29%, $n = 708$) of the patients screened positive for any of the six behavioral health factors, with 38% of those 708 women screening positive for more than one. Overall, 7.8% of patients screened positive for depression (4.4% for depression only and 3.4% for both depression and anxiety). In comparing patients with and without a positive screen for depression (Table 1), no differences were found by age, birthplace, race/ethnicity, or parity.

As shown in Table 2, most (88%) chose a more effective method, with oral contraceptives being the most common method chosen (32%), followed by male condoms (28%). Among patients who chose a more effective method, those who screened positive for depression had significantly higher odds of choosing condoms (OR: 1.45, 95% CI: 1.07–1.97) and significantly lower odds of choosing hormonal methods of contraception (oral contraceptives, patch, implant or injectables (one-month and three-month) (OR: 0.61, 95% CI: 0.45–0.82), compared to those who did not screen positive for depression.

Co-occurrence of behavioral and mental health factors was common, and the magnitude of association between a positive screen for depression and other positive screens was strong. Compared to those who did not screen positive for depression, patients who screened positive were significantly more likely to screen positive for anxiety (OR = 16.5, 95% CI: 11.65–23.31), smoking (OR = 2.22, 95% CI: 1.54–3.22), alcohol (binge drinking) (OR = 5.54, 95% CI: 2.49–12.33), and a history of physical and/or sexual abuse (OR = 4.37, 95% CI: 3.10–6.14), but not illicit drug use.

Among sexually active patients, in bivariate analyses with choosing a more effective method as the outcome (Table 3), patients who screened positive for depression or alcohol were significantly less likely to choose a more effective method at the end of the visit. Birthplace was the only sociodemographic characteristic found to be significantly associated with this outcome, with US-born women significantly more likely to choose a more effective method. After adjusting for all BRF screening results and birthplace, women screening positive for depression had significantly lower odds of choosing a more effective method of contraception (adjusted OR = 0.56, 95% CI: 0.36–0.87). Birthplace also remained a significant predictor.

The distribution of the outcome of interest did not differ significantly by age, with 90% of those under age 20, 89% of those age 20–29 and 87% of those age 30 and over choosing a more effective method ($P = 0.24$). But there were significant differences in the distribution of the type of method chosen, with women in the youngest age group significantly more likely to choose oral contraceptives (53% of teens compared to 44% of those age 30 and over ($P < 0.001$), and less likely to choose an IUD (less than 1% of teens,

Table 1 Sociodemographic and behavioral and mental health characteristics of women seeking services at eight reproductive health centers in New York City ($n = 2,476$)

Characteristics	Screened negative for depression ($n = 2,283$) *n* (%)	Screened positive for depression ($n = 193$) *n* (%)	All ($n = 2,476$) *n* (%)
Sociodemographic			
Age			
19 and under	412 (19)	38 (21)	450 (19)
20–29	1065 (50)	85 (46)	1150 (49)
30 and older	667 (31)	60 (33)	727 (31)
Race/Ethnicity			
Hispanic, any race	1164 (63)	98 (69)	1262 (63)
Non-Hispanic black	545 (29)	37 (26)	582 (29)
Non-Hispanic, non-black	144 (8)	8 (6)	152 (8)
Birthplace			
US	1000 (44)	85 (45)	1085 (44)
Other countries	1278 (56)	106 (56)	1384 (56)
Parity			
No live birth	712 (40)	64 (42)	776 (40)
1 live birth	497 (28)	43 (28)	540 (28)
2 live births	346 (20)	26 (17)	372 (19)
3 or more live births	215 (12)	21 (14)	236 (12)
Behavioral and mental health screening result[a]			
Smoking			
Positive screen	247 (11)	41 (21)***	288 (12)
No positive screen	2036 (89)	152 (79)	2188 (88)
Alcohol (binge drinking)			
Positive screen	20 (1)	9 (5)***	29 (1)
No positive screen	2263 (99)	184 (95)	2447 (99)
Illicit drug use			
Positive screen	104 (5)	13 (7)	117 (5)
No positive screen	2179 (95)	180 (93)	2359(95)
Anxiety			
Positive screen	102 (5)	84 (44)***	186 (8)
No positive screen	2181(95)	109 (56)	2290 (92)
Childhood and/or adult physical and/or sexual abuse			
Positive screen	200 (9)	57 (30)***	257 (10)
No positive screen	2083 (91)	136 (70)	2219 (90)

[a] Screening results not mutually exclusive

*** Chi square test of distribution by depression screening result, $P < .0001$

compared to 6% of those age 30 and over). When the multivariate analysis described above was repeated adding age to the model, depression (adjusted OR = 0.59, 95% CI: 0.38–0.94), alcohol (adjusted OR = 0.37, 95% CI: 0.14–0.94), and US birthplace (adjusted OR = 1.41, 95% CI: 1.04–1.91) remained significant predictors of choosing a more effective method (data not shown in table).

Statistically significant differences were found by birthplace in the distribution of independent and dependent variables. Compared to foreign-born women, US-born women in the sample had a significantly higher proportion who were age 19 or younger (33.6% vs. 6.1%, $P < .001$); a lower proportion with a previous live birth (37.8% vs. 73.5%, $P < 0.001$); a higher proportion who screened positive for smoking (19.9% vs. 5.2%, $P < 0.001$), alcohol (1.8% vs. 0.7%, $P = 0.019$), drug use (9.4% vs. 1.1%, $P < 0.001$), anxiety (9.4% vs. 6.0%, $P = 0.001$), and IPV (12.2% vs. 9.0%, $P = 0.009$); and a lower proportion who chose a less effective method of contraception (9.7% vs. 13.2%, $P = 0.008$).

Discussion

Women who reported symptoms of depression were significantly more likely to leave their visit without a

Table 2 Contraceptive method choice, by depression screening result, among women seeking services at eight reproductive health centers in New York City ($n = 2,476$)

Characteristics	Screened negative for depression ($n = 2,283$) *n* (%)	Screened positive for depression ($n = 193$) *n* (%)	All ($n = 2,476$) *n* (%)
Contraceptive method choice, dichotomized			
More effective methods[a]	2030 (89)	159 (82)***	2189 (89)
Less effective methods[b]	253 (11)	34 (18)	287 (11)
Contraceptive method choice, by group			
Hormonal methods[c]	1169 (51)	75 (39)**	1244 (50)
Male condom	633 (28)	69 (36)	702 (28)
Other barrier methods (diaphragm, female condom)	46 (2)	1 (<1)	47 (2)
Spermicide or sponge (with or without condoms)	117 (5)	7 (4)	124 (5)
IUD	65 (3)	7 (4)	72 (3)
Periodic abstinence	163 (7)	21 (11)	184 (7)
No method chosen	90 (4)	13 (7)	103 (4)

[a] Includes oral contraceptives, patch, injectable (1 month or 3 month), male condoms, diaphragm, female condom, spermicide, sponge, and IUD

[b] Includes periodic abstinence and no method chosen

[c] Oral contraceptives, patch, injectable (1 month or 3 month), implant

** Chi square test of distribution by depression screening result, $P < 0.01$

*** Chi square test of distribution by depression screening result, $P < .0001$

contraceptive method in hand (they either chose no method or relied on periodic abstinence but were not intending to become pregnant), even after controlling in the analysis for other behavioral and mental health screening results and birthplace. Choosing a less effective method of contraception places sexually active women who are not seeking pregnancy at increased risk of unintended pregnancy. Previous research on the association between mental health and unintended pregnancy has been primarily focused on adolescents, with many studies examining depression as an outcome of unintended pregnancy rather than as a predictor. Our findings mirror those of previous studies that have found a link between depressive symptoms and self-reported contraceptive non-use, [12] but strengthen the existing body of evidence. We studied an ethnically diverse group of women of reproductive age who received standardized mental and behavioral health screening integrated into reproductive health services and examined depression and other behavioral and mental health factors as predictors of clinical outcomes from the same visit.

Contraceptive method choice in our population is similar to that made by populations of other providers who receive federal Title X funds to provide access to contraceptive methods and information, although the proportion of sexually active patients relying on periodic abstinence (7% of those included in our analysis of method provided) is considerably higher than national figures of 1–2% [23, 24]. According to Title X program reporting guidelines, from which some of the centers in the analysis receive funding, periodic abstinence and abstinence are classified as contraceptive methods, but for the purposes of this analysis, periodic abstinence—which has a first year failure rate of approximately 20%, compared to 7–8% for oral contraceptives—was grouped with no method for patients who were not seeking pregnancy [16, 17, 24].

The study has several limitations which should be considered. The key predictor was symptoms of depression, as determined through nurse-administered screening using the PHQ-9, not a diagnosis of depression or anxiety using the Diagnostic and Statistical Manual of Mental Disorder (DSM-IV). We were unable to measure risk of unintended pregnancy; this analysis examined only the provision of a method at the end of the visit, not contraceptive use [25] or correct use of the chosen method, which has been found to be lower among depressed women [12]. Although we excluded women who reported being not sexually active as well as women who reported seeking pregnancy, the study sample included only women seeking reproductive health services in the clinical setting, not the general population. The general population likely includes a higher proportion of sexually inactive women with symptoms of depression, and a higher proportion of women at risk of unintended pregnancy. A final limitation of this cross-sectional study is the lack of statistical power to detect subgroup differences in adjusted models, particularly by birthplace.

Table 3 Sociodemographic, behavioral and mental health predictors of choosing a more effective method of contraception (compared to choosing a less effective method) among women seeking services at reproductive health centers in New York City ($n = 2,476$)

Characteristic	*n*	Proportion (%) choosing a more effective method	Unadjusted odds ratio (95% CI)	Adjusted odds ratio (95% CI)[a]
Sociodemographic				
Age				
19 and under	450	90	1.32 (0.91–1.91)	–[b]
20–29	1150	89	1.22 (0.92–1.62)	–
30 and older	727	87	1.0 [Ref.]	–
Race/ethnicity				
Hispanic, any race	1262	91	1.54 (0.93–2.56)	–
NH Black	582	91	1.51 (0.87–2.62)	–
Non-Hispanic, non-black	152	87	1.0 [Ref.]	–
Birthplace				
US	1085	90	1.41 (1.10–1.82)**	1.43 (1.09–1.86)**
Other countries	1384	87	1.0 [Ref.]	[Ref.]
Parity				
1 or more live birth	1148	87	0.90 (0.69–1.17)	–
Nulliparous	776	86	1.0 [Ref.]	–
Behavioral and mental health screening result[c]				
Depression				
Positive screen	193	82	0.58 (0.39–0.86)**	0.57 (0.36–0.88)**
No positive screen	2283	18	1.0 [Ref.]	1.0 [Ref.]
Smoking				
Positive screen	288	88	1.02 (0.69–1.49)	0.99 (0.65–1.51)
No positive screen	2188	12	1.0 [Ref.]	1.0 [Ref.]
Alcohol (binge drinking)				
Positive screen	29	76	0.41 (0.17–0.96)*	0.43 (0.17–1.08)
No positive screen	2447	24	1.0 [Ref.]	1.0 [Ref.]
Illicit drug use				
Positive screen	117	89	1.05 (0.58–1.90)	1.06 (0.54–2.06)
No positive screen	2359	11	1.0 [Ref.]	1.0 [Ref.]
Anxiety				
Positive screen	186	88	0.98 (0.61–1.55)	1.30 (0.77–2.19)
No positive screen	2290	12	1.0 [Ref.]	1.0 [Ref.]
Childhood and/or adult physical and/or sexual abuse				
Positive screen	257	86	0.78 (0.54–1.14)	0.84 (0.57–1.25)
No positive screen	2219	14	1.0 [Ref.]	1.0 [Ref.]

[a] Model adjusted for birthplace and behavioral and mental health screening results

[b] Indicates variable not included in adjusted model

[c] Screening results not mutually exclusive

* $P < 0.05$

** $P < 0.01$

The link between contraceptive method use and unintended pregnancy has been well established in the literature, despite difficulties in measuring pregnancy intention [26, 27]. A first step in reducing the prevalence of unintended pregnancies is increased choice and, subsequently, use of reliable contraceptive methods [28, 29]. In our multivariate analysis, women screening positive for depression had significantly lower odds of choosing a more effective method of contraception. Even among women who did choose a more effective method of contraception, those who screened positive for depression, compared to women who did not, were significantly less likely to choose hormonal methods of contraception and more likely to choose condoms. Counseling protocols should take into

account that many of the more effective contraceptive methods (particularly long-term reversible methods), which require less patient participation at the time of use, require a greater degree of patient engagement in contraceptive decision-making at the time a method is chosen [30]. Efforts should be made to tailor contraceptive counseling strategies to promote decision-making and appropriate contraceptive choice and subsequent use, specifically among women with depression [30–32]. Additional research is also needed to better understand the association between mental health and contraceptive choice in various sociodemographic subgroups, as well as to examine, using a prospective approach, the incidence of unintended pregnancy in women with and without depression.

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