

Relationship of Maternal Spiritual Health with Nutritional Behavior and Physiologic Parameters of Neonates in Cesarean Mothers during Spinal Anesthesia

Received 15 Jan 2019; Accepted 27 Jul 2019

<http://dx.doi.org/10.29252/jhsme.6.3.18>

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Abstract

Background and Objectives: Mother's general health, including spiritual well-being, is a prerequisite for neonatal health. This study aimed to investigate the relationship of maternal spiritual well-being with the nutritional behavior and psychological parameters of neonates.

Methods: In this cross-sectional study, a total of 101 women with non-emergency cesarean delivery were evaluated by convenience sampling method at Amiralmomenin Hospital in Grash, Iran. The study instruments consisted of demographic characteristic form, standard breastfeeding assessment tool, infant physiological parameters registration form, and spiritual well-being scale. Before delivery, the standard breastfeeding method was instructed to the mothers, and their mental health scores were recorded. After delivery, nutritional behavior was recorded by the relevant instrument. Furthermore, the physiological parameters of the newborns were recorded by a tympanic thermometer, pulse oximetry, and neonatal examination. The data were analyzed using descriptive and inferential statistics, as well as correlational tests.

Results: The majority of pregnant women (78.2%) had a moderate level of spiritual well-being. Based on the Pearson correlation test, maternal spiritual well-being showed no significant relationship with mean nutritional behavior (e.g., readiness to feed, rooting, latching, and sucking) and neonatal physiological parameters ($P \geq 0.05$).

Conclusion: Maternal spiritual well-being did not significantly affect the nutritional behavior and physiological parameters of the neonates on the first days after birth. It is suggested that similar studies be performed in different hospitals to evaluate the correlation between these parameters.

Keywords: Spiritual well-being, Mothers, Nutritional Behavior, Physiological Parameters, Neonate.

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Please Cite This Article As: Dejbakhat M, Khooshab E, Akbarzadeh M. Relationship of Maternal Spiritual Health with Nutritional Behavior and Physiologic Parameters of Neonates in Cesarean Mothers during Spinal Anesthesia. Health Spirituality Med Ethics. 2019;6(3):18-25.

Introduction

Spiritual well-being is a newly known dimension of health emerged after physical, mental, and social dimensions. It is of paramount importance to consider all aspects of health, including spiritual well-being, in the development of a holistic view of human being (1). The achievement of inner peace, faith, and hope are the important components of spiritual well-being (2). A review study referred to the extensive evidence

about the positive effects of spiritual well-being interventions on the reduction of stress, anxiety, and depression among individuals (3). In a study, religious education was reported to increase the tranquility and mental health of pregnant women and enabled them to cope with severe anxiety during pregnancy. The women receiving such education successfully managed to reduce their anxiety level, compared to the group without any training.

Therefore, religious education and practices significantly diminished the mental and psychological alterations (4, 5).

People can cope with internal and external stressors and challenges in different stages of their lives through spiritual well-being. According to available research, pregnancy and childbearing are two major events in women's developmental transition. These key events exert profound effects on maternal mental balance; however, they can trigger stress, anxiety, and fear in pregnant women (6). The results of a study conducted by Tajvidi et al. showed that spirituality, religiosity, spiritual tendencies, and spirituality of pregnant women's relatives, were among the factors influencing fetal health, delivery success, and breastfeeding.

Mother's general health, including her spiritual well-being, is a prerequisite for a successful delivery, natural breastfeeding, and neonatal health (7). Based on a study conducted by Biran et al., spiritual practices, such as prayer, can relieve the pain, nausea, and vomiting of the mother after childbirth and increase her tranquility (8). It is believed that the enhancement of maternal tranquility leads to the elevation of oxytocin and prolactin and reduction of cortisol level, thereby resulting in increased milk production and secretion, as well as easier sucking (6).

According to a study carried out by Binns et al., breastfeeding will be easier in the first hours after birth, if the newborn has a good nutritional behavior, including sucking strength. This plays a major role in the reduction of neonatal mortality and brings a lot of short- and long-term benefits to breastfeeding, as well as maternal and neonatal health (9).

Nowadays, it is believed that spirituality and religiosity should be considered as a key element of health care education. In this regard, healthcare supervisors can provide their clients with more comprehensive services by the proper conceptualization of their religious needs (10). Many studies have already proved the negative effects of pregnancy and postpartum stress, anxiety, and depression on the developmental,

psychological, and physiological (e.g., heart rate) characteristics of the neonates (11-13). In this regard, since spiritual well-being opposes the mentioned factors (i.e., stress, anxiety, and depression), further studies are needed to investigate the effects of maternal spiritual well-being and inner peace on the different dimensions of neonatal health.

No study has yet been carried out on the relationship between maternal spiritual well-being and the physiological parameters and nutritional behaviors of the infants. In addition, the research on maternal spiritual well-being is limited in this field. Therefore, this study was conducted to investigate the relationship of maternal spiritual well-being with nutritional behavior and physiological parameters of neonates to pave the way for the implementation of more detailed studies and planning in this field.

Methods

This cross-sectional study was conducted on 110 participants. The inclusion criteria entailed: 1) candidacy for non-emergency cesarean section, 2) gestational age of 38-42 weeks, 3) singleton pregnancy, 4) tendency to breastfeeding, 5) no history of mental illness, and 6) willingness to participate in the study. On the other hand, the exclusion criteria included: 1) neonatal weight of < 2,500 and > 4,000 g, 2) 1 or 5-minute Apgar score of < 7, 3) meconium-stained amniotic fluid, 4) any neonatal abnormality, 5) use of contraindicated drugs in breastfeeding, 6) neonatal nourishment with formula, and 7) reluctance to continue participating in the study. To select the participants, the researchers referred to the Operating Ward of Amir al-Momenin hospital in Ghash, Iran, on a daily basis. They selected the pregnant women who were candidate for cesarean section, met the research criteria, and expressed their willingness to participate in the study in a written form. This process went on until obtaining the satisfactory sample size. The study population included all the newborns whose mothers referred to Amir al-Momenin Hospital for undergoing non-emergency cesarean section during the allocated time in 2017. The research

instruments entailed the questionnaires for the collection of demographic information of mothers and newborns, Standard Infant Nutritional Assessment Tool, frequency and duration of breastfeeding form, neonatal physiological parameters registration form, and Spiritual Well-being Scale.

Demographic characteristic form; regarding the similar studies, the demographic information form consisted of two parts related to maternal and neonatal data. The maternal demographic and pregnancy characteristics included age, weight, gestational age, number of pregnancies, number of children, history of lactation, complications during pregnancy, and the reason for cesarean section. In addition, the neonatal section enquired such demographic information as gender, weight, 1- and 5-minute Apgar score, and childbirth complications. The mentioned questionnaire was completed for the two groups by the researcher using interview and observation.

Neonatal nutritional behavior assessment form. This form includes the Standard Breastfeeding Assessment Tool, which has been validated and used in a study by Biranvand et al. (14). It consists of four subscales, including sucking reflex, readiness to feed, rooting, and latching. Each scale is rated on a score range of 0-3, rendering a total score of 0-12. The information is recorded with the first feeding of the newborn at the first hour of birth, and then between 1-6, 6-12, 12-24, 24-36, and 36-48 h after birth. The time interval for the registration of physiological parameters is determined to take the sleeping and waking state of the newborn into account and avoid any interference with the neonate's sleep time.

Breastfeeding frequency and duration form

This form, completed by mother during breastfeeding, includes the parental diary of neonatal behavior. This questionnaire was used in a similar article (15).

Neonatal physiological parameters registration form. This form covers the physiological sign of the neonate (e.g., heart rate, respiratory rate, body temperature, and arterial blood oxygen percentage). Vital signs are once measured after the stabilization of

neonatal conditions within the first 48 h of birth.

Spiritual well-being scale. This scale, designed by Polotzin and Ellison in 1938, is composed of 20 items consisting of even, odd, and a combination of odd and even questions that assess the individual's existential health, religious health, and spiritual well-being, respectively. It is rated on a six-point Likert scale from strongly disagree to strongly agree. The final score of spiritual well-being and that of each dimension are within the range of 20-120 and 10-60, respectively. The score ranges of 0-40, 41-99, and 100-120 are suggestive of low, moderate, and high spiritual well-being, respectively (18). Allah Bakhshian et al. translated this questionnaire into Persian and confirmed its content validity. They calculate the Cronbach's alpha coefficient of 0.82 (16). Jafari et al. calculated Cronbach's alpha coefficient of religious health, existential health, and spiritual well-being at 0.91%, 0.91%, and 0.93%, respectively. In addition, test-retest results for spiritual well-being, religious health, and existential health were reported as 0.93%, 0.96%, and 0.86%, respectively (17). In a study conducted by Ramezankhani et al., Cronbach's alpha coefficient was rendered as 0.80% (18). Therefore, this tool was applied in the present study.

Research procedure. First of all, all the mothers meeting the inclusion criteria were instructed about the standard breastfeeding procedure before cesarean section, and their spiritual well-being score was recorded. Thereafter, during the first 48 h after delivery, the researcher and assistant researcher recorded the nutritional behavior and physiological parameters of the neonates. The data on physiological parameters were recorded by the researcher using tympanic thermometer, pulse oximeter, and neonatal observation. Furthermore, the data on the nutritional behavior of the newborns were recorded by the assistant researcher (i.e., nurse). The information related to the frequency and duration of breastfeeding were recorded in the given form.

Table 1. Analysis of neonatal nutritional behavior in relation to maternal spiritual well-being

factors	Spiritual well-being	number	mean	Standard deviation	Standard error	p value
Readiness to feed	Moderate	79	1.89	0.60	0.07	.067
	high	22	2.15	0.53	0.11	
	total	101	1.95	0.59	0.06	
Rooting	moderate	79	2.51	0.50	0.06	.282
	high	22	2.38	0.54	0.11	
	total	101	2.49	0.51	0.05	
Latching	moderate	79	2.58	0.50	0.06	.577
	high	22	2.38	0.54	0.11	
	total	101	2.49	0.51	0.05	
Sucking	moderate	79	2.51	0.46	0.05	.572
	high	22	2.58	0.47	0.10	
	total	101	2.53	0.46	0.05	
total score of neonatal nutritional behavior	moderate	79	9.50	1.11	0.10	.336
	high	22	9.75	0.90	0.19	
	total	101	9.55	1.07	0.11	

To evaluate the reliability of the Nutritional Behavior Assessment Tool, two observations were simultaneously performed by two nurses. In this regard, neonatal nutritional status was evaluated in a random sample by a researcher and assistant researcher using the mentioned questionnaire. Furthermore, the reliability of the pulse oximeter, digital thermometer, and the barometer was measured by similar devices to ensure the accuracy in the calculation of the physiological parameters of the newborns. When the mother and the neonate were discharged, a DVD containing information about neonatal care was given to the mother. It should be noted that the anesthesia was performed by an anesthetist.

Statistical analysis: Descriptive statistical methods were employed to calculate the mean, standard deviation, frequency, and percentage indices. Furthermore, the ANOVA was used to analyze the mean score of neonatal nutritional behaviors and maternal spiritual well-being.

Additionally, it was applied for the determination of the mean of neonatal heart rate, arterial blood oxygen percentage, neonatal respiratory rate, and neonatal body temperature. In addition, a correlation test was performed to determine the relationship of spiritual well-being with the mean score of nutritional behavior and physiological parameters of the neonate. A p-value less than 0.05 was considered statistically significant. All data were analyzed in SPSS software, version 16.

Ethical consideration: Introduction letter was offered to the hospital authorities, and permission was obtained from the operating room manager and the head of the Amir al-Momenin Hospital. The study subjects were provided with detailed information about the objectives and method of the research. In addition, written informed consent was obtained from all mothers. Moreover, the participants could withdraw from the study at

Table 2. Analysis of neonatal physiological parameters in relation to maternal spiritual well-being

variable	Spiritual well-being	number	mean	Standard deviation	Standard error of mean	P value
Neonatal heart rate	moderate	79	137.71	9.70	1.90	.618
	high	22	136.45	12.60	2.69	
	total	101	137.44	10.35	1.03	
Arterial blood oxygen percentage	moderate	79	97.99	1.32	0.15	.969
	high	22	98.00	1.38	0.29	
	total	101	97.99	1.32	0.13	
Respiratory rate	moderate	79	44.59	6.39	0.72	.905
	high	22	44.41	6.48	1.38	
	total	101	44.55	6.38	0.64	
Body temperature	moderate	79	36.47	0.49	0.06	.250
	high	22	36.61	0.50	0.11	
	total	101	36.50	0.49	0.05	

any research stage.

Result

Among 101 neonates with recorded physiological parameters, the mean heart rate, arterial oxygen percentage, respiratory rate, body temperature, and neonatal nutritional behavior were 137.44 ± 10.35 , 97.99 ± 1.32 , 44.55 ± 6.38 , 36.5 ± 0.49 , and 9.55 ± 1.07 , respectively. Furthermore, 78.2% and 21.8% of mothers (n=101) had moderate and high levels of spiritual well-being, respectively. The mean score of spiritual well-being among the study population was 89.02 ± 12.39 . The one-way ANOVA was used to compare maternal spiritual well-being in terms of the mean scores of neonatal nutritional behavior and physiological parameters. The results showed no significant differences between the mothers with moderate and high levels spiritual well-being regarding neonatal nutritional behavior and physiological parameters (tables 1 and 2). Furthermore, based on the results of Pearson correlation, maternal spiritual well-being showed no significant relationship with neonatal nutritional behavior and physiological parameters (Table 3).

Table 3. Correlation of maternal spiritual well-being with mean neonatal nutritional behavior and physiological parameters

variables	Spiritual well-being	Correlation	number	p-value
Neonatal nutritional parameters	Readiness to feed	0.181	101	0.07
	Rooting	0.136	101	0.176
	latching	0.02	101	0.844
	sucking	0.07	101	0.488
	Neonatal nutritional behavior	0.058	101	0.568
Neonatal physiologic parameters	Neonatal heart rate	0.035	101	0.725
	Arterial blood oxygen percentage	0.098	101	0.328
	Respiratory rate	0.099	101	0.326
	Body temperature	0.029	101	0.771

Discussion

The results of the present study demonstrated that all mothers had moderate to high levels of spiritual well-being. Similarly, related studies reported moderate and high levels of spiritual

well-being among Iranian women (19), with a mean spiritual well-being of 89.02 ± 12.39 . This score is suggestive of a moderate level of spiritual well-being in society that can be attributed to the culture and religious beliefs of people. Moreover, in other studies conducted in Iran, the mean maternal spiritual well-being scores were reported as 99.33, 97.7, and 64.64, respectively, showing no significant difference with our results. However, the slight existing difference may be due to study population differences (20,21).

Moreover, the results of national and international studies carried out on pregnant women are indicative of the improvement of spirituality among pregnant women. This indicates an increased desire on the part of the women to establish a close bonding with a superior power to achieve inner peace. In addition, this increased spirituality is suggestive of the women's thirst for more spiritual protection and support (7, 10). The results of the current study showed that the mean physiological parameters of the neonates was within the normal range, which can be attributed to the inclusion and exclusion criteria. These criteria were established to include only newborns with normal physiological conditions before and after the birth.

One of the hypotheses of this study concerning the correlation between maternal spiritual well-being and neonatal physiological parameters was rejected due to the insignificant results. If we divide health dimensions into two general categories of physiological and nonphysiological, this study compared maternal spiritual well-being as a dimension of nonphysiological health, with neonatal physiological parameters. To compare these two different health dimensions, it seems crucial to investigate the role of mediators, such as maternal stress and anxiety, between the two dimensions. These factors directly affect cortisol levels in maternal and neonatal blood, thereby altering the physiological parameters. Lack of significance in this study can be due to the fact that the majority of subjects enjoyed moderate to high

levels of spiritual well-being resulting in the reduction of stress level during delivery.

According to the results of a study conducted by Glover et al., stress during delivery affects the physiological parameters of newborns (22). Therefore, the absence or reduction of stress can be regarded as a mediator between spiritual and physiological health. Moreover, in another study investigating the relationship between spiritual well-being and maternal stress in the Neonatal Intensive Care Unit (NICU), an inverse correlation was indicated between maternal spiritual well-being and stress in the mothers with NICU-admitted newborns (23). In a descriptive correlational study conducted on 450 Iranian pregnant women, spirituality and psychological well-being were found to have migratory effects on pregnancy-specific stress (24).

On the other hand, neonatal physiological parameters were measured only in the early hours after birth until hospital discharge. However, according to the literature, religious beliefs and spiritual support for mothers are more influential on neonatal health in the post-hospital discharge phase (25). So the contrary, the negative effects of maternal stress near the delivery have been investigated in neonatal and post neonatal periods (26). Furthermore, other studies have highlighted the role of mediators in the relationship between spiritual and physical health. Namely to say, a study carried out by Heather et al. on the relationship between spirituality and physical health among the cancer-afflicted patients indicated the effective role of emotional, mental, and social factors, such as positive feelings, hope, generosity, and health behavior (27).

The results showed a relatively high mean score of nutritional behavior in neonates (9.55 out of 12). According to the inclusion and exclusion criteria, the apparent influential factors included maternal tendency to breastfeed, maternal mental health, neonatal physical health, consideration of neonatal sleep/wake cycle, as well as proper breastfeeding training by the researcher. Another hypothesis of the study about the correlation between maternal spiritual well-being and neonatal nutritional behavior was

rejected because of insignificant results. However, this result could be influenced by maternal pain and physiological and psychologic stress induced during labor, due to the fact that the neonatal nutritional behavior is measured in the early hours after birth when the mother is temporarily experiencing this pain. This result could have been different if this measurement was performed when the mother is in a better physical and mental situation. In such a circumstance, nutritional behavior score could be much higher, and it could be correlated with moderate spiritual well-being in mothers.

According to another study carried out by Cooklin et al., physical and psychological factors, such as breast pain, mastitis, cesarean section pain, concern about inadequate milk supply, fatigue, and irritability immediately after delivery, affect breastfeeding quality (28). Spiritual well-being is an aspect of health with diverse definitions in different cultures and religions. In this regard, experts have not yet reached a consensus on a precise definition of this important aspect of health that is closely knit-related to other aspects of health (29).

In the same vein, the results regarding the relationship of spiritual well-being with other factors do not concur. Therefore, the results of the present research are consistent with the following studies (2007). Kersting et al. reported that the power of religious beliefs and social support predicted lower scores for postpartum sadness (30). Moreover, a project on perinatal mortality and some specific religious beliefs and deeds showed no association between religious practices and depression scores during the two-year follow-up after abortion (31). In addition, the results of another study on post-abortion women revealed no significant relationship between prayer and post-traumatic stress disorder or depression (32). Also Mokhtarian et al regarding the article of Dalmida et al with entitled” Spirituality, Religiousness, Psychosocial, factors, and maternal-infant outcomes in Latina mothers In 2010 reported that spiritual/religious variables were inversely correlated with perceived stress and depression symptoms, and mean birth weight was

positively correlated with social functioning, quality of life, and religious behaviors (4). One of the limitations of this study is the self-reporting nature of the research tool which might have reduced the participants' inclination to unveil the reality and increased the possibility of responding according to community norms and values. In addition, the occupation and educational level should be taken into account, while the current study just considered neonatal health. Furthermore, it is suggested to evaluate the nutritional behavior of newborns after hospital discharge and determine the relationship of spiritual well-being with neonatal developmental and evolutionary stages in future studies.

Conclusion

As the findings of the present study indicated, maternal spiritual well-being demonstrated no significant relationship with neonatal nutritional behaviors and physiological parameters. Therefore, maternal spiritual well-being and inner peace have no significant effect on the different dimensions of neonatal health. It can be concluded that maternal spiritual well-being does not have a significant effect on the nutritional behavior and physiologic parameters of newborns during the first days after birth.

Conflict of interest

The authors state that there is no conflict of interest regarding the publication of this study.

Acknowledgements

This article is based on an approved research project with the code of 13666-95. We would like to thank the University of Medical Sciences for funding the project. Moreover, the researchers express their gratitude to all the mothers participating in the project.

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