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Associations between recent contraceptive use and quality of life among women

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Abstract

Background—Whether contraception affects health-related quality of life (HRQoL) is unclear.

Study Design—Cross-sectional analysis of routine intake data collected from women aged 18–50 years, including the RAND-36 measure of HRQoL, pregnancy intentions, and recent contraceptive use. We used multivariable logistic regression to test the relationship between HRQoL and use of any and specific contraceptives. Physical and mental HRQoL were dichotomized based on U.S. population averages. Models were adjusted for age, race, marital status, education and pregnancy intentions.

Results—Among the 726 women, those using any form of contraception were more likely to have average or better mental HRQoL than women using no contraception (adjusted odds ratio (aOR)=1.60, 95% confidence interval (CI) 1.01, 2.53). Women using injectable contraception were less likely than those using combined hormonal methods to have average or better physical HRQoL (aOR=0.26, 95% CI 0.09, 0.80) and mental-HRQoL (aOR=0.24, 95% CI 0.06, 0.86).

Conclusions—Measures of women's HRQoL differ with contraceptive use.

Keywords

Quality of life; Contraceptive use; Tubal sterilization; Injectable contraceptive

1. Introduction

Decisions about which, if any, contraceptive to use are influenced by many factors, including side effect profiles, cost, and ease of use [1, 2]. In addition, a woman's personal experiences, and her perceptions of how a contraceptive may potentially impact her quality of life or sexual health, may also influence contraceptive decision-making. For instance, hormonal contraceptives reduce bleeding [3], anemia [4], and dysmenorrhea [5, 6],

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Declaration of Conflicting Interests

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symptoms which may all affect a woman's quality of life. Alternatively, breakthrough bleeding and change in sexual function that may result from the use of hormonal contraceptives may adversely affect a woman's quality of life [7]. In addition, some have hypothesized that fear of an unintended pregnancy may have an adverse effect on a woman's quality of life [8].

As patient-centered care has become an explicit goal of our health care system, quality of life has become an important health indicator [9, 10] and is commonly considered in assessments of the cost-effectiveness of health interventions [11]. As other preventive health services, which may compete with contraceptive services for limited public health dollars, are frequently evaluated using measures that incorporate the health service's impact on quality of life [12], it is important that evaluations of contraceptive services also consider effects on quality of life [8].

To date, however, there have been few studies addressing the impact of contraceptive use on women's quality of life. A Chinese study comparing baseline and follow-up measures of quality of life in women that were first time users of oral contraceptive pills, an injectable contraceptive (depot-medroxyprogesterone acetate), an intrauterine device, or tubal sterilization found that none of methods examined had a significant adverse effect on quality of life [13]. A study of rural Chinese women comparing baseline and follow-up measures of quality of life for women who started to use either combined oral contraceptive pills or a copper intrauterine device, found an improvement in overall satisfaction, physical health, mood and general well-being with initiation of both oral contraceptive pills or use of an intrauterine device, although intrauterine device users had a greater magnitude of improvement in these domains than was seen for women using oral contraceptive pills [14]. Researchers in Poland, who compared women using a levonorgestrel-releasing intrauterine device to women using another (unspecified) intrauterine device and women using no contraception, found that women using the levonorgestrel-releasing intrauterine device had the highest measures of quality of life [15]. This study, therefore, aimed to characterize associations between women's contraceptive use and measures of their health-related quality of life (HRQoL) in a sample of women in the United States, with particular attention to differences between contraceptive methods.

2. Methods

We conducted a cross-sectional analysis of data collected as a part of routine clinical care from patients cared for by a large academic general internal medicine practice in Pittsburgh, Pennsylvania. The 81 physicians in this group care for a diverse population of 17,400 adults: 46% are women between the ages of 18 and 50, 30% are non-white, 16% have Medicare, and 13% have Medicaid or receive free care. Since 2005, this practice has used a computerized data collection system run on wirelessly-networked tablet computers, called the Functional Assessment Screening Tablet (FAST) [16]. The FAST collects patient-reported information regarding health behaviors and HRQoL using branched logic to select appropriate questions based on patient characteristics, visit type, and responses provided on prior clinic visits, while patients wait to see their primary care provider. This information is supplied to providers at the time of the patient's visit [17].

The RAND-36 is a generic instrument used to evaluate HRQoL over the previous four weeks. The RAND-36 health survey contains the same items as the Medical Outcomes Study 36-item Short Form General Health Survey (SF-36), but uses item response theory-based scoring. It can be used both in general and in disease-specific populations over age 14 years [18]. Since its development, the SF-36 has become the most widely used measure of health status and HRQoL worldwide [19]. The instrument has been studied and/or used in

more than 5,000 publications [20]. The validity, sensitivity, reliability, internal consistency and stability, as well as test–retest reliability have been confirmed and documented extensively [21]. The RAND-36 includes eight scales that assess the following general health concepts: general health perceptions, physical functioning, role limitations due to physical health problems, bodily pain, vitality, social functioning, role limitations due to emotional problems, and mental health [18]. These scales are grouped into two broad categories of summary measures, the physical health composite score (PHC) and the mental health composite summary (MHC) score [18]. The raw composite scores can range from 0–100 and are standardized so that the mean (SD) for the validated population is 50 (10) points.

The University of Pittsburgh Institutional Review Board approved this study, and we obtained de-identified FAST data from visits with English-speaking, non-pregnant, sexually active women between the ages of 18 and 50 years old who completed the FAST questionnaire prior to visiting their primary care physician between January 2008 and January 2011. We included only women who completed the RAND-36 questionnaire within 14 days of answering questions about their contraceptive status. Because some women made repeat visits, we selected only the first visit from each woman that met these requirements. In addition, the FAST questionnaire collected demographic information, as well as women's responses to questions regarding current plans for pregnancy and contraceptive use within the past month. Women who were trying to become pregnant were excluded from this analysis. When women reported using more than one method of contraception, they were considered to be using the most effective method, based on failure rates with typical use [7]. Included patients were compared to other patients seen in the clinic, hereafter called "other patients," defined as reproductive-age female patients who either did not complete both the RAND-36 questionnaire and questions about their contraceptive status (either due to time constraints or because they were never prompted to) or did not complete both sets of questions within 14 days of each other.

We compared the characteristics of patients with recent use of any contraceptive method to patients without recent contraceptive use. Physical and mental HRQoL were dichotomized based on U.S. general population averages as "worse than average" or "average or better". We conducted Student's t-test, chi-square, Fisher's exact and ANOVA for normally distributed variables, and Kruskal-Wallis for non-normally distributed variables, to examine the bivariate relationships between the RAND-36 composite scores, contraceptive use (any versus none) and use of a specific contraceptive method, as well as the relationships with potential confounders including age, race, marital status, education and pregnancy intentions. Finally, we ran four multivariable logistic regression models: The first two models examined the relationship between contraceptive use (any vs. none) and average or better PHC score and MHC score, respectively, while controlling for the aforementioned potential confounders. The third and fourth models examined the relationship between specific contraceptive methods and average or better PHC score and MHC score, respectively, while controlling for potential confounders. For these two models, contraceptive method was entered as a categorical variable and combined hormonal contraceptives (oral contraceptive pills, the vaginal ring and the transdermal skin patch) were used as the reference group, as they are the most commonly used methods of contraception [22]. All categorical variables were entered into models using dummy variables to code for each level of the variable. The appropriate assumptions for logistic regression were met for all models. For each model, we report unadjusted and adjusted odds ratios, 95% confidence intervals and *p* values where appropriate. All analyses were conducted using STATA version 11 (StataCorp LP, College Station, TX); *p* values <0.05 were considered significant.

3. Results

A total of 726 non-pregnant, sexually active women completed both the questions about contraceptive use and the RAND-36 and were included in this analysis. Included respondents were similar to patients who did not complete these questions in terms of race (69% of respondents were white vs. 68% of other patients, $p=0.6$) and education (67% of respondents had a least a college degree vs. 67% of other patients, $p=1.0$). However, the respondents were older (mean (SD), 35 (9) yrs respondents vs. 34 (10) yrs other patients, $p=0.003$) and more likely to be married (51% of respondents vs. 36% of other patients, $p<0.001$).

Eighty-five percent of respondents reported recent use of some form of contraception. Women who reported recent use of any contraception were similar to women who reported no recent use of contraception in most respects (Table 1). However, women who reported no recent use of contraceptive were, on average, older than contraceptive users (mean (SD), 38 (9) vs. 34 (9) years, $p<0.001$). There was no difference in the mean PHC score between contraceptive users and non-users, nor in the mean MHC score. However, 44% of non-users reported average or better PHC scores vs. 55% of contraceptive users ($p=0.04$). Similarly, 32% of non-users reported average or better MHC scores vs. 44% of contraceptive users ($p=0.01$; Table 1).

Among women who reported recent use of contraception, the most commonly used methods of contraception were combined hormonal contraceptives (35%), including oral contraceptive pills, the vaginal ring, or the transdermal skin patch. More than a quarter (28%) of respondents reported primarily using barrier methods, including condoms or a diaphragm. Smaller proportions of women reported that their primary method of contraception was a partner's vasectomy (6%), a highly effective reversible contraceptive (intrauterine device or contraceptive implant; 10%), tubal sterilization (12%), depot-medroxyprogesterone acetate (DMPA; 3%) or other methods (spermicide, the sponge, withdrawal, or fertility awareness-based; 6%). Users of each contraceptive method differed in age, race, marital status and educational attainment (Table 2). In bivariate analyses, there were significant differences in both average physical ($p<0.001$) and mental ($p<0.001$) HRQoL among women using different contraceptive methods (Table 2). Among contraceptive users, women reporting use of a combined hormonal contraceptive had the highest average scores on the RAND-36, followed by women using highly effective reversible contraceptives. Women using depot-medroxyprogesterone acetate had both the lowest mean PHC and MHC scores.

In both unadjusted and adjusted models, contraceptive users were not more likely to report average or better physical-HRQoL than non-users (adjusted odds ratio=1.10, 95% CI 0.71, 1.72, Table 3). However, contraceptive users were more likely to report average or better mental-HRQoL than non-users in unadjusted and adjusted analyses (aOR=1.60, 95% CI 1.01, 2.54, Table 3). In adjusted models investigating the relationship between specific types of contraception, women were less likely to have average or better physical-HRQoL than those using combined hormonal contraceptives (reference) if they used DMPA (aOR=0.26, 95% CI 0.09, 0.80) or had undergone tubal sterilization (aOR=0.53, 95% CI 0.28, 0.87, Table 3). Similarly, women were also less likely than those using combined hormonal contraceptives to have average or better mental-HRQoL if they used DMPA (aOR=0.24, 95% CI 0.06, 0.86, Table 3).

4. Discussion

This cross-sectional analysis found that sexually active women of reproductive age who use any form of contraception have greater odds of reporting average or better mental-HRQoL than those who use no contraception. When comparing HRQoL across different methods of contraception, women who had undergone tubal sterilization or used DMPA were less likely to report average or better physical-HRQoL than users of combined hormonal contraceptives, even after adjusting for the effects of sociodemographic confounders; users of DMPA were also less likely to report average or better mental-HRQoL.

While there are few similar studies with which to compare these findings, it is known that despite being one of the most effective methods of contraception [7] and having a strong record of long-term safety [23], DMPA has been plagued by relatively high rates of discontinuation [24, 25], perhaps reflecting effects on women's HRQoL. Concerns about changes in menstrual patterns, weight gain [26] and effects on bone mineral density [27–29] have deterred some physicians [30] and patients [22] from recommending and using this method of contraception. Data from the 2006–2008 cycle of National Survey on Family Growth showed that current DMPA use among all reproductive-age women in the United States decreased to 2.0%, from 3.3% in 2002 [22].

Prior work conducted in Turkey found that women who had undergone tubal sterilization had significantly lower quality of life measures than age-matched controls [31]. Post-tubal sterilization syndrome, in which women develop menstrual abnormalities and pelvic pain following tubal sterilization, was first described in 1951 by Williams et al. [32]. Although it has been largely disproven that such symptoms are a result of tubal sterilization [33], many women who have undergone the procedure still report menstrual abnormalities and pelvic pain, and may have the perception that they are related. Further, women who have undergone tubal sterilization also appear more likely to undergo subsequent hysterectomy than women whose husbands had undergone vasectomy for contraception [34]. Together, this evidence suggests that for some women persistent symptoms associated with their contraceptive choice could negatively impact health status and HRQoL.

There are several limitations to this study. The majority of women in this study reported using either CHC or barrier methods, so the number of women using the other methods was limited and reduced our power to detect potentially significant relationships between these methods and HRQoL. Very few women reported using DMPA as their method of contraception which may make these particular estimates unstable. Additionally, women may use contraceptive products for a myriad of reasons other than, or in addition to, pregnancy prevention [6, 7], but we were unable to control for the motives of women to use their reported contraceptive of choice, as this data is not collected by the FAST. Different motivations for using contraception may result in differential impact on quality of life. A previous prospective study conducted in Japan showed that women who were using combined oral contraceptive pills for non-contraceptive reasons reported higher measures of quality of life than women using oral contraceptive pills for contraception alone [35]. Finally, we did not have data on women's overall health status or the presence of specific health conditions which could also directly affect HRQoL.

As HRQoL is a multifactorial construct involving a complex interplay between health status, sociodemographic factors and social factors [36, 37], it is difficult to determine the direct impact of contraception on HRQoL. However, as HRQoL is a multidimensional construct, further prospective studies are needed to fully understand this relationship, and the potential interactive effects of health status, contraceptive use, sociodemographics, reproductive health characteristics and other social factors on HRQoL. Nonetheless, the findings of this

study suggest that women who use any form of contraception may have an improved HRQoL, over those who use none, and that different contraceptive methods have varying degrees of impact on women's HRQoL. As the cost-effectiveness of using any method of contraception has been well established [38], understanding the potential influence certain methods of contraception have for women may substantiate the use of more expensive methods, which also tend to be the most efficacious methods [38, 39].

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Table 1

Sociodemographic characteristics of study participants, by contraception status

	Contraceptive non-user (N=111)	Contraceptive user (N=615)	<i>p</i> value
Age, mean (SD), y	38.4 (9)	33.9 (9)	<0.001 [*]
Race, N (%)			0.20 [†]
White	74 (67)	428 (70)	
Black	28 (25)	110 (18)	
Asian	6 (5)	41 (7)	
Other/multiracial	3 (3)	35 (6)	
Married, N (%)	65 (59)	306 (50)	0.09 [†]
Education, N (%)			0.23 [†]
Less than college degree	37 (33)	205 (33)	
College degree	33 (30)	227 (37)	
Graduate degree	41 (37)	183 (30)	
RAND-36 Composite score, mean (SD)			
Physical health	45.4 (11.3)	46.9 (11.0)	0.17 [*]
Mental health	42.8 (11.5)	44.5 (12.2)	0.19 [*]
Health-related quality of life (HRQoL), N (%)			
Average or better physical HRQoL	49 (44)	340 (55)	0.04 [†]
Average or better mental HRQoL	35 (32)	271 (44)	0.01 [†]

^{*} Student's t-test.[†] Chi-square test.

Table 2

Sociodemographic characteristics of study participants, by method of contraception

	Vasectomy (N=39)	Tubal sterilization (N=72)	HER-C* (N=64)	DMPA* (N=18)	CHC* (N=214)	Barrier methods* (N=174)	Other* (N=34)	p value
Age, mean (SD), y	41.9 (5.2)	42.5 (5.8)	33.4 (7.5)	30.9 (9.3)	29.9 (7.7)	33.1 (8.1)	37.9 (7.5)	<0.001 [‡]
Race, N (%)								<0.001 [‡]
White	36 (92.3)	32 (44.4)	43 (68.3)	8 (44.4)	174 (81.3)	108 (62.1)	27 (79.4)	
Black	1 (2.6)	35 (48.6)	10 (15.9)	7 (38.9)	26 (12.2)	27 (15.5)	4 (11.8)	
Asian	0	0	6 (9.5)	1 (5.6)	6 (2.8)	28 (16.1)	0	
Other/multiracial	2 (5.1)	5 (6.9)	4 (6.4)	2 (11.1)	8 (3.7)	11 (6.3)	3 (8.8)	
Married, N (%)	36 (92.3)	37 (51.4)	36 (56.3)	5 (27.8)	85 (39.7)	83 (47.7)	24 (70.6)	<0.001 [‡]
Education, N (%)								<0.001 [‡]
Less than college degree	12 (30.8)	45 (62.5)	15 (23.4)	11 (61.1)	57 (26.6)	56 (32.2)	9 (26.5)	
College degree	17 (43.6)	19 (26.4)	20 (31.3)	4 (22.2)	95 (44.4)	59 (33.9)	13 (38.2)	
Graduate degree	10 (25.6)	8 (11.1)	29 (45.3)	3 (16.7)	62 (29.0)	59 (33.9)	12 (35.3)	
RAND-36 composite score, mean (SD)								
Physical health	45.6 (10.3)	41.0 (12.0)	48.0 (10.7)	40.8 (11.6)	49.7 (9.5)	46.4 (11.3)	47.4 (10.4)	<0.001 [§]
Mental health	44.3 (12.2)	39.7 (14.2)	43.5 (12.2)	38.7 (9.9)	46.6 (11.3)	44.5 (12.3)	46.1 (10.5)	<0.001 [§]
Health-related quality of life (HRQoL), N (%)								
Average or better physical HRQoL	17 (43.6)	23 (31.9)	38 (59.4)	5 (27.8)	141 (65.9)	96 (55.2)	20 (58.8)	<0.001 [‡]
Average or better mental HRQoL	16 (41.0)	22 (30.6)	26 (40.6)	3 (16.7)	109 (50.9)	79 (45.4)	16 (47.1)	0.003 [‡]

* Highly effective reversible contraception (HER-C)=intrauterine device or contraceptive implants; depot-medroxyprogesterone acetate (DMPA); combined hormonal contraceptives (CHC)=oral contraceptive pills, vaginal ring or patch; barrier methods=condoms or diaphragm; other=spermicide, sponge, withdrawal method or fertility awareness-based methods.

[‡] Kruskal-Wallis test.

[§] Chi-square test.

[§] One-way analysis of variance.

Table 3

Multivariable logistic regression models predicting average or better health composite scores by contraceptive used

	Physical health composite score (N=726)			Mental health composite score (N=726)		
	Unadjusted		Adjusted*	Unadjusted		Adjusted*
	OR	95% CI	OR	95% CI	OR	95% CI
Contraceptive use						
No method	reference		reference	reference	reference	
Any method	1.35	0.90, 2.03	1.10	0.71, 1.72	1.60	1.01, 2.53
Contraceptive method						
CHC †	reference		reference	reference	reference	
Vasectomy	0.40	0.20, 0.80	0.64	0.30, 1.37	0.83	0.39, 1.77
Tubal sterilization	0.24	0.14, 0.43	0.53	0.28, 0.87	0.66	0.35, 1.28
HER-C †	0.76	0.43, 1.34	0.80	0.44, 1.45	0.61	0.34, 1.12
DMPA †	0.20	0.07, 0.58	0.26	0.09, 0.80	0.24	0.06, 0.86
Barrier methods †	0.64	0.42, 0.96	0.74	0.47, 1.15	0.81	0.53, 1.25
Other †	0.74	0.35, 1.55	1.03	0.47, 2.27	0.96	0.45, 2.07

* Adjusted for age, race, marital status, education, and pregnancy intentions.

† Highly effective reversible contraception (HER-C)=intrauterine device or contraceptive implants; depot-medroxyprogesterone acetate (DMPA); combined hormonal contraceptives (CHC)=oral contraceptive pills, vaginal ring or patch; barrier methods=condoms or diaphragm; other=spermicide, sponge, withdrawal method or fertility awareness-based methods.