Title

Psychological distress and post-abortion contraceptive method effectiveness level chosen at an urban clinic

Journal

Contraception, 88(6)

ISSN

0010-7824

Authors

Steinberg, Julia R
Tschann, Jeanne M
Henderson, Jillian T
et al.

Publication Date

2013-12-01

DOI

10.1016/j.contraception.2013.08.009

Peer reviewed

Published in final edited form as:
Contraception. 2013 December ; 88(6): . doi:10.1016/j.contraception.2013.08.009.

Psychological distress and post-abortion contraceptive method effectiveness level chosen at an urban clinic

Julia R. Steinberg[a], **Jeanne M. Tschann**[a], **Jillian T. Henderson**[b], **Eleanor A. Drey**[c], **Jody E. Steinauer**[c], and **Cynthia C. Harper**[c]

[a]Department of Psychiatry, University of California, San Francisco

[b] Kaiser Permanente Center for Health Research, Northwest

[c]Department of Obstetrics, Gynecology and Reproductive Sciences, University of California, San Francisco

Abstract

Objective—We investigated whether more psychological distress before an abortion is associated with the effectiveness of contraception selected (low, moderate, or high effectiveness) at an abortion clinic visit.

Method—Using data from 253 women attending an urban abortion clinic that primarily serves low-income women, we tested the association between pre-abortion psychological distress and the effectiveness level of post-abortion contraceptive choice. Based on typical use failure rates, we classified effectiveness of contraceptive choice into three levels—low, moderate, and high effectiveness. We measured psychological distress with four validated measures of depressive, anxious, and stress symptoms, and negative affect, as well as with a global measure comprised of these four measures. We used multivariable ordinal logistic regression to measure the association of each psychological distress measure with post-abortion contraceptive method effectiveness level, adjusting for sociodemographic factors, pregnancy history, trimester of abortion, and importance of avoiding pregnancy in the next year.

Results—We found that compared to women experiencing less stress symptoms, negative affect, and global psychological distress, women experiencing more stress symptoms [*AOR* = 1.028, *95% CI*: 1.001-1.050], negative affect [*AOR* = 1.05, *95% CI*: 1.01-1.09], and global psychological distress [*AOR* = 1.46, *95% CI*: 1.09-1.95] were more likely to choose more effective versus less effective methods, *ps* < .05, in adjusted models. Using dichotomous psychological measures we found similar results.

Conclusions—Women experiencing more psychological distress before an abortion selected more effective contraceptive methods after their abortions. Future research should examine whether this distress is associated with subsequent contraceptive use or continuation.

Implications—The current study suggests that contraceptive providers should not assume that women experiencing more psychological distress prefer to use less effective contraceptive methods.

Author Correspondence: Julia R. Steinberg Department of Psychiatry University of California, San Francisco 3333 California St., Ste. 465, Box 0848 San Francisco, CA 94143-0848 415.476.7736 Julia.Steinberg@ucsf.edu.

Keywords

post-abortion contraceptive method selection; psychological distress; contraceptive effectiveness level

Women who have abortions are at high risk of having subsequent unwanted pregnancies. Of U.S. women having abortions, 50% have had one or more previous abortion [1]. Among women in a contraceptive continuation study who reported not wanting to become pregnant in the next year, those recruited from abortion care visits were 60% more likely to become pregnant in the next year than those recruited from contraceptive care visits [2]. To help women seeking abortions avoid future unwanted pregnancies, we must understand what influences women's contraceptive decisions in the abortion care setting.

Psychological theories suggest that psychological distress may influence women's contraceptive choices [3-5]; and previous research has examined the role of mental health and distress in sexual and reproductive behaviors such as condom use, birth control use and discontinuation, and contraceptive method choice in reproductive health care settings [6-18]. Building on this, we examined the role of distress in women's post-abortion contraceptive method effectiveness level choice (i.e., low, moderate, or high effectiveness) in an urban, hospital-based abortion clinic that serves low-income women. Psychological distress before an abortion is common, with 20% of women experiencing relatively high levels of depressive symptoms and 40-45% experiencing relatively high levels of anxiety just before the abortion [19,20]. While research has examined the effects of pre-abortion psychological distress on post-abortion psychological adjustment [19,20], no research has examined the effects of pre-abortion distress on other outcomes such as women's post-abortion contraceptive behaviors.

Most abortion clinics in the United States provide contraceptive information and counseling during the abortion care visit [21]. Little research has focused on what influences post-abortion contraceptive effectiveness level choice, let alone whether distress does so. The current research tested whether psychological distress before an abortion influenced women's post-abortion contraceptive effectiveness level choice. One possibility is that among women presenting for abortion, those experiencing more psychological distress will leave the abortion care visit with no contraceptive method. Cognitive resources allocation and processing efficiency theories suggest that women's attention may be so focused on their emotions that they may not have sufficient cognitive resources to devote to making contraceptive decisions [3,4]. Therefore, experiencing more psychological distress in the abortion care setting may result in a woman leaving the visit with less effective or no contraceptive methods. Indeed, there is evidence that on days in which individuals experience more negative emotions, their cognitive resources are reduced, possibly due to less focused attention and motivation when experiencing negative affect [22].

An alternative possibility, from a stress and coping perspective, is that greater psychological distress may lead to coping strategies that are more effective at preventing another unwanted pregnancy. Consequently, those who are more psychologically distressed before an abortion may engage in problem-focused coping, specifically active-behavioral coping [5,23,24], by choosing to use more effective methods for preventing another unwanted pregnancy. From this theory, we would hypothesize that women who were more psychologically distressed would choose to leave their abortion care visit with more effective contraceptive methods.

Methods

Sample

Women seeking surgical abortion services between April and September 2010 at an urban hospital-based clinic were recruited to participate in this study. At this clinic, the overwhelming majority of women do not have cost barriers for contraception because they are covered by California Medicaid or Family PACT (91% in this sample), a California state program that provides no-cost, FDA-approved contraceptive methods to women living below 200% of the federal poverty line who do not have health insurance [25].

To be eligible, women had to be 18 years or older, literate in Spanish or English, and seeking an elective abortion for reasons other than a fetal anomaly or maternal health conditions. When women checked in to their abortion care visit, the front desk clinic staff asked them if they were willing to participate in a study which required filling out two booklets of questionnaires during their visit. Women received a $15 gift certificate for participating.

Procedure

Women who agreed to participate were given Part 1 of a self-administered survey to complete in the waiting room before receiving any services. Part 1 included measures of psychological distress, demographic variables, pregnancy history and future pregnancy desires. Clinic staff placed Part 2 in women's medical folders, and women completed this after their contraceptive counseling and abortion but before leaving the clinic. Part 2 surveyed women about the contraceptive method with which they actually selected to leave the clinic.

Outcome measure: Effectiveness level of post-abortion contraceptive choice

Post-abortion contraceptive choice was coded into three effectiveness levels based on the typical use failure rate of the most effective method women selected [26]. In Part 2 of the survey, women were asked: “What method(s) of pregnancy prevention are you leaving the clinic with today? If you are going home with more than one, please check all that apply.” The response options included: the oral pill, the patch, the ring, the injectable, the implant, the levonorgestrel intrauterine device (IUD), the copper IUD, the diaphragm, spermicide or sponge, condoms, emergency contraception, no method, and other (and specify what method). No one chose to leave with the diaphragm, spermicide, or sponge. Women who reported that they were leaving with no method, condoms, or emergency contraception (EC) were coded as selecting low effective method because the typical use failure rate is greater than 17%. Women who reported that they were leaving with the pill, patch, ring, or shot (injectable) were coded as selecting moderately effective methods because the typical use failure rate of these methods ranges from 6% to 9%. Women who reported that they were leaving with an intrauterine device or an implant were coded as choosing highly effective methods—long-acting reversible (LARC) methods—because the typical use failure rate of these methods is less than 1%. If a woman did not check any option, she was excluded from analyses. From this question, we coded our dependent variable of method effectiveness level: 0 = low effectiveness (none, condoms, or emergency contraception), 1 = moderate effectiveness (pill, patch, ring, or injectable), and 2 = high effectiveness (implant or IUD).

At this clinic, women who choose the IUD or implant leave with this method inserted. Women who choose the pill leave with one pack and a 12-month prescription. Women who choose the shot get an injection while in recovery before leaving the clinic. Women who choose the patch or ring leave with a 12-month prescription. Women who choose emergency contraception (EC) leave with at least one EC pill; and all women leave with condoms.

Main predictor: Psychological distress

In line with other scales of psychological distress [27,28] that include items assessing depressive, anxiety, and stress symptoms and negative affect, we used four scales to assess various aspects of psychological distress: the Center for Epidemiologic Studies Depression (CES-D) Scale [29], the anxiety and stress subscales of the short-form version of the Depression Anxiety and Stress Scales (DASS-21) [30], and the negative affect subscale of the Positive and Negative Affect Schedule (PANAS) [31]. For each scale, mean imputation was used to calculate scores if a woman had completed at least 70% of the items (16 of 20 for the CES-D, 5 of 7 for the anxiety and stress subscales of the DASS-21, and 7 of 10 for the negative affect scale). If a woman had completed less than 70% of any scale (n = 6 and 5 for the CES-D and negative affect measure, respectively), she was missing a score on that scale. Because the scales were highly correlated (correlations range from 0.47 to 0.82) and another study of women having abortions has created a composite of similar scales [28], we created a composite of the mean of the standardized score on each of the four measures, which we term global psychological distress. Women had to have a score on at least three of the four measures to have a value for this measure. The alpha of this four-item measure was 0.88.

We examined continuous and dichotomous variables for each of the five distress measures. The dichotomous variables classified people as experiencing severe depressive, anxiety, or stress symptoms, high negative affect, and high global distress versus not. We used existing cut-off scores for the anxiety (score ≥ 15) and stress (score ≥ 26) measures that define severe amounts of each [32]. This resulted in 15.8 % and 15.4 % of the sample being classified as experiencing severe anxiety or stress symptoms. To determine severe depressive symptoms, high negative affect, and high global distress, we used a cut-off that was 1 standard deviation above each measure's mean in this sample. This left 16.2% of the sample in the severe depressive symptoms category, 17.8% in the high negative affect category, and 16.2% in the high global psychological distress category.

Covariates

Based on the literature, we included the covariates of age, self-identified race/ethnicity (White, Black/African American, Hispanic, or Other), education (less than high school, high school, some college, or college graduate or more), marital status (never married, cohabitating, married, or separated/divorced), number of children, number of previous abortions, the trimester of pregnancy at time of termination, and perceived importance of avoiding pregnancy in the next year [18,33]. For race/ethnicity, the other category included those who reported they were Asian, Native American, one person who reported “Mixed,” and another who did not report anything. Those who did not report educational level (n = 1), marital status (n = 3), number of previous abortions (n = 21), and number of children (n = 5) were given the mode value for their age. For the five women who did not report the level of importance of avoiding pregnancy in the next year, we imputed values based on responses to similar items. One woman who strongly agreed that it was very important to avoid pregnancy in the next six months and four women who said that that they strongly disagreed that they would get pregnant in the next year were coded as agreeing that it was very important to avoid pregnancy in the next year. In total, 30 women were missing on at least one of these covariates, with 22 missing on one, 7 missing on two, and 1 missing on three of them. Because main findings did not change if we exclude these 30 women, they were retained in the analyses.

Analysis

We first examined bivariate relationships between each psychological distress measure (the continuous measure) and the other study variables. Correlations were used for continuous

variables, and one-way ANOVAs were used for categorical variables to detect significant relationships. If the omnibus test for the one-way ANOVA was significant at $p \leq .05$ and the category had more than two levels, we followed-up with Tukey's Honestly Significant Difference test to correct for multiple comparisons and pinpoint which categories were different from one another. We then tested unadjusted and adjusted ordinal logistic regression models in which the main predictor was each of the five psychological distress measures. For each psychological measure, we examined one model that included the continuous psychological measure and one model that included the dichotomous variable.

Results

We recruited 302 women who completed Parts 1 and 2 of the survey. Of these, 20 women were missing a substantial number of items, 16 did not report the contraception method with which they were leaving their abortion care visit, and 13 were missing on more than one of the four scales comprising psychological distress, leaving 253 women (84% of the eligible sample) for analyses. Of these 253, 11 women had a score on only three of the four psychological distress measures. Table 1 shows descriptive information on the sample, including means, standard deviations, and internal consistencies of the measures of psychological distress, the different types of methods chosen, demographic characteristics, reproductive history, and contextual factors of current abortion. The most common method chosen was the IUD and the least common method chosen was emergency contraception. Fifteen percent of the sample reported going home with low effective methods (no method, condoms, or EC); 43% reported going home with moderately effective methods (pill, patch, ring, or shot); and 42% reported going home with highly effective methods (i.e., IUD or implant) in place. Eighty-one percent of women self-identified as non-White, 89 % had less than a college education, and 57% were never married. Sixty percent of the women were having a second-trimester abortion, 61% had had at least one previous abortion, and 60% of women in this sample had at least one child.

The only significant relationship between any of the psychological distress measures and the other study covariates was found between race/ethnicity and depressive symptoms and negative affect (Table 2). Women who self-identified as Hispanic had more depressive symptoms than women who self-identified as Other (includes Asians, Native Americans, Mixed, and one woman who was missing), and women who identified as Black or African American had less negative affect than women who identified as White, $ps < .05$.

In unadjusted ordinal logistic regression models, the continuous measures of depressive symptoms, stress symptoms, negative affect, and the psychological distress composite were significantly related to contraceptive effectiveness level choice, $ps < .05$ (Table 3). Women experiencing more depressive symptoms [OR = 1.021; 95% CI: 1.001-1.043], more stress symptoms [OR = 1.028; 95% CI: 1.004-1.051], more negative affect [OR = 1.051; 95% CI: 1.013-1.090], and more global psychological distress [OR = 1.46; 95% CI: 1.10-1.94] had an increased likelihood of choosing more rather than less effective methods. Similarly, the dichotomous measures of severe depressive symptoms, high negative affect, and high psychological distress were all related to contraceptive effectiveness level choice, $ps < .05$. Women experiencing severe depressive versus not severe depressive symptoms [OR = 2.27; 95% CI: 1.17-4.40], high negative versus not high negative affect [OR = 2.16; 95% CI: 1.14-4.08], and high versus not high global psychological distress [OR = 2.84; 95% CI: 1.52-5.29] were more likely to choose more rather than less effective contraceptive methods.

Adjusted models showed similar findings with the exception that the continuous measure of depressive symptoms [*AOR* = 1.020; *95% CI*: 0.998-1.042] was only a marginally significant predictor of contraceptive effectiveness level, $p = .08$. The continuous measures

of stress symptoms, negative affect, and global psychological distress and the dichotomous measures of severe depressive symptoms, high negative affect, and high global psychological distress all remained significantly related to contraceptive effectiveness level, *ps* < .05.

Table 4 presents the adjusted model with all the covariates for the continuous global psychological distress composite. Controlling for the covariates, compared to women with less global psychological distress, women with more global psychological distress were more likely to choose more effective methods, *AOR*=1.46, *95% CI*: 1.09-1.95, $p < .05$. In addition, women who were having a second-trimester compared to a first-trimester abortion, *AOR* = 1.72, *95% CI*: 1.03-2.88, $p < 0.05$, those who reported it was very important to avoid becoming pregnant in the next year, *AOR* = 2.19, *95% CI*: 1.26-3.81, $p < 0.01$, and those who had had more abortions, *AOR* = 1.27, *95% CI*: 1.02-1.59, $p < 0.05$, had an increased likelihood of choosing more effective methods. These variables were also significant in the models with the other validated measures of distress.

Discussion

This is the first study to examine the association between psychological distress and post-abortion contraceptive effectiveness level choice. . Women experiencing more negative psychological states just before their abortion were more likely to leave their visit with more effective contraceptive methods. In addition, experiencing severe depressive symptoms, high negative affect, and high global psychological distress were associated with leaving with more versus less effective contraceptive methods post-abortion. These findings lend support to the active coping hypothesis rather than that of cognitive load. That is, those with more psychological distress may have chosen more effective methods in order to improve their chances of avoiding a future unwanted pregnancy. In contrast, those with less psychological distress may not have been as motivated at the time of the visit to choose more effective methods to prevent unwanted pregnancy.

Some characteristics of this sample differ from those of national data on women having abortions. The percentage of women having second trimester abortions in this sample (60 %) was much higher than that of 11 % of women having abortions in the U.S. [34]. The percent having had a previous abortion in this sample (61%) is also slightly higher than that of 50 % of women having abortions in the U.S. [1]. The unique characteristics of this sample may mean these findings are not generalizable to other clinics. Nevertheless, since levels of pre-abortion psychological distress, the main variable of interest, were similar to other samples of women having abortions [19,20], our findings may be generalizable to women in general who are having abortions. Future research could examine the association between pre-abortion psychological distress and effectiveness of post-abortion contraceptive choice in other clinics.

Another reason findings should be interpreted with caution is the abortion care and contraceptive counseling model used by this clinic [35,36]. We did not consider how contraceptive counseling may have interacted with psychological distress to influence contraceptive choice. At this clinic, counseling is patient-centered [35,37]. Some counselors may have spent more time with women who were psychologically distressed, listening to their concerns, comforting them, and providing support, all of which may have allowed women experiencing more psychological distress to feel more comfortable actively choosing more effective methods compared to those not experiencing psychological distress. It is also possible that contraceptive counselors may have more strongly recommended more effective methods for those more psychologically distressed and this recommendation may have been the reason for our findings. To better inform clinical practice, future research could assess

how various characteristics of abortion care services and contraceptive counseling interact with psychological distress to influence patients' contraceptive choices in reproductive health care settings.

It also should be noted that these results are in contrast to other research finding that, in young women, more depressive, anxiety, or stress symptoms are associated with more risky sexual and reproductive behaviors such as not using condoms during sex, discontinuing contraception, inconsistent contraceptive use, using less effective contraceptive methods, or choosing no method versus choosing some method in a family planning visit [7,9-14,18]. However, not all research has found that more distress or depressive symptoms are associated with not using condoms or other contraception, or using less effective methods in young women [6-8,15]. For instance, among high income women, Farr and colleagues did not find an association between more mental distress and using less effective methods [7]; and other studies have not found an association between current depressive symptoms and condom or birth control use during recent intercourse among adolescent girls or young women [6,14,15]. Moreover, in laboratory settings, some psychological research on anxiety or depressive symptoms and risk taking behavior has found that higher levels of anxiety or depressed mood are associated with engaging in more risk-averse decisions [38,39], suggesting that higher levels of anxiety, stress, negative affect, or depressive symptoms may be associated with less risky sexual practices.

While these contradictory findings point to the need for future research examining the association between psychological distress and contraceptive behaviors that are more effective at protecting individuals from unwanted pregnancy and STIs, the current study suggests that contraceptive providers should not assume that women experiencing more psychological distress prefer to use less effective contraceptive methods. Previous research may have found that more distress was associated with use of less effective methods because the distress was not as transient as it may have been in the current study. Indeed, other research has found that among women having abortions, psychological distress declines dramatically from just before to just after the abortion [20,40,41]. Therefore, future research could tease out the effects of chronic versus acute stress on contraceptive behaviors.

In addition to this sample not being representative of women having abortions in some ways and the clinic possibly having a unique atmosphere, a few other limitations are worth mentioning. First, as with much other research in this area [6-8,12-15,17,33], this study is limited by self-report of behaviors and experiences. Second, we do not have information on whether women continued to use the inserted IUD or implant or the injectable that was administered or whether they actually began to use the other moderately and low effective methods. Because our study did not investigate subsequent use of contraceptive methods, we do not know whether continuation rates or correct use would also be heightened among the women experiencing greater distress. It is possible that women with lower stress may have life circumstances and coping resources that would facilitate higher rates of method continuation and correct use, and lower rates of unintended pregnancy following their abortion. Indeed, those with lower psychological distress may have chosen less effective methods because they were confident and motivated to use these methods, which require more monitoring and motivation to use correctly. Further research is needed to understand how psychological states at the time of an abortion influence method continuation, correct use, and subsequent unintended pregnancy. Third, while our findings suggest that women actively coped with their distress by choosing more effective methods to prevent future unwanted pregnancies, future research could more fully test this by asking women the reasons they chose their particular method, assessing the role of contraceptive counseling, and measuring the coping strategies women used in their current situation [23,24].

We did not find associations between sociodemographic factors and the psychological distress measures or between sociodemographic factors and contraceptive effectiveness level choice, perhaps due to the homogeneity of this sample of low income women. Eighty percent of the women were between ages 18 and 30, 84% had never been married, and 89% had not graduated college. In addition, given that there exist inconsistent findings on the relationship between psychological distress and sociodemographic factors and the relationship between contraceptive method effectiveness level and sociodemographic factors, it is unclear how these factors should be related [7,18,33,42-44]. For instance, some research has found young White women to have a lower prevalence of depression or mental distress than young Hispanic or African American women [7,42]. Other research has found young African American women to have a lower prevalence of depression than young White or Hispanic women [43,44] or no association between race/ethnicity and depression among young women [18]. Similarly, some research has found younger versus older women and African American versus White women to be more likely to use methods such as injectables, patch, ring, IUD, or implant versus the pill and condoms [33], while other research has found no association between age or ethnicity and choosing more effective contraceptive methods [18]. Therefore it is unclear whether relationships would be expected between sociodemographic factors and mental health symptoms and contraceptive method choice in the current demographically-homogenous sample.

Women experiencing more versus less psychological distress pre-abortion were more likely to go home with more effective contraceptive methods post-abortion, suggesting providers should not assume that experiencing more distress means patients are not planning to use the more effective contraceptive methods. While this suggests women actively coped with their distress, the nature of the clinic—the safe and supportive environment provided by staff, particularly for those experiencing more psychological distress—may be integral to this finding. Future research in other abortion clinics and reproductive health care settings is needed to further our understanding of the relationship between psychological distress and contraceptive effectiveness level choice. Nevertheless, these findings suggest that it is possible to create an environment such that women who experience more psychological distress before an abortion choose contraceptive methods that are more protective against future unwanted pregnancies.

Acknowledgments

Support

This work was supported by an NICHD/NIH Building Interdisciplinary Research Careers in Women's Health (BIRCWH) K12 award, the Ellertson Fellowship, and a grant from the Society of Family Planning awarded to JRS.

References

1. Jones, RK.; Singh, S.; Finer, LB.; Frohwirth, LF. Repeat abortion in the United States, Occasional Report. Guttmacher Institute; New York, NY: 2006.
2. Upadhyay UD, Brown BA, Sokoloff A, Raine TR. Contraceptive discontinuation and repeat unintended pregnancy within 1 year after an abortion. Contraception. 2012; 85(1):56–62. [PubMed: 22067792]
3. Ellis, HC.; Ashbrook, PW. Resource allocation model of the effects of depressed mood states on memory. In: Fiedler, K.; Forgas, J., editors. Affect, Cognition, and Social Behavior. Hogrefe; Toronto (Ontario, Canada): 1988. p. 25-43.
4. Eysenck MW, Calvo MG. Anxiety and performance: The processing efficiency theory. Cognition and Emotion. 1992; 6(6):409–434.
5. Lazarus, RS.; Folkman, S. Stress, Appraisal, and Coping. Springer Publishing Company; New York (NY): 1984.

6. Broccoli TL, Sanchez DT. Implicit hopelessness and condom use frequency: Exploring nonconscious predictors of sexual risk behavior. Journal of Applied Social Psychology. 2009; 39(2): 430–448.
7. Farr SL, Curtis KM, Robbins CL, Zapata LB, Dietz PM. Use of contraception among U.S. women with frequent mental distress. Contraception. 2011; 83(2):127–133. [PubMed: 21237337]
8. Morokoff PJ, Redding CA, Harlow LL, et al. Associations of sexual victimization, depression, and sexual assertiveness with unprotected sex: A test of the Multifaceted Model of HIV risk across gender. Journal of Applied Biobehavioral Research. 2009; 14(1):30–54.
9. Westhoff C, Truman C, Kalmuss D, et al. Depressive symptoms and Depo-Provera. Contraception. 1998; 57(4):237–240. [PubMed: 9649914]
10. Westhoff C, Truman C, Kalmuss D, et al. Depressive symptoms and Norplant contraceptive implants. Contraception. 1998; 57(4):241–245. [PubMed: 9649915]
11. Hall KS, White KO, Rickert VI, Reame N, Westhoff C. Influence of depressed mood and psychological stress symptoms on perceived oral contraceptive side effects and discontinuation in young minority women. Contraception. 2012; 86(5):518–525. [PubMed: 22673038]
12. Hall KS, Moreau C, Trussell J, Barber J. Role of young women's depression and stress symptoms in their weekly use and nonuse of contraceptive methods. Journal of Adolescent Health. In press.
13. Walsemann KM, Perez AD. Anxiety's relationship to inconsistent use of oral contraceptives. Health Education & Behavior. 2006; 33(2):197–214. [PubMed: 16531513]
14. Kowaleski-Jones L, Mott FL. Sex, contraception and childbearing among high-risk youth: Do different factors influence males and females. Family Planning Perspectives. 1998; 30(4):163–169. [PubMed: 9711453]
15. Shrier LA, Harris SK, Sternberg M, Beardslee WR. Associations of depression, self-esteem, and substance use with sexual risk among adolescents. Preventive Medicine. 2001; 33(3):179–189. [PubMed: 11522159]
16. Crepaz N, Marks G. Are negative affective states associated with HIV sexual risk behaviors? A meta-analytic review. Health Psychology. 2001; 20(4):291–299. [PubMed: 11515741]
17. Faisal-Cur, A.; Menezes, PR.; Huang, H. Contraception. The relationship between perinatal psychiatric disorders and contraception use among postpartum women.. In press
18. Garbers S, Correa N, Tobier N, Blust S, Chiasson MA. Association between symptoms of depression and contraceptive method choices among low-income women at Urban Reproductive Health Centers. Maternal and Child Health Journal. 2010; 14(1):102–109. [PubMed: 19067135]
19. Bradshaw Z, Slade P. The effects of induced abortion on emotional experiences and relationships: A critical review of the literature. Clinical Psychology Review. 2003; 23(7):929–958. [PubMed: 14624822]
20. Cozzarelli C. Personality and self-efficacy as predictors of coping with abortion. Journal of Personality and Social Psychology. 1993; 65(6):1224–1226. [PubMed: 8295119]
21. Kavanaugh ML, Jones RK, Finer LB. How commonly do US abortion clinics offer contraceptive services. Contraception. 2010; 82(4):331–336. [PubMed: 20851226]
22. Brose A, Schmiedek F, Lovden M, Lindenberger U. Daily variability in working memory is coupled with negative affect: The role of attention and motivation. Emotion. 2012; 12(3):605–617. [PubMed: 21787075]
23. Billings AG, Moos RH. The role of coping responses and social resources in attenuating the stress of life events. Journal of Behavioral Medicine. 1981; 4(2):139–157. [PubMed: 7321033]
24. Carver CS, Scheier MF, Weintraub JK. Assessing coping strategies: A theoretically based approach. Journal of Personality and Social Psychology. 1989; 56(2):267–283. [PubMed: 2926629]
25. Bixby Center for Global Reproductive Health, UCSF. Fact sheet on Family PACT: An overview. 2012. Version 5. Available at: http://www.familypact.org/Providers/fact-sheets
26. Hatcher, RA.; Trussell, J.; Nelson, Al, et al. Contraceptive Technology. 20th Revised Edition. Ardent Media; New York (NY): 2011.
27. Kessler RC, Andrews G, Colpe LJ. Short screening scales to monitor population prevalences and trends in non-specific psychological distress. Psychological Medicine. 2002; 32(6):959–976. [PubMed: 12214795]

28. Major B, Zubek JM, Cooper ML, Cozzarelli C, Richards C. Mixed messages: Implications of social conflict and social support within close relationships for adjustment to a stressful life event. Journal of Personality and Social Psychology. 1997; 72(6):1349–1363. [PubMed: 9177021]
29. Radloff LS. The CES-D scale: A self-report depression scale for research in the general population. Applied Psychological Measurement. 1977; 1(3):385–401.
30. Henry JD, Crawford JR. The short-form version of the Depression Anxiety Stress Scales (DASS-21): Construct validity and normative data in a large non-clinical sample. The British Journal of Clinical Psychology. 2005; 44(2):227–239. [PubMed: 16004657]
31. Watson D, Clark LA, Tellegen A. Development and validation of brief measures of positive and negative affect. The PANAS scales. Journal of Personality and Social Psychology. 1988; 54(6): 1063–1070. [PubMed: 3397865]
32. Lovibond, SH.; Lovibond, PF. Manual for the Depression Anxiety Stress Scales. 2nd Ed.. Psychology Foundation of Australia; Sydney (Australia): 1995.
33. Frost JJ, Darroch JE. Factors associated with contraceptive choice and inconsistent method use, United States, 2004. Perspectives on Sexual and Reproductive Health. 2008; 40(2):94–104. [PubMed: 18577142]
34. Pazol K, Zane S, Parker, et al. Abortion Surveillance—United States, 2007. Centers for Disease Control and Prevention Morbidity and Mortality Weekly. 2011; 60(1):1–39.
35. Perrucci, AC. Decision assessment and counseling in abortion care: Philosophy and Practice. The Rowman & Littlefield Publishing Group, Inc; Lanham (MD): 2012.
36. Benson LS, Perrucci A, Drey EA, Steinauer JE. Effect of shared contraceptive experiences on IUD use at an urban abortion clinic. Contraception. 2012; 85(2):198–203. [PubMed: 22067784]
37. Personal communication with clinic director. May.31:2013.
38. Maner JK, Schmidt NB. The role of risk avoidance in anxiety. Behavior Therapy. 2006; 37(2): 181–189. [PubMed: 16942970]
39. Yuen KSL, Lee TMC. Could mood state affect risk-taking decisions? Journal of Affective Disorders. 2003; 75(1):11–18. [PubMed: 12781345]
40. Major B, Cozzarelli C, Cooper ML, et al. Psychological responses of women after first-trimester abortion. Archives of General Psychiatry. 2000; 57(8):777–784. [PubMed: 10920466]
41. Lowenstein L, Deutcsh M, Gruberg R, et al. Psychological distress symptoms in women undergoing medical vs. surgical termination of pregnancy. General Hospital Psychiatry. 2006; 28(1):43–47. [PubMed: 16377364]
42. Rickert VI, Weimann CM, Berenson AB. Ethnic differences in depressive symptomatology among young women. Obstetrics & Gynecology. 2000; 95(1):55–60. [PubMed: 10636503]
43. Berenson AB, Breitkopf CR, Wu ZH. Reproductive correlates of depressive symptoms among low-income minority women. Obstetrics & Gynecology. 2003; 102(6):1310–1317. [PubMed: 14662220]
44. Barnes DM, Keyes KM, Bates LM. Racial differences in depression in the United States: how do subgroup analyses inform a paradox? Social Psychiatry and Psychiatric Epidemiology. In press.

Table 1

Descriptive statistics of the sample from the abortion clinic (n = 253).

Variable	
Age (Mean & SD)	25.3 (5.8)
Race/ethnicity (%)	
White	19 %
Hispanic	28 %
Black or African American	34 %
Other[1]	19 %
Education (%)	
Less than high school	16 %
High school graduate	25 %
Some college	48 %
College graduate or more	11 %
Marital status (%)	
Never married	57 %
Cohabitating	27 %
Married	7 %
Divorced or separated	9 %
Number of prior abortions (Mean & SD)	1.24 (1.28)
Number of children (Mean & SD)	1.14 (1.29)
Very important to avoid pregnancy in next year (%)	
Yes	71 %
No	29 %
Abortion trimester (%)	
First-trimester	40 %
Second-trimester	60 %
Psychological distress measures (Mean & SD)	
Depression using the CES-D[2], α = .91	23.6 (11.8)
Anxiety subscale of DASS-21, α = .82	7.3 (8.2)
Stress subscale of DASS-21, α = .91	12.8 (10.6)
Negative affect scale of PANAS[3], α = .89	10.1 (6.7)
Global psychological distress, α = .88	0.00 (0.87)
Post-abortion contraceptive method (%)	
IUD	38 %
Contraceptive Implant	4 %
Oral Contraceptive Pill	21 %
Transdermal Patch	4 %
Vaginal Ring	4 %
Injectable (DMPA) Shot	14 %
Condoms	10 %

Variable	
Emergency contraception	0.4 %
No method	5 %
Effectiveness level of method choice (%)	
Highly effective methods (IUD, implant)	42 %
Moderately effective methods (pill, patch, ring, shot)	43 %
Low effective methods (condoms, EC, no method)	15 %

*1*includes women who reported Asian, Native American or Mixed ethnicity/race and one who was missing

*2*N = 247 because 6 women did not have a score on the CES-D

*3*N = 258 because 5 women did not have a core on negative affect

Table 2

Bivariate relationship between psychological distress measures and other study variables

Variable	Depressive symptoms	Anxiety symptoms	Stress symptoms	Negative affect	Global psychological distress
Age (Correlation)	.01	.07	.08	−.05	.03
Number of prior abortions (Correlation)	.08	.03	.11≠	−.09	.04
Number of children (Correlation)	.04	.04	.07	−.06	.03
Race/ethnicity (Mean, SD)	.037			.017	
White	24.7[ab] (13.6)	8.4 (10.2)	14.4 (12.0)	12.4[a] (7.1)	0.18 (1.02)
Hispanic	26.3[a] (12.1)	8.1 (8.7)	13.3 (10.7)	10.6[ab] (6.7)	0.11 (0.92)
Black	22.9[ab] (10.4)	6.8 (7.4)	12.7 (10.2)	8.6[b] (6.1)	−0.09 (0.78)
Other[1]	20.1[b] (10.9)	6.2 (6.5)	10.8 (9.9)	10.1[ab] (6.8)	−0.16 (0.76)
Education (Mean, SD)					
Less than high school	25.1 (12.6)	5.8 (6.9)	11.8 (9.3)	10.7 (6.5)	−0.03 (0.83)
High school graduate	23.7 (13.4)	7.6 (8.7)	13.7 (11.7)	10.0 (7.4)	0.04 (1.01)
Some college	22.4 (10.1)	7.2 (7.9)	12.0 (10.0)	9.7 (6.4)	−0.07 (0.78)
College graduate or more	23.6 (11.8)	9.5 (9.5)	15.8 (12.2)	11.4 (7.0)	0.27 (0.96)
Marital status (Mean, SD)					
Never married	23.3 (11.0)	9.3 (7.5)	14.7 (10.1)	9.0 (7.0)	−0.04 (0.88)
Cohabitating	23.0 (11.1)	6.9 (7.7)	13.0 (10.6)	10.0 (6.1)	−0.02 (0.81)
Married	28.5 (13.1)	7.7 (7.9)	15.6 (10.7)	12.8 (7.9)	0.09 (0.86)
Divorced or separated	23.2 (11.9)	7.2 (8.6)	12.1 (10.7)	9.9 (6.7)	0.26 (0.97)
Very important to avoid pregnancy in next year (Mean, SD)					
Yes	22.8 (11.7)	7.6 (8.2)	12.6 (11.1)	9.9 (7.1)	0.01 (0.86)
No	24.0 (11.8)	7.2 (8.2)	12.9 (10.5)	10.2 (6.6)	−0.01 (0.91)
Abortion trimester (Mean, SD)					
First-trimester	24.4 (11.7)	6.7 (7.5)	12.6 (10.5)	9.7 (6.7)	−0.02 (0.84)
Second-trimester	23.2 (11.9)	7.7 (8.6)	13.0 (10.7)	10.4 (6.7)	0.02 (0.89)
Contraceptive method effectiveness level (Mean, SD)	.103		.055	.011	.022
Highly effective methods	22.1 (11.2)	6.1 (8.4)	11.2 (10.8)	9.4[a] (7.2)	0.18[a] (0.91)
Moderately effective methods	22.3 (11.2)	6.7 (7.4)	11.6 (9.8)	8.9[b] (6.3)	−0.12[b] (0.78)
Low effective methods	25.5 (12.4)	8.4 (8.8)	14.7 (11.2)	11.6[ab] (6.7)	−0.13[ab] (0.91)

Notes.

Correlations were used for the continuous variables and one-way ANOVAs were used for the categorical variables to detect significant relationships between the psychological distress measures and study variables. If $p \leq .05$ for omnibus F-values, we conducted post-hoc Tukey tests to examine where differences lie. Within a cell, values with different superscripts indicate significant differences at $p < .05$. Highly effective methods = IUD and implant; Moderately effective methods = pill, patch, ring, or shot; and low effective methods = condoms, EC, and no method

*$p < .05$, **$p \leq .01$.

1 includes women who reported Asian, Native American or Mixed ethnicity/race and one who was missing.

≠ $p < .10$

Table 3

Odds ratios (and 95% CI) of the relationship between each measure of psychological distress and post-abortion contraceptive effectiveness level

Individual psychological distress measures	Unadjusted OR	Adjusted OR
Depressive symptoms (n = 247)		
Continuous measure (range: 1-57)	1.021 * (1.001-1.043)	1.020 ≠ (0.998-1.042)
Dichotomous (score ≥ 35.4)	2.21 * (1.14-4.28)	2.40 * (1.20-4.82)
Anxiety symptoms (n = 253)		
Continuous measure (range: 0-40)	1.029 ≠ (0.999-1.060)	1.030 ≠ (0.999-1.063)
Dichotomous (score ≥ 15)	1.58 (0.82-3.05)	1.62 (0.82-3.21)
Stress symptoms (n = 253)		
Continuous measure (range: 0-42)	1.028 * (1.004-1.051)	1.025 * (1.001-1.050)
Dichotomous (score ≥ 26)	1.75 ≠ (0.90-3.39)	1.59 (0.80-3.15)
Negative affect (n = 248)		
Continuous measure (range: 0-30)	1.051 ** (1.013-1.090)	1.054 ** (1.014-1.096)
Dichotomous (score ≥ 16.8)	2.11 * (1.12-3.99)	2.31 * (1.182-4.52)
Global psychological distress (n = 253)		
Continuous measure (range:	1.46 ** (1.10-1.94)	1.46 ** (1.09-1.95)
Dichotomous (score ≥ .87)	2.16 * (1.11-4.19)	2.15 * (1.08-4.33)

Notes. Models are ordinal logistic regression ones where the outcome is three levels: 0 = low effective methods, 1 = moderately effective methods, and 2 = highly effective methods. Adjusted model includes: age, self-identified race/ethnicity, marital status, education level, number of previous abortions, number of children, trimester of abortion, and importance of preventing pregnancy in next year.

≠ p < .10

* $p < .05$

** $p \leq .01$

Table 4

Adjusted odds ratios (and 95% CI) of the relationship between global psychological distress and post-abortion contraceptive effectiveness level

Variable	Effectiveness level of contraceptive method choice
Age	0.98 (0.93-1.03)
Race/ethnicity	
Black	1.20 (0.56-2.57)
Hispanic	1.26 (0.60-2.68)
Other	1.08 (0.48-2.39)
White[1]	1.00
Marital Status	
Cohabitating	1.55 (0.87-2.75)
Married	0.65 (0.22-1.95)
Divorced/Separated	0.80 (0.33-1.96)
Never married[1]	1.00
Education	
Less than high school	1.09 (0.41-2.92)
High school graduate	0.64 (0.26-1.61)
Some college	0.87 (0.37-2.03)
College graduate or more[1]	1.00
Number of children	1.11 (0.87-1.40)
Number of prior abortions	1.27* (1.02-1.59)
Trimester of abortion	
Second	1.72* (1.03-2.88)
First[1]	1.00
Very important to avoid pregnancy in next year	
Yes	2.19** (1.26-3.81)
No[1]	1.00
Psychological distress	1.46** (1.09-1.95)

Notes. Model is an ordinal logistic regression one where the outcome is three levels: 0 = low effective methods, 1 = moderately effective methods, and 2 = highly effective methods. N = 253.

[1] reference group

* $p < .05$

** $p \leq .01$.