
RELATIONSHIPS AMONG PERCEIVED STRESS, PREMENSTRUAL SYMPTOMATOLOGY AND SPIRITUAL WELL-BEING IN WOMEN

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Research demonstrates that psychological and physiological outcomes are impacted positively by spirituality. Yet, spirituality may also exacerbate the impact of stressors. In order to assess the relationships among spirituality, premenstrual symptomatology (PMS) and stress in women, we performed the following survey of 145 females. Participants completed a measure of PMS symptoms, perceived stress and spiritual well-being. Our findings indicated that increases in spiritual well-being were positively related to PMS and stress endorsement. Furthermore, spiritual well-being served as a partial mediator between stress and PMS. As women who scored the highest on spirituality measures also had the highest PMS endorsement, women of Christian faith may benefit from heightened self-care practices surrounding stress management.

As of late, investigators studying the relationships among stress, health and well-being in women have come to include measures of spiritual well-being in their analyses (e.g., Daaleman, Cobb & Frey, 2001; Tanyi & Werner, 2003; Targ & Levine, 2002; Wenzel, Donnelly & Fowler, 2002). This shift away from a secular approach to studying health and well-being has been motivated in part by the high percentage of people that believe in God. According to the 2004 Gallup poll, researchers found that 90% of Americans reported believing in God (Gallup Organization, 2005). Given this

widespread belief, it follows that the majority of Americans recognize that spirituality is influential. Therefore, to get a complete and accurate understanding of what it means to be a healthy person, one must include an assessment of those aspects of self that transcend what it means to be a physical being. This includes the spiritual or faith-based aspect of self, and that part of a person which provides a sense of meaning or ultimate purpose in life, which is the existential aspect of self.

The importance of this multidimensional approach to the study of well-being was detailed by Craig W. Ellison as he developed the Spiritual Well-Being Scale (Ellison, 1983). Including a measure of both religious and existential well-being, the Spiritual Well-Being Scale was introduced in an effort to provide researchers with a tool for measuring aspects of self previously deemed too difficult to study empirically. This methodological advancement has allowed researchers to reveal much about the importance of faith/spirituality in the physical and mental health of persons. Specifically, researchers have demonstrated significant positive relationships between faith/spirituality and cardiovascular health as well as outcomes of cancer patients (Powell, Shahabi, & Thoresen, 2003), and that faith/spirituality mediates the perception of stress (Maynard, Gorsuch, & Bjork, 2001) as well as symptoms of depression and anxiety (Young, Cashwell & Shcherbakova, 2000). Furthermore, in studies of stress-related factors researchers have delineated specific outcomes resulting from various stressors. Strawbridge, Shema, Cohen, Roberts and Kaplan (1998) found that religiosity (defined as occurrence of prayer and church attendance as well as the subjective importance of faith based beliefs)

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buffered associations between stressors not specifically dependent on family, such as neighborhood problems, financial problems, and illness with depression. These investigators also found that religiosity exacerbated the effect of family stressors such as marital problems, care giving and child-related problems on depression.

Findings such as these which indicate that faith/spirituality can exacerbate negative aspects of well-being raises methodological questions as generally, research yields a positive relationship between religiosity/spirituality and mental health (for review see Hackney & Sanders, 2003). Studies performed to answer these questions have demonstrated that the positive relationship depends greatly on the religious or spiritual dimension being measured. For instance, spiritual dimensions such as church attendance positively correlate with subjective well-being, less depression, and less behavioral risk factors (Mitchell & Weatherly, 2000; Plante & Sherman, 2001). When religious/spiritual factors such as religious strain or negative religious coping are measured, researchers found a negative relationship with mental health, that is, more stress and depression are reported. In a study where religiously devout college students participated in an assessment of emotional adjustment, Richards (1991) found that students who reported that they were religiously devout were not found to be more depressed or to have less purpose and meaning in life than nontraditionally religious students. However, there is no evidence provided that suggests being religious improves one's mental health, or whether religious students experienced more purpose and meaning in life than non-religious students.

Schumaker (1992) argued that the ritualistic aspect of religion offers benefits to one's mental health. Yet it is possible that the responsibilities that come with being a person of faith could introduce stress in one's life. If stress management coping is not already practiced, some may experience an increase in stress-related health problems. This may, in part, explain the negative findings relating spirituality and mental health in women reported by Helm, Berecz and Nelson (2001). These researchers reported that as adherence to religious fundamentalism increased, a significant decrease in the degree of one's sense of pride was evident. Yet, the picture is not clear as Bridges and Spilka (1992) reported that college women who are religiously active are less anxiety prone than those that are not religiously active.

Taken together, the findings relating spirituality and well-being in women generate more questions than provide answers. An aspect of women's health with profound religious implication that has not been directly addressed in the literature is the cluster of physical and mental changes related to the women's reproductive cycle known as premenstrual syndrome (PMS). Simoni & Ortiz (2003) found that spirituality induced stress especially when it was associated with fatalistic reinterpretation of illness as a punishment for prior misdeeds. Monthly menstruation and the PMS symptom cluster immediately preceding this event may certainly fall under this category. Christian women who attend regular religious services in which scripture is read and discussed, may be reminded that menstruation is a result of living in a fallen world (Genesis 3:16, *New International Version Study Bible*). Even sermons which address the healing power of Jesus can be influenced by negative images for women as with story of the hemorrhaging woman in Mark 5:25-34 (*New International Version Study Bible*). It may be that women of faith may experience more stress according to the theory proposed by Simoni and Oritz (2003). Hughes (2004) writes of a tendency in Western cultures to view sickness, suffering and negative life-events as the will of God, as a result of His anger or a punishment. Here again, for women of faith, the negativity and even bothersome act of menstruation may spark a feeling of having done wrong. A better understanding here requires direct assessment of stress, well-being and premenstrual symptomatology in women.

Therefore, our purpose was to investigate the relationships among perceived stress, PMS and spiritual well-being in women. Our aim was to assess whether women who feel a strong sense of spiritual well-being tended to feel less stress and fewer premenstrual symptoms, or conversely, if women who feel a strong sense of spiritual well-being feel more stress and worse premenstrual symptoms.

METHOD

Participants

Following approval from the University Institutional Review Board (IRB), our research team recruited a convenience sample of 145 women from several courses taught throughout the University to participate in our survey.

Measures

(1) *Demographic Questionnaire*. We generated a demographic questionnaire which assessed participant age, gender and religious affiliation.

(2) *Perceived Stress*. Each participant completed the Perceived Stress Scale (Cohen, Kamarack & Mermelstein, 1983). This ten-item questionnaire assessed an individual's appraisal of stress over the previous month. Participants rated how often they experience unpredictable situations, and/or feel a lack of control over or inadequate time to complete things important to them on a 5-point Likert scale which ranges from (0) "never felt or thought that way" to (4) "very often felt or thought that way". We obtained a perceived stress summary score by reverse-scoring the four positively stated items and calculating a sum across all items. This provided a score range from 0 to 40. Cohen and Williamson (1988) reported that in a U.S. sample of 2,387 individuals, the mean score for women 18-29 years was 14.2 ± 6.2 and the internal consistency .78 with construct validity ranging from .26 to .39.

(3) *Premenstrual Symptomatology (PMS)*. Each participant completed the shortened premenstrual assessment form (SPAF) as an indicator of PMS. The SPAF (Allen, McBride & Pirie, 1991) measures magnitude of premenstrual symptoms. This questionnaire provides a list of symptoms associated with the premenstrual phase of the menstrual cycle. Participants respond to the listed symptom by indicating a change in severity ranging from (1) "not present at all or no change from the usual level" to (6) "extreme change". To score this questionnaire we calculated an overall sum ranging from 10-60. This 10-item questionnaire also gives rise to three subscales, including measures of pain, affect and water retention. Possible scores on these subscales include 3-18 points for pain, 4-24 points for affect and 3-18 for water retention. Allen, et al. generated the SPAF from the original 95-item Premenstrual Assessment Form developed by Halbreich, Endicott, Schacht, and Nee (1982). Allen, et al. demonstrated that the SPAF provides the same assessment of premenstrual symptomatology as the original assessment tool, as shown through its equally strong reliability (test-retest coefficient range from .6 to .7) and validity (internal consistency coefficient of .95). In their study of 217 regularly cycling women, these researchers reported a score range from 10-60 with an approximate mean of 30.

(4) *Spiritual Well-Being*. Participants completed the Ellison Spiritual Well-Being scale (Ellison, 1983). By responding to a 6-point Likert scale ranging from (1) "strongly disagree" to (6) "strongly agree", participants provided a measure of both existential and religious well-being. Of the twenty items which make up this scale, 10 items measure existential well-being and 10 items religious well-being. The existential component has two combined sub-factors related to life direction and satisfaction. Religious well-being is assessed by participant agreement ratings to items such as "I believe that God loves me and cares about me" and "I don't get much personal strength and support from my God." To score this scale, we reverse scored the negatively worded items and generated an overall sum with higher scores representing higher spiritual well-being. Next, we summed the odd-numbered items as a measure of religious well-being and the even numbered items as a measure of existential well-being. Possible scores on the Spiritual Well-Being Scale range from 20 to 120 with half (10-60) measuring religious well-being and the other half measuring existential well-being. In a sample of 117 college students from the University of Idaho, Bufford, Paloutzian and Ellison (1991) reported mean scores for the 50 students classifying themselves as evangelical Christians as 53.70 ± 6.32 on Religious Well-Being, 49.54 ± 5.50 for Existential Well-Being, and 104.26 ± 9.46 for overall Spiritual Well-Being. Test-retest reliability coefficient was .93 for spiritual well-being, .96 for religious well-being and .86 for existential well-being. The internal consistency (alpha) was .89 for spiritual well-being, .87 for religious well-being, and .78 for existential well-being. Furthermore, Bufford, et al. reported good face validity for this tool with predicted correlations to other scales with similar assessment factors (see Bufford et al. for details).

Procedure

After receiving permission from the instructor, we made an announcement indicating our interest in having women complete a series of questionnaires about their faith and health. We read aloud a brief summary of our purpose along with the expected length of time it would take to complete the survey. After addressing questions we left packets containing the questionnaires along with an IRB approved consent in the classroom for students to pick up. Participants were allowed to complete the surveys on their

TABLE 1
Means, Standard Deviations and Possible Score Ranges for PMS, Spiritual Well-Being and Perceived Stress.

Measure	Possible Score Range	Calculated Mean (SD)
Premenstrual Symptomatology		
Summary Score	10-60	26.7 (9.3)
Pain	3-18	7.8 (3.4)
Affect	4-24	11.4 (4.2)
Water Retention	3-18	7.5 (3.5)
Spiritual Well-Being		
Summary Score	20-120	39.8 (14.5)
Religious Well-Being	10-60	18.8 (10.3)
Existential Well-Being	10-60	20.9 (6.5)
Perceived Stress		
Summary Score	0-40	17.3 (6.7)

TABLE 2
Correlations among PMS, perceived stress, and spiritual well-being (N = 145).

	Religious Well-being (WB)	PMS	Stress	Spiritual WB
PMS	.25*			
Stress	.29*	.33*		
Spiritual WB	.92*	.29*	.43*	
Existential WB	.47*	.26*	.50*	.78*

* $p < .005$

own time and with complete privacy. Participants returned the completed surveys to a collection box placed in their classroom which allowed for complete anonymity. Research team members collected the returned packets the next day the class met.

RESULTS

The majority of the participants identified themselves as Caucasian (93%) between 18 and 21 years of age (92%). Ninety four participants identified themselves as a non-denominational Christian (65%), 24 identified as Presbyterian (17%), ten as Methodist (7%), six as Lutheran (4%), and eight as Roman Catholic (5%). Three participants (2%) failed to complete the religious affiliation portion of the demographic questionnaire. All 145 participants

completed all portions of the remaining scales except for two participants, who chose not to complete the Premenstrual Assessment Form.

Means, standard deviations and possible score ranges for PMS, stress and spiritual well-being are summarized in Table 1. As can be seen, change in affect was the most highly endorsed premenstrual symptom.

Correlation coefficients were computed among perceived stress, PMS and spiritual well-being. As shown in Table 2, all of the correlations were significant once the Bonferroni correction for Type I error inflation was applied and a p value of .005 used for determining statistical significance. Furthermore, all of the correlations were in the positive direction indicating that not only is an increase in stress related to an increase in PMS, so too is it related to an

Figure 1a. Mediation Model.

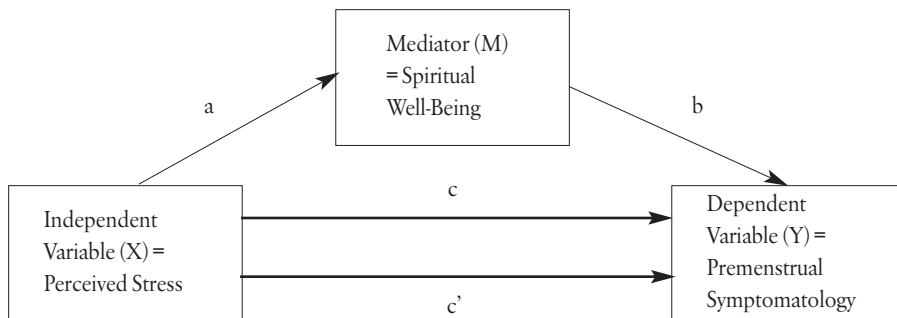
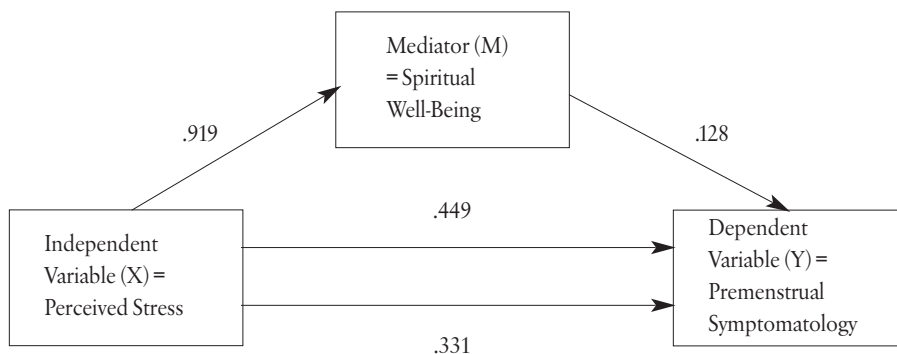


Figure 1b. Mediation Model with Data Values.



increase in religious, existential, and overall spiritual well-being reports.

To determine if spiritual well-being mediated the relationship between stress and PMS, three simultaneous multiple regression analyses were performed in accordance with the Baron and Kenney method (1986). The first equation combined stress as the independent variable with PMS as the dependent variable. The second equation combined spiritual well-being (the suspected mediator) as the independent variable and PMS as the dependent variable. The final equation included both stress and spiritual well-being as predictors of PMS. The model summarizing these relationships is depicted in Figure 1a. As can be seen in Table 3, stress predicted premenstrual symptomatology in all three regression analyses. Yet a drop to $c' = .331$ from $c = .449$ was also observed. Given this, a direct test of the mediation model was performed using the Sobel test. The mediation model along with path coefficients for this study is depicted in Figure 1b. Utilizing the equation: $z' = a *$

$b / \sqrt{(a^2 * s_b^2 + b^2 * s_a^2)}$, analyses revealed a z value of 2.207 with a 95% confidence interval of .013 to .222. As zero was not in the interval, results are statistically significant. Use of an online interactive calculation tool revealed a p value of .027 (Preacher & Leonardelli, 2003). Yet it is important to point out that, as shown in Table 3, the adjusted effect of stress on PMS is significant with only 26.2% of the effect of stress on PMS being due to the mediator, spiritual well-being (proportion mediated = ab / c). Collectively these findings suggest that spiritual well-being does not completely mediate the relationship between stress and premenstrual symptomatology but rather serves as a partial mediator.

DISCUSSION

Our purpose was to determine whether women who felt a strong sense of spiritual well-being tended to feel less stress and fewer premenstrual symptoms than women with lesser spiritual well-being, or conversely, if women who felt a strong sense of spiritual

TABLE 3

Mediation Analyses of Perceived Stress and PMS with Spiritual Well-Being as the Mediator.

Regression (DV)	B	p	R ²	Adj. R ²
Regression 1 (PMS)				
<i>F</i> (1, 145) = 16.54, <i>p</i> < .0001				
Stress	.45	.0001	.10	.10
Regression 2 (Spiritual Well-Being)				
<i>F</i> (1, 145) = 29.48, <i>p</i> < .0001				
Stress	.92	.0001	.17	.16
Regression 3 (PMS)				
<i>F</i> (2, 145) = 11.42, <i>p</i> < .0001				
Stress	.33	.006		
Spiritual Well-Being	.13	.018		

well-being felt more stress and worse premenstrual symptoms. Our results revealed a significant positive relationship among all variables assessed. Specifically, women reporting the highest levels of spiritual, existential and religious well-being also reported the highest levels of stress and the most severe premenstrual symptoms. Furthermore, mediation analysis revealed spiritual well-being as a partial mediator between stress and premenstrual symptomatology.

These findings are striking in light of recent reports suggesting a supportive or enhancing effect of spiritual well-being on health-related measures (Bridges & Spilka, 1992; Hackney & Saunders, 2003). One plausible explanation for these results lies in the very nature of Christian faith for women worldwide. Women of faith are taught from a young age that they will be reminded monthly of the gift God has given them in their ability to bare a child. Yet the joy of that gift is tempered by the simultaneous cyclical punishment that a woman lives out in a fallen world; that punishment being menstruation. Being more in tune with this, when asked to recall menstrual symptoms and perceived stress, a woman of faith may provide amplified responses rather than blunted responses.

If one looks to history, being a person of faith has provided a lifestyle challenge. These challenges were likely stressful for believers. One could argue then that being a person of faith adds a degree of stress to one's life as does many forms of responsibility. This is not a negative thing per se, but rather one that requires recognition and life adjustment in order to accommodate this added responsibility. As an individual with a

high powered and time demanding career knows to engage in self-care behaviors aimed at managing stress levels, so too should a woman of Christian faith.

While this was not a prospective study, the direction of the relationship between these variables may be inferred from the nature of the wording of the Spiritual Well-Being scale. Participants rated their feelings toward and satisfaction with their faith and their lives. They are not asked about extrinsic faith measures such as the amount of time spent in prayer. It may be that increases in stress or premenstrual symptomatology lead to increases in extrinsic measures of faith, however in this study of spiritual well-being, women rated their symptoms and stress as poorer the more satisfied and positive they felt about their spirituality. Thus, these findings suggest that women are associating their faith with these psychophysiological aspects of self in such a way that would suggest that faith or spiritual well-being does not improve these outcomes but rather calls a person of faith to greater self care.

It is important to note that the women in this study were primarily of traditional college age (i.e., 18-21 years of age). It is possible that the level of spiritual maturation plays a role in these findings. A study in which lifespan stage and perception of spiritual development are also considered in the analyses would be helpful in teasing out this concern.

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