



The risk of unintended pregnancy among young women with mental health symptoms

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ABSTRACT

Depression and stress have been linked with poor contraceptive behavior, but whether existing mental health symptoms influence women's subsequent risk of unintended pregnancy is unclear. We prospectively examined the effect of depression and stress symptoms on young women's pregnancy risk over one year. We used panel data from a longitudinal study of 992 U.S. women ages 18–20 years who reported a strong desire to avoid pregnancy. Weekly journal surveys measured relationship, contraceptive use and pregnancy outcomes. We examined 27,572 journal surveys from 940 women over the first study year. Our outcome was self-reported pregnancy. At baseline, we assessed moderate/severe depression (CESD-5) and stress (PSS-4) symptoms. We estimated the effect of baseline mental health symptoms on pregnancy risk with discrete-time, mixed-effects, proportional hazard models using logistic regression. At baseline, 24% and 23% of women reported moderate/severe depression and stress symptoms, respectively. Ten percent of young women not intending pregnancy became pregnant during the study. Rates of pregnancy were higher among women with baseline depression (14% versus 9%, $p = 0.04$) and stress (15% versus 9%, $p = 0.03$) compared to women without symptoms. In multivariable models, the risk of pregnancy was 1.6 times higher among women with stress symptoms compared to those without stress (aRR 1.6, CI 1.1,2.7). Women with co-occurring stress and depression symptoms had over twice the risk of pregnancy (aRR 2.1, CI 1.1,3.8) compared to those without symptoms. Among women without a prior pregnancy, having co-occurring stress and depression symptoms was the strongest predictor of subsequent pregnancy (aRR 2.3, CI 1.2,4.3), while stress alone was the strongest predictor among women with a prior pregnancy (aRR 3.0, CI 1.1,8.8). Depression symptoms were not independently associated with young women's pregnancy risk. In conclusion, stress, and especially co-occurring stress and depression symptoms, consistently and adversely influenced these young women's risk of unintended pregnancy over one year.

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Introduction

Unintended pregnancy among young women has been attributed to many diverse demographic, social, and cognitive behavioral factors. Young age, low educational attainment, low income, minority race/ethnicity, disrupted childhood family situation, having a mother who had a teenage pregnancy, earlier age at coitarche, more sexual partners, ambivalent pregnancy desire, lack of contraceptive knowledge, misperceptions of side effects, and low self-efficacy are just a few examples of the many factors shown to predict poor

contraceptive behavior and unintended pregnancy among young women (Finer & Henshaw, 2006; Frost & Darroch, 2008; Rosenberg, Waugh, & Long, 1995). While this research has isolated specific risk factors for unintended pregnancy, studies have often failed to account for the interrelatedness of different dimensions of young women's lives. Notably, the impact of mental health on young women's risk of adverse family planning outcomes has seldom been the focus of rigorous study (Chen, Stiffman, Cheng, & Dore, 1997; Farr, Bitsko, Hayes, & Dietz, 2010; Hall, 2011).

Among the most common mental health problems worldwide, depression, anxiety, and related psychological stress disproportionately impact young and socially disadvantaged women (APA, 2000; NIMH, 2012; USDHHS, 2001). These conditions, which are

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highly comorbid, are a significant burden to society and contribute to negative biopsychosocial outcomes and reproductive sequelae, including maternal and infant morbidity and mortality (Alder, Fink, Bitzer, Hosli, & Holzgreve, 2007; APA, 2000; Kelly et al., 2002; NIMH, 2012; USDHHS, 2001; Williams, Marsh, & Rasgon, 2007).

A considerable body of research has linked mental health symptomatology with risky sexual experiences. Depression and stress symptoms have been associated with having more sexual partners, earlier coitarche, higher sexually transmitted infections (STI) rates, sex while under the influence of alcohol and drugs, non-consensual sex and intimate partner violence (Brooks, Harris, Thrall, & Woods, 2002; Chen et al., 1997; Lehrer, Shrier, Gortmaker, & Buka, 2006; Silverman, Raj, Mucci, & Hathaway, 2001).

More recent studies, using mostly clinic-based samples, have begun to identify associations between women's mental health status and risky contraceptive behaviors, including contraceptive nonuse, misuse, discontinuation, and less effective method use (Bennett, Culhane, McColuum, & Elo, 2006; Farr et al., 2010; Garbers, Correa, Tobier, Blust, & Chiasson, 2010; Hall, Moreau, Trussell, & Barber, 2013a, 2013b; Hall, Reame, O'Connell, Rickert, & Weshoff, 2012; Ko, Farr, Dietz, & Robbins, 2012; Lee, Casanueva, & Martin, 2005; Zink, Shireman, Ho, & Buchanan, 2002). In a study of 354 young minority urban family planning patients, Hall and colleagues found an association between elevated baseline depression and stress symptoms and 6-month oral contraceptive discontinuation rates. Using clinical data from 2476 urban, predominantly Black and Latina women, Garbers and colleagues found that women who screened positive for depression had 45% higher odds of selecting condoms and 39% lower odds of selecting hormonal methods at their clinic visit compared to women without depressive symptoms. Similarly, Farr and colleagues used cross-sectional national data from 53,255 women ages 18 and older in the Behavioral Risk Factor Surveillance System and found that low-income women with frequent mental distress had a reduced likelihood of using long-acting/hormonal methods (OR 0.5) and condoms (OR 0.6) than other less effective methods.

Given that inadequate contraceptive use accounts for 90% of the estimated 3.2 million annual U.S. unintended pregnancies, contraceptive (and sexual risk) behavior is indeed a primary mediating factor of unintended pregnancy (Finer & Henshaw, 2006; Kost, Singh, Vaughan, Trussell, & Bankole, 2008; Trussell & Vaughn, 1999). Thus, research describing a link between mental health symptoms and family planning behaviors has been an important scientific contribution, one that appears to have theoretical validity. Within a cognitive behavioral framework, mental health symptoms may interfere with a woman's cognitive capacities for decision-making, including risk assessment, planning, and social learning, as well as influence or distort their perceptions of benefits and threats of a preventive health therapy like contraception and their perceived susceptibility to an outcome like pregnancy (Hall, 2011; Maner & Schmidt, 2006; Yuen & Lee, 2003). While this has not been directly tested to our knowledge, it is reasonable to hypothesize that symptoms of depression or stress, such as decreased motivation or distraction, could impair a woman's ability to use certain methods correctly (e.g. contraceptive pills) or to make suboptimal contraceptive choices (e.g. condom non-use or method discontinuation), for example.

A potentially more important question, though, is whether the influence of depression and stress symptoms on contraceptive use translates to an actual effect on women's risk of unintended pregnancy. The majority of studies focused on mental health and reproduction have described the prevalence, correlates, and treatment of perinatal and postpartum depression among women who have already experienced an unintended pregnancy (Alder et al.,

2007; Dennis, Ross, & Grigoriadis, 2007; Flynn, Walton, Chermack, Cunningham, & Marcus, 2007; Grote et al., 2010; Vesga-Lopez et al., 2008). Other studies that have examined associations between mental health and unintended pregnancy (and related outcomes like abortion) have encountered temporality problems inherent in cross-sectional datasets and retrospective designs (Ko et al., 2012; Steinberg, Trussell, Hall, & Guthrie, 2012; Tenkku et al., 2009). One analysis of data from pregnant Japanese women in a birth cohort study found that women who had been diagnosed with depression were more likely to report that their current pregnancy was mistimed compared to those without depression; women with an anxiety diagnosis were more likely to report that their pregnancy as unwanted (Takahashi et al., 2012). Another study of 5877 respondents aged 15–54 years in the National Comorbidity Survey found that men and women who reported having an early onset psychiatric disorder had a higher cumulative probability of also having experienced a teenage childbirth compared to those without a psychiatric history (Kessler et al., 1997). So, even some research that has attempted to account for temporal ordering of mental health diagnoses and pregnancy outcomes has been limited by historical data and retrospective reporting (Kessler et al., 1997; Takahashi et al., 2012).

Moreover, even less is known about unintended pregnancy and the influence of psychological stress, which is prevalent among young women and commonly co-occurs with depression and anxiety. As a distinct condition, stress has been defined as an emotional, psychological, behavioral or physiological response (and a subjective appraisal of this response) to situational demands (Larzelere & Jones, 2008; Selye, 1956). Stress is increasingly recognized as an important and independent contributor to morbidity (APA, 2013; Larzelere & Jones, 2008), including reproductive sequelae like preterm birth (Hogue et al., 2013). However, the distinct effect that stress may have on young women's risk of unintended pregnancy, as well as the effect of co-occurring stress and depression symptoms, has not been studied.

We sought to prospectively estimate the influence of baseline depression and stress symptoms on women's risk of unintended pregnancy over one year. We hypothesized that the proportion of women who experienced a new pregnancy would be higher among women with elevated mental health symptoms at baseline than those without symptoms. We also hypothesized that after taking into account confounding effects of women's sociodemographic characteristics and reproductive histories, the risk of pregnancy would be higher among women with mental health symptoms than those without symptoms. Finally, we hypothesized that both depression and stress would exhibit similar but independent adverse effects on women's pregnancy risk.

Materials and methods

Sample and design

In other reports on young women's contraceptive behavior (Hall et al., 2013a, 2013b), we previously described the study sample and design. Briefly, we used data from a representative population-based cohort study of 992 young women aged 18–20 years residing in a racial/ethnically and socioeconomically diverse Michigan county. Names and contact information were randomly selected from state driver's license and personal identification card registries. Eligible women (ages 18–20 and a county resident) were contacted by mail or phone and asked to participate. Sampling occurred between March 2008 and March 2009. The Institutional Review Board of the University of Michigan approved this study.

After informed consent, a trained research assistant conducted a 60-min in-person baseline survey interview to elicit information on

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