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Premenstrual experiences: The simultaneous examination of the association of self-perceived stress, college-related stress, and sleep quality

Sara Julia Gonzalez
University of Texas-Pan American

PREMENSTRUAL EXPERIENCES: THE SIMULTANEOUS EXAMINATION OF THE

ASSOCIATION OF SELF-PERCEIVED STRESS, COLLEGE-RELATED STRESS, AND

SLEEP QUALITY

A Thesis

by

SARA JULIA GONZALEZ

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COMMITTEE MEMBERS

Dr. Grant Benham
Chair of Committee

Dr. Frederick A. Ernst
Committee Member

Dr. Margaret Graham
Committee Member

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ABSTRACT

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Research suggests that stress may contribute to the severity of premenstrual experiences, but the contribution of different types of stress has not been carefully examined. Using self-report measures, the current study examined the relation between self-perceived stress, college-related stress, sleep quality, and premenstrual experience in a predominantly Hispanic female college sample. Results indicated that self-perceived stress accounts for a statistically significant proportion of the variance in premenstrual experience ratings, with higher stress associated with greater premenstrual distress. Based on a hierarchical regression analysis, adding college-related stress to the predictive model allows for a significantly larger amount of the variance in premenstrual experiences to be accounted for and subsequently adding sleep quality as a predictor improves the model further. In the final model, all three predictor variables were statistically significant and accounted for 29% of the variance in premenstrual distress.

DEDICATION

The completion of my graduate studies could not have been possible without the incredible support of my mother, Julia Gonzalez, and my brother, Pablo Barajas. This milestone would not have been possible without them. Thank you both for always believing in me.

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CHAPTER I

INTRODUCTION

Research supports the etiology for menstrual pain (*dysmenorrhea*) in women's reproductive cycle as a biologic one; however, for the premenstrual physical and emotional discomforts that are regarded as *premenstrual syndrome* (PMS) and *premenstrual dysphoric disorder* (PMDD) the cause is not as definitive (Taylor, 2006). Theories regarding the cause of premenstrual experiences have evolved over the years from the notion of biological hormonal imbalance (Redei & Freeman, 1995; Rubinow & Schmidt, 1992) to psychological causes (Bailey & Cohen, 1999). However, the recognition of multiple causes (Campagne & Campagne, 2007; Clare, 1985) has now led to an acceptance of a bio-psychosocial model (Connolly, 2001). Research has shed light on variables such as life stress, response to stress, history of sexual abuse, and cultural socialization as important contextual determinant factors of observed premenstrual changes (Vigod, Ross, & Steiner, 2009). It is now considered highly unlikely that a single theory can fully explain the manifestation of premenstrual experiences for all women. In view of the numerous psychosocial and cultural factors, the effects of the premenstrual biological processes vary for each woman and therefore create a variety of unique experiences (Gotts, Morse, & Dennerstein, 1995; Taylor, 2006).

One agent frequently associated with premenstrual complaints is stress. A number of studies indicate that women with premenstrual issues experience higher levels of both daily and life stress (Girdler et al., 1998; Golding, Taylor, Menard, & King, 2000; Paddison, et al., 1990;

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Thomas & Narayanan, 2006; Woods, Lentz, Mitchell, & Kogan, 1994), leading some to recommend stress reduction and lifestyle/behavioral changes to help ameliorate premenstrual distress (Thomas & Narayanan, 2006). A major contributor to self-perceived stress in college settings is academic stress, but the relationship between specific college-related stress and premenstrual issues in young female students has not been deliberately studied. The current study attempts to fill this gap in the literature by investigating the relationship between specific college-related stress and premenstrual distress. The study examines whether higher stress levels, including higher college-related stress levels, are related to higher premenstrual distress reports.

Recently, researchers have proposed that inadequate sleep may also act as a biological stressor (Benham, 2010). Inadequate sleep has been linked to a number of mental and physical health conditions and has been found to have a temporal relation to the late-luteal phase in which premenstrual distress occurs (Baker & Colrain 2010; Baker, Kahan, Trinder, & Colrain, 2007; Baker et al., 2012; Lamarche, Driver, Wiebe, Crawford, & De Koninck 2007; Manber & Bootzin, 1997). Given this association, the current study assesses sleep and examines (i) whether inadequate sleep is positively associated with premenstrual distress and (ii) whether sleep quality improves the predictive power of a stress – premenstrual distress model.

CHAPTER II

REVIEW OF THE LITERATURE

Introduction of Premenstrual Distress

Brief History of Premenstrual Distress

The earliest reference to menstrual-related psychological and physical distress date back to the time of Hippocrates (460–377 BC) and also appear in ancient Egyptian writings (Veith, 1965). Although premenstrual distress was not seen as a distinct entity, Hippocrates described a temporal association of certain events to the menstruation cycle, "Shivering, lassitude, and heaviness of the head denotes the onset of menstruation" (Bronfen, 1998). In the 11th-century, Trotula of Salerno, a woman regarded as the world's first gynecologist, wrote a gynecological and obstetric book titled *Passionibus Mulierum Curandorum* (The Disease of Women). The book addressed subjects such as the retention and paucity of the menses, and its reestablishment after giving birth. The book did not cite a definitive premenstrual condition, however it did describe distress alleviation with the onset of the menses, "There are young women who are relieved when the menses are called forth" (Mason-Hohl, 1940).

During the Renaissance period, the Italian physician Giambattista Da Monte (1489–1551) advised physicians that they could attain the trust of their female patients by correctly predicting the approach of menstruation through the observation of changes in the body. He explained that blood that wanted to flow down to the uterus would begin to move and become agitated. This in turn caused heaviness, heat in the whole body, and weariness to the patient. Due to the "many

ascending vapours", pain and heaviness in the head would then follow. The woman's belly

would then swell so much that she would appear pregnant (Stolberg, 2000).

While it is evident that women throughout history experienced premenstrual changes, it

was not until 1931 that the physician Dr. Robert Frank finally delineated a set of symptoms

related to menstruation as a clinical entity (Frank, 1931). Frank called the constellation of

symptoms that occurred the week prior to menstruation and which ended with the onset of

menstruation, "*premenstrual tension*". The continuum of complaints ranged from physical

symptoms such as headache, backache, abdominal and back pain, breast fullness and discomfort,

weight gain, abdominal bloating, fatigue and nausea, to more psychological symptoms such as

depression, difficulty concentrating, nervousness, irritability, restlessness, and generalized

emotional tension (Frank, 1931; Janiger, Riffenburgh, & Kersh, 1972; Rubinow & Roy-Byrne,

1984).

Unsatisfied with the term "premenstrual tension", as tension was only one of the many

components of the syndrome, Dr. Raymond Green and Dr. Katarina Dalton published a paper in

the British Medical Journal in 1953 in which they coined the term "premenstrual syndrome"

(Greene & Dalton, 1953). The new name was a major turning point in the medicalization of

women's menstrual cycles: the term began to be taken more seriously and was seen as an

important problem to be solved (Chrisler & Caplan, 2002).

Defining Premenstrual Distress

To date, there is no clear consensus on the definition of premenstrual afflictions. Instead,

conditions are seen as making up a continuum of disorders that are loosely defined according to

the nature and severity of their distress (Yonkers, Pearlstein, & Rosenheck, 2003). The

symptoms, sensations, feelings, and observations such as bloating, headaches, nausea, ovulatory

pain, and breast tenderness that many women experience during the premenstrual phase of their cycles defines the least troublesome condition referred to as *premenstrual molimina*. Symptoms falling under this category do not cause any functional impairment and are minimally distressing (Yonkers et al., 2003). Generally if the symptoms occur within 3 days prior to the onset of menses and do not represent a woman's chief presenting complaint to her doctor, symptoms are considered to be a normal part of a woman's menstrual cycle—they simply forebode ovulation and subsequent menstruation *(Managing Premenstrual Symptoms: Definitions*, 2008).

Premenstrual syndrome (PMS) includes symptoms that are distressing and are of sufficient severity for individuals to seek some form of treatment (Yonkers et al., 2003). To meet the criteria for PMS, symptoms experienced must occur during the luteal phase of the menstrual cycle and settle within a few days of the onset of menstruation (Shulman, 2010). However, most premenstrual symptoms are often referred to as PMS (Steiner, 2000) because there is generally no demonstrated gold standard definition (Freeman et al., 2011). In clinical trials, about sixty-five different questionnaires and scales, incorporating 199 symptoms, have been used as inclusion criteria or outcome measures—making any comparative evaluation of possible treatments for PMS extremely complicated (Budeiri, Li Wan Po, & Dornan, 1994). Therefore a diagnosis of PMS relies heavily on the instrument utilized.

The extreme and predominantly more psychological form of PMS is referred to as *premenstrual dysphoric disorder* (PMDD) (Cheng et al., 2013). The diagnosis first appeared in the appendix of the revised third edition of the *Diagnostic and Statistical Manual of Mental Disorders* (3rd ed., rev.; DSM-III-R; American Psychiatric Association, 1987) as *late luteal phase dysphoric disorder* (LLPDD). It was subsequently renamed PMDD and incorporated into the appendix of the fourth edition (4th ed.; DSM-IV; American Psychiatric Association, 1994)

and, in 2013, PMDD became a distinct depressive disorder in the fifth edition (5th ed.; DSM–5; American Psychiatric Association, 2013). Like PMS, to meet the criteria for PMDD the symptoms experienced must occur during the luteal phase of the menstrual cycle and alleviate within a few days of the onset of menstruation (Shulman, 2010). This condition includes at least one disabling affective symptom (Halbreich et al., 2007); and has been described as having an associated reduced quality of life comparable to that of chronic depression (Halbreich, Borenstein, Terry, & Kahn, 2003). Some have criticized the diagnosis, arguing the need for more research regarding the criteria, its method of assessment, and determination of symptom change (Di Giulio, & Reissing, 2006).

In studying this female phenomenon, the current study will follow in the steps of feminist psychologists that have chosen to use terms such as 'premenstrual change' or 'premenstrual distress' in order to avoid the criticized medicalized diagnostic categories of PMS or PMDD (Ussher, 2006); focusing only on the variable of premenstrual distress as measured by self-reported premenstrual changes experienced.

Premenstrual Distress Prevalence

In recent population samples, 90-91% of adult women reported at least one premenstrual symptom (Tschudin, Bertea, & Zemp, 2010; Campagne & Campagne, 2007). This rate is similar to that found in the younger college student population. In a study of American nursing school graduates, 87% reported an overall lifetime prevalence of premenstrual distress (Johnson, McChesney, & Bean, 1988). At least one premenstrual symptom was experienced by 96% of university students in Saudi Arabia (Rasheed & Sowailem, 2003) and 79% of Japanese college students reported having experienced premenstrual distress (Yamamoto, Okazaki, Sakamoto, & Funatsu, 2009).

Beyond the experience of symptoms associated with diagnostic entity of PMS, as many as 75% of women have reported experiencing PMS to some degree during their reproductive years (Johnson, 1987; Steiner, 1997). PMS is also a commonly reported problem among college-age women (Cheng et al., 2013; Tabassum, Afridi, Aman, Tabassum, & Durrani, 2005); and nearly one-third of adolescents report experiencing severe PMS or PMDD (Steiner et al., 2011; Vichnin, Freeman, Lin, Hillman, & Bui, 2006).

Some have suggested that race and ethnicity may have an influence on expression of premenstrual distress and therefore its observed prevalence. In Japanese women, moderate to severe PMS and PMDD prevalence rate was only 5.3 and 1.2% respectively, much lower than rates reported by Western women (Takeda, Tasaka, Sakata, & Murata, 2006). Differences however, may depend on instruments used to assess symptoms.

Measuring Premenstrual Distress

Various instruments that assess premenstrual distress are currently available for research or clinical use. While retrospective instruments rely on the rating of distress severity during a typical cycle from memory, prospective or concurrent measures rely on daily checklists of symptoms (Haywood, Slade, & King, 2002). Some have argued that retrospective measures provide an exaggerated estimation of symptom severity by the participant recall (Endicott & Halbreich, 1982). Although concurrent measures rely less on memory, they are very demanding on participants and can potentially lead to nonadherence (Haywood et al., 2002).

Some measures, developed for use in the clinical setting, are designed to determine the presence or absence of PMS using dichotomous criteria (Steiner, Haskett, & Carroll, 1980). Such scales are useful in identifying higher levels of symptom severity (Haywood et al., 2002). Other instruments measure symptoms using scales that range from not present to severe

(Mortola, Girton, Beck, & Yen, 1990) which allow the study of differing levels of change in a range of populations (Haywood et al., 2002).

Each instrument has its own strengths and limitations for use. Menstrual cycle researchers and clinicians therefore need to consider the available methods for measuring symptoms in a systematic way when choosing upon the most appropriate measure that meets their needs (Haywood et al., 2002). The current study uses a retrospective measure that inquires about change in affect, water retention, and pain compared with the nonpremenstrual state—that is, changes that occur in the 7 days prior to the onset of menses.

Introduction to Stress

Chronic stress is defined as a continuous state of arousal in which individuals perceive demands as greater than the inner and outer resources available for dealing with them (Gerrig & Zimbardo, 2002). There is now substantial evidence demonstrating the negative impact of chronic stress on health; indeed, it has been estimated that 75% of doctor visits are related to stress-related illness (Cass, 2006). Stress is associated with suppressed immune function, increasing susceptibility to infection, and increased risk for coronary heart disease (Chandola et al., 2008) and hypertension (Spruill, 2010).

Stress is also implicated in depression. Interestingly, women exhibit higher stress sensitivities than men, which may contribute to their greater vulnerability to the condition (Gourion, 2009). Moreover, women are more likely than men to report physical and emotional symptoms associated with stress (APA, 2012). It is noteworthy that symptoms commonly associated with PMS such as irritability, tension, fatigue, crying, headaches, and backaches appear to overlap with the physical symptoms frequently associated with stress (Chrisler, 1996).

Stress and Premenstrual Distress

PMS has been referred to as a psychoneuroendocrine stress related disorder—a stress induced disorder (Dvivedi, Dvivedi, Mahajan, Mittal, & Singhal, 2008). Women with premenstrual symptoms have been found to experience higher levels of both daily stress and life stress (Girdler et al., 1998; Golding, Taylor, Menard, & King, 2000; Paddison et al., 1990; Thomas & Narayanan, 2006; Woods et al., 1994). Additionally, the level of serum cortisol (a steroid hormone released in response to stress) is significantly higher in women with PMS than in women with no symptoms of PMS (Dvivedi, Dvivedi, Kaur, 2011).

Women with high PMS report lower quality of life and significantly higher stress than women with low PMS (Lustyk, Widman, Paschane, & Ecker, 2004). Among US active duty women, overall job stress was among the most significant predictors of premenstrual symptoms (Hourani, Yuan, & Bray, 2004). Family and work-related stress has also been implicated as a factor that increases menstrual-related problems and alters the menstrual cycle (Hatch, Figa-Talamanca, & Salerno, 1999; Kuczmierczyk, Labrum, and Johnson, 1992). Significant positive correlations continue to be found between the severity of premenstrual symptoms and perceived stress level (Hamaideh, Al-Ashram, & Al-Modallal, 2013). Research also indicates that higher perceived stress precedes an increased severity of both premenstrual and menstrual symptoms (Gollenberg et al., 2010), providing evidence for a directional causal effect.

Some feminist scholars, who view PMS and PMDD as Western social constructs, contend that work and family stress along with poor coping strategies, history of childhood trauma, or underlying chronic conditions can accurately explain the experience of premenstrual symptoms (Chrisler & Caplan, 2002). While the majority of women experience at least one premenstrual symptom, most are still able to function normally without any significant

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impairment (Daley, 2009; Tschudin et al., 2010). However, it is evident that a relationship between premenstrual symptomatology and stress exists; and because long-term health consequences associated with stress are also evident, premenstrual symptom reports should not be trivialized.

Sadler et al. (2010) have argued that women are simply less likely to experience symptoms if they suffer less from stress. It is therefore hypothesized that higher self-perceived stress levels will be related to higher self-reported premenstrual distress levels in the current study sample.

College-Related Stress

In the university student population, time is heavily invested in academic endeavors. It is then reasonable to hypothesize that unique college-related stressors play a major role in the stress experienced by students. University course load has been shown to be a major source of stress affecting academic performance (Talib & Sansgiry, 2011). Exams and their results have been reported to be the highest causes of stress for university students; followed by studying for exams, a heavy agenda, and the large amount of material to learn (Abouserie, 1994).

College related stress is also linked to student health. Among college students, academic stress was found to be associated with poorer health outcomes of depression and physical illness (MacGeorge, Samter, & Gillihan, 2005). Compounding this issue, positive health behaviors such as exercise, nutrition, self-care, drug avoidance, and vehicle safety have previously shown to deteriorate during times of academic stress (Weidner, Kohlmann, Dotzauer, & Burns, 1996).

Recently, Cruz et al., (2013) found that almost all students report sedentary lifestyles during periods of greater academic stress; a particularly important finding given that students who meet physical activity recommendations are less likely to report poor mental health and

perceived stress (Vankim & Nelson, 2013). High levels of academic stress are also significantly related to high non-medical use of prescription drugs (NMUPD) such as stimulants, depressants, and sleeping medication (Betancourt et al., 2013). Furthermore, in investigating the strategies that students use to cope with stress, alcohol consumption has been found to be associated with academic stress (González et al., 2013).

Given the focus of this current study, it is important to note that female students report higher levels of stress than men (Abouserie, 1994); and, specifically, higher levels of academic stress (Cruz et al., 2013). Both American and international female college students display greater behavioral (e.g., crying, drug use, smoking, and irritability) and physiological reactions (e.g., sweating, stuttering, trembling, exhaustion, weight loss/gain, and headaches) to academic stressors (Misra & Castillo, 2004).

College Students, Stress, and Premenstrual Distress

Various types of chronic stress are related to premenstrual distress in college students. Psychosocial stress is a significant predictor of premenstrual distress and the experience of irregular menstrual cycles (Yamamoto et al., 2009) and of higher premenstrual severity; the latter amplified in female students with a history of abuse (Lustyk, Widman, & Becker, 2007). In a single study of Turkish students, emotional stress was shown to be a contributing factor to PMS (Erbil, Karaca, & Kiris, 2010), but the relationship between academic stress and premenstrual distress has not been extensively studied, particularly in Hispanic women.

Due to the unique stressors attending college provides, it is hypothesized that the more college-related stress students report, the higher the premenstrual distress level reports will be. Furthermore, it is hypothesized that college-related stress will add predictive power to the stress and premenstrual distress relationship among female college students.

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Stress, Sleep Quality, and Premenstrual Distress

      Stress is associated with poor sleep quality and it has been suggested that studies of stress and health may benefit from the inclusion of sleep measures (Benham, 2010). Bedtime stress and worries have been found to be a major predictor of sleep quality (Akerstedt et al., 2012) and occupational stress has been suggested as a risk factor for insomnia and shorter sleep for both men and women (Utsugi et al., 2005). Among undergraduate students, negative family life events coupled with academic stress predicted the highest levels of insomnia (Bernert et al., 2007). Women, more often than men, perceive interpersonal problems and psychological factors such as different worries and regrets, as the most frequent factors impairing falling asleep and the quality of sleep (Urponen, Vuori, Hasan, & Partinen, 1988).

      Females are at increased risk for poor sleep (Middelkoop, Smilde-van den Doel, Neven, Kamphuisen, & Springer, 1996; Schutte-Rodin, Broch, Buysse, Dorsey, & Sateia, 2008). A temporal relationship between sleep complaints and the menstrual cycle has also been noted: women with severe PMS report more daytime sleepiness and fatigue compared to when they are distress-free and when compared to women with minimal premenstrual distress (Baker & Colrain 2010; Lamarche et al., 2007; Manber & Bootzin, 1997). Women with severe PMS are particularly prone to poor sleep quality during the late-luteal phase (Baker et al., 2007; Baker et al., 2012) and poorer sleep quality is also more common during the three premenstrual days and the four initial days of menstruation in women without significant menstrual-related distress (Baker & Driver, 2004). Given this association, some have recommended mid-afternoon naps during the late-luteal phase of the woman's cycle to temporarily improve and possibly help prevent worsening of premenstrual distress (Lamarche, Driver, Forest, & De Koninck, 2010).

Given this prior research, it is hypothesized that poor sleep quality will be related to higher self-reported premenstrual distress levels. In addition, because previous stress and health research has suggested that a stress-health model can be improved by adding sleep as a predictor, it is hypothesized that poor sleep quality will add predictive power to a model that already contains self-perceived stress and college-related stress as predictors of premenstrual distress.

Overview of Hypotheses

Research on premenstrual distress has revealed the female phenomenon as multi-causal. Stress has consistently been demonstrated to be an important factor. Yet, in respect to female college students, there is a paucity of research specifically demonstrating the impact of college-related stressors. The primary purpose of this study is to determine whether higher college-related stress measures are related to higher premenstrual distress levels among female students; and, if so, whether the more germane measure of college-related stress scores among this unique female subgroup improve the predictive power of the stress-premenstrual distress model. In addition, the study will also examine whether sleep quality will further improve the model. It is hypothesized that:

1) Self-perceived stress will be positively correlated with self-reported premenstrual distress.

2) College-related stress will be positively correlated with self-reported premenstrual distress.

3) Sleep quality will be negatively correlated with self-reported premenstrual distress.

4) A regression model predicting premenstrual distress levels from self-perceived stress will be improved by the addition of college-related stress as a predictor and further improved by the subsequent addition of sleep quality as a predictor.

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CHAPTER III

METHODOLOGY

Participants

Three hundred and eighty-eight females participated in the study. Participants ranged in age from 18 to 46 years old ($M = 22.84$, $SD = 4.77$), 95.2 % were undergraduate students, and 89.5% described themselves as Hispanic.

Procedure

The researcher emailed recruitment flyers with the study's information and survey link to professors from the College of Social and Behavioral Sciences at the University of Texas-Pan American to recruit participants for extra credit. Recruitment at UTPA also included in-class announcement of study and distribution of recruitment flyers by the researcher. Additionally, the survey was made available for any female to complete through word-of-mouth and social media (i.e., Facebook posts).

Responses were collected using Qualtrics online survey software. The online survey contained questionnaires that obtained measures of premenstrual distress levels, perceived stress levels, college-related stress levels, sleep quality, and demographic information. Inclusion criteria included regular menstruation, not currently pregnant, and not currently using any method of hormonal contraception that suppresses regular menstruation. Respondents who indicated that they were not currently college students, were currently pregnant, reported having been previously diagnosed with either a sleep disorder or insomnia, or did not finish the survey

were excluded from the final analysis. These exclusions resulted in a final sample size of three hundred and twenty-five.

Measures

Shortened Premenstrual Assessment Form (SPAF)

Premenstrual distress was measured by the Shortened Premenstrual Assessment Form (SPAF) developed by Allen, McBride, and Pirie (1991). The 10-item SPAF provides an equivalent assessment to the 95-item original Premenstrual Assessment Form as evidenced by its equally strong reliability (test-retest coefficient range of .6 to .7) and validity (internal consistency coefficient of .95). The SPAF evaluates the presence or change in intensity of symptoms typical during the female reproductive premenstrual phase. The SPAF has three subscales that include affect, pain, and water retention; and uses a six-point Likert scale ranging from 'no change' (1) to 'extreme change' (6). The participants were asked to indicate the severity of their distress by the scaled number that most closely described the intensity of their premenstrual experience during their last cycle. SPAF scores range from 10 to 60. Higher SPAF scores indicate more severe symptoms, with a score greater than 30 generally indicating moderate PMS symptoms.

Perceived Stress Scale (PSS)

Stress was measured using the 10-item Perceived Stress Scale (PSS) developed by Cohen and Williamson (1988). The 10-item PSS is a revision of the published original 14-item PSS (Cohen, Kamarck, & Mermelstein, 1983) and is recommended as an adequate measure over the longer version due to a tighter factor structure and slight improvement in internal reliability (Cohen & Williamson, 1988). The 10-item PSS uses a five-point Likert scale ranging from

'never' (0) to 'very often' (4). PSS scores range from 0 to 40, with higher scores indicating more stress.

College Stress Inventory (CSI)

College related stress was measured using the College Stress Inventory (CSI) developed by Solberg, Hale, Villarreal, and Kavanagh (1993). The scale was among the first created and empirically validated for use with Latino undergraduate college students. The CSI is a 21-item instrument has three identified subscales within the measure: Academic Stress, Social Stress, and Financial Stress. It uses a five-point Likert scale from 'never' (0) to 'very often' (4). CSI total scores range from 0 to 84, with higher scores indicating more college stress.

Pittsburgh Sleep Quality Index (PSQI)

Sleep quality was assessed using the Pittsburgh Sleep Quality Index (PSQI) developed by Buysse, Reynolds, Monk, Berman, and Kupfer (1989) that provides a global measure of sleep quality. The scale consists of 19 questions based on seven components: subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleeping medication and daytime dysfunction over the last month. The items are scored on a four-point Likert scale ranging from 'not during the past month' (0) to 'three or more times a week' (3). PSQI scores range from 0 to 21, with higher scores representing worse sleep quality.

CHAPTER IV

RESULTS

Demographics

The majority of participants, 84.9%, indicated that they were not currently using any

method of hormonal birth control (e.g., oral contraceptives, contraceptive patch, etc.). More than

half, 52.9%, reported the use of over-the-counter medication for premenstrual and/or menstrual

symptoms; and only 6.5% reported the use of prescription medication for premenstrual and/or

menstrual symptoms. Table 1 provides a more detailed summary of the sample characteristics.

Correlations Between Variables

Correlations between the measured variables are presented in Table 2. All analyses were

directional and calculated as Pearson product-moment correlation coefficients with alpha set at

.05. All variables were significantly correlated with each other, in the directions hypothesized.

Premenstrual distress was positively correlated with both self-perceived and college-related

stress and negatively correlated with sleep quality (higher scores on the PSQI represent poorer

sleep quality).

Regression Analysis

A hierarchical regression analysis was conducted to examine whether adding measures of

college-related stress and sleep quality to the hypothesized stress-premenstrual distress model

would improve the predictive model. To investigate this hypothesis, self-perceived stress was

entered at the first step, college-related stress was entered at the second step, and sleep quality

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was entered at the third step. In the first step of the hierarchical regression, the results indicated that the model was statistically significant (F (1, 316) = 78.05, p < .001) with self-perceived stress explaining 19.8 % of the variance in premenstrual distress levels. In step 2, when college-related stress was added to the model, the total variance explained was 27.7% (F (2, 315) = 60.30, p < .001). The addition of the college-related stress measure explained a significantly greater proportion of the variance in premenstrual distress levels, after controlling for self-perceived stress (R^2 change = .08, F (1, 315) = 34.32, p < .001). In step 3, with the addition of sleep quality, the total variance explained by the model as a whole was 29% (F (3, 314) = 42.78, p < .001). Thus, the introduction of the sleep quality measure added a small, but statistically significant, increase in the proportion of variance in premenstrual distress levels that could be explained by the model (R^2 Change = .01, F (1, 314) = 5.88, p =.02). The final model indicated that all three predictor variables were statistically significant, with college-related stress providing a higher Beta weight (β = .28, p < .001) than self-perceived stress (β = .27, p < .001) and sleep quality (β = .13, p =.02). Results of this analysis are presented in Table 3.

Exploratory Analyses

As a supplemental analysis, we explored whether the day in the menstrual cycle in which the survey was filled out affected self-reports of self-perceived stress, college-related stress, sleep quality, and premenstrual distress. Independent t-test was performed to assess differences in scores on any of the four scales between those who filled out the measures within 2 weeks of starting menstruation versus those who filled out the measures more than 2 weeks after starting menstruation. Results indicated no difference between these two groups on any of the four measures. Results of this analysis are presented in Table 4.

Additionally, we explored whether sleeping alone vs. sleeping with a partner was associated with individuals' levels of stress, sleep quality, and premenstrual distress. Two-tailed independent t-tests indicated that individuals who slept with a partner had significantly greater premenstrual distress ($M = 34.86$, $SD = 10.16$) than participants who reported sleeping in bed alone ($M = 31.76$, $SD = 11.14$; t (323) = -2.31, $p = .02$). The groups did not differ on measures of stress or sleep quality. Results of this analysis are presented in Table 5.

Table 1.
Demographic Sample Percentages for Characteristics

Age			Number of Children		
	18 – 20	37.2%		None	85.8%
	21 – 23	37%		1	7.1%
	24 – 26	12.6%		2	3.4%
	27 – 29	5.5%		3 or More	3.7%
	30 – 32	3.1%	Class Standing		
	33 – 35	.9%		Freshmen	5.8%
	36 and Over	3.6%		Sophomore	11.4%
Ethnicity				Junior	30.5%
	African American	1.8%		Senior	48%
	Asian	3.4%		Graduate Student or Other	4.3%
	Caucasian	1.8%	Current Semester		
	Hispanic	90.2%	Hours of College	1 – 3	13.2%
	Other	2.8%	Course Load	4 – 6	25.2%
Household Income				7 – 9	7.6%
	Less than $10,000	25.5%		10 – 12	17.8%
	$10,000 - $19,999	16.7%		13 – 15	25.2%
	$20,000 - $29,999	15.4%		16 or More	10.8%
	$30,000 - $39,999	6.3%	Paid Hours of Work		
	$40,000 - $49,999	9.4%	per Week	None	38.5%
	$50,000 - $59,999	8.5%		1 – 10	9.8%
	$60,000 - $69,999	3.5%		11- 20	23.4%
	$70,000 - $79,999	4.1%		21 – 30	16.3%
	$80,000 or More	10.6%		More than 30	12%
Marital Status			Unpaid Hours of		
	Single	77.5%	Work per Week	None	49.7%
	Living with Another	8.6%		1 – 10	36.7%
	Married	10.5%		11- 20	9%
	Separated	1.5%		21 – 30	3.4%
	Divorced	1.8%		More than 30	1.2%

Table 2.
Descriptive Correlations for Study Variables

	M	SD	N	SPAF	PSS	CSI
SPAF	32.64	10.95	325			
PSS	22.91	4.68	325	.45***		
CSI	28.51	14.19	325	.47**	.49***	
PSQI	6.65	3.64	318	.32***	.30***	.39***

Note: SPAF = the Shortened Premenstrual Assessment Form; PSS = the Perceived Stress Scale; CSI = the College Stress Inventory; PSQI = the Pittsburgh Sleep Quality Index.
***p< .001

Table 3.
Hierarchical Regression Analysis for Predicting Premenstrual Distress Levels

Predictor	R	R^2	ΔR^2	F	df	B	β weight
Step 1:							
PSS	.45	.20	.20***	78.05	1, 316	.62***	.27***
Step 2:							
CSI	.53	.28	.08***	60.30	2, 315	.21***	.28***
Step 3:							
PSQI	.54	.29	.01*	42.78	3, 314	.38*	.13*

Note: PSS = the Perceived Stress Scale; CSI = the College Stress Inventory; PSQI = the Pittsburgh Sleep Quality Index.
*p<.05, ***p<.001

Table 4.
Results of t-test and Descriptive Statistics by Time Between Starting Menstruation and Filling in Survey

	Within 2 weeks			Later than 2 weeks			95% CI for Mean Difference		
	M	*SD*	*N*	*M*	*SD*	*N*		*t*	*df*
PSS	23.25	5.28	128	22.96	4.01	156	-.83, 1.41	.51	233
CSI	29.70	14.90	128	27.52	15.50	156	-1.27, 5.62	1.24	282
PSQI	6.80	3.89	127	6.71	3.36	151	-.76, .95	.22	276
SPAF	32.83	11.56	128	32.75	10.62	156	-2.52, 2.67	.06	282

Note: PSS = the Perceived Stress Scale; CSI = the College Stress Inventory; PSQI = the Pittsburgh Sleep Quality Index; SPAF = the Shortened Premenstrual Assessment Form.

Table 5.

Results of t-test and Descriptive Statistics by Presence or Absence of Bed Partner

| | Group | | | | | | 95% CI for Mean | | |
| | Sleep Alone | | | Sleep With Partner | | | Difference | | |
	M	*SD*	*N*	*M*	*SD*	*N*		*t*	*df*
PSS	22.82	4.80	233	23.15	4.36	92	-1.47, .80	-.58	323
CSI	27.75	14.31	233	30.45	13.76	92	-6.13, .73	-1.55	323
PSQI	6.50	3.45	226	7.04	4.07	92	-1.43, .34	-1.22	316
SPAF	31.76	11.14	233	34.86	10.16	92	-5.73, -.46	-2.31*	323

Note: PSS = the Perceived Stress Scale; CSI = the College Stress Inventory; PSQI = the Pittsburgh Sleep Quality Index; SPAF = the Shortened Premenstrual Assessment Form.

*p<.05

CHAPTER V

DISCUSSION

Previous research shows that stress is an important predictor of premenstrual distress levels, however little research addresses the relationship of specific college-related stress among female college students. The present study explored this issue by analyzing the impact self-perceived stress has on premenstrual distress levels and testing whether college-related stress reported by students improves the predictive relationship. Furthermore, the study examined the additional contribution of sleep to the predictive relationship.

In the present study, higher levels of self-perceived stress reported were found to be associated with higher levels of premenstrual distress levels. This relationship was also observed by Lustyk, Beam, Miller, and Olson (2006), who found that a positive relationship between self-perceived stress and premenstrual distress levels in a university sample, by Thomas and Narayanan (2006), who found a positive correlation between life-stress and premenstrual distress, and by Deuster, Adera, and South-Paul (1999), who found that stress was the strongest predictor for PMS after controlling for biological, social, and behavioral factors in women.

Students' reports of college-related stress were also found to be positively related to premenstrual distress levels in the current sample. This is a particularly important finding, given that the specific impact of college stress on premenstrual complaints has not been widely studied. Our findings support those of a recent investigation of adolescent girls in India that demonstrated

a correlation between premenstrual distress and the number of academic projects and presentations due (Padmavathi, Sankar, & Kokilavani, 2014).

Although the independent correlations between self-perceived stress and premenstrual distress and between college stress and premenstrual distress were almost identical, allowing each to independently predict approximately 20% of the variance in premenstrual distress scores, the hierarchical regression analysis suggests that the two stress measures are not simply measuring the same thing. Adding college stress to the initial stress-distress regression model allows one to predict premenstrual distress more accurately, accounting for an additional 8% of the variance in distress scores. College students experience a unique cluster of stressors (Garrett, 2001) that more generalized stress measures may not adequately assess, therefore it may be important to consider the supplementation of general stress scales with this targeted measure to more accurately quantify college students' stress levels. Both measures examined the frequency with which participants experienced the listed items "during the last month", but the college stress scale asked participants to enumerate financial, academic, and social difficulties (such as taking exams) whereas the perceived stress scale asked more general questions about feeling nervous and stressed, feeling unable to cope, and controlling irritations. The results do not suggest that college stress is a better predictor of premenstrual distress than general stress measures (the independent correlations were comparable), but its addition to a multivariate model appears to add predictive power.

Sleep quality was shown to be negatively associated with premenstrual distress levels but the strength of the correlation was less than that demonstrated by either of the stress measures, independently accounting for 10% of the variance in premenstrual distress. Nonetheless, sleep quality did prove to be significantly associated with premenstrual distress; a relationship that has

been previously demonstrated in the literature. Shao, Chou, Yeh, and Tzeng, (2010) found that poor sleep quality was related to premenstrual dysphoria and that sleep disturbances commonly occur during the premenstrual time not only for women diagnosed with PMS, but for women in general (Mauri, Reid, & MacLean, 1988). One of the aims of this study was to examine whether sleep quality might add to the predictive power of a stress-premenstrual distress model. The small, but statistically significant, increase in R^2 demonstrated in our model after adding sleep quality, indicates that this variable significantly improved the model's ability to predict premenstrual distress over and above that which can be predicted by self-perceived stress and college stress. In other words, sleep quality is a significant predictor of a woman's premenstrual distress even after having controlled for her level of self-perceived stress and college stress.

All three predictors (self-perceived stress, college-related stress, and sleep quality) contributed significantly to the final model jointly accounting for 29% of the variance in reported premenstrual distress. Such results support previous findings of a multi-causal phenomenon (Campagne & Campagne, 2007). As proposed by Benham (2010), inadequate sleep might be conceptualized as a form of physiological stress that, alongside other stressors, has a negative impact on health. Thus, the final model presented in the current study might best be thought of as a stress-health model that integrates three qualitatively different measures of stress as predictors of premenstrual distress. While the model accounts for a respectable 30% of the variability in premenstrual distress, this leaves another 70% accounted for by other factors. Future research should build upon this stress-premenstrual distress model by examining other contributing variables. For example, there is evidence that certain personality factors, such as neuroticism (Taylor, Fordyce, & Alexander, 1991) and Type-A personality (Thomas and Narayanon, 2006), may be predictive of the level of self-reported premenstrual symptoms.

Although not part of the original hypothesis, exploratory analyses revealed an interesting difference in premenstrual distress tied to the presence or absence of a partner in bed. Women who indicated that they slept in bed with a partner reported significantly higher premenstrual distress levels than women who slept alone. While one might be tempted to ascribe this difference to poorer sleep, there were no significant differences in sleep quality between these two groups.

In summary, self-perceived stress, specific college-related stress, and sleep quality were all significantly related to premenstrual distress levels. The three predictors did not account for all variance in premenstrual distress levels, but these factors did account for almost 1/3 of the variance—a sizable proportion to bear in mind when addressing high premenstrual complaints.

Limitations and Future Directions

As with all research, we recognize that our study suffers from a number of limitations. The current sample was predominately Hispanic. Thus, while this demographic is traditionally underrepresented in research, our findings may not be generalizable to other populations. A selection bias in the sample may also be present. Females with higher premenstrual distress levels may be more interested in participating in the current study than females with lower distress levels, which could lead to selection bias. It should also be noted that the large majority of students participated in the study in return for extra credit in their college courses. Extra credit need may be driven by low performance in a course—thus participants with higher academic stress due to lower grades may have been more inclined to participate.

Another limitation of this study is the retrospective self-report design for assessing premenstrual distress levels, stress, and sleep quality. It has been argued that participants may

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either over- or under-estimate the degree to which they were affected by their premenstrual changes (Endicott & Halbreich, 1982), but other researchers have defended the reliability and validity of retrospective self-reports in premenstrual distress research (Hart, Coleman, & Russell, 1987). Similarly it can be argued that the degree of estimation for stress and sleep quality may be compromised by inaccurate memory recall. In line with our own findings, prior research has shown self-reports of sleep disturbances to be common in women with high levels of premenstrual distress, but research that uses physiological polysomnographic measures has shown inconsistent associations (e.g., Baker et al., 2007). In general terms, the current study suffers from the problem of common methods' variance because both the predictor and dependent variables are based on self-reports provided during a single online survey administration session. Future research would benefit from the incorporation of both self-report and physiological measures, such as the assessment of the stress hormone cortisol and electroencephalographic measures of sleep, though these benefits must always be balanced against the attendant increases in research time and costs.

Our study found no differences in premenstrual distress between women who had begun menstruation within the two week period prior to taking the survey and those who had taken the survey more than two weeks after beginning menstruation. The date of participation in our study and reported date of last start of menstruation allowed for a crude calculation to be examined. On account of the average menstrual cycle being 28 days long (Widmaier Raff, Strang, & Vander, 2010), the sample was split into two groups; group 1 consisted of those students who participated in the survey within two weeks (i.e., 14 days) of the first day of their menstrual cycle (i.e., first day of last menstruation) and group 2 consisted of those students who participated after the two-week (i.e., 15+ days) time frame. However, exact menstrual cycle lengths were not

known for the sample and, although 28 days is the average, normal cycles can vary from 21-35 days (Widmaier et al., 2010). Furthermore, women under 25 years of age have the highest variability of menstrual cycle lengths (Chiazze, Brayer, Macisco, Parker, Duffy, 1968). Thus, future research would benefit from collecting self-reported menstrual cycle lengths and, if possible, an assessment of the exact phase of participants' menstrual cycle (i.e., follicular and luteal).

The cross-sectional methodology used in this study does not allow us to make causal attributions regarding the impact of stress and sleep on premenstrual symptomology, however, the study presents a reasonable preliminary examination towards understanding the relationships among these variables in female students and their predictive utility.

Conclusions

The current study offers empirical support for the notion that it is essential to consider stress when studying premenstrual distress. Moreover, it demonstrates the importance of specifically examining college-related stress; female students experience stressors unique to the academic environment that, in turn, can contribute to their overall state of chronic stress.

The results suggest that high premenstrual distress complaints may be partially driven by other important health issues. Thus, health care providers simply relying on medically treating the specific complaints of premenstrual distress may be neglecting underlying contributing factors that carry their own health risks, such as high stress and poor sleep quality; factors that women may not be addressing as actively as their premenstrual distress. Health practitioners are urged to consider engaging in frank discussions about the impact different stressors have on the premenstrual experience and the benefits that stress reduction exercises might convey.

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APPENDIX A

APPENDIX A

SHORTENED PREMENSTRUAL ASSESMENT FORM (SPAF)

For each of the symptoms below, circle the number that most closely describes the intensity of your premenstrual symptoms <u>during your last cycle</u>. These are symptoms that would occur during the premenstrual phase of your cycle. This phase begins about seven days prior to menstrual bleeding (or seven days before your period) and ends about the time bleeding starts. Rate each item on this list on a scale from 1 (not present or no change from usual) to 6 (extreme change, perhaps noticeable even to casual acquaintances).

	1=No change				Extreme change=6	
1. Pain, tenderness, enlargement or swelling of breasts	1	2	3	4	5	6
2. Feeling unable to cope or overwhelmed by ordinary demands	1	2	3	4	5	6
3. Feeling under stress	1	2	3	4	5	6
4. Outburst of irritability or bad temper	1	2	3	4	5	6
5. Feeling sad or blue	1	2	3	4	5	6
6. Backaches, joint and muscle pain, or joint stiffness	1	2	3	4	5	6
7. Weight gain	1	2	3	4	5	6
8. Relatively steady abdominal heaviness, discomfort or pain	1	2	3	4	5	6
9. Edema, swelling, puffiness, or water retention	1	2	3	4	5	6
10. Feeling bloated	1	2	3	4	5	6

Total Score ____

(Note: A score greater than 30 generally indicates moderate PMS symptoms; the more severe the symptoms, the higher the score.)

Used with permission. Allen, S., McBride, C., & Pirie, P. (1991). The shortened premenstrual assessment form. *The Journal of Reproductive Medicine, 36*(11), 769-772.

APPENDIX B

APPENDIX B

PERCEIVED STRESS SCALE (PSS)

Perceived Stress Scale- 10 Item
The questions in this scale ask you about your feelings and thoughts during the last month. In each case, please indicate with a check how often you felt or thought a certain way.

1. In the last month, how often have you been upset because of something that happened unexpectedly?
___0=never   ___1=almost never   ___2=sometimes   ___3=fairly often   ___4=very often

2. In the last month, how often have you felt that you were unable to control the important things in your life?
___0=never   ___1=almost never   ___2=sometimes   ___3=fairly often   ___4=very often

3. In the last month, how often have you felt nervous and "stressed"?
___0=never   ___1=almost never   ___2=sometimes   ___3=fairly often   ___4=very often

4. In the last month, how often have you felt confident about your ability to handle your personal problems?
___0=never   ___1=almost never   ___2=sometimes   ___3=fairly often   ___4=very often

5. In the last month, how often have you felt that things were going your way?
___0=never   ___1=almost never   ___2=sometimes   ___3=fairly often   ___4=very often

6. In the last month, how often have you found that you could not cope with all the things that you had to do?
___0=never   ___1=almost never   ___2=sometimes   ___3=fairly often   ___4=very often

7. In the last month, how often have you been able to control irritations in your life?
___0=never   ___1=almost never   ___2=sometimes   ___3=fairly often   ___4=very often

8. In the last month, how often have you felt that you were on top of things?
___0=never   ___1=almost never   ___2=sometimes   ___3=fairly often   ___4=very often

9. In the last month, how often have you been angered because of things that were outside of your control?
___0=never   ___1=almost never   ___2=sometimes   ___3=fairly often   ___4=very often

10. In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?
___0=never   ___1=almost never   ___2=sometimes   ___3=fairly often   ___4=very often

APPENDIX C

APPENDIX C

COLLEGE STRESS INVENTORY (CSI)

In the last month, how often have you experienced….

1. Difficulty trying to fulfill responsibilities at home and at school.
___0=never   ___1=almost never   ___2=sometimes   ___3=fairly often   ___4=very often

2. Difficulty trying to meet peers of your race/ethnicity on campus.
___0=never   ___1=almost never   ___2=sometimes   ___3=fairly often   ___4=very often

3. Difficulty taking exams.
___0=never   ___1=almost never   ___2=sometimes   ___3=fairly often   ___4=very often

4. Difficulty finding support groups sensitive to your needs.
___0=never   ___1=almost never   ___2=sometimes   ___3=fairly often   ___4=very often

5. A fear of failing to meet family expectations.
___0=never   ___1=almost never   ___2=sometimes   ___3=fairly often   ___4=very often

6. Difficult participating in class.
___0=never   ___1=almost never   ___2=sometimes   ___3=fairly often   ___4=very often

7. Difficulty living in the local community.
___0=never   ___1=almost never   ___2=sometimes   ___3=fairly often   ___4=very often

8. Difficulty handling relationships.
___0=never   ___1=almost never   ___2=sometimes   ___3=fairly often   ___4=very often

9. Difficulty handling your academic workload.

___0=never ___1=almost never ___2=sometimes ___3=fairly often ___4=very often

10. Difficulty with peers treating you unlike they treat each other.
___0=never ___1=almost never ___2=sometimes ___3=fairly often ___4=very often

11. Difficulty writing papers.
___0=never ___1=almost never ___2=sometimes ___3=fairly often ___4=very often

12. Difficulty paying student fees next quarter.
___0=never ___1=almost never ___2=sometimes ___3=fairly often ___4=very often

13. Financial difficulties due to owing money.
___0=never ___1=almost never ___2=sometimes ___3=fairly often ___4=very often

14. Difficulty paying rent.
___0=never ___1=almost never ___2=sometimes ___3=fairly often ___4=very often

15. Difficulty paying for food.
___0=never ___1=almost never ___2=sometimes ___3=fairly often ___4=very often

16. Difficulty paying for recreation and entertainment.
___0=never ___1=almost never ___2=sometimes ___3=fairly often ___4=very often

17. Difficulty due to your family experiencing money problems.
___0=never ___1=almost never ___2=sometimes ___3=fairly often ___4=very often

18. Difficulty meeting deadlines for course requirements.
___0=never ___1=almost never ___2=sometimes ___3=fairly often ___4=very often

19. Difficulty because of feeling a need to preform well in school.
___0=never ___1=almost never ___2=sometimes ___3=fairly often ___4=very often

20. Difficulty from faculty on the basis of your ethnicity.
___0=never ___1=almost never ___2=sometimes ___3=fairly often ___4=very often

21. Difficulty from peers on the basis of your ethnicity.
___0=never   ___1=almost never   ___2=sometimes   ___3=fairly often   ___4=very often

Used with permission. Solberg, V. S., Hale, J. B., Villarreal, P., & Kavanagh, J. (1993). Development of the college stress inventory for use with hispanic populations: a confirmatory analytic approach. *Hispanic Journal of Behavioral Sciences, 15*(4), 490–497.

APPENDIX D

APPENDIX D

PITTSBURGH SLEEP QUALITY INDEX (PSQI)

INSTRUCTIONS:
The following questions relate to your usual sleep habits during the past month <u>only</u>. Your answers should indicate the most accurate reply for the <u>majority</u> of days and nights in the past month.

Please answer all questions.
1. During the past month, what time have you usually gone to bed at night?
       BED TIME _____
2. During the past month, how long (in minutes) has it usually taken you to fall asleep each night?
       NUMBER OF MINUTES _____
3. During the past month, what time have you usually gotten up in the morning?
       GETTING UP TIME _____
4. During the past month, how many hours of actual sleep did you get at night? (This may be different than the number of hours you spent in bed.)
       HOURS OF SLEEP PER NIGHT _____

For each of the remaining questions, check the one best response. Please answer <u>all</u> questions.
5. During the past month, how often have you had trouble sleeping because you . . .

    a) Cannot get to sleep within 30 minutes
    Not during the   Less than   Once or twice   Three or more
       past month _____   once a week _____   a week _____   times a week _____

    b) Wake up in the middle of the night or early morning
    Not during the   Less than   Once or twice   Three or more
       past month _____   once a week _____   a week _____   times a week _____

    c) Have to get up to use the bathroom
    Not during the   Less than   Once or twice   Three or more
       past month _____   once a week _____   a week _____   times a week _____

    d) Cannot breathe comfortably

Not during the   Less than   Once or twice   Three or more
    past month _____   once a week _____   a week _____   times a week _____

    e) Cough or snore loudly

Not during the   Less than   Once or twice   Three or more
    past month _____   once a week _____   a week _____   times a week _____

    f) Feel too cold

Not during the   Less than   Once or twice   Three or more
    past month _____   once a week _____   a week _____   times a week _____

    g) Feel too hot

Not during the   Less than   Once or twice   Three or more
    past month _____   once a week _____   a week _____   times a week _____

    h) Had bad dreams

Not during the   Less than   Once or twice   Three or more
    past month _____   once a week _____   a week _____   times a week _____

    i) Have pain

Not during the   Less than   Once or twice   Three or more
    past month _____   once a week _____   a week _____   times a week _____

    j) Other reason(s), please describe_____
    _____

       How often during the past month have you had trouble sleeping because of this?

Not during the   Less than   Once or twice   Three or more
    past month _____   once a week _____   a week _____   times a week _____

6. During the past month, how would you rate your sleep quality overall?
       Very good   _____
       Fairly good   _____
       Fairly bad   _____
       Very bad   _____

7. During the past month, how often have you taken medicine to help you sleep (prescribed or "over the counter")?

Not during the   Less than   Once or twice   Three or more
    past month _____   once a week _____   a week _____   times a week _____

8. During the past month, how often have you had trouble staying awake while driving, eating meals, or engaging in social activity?

Not during the past month	_____	Less than once a week	_____	Once or twice a week	_____	Three or more times a week	_____

9. During the past month, how much of a problem has it been for you to keep up enough enthusiasm to get things done?

        No problem at all   _____
        Only a very slight problem   _____
        Somewhat of a problem   _____
        A very big problem   _____

10. Do you have a bed partner or room mate?

        No bed partner or room mate   _____
        Partner/room mate in other room _____
        Partner in same room, but not same bed _____
        Partner in same bed   _____

If you have a room mate or bed partner, ask him/her how often in the past month you have had . . .

   a) Loud snoring

Not during the past month	_____	Less than once a week	_____	Once or twice a week	_____	Three or more times a week	_____

   b) Long pauses between breaths while asleep

Not during the past month	_____	Less than once a week	_____	Once or twice a week	_____	Three or more times a week	_____

   c) Legs twitching or jerking while you sleep

Not during the past month	_____	Less than once a week	_____	Once or twice a week	_____	Three or more times a week	_____

   d) Episodes of disorientation or confusion during sleep

Not during the past month	_____	Less than once a week	_____	Once or twice a week	_____	Three or more times a week	_____

   e) Other restlessness while you sleep; please describe _____

_____

Not during the past month	_____	Less than once a week	_____	Once or twice a week	_____	Three or more times a week	_____

Buysse,D.J., Reynolds,C.F., Monk,T.H., Berman,S.R., & Kupfer,D.J. (1989). The Pittsburgh Sleep Quality Index (PSQI): A new instrument for psychiatric research and practice. *Psychiatry Research, 28*(2), 193-213.

BIOGRAPHICAL SKETCH

Sara Julia Gonzalez completed her Master's degree in Experimental Psychology with a concentration in Applied Behavior Analysis at the University of Texas-Pan American in July 2014. She graduated *cum laude* with a Bachelor of Science in Psychology and a Bachelor of Arts in Anthropology from the University of Texas-Pan American in May 2011. She is a member of Psi Chi the International Honor Society in Psychology.

Ms. Gonzalez plans on taking her certification exam in November 2014 to become a board certified behavior analyst. She looks forward to working in the field of behavior analysis and plans to possibly apply to a doctoral program in the future. Her current residence is in the Texas' Rio Grande Valley and she can be reached at the following email address, sarajuliagonzalez@gmail.com.