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COMPARING PREGNANT UNIVERSITY STUDENTS TO NON-PREGNANT STUDENTS AND NON-STUDENT PREGNANT WOMEN

SARA L. SOHR-PRESTON*, BLAIR HARRIS & JACEY FITZMORRIS
Department of Psychology, Southeastern Louisiana University, Hammond, LA, USA
*Box 10831, Hammond, LA 70402

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ABSTRACT

Investigators aimed to identify areas of vulnerability for pregnant university students. Pregnant students were compared to other student and pregnant participants on a variety of online self-report measures. Pregnant students exhibited higher body dissatisfaction than males, but not other females. Both pregnant groups reported elevated depressive symptoms compared to other groups. Pregnant students reported lower life satisfaction than other females. Non-student pregnant participants displayed higher pregnancy-related anxiety than pregnant students, but not with age held constant. Differences also emerged regarding career-related parental social support and professor support, with pregnant students and male students reporting lower degrees than female non-pregnant students. Compared to others, pregnant university students exhibited the highest college stress. Findings suggest areas for future research on the needs of pregnant students to maximize prenatal health, academics, and retention.

Keywords: pregnancy, higher education, depressive symptoms, life satisfaction, college stress

1.0 INTRODUCTION

University faculty often feel obliged to provide support beyond conveying course content, and appropriate support differs given students' circumstances. The current investigation targets student pregnancy on a US campus, posing physical, mental, academic, social, and financial challenges. Anyone seeking resources face a surprising lack of information, services, or guidance, with many potentially unaware that student pregnancy is included in Title IX protections (U.S. Department of Education, Office for Civil Rights, 2026) and grants pregnant students certain accommodations. The lack of attention given to this potentially vulnerable student population is alarming.

Although faculty may remember pregnant students, determining frequency of pregnancy during university proves difficult, because, even if universities collect such data, students may not report pregnancy status. Earlier data indicated 23% of Texas college students reported having been pregnant or getting someone pregnant (Wiley et al., 1997). While no current statistic of this exact nature was available upon writing, available data indicates unplanned pregnancy is highest among 18-24-year olds (Brown and Amankwaa, 2007; Guttmacher Institute, 2019) and approximately one-fourth of US university students are raising children (Gault et al., 2014). Of course, not all student parents have been pregnant, and not all pregnant students will parent a child, but this group of nontraditional students is likely increasing (Brown and Nichols, 2012). To clarify areas of vulnerability, the current investigation compares pregnant university students to their non-pregnant peers (male and female) and to pregnant

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women not in college. Based on experience and research, the authors hypothesized the following differences.

2.0 BODY DISSATISFACTION

Pregnant university students may experience poor body dissatisfaction. First, university students, as a group, are at risk for body dissatisfaction (Lowery et al., 2005), and, though many note increased pressure on men to maintain a muscular build in recent decades (Leit et al., 2001), university women exhibit particularly negative body image and pressure to maintain a low body weight and thin appearance (Lowery et al., 2005; Thompson, 1990). In addition, pregnancy typically changes body shape in a manner against contemporary beauty ideals of being thin, toned, and possessing a flat abdomen. Research has supported increased body dissatisfaction during pregnancy (Clark et al., 2009; Coyne et al., 2018; Skouteris et al., 2005). Therefore, the authors hypothesized pregnant students would exhibit body dissatisfaction exceeding levels of non-pregnant students and non-student pregnant women.

2.1 Depressive Symptoms

University students are at heightened risk for psychopathology and distress compared to same-aged peers (Farrer et al., 2016), and women exhibit twice the risk for depression as men (Bertschy et al., 2016). Depressive symptoms are common during pregnancy, possibly because of numerous biological, emotional, psychological, social, and cultural stressors and transitions (Boekhorst et al., 2019; Jacques et al., 2020). Pregnant students must face major life changes while managing their coursework and finances and planning future enrollment. In one sample of recently pregnant students (Manze et al., 2023), those who reported pregnancy interfering with school were more likely to report requiring mental health treatment. Pregnant students may be at risk for depressive symptoms because of their antenatal status, their sex, and their student status, leading to the hypothesis that pregnant students would exhibit higher levels of depressive symptoms than the other groups.

2.2 Life Satisfaction

Because individuals anticipate experiencing pregnancy and university separately, pregnant students could have lower satisfaction with life compared to their non-pregnant student peers and other pregnant women. University students report moderate (Alleyne et al., 2010) to high (Chow, 2005) levels of life satisfaction. Stress and financial security are among factors linked to reduced life satisfaction in university students (Alleyne et al., 2010; Simons et al., 2002). Pregnancy could add to a student's stress and financial worries given the accompanying medical appointments, planning for childcare arrangements, planning around postpartum recovery, reduced ability to continue paid work or academic studies, and exorbitant costs in the US for hospital services. In fact, research with undergraduate student mothers indicates financial strains are a key barrier to studies (Kensinger and Minnick, 2018). Compared to other pregnant women, pregnant university students may be younger and not yet established in careers, leading to the hypothesis they would report lower life satisfaction than other groups.

2.3 Social Support

University studies and pregnancy both may be influenced by social support from parents, instructors, and classmates. Findings from primary and secondary school samples suggest parent, teacher, and classmate support predict higher levels of student engagement (Danielsen et al., 2011; Furrer and Skinner, 2003; Nelson and DeBacker, 2008; Soylu et al., 2020; Wentzel, 1997). University students may exhibit similar patterns, and many pregnant university students are in early adulthood and experiencing unplanned pregnancy. Past research indicates unintentionally expectant mothers in early adulthood selectively reveal their pregnancy status and possibly reduce opportunities for receiving social support (Moseson et al., 2019). The authors predicted that becoming pregnant during university would link to lower levels of social support from parents, professors, and classmates.

2.4 College Stress

Finally, psychosocial stress is common during pregnancy (Woods et al., 2010), and the university experience may present potential stressors addressed previously (social stigma, financial strain, physical discomfort, scheduling medical appointments, planning for a major life transition). Pregnant students also may experience stress from role conflicts, in which partners, family members, and the university community seem to expect them to put studies aside once pregnant and devote themselves to their expectant mother role (Madden, 2018). The final hypothesis examined was that pregnant students would experience heightened college-related stress compared to their non-pregnant classmates.

3.0 METHOD

3.1 Participants

The convenience sample consisted of four groups. First, 192 pregnant university students were recruited with fliers, social media posts, and announcements in introductory and developmental psychology classes at a public university in the southern US. Classes targeted for recruitment ranged from 40 to 100 students and included online and traditional classes. Pregnant student participants could be in any trimester and had to be enrolled in at least one university course. Students recruited through specific classes were able to earn credit, either bonus or fulfilling an enrichment requirement. The mean age for the pregnant students was 19.84 years old (SD = 2.41; min = 18, max = 37).

Next, 193 male university students and 245 female students not currently pregnant were recruited from the same courses. The average age for the non-pregnant female students was 19.60 years old (SD = 2.93; min = 18, max = 48), while the male students group was 20.47 years old (SD = 3.30; min = 18, max = 46). Finally, 194 pregnant women not currently enrolled in university were recruited online using Amazon Mechanical Turk (MTurk). This group was notably older and averaged 29.25 years old (SD = 4.55; min = 20, max = 48).

The sample was mostly White (59.79%), with 20.85% African American, 6.60% Hispanic or Latinx, 2.45% Asian, 2.34% Native American, Aleut, or Aboriginal peoples, and 7.98% identifying as “other.” For college participants, average estimated current grade point average (GPA) was 3.09 (SD = .61; min = .80, max = 4.00). The Institutional Review Board of the university reviewed and approved this study before recruitment.

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3.2 Measures

Demographic Information

All participants were asked to complete items on sex, pregnancy status, student status, age, and race.

3.3 Body Dissatisfaction

The Body Shape Questionnaire (Cooper et al., 1987), a 34-item self-report instrument answered using a 6-point (1 = never to 6 = always) Likert-type scale, assessed body dissatisfaction for all groups. Maximum score would be 204, with higher scores reflecting greater body dissatisfaction. Mean scores were: pregnant students= 99.41 (SD = 42.72); female non-students = 102.88 (SD = 42.61); male students = 81.26 (SD = 41.27); and non-student pregnant women = 118.34 (SD = 49.30). As with previous studies (see Wade, 2016) inter-item reliability was high (Cronbach's $\alpha = .98$).

3.4 Depressive Symptoms (General)

General depressive symptoms were measured for all groups with eight of nine items from the Patient Health Questionnaire (PHQ-9; Kroenke et al., 2001). Specifically, an item addressing suicidal ideation was omitted, because the investigation would lack adequate follow-up. Using other items, scaled from 0 (Not at all) to 3 (Nearly every day), possible scores ranged from 0 to 24. Pregnant students averaged 8.62 (SD = 5.69), female non-pregnant students 7.56 (SD = 5.52), male students 6.85 (SD = 6.02), and non-student pregnant women 10.25 (SD = 7.12). The 9-item instrument has exhibited reliability and validity (Gilbody et al., 2007). In the present study, internal consistency was similarly high (Cronbach's $\alpha = .91$).

3.5 Life Satisfaction

Satisfaction with life was assessed for all groups with the Satisfaction with Life Scale (Diener et al., 1985), a five-item self-report measure of overall life satisfaction. Items are scaled from 1 (strongly disagree) to 7 (strongly agree). Pregnant students scored a mean of 21.79 (SD = 7.46), non-pregnant female students 24.28 (SD = 6.44), male students 22.92 (SD = 7.29), and non-student pregnant women 27.37 (SD = 6.27). Validity and reliability have both been demonstrated (Pavot and Diener, 1993), and the current sample displayed high internal consistency (Cronbach's $\alpha = .89$).

3.6 Pregnancy-related Anxiety

Both pregnant groups completed the revised Pregnancy Related Anxiety Questionnaire (PRAQ-R; Huizink et al., 2004), a 10-item self-report measure addressing general aspects of pregnancy-related anxiety supported by confirmatory factor analysis: fear of giving birth, fear of bearing of physically or mentally handicapped child, and concern about one's appearance. Participants answered on a scale from 1 (absolutely does not apply) to 7 (applies very well), yielding a possible range of scores from 10 to 70. Pregnant students averaged 38.94 (SD = 14.93), and non-student pregnant women 42.76 (SD = 16.77). Inter-item reliability was high

(Cronbach's α = .92), consistent with previous support (Arch, 2013; Brunton et al., 2019; van Bussel et al., 2009).

3.7 Pregnancy-related Depressive Symptoms

Pregnancy-related depression symptoms were assessed in both pregnant groups using nine items from the 10-item Edinburgh Postnatal Depression Scale (EDPS; Cox et al., 1987), originally designed to detect postpartum depression. The instrument has been supported for detection of depression during pregnancy (Tendais et al., 2014). As with the PHQ-9, the item addressing self-harm was omitted. The validity and reliability for assessment during and after pregnancy have been supported (McBride et al., 2014). With nine items given, internal consistency was high (Cronbach's α = .83).

3.8 Career-related Parental Social Support

All three student groups reported on specific career-related parental social support using the Career-Related Parent Social Support Scale (Turner et al., 2003), a 27-item instrument including subscales for instrumental assistance (IA), career-related modeling (CM), verbal encouragement (VE), and emotional support (ES). Items are answered on a 5-point Likert scale from 1 (strongly disagree) to 5 (strongly agree). Construct validity and internal consistency have been demonstrated (Raque-Bogdan et al., 2013; Turner et al., 2003).

For the 7-item IA subscale, pregnant students averaged 22.53 (SD = 6.69), non-pregnant female students 22.51 (SD = 6.41), and male students 22.41 (SD = 5.54). Inter-item reliability was high (Cronbach's α = .86). On the 7-item CM subscale, means were 24.93 (SD = 6.44) for pregnant students, 28.54 (SD = 6.17) for non-pregnant female students, and 25.70 for male students (SD = 6.45). Internal consistency was high (Cronbach's α = .93). Regarding the 6-item VE subscale, pregnant students averaged 22.40 (SD = 5.41), non-pregnant female students 24.72 (SD = 5.01), and male students 23.27 (SD = 5.11). There was high inter-item reliability (Cronbach's α = .88). For the 7-item ES subscale, pregnant students averaged 24.53 (SD = 6.67), non-pregnant female students 25.69 (SD = 6.58), and male students 24.14 (SD = 5.95). It displayed high internal consistency (Cronbach's α = .90).

3.9 Professor and Classmate Support

Professor and classmate support were assessed for student groups using a modified version of the Teacher and Classmate Support Scale (Torsheim et al., 2000), an 8-item self-report inventory with four items targeting teacher support and four items addressing classmate support. Modification involved changing "teachers" to "professors." In addition, while items are typically answered on a 5-point Likert-type scale of 1 (always) to 5 (never) for teachers, and 1 (strongly agree) to 5 (strongly disagree) for classmates, for the current investigation all items were answered from 1 (strongly disagree) to 5 (strongly agree).

For professor support, pregnant students averaged 14.16 (SD = 3.63), non-pregnant female students 15.27 (SD = 2.91), and male students 14.64 (SD = 2.96). Regarding classmate support, pregnant students scored a mean of 13.69 (SD = 3.34), non-pregnant female students 13.65 (SD = 2.58), and male students 13.41 (SD = 2.73). The original version has exhibited validity and reliability (Torsheim et al., 2000; Torsheim et al., 2012). High internal consistency

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emerged for the current sampling (professor support Cronbach's α = .83; classmate support Cronbach's α = .84).

3.10 College Stress

The three student groups reported on college-related stress with the College Stress Inventory (Solberg et al., 1993), a 21-item self-report measure scored from 0 (never) to 4 (very often). Pregnant students averaged 38.97 (SD = 20.19). Female non-pregnant students scored a mean of 29.28 (SD = 15.25). Male students had an average score of 33.57 (SD = 17.64). Consistent with previous studies (Skowron et al., 2004; Solberg et al.,1993), the current investigation suggested high internal consistency (Cronbach's α = .96).

4.0 PROCEDURE

Data collection occurred online. There were four different versions of the survey provided, accessed using a separate link. Some student participants received course credit for participation. MTurk participants were paid. All materials specified that participants must be at least 18 years old to participate. Participants were required to complete the survey in one session. Instructions stated that participants could skip any items with which they felt uncomfortable.

5.0 RESULTS

Analyses involved three multivariate analyses of covariance (MANCOVA), including participant age as a covariate. The first MANCOVA compared all groups on body dissatisfaction, general depressive symptoms, and life satisfaction. Since Box's Test of Equality of Covariance Matrices was significant (p = .00), the test statistic interpreted was Pillai's trace since it is most robust to violations of assumptions (Finch, 2005). For the covariate, Pillai's trace was .01 (p = .13); partial η2 = .04 (small effect size). For the quasi-independent variable of group, Pillai's trace was .13 (p = .00), indicating significant difference among the groups. The means adjusted for the covariate are listed in Table I. Non-adjusted means were previously presented.

Follow-up tests using univariate analyses of covariance (ANCOVA) indicated group differences for all three variables. Post hoc testing using Bonferroni correction revealed body dissatisfaction was lowest among male students, and significantly lower than other groups. For general depressive symptoms, both pregnant groups scored significantly higher than non-pregnant groups, but not significantly different from one another. Life satisfaction was highest in non-student pregnant women, even when controlling for age, and that group scored significantly higher than others. Pregnant students also scored significantly lower than non-pregnant female students. As recommended by Simmons et al. (2011) that results including a covariate be accompanied by results without the covariate, a multivariate analysis of variance (MANOVA) was carried out. Without controlling for age, there was a significant but higher test statistic, Pillai's trace = .20 (p = .00); partial η2 = .07 (medium effect size). While differences in analyses of variance (ANOVA) with Bonferroni post hoc testing were similar to the ANCOVA for body dissatisfaction and life satisfaction, unadjusted results for general depressive symptoms were different. Specifically, while the two pregnant groups were not significantly different based on adjusted means, the original means were slightly different, with

non-student pregnant women scoring significantly higher than pregnant students. The fact that this was no longer supported once age was held constant suggests the difference owed to the non-student pregnant group being older rather than their non-student status.

Next, both pregnant groups were compared on pregnancy-related anxiety and pregnancy-related depressive symptoms while holding age constant. In that MANCOVA (see Table II), there was not a significant effect, Pillai's trace = .01 ($p = .06$). A MANOVA carried out without the covariate did indicate an effect of being a student while pregnant on pregnancy-related anxiety and depressive symptoms, Pillai's trace = .02 ($p = .01$), partial $\eta 2 = .02$ (small effect size). The follow-up ANOVA indicated the difference was in pregnancy-related anxiety, with non-student pregnant women reporting significantly higher levels.

Finally, the three student groups were compared on career-related parent social support, professor support, classmate support, and college stress while controlling for age. Results of the MANCOVA were significant, Pillai's trace = .15 ($p = .00$), partial $\eta 2 = .08$ (medium effect). Follow-up ANCOVA indicated significant differences for career-related modeling, verbal encouragement, emotional support, professor support, and college stress. Bonferroni post hoc testing supported that, for career-related modeling, female students not currently pregnant reported the highest levels, and significantly higher than pregnant students and male students (see Table III). Verbal encouragement also was highest in the non-pregnant female student group and significantly higher than the other two groups. Additionally, emotional support, while exhibiting a significant omnibus effect, was not significantly different among groups in post hoc testing. Professor support was significantly higher for non-pregnant female students than for pregnant students, but difference from male students was not significant. Finally, college stress was highest for pregnant students and significantly higher than both other groups. Non-pregnant female students and male students did not differ significantly in college stress.

Without controlling for age, student group comparisons remained significant, Pillai's trace = .16 ($p = .00$), partial $\eta 2 = .08$ (medium effect). The pattern supported by follow-up ANOVA were mostly similar, but with emotional support significantly lower in male students when compared to non-pregnant female students.

6.0 DISCUSSION

Pregnant university students are present on many campuses and may face unique challenges as both students and prospective parents, yet little information is currently available for university faculty and administration or health professionals to best meet their needs. The current investigation represents a preliminary attempt to clarify areas for additional support or assistance. Based on available evidence and practical experience, the investigators compared pregnant students to other students and other pregnant women on a variety of factors. When discussing results below, suggestions for possible application are offered. All suggestions necessitate that findings are first replicated on a variety of campuses.

Compared to other students and pregnant women not attending university, pregnant students exhibited higher body dissatisfaction than male students, but not significantly different than other female participants. Such is consistent with previous evidence that being female involves greater risk for body dissatisfaction (Quittkat et al., 2019). Even if pregnant students are at no greater risk for body dissatisfaction than other female adults, body dissatisfaction is

concerning, because it has been linked to excessive gestational weight gain (Fealy et al., 2020). Medical professionals interacting with any pregnant patients would seem wise to inquire about body image and provide education on adequate nutrition and exercise modifications during pregnancy.

Pregnant students and their pregnant peers not attending university also exhibited elevated depressive symptoms compared to students (male or female) not experiencing a pregnancy. Because depression during pregnancy may bring about serious risks to fetus and mother (Bonari et al., 2004) and depressed mood in university students has been linked to various health and academic problems (Lindsey et al., 2009), it would be beneficial for universities to have counseling services available to pregnant students to potentially mitigate these dangers.

Pregnant university students additionally were low in life satisfaction compared to other female participants and particularly low compared to pregnant women not in university, perhaps because of overlap in two major life events and possible role overload. Considering that life satisfaction has been positively associated with academic performance in university students (Rode et al., 2005), reduced life satisfaction may present an additional risk factor for poor academic performance or a barrier to retention and degree attainment for pregnant students. Low life satisfaction is another issue which could be addressed through university counseling services or other available mental health services.

Pregnant university students were compared to other pregnant women on pregnancy-related anxiety and depressive symptoms. Pregnant women not attending university were almost ten years older on average, so age could not be disregarded as a key confounding variable. Indeed, when age was held constant, comparisons did not support significant differences. The non-student, and generally older, pregnant participants reported higher pregnancy-related anxiety, potentially because of possessing more life experience and having had more opportunities to hear or read about pregnancy complications and the impact of childbirth on health and life quality.

Compared to other students, pregnant students exhibited additional differences in social support and college stress. Regarding career-related modeling and verbal encouragement, pregnant students displayed lower levels than their non-pregnant female student peers but not male student peers (who also scored significantly lower than non-pregnant female students). In contrast to current findings, past evidence for sex- or gender-based differences in career-related parent social support have supported higher emotional support for women than men, but no differences for instrumental assistance, career-related modeling, or verbal encouragement (Raque-Bogdan et al., 2013). The sample in the previous study was younger (17.90 years old, on average) and consisted of incoming instead of current students at a different campus. While sample differences may at least partially explain the seemingly conflicting findings, further replication is clearly warranted before confident statements about differential career-related parent social support in men versus women may be put forward. If current results placing pregnant students at a disadvantage in terms of parental career-related modeling and verbal encouragement are reliable, need remains to clarify whether these factors are antecedents or consequences of pregnancy in university students.

Professor support was similarly lower for pregnant university students compared to other female students, but at levels comparable to male students. There may be many explanations

for lower perceived support from professors, including the possibility of professors assuming a pregnant student will drop a course or not continue in their studies, thus rendering support as a seeming waste of time and effort. Alternatively, pregnant students may seek less support because they fear such a reaction. It may prove beneficial for university faculty to voice their support of and commitment to the success of all students, including pregnant and parenting students.

Finally, pregnant students endorsed higher levels of college stress compared to female and male peers. Higher education presents many noteworthy stressors, and pregnancy adding further stressors is sensible. Heightened stress in pregnant students is alarming given that stress is the factor students are most likely to identify as an impediment to academic performance (Frazier et al., 2019), and stress during pregnancy is a risk factor for low birth weight (Schetter and Tanner, 2012). Because the measure employed specifically assessed college stress, non-student pregnant participants did not report on their stress, meaning the two pregnant groups were not compared on perceived stress, an oversight to be remedied in future research. Elevated stress in university students is another factor which could be discussed and possibly reduced with access to university counseling services.

6.1 Limitations and Future Directions

While results contribute to understanding of a neglected student population, they remain a preliminary effort to clarify struggles and needs of pregnant students. This work must be replicated and expanded upon to increase confidence in findings and fully address research questions. The student participants attended a single campus, meriting replication in other geographic regions and in a variety of institution types (private and public, community colleges and universities). All measures were self-report and possess the typical concerns about demand characteristics and validity of responses. Given the quasi-experimental study design and lack of random assignment, it is risky to assume causality about any differences observed. Temporality is also impossible to establish without a longitudinal design. That is, supported differences could follow from a student becoming pregnant, or they may render a student more likely to become pregnant in the first place. Greater understanding could come about from tracking students over time and making comparisons before, during, and after pregnancy. Such a design would necessitate a large sample of university students since most university students never experience pregnancy and those that do often do so without expecting to.

6.2 Recommendations

While findings are preliminary and intended to spark further investigation, they suggest strategies for university personnel and health professionals. First, attending university while pregnant places additional physical and mental demands on an individual. In addition to bodily symptoms and changes, pregnant students seem to experience mental strains which may place their embryo or fetus and future studies at risk. Many pregnant students are likely unaware that Title IX applies to them, meaning they are entitled to excused absences and the right to make up missed work (U.S. Department of Education Office for Civil Rights, 2026). Pregnant students may be completely unaware that they are entitled to other accommodations, such as a larger desk, elevator access, and parking close to the classroom. Pregnant students may never utilize these resources, even when it is guaranteed by law or university policy. Similarly, while many universities have student counseling services available which could address depressive

symptoms, reduced life satisfaction and stress, pregnant students may not be aware of such services. Universities may need to reach out to their pregnant students to make accommodations and support services known to these vulnerable students. For this to happen effectively, universities need to know which accommodations and support services would best serve pregnant students beyond those which are legally mandated. Future studies will hopefully add to this list, but promising candidates include mental health services or support groups, student health referrals for testing and management of pregnancy side effects, and assistance with finding family housing and childcare.

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