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Psychiatric disorders among low-income women and unintended pregnancies

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Abstract

Research Question—Prevalence of both unintended pregnancy and psychiatric disorder in pregnancy is high and each is associated with compromised birth outcomes and challenges in child-rearing. This study examines the relationship between mental illness and unintended pregnancy in seeking to improve the care provided to women and our ability to minimize the number of children born unwanted and ill-cared for.

Methods—The sample consisted of 744 pregnant WIC participants with a stratified enrollment design by residence and representative by race for each WIC county. Analysis consisted of post-stratification by developmental age group with logistic regression models estimating odds of unintended pregnancy among women with and without a psychiatric disorder. Covariates included race, education and marital status.

Findings—Almost one-third (30.9%) had at least one psychiatric disorder with over two-thirds (67.3%) reporting their pregnancy as unintended. No grouped psychiatric disorder was associated with unintended pregnancy with all ages combined. However, adolescent women (age 15–19) with a substance disorder were less likely to have an unintended pregnancy (aOR 0.3, CI 0.1–0.7) than women without a substance disorder and emerging adult women (age 20–23) with an anxiety disorder were less likely to have an unintended pregnancy (aOR 0.4, CI 0.2–1.0) compared to those without the targeted disorder.

Conclusions—Prevalence of unintended pregnancy is not associated with having a psychiatric disorder, although substance use disorders and anxiety disorders were associated with a decreased

likelihood for an unintended pregnancy in a specific age group. Importantly, targeted efforts are needed to identify and counsel women with mental illness about pregnancy planning.

Introduction and Background

Each year in the US, approximately half of all pregnancies are reported as unintended (Finer & Henshaw, 2006). Young, unmarried women account for as many as 80% of the unintended pregnancies in the US, which in turn often results in poor maternal and child outcomes (Abma, Martinez, Mosher, & Dawson, 2004; Brown & Eisenberg, 1995). While a number of studies have explored pregnancy intention in the general population, little is known about the relationship between mental health status and pregnancy intention. Women with active psychiatric disorders experience greater social disadvantage than healthy women including greater likelihood of poverty, partner abuse, divorce and negative life events (Tweed, 1993; Kessler, 1982; Kessler & Frank, 1996), as well as engage in behaviors that are even riskier during a pregnancy, such as tobacco or substance use, delayed prenatal care or poor nutrition. One might expect the social disadvantages and risky behaviors that often accompany psychiatric disorder might lead to a greater likelihood of unintended pregnancy for women of reproductive age, but no research to date has examined this relationship.

Unintended pregnancy was first conceptualized and measured in 1973 with the majority of studies using a single-item to assess intendedness. Unintended pregnancy is currently defined as those pregnancies that are either mistimed (conceptions wanted by the woman at some time but occurring sooner than wanted) or unwanted (conceptions occurring when the woman did not want to be pregnant then or at any time in the future. In the U.S., the only nationally representative data on prevalence of unintended pregnancy is the National Survey of Family Growth (NSFG) which has been conducted every few years since 1973. Empirical studies to date have reported associations between unintended pregnancy and being young, unmarried, Black, less educated, and having one or more children (Abma et al., 2004; Beck, Morrow, Lipscomb, Johnson, Gaffield, & Rogers, 2002; Besculides & Laraque, 2004; Musick, 2002; Pulley, Klerman, Tang, & Baker, 2002). Other investigations have examined a host of social, behavioral and psychological factors that may influence a woman reporting her pregnancy as unintended. These include, age of the father (Darroch, Landry, & Oslak, 1999), intention of the father (Davies, DiClemente, Wingwood, Harrington, Crosby, & Sionean, 2003; Green, Gazmararian, Mahoney, & Davis 2002; Kroelinger & Oths, 2000; Speizer, Santelli, Afable-Munsuz, & Kendall, 2004), being from a single parent family (Musick, 2002), having experienced abuse (Cubbin, Braveman, Marchi, Chavex, Santelli, & Colley-Gilbert, 2002; Gazmararian, Adams, Saltzman, Johnson, Bruce, & Marks, 1995; Goodwin, Gazmararian, Johnson, Gilbert, Saltzman, & PRAMS Working Group, 2000; Pallitto & O'Campo, 2004), alcohol use (Cloud, Baker, DePersio, DeCoster, & Lorenz, 1997; Naimi, Lipscomb, Brewer, & Gilbert, 2003), denial and ambivalence (Crosby, DiClemente, Wingwood, Rose, & Lange, 2003), being of adolescent age (Kessler, Berglund, Foster, Saunders, Stang, & Walters, 1997), contraception use (Trussell, Vaughan, & Stanford, 1999), depression (Cartwright, 1988; Reardon & Cougle, 2002), and ability to negotiate contraception with her partner (Manlove, Ryan, & Franzetta, 2004).

In any given year in the United States, approximately one in five adults have some form of psychiatric disorder (Kessler, Berglund, Demler, Jin, & Walters, 2005; Regier, Narrow, Rae, & Manderscheid, 1993). Previous studies of psychiatric disorders and pregnancy have reported up to 70% of pregnant women with depressive symptoms with 10 to 16% meeting diagnostic criteria for major depression (Llewellyn, Stowe, & Nemeroff, 1997), 38% who screened positive for other depressive disorders (Kelly, Zatzick, & Anders, 2001), and close to 30% who screened positive for an anxiety disorder (Birndorf et al., 2001). A recent systematic review by Bennett and colleagues (2004) examined 21 published articles for prevalence rates of

depression during each trimester that indicated a large proportion of women who experience depression at some point during pregnancy. In addition, pregnant women of low socioeconomic status were shown to have higher rates of depression when compared to the general pregnant population. Finally, in one of the first large-scale US studies to examine both recent and lifetime prevalence of psychiatric disorders in a community sample of low-income pregnant women using DSM-IV criteria, prevalence of having one or more psychiatric disorder in the previous 12 months was 30.9%.

Importantly, little research has examined psychiatric disorder in adolescent women and reproductive planning. A study conducted by Kessler and colleagues (1997), based upon the National Comorbidity Study (NCS), used a subsample of 5,877 for respondents ranging in age between 18 and 24 (Kessler et al., 1997). They report that early onset of psychiatric disorders predicted subsequent teenage pregnancy. Four classes of psychiatric disorders (affective, anxiety, substance, and conduct) were positively related to an adolescent becoming pregnant, with addictive disorders the strongest predictors and anxiety disorders the weakest.

The literature suggests a difference between adolescent and older women in the circumstances leading to an unintended pregnancy (Cubbin et al., 2002). For example, women between 15–19 years old are less likely to have completed high school, to be married, or to have a previous child. While women aged 20–24 may be more likely to have completed high school, they are also more likely to be single than women aged 25–39. For this study, education for the youngest age group was recoded to reflect whether or not they had completed the years of education appropriate for their age. This ‘age-appropriate education’ variable was created to reduce confounding between age and education as 25% of the sample was under age 19 and many were still in school.

This is an important public health problem because the prevalence of both unintended pregnancy and psychiatric disorders in pregnancy is high and each is associated with compromised birth outcomes as well as child-rearing challenges. If they are related, then new mothers with psychiatric disorders might be more likely than mentally healthy women, to be even more challenged by providing care for an infant whose birth was either unwanted or mistimed. This places a compound burden on the coping skills of an already emotionally burdened individual. In the extreme, such as the Andrea Yates and Paula Sims cases, an unintended birth may lead to loss of life. Prevalence of psychiatric disorders in women and the effects of disorders on the ability to care for children have only been studied in the last several decades of the 20th century with little understood about the effects of psychiatric symptoms on reproductive decision-making or the ability to act consistently to prevent pregnancy.

In this paper, we examined whether women with a psychiatric disorder have a higher prevalence of unintended pregnancy than women without psychiatric disorders. Secondary analysis considered the relationship of women’s contraceptive behaviors by developmental age group, stratified by developmental stage, examined the relationship between psychiatric disorder and unintended pregnancy controlling for significant maternal characteristics supported in the literature.

Methods

Data

Data for this secondary analysis was obtained from a prospective cohort investigation of prenatal mental health and its impact on birth outcomes, use of health care services and health services costs (Loveland Cook, Flick, Homan, Campbell, McSweeney, & Gallagher, 2004; Flick, Cook, Homan, McSweeney, Campbell, & Parnell, 2006). Approval for this study was granted by the Saint Louis University Institutional Review Board.

Participants

Subjects for the original study were 744 Medicaid-eligible pregnant women recruited from urban Women, Infants and Children's Supplemental Nutrition Program (WIC) sites in St. Louis City and five rural counties in southeastern Missouri. The sample was stratified by place of residence (urban/rural) and was representative by race (Black and White) of the WIC programs in each county. Subjects were between the age of 13 and 44 years and spoke English. Of the initial 877 eligible women approached for the study, 132 (15%) refused or were unavailable for the scheduled interviews, for a response rate of 85%. One subject with a physician diagnosis of bipolar disorder was unable to complete the interview due to confusion, leaving a final sample of 744. For the study reported here, we restricted the age range to women aged 15 to 39 years which excluded seven women (four < age 15 and three older than age 39) yielding a sample for analysis of 737.

Data collection/Study Variables

Participants were interviewed once during pregnancy by trained interviewers either in their homes or at the WIC site. Subjects varied in their gestation at the pregnancy interview.

Dependent variable

Unintended Pregnancy—Unintended pregnancy was assessed with the question, "Thinking back to just before you got pregnant, tell me which statement best describes how you felt about becoming pregnant", taken from the 1999 version of the Pregnancy Risk Assessment Monitoring System (PRAMS) survey, the same question used in the National Survey of Family Growth. Response categories included 1=I wanted to be pregnant sooner, 2=I wanted to be pregnant later, 3=I wanted to be pregnant then, 4=I didn't want to be pregnant then or at any time in the future, to 5=I don't know. This study used the single intention question to measure unintended pregnancies as the revised NSFG took place after the time period for data collection.

In this sample, 68 women (9.1%) did not know whether or not their pregnancy was unintended at the time they learned they were pregnant. Previous studies of unintended pregnancy have employed one of two strategies to deal with the category "I don't know" which has been equated with "unsure" (Cubbin et al., 2002; Poole, Klerman, Flowers, Goldenberg, & Cliver, 1997). The majority of studies created a dichotomous variable for intended versus unintended pregnancies and included those who responded as 'unsure' in the unintended category. Others created a dichotomous variable but removed the 'unsure' and treated them as missing while still others treated 'unsure' as a third category. In this study we used two coding strategies and compared the results. These included a) collapse the Don't Know (DK) cases (n=68) into the unintended group and b) recode the DK cases as missing.

Exposure variable

Psychiatric Disorder—Subjects were assessed for 24 current diagnoses using the Diagnostic Interview Schedule, Version IV (DIS-IV) (Robins, Cottler, Bucholz, Compton, North, & Rourke, 2003), which is based upon the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV), (APA, 1994). The DIS-IV, a well-known, lay-administered, standardized diagnostic interview, that assesses the presence of current and lifetime psychiatric diagnoses based upon symptom, severity, and duration criteria. Good to excellent reliability with the DIS-IV for most diagnoses (kappa .60 to .81) has been demonstrated by Horton and colleagues (Horton, Compton, & Cottler, 1998). In addition, validity has been demonstrated in comparing the DIS-IV to other diagnostic structured interview assessments (Dascalu, Compton, Horton, & Cottler, 2003), in comparing lay administered to psychiatrist administered versions (Leviton, Blouin, Navarro, & Hill, 1991),

and in comparing previous versions of DIS scoring to psychiatric clinical assessment of clinical populations (Leviton, Blouin, Navarro, & Hill, 1991), and the general population (Robins, Helzer, Croughan, & Ratcliff, 1981; Robins, Helzer, Ratcliff, & Seyfried, 1982).

Each of the 24 diagnoses was determined by applying the scoring program developed by the authors of the DIS-IV. These diagnoses included: generalized anxiety disorder, agoraphobia, panic disorder, social phobia, specific phobia, obsessive compulsive disorder, posttraumatic stress disorder (PTSD), major depressive disorder (MDD), dysthymia, bipolar I and II disorder, schizoaffective disorder, schizophrenia, schizophreniform, anorexia, bulimia, attention deficit hyperactivity disorder (ADHD), oppositional disorder, conduct disorder, antisocial personality disorder, nicotine dependence, alcohol abuse or dependence, and drug abuse or dependence. Because of concerns about power, individual psychiatric disorders were categorized into any affective disorder, any anxiety disorder, any substance disorder and any psychiatric disorder. These four variables were coded as 1=meeting criteria for at least one of the disorders in the category and 0=not meeting the criteria for any of the disorders in the category.

Covariates

Information on maternal age, education, marital status and contraceptive use were obtained from the mother at the pregnancy interview. Race was extracted from WIC records at the time of recruitment and place of residence determined by recruitment location, either City of St. Louis (urban) or Missouri Bootheel (rural).

Developmental age was categorized as adolescent (age 15–19), emerging adult (age 20–23), and adult (age 24–39). Education was recoded as 0=high school or more and 1=less than high school for the older two age groups. For the youngest age group, education was recoded to reflect whether or not they had completed the years of education appropriate for their age. Thus, an 18 year old should have 12 or more years of education, a 17 year old, 11 or more, a 16 year old, 10 or more and so on. This ‘age-appropriate education’ variable was created to reduce confounding between age and education as 25% of the sample was under age 19 and many were still in school. This variable was coded as 0=Yes and 1=No. Marital status was coded as ‘married’ or ‘not currently married’ which includes single, never married, divorced and widowed.

Birth control use—Because of the strong relationship between contraceptive use and unintended pregnancy, a birth control variable was incorporated into the analyses as a covariate. Women were asked at the pregnancy interview if they used birth control at the time of conception and data were coded as a dichotomous yes/no variable.

Analysis

The objective of this study was to determine if there is an association between psychiatric disorder and likelihood of unintended pregnancy. Analyses consisted of logistic regression modelling with all ages combined followed by use of the same modelling strategy for each of three developmental age strata. Post-stratification allowed for a different pattern of association by developmental stage. The SPSS version 14.0 (SPSS Inc., 2005) was used in conducting all analyses.

Bivariate logistic regression analyses were first conducted to estimate the unadjusted odds of having an unintended pregnancy given each of the sample characteristics and the presence or absence of each of the four grouped psychiatric disorder categories. Next, sixteen multiple logistic regression models were fitted, one for each of four psychiatric categories within each of the four age strata. These psychiatric disorder categories included “any current affective disorder”, “any current anxiety disorder”, any current substance disorder” and “any current

psychiatric disorder". Race was included as a covariate in all models since it was a sampling variable. Each of the other covariates (education, marital status, and birth control use) were added in turn, evaluated as potential confounders and retained in the model if the magnitude of the risk estimate for the psychiatric categories changed by $\geq 10\%$, and whether the precision of that estimate improved as indicated by a tighter confidence interval.

Results

Unintended Pregnancy

Pregnancy intention for the full sample of women (N=744) is presented in Table 1. When the "wanted to be pregnant later" and "did not want to be pregnant then or anytime in the future" categories were collapsed to create an unintended pregnancy category, as defined by the NSFG and PRAMS, over two-thirds (67.3%) of the sample reported their current pregnancy as unintended with over one-fifth (23.2%) reporting an intended pregnancy and 9.5% reporting they didn't know (DK). Only one model out of sixteen changed with the exclusion of the DK cases with the change falling to non-significance, thus it was concluded that exclusion of the DK cases did not substantially change the results and all final results and conclusions are based upon the inclusion of the 68 DK cases within the unintended pregnancy category.

Sample Characteristics

This low income sample had a mean age was 22.2 years with age ranging from 13 to 44. The sample was fairly evenly represented by race due to sample selection as shown in Table 2 with slightly more Black women (57.5%) than White women (42.5%). Almost forty-two percent (41.8%) had less than a high school education while another 48.4% had at least a high school education with a little over seven percent of these completing a GED. Over two-thirds (70.3%) of the women were not married at the time of the interview compared to a little over one-fifth (21.5%) who were currently married. Additionally, thirty-nine women (5.2%) were divorced, twenty-one (2.8%) were separated, and one woman (0.1%) was widowed. The sample was stratified by place of residence thus representation by geographic area was fairly even with 59.0% from the rural area of southeastern Missouri and 41.0% from the urban City of St. Louis. The median annual income reported on the WIC intake form, adjusted for a family size of four was \$8, 224 and the mean number of full-time months worked in the previous 12 months was 4.5 months.

Over half (57.8%) of the women in this sample, all of whom were pregnant when interviewed, had a previous live birth. Women were asked if they were using a method of contraception at the time of conception of their current pregnancy and almost three-fourths (72.2%) said they were not using any form of birth control. Subjects were interviewed at varying points in their pregnancy with most occurring in their second (43.8%) and third (36.3%) trimesters. Differences in the likelihood of reporting an unintended pregnancy by trimester of interview were examined and no significant differences were found (χ^2 (1, n=742) = 2.0, p=n.s).

Table 3 presents the sample characteristics by unintended pregnancy, with the "Don't Know" cases included in the unintended group (n=735). Women who reported their pregnancy as unintended were four times more likely to be unmarried (cOR 3.8, CI 2.6–5.6) than married and almost three times more likely to be Black rather than White (cOR 2.7, CI 1.9–3.9). Importantly, there were no differences by education, parity, rural or urban residence, birth control use or income within this low income sample. When the sample was stratified by age group, the youngest age group (age 15–19) was two and a half times more likely to have an unintended pregnancy (cOR 2.3, CI 1.5–3.7) when compared to the oldest group. The effect of education indicated that those with less than a high school education were at an increased risk for an unintended pregnancy (cOR 1.4, CI 1.0–2.0) while no association was indicated for

age-appropriate education (cOR 0.9, CI 0.6–1.3). Finally, when birth control use at conception was examined by unintended pregnancy, no difference was indicated between the two intention groups (cOR 1.3, CI 0.9–1.9).

Psychiatric disorders

Table 4 presents the unadjusted prevalence estimates for psychiatric disorder categories by unintended pregnancy for all ages combined and then stratified by age. No association was found between any category of psychiatric disorder and unintended pregnancy when all ages of women were combined. However, when stratified by age group, adolescent women (age 15–19) with a substance use disorder had less risk (cOR 0.2, CI 0.1–0.6) for having an unintended pregnancy than adolescent women without a substance use disorder. Secondly, women in the emerging adult group (age 20–23 years), with an anxiety disorder had less risk (cOR 0.4, CI 0.2–1.0) for having an unintended pregnancy compared to women without an anxiety disorder.

Multivariate regression models

The logistic regression analyses regressing psychiatric disorder categories on unintended pregnancy for each age group, adjusting for the stratified sampling by race and including the retained confounder, marital status, are presented in Table 5. When all ages were combined, no psychiatric disorder category was associated with likelihood of having an unintended pregnancy. However, when stratified by age, having a substance disorder was associated with a *decreased* likelihood of having an unintended pregnancy for the adolescent group (age 15–19) (aOR 0.3, CI 0.1–0.7). Moreover, having an anxiety disorder was associated with a *decreased* likelihood of having an unintended pregnancy for the emerging adult group (age 20–23) (aOR 0.4, CI 0.2–1.0).

Education as either age-appropriate for ages (15–9) or high school diploma or less than high school for the two older age groups were entered as covariates in each of the sixteen models while adjusting for race. When either education variable was entered in the model, it did not affect the OR of any age strata by psychiatric disorder model, thus was not retained as a confounder for any model. Marital status was then entered as a covariate in the combined age group and the two older age strata and was retained as a confounder for the substance use disorder model when all ages were combined and the older adult age model. Marital status was also retained as a confounder for the affective disorder category in the emerging adult and older adult models.

Race was significantly associated with the likelihood of having an unintended pregnancy in all sixteen models. When all ages of women were considered, Black women compared to White women were 2–3 times more likely to have an unintended pregnancy after adjusting for any affective disorder (aOR 2.7, CI 1.9–3.9), any anxiety disorder (aOR 2.8, CI 1.9–3.9), any substance disorder (aOR 2.0, CI 1.4–2.9) and any psychiatric disorder (aOR 2.7, CI 1.9–3.9). Further, Black women have a 2–3 times greater likelihood of reporting their pregnancy was unintended over and above the effects of any of the psychiatric disorder variables entered and over and above the effect of marital status. Black adolescents were three times more likely to have an unintended pregnancy compared to White adolescents after adjusting for affective disorder, anxiety disorder, substance use disorder or any disorder with an aOR between 2.9 (CI 1.4–6.1) and 3.1 (CI 1.5–6.6). The Black emerging adult woman was two times more likely to have an unintended pregnancy after adjusting for anxiety disorder, substance disorder or any disorder at an aOR of 2.0 (CI 1.1–3.4). Older adult Black women were three and one-half times more likely to have an unintended pregnancy compared to White older women after adjusting for affective disorder, anxiety disorder, substance disorder and any disorder with the range of aORs between 3.3 (CI 1.7–6.3) and 4.1 (CI 2.2–7.8).

In several of the psychiatric disorder models, being unmarried contributed to higher likelihoods of having an unintended pregnancy. For all ages combined, unmarried women were three times more likely to have an unintended pregnancy compared to married women when adjusting for race and having a substance disorder (aOR 3.0, CI 2.0–4.5). When stratified by age group, the unmarried emerging adult woman (ages 20–23) was almost two and a half times more likely to have an unintended pregnancy compared to married women when adjusting for race and having an affective disorder (aOR 2.3, CI 1.2–4.5). Further, the unmarried older adult woman (ages 24–39), was more than two times more likely to have an unintended pregnancy compared to married women when adjusting for having either an affective disorder (aOR 2.1, CI 1.1–4.1) or having a substance disorder (aOR 2.2, CI 1.1–4.3).

Discussion

In this sample of low-income women, prevalence of psychiatric disorders (30.9%) was similar to the national prevalence of 30% for all adults (Loveland Cook, Flick, Homan, Campbell, McSweeney, & Gallagher, 2008). The prevalence of unintended pregnancy, however, was much higher than the national prevalence of 49%, with over two-thirds (67.3%) of this sample reporting an unintended pregnancy. An association was found between type of psychiatric disorder and likelihood of having an unintended pregnancy when sorted by developmental age, where adolescents with substance use disorders and emerging adult women with anxiety disorders were found to have a decreased likelihood for an unintended pregnancy when compared to those with no disorder.

When examined across the entire sample, the single most prevalent disorder within the substance use disorder category was nicotine dependence, with an overall prevalence of 8.3% (n=62). Among the adolescent age group, of those with nicotine dependence, 40% intended to become pregnant. This is an unusual finding and there is some evidence to suggest that adolescent teens who smoke, may also engage in other risky or unconventional behaviors including drinking alcohol and unprotected sex (Donovan, Jessor, & Costa, 1988; Boyles, 2007). While this suggests a greater likelihood of an unintended pregnancy, unconventional behaviors may also include wanting a child at a young age or not using birth control effectively. Although some research has examined the relationship of depression, smoking, and anxiety among adolescent teens, (Feltz, 2007) little to no research has examined a relationship between adolescent smoking and intention to become pregnant.

Emerging adult women with anxiety disorders were also more likely to have an intended pregnancy. Post-traumatic stress disorder (PTSD) was the most prevalent individual diagnosis within the anxiety disorder group. When PTSD was examined in bivariate analyses, women with PTSD were more likely to report their pregnancy as *intended*. Women who experience PTSD symptoms are at a much higher risk of abusing drugs and alcohol in response to associated depression, or in an effort to free themselves of symptoms of re-living their trauma and sleep disturbance (Ullman, Filipa, Townsend, & Starzynski, 2005; Ullman, Filipa, Townsend, & Starzynski, 2006). Drug and alcohol abuse may contribute to delusional ideation and decreased focused on family planning methods. Becoming pregnant may also be seen by those with psychiatric disorders as a way to improve how they feel about themselves. One study in which chronically institutionalized schizophrenic women were interviewed in a qualitative study found that 14 out of 23 wanted to become pregnant (McEvoy, Hatcher, Appelbaum, & Abernathy, 1983). No research was found on women with anxiety disorders wanting to be pregnant.

Unlike earlier studies, this study did not find a link between mental health and unintended pregnancy. Three of those earlier studies found that women with depression were more likely to have an unintended pregnancy (Cartwright, 1988; Reardon & Cougle, 2002; Schmeige &

Russo, 2005), while one found no association between depression and unintended pregnancy (Ullman et al., 2006). The difference in findings could be attributed to two methodological issues. The study reported here was based upon a diagnostic measure (DIS-IV) that relies on full diagnostic criteria as opposed to the use of measures limited to symptom counts. In addition, this study applied multivariable methods to control for confounding from sample characteristics that cannot be controlled in an observational design. Studies examining clinical samples of women report inconsistent results about unintended pregnancies. For example, one study (Burr, Falek, Strauss, & Brown, 1979), found no difference in the prevalence of unintended pregnancy in either outpatient or inpatient women with schizophrenia when compared to non-ill women in the general population, while another study (Miller & Finnerty, 1996), found that women with schizophrenia were more likely to have unintended pregnancies compared to women without any psychiatric disorder. A qualitative study conducted by McEvoy and colleagues (1983), reported that 14 out of 23 women with schizophrenia *wanted* to be pregnant (McEvoy et al., 1983). Differences between these findings and those reported in this study could be attributed to sample characteristic differences, such as a community-based versus a clinical sample.

While not a focus of this study, an important question to consider is the mental health utilization of low-income pregnant women. The sample for the initial study was drawn from pregnant women attending WIC clinics in both urban and rural settings. Research to date on treatment of psychiatric disorders in pregnant women (Kelly, Zatzick, Anders, 2001, Marcus et al, 2003) indicates that a relatively high number of women are not receiving treatment. When research has specifically examined treatment of psychiatric disorders in low-income women (Cavaleri, 2005) a larger number of women do not attend treatment and cite significant barriers in receiving care. These barriers include both environmental and attitudinal barriers including increased age, lack of insurance, a prior diagnostic history, having only a high school diploma and not having engaged in treatment in the past. Conversely, it has been suggested that white, poor women are more likely to seek mental health treatment compared to other low income minority groups (Rosen et al 2006). Little research has examined mental health utilization of low-income, pregnant women on Medicaid.

The implications for policy are complex. First and foremost would be the need to fund specific studies to examine the mental health utilization of low-income women who receive some form of government-assisted medical care. These studies will need to examine barriers to receiving care from an ecological perspective (Bronfenbrenner, 1979) that includes individual as well as system-level barriers. The Surgeon General's Mental Health Report of 1999 and its supplement, *Mental Health: Culture, Race and Ethnicity* states that "evidence suggests that in clinical practice settings, minorities are less likely than whites to receive treatment that adheres to treatment guidelines" (DHHS, 1999, Lehman & Steinwachs, 1998; Sclar et al., 1999; Blazer et al., 2000; Young et al., 2001). This report recommended that existing treatment guidelines should be applied to all people with mental disorders, regardless of ethnicity or race. However, these treatments need to be tailored and delivered appropriately for individuals according to age, gender, race, ethnicity, and culture to be effective (DHHS, 1999).

In her weathering hypothesis, Geronimus has theorized that some of the differential treatment services are at least in part due to generational exposure to institutionalized levels of racism (Geronimus, 2001) while Dr. Camara Jones has suggested that there are three levels of racism (institutionalized, personalized and internalized) that continue to be evidenced in the racial disparities in health that we see in the US (Jones, 2000). While these are suggested theories, future examination of mental health treatment of low-income pregnant women should consider the perceived and real impact of racism on health-seeking behaviors. Finally, it is important that we continue to examine our social policies in light of increasing levels of evidence on what is the best approach to the provision of mental health care to impoverished women. If this care

is provided in ways that are culturally relevant and can address the more complex individual and system-level barriers, we would advance the field of mental health treatment both effectively and efficaciously.

Strengths and Limitations

This was the first known study to examine psychiatric disorders using a structured diagnostic interview and unintended pregnancy in a large sample of impoverished pregnant women from the general population with nearly equal representation of Black and White women from urban and rural areas. The study also allowed stratification by developmental age of the women. Despite these advantages, the findings in this study are based on secondary data analyses with the challenge of fitting theoretical and answerable research questions to data that was not collected for the specific purposes of the study. For example, contraceptive use, an important issue in the study of unintended pregnancy, was briefly addressed in the original study. Women responded with either yes or no to the question, 'did you use birth control', whereas information on type of birth control and the effectiveness of its use would have added important information in this study.

Another limitation was asking the question about intendedness only once and not asking at a consistent time in the pregnancy. There is evidence to suggest that if women are asked about their intention about conception before they know they are pregnant and then later on in the same pregnancy, many will change how they report that pregnancy (Besculides & Laraque, 2004). The sample for this current study had an unusually high prevalence of unintended pregnancy which may have been reduced (or increased) if the question had been asked at two different time points or even at the same point in pregnancy for all mothers.

No literature to date has published reliability for the question on unintended pregnancy used in this study, and in fact, this question as defined by the NSFG has been under scrutiny in recent years as it is believed that this single-item question does not adequately address the factors that may influence how a woman perceives her pregnancy (Trussell et al., 1999; Santelli, Rochat, Hatfield-Timajchy, Gilbert, Cabral, Hirsch, et al., 2003; Sable & Libbus, 2000). As a result of these recent examinations, the NSFG now includes questions on attitudes toward being pregnant, such as ambivalence and whether or not the woman is happy about her pregnancy.

This was a relatively large sample of low-income, pregnant women (N=744) with a large proportion meeting criteria for a current 12-month psychiatric disorder (30.9%), however, the statistical analysis strategies were limited due to the need for post-stratification by age. The post-stratification analysis was an important methodological strategy due to hypothesized differences by reproductive age. As this sample included women who were already pregnant, women who might have reported an unintended pregnancy and who had an abortion are not included. It has been reported that women with psychiatric illness are more likely to seek abortion to end an unwanted pregnancy and these women are excluded from this sample. Had they been included, our results may have been different.

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Table 1

Frequency Distribution of Pregnancy Intention (N=744)

Response Categories	Intended n (%)	Unintended n (%)	Don't Know n (%)	Missing n (%)	Total n (%)
Wanted to be Pregnant Sooner	71 (9.5)				71 (9.5)
Wanted to be Pregnant Later		309 (41.5)			309 (41.5)
Wanted to be Pregnant Then	102 (13.7)				102 (13.7)
Did Not Want to Be Pregnant Then or Anytime in the Future		192 (25.8)			192 (25.8)
Did Not Know If Wanted to Be Pregnant			68 (9.1)		68 (9.1)
Missing				2 (0.3)	2 (0.3)
TOTAL	173 (23.2)	501 (67.3)	68 (9.1)	2 (0.3)	744 (100)

Table 2

Sociodemographic Characteristics of Sample (N = 744)

Characteristic	n	Percent
<u>Race</u>		
African American	428	57.5%
Caucasian	316	42.5%
<u>Education</u> ¹		
Less than High School	311	41.8%
High School Graduate	360	48.4%
Vocational or Some College	58	7.8%
Bachelor's Degree	8	1.1%
Graduate Degree	7	0.9%
<u>Age-appropriate Education</u>		
No	427	57.4%
Yes	312	41.9%
Missing	5	-----
<u>Marital Status</u>		
Never Married	523	70.3%
Married	160	21.5%
Separated	21	2.8%
Divorced	39	5.2%
Widowed	1	0.1%
<u>Residence</u>		
Rural	439	59.0%
Urban	305	41.0%
<u>Other Previous Live Birth (Yes)</u>	428	57.8%
<u>Birth Control Use at Conception</u>		
No	532	72.2%
Yes	205	27.8%
Missing	7	-----
<u>Income</u> ² <median of 8,224)	364	49.9%
Missing	15	-----
	<u>Mean+ SD</u>	<u>Median</u>
Education in Years	11.34±1.8	12.0
Age in Years	22.2±5.2	21.0
Months Full-Time Work ³ in Last 12 Months	4.5±4.5	3.0

¹ Highest level achieved, GED is coded as high school graduate² Income adjusted for a family of four³ Full-time work is equal to 35 hours or more per week

Table 3

Prevalence and Crude Odds Ratios (with 95% CIs) of Sample Characteristics by Intended and Unintended Pregnancy (N=735)^{1,2}

Characteristics	Intended n (%)	Unintended n (%) cOR	95% C.I.
Age ³			
15–19	36 (21.0)	214 (37.9) 2.3	1.5, 3.7
20–23	73 (42.7)	193 (34.3) 1.0	0.7, 1.6
24–39	62 (36.3)	157 (27.8) 1.0	
Race			
Black	66 (38.6)	356 (63.1) 2.7	1.9, 3.9
White	105 (61.4)	208 (36.9) 1.0	
Education			
< H.S.	60 (35.1)	246 (43.6) 1.4	1.0, 2.0
H.S. or more	111 (64.9)	318 (56.4) 1.0	
Age-appropriate Education ⁴			
No	101 (59.4)	319 (57.0) 0.9	0.6, 1.3
Yes	69 (40.6)	241 (43.0) 1.0	
Marital status ⁵			
Not married	100 (58.5)	476 (84.4) 3.8	2.6, 5.6
Married	71 (41.5)	88 (15.6) 1.0	
Residence			
Rural	102 (59.0)	336 (59.0) 1.0	0.7, 1.4
Urban	71 (41.0)	233 (41.0) 1.0	
Other Previous Live Birth			
Yes	106 (62.0)	318 (56.7) 1.2	0.9, 1.8
No	65 (38.0)	243 (43.3) 1.0	
Birth Control Use at Conception			
No	117 (68.4)	409 (73.4) 1.3	0.9, 1.9
Yes	54 (31.6)	148 (26.6) 1.0	
Income			
<Median of \$8,224	74 (44.0)	284 (51.4) 0.7	0.5, 1.1
Median of \$8,224 or more	94 (56.0)	268 (48.6) 1.0	

¹ Total sample reduced to 735 due to deletion of 7 cases outside age range of 15–39 and 2 missing cases.

² Don't Know Cases Included in the Unintended Category

³ <15 (n=4) and >39 (n=3) recoded to missing

⁴ No=education not appropriate for age

⁵ Not married includes: widowed, separated, divorced, never married

Table 4Current psychiatric disorders in past 12 months by age groups by pregnancy intention ^{1,2}

	Intended (n=171) n(%)	Unintended (n=564) n(%)	cOR	95% C.I.
<u>All Ages 15–39 (n=735)</u>				
<u>Any Affective Disorder</u>				
Any Affective	29 (17.0)	70 (12.4)	0.7	(0.4, 1.1)
Other Disorder, not Affective	28 (16.4)	101 (17.9)	1.1	(0.7, 1.8)
No Disorder	114 (66.7)	393 (69.7)	1.0	
<u>Any Anxiety Disorder</u>				
Any Anxiety	26 (15.2)	70 (12.4)	0.8	(0.5, 1.3)
Other Disorder, not Anxiety	32 (18.7)	101 (17.9)	0.9	(0.6, 1.5)
No Disorder	113 (66.1)	393 (69.7)	1.0	
<u>Any Substance Disorder</u>				
Any Substance Disorder	23 (13.5)	56 (9.9)	0.7	(0.4, 1.2)
Other Disorder, not Substance Disorder	34 (19.9)	115 (20.4)	1.0	(0.7, 1.6)
No Disorder	114 (66.7)	393 (69.7)	1.0	
<u>Any Current Psychiatric Disorder</u>				
Any Disorder	57 (33.3)	171 (30.3)	0.9	(0.5, 1.3)
No Disorder	114 (66.7)	393 (69.7)	1.0	
<u>Ages 15–19 (n=251)</u>				
<u>Any Affective Disorder</u>				
Any Affective	5 (13.9)	27 (12.6)	0.9	(0.3, 2.5)
Other Disorder, not Affective	9 (25.0)	46 (21.5)	0.8	(0.4, 1.9)
No Disorder	22 (61.1)	141 (65.9)	1.0	
<u>Any Anxiety Disorder</u>				
Any Anxiety	5 (13.9)	35 (16.4)	1.2	(0.4, 3.3)
Other Disorder, not Anxiety	9 (25.0)	38 (17.8)	0.6	(0.3, 1.5)
No Disorder	22 (61.1)	141 (65.9)	1.0	
<u>Any Substance Disorder</u>				
Any Substance Disorder	9 (25.0)	16 (7.5)	0.2*	(0.1, 0.6)
Other Disorder, not Substance Disorder	5 (13.9)	57 (26.6)	2.3	(0.8, 6.1)
No Disorder	22 (61.1)	141 (65.9)	1.0	
<u>Any Current Psychiatric Disorder</u>				
Any Disorder	14 (38.9)	73 (34.1)	0.8	(0.4, 1.7)
No Disorder	22 (61.1)	141 (65.5)	1.0	
<u>All Ages 20–23 (n=267)</u>				
<u>Any Affective Disorder</u>				
Any Affective	12 (16.4)	21 (10.9)	0.6	(0.3, 1.3)
Other Disorder, not Affective	12 (16.4)	26 (13.5)	0.8	(0.4, 1.7)
No Disorder	49 (67.1)	146 (75.6)	1.0	
<u>Any Anxiety Disorder</u>				
Any Anxiety	12 (16.4)	15 (7.8)	0.4*	(0.2, 1.0)
Other Disorder, not Anxiety	12 (16.4)	32 (16.6)	1.0	(0.4, 2.1)
No Disorder	49 (67.1)	146 (75.6)	1.0	
<u>Any Substance Disorder</u>				
Any Substance Disorder	9 (12.3)	16 (8.3)	0.6	(0.3, 1.5)
Other Disorder, not Substance Disorder	15 (20.5)	31 (16.1)	0.7	(0.4, 1.5)
No Disorder	49 (67.1)	146 (75.6)	1.0	
<u>Any Current Psychiatric Disorder</u>				
Any Disorder	24 (32.9)	47 (24.4)	0.7	(0.4, 1.2)
No Disorder	49 (67.1)	146 (75.6)	1.0	
<u>Ages 24–39 (n=219)</u>				
<u>Any Affective Disorder</u>				
Any Affective	12 (19.4)	22 (14.0)	0.7	(0.3, 1.5)
Other Disorder, not Affective	7 (11.3)	29 (18.5)	1.8	(0.7, 4.3)
No Disorder	43 (69.4)	106 (67.5)	1.0	
<u>Any Anxiety Disorder</u>				
Any Anxiety	9 (14.5)	20 (12.7)	0.9	(0.4, 2.0)
Other Disorder, not Anxiety	11 (17.7)	31 (19.7)	1.1	(0.5, 2.4)
No Disorder	42 (67.7)	106 (67.5)	1.0	
<u>Any Substance Disorder</u>				
Any Substance Disorder	5 (8.1)	24 (15.3)	2.1	(0.7, 5.7)
Other Disorder, not Substance Disorder	14 (22.6)	27 (17.2)	0.7	(0.3, 1.5)
No Disorder	43 (69.4)	106 (67.5)	1.0	
<u>Any Current Psychiatric Disorder</u>				
Any Disorder	19 (30.6)	51 (32.5)	1.1	(0.6, 2.1)

	Intended (n=171) n(%)	Unintended (n=564) n(%)	cOR	95% C.I.
No Disorder	43 (69.4)	106 (67.5)	1.0	

¹Total sample reduced to 735 due to deletion of 7 cases outside age range (15–39) and 2 missing cases.

²Don't Know cases are included in the Unintended Group

*
p<.01

Table 5

Unintended Pregnancy by Psychiatric Disorders by Age Group, Adjusting for Race and Including Confounders Meeting Criteria (N=744)^{1,2}

Psychiatric Disorder Model Variables	All Ages Final Model n=735 aOR (95% CI)	Age 15–19 Final Model n=250 aOR (95% CI)	Age 20–23 Final Model n=266 aOR (95% CI)	Age 24–39 Final Model n=219 aOR (95% CI)
Any Current Affective Disorder				
Affective disorder	0.7 (0.4, 1.2)	0.8 (0.3, 2.4)	0.7 (0.3, 1.5)	0.6 (0.3, 1.4)
Any other disorder	1.1 (0.7, 1.8)	0.9 (0.4, 2.0)	0.8 (0.4, 1.7)	1.8 (0.7, 4.6)
No disorder	1.0	1.0	1.0	1.0
Race				
Black	2.7 (1.9, 3.9)	3.0 (1.4, 6.2)	1.4 (0.8, 2.6)	3.4 (1.8, 6.4)
White	1.0	1.0	1.0	1.0
Marital status				
Not married			2.3 (1.2, 4.5)	2.1 (1.1, 4.1)
Married			1.0	1.0
Any Current Anxiety Disorder				
Anxiety disorder	0.7 (0.4, 1.2)	1.1 (0.4, 3.2)	0.4 (0.2, 1.0)	0.6 (0.3, 1.6)
Any other disorder	1.0 (0.6, 1.6)	0.7 (0.3, 1.7)	1.0 (0.5, 2.0)	1.2 (0.5, 2.8)
No disorder	1.0	1.0	1.0	1.0
Race				
Black	2.8 (1.9, 3.9)	2.9 (1.4, 6.1)	2.0 (1.2, 3.5)	4.1 (2.2, 7.8)
White	1.0	1.0	1.0	1.0
Any Current Substance disorder				
Substance disorder	0.8 (0.4, 1.3)	0.3 (0.1, 0.7)	0.7 (0.3, 1.6)	2.1 (0.7, 6.3)
Any other disorder	0.9 (0.6, 1.4)	1.9 (0.7, 5.3)	0.7 (0.4, 1.5)	0.6 (0.3, 1.4)
No disorder	1.0	1.0	1.0	1.0
Race				
Black	2.0 (1.4, 2.9)	3.1 (1.5, 6.6)	2.0 (1.1, 3.4)	3.3 (1.7, 6.3)
White	1.0	1.0	1.0	1.0
Marital status				
Not married	3.0 (2.0, 4.5)			2.2 (1.1, 4.3)
Married	1.0			1.0
Any Current Psychiatric Disorder				
Any current psychiatric disorder	0.9 (0.6, 1.3)	0.8 (0.4, 1.8)	0.7 (0.4, 1.3)	1.0 (0.5, 2.0)
No disorder	1.0	1.0	1.0	1.0
Race				
Black	2.7 (1.9, 3.9)	3.0 (1.4, 6.2)	2.0 (1.1, 3.4)	3.8 (2.1, 7.1)
White	1.0	1.0	1.0	1.0

Note: Only variables retained in the final models are included.

¹Total sample of 744 reduced to n=735 due to deletion of 7 cases outside of the age range 15–39 and 2 missing cases.

²Don't Know cases are included in the Unintended Group