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# Relationships between spiritual health and perceived stress with breastfeeding adequacy in mothers with infants aged 1–6 months

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## Abstract:

**BACKGROUND:** Previous studies have shown that psycho-spiritual state of mothers may have significant effects on their breastfeeding. The most common cause of nonexclusive breastfeeding is inadequate breastfeeding; therefore, this study examined the relationship between spiritual health and perceived stress with breastfeeding adequacy in mothers with infants aged 1–6 months.

**MATERIALS AND METHODS:** This cross-sectional, descriptive, correlational study was performed on 186 mothers with infants aged 1–6 months, who referred to the health centers in Dorud city of Lorestan province, Iran, in 2021, which were selected based on cluster sampling. Data were collected through four questionnaires including demographic–fertility, spiritual health, perceived stress, and breastfeeding adequacy. Data was analyzed by Statistical Package for the Social Sciences (SPSS) software version 22 using descriptive and analytical statistics.

**RESULTS:** The mean  $\pm$  standard deviation (SD) values of spiritual health, perceived stress, and breastfeeding adequacy were  $99.59 \pm 12.96$ ,  $23.8 \pm 72.19$ , and  $55.67 \pm 7.67$ , respectively. There was a significant positive relationship between spiritual health and breastfeeding adequacy ( $P < 0.001$ ,  $r = 0.268$ ). In addition, there was a significant negative relationship between perceived stress and breastfeeding adequacy ( $P = 0.002$ ,  $r = -0.231$ ).

**CONCLUSION:** Breastfeeding adequacy has a significant positive relationship with spiritual health and a significant negative relationship with perceived stress. Since infants are one of the most vulnerable groups and breastfeeding is the best way to support their health and reduce infant mortality rates, breastfeeding adequacy can be improved by reducing stress and promoting spiritual health.

## Keywords:

Breastfeeding Adequacy, Iran, perceived stress, spiritual health

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## Introduction

Maintaining and promoting the health of children in all physical, mental, social, and spiritual aspects requires proper nutrition, timely prevention of diseases, reduction of psychological stress, creating and strengthening psycho-emotional relationship, and education. The inevitable importance of breastfeeding in the health and well-being of mother and infant is widely accepted around the world.<sup>[1]</sup> Exclusive

breastfeeding in the first 6 months of life and its continuation with complementary foods for at least 12 months is an important strategy to improve public health, reduce infant mortality and complications in the mother, and control the cost of health care.<sup>[1,2]</sup> The World Health Organization and the United Nations Children's Fund (UNICEF) recommend that all infants should be exclusively breastfed until the age of 6 months, and that breastfeeding should be continued with complementary foods

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until the age of 2 years.<sup>[2]</sup> Breastfeeding has also been mentioned with special importance in Islamic teachings and the Holy Quran several times (including Chapter 2: Verse 233, Chapter 46: Verse 15, Chapter 31: Verse 14, Chapter 4: Verse 23, Chapter 65: Verse 6, Chapter 22: Verse 2, and Chapter 28: Verse 7 and 12).<sup>[3]</sup> According to the latest studies, the rate of exclusive breastfeeding by 6 months is 37% in low-income countries and less than 20% in developed countries.<sup>[4]</sup> In Iran, the goals of exclusive breastfeeding have not been achieved satisfactorily as the rate of exclusive breastfeeding at 6 months is 53.13% and in urban areas is 47.79%.<sup>[5]</sup>

Some studies have assessed the successes and failures of the breastfeeding promotion program in Iran<sup>[6,7]</sup> and showed that the most important reason for discontinuity of breastfeeding is the misconception of Iranian mothers about the signs of breastfeeding adequacy, their mental feeling of breastfeeding inadequacy, and their concern about breastfeeding inadequacy to meet the needs of infants, which is usually diagnosed by themselves based on infants' too much crying, not sleeping, and changing their nutrition patterns.<sup>[8,9]</sup> In a study on 63,071 Iranian mothers with infants in the Integrated Monitoring Evaluation System Survey (IMES), the most important reasons for discontinuation of exclusive feeding in infants under 6 months were doctor's recommendation (54%) and breastfeeding inadequacy (28%).<sup>[6]</sup>

Successful breastfeeding depends on many physiological and psychological factors in mothers.<sup>[10]</sup> Considering that women's psychological issues are very important in their breastfeeding process, assessing the psychological health of breastfeeding mothers in terms of perceived stress and spiritual health as important indicators is essential.<sup>[11]</sup> Stress as a physiological response to physical and psychological needs and threats is an important and influential risk factor in human life.<sup>[12]</sup> Intensity of perceived stress shows how serious the issue of stress is for the individual, and perceived stress is a significant factor to select the coping methods by people in stressful situations.<sup>[13]</sup> The mother's coping style against perceived stress affects her breastfeeding success.<sup>[14]</sup>

Spiritual health is another important dimension of health and one of the significant predictors of human health outcomes that helps people adapt to stresses and crises.<sup>[15]</sup> The people who have good spiritual health have an open-minded and holistic approach in their life and they can act more flexible in dealing with their surrounding problems.<sup>[16]</sup> Today, the importance of spiritual health and its impact on various aspects of health has been revealed in most countries of the world,<sup>[17]</sup> and in recent years, spiritual health has been accepted as a dimension of human health, along with physical, psychological, and social aspects.<sup>[18]</sup> There are contradictions in the results of

numerous studies on the relationship between spiritual health and psychological health components (including perceived stress). For example, one study showed that without spiritual health, other biological, psychological, and social dimensions cannot function properly or reach their maximum capacity.<sup>[19]</sup> Also, some studies show that having religious commitment and healthy religious functions based on inner spirituality has a significant positive relationship with physical health, psychological health, and coping with stressors.<sup>[20,21]</sup> In contrast, in another study, no significant relationship was observed between spiritual health and perceived stress.<sup>[22]</sup>

Despite extensive educational programs to promote breastfeeding, the question of "why programs have not made significant progress" has remained unanswered. The question is why there is a gap between our knowledge and what is actually happening, and what we can do. The process of breastfeeding, especially persistence and continuance of breastfeeding, is influenced by demographic, physical, social, and psychological variables. Considering that previous studies have shown that factors such as spiritual health and perceived stress have significant effects on the quality and quantity of a person's performance<sup>[11]</sup> and that the most common cause of nonexclusive breastfeeding is breastfeeding inadequacy,<sup>[6]</sup> and also, since no study has been published about the relationship between spiritual health and perceived stress with breastfeeding adequacy yet and Iran is currently at the onset of increasing the number of births by adopting a policy of encouraging childbearing, this study aimed to assess the relationship between spiritual health and perceived stress with breastfeeding adequacy in mothers with infants aged 1–6 months, who referred to comprehensive health centers in Dorud city.

## Materials and Methods

### Study design and setting

The present study is a correlational, descriptive, cross-sectional study conducted in Dorud city, Iran, in 2021.

### Study participants and sampling

Statistical population included mothers with infants 1–6 months of age. Inclusion criteria were mothers having infants 1–6 months of age, not pregnant, exclusive or combined breastfeeding pattern, no history of psychological disorders requiring treatment, no history of sudden and serious stress in the past 6 months, and willingness to collaborate in the study. The exclusion criterion was not completing the questionnaires completely. According to a previous studies in this field,<sup>[11]</sup> the number of samples in this study was calculated to be 186.

In this study, the health centers were selected nonrandomly based on cluster sampling from three clusters including five comprehensive health centers, six urban health centers, and seven rural health centers of Dorud city. Two comprehensive health centers, two health centers, and three rural centers that have many referrals were selected. The participants were selected by convenience sampling method in each center. Sampling was done, so that the number of participants in these three clusters was equal.

### Data collection tool and technique

Data were collected using four questionnaires including demographic–fertility questionnaire, spiritual health questionnaire, perceived stress questionnaire, and breastfeeding adequacy questionnaire. The spiritual health questionnaire, developed by Pulitzine and Ellison, consists of 20 items in two dimensions including religious health (10 items) and existential health (10 items). The items were scored on a 6-point Likert scale ranging from strongly disagree (1) to strongly agree (6). The score of each dimension ranges from 10 to 60, and the total score of the questionnaire ranges from 20 to 120; a higher score indicates higher spiritual health. Alah Bakhshian *et al.*<sup>[23]</sup> confirmed the content validity of the scale after translating it into Persian. Also, its reliability was confirmed with Cronbach’s alpha coefficients of the total questionnaire and its dimensions were between 0.84 and 0.91.

Perceived stress questionnaire, developed by Cohen *et al.* in 1983<sup>[24]</sup>, contains 14 items scored on a 5-point Likert scale ranging from never (0) to always (4). The total score of the questionnaire is 0–56, and higher score means having higher perceived stress. The cutoff point for perceived stress was considered 28. The validity of this questionnaire was confirmed in the study of Asghari *et al.*<sup>[25]</sup> by factor, structural, and content analysis. Its reliability was confirmed by Cronbach’s alpha of 0.84.

The breastfeeding adequacy questionnaire based on mothers’ viewpoints was developed based on the results of a qualitative study. This questionnaire has 14 items scored on a 5-point Likert scale from strongly agree (5) to strongly disagree (1). The total score of this questionnaire is 14–70. A score of 14–42 means inadequate breastfeeding and 43–70 means adequate breastfeeding. In the Kohan and Heidari’s study, the validity of this questionnaire was confirmed using content validity and reliability was confirmed by acceptable Cronbach’s alpha coefficient (0.90).<sup>[26]</sup>

After the study was approved by the university, the researcher went to the selected centers of Dorud city for data collection. The participants were selected based on the inclusion criteria out of the mothers who referred

to the centers for health care or vaccination. After the participants signed the informed written consent form, the questionnaires were completed by them in the presence of the researcher. If the mother was illiterate, the questionnaire was completed by the researcher.

The data were analyzed using descriptive and analytical statistics by Statistical Package for the Social Sciences (SPSS) software version 20. Analytical statistics included Pearson and Spearman’s correlation coefficient, analysis of variance, and multiple regression. A significance level for all tests was considered to be 0.05.

### Ethical consideration

The research was approved by the ethics committee of Isfahan University of Medical Sciences (IR.MUI.RESEARCH.REC.1400.056). In addition, the questionnaires were anonymous and informed written consent was obtained from all participants. Also, the mothers were allowed to leave the study at any stage if they wished, without any consequences. The completion of the questionnaires was conducted in a quiet and private environment, following the health protocols (using masks, gloves, social distance, etc.).

## Results

The main purpose of the present study was to assess the relationship between spiritual health and perceived stress with breastfeeding adequacy in mothers with infants 1–6 months of age, who referred to selected health centers of Dorud city. One hundred and eighty-six mothers filled the questionnaires completely and entered the statistical analysis. The mean age of the mothers and fathers was  $28.82 \pm 5.82$  and  $33.37 \pm 6.23$  years, respectively. Demographic and fertility characteristics of the participants are shown in Table 1.

The results showed that the mean  $\pm$  standard deviation (SD) values of total score of mothers’ spiritual health and its two dimensions including the religious health and the existential health were  $99.59 \pm 12.96$ ,  $52.6 \pm 33.03$ , and  $47.26 \pm 8.18$ , respectively. Also, spiritual health was at an average level in 87 mothers (46.8%) and at a high level in 99 mothers (53.2.2%).

Also, the results showed that the mean  $\pm$  SD of the mothers’ perceived stress was  $23.72 \pm 8.19$ . Moreover, the stress was perceived at an average level in 121 mothers (65.1%) and at a high level in 65 mothers (34.9%). The results indicated that the mean  $\pm$  SD of the mothers’ breastfeeding adequacy was  $55.67 \pm 7.67$ . In addition, breastfeeding was inadequate in 12 mothers (6.5%) and adequate in 174 mothers (93.5%).

The findings revealed significant positive relationships between the mothers’ breastfeeding adequacy with

**Table 1: Demographics and fertility characteristics of the study participants**

Variables	n	%
Mother's education level		
Illiterate	7	3.80
Primary school	48	25.80
High school diploma	97	52.20
University degree	34	18.30
Father's education level		
Illiterate	7	3.80
Primary school	47	25.30
High school diploma	91	48.90
University degree	41	22.00
Mother's job		
Employed	176	94.60
Housewife	10	5.40
Father's job		
Employee	19	10.20
Worker	59	31.70
Self-employed	93	50.00
Jobless	15	8.10
Economic situation		
Income less than expenses	121	65.10
Income equal to expenses	63	33.90
Income more than expenses	2	1.10
Number of pregnancies		
1	62	33.30
2	68	36.60
3	33	17.70
4-8	23	12.40
Number of deliveries		
1	69	37.10
2	69	37.10
3	32	17.20
4-8	16	8.60
Number of live children		
1	71	38.20
2	67	36.00
3	33	17.70
4-6	15	8.10
History of abortion		
Yes	35	18.80
No	151	81.20
Method of the last delivery		
Vaginal delivery	120	64.50
Cesarean	66	35.50
Age of infant (months)		
1-2	74	39.80
3-4	50	26.90
5-6	62	33.30
Wanted or unwanted pregnancy		
Wanted	155	83.30
Unwanted	31	16.70
Sex of infant		
Boy	107	57.50
Girl	79	42.50
History of infertility		

Contd...

**Table 1: Contd...**

Variables	n	%
Yes	9	4.80
No	177	95.20
Total	186	100.00

their spiritual health ( $P < 0.001$ ,  $r = 0.268$ ) and its dimensions of religious health ( $P = 0.008$ ,  $r = 0.195$ ) and existential health ( $P < 0.001$ ,  $r = 0.281$ ). Moreover, there was a significant negative relationship between mothers' breastfeeding adequacy and their perceived stress ( $P = 0.002$ ,  $r = -0.231$ ) [Table 2].

Also, Pearson correlation coefficient revealed significant negative relationships between mothers' perceived stress and their spiritual health ( $P < 0.001$ ,  $r = -0.391$ ), religious health ( $P < 0.001$ ,  $r = -0.254$ ), and existential health ( $P < 0.001$ ,  $r = -0.435$ ) [Table 3]

In addition, one-way analysis of variance showed that the mean score of mothers' breastfeeding adequacy was significantly related to their education level. Also, the mean score of breastfeeding adequacy in illiterate mothers or the ones with elementary education was significantly higher than that of mothers with high school diploma and university education ( $P = 0.019$ ). The independent *t*-test showed that the mean score of breastfeeding adequacy in mothers with an income less than expenses was significantly higher than that of mothers with income equal to or more than expenses ( $P = 0.021$ ). There were no significant relationships between the score of breastfeeding adequacy with other demographic and fertility characteristics.

Moreover, Spearman's correlation coefficient indicated significant negative relationships between spiritual health and the number of childbirth ( $P = 0.02$ ,  $r = -0.171$ ) and the number of live children ( $P = 0.03$ ,  $r = -0.157$ ). But there were no significant relationships between spiritual health and other demographic and fertility characteristics. Also, no significant relationships were observed between the perceived stress and the demographic and fertility characteristics.

Multiple regression model was used to investigate the simultaneous relationship between mothers' breastfeeding adequacy with spiritual health, perceived stress, demographic, and fertility characteristics. For this purpose, the breastfeeding adequacy score entered the model as a dependent variable. Also, spiritual health, perceived stress, and the demographic and fertility variables that had significant relationships with breastfeeding adequacy at  $P = 0.1$ , based on previous tests, were considered as independent variables and entered the model. The results of regression model showed that the independent variables could significantly

**Table 2: The relationship between spiritual health and perceived stress with breastfeeding adequacy**

Variables	Breastfeeding adequacy	
	Pearson correlation coefficient	P
Spiritual health	0.268	<0.001
Religious health dimension	0.195	0.008
Existential health dimension	0.281	<0.001
Perceived stress	-0.231	0.002

**Table 3: The relationship between perceived stress with spiritual health and its dimensions**

Variables	Perceived stress	
	Pearson correlation coefficient	P
Spiritual health	-0.391	<0.001
Religious health dimension	-0.254	<0.001
Existential health dimension	-0.435	<0.001

predict the changes in the mothers’ breastfeeding adequacy ( $P < 0.01$ ). The amount of the R2 for the regression model was 0.17, meaning that 17% of the changes in mothers’ breastfeeding adequacy is explained by the independent variables. In the analysis, spiritual health ( $P = 0.003$ ,  $\beta = 0.134$ ), education level ( $P = 0.024$ ,  $\beta = -2.760$ ), and the number of live children ( $P = 0.015$ ,  $\beta = 1.299$ ) were significant predictors. So, controlling other factors, for a unit of increase in spiritual health, the breastfeeding adequacy score increased 0.134 units. The breastfeeding adequacy score in mothers with high school diploma and higher education was 2.8 units less than that of mothers with lower education. Also, for one-unit increase in the number of children, the mothers’ breastfeeding adequacy score increased by 1.3 units. Considering the standardized beta coefficient values, the spiritual health had the highest share in explaining the breastfeeding adequacy in mothers [Table 4].

### Discussion

In the present study, the relationships between spiritual health and perceived stress with breastfeeding adequacy of mothers with infants aged 1–6 months who referred to the selected health centers in Dorud city in 2021 were investigated. The findings showed that most mothers had high or moderate spiritual health. Consistent with the present study, Didarloo *et al.*,<sup>[11]</sup> based on a study in Iran, reported a high level of spiritual health among the mothers with hospitalized infants. Conversely, Dejbakhat *et al.*,<sup>[27]</sup> in another study in Iran, examined the spiritual health of mothers who were candidates for cesarean section and reported that most mothers had moderate spiritual health. This difference could be attributed to the difference between the participants of the two studies. The mothers studied in Dejbakhat *et al.*’s study were the candidates for nonemergency cesarean delivery who

were hospitalized and experienced cesarean section stress, while the participants of the present study were breastfeeding mothers in a stable condition.

In addition, the findings of the present study showed that the mothers’ perceived stress score was 23.72 using the Cohen questionnaire and in most of them, it was moderate to high. In line with the results of the present study, the study of Kahforoushan *et al.*<sup>[28]</sup> in Tabriz showed that the mean score of perceived stress in breastfeeding mothers with premature infants using the Cohen questionnaire was 26.5, which is below the cutoff point (28) of the questionnaire. In contrast, the results of another study<sup>[11]</sup> indicated that the mean score of perceived stress in mothers with hospitalized infants was 37.5 with the same questionnaire, which is higher than the results of the present study and higher than the cutoff point. The reason for the difference in the results may be the difference in the conditions of the participants in these studies; in the present study, the mothers had healthy infants, whereas in the other study, the mothers had hospitalized infants and the vulnerability of the hospitalized infant could increase the mothers’ perceived stress.

Also, the results showed that the mothers’ breastfeeding adequacy score was 55.67 and it was adequate in most of them. In line with the results of the present study, in a study by Kohan and Heidari (2016), the mean score of breastfeeding adequacy was 56.7 with the same questionnaire.<sup>[26]</sup>

Moreover, the results of the present study showed that there was a significant positive relationship between mothers’ breastfeeding adequacy score and the total score of spiritual health and its dimensions including religious health and existential health. To the best of our knowledge, no study has been published regarding the relationship between breastfeeding adequacy and spiritual health score; so, we had to compare our findings with the studies that examined the relationship between spiritual health with breastfeeding self-efficacy and breastfeeding performance. In this regard, the results of Farhadi’s study<sup>[29]</sup> showed that spirituality can affect the management of breastfeeding behavior. In addition, the findings of another study showed that breastfeeding self-efficacy has significant relationships with mothers’ spiritual health, perceived stress, and monthly income.<sup>[11]</sup> The results of these studies are somehow consistent with the present study because they show that spirituality affects breastfeeding process by managing breastfeeding behavior.

The findings of the present study showed that there was a significant negative relationship between mothers’ breastfeeding adequacy and perceived stress, in a way

**Table 4: Estimation of maternal breastfeeding adequacy regression model parameters**

Variables	Non-standard		Standard Beta value	t-statistics	P
	Beta value	Standard error			
Constant value	47.501	5.744		8.269	0.0
Perceived stress	-0.129	0.069	-0.138	-1.866	0.064
Spiritual health	0.134	0.044	0.226	3.029	0.003
Education level	-2.760	1.211	-0.180	-2.279	0.024
Number of live children	1.299	0.526	0.172	2.468	0.015
Economic situation	-2.111	1.152	-0.132	-1.832	0.069

that increase in perceived stress was associated with a decrease in breastfeeding adequacy. Since no similar study was available, the findings of the present study were compared with the findings of studies that examined the relationship between stress and breastfeeding self-efficacy and breastfeeding duration. The study by Foligno *et al.*<sup>[30]</sup> showed a significant negative relationship between duration of breastfeeding and perceived stress. In Azizi *et al.*'s study,<sup>[31]</sup> there was a significant negative relationship between breastfeeding self-efficacy and perceived stress. Also, the study of Kahforoushan *et al.*<sup>[28]</sup> showed that with increasing breastfeeding self-efficacy, perceived stress was significantly reduced, but there was no statistically significant relationship between breastfeeding self-efficacy and breastfeeding performance. The results of these studies were in line with the present study and showed that stress could affect breastfeeding performance.

Also, the results of the present study showed that there was a significant negative relationship between perceived stress score in mothers and spiritual health and its dimensions including religious health and existential health, in a way that increasing spiritual health was associated with reducing perceived stress. Consistent with the results of the present study, other studies showed a significant negative relationship between spiritual health and perceived stress.<sup>[11,32,33]</sup> In contrast, in the study of Kadivar *et al.*<sup>[22]</sup> entitled "Exploring the relationship between spiritual well-being and stress and coping strategies in the mothers of infants hospitalized in the neonatal intensive care units," no significant relationship was reported between spiritual health and stress. The probable reason for this contradiction can be attributed to the different conditions of the participants in the above-mentioned study, since in that study, the participants were the mothers with hospitalized infants, while in the present study, the participants were mothers with healthy infants.

The results of the present study showed that the mean score of breastfeeding adequacy in illiterate mothers and in the mothers having primary school education was significantly higher than that of mothers with high school diploma and university education. To explain this finding, it can be said that such mothers are usually housewives

and have more opportunities for regular breastfeeding than working mothers, which helps to produce more milk. Also, the average score of breastfeeding adequacy in mothers with income less than expenses was significantly higher than that of mothers with income equal to or more than expenses. To justify this finding, it can be said that these mothers may breastfeed regularly with more motivation due to financial constraints in the supply of artificial milk, which could lead to better milk production and adequate breastfeeding. In contrast, the results of another study showed that breastfeeding self-efficacy has a significant direct relationship with monthly income, while it has no significant relationship with other demographic variables.<sup>[11]</sup> Also, another study by Azizi *et al.*<sup>[31]</sup> indicated that breastfeeding self-efficacy was directly related to family income level. To explain this contradiction, we could point to the factors such as using different questionnaires (Dennis breastfeeding self-efficacy) and differences in the specific characteristics of participants in the studies.

The first strong point of the present study is the novelty of the subject. As mentioned earlier, no study has been published on the relationship between spiritual health and perceived stress with breastfeeding adequacy. The second strong point is the use of a new scale for breastfeeding adequacy.

### Limitation and Recommendation

The limitation of our study is that the relationship between study variables was examined in only one city. So, it is suggested that this relationship be examined in other populations.

### Conclusion

The results of the present study showed that breastfeeding adequacy in mothers has a significant positive relationship with their spiritual health, but has a significant negative relationship with mothers' perceived stress. Iran is currently on the verge of increasing the number of births by adopting a policy of increasing birth rate. Infants are among the most vulnerable groups, and breastfeeding is definitely the best way to support and reduce infant mortality rate. According to the results of

this study, it is suggested that the promotion of spiritual health should be considered in policymaking and health planning of mothers and infants to improve the mothers' breastfeeding adequacy.

### Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published, and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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### Conflicts of interest

There are no conflicts of interest.

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