



A Correlational Study Between Attachment Behaviors and Spiritual Health with Stress in Pregnant Women Referred to Healthcare Centers in Qazvin, Iran, in 2015

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Abstract

Background: Prenatal stress causes negative health outcomes for the mother and fetus. Hence, investigating coping strategies is essential to reduce such negative effects.

Objectives: The current study aimed to investigate the correlation between attachment behaviors and spiritual health with stress during pregnancy.

Methods: In this cross-sectional study, 200 pregnant women referred to the health centers affiliated to Qazvin University of Medical Sciences in 2015 are studied. Participants were selected using the multi-stage sampling technique. Data were collected using Paloutzian & Ellison's Spiritual Well-Being Scale, Cranley's Maternal-Fetal Attachment Scale, the Pregnancy Stress Scale, and a researcher-made questionnaire consisting of demographic and midwifery information. Data were analyzed by SPSS version 20 using Pearson's correlation coefficient and the multivariate linear regression analysis.

Results: The mean scores for spirituality, attachment behaviors, and prenatal stress were 104.15 ± 10.59 , 95.91 ± 8.9 , and 88.92 ± 36.93 , respectively. A positive weak correlation was spotted between attachment and stress ($P = 0.02$, $r = 0.15$), and spiritual health was found to have a negative, weak but significant association with the financial status ($P < 0.001$, $r = -0.22$) and personal-family ($P = 0.03$, $r = -0.14$) subscales of stress. No significant correlation was observed between spiritual health and the total score of stress ($P > 0.05$).

Conclusion: This study demonstrated that maternal-fetal attachment was correlated with prenatal stress while spiritual health was not correlated with prenatal stress; however, spiritual health could predict some subscales of stress.

Keywords: Attachment, Maternal-Fetal Spiritual, Pregnancy, Stress

1. Background

Pregnancy is a critical time in a woman's life (1). About 16.5 to 74% of women experience stress in their first pregnancy (2). Salari et al. (2005) reported that 16.7 and 13.6% of mothers suffered from severe and mild stress, respectively (3). According to the literature, prenatal stress causes epigenetic changes that have lasting effects on the health of both mother and fetus during childbirth and after pregnancy (4). The theory of psychological stress mentioned stress as negative life events related to some social factors that affect people's mental and physical health (5).

Prenatal stress and anxiety cause the mother's inappropriate responses to the fetus during pregnancy. Women

use various coping strategies to control prenatal stresses, in which maternal-fetal attachment is a common choice (6). Maternal-fetal attachment refers to the emotional and affective experiences between pregnant women and the fetus (7). The maternal-fetal attachment includes a wide range of behaviors such as talking to the fetus and stroking and touching the abdomen, which may start at the beginning of the pregnancy when feeling the first fetal movements or during the initial ultrasound. This attachment gradually increases with gestational age, particularly as the mother feels an enhanced frequency of fetal movements (8).

Delavari et al. (2018) reported increased levels of

maternal-fetal attachment behaviors during the third trimester that the fetus movements are significantly higher (9). Attachment behaviors such as talking, touching, and thinking about the fetus can calm the mother, and daily repetition of these behaviors helps to reduce the activity of the sympathetic nervous system, which in turn is useful for avoiding unwanted thoughts (10). Findings regarding the association between attachment behaviors and prenatal stress are contradictory. So, Hee & Young (2015) reported a negative association between maternal-fetal attachment and prenatal stress (11). While Mi-Kyung et al. (2011) reported no association between maternal-fetal attachment and stress and depression (12).

Spiritual health is a key concept in coping with the stress caused by diseases and adaptation to problems and ailments (13). Iranian women regard pregnancy as a divine gift (14). Zareipour et al. (2016) displayed a high level of the spiritual health of pregnant Iranian women (13). Evidence regarding the effect of spiritual health on stress are contradictory. Goncalves et al. (2015) reported a negative association between spiritual and religious interventions with stress (15). Zareipour et al. (2016) also found lower levels of perceived stress in diabetic women with high levels of spiritual health (16), but in the study by Powers et al. (2007), spirituality was found to not predict any aspect of affective well-being, including stress (17).

2. Objectives

Prenatal stress causes several negative consequences for the mother and fetus. Hence, identifying effective coping strategies to reduce prenatal stress has a major role in improving maternal and fetal outcomes. According to what was mentioned before and regarding the mentioned gap in the literature, the current study aimed to investigate the correlation between attachment behaviors and spiritual health with stress during pregnancy.

3. Methods

3.1. Design and Setting

In this cross-sectional study, 200 pregnant women referred to health centers affiliated to Qazvin University of Medical Sciences in 2015 are studied. Participants were selected using a multi-stage sampling technique. So, initially, the city of Qazvin was divided into three districts. Then, cluster sampling was performed. Two clusters were selected at random from district one, three clusters from district two, and one from district three. The participants were distributed according to the number of people presenting to the health centers. In the third stage, purposive sampling was continually performed for three months.

Using the following formula, which is specially designed for descriptive-correlational studies, and by considering a statistical power of 0.8, the minimum sample size was determined at 196. However, we increased the sample size to 200.

$$n \geq \left[\frac{z_{1-\frac{\alpha}{2}} + z_{1-\beta}}{0.5 \times \ln \left[\frac{1+r}{1-r} \right]} \right]^2 + 3 \quad (1)$$

$$r = 0.20$$

$$\alpha = 0.05, Z_{1-\alpha/2} = 1.96$$

$$\beta = 0.20, Z_{1-\beta} = 0.84$$

3.2. Inclusion and Exclusion Criteria

The study inclusion criteria were being Iranian, at least primary school education, being 18 - 35 years old, being pregnant, having a gestational age of 28 - 42 weeks, having intended their pregnancy (both father and mother), undergoing at least one ultrasound during gestation (to evaluate fetal health), and having single healthy embryo. The exclusion criteria consisted of failing to respond or incompleteness of the questionnaire and unwillingness to participate.

3.3. Data Collection Tools

Data were collected using the Paloutzian & Ellison's Spiritual Well-Being Scale (SWS), Cranley's Maternal-Fetal Attachment Scale, the Pregnancy Stress Scale, and a researcher-made questionnaire consisting of demographic and midwifery information. The personal-demographic scale consisted of three sections of personal points, pregnancy points, and history of chronic diseases.

The Spiritual Well-Being Scale (Paloutzian and Ellison, 1982) contains 20 items that are divided into two dimensions of religious health and existential health (18). The scores of each dimension range from 10 to 60. Hence, the total score of spirituality ranges from 20 to 120. The score was divided into three categories of 20 - 40 (low), 41 - 99 (moderate), and 100 - 120 (high). The Persian version of SWS has been used in studies by Zareipour et al. (2016), Riazi et al. (2017), and other studies, and its reliability has been confirmed with a Cronbach's alpha of 0.76 and 0.8 (16, 19), respectively. In this study, the reliability of the scale was verified by a Cronbach's alpha of 0.85 and a test-retest coefficient of 0.78.

Cranley's Maternal-Fetal Attachment Scale (MFA) is a 24-item scale. The MFA consists of five sub-scales of interaction with fetus, differentiation of self from fetus, role taking, attributing characteristics to fetus, and giving of self. This scale was first used by Cranley in 1981, and its validity was confirmed (20). Firstly, it was translated into Persian

by Khoramroodi, and its validity and reliability were verified by the content validity and test-retest ($r = 0.83$) methods (21). The Persian version of this scale has been used by Mehran et al. (2013), and Delavari et al. (2018), and its reliability is confirmed with a Cronbach's alpha of 0.83 and 0.76 (9, 22), respectively. In the present study, the score of maternal-fetal attachment was categorized into low (24-56 points), moderate (57 - 88), and high (89 - 120). Its validity was also confirmed using qualitative face validity. The reliability of MFA was evaluated using Cronbach's alpha ($\alpha = 0.88$). The Pregnancy Stress Scale (Salari et al., 2015) contains 51 items which are categorized into six domains, including other people's notion of the person (seven items) and his/her financial status (three items), religious (five items), environmental (seven items), personal-family (six items), and health (23 items). Its validity and reliability are confirmed by the content validity method and with a Cronbach's alpha of 0.75 (3). In the current study, the reliability of this scale was verified by a high internal consistency ($\alpha = 0.87$) and also with the test-retest method ($r = 0.81$).

3.4. Ethical Considerations and Statistical Analysis

The current research was performed following permission from the Qazvin University of Medical Sciences (ethical compliance code: 116.636). After explaining the objectives of the study, participants were ensured about the confidentiality of the data. Besides, they were informed that they can withdraw from the study at any time. After presenting their verbal satisfaction and under the guidance of the questioner, all participants filled the questionnaires in a private setting and in a self-report manner.

Firstly, the Kolmogorov-Smirnov test was applied to test for a normal distribution. Then, parametric tests (i.e., multivariate linear regression analysis and Pearson's correlation coefficient) were applied to investigate the correlation between variables. Data were analyzed by SPSS version 20. Statistical significance was considered when P -value < 0.05 .

4. Results

All participants filled the four questionnaires completely. Most of them were younger than age 23 (24%), had a high school diploma (42%), and were pregnant for the second time (42%). The mean age and mean gestational age of participants were, respectively, 27.45 ± 4.63 years and 33.09 ± 3.76 weeks. The mean total score of spiritual health was calculated as 104.15 ± 10.59 , and 69.5% of the subjects had a high, and 30.5% had moderate spiritual health. The mean score of maternal-fetal attachment was 95.91 ± 8.9 , and 65.5% of the participants had a high, and 34.5% had

a moderate attachment. The mean total score of prenatal stress was 88.92 ± 36.93 , and 33% of the subjects had mild stress, 56% moderate, and 11% high stress. The mean scores of spiritual health, attachment behaviors, and prenatal stress, separated by their subscales, are presented in Table 1.

Pearson's correlation test revealed a positive, weak, but significant correlation between maternal-fetal attachment and stress ($P = 0.02$, $r = 0.15$). Besides, we found a positive, significant association between attachment and the subscales of stress as well as between stress and the subscales of attachment. Spiritual health was found to have a weak, negative but significant association with the financial ($P < 0.0001$, $r = -0.22$) and personal-family ($P = 0.03$, $r = -0.14$) subscales of the stress. No significant correlation was observed between spiritual health and the total score of stress ($P > 0.05$). The correlation between stress and its dimensions with attachment and spiritual health is provided in Table 2.

According to the results of the regression analysis, maternal-fetal attachment and its 'giving of self' domain and also spiritual health could significantly predict prenatal stress ($P < 0.05$). For every one-unit increase in the attachment score and 'giving of self' score, the score of maternal stress increased by 0.15 and 0.25, respectively. On the other hand, each unit of increase in spirituality score reduced the stress by 0.16. According to the Beta value, which shows the approximate importance of the independent variable in predicting the dependent variable, the 'giving of self' score had the highest impact on increasing prenatal stress (Table 3).

5. Discussion

This study intended to investigate the correlation between attachment behaviors and spiritual health with stress in pregnancy. The results showed that a stronger maternal-fetal attachment was associated with an increase in maternal stress and exacerbated stress in the domains of 'other people's notion of the person', 'religion' and 'health'. An increase in the 'giving of self' subscale of attachment was associated with increased prenatal stress, which is consistent with findings of Chang et al. (2016), which showed that depression and maternal-fetal attachment could predict psychosocial stress in pregnant women (23). Moreover, Allison et al. (2011) showed high anxiety in pregnant women undergoing invasive prenatal diagnostic techniques was associated with high maternal-fetal attachment (24); however, these findings are not in line with the study by Hee & Young (2015), Kwon & Bang (2011), and Moe et al. (2018), which showed that an increased maternal-fetal attachment reduced stress and anx-

Table 1. The Mean Scores of Stress, Attachment Behavior, and Spiritual Health of Participants

Variable	Mean (SD)	Range of Attained Scores	Range of Available Scores to Gain
Stress			
Other people's notion of the person	12.21 (7.57)	28 - 0	28 - 0
Financial	4.11 (3.63)	12 - 0	12 - 0
Religious	8.98 (5.05)	20 - 0	20 - 0
Environmental	11.99 (6.43)	28 - 0	28 - 0
Personal - family	6.86 (4.86)	21 - 0	24 - 0
Health	44.76 (18.10)	85 - 1	92 - 0
Total score	88.92 (36.93)	176 - 12	204 - 0
Attachment behavior			
Interaction with the fetus	17.41 (2.02)	20 - 9	20 - 4
Differentiation of self from the fetus	20.21 (2.38)	25 - 13	25 - 5
Role - taking	24.66 (2.71)	30 - 17	30 - 6
Attributing characteristics to fetus	15.5 (2.5)	20 - 9	20 - 4
Giving of self	18.13 (2.79)	25 - 10	25 - 5
Total score	95.91 (8.9)	120 - 69	120 - 24
Spiritual health			
Religious health	51.92 (5.65)	60 - 28	60 - 10
Existential health	57.3 (6.36)	60 - 32	60 - 10
Total score	104.15 (10.59)	120 - 61	120 - 20

Table 2. The Correlation of Stress with Maternal-Fetal Attachment and Spiritual Health^a

Spiritual health and attachment	Stress	Other People's Notion of the Person	Financial	Religious	Environmental	Personal-Family	Health
Interaction with the fetus	-0.03	-0.06	0.20**	0.09	-0.00	-0.13	0.02
Differentiation of self from the fetus	0.10	0.06	-0.05	0.16*	0.08	0.01	0.13
Role-taking	0.05	0.04	-0.13	0.16*	-0.02	-0.06	0.09
Attributing characteristics to the fetus	0.13	0.14*	0.02	0.10	0.05	0.06	0.13
Giving of self	0.25**	**0.27	0.04	0.12	0.17*	0.23**	0.24**
The total score of attachment	0.15*	*0.14	-0.08	0.18**	0.08	0.03	0.18**
Religious health	-0.16*	*-0.14	-0.22**	-0.07	-0.15*	-0.17*	-0.00
Existential health	-0.06	-0.10	-0.20	0.05	-0.08	-0.10	-0.00
The total score of spiritual health	-0.11	-0.13	-0.22**	-0.01	-0.11	-0.14*	-0.05

^a* P < 0.05, ** P < 0.01.

iety (11, 12, 25). The discrepancy in the reported results can be attributed to demographic characteristics of participants of various studies as well as the difference in health systems of various countries. Also, special attention should be paid to the inclusion criteria of studies. For example, 17% of the samples in the current study had a poor, and 58.5% of them had a moderate to poor financial status,

so a poor financial status can probably be considered a contributing factor to stress; but, the samples in Hee & Young's research were in different situations. Rossen et al. (2016) also showed that stress in pregnancy was inversely correlated with poorer mother-infant bonding at eight weeks postnatally (26). The present findings support the hypothesis that women with a greater fetal attachment experi-

Table 3. The Linear Regression of Predicting Prenatal Stress Based on Spiritual Health and Maternal-Fetal Attachment^a

Variable	R ²	F	B Standardized Coefficient	P Value
Attachment behavior	0.024	4.897	0.155	0.028*
Interaction with the fetus	0.001	0.175	-0.030	0.677
Differentiation of self from the fetus	0.011	2.243	0.106	0.136
Role-taking	0.003	0.560	0.053	0.455
Attributing characteristics to the fetus	0.017	3.394	0.130	0.067
Giving of self	0.067	14.205	0.259	0.000**
Spiritual health	0.013	2.707	-0.116	0.102
Religious health	0.028	5.629	-0.166	0.019*
Existential health	0.004	0.833	-0.065	0.362

^a* P < 0.05, ** P < 0.01.

ence greater stress and anxiety about pregnancy and their unborn infant, while mothers with lower levels of attachment experience less prenatal anxiety and stress (27, 28).

These results show that higher spiritual health reduces the stress of pregnant women concerning financial and personal-family subscales. Meanwhile, Powers et al. (2007) reported that spirituality could not predict any aspect of affective well-being (17). This contradiction can be explained by noting the differences between these two studies', particularly the study populations. In the study by Powers et al., all participants were students that have a different level of stress and spiritual perspective compared to pregnant women; it seems that pregnancy is a great opportunity for submerging in spirituality or renewing spiritual connections. The findings of the present study showed that religious health could predict prenatal stress, which is in line with Jung (2014), who showed an interaction between religious attendance and stress in women (29). Lucero et al. (2013) also showed that spirituality is a strong predictor of reduced stress in pregnant women (30). Moreover, Goncalves et al. (2015) showed that spiritual interventions could reduce stress (15). Zareipour et al. (2016) also showed that perceived stress was lower in women with high levels of spiritual health (16). Spiritual health and religious practices and behaviors, such as praying to God, resorting to a greater power, and saying prayers, help to adapt to the changes of pregnancy as well as reducing the resultant stress. Pregnant women's perceived stress and the spiritual dimension of health are different in various cultures. Hence, caution should be taken when generalizing the findings to other contexts.

According to the results, most of the participants experienced high to moderate maternal-fetal attachment. A previous study displayed that most of the pregnant women showed high maternal-fetal attachment behaviors

(9). This study showed that most of the samples had high to moderate spiritual health. Also, other studies reported that more than half of the pregnant women had high spiritual health (13, 17). Pregnancy is a sensitive period for broadening or renewing feelings about spirituality that help to protect the mother against negative outcomes of pregnancy changes. Spiritual beliefs create some positive effects such as meaning and purpose in pregnancy (31). According to the findings of the present study, more than half (67%) of the pregnant women had moderate to high levels of stress, which is consistent with the results of a study conducted in 2012, in which 94% of the women had low to moderate stress and 6% suffered from high levels of stress (32).

5.1. Limitations and Suggestions

The current study had limitations, including not investigating factors that can mediate between stress, spiritual health, and attachment, such as the mother's adaptation and self-esteem. Therefore, the authors recommend investigating these factors in future studies, including adaptation and self-esteem. Given the cross-sectional nature of this research, a similar study should be conducted in a longitudinal form from the beginning to the end of pregnancy to compare the pregnancy outcomes based on the trimesters to find how maternal-fetal attachment and spiritual health affect maternal stress. Interventional studies are also recommended to be conducted to investigate the effect of spiritual therapy on stress and attachment behaviors as well as the effect of higher attachment on pregnant women's mental health.

5.2. Conclusion

This study demonstrated a correlation between maternal-fetal attachment and prenatal stress, while

spiritual health was not correlated with prenatal stress; however, spiritual health was could predict certain subscales of stress. Therefore, regarding the importance of the mental health of pregnant women, health policymakers are recommended to pay further attention to spiritual health and maternal-fetal attachment behaviors while providing midwifery care.

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Footnotes

Authors' Contribution: Study concept and design: Haji Rafiei and Dr. Zahran. Analysis and explanation of data: Haji Rafiei and Dr. Hajian. Drafting of the manuscript: Haji Rafiei. The final revision of the manuscript for important intellectual content: Dr. Hajian and Dr. Zahran. Statistical analysis: Dr. Alavi Majd.

Conflict of Interests: None declared.

Ethical Approval: The current study was verified by the Ethics Committee of the Shahid Beheshti University of Medical Sciences (No. 116.636, dated 11 June 2014).

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Informed Consent: The participants were briefed on the study objectives, confidentiality of the data and the right to withdraw from the study at any stage. After submitting their verbal consent, the participants completed the questionnaires in a self-report manner in a private setting under the guidance of the questioner.

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