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Stress, discrimination and risk of repeat pregnancy in adolescent parents

Master's Thesis

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ABSTRACT

Objective

Adolescent mothers are at high risk of repeat pregnancy and repeat birth with short birth intervals. Perceived stress is known to affect young women's use of contraception, and therefore risk of unintended pregnancy. The primary aim of the study was to examine how stress, stressful life events, discrimination and economic hardship affect adolescent mothers' risk for repeat pregnancy. Secondary aims included examining if the association between stress and repeat pregnancy was mediated by contraception use, if the stress experienced by the mother's partner was associated with risk of pregnancy and if the association between stress and repeat pregnancy was mediated by social support and family functioning.

Methods

Data was obtained from a subset of participants from a longitudinal study of pregnant adolescent females and their partners. Couples completed individual structured interviews via audio computer-assisted self-interview (ACASI) during pregnancy and at six and twelve months postpartum. The association between the predictors and repeat pregnancy was examined using logistic regression.

Results

Stressful life events (OR: 1.52, 95% CI: 1.13, 2.03) and discrimination (OR: 2.35, 95% CI: 1.16, 4.76) were associated with greater risk of repeat pregnancy. Contraception use did not mediate the association between the predictors and repeat pregnancy.

Conclusions

The results of this study suggest that adolescent mothers that experience mental distress, and specifically stressful life events and discrimination, are at a greater risk of repeat pregnancy. The results support the need for postpartum services that address the physical health as well as the mental health of adolescent mothers to help them avoid a repeat pregnancy.

Introduction

Adolescent parents are at a higher risk of adverse physiological and psychological health outcomes than older parents [1] while their children are at a higher risk for negative health outcomes throughout their childhood [2]. Furthermore, adolescents who have already become pregnant are at a high risk of a repeat pregnancy; 18% of births to females age 15-19 are repeat pregnancies [3]. Most adolescent mothers who experience a repeat pregnancy report that the pregnancy was unplanned [4]. Women aged 15-19 are more likely to experience a pregnancy within 18 months of a prior pregnancy than mothers in other age groups [5]. Short birth intervals (less than 18 months) are associated with low birth weight and preterm birth, as well as neonatal and infant mortality [6]. The risk for adverse birth outcomes is even greater when the inter-pregnancy interval is less than 6 months.

Previous research has addressed factors that contribute to contraceptive use in adolescents, including length of relationship, intimate partner violence and partner communication [7] [8]. However, studies identifying risk factors for rapid repeat pregnancy have largely considered demographic factors such as age, race and marital status of the mother [9]. While more effective methods of contraception, such as the sub-dermal implant and intrauterine devices are shown to reduce instances of repeat pregnancies in adolescents, only 22% of adolescent parents choose a method of contraception that is considered highly effective [3]. Adolescents are known to change their contraceptive use patterns during the postpartum period [10], and identifying the specific factors that affect contraception use could help to reduce rates of rapid repeat pregnancy.

Managing parenting responsibilities and relationship roles as an adolescent can be challenging. Adolescent parents, who may experience a number of stressful challenges, particularly if they are from a low-income minority background, may be less equipped to manage

their own health needs [11]. While most adolescent parents do not want to experience a repeat pregnancy, stress associated with being a young parent can impact their ability to successfully avoid a second pregnancy.

Young women who experience stress are less likely to use contraception consistently [12]. Young women with moderate to severe symptoms of stress are also more likely to experience an unintended pregnancy [13]. While general stress and anxiety have been established as predictors of inconsistent contraceptive use and therefore unintended pregnancy, other sources of stress for adolescents, such as stressful events, discrimination and economic hardship have not been examined for their impact on unintended pregnancy.

Stressful life events, such as a romantic break-up or familial disruption, are associated with risky behavior in young adolescents [14]. Further, studies have shown associations between risky sexual behavior and other forms of social stressors, like racial discrimination [15] and economic hardship [16]. However, the association between stressful factors and risky sexual behaviors has shown to be modifiable. Supportive friendships are protective in the association of stressful life events and risky sexual behavior in adolescents [17] and support from parents moderates the association between family economic hardship and mental health issues [18].

While stress factors also influence the risk-taking sexual behavior of males [14] [17], no studies that we are aware of examine how male experiences of stress are associated with unintended pregnancy of their partner. Risk factors for rapid repeat pregnancy in adolescents have largely been assessed only from the perspective of the adolescent mother, [19] [9] and do not consider how the experiences of the father may affect risk for repeat pregnancy.

The aim of this study is to identify how stress, stressful life events, discrimination and economic hardship impact adolescent mothers' risk for repeat pregnancy. Secondary aims

include examining the mediating effect of contraceptive use practices between stress predictors and repeat pregnancy, examining how a partner's stress contributes to the adolescent mothers' risk of repeat pregnancy and how social support and family functioning can moderate the risk of repeat pregnancy.

Methods

Procedure

The data are from a subset of participants from a longitudinal study of 296 pregnant adolescent females and their partners. Participants were recruited between July 2007 and February 2011 from obstetrics and gynecology clinics and an ultrasound clinic in four hospitals in Connecticut. Interested participants were screened by research staff. Research staff explained the study to eligible participants and answered any questions. If only the mother was present during screening, she was provided with materials to give to the father, and research staff requested permission to contact the father regarding participation in the study.

Inclusion criteria stipulated that participants must be: (a) pregnant or partner is pregnant in the second or third trimester at the time of baseline interview; (b) women are age 14-21 and men are age 14 or older at the time of the baseline interview; (c) both participants report being in a romantic relationship with each other; (d) both report being the biological parents of the unborn baby; (e) both agree to participate in the study and (f) both are able to speak Spanish or English. An initial run-in period was used as part of the eligibility criteria and participants were deemed ineligible if they could not be re-contacted after screening and before their estimated due date.

Research staff obtained informed consent at the baseline appointment. Couples completed individual structured interviews via audio computer-assisted self-interview (ACASI). Participation was voluntary and confidential, and did not influence the provision of health care or social services. Adolescents who chose to participate in the study did not differ from those that

declined to enroll in the study on any screening characteristics except that participants were more likely to be two weeks further along in their pregnancy ($p < 0.05$). Demographic variables were assessed at baseline.

Predictors

Stress was measured using the 10-item Perceived Stress Scale [20]. Participants were asked to rate how often in the past month individuals perceived their lives to be unpredictable and uncontrollable. Questions included “In the past month, how often have you felt unable to control important things in your life?”. Response choices were: 0= “Never”, 1= “Almost never”, 2= “Sometimes”, 3= “Often” and 4= “Very often”. Stress was measured at six months postpartum. Reliability for this measure was 0.78 for females and 0.81 for males.

Stressful life events were measured using an 11-item scale adapted from the Life Events Scale [21]. Eleven stressful events were listed, including financial problems, problems with the police or death of a friend or family member. Participants were asked if they experienced any of the events in the previous six months. Responses choices were 1= “Yes” and 0= “No”. The responses were summed to form a total score. Stressful life events were measured at six months postpartum.

General discrimination was measured using a 20-item scale adapted from the Daily Life Experiences Scale [22]. Participants were asked how often they experienced situations of discrimination, such as being treated suspiciously or hearing offensive jokes or comments. Response choices were: 0= “Never,” 1= “Less than once a year,” 2= “A few times a year,” 3= “About once a month,” 4= “A few times a month,” and 5 = “Once a week or more.” General discrimination was measured at baseline. Reliability for this scale was 0.93 for females and 0.94 for males.

Economic hardship was measured by asking participants if in the past year they experienced any of eight financial problems such as having a household utility shut off, going hungry or needing to borrow money from family or friends. Responses choices were 1= “Yes” and 0= “No”. The responses were summed to form a total score. Economic hardship was measured at 12 months postpartum.

Outcome

Repeat pregnancy was measured by asking female participants at 6 months and at 12 months postpartum if they had become pregnant in the previous six months or were currently pregnant at the time of the interview. If participants indicated they had experienced a subsequent pregnancy at either time point, repeat pregnancy was measured as 1= “Yes”. If they indicated that they had not experienced a subsequent pregnancy, repeat pregnancy was measured as 0= “No”.

Mediators

Effective and ineffective methods of contraception were categorized based on failure rates for typical use from the Centers for Disease Control [23]. Effective methods had failure rates of less than 10% with typical use and ineffective methods had failure rates of 10% or more with typical use. Effective methods of contraception were intrauterine devices, oral contraception, hormonal injections, the hormonal patch or the NuvaRing. The percent of the time using effective methods of birth control was calculated from participants’ responses to questions about what percent of the time they used each individual method of contraception. The percent of the time using ineffective methods of birth control, considered condoms, the rhythm method or withdrawal, was also calculated from participants’ response to questions about what percent of the time they used each individual method of contraception. If participants did not use any

method of contraception, they received a score of “0” for both their percent of time using ineffective methods and effective methods of contraception. Contraceptive use was measured at 6 months postpartum.

Moderators

Social support was assessed using a 9-item scale adapted from the Medical Outcomes Study Social Support Survey (MOS Survey) [24]. Participants were asked how often someone was available to help them if they were confined to a bed, to talk to about their problems, to give them advice, and to show them love and affection. Response choices were: 0= “None of the time”, 1= “A Little of the Time”, 2= “Some of the Time”, 3= “Most of the Time”, and 4= “All of the Time”. Social support was measured at 6 months postpartum. Reliability of the social support scale was 0.97 for females and 0.97 for males.

Family functioning was assessed using a 12-item scale adapted from the 40-item Family Functioning Scale (FFS) [25]. The scale measures general dimensions of family functioning with items such as “My family accepts me as I am” and “People in my family listen when I speak”. Response choices were 1= “Never”, 2= “Almost Never”, 3= “Rarely”, 4= “Sometimes”, 5= “Frequently”, 6= “Almost Always”, 7= “Always”. Responses were summed to generate a total family functioning score, with a higher score indicating a greater degree of family functioning. Family functioning was measured at 6 months postpartum. Reliability of this scale was 0.86 for females and 0.82 for males.

Data Analysis

Frequencies and means of the demographic and predictor variables were used to describe the sample. T-tests were conducted for continuous variables and Chi-Square tests were conducted for categorical variables to compare female participants who experienced a repeat

pregnancy to those that did not. Logistic regression was used to examine the effect of the predictor variables on the outcome of repeat pregnancy within one year of giving birth. In addition to age, race, years of education and income, parity, breastfeeding status at 6 months postpartum and relationship status with partner at 6 months postpartum were included as covariates.

First, bivariate associations between each of the predictor variables and the outcome of repeat pregnancy were examined. Next, interactions between social support and family functioning and each of the predictors of interest were added to the models one at a time. Prior to creating the interaction terms, the moderator variables social support and family functioning were centered about the mean for female participants. Any significant interaction terms were retained in the model. Finally, the mediating effects of percent of time using of effective and ineffective methods of contraception for the predictors of interest that showed a significant association with repeat pregnancy were examined using the program PRODCLIN [26]. All other analyses were performed using SAS 9.3 statistical software.

Results

17.1% (N=39) of participants experienced a pregnancy by 12 months postpartum. In examining the unadjusted bivariate associations between the main predictors and covariates and repeat pregnancy, Latino race (OR: 0.43, 95% CI: 0.192, 0.942), being in a relationship with their partner at 6 months (OR: 0.42, 95% CI: 0.19, 0.95) and greater use of effective methods of contraception (OR: 0.88, 95% CI: 0.80, 0.96) were associated with reduced odds of repeat pregnancy. Stressful life events (OR: 1.27, 95% CI: 1.07, 1.50) and general discrimination (OR: 1.50, 95% CI: 1.01, 2.22) were associated with increased odds of repeat pregnancy (Table 2).

When all main predictors and covariates were included in the same multivariate model, the associations between Latino race, relationship status with partner and percent use of effective contraception with repeat pregnancy remained significant (Table 3). After adjustment, white race was associated with reduced odds of repeat pregnancy (OR: 0.11, 95% CI: 0.02, 0.57). Stressful life events (OR: 1.51, 95% CI: 1.13, 2.03) and general discrimination (OR: 2.35, 95% CI: 1.16, 4.8) were also still associated with increased odds of repeat pregnancy after adjustment.

None of the associations between perceived stress, stressful life events, general discrimination, economic hardship or the partner variables and repeat pregnancy were modified by social support or family functioning, so the moderating variables were not included in the final model (Table 3).

Greater use of effective methods of contraception was significantly associated with a reduced risk of repeat pregnancy ($B=-0.235$, $p=0.001$), but greater use of ineffective methods of contraception was not associated with repeat pregnancy ($B=0.055$, $p=0.414$). We examined contraception use as a possible mediator between significant predictors and repeat pregnancy using PRODCLIN to assess indirect effects. Use of effective methods of contraception did not mediate the relationship between stressful life events and repeat pregnancy (95% CI: -0.141, 0.057) or discrimination and repeat pregnancy (95% CI: -0.253, 0.192). In addition, use of ineffective methods of contraception did not mediate the relationship between stressful life events and repeat pregnancy (95% CI: -0.035, 0.034) or discrimination and repeat pregnancy (95% CI: -0.150, 0.053).

Discussion

Our results show a significant association between stressful life events and repeat pregnancy and general discrimination and repeat pregnancy in the first year postpartum for

adolescent mothers. These results support findings in the literature that mental health issues, and specifically stress, are associated with an increased likelihood of pregnancy among young women. Our study extends these findings to discrete stressful life events and to general discrimination. It is likely that women who experience stress are unable to manage their own health needs and adequately protect themselves against pregnancy. As for discrimination, it is postulated that feelings of discrimination cause minority groups to engage in behaviors that resist the prevailing health norms [27]. During a period of role transition which can involve moving out of their childhood home or conflicts with friends and family members, the stressful events that adolescents experience may increase their risk of experiencing a repeat pregnancy. In addition, adolescent parents report experiencing stigma for reasons including their age, marital status and socioeconomic status [28]. The stressful circumstances that stem from being an adolescent mother may place young mothers at a greater risk for repeat pregnancy. Postpartum care for adolescent mothers should address not only the mental health of the adolescent mother, but also the life circumstances that may cause her stress.

Contrary to the literature, we did not find an association between general perceived stress and repeat pregnancy. This may be a consequence of our study population consisting entirely of adolescent mothers, rather than young women that are seeking to prevent a first pregnancy. We used the Perceived Stress Scale to examine stress, and young mothers may be more likely to cite their parenting experiences as sources of stress rather than general situations of anxiety. Infant temperament and parenting responsibilities can be sources of stress for adolescent mothers [29], whereas the scale that we used to assess general stress did not contain items specifically about parenting responsibilities. Familial economic hardship has also been shown to lead to risky health behaviors in adolescents [16], though this was not found for our study population. The

association between economic hardship and adolescent health behaviors has primarily been established in the context of parental economic hardship. This relationship could be different when the adolescent is experiencing their own economic hardship, rather than the hardship of a parent. As half of the population in our study was not living with their parents at 6 months postpartum, they may be less affected by parental economic hardship.

The pathway by which stressful life events and perceived discrimination are associated with an increased risk of pregnancy cannot be explained by a failure to use contraception, as has been described in the literature [12] [13]. However, it has been established that adolescents with mental illness are at greater risk of pregnancy. A large longitudinal study of adolescents with major mental illness, including depression, schizophrenia and bipolar disorder, showed that adolescents with mental illnesses had higher fertility rates than unaffected adolescents, and that while the overall rate of adolescent pregnancy is decreasing, the rate of pregnancy among adolescents with a mental illness is decreasing at a slower rate [30]. The authors of this study note that due to the lack of research in the area of adolescent mental health and reproduction, they were unable to sufficiently explain their findings. Adolescent mothers that experience a repeat pregnancy report not intending to become pregnant, but also a lack of intention to prevent the pregnancy; intercourse often occurred due to coercion and spontaneity [31]. While we did not find contraception use to mediate the pathway between stressful life events, discrimination and repeat pregnancy, stress may be associated with risk of pregnancy by affecting the adolescents' ability to make decisions about the frequency and circumstances of intercourse. Our findings indicate a need to further examine the nature of the relationship between mental well-being and pregnancy in adolescents.

None of the partner stress variables were associated with repeat pregnancy. Studies have found an association between stress and sexual risk behaviors and discrimination and sexual risk behaviors in both males and females [15]. Our results suggest that this association is not the same in males and females when the outcome examined is pregnancy. While certain relationship characteristics have been associated with contraceptive practices [32], current findings suggest individual characteristics of the adolescent mother are most important in determining pregnancy risk.

We did not find the association between stressful life events and repeat pregnancy and discrimination and repeat pregnancy to be moderated by social support or family functioning. Other studies have found that supportive friendships and supportive parenting can buffer against the effects of stress with regard to risky sexual behaviors [17] [18]. Again, this may be a consequence of our sample consisting of young women who are already parents. At the point that young women are already mothers, the support that they receive from parents and friends may be less salient in buffering the negative effects of stressors.

Our study had several strengths, including a large sample size, a longitudinal design and the inclusion of young women in romantic relationships, which allowed us to examine partner effects. However, our study had several limitations. All of our predictor and outcome variables were measured using self-report, which may be subject to bias. We also only measured instances of repeat pregnancy up until one year postpartum, whereas repeat pregnancy is often defined as experiencing pregnancy over 18 months postpartum [33]. Finally, our sample also consisted primarily of low-income mothers, which may limit the generalizability of our results. The characteristics that are associated with pregnancy in adolescent mothers may not operate in the same way for young women who are seeking to prevent a first pregnancy. However, low-income

adolescent mothers suffer the largest burden of negative health outcomes for themselves and their children, therefore making our sample relevant in understanding health disparities

Adolescents who become pregnant, despite the fact the majority indicate the pregnancy was unintended, are at a high risk of a subsequent pregnancy [4] [3]. The transition to parenthood can be a challenging time for adolescents, limiting their ability to prevent future pregnancies. It is important to assist adolescent mothers in managing their mental health both to promote healthy parenting practices [34], and also to ensure that adolescent mothers have the appropriate resources to be able to prevent subsequent pregnancies. Our results demonstrate that young mothers that experience stressful life events and discrimination are less able to prevent a subsequent pregnancy. These findings support the need for programs that address the individual mental health needs of adolescent mothers during the postpartum period, and that resources to prevent subsequent pregnancies should specifically target young women. Our results also support the need for more research on pregnancy risk among adolescents experiencing mental distress.

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Tables

Table 1. Demographics and participant characteristics

	Became pregnant again			Did not become pregnant again		
	N	Mean (SD)	%	N	Mean (SD)	%
Demographics						
Age	39	19.08 (1.31)		189	18.62 (1.67)	
African American	21		53.85	69		36.51
Latino	11		28.21	85		44.97
White	4		10.26	28		14.81
Other race	3		7.69	7		3.70
Years Education	39	12.05 (1.99)		189	11.79 (1.87)	
Household income	39	12500.0 (13470.7)		188	12906.9 (13537.8)	
Predictors						
Stress	39	15.0256 (6.1537)		189	14.9153 (6.4711)	
Stressful Life Events	39	2.6154 (2.2197)		188	1.6170 (1.8067)	
General Discrimination	39	1.0615 (0.9293)		189	0.7685 (0.7803)	
Economic Hardship	39	1.4103 (1.6176)		180	1.1944 (1.4574)	
Stress (Partner)	31	15.5313 (7.3878)		172	14.7427 (6.7155)	
Stressful Life Events (Partner)	32	2.5000 (2.1251)		172	1.8421 (1.9109)	
General Discrimination (Partner)	39	1.1808 (1.1577)		187	1.0249 (1.0043)	
Economic Hardship (Partner)	35	1.3714 (1.6104)		162	1.3210 (1.7110)	

Table 2. Unadjusted associations between predictors and repeat pregnancy

Demographics	Odds Ratio	95% CI
Age	1.20	0.96, 1.51
African American	1.00	ref
Latino	0.43	0.19, 0.94
White	0.47	0.15, 1.50
Other race	1.41	0.33, 5.93
Years Education	1.07	0.90, 1.28
Household income	1.00	1.00, 1.00
Covariates		
Percent use of effective contraception	0.88	0.80, 0.96
Percent use of ineffective contraception	1.05	0.97, 1.14
Breastfeeding status	0.64	0.18, 2.27
In relationship with partner	0.42	0.19, 0.95
Parity	1.26	0.65, 2.42
Predictors		
Stress	1.00	0.95, 1.06
Stressful Life Events	1.27	1.07, 1.49
General Discrimination	1.50	1.01, 2.22
Economic Hardship	1.10	0.88, 1.37
Stress (Partner)	1.02	0.96, 1.08
Stressful Life Events (Partner)	1.17	0.98, 1.40
General Discrimination (Partner)	1.15	0.84, 1.59
Economic Hardship (Partner)	1.02	0.82, 1.26

Table 3. Adjusted associations between predictors and repeat pregnancy

Demographics	Odds Ratio	95% CI
Age	1.49	0.95, 2.33
African American	1.00	ref
Latino	0.18	0.05, 0.67
White	0.11	0.02, 0.57
Other race	0.59	0.07, 5.04
Years Education	1.15	0.83, 1.59
Household income	1.00	1.00, 1.00
Covariates		
Percent use of effective contraception	0.79	0.69, 0.91
Percent use of ineffective contraception	1.06	0.93, 1.21
Breastfeeding status	0.36	0.04, 3.12
In relationship with partner	1.19	0.26, 5.45
Parity	1.01	0.35, 2.87
Predictors		
Stress	0.95	0.88, 1.03
Stressful Life Events	1.52	1.13, 2.03
General Discrimination	2.35	1.16, 4.76
Economic Hardship	0.86	0.58, 1.28
Stress (Partner)	1.00	0.92, 1.08
Stressful Life Events (Partner)	1.14	0.89, 1.46
General Discrimination (Partner)	1.32	0.84, 2.07
Economic Hardship (Partner)	1.02	0.74, 1.40