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The effect of teaching religious principles on the infants' growth and development

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Abstract:

BACKGROUND: Teaching religious principles can inevitably strengthen the mothers' motivation and may improve the infant's growth indices. This study aimed to investigate the effect of teaching religious principles on the infants' growth and development from birth up to the age of 3 months.

METHODS: In a randomized controlled trial, 84 primiparous women who had average or weak religious attitude were randomly divided into intervention and control groups in 2013. The intervention group attended six 90-min sessions of religious education held once a week. The control group received the routine pregnancy care. Data were collected through physical growth indices and Denver's questionnaire.

RESULTS: A significant difference was found between the intervention and control groups regarding the head circumference at birth (34.61 ± 1.51 vs. 32.97 ± 6.98). Besides, a significant relationship was observed between religious knowledge before delivery and infants' development in gross motor skills ($P = 0.047$, $r = 0.114$) and major motor skills ($P = 0.019$, $r = 0.359$) at 1 month of age, and also language skills ($P = 0.015$, $r = 0.119$), major motor skills ($P = 0.008$, $r = 0.404$), and fine motor skills ($P = 0.035$, $r = 0.425$) at the age of 3 months in the intervention group.

CONCLUSION: Training the pregnant mothers regarding religious principles was effective in some indices of infants' physical growth and development.

Keywords:

Development, infant, physical, religion

Introduction

The growth and development of the infant are influenced by inherited, genetic, physical, and psychological factors^[1] The etiology of the mortality of infants in different countries depends on their health status, but physical indicators are important factors that have been reported in infant mortality and morbidity in most researches.^[2-4] The defects of the prenatal period, the birth, and the 1st year after birth have irreparable consequences in the developmental process of the subsequent years.^[5]

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Appropriate weight gain during pregnancy affects the infants' weight and health at birth. The infants' weight of independent of all effective factors (heredity, environment, and neonatal diseases) is also directly related to the birth weight and intrauterine growth.^[6] The most common cause of death in infants under 5 years of age is low birth weight infants.^[7] The LBW mortality rate is approximately twenty times that of normally born babies.^[8] The rate of death and mortality in low birth weight infants is increased and more deaths occur in the first 24 h. In a study in Iran, 8.8% of the infants had low birth weight;^[9] also, in another study on 3734 term pregnancies, 2.5% had

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low birth weight infants.^[10] According to UNICEF, 95.6% of low birth weight infants occur in developing countries.^[8]

Determining the growth index of weight, height, and head circumference at birth can reliably indicate intrauterine growth.^[11] Pregnancy period is a good chance for mothers to get information on health care settings and nutrition.^[12] On the other hand, effective education during pregnancy can deeply impact the number of diseases, complications, outcomes of pregnancy, and health promotion.^[13] Because pregnant mothers are mainly motivated to improve the health of their baby, this inner motivation is one of the important factors for acquiring skills during pregnancy.^[14] Religious and cultural beliefs create a potential for human beings who conduct their motivation to conduct specific behaviors.^[15] The emphasis on the fourth dimension of spirituality by the World Health Organization (i.e., biopsychosociospiritual) expresses the knowledge of mental health professionals, emphasizing the importance of religion and spirituality, which helps to reduce stress and increase relaxation.^[16-18] As a result of this attitude, the internal motivation of people to eat a healthy and halal diet increases.^[19] Increasing the mother's knowledge and skills during pregnancy, or adaptive behavior, in pregnancy care is one of the important factors that affects the natural process of pregnancy and development of the fetus. Previous researches have also confirmed the association of religion and spirituality with health outcomes.^[20-22] This research is based on the assumption that one of the proper ways of educating pregnant mothers is to get help from Islamic culture with religious principles for teaching monotheism and belief in God as well as for mental and spiritual tranquility, religious recommendations with respect to health, particularly pregnant women's nutrition, importance of breast feeding, and its association with fetal attachment, and nutrition from holy Quran's perspective.^[23]

Considering the fact that the studies conducted in the past decades show that there is a positive relationship between religious attitude and spiritual well-being with diseases, mental health and concepts such as pregnant women's nutrition, breastfeeding, its relationship with fetal attachment, and nutrition from holy Quran's perspective have been emphasized in Islam; it is questionable whether Islamic teachings and recommendations are effective in improvement of the mothers' physical and mental health as well as the infants' growth and development indices. According to the review of numerous articles, it was found that the aforementioned religious and spiritual interventions have not been performed much in Iran. The aim of this study was to determine the effect of teaching religious

principles on the infants' growth and development indices since birth up to the age of 3 months in pregnant women.

Methods

Subjects

This experimental study was conducted in the selected prenatal clinics of Tehran University of Medical Sciences in 2013 in a single blind intervention. The researcher was only informed of the content of classes because the mothers in the intervention group were trained for a couple of days and those in the control group underwent a routine training in opposite days of the week.

According to the statistical consultation, with $\alpha = 0.05$, $\beta = 0.2$, $d = 2$, and power = 95%, and using the following formula, an 84-individual sample size (42 in each group) was determined for the study:

$$n = \frac{(Z_{1-\alpha/2} + Z_{1-\beta})^2 \times (p_1 \times [1-p_1] + p_2 \times [1-p_2])}{(p_1 - p_2)^2}$$

The samples were selected in several stages based on the inclusion criteria. In the first stage, 220 individuals were selected from those referring to the maternal clinics through purposive sampling. In the second stage, they were randomly divided into the control and intervention groups using systematic random sampling. In doing so, the first qualified individual was allocated to the intervention group and the second one to the control group; the process was continued until 110 pregnant women entered each study group [Figure 1]. In the third stage, religious knowledge and attitude questionnaire was filled out. 42 participants in each group with average or weak religious knowledge were enrolled in the study, while those with high religious knowledge were excluded.

Inclusion criteria

The inclusion criteria of the study were the age range of 18–45 years, single and wanted pregnancy, gestational age of 20–28 weeks, not suffering from chronic diseases, having low or moderate anxiety level according to Spielberger's anxiety scale, and having average or weak religious knowledge according to the knowledge questionnaire. The exclusion criteria of the study were lack of willingness to cooperate in the study and incidence of any midwifery problem during pregnancy.

Intervention

Before intervention

The religious awareness and anxiety level were determined by knowledge assessment and Spielberger's scale. This scale used for assessment of state and trait

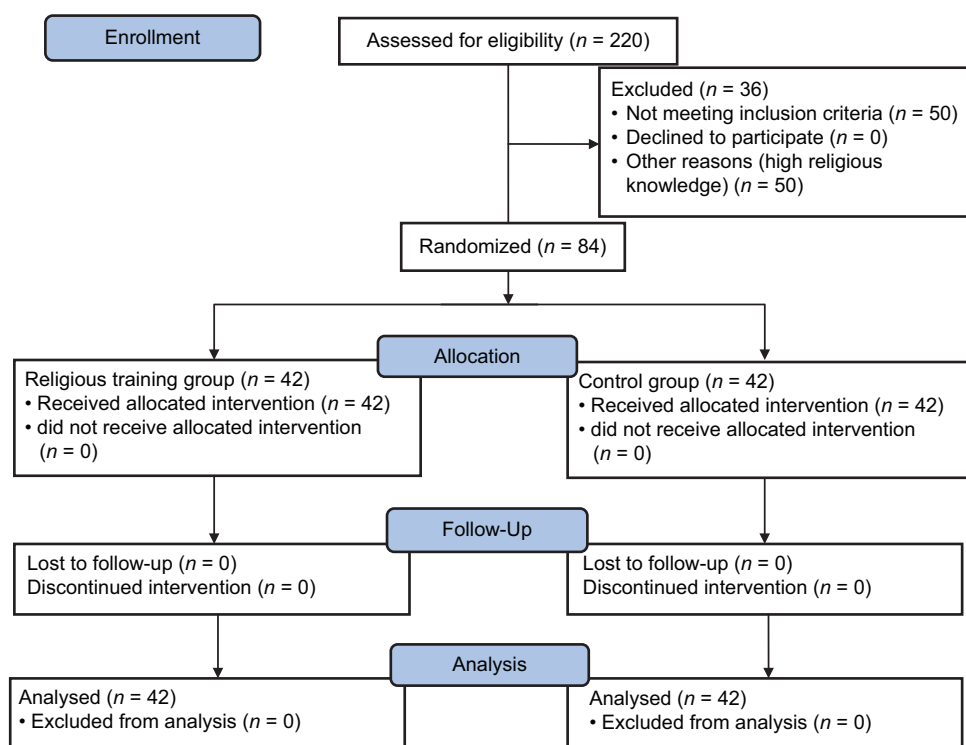


Figure 1: CONSORT flow diagram of the participants

anxiety (20 items for each) included 40 items with a total of 80 scores. The reliability and validity indexes reported by Masoomeh Aghamohammadi Kalkhoran (2007) were considered in our study.^[24]

Intervention in pregnancy

In the intervention group, instruction of religious principles was started for mothers from the 20th to the 28th weeks of gestation in on-site training classes in the prenatal care hospital. The educational classes were held through 6 weekly 60–90 min sessions; each class was held with 14 participants so that each participant could contribute to class discussions.

The first three sessions were conducted by the researcher (topic of obstetric and midwifery) while the last three ones were managed by a clergyman (topics of religious content). The content of the educational classes was as follows: first session: problems during the pregnancy period, importance of pregnancy period in Islamic culture, and recommendations for the pregnancy period; second session: breastfeeding in Quran, mother and child attachment, and infant's right for breastfeeding; third session: individual ethics (trust, sincerity, and gratefulness), importance of mother's characteristics such as good-temperedness, cheerfulness, kindness, modesty, and forgiveness; fourth session: collective ethics, good-temperedness, and showing empathy with others; fifth session: emotional feeling toward God including love of God, fear from God's anger, emotional

feeling toward others, emotional feeling toward parents, positive emotions toward oneself, and positive emotion toward the world; and sixth session: doing one's religious duties, praying (individual praying, fasting), and knowing the importance of collective prayers.

After training and delivery, development indices since birth up to 3 months of age were measured using Denver's questionnaire. Besides, anthropometric indices (weight [Scale Seca Germany], height [lying «Length» nonstretch meter], and head circumference [nonstretch meter]) were evaluated in the two groups at birth, 1 month of age, and 3 months of age by the researcher. The reliability of Scale Seca was evaluated before and during the research by the weight of one kg.

Knowledge assessment questionnaire was a researcher-made instrument including 41 items in 6 dimensions of praying, ethics and values, effect of religion on life and behavior (praying and fasting), social issues, world view and beliefs, and science and religion. This questionnaire is scored through a Likert scale; scores of 4–5, 1–2, and 3 are allocated to the options with positive attitude, options with negative attitude, and those in-between, respectively. The maximum score of this scale is 205. Besides, scores >164, 82–164, and <82 represent high, average, and low religious knowledge, respectively.

The questionnaire's validity was confirmed by 10 expert professors of schools of nursing and midwifery in Shiraz

and Tehran, and the whole questionnaire’s reliability was confirmed by Cronbach’s alpha = 81.

Spielberger’s scale which is used for assessment of state and trait anxiety (20 items for each) includes 40 items with a total of 80 scores. The reliability and validity indexes reported by Masoomeh Aghamohammadi Kalkhoran (2007) were considered in our study.^[24]

Intervention after delivery

Development status in two groups was evaluated in two stages. At birth, by the researcher, but at 1 month of age and 3 months of age, they were reported by the mothers. Data collection was done using Denver developmental screening test (DDST).

DDST-II is used as a clinical screening tool, and the most common developmental screening test was devised in 1990 by Glascoe Later, as amended, the general skills tests increased from 105 to 125 questions. 125 skills in four areas of gross motor, fine adjustment movement, language and personal and social factors were evaluated, taking into account the beginning of the child’s chronological age and through direct assessment report or observation points by the family (mother).^[25] To evaluate the status of the infant’s developmental skills, Denver questionnaire (25 questions) was designed. Four areas were examined: individual areas – social (5 questions), fine motor domain adaptive questions (5 questions), the area of speech and language questions (6 questions), and questions on gross motor (9 items). The reliability of this scale was obtained as 0.951. The reliability and validity indexes reported by Shahshahani *et al.* were the basis of the present study. She stated, “All of the questions in DDST-II had appropriate content validity, and there was no need to change them.” Cronbach’s α coefficient and Kappa measure of agreement for test–retest were 92 and 87 and for interrater, they were 90 and 76, respectively.^[26]

The response to each question can be normal (which means the child is able to do the task), delayed (which means the child is not able to do the tasks that 90% of his/her age-matched children can do), and caution (which means the child is not able to do the tasks that 75% of his/her age-matched children can do).^[27]

Ethical considerations

This study was approved by the Ethics Committee of Shiraz University of Medical Sciences. In addition, written informed consent was obtained from each participant before the study. The participants were also assured of the confidentiality of all their personal information. The control group after the intervention was given an educational pamphlet.

Data analysis

Data analysis was performed using SPSS statistical software (Version 16.0, SPSS Inc. Chicago, IL, USA, and $P < 0.05$ was considered as statistically significant. State and trait anxiety and physical and developmental index were analyzed using independent *t*-test. Besides, independent *t*-test was used for evaluation of the homogeneity of the age groups and Chi-squared test for homogeneity of the education groups.

Results

The study results revealed no significant difference between the two groups regarding demographic features [Table 1]. The results of independent *t*-test indicated no significant difference between the two groups with respect to the participants’ mean score of state anxiety before the intervention ($P = 0.9$). However, a significant difference was found in this regard after the intervention ($P = 0.001$). Furthermore, the two groups were similar concerning trait anxiety before the intervention ($P = 0.202$), but a significant difference was observed between the two groups in this regard after the intervention ($P = 0.001$).

The results of independent *t*-test demonstrated no significant difference in the two groups with respect to the infants’ physical indices (weight, height, and head circumference) at birth, 1 month of age, and 3 months of age. However, a significant difference was observed between the intervention and control groups regarding the head circumference at birth (60.14 ± 66.13 vs. 49.88 ± 3.29) [Table 2].

The study findings demonstrated no significant difference in the two groups regarding the mean of infant development indices at the age of 1 month [Table 3]. Furthermore, no significant difference was observed in the two groups concerning the mean of development indices at 3 months of age [Table 3].

Table 1: Demographic characteristics of the pregnant women in the two groups

| Variable | Groups, frequency (%) | | P |
|---------------------------|-----------------------|-----------|-----|
| | Intervention | Control | |
| Age at pregnancy (years)* | | | |
| Below 20 | 2 (6.1) | 8 (22.8) | 0.1 |
| 21-25 | 15 (45.5) | 18 (51.4) | |
| 26-30 | 10 (30.3) | 8 (22.9) | |
| Above 31 | 6 (18.1) | 1 (2.9) | |
| Women’s education level** | | | |
| Below diploma | 6 (14.3) | 12 (30) | 0.4 |
| Diploma | 22 (52.4) | 24 (40) | |
| B.Sc. and above | 14 (33.3) | 4 (10) | |

*Number of missing about variable of age is in intervention mother 9 and the control mother 7, **Number of missing about variable of education is in the control mother 2

In this study, a significant relationship was observed between religious knowledge before delivery and intervention group infants' development in gross motor skills ($P = 0.047, r = 0.114$) and major motor skills ($P = 0.019, r = 0.359$) at 1 month of age and also in language skills ($P = 0.015, r = 0.119$), major motor skills ($P = 0.008, r = 0.404$), and fine motor skills ($P = 0.035, r = 0.425$) at the age of 3 months [Table 3].

Discussion

The study results revealed that in comparison to the routine training, education based on religious principles had a positive effect on reduction of the mothers' anxiety. In physical growth indices, a significant difference was observed between the two groups regarding the head circumference at birth.

In a long-term prospective study, depression and social adjustment were investigated by adaptation, religious practice, and frequency of religious services attendance. The results showed that effective presence in religious places may prevent major depression; this protective quality might be reduced in adults with depressed parents.^[28] Gupta *et al.* conducted a study in a general hospital in Chandigarh, North India on the relationship

between religiosity and the level of depression, hopelessness, and intention for committing suicide. The results showed that there was a reverse relationship between religiosity, depression, and intention to commit suicide.^[29] Based on this study and the impact of religious ritual attendance on depression, it seems that religious education in our study on knowledge and attitude of women was effective, and the mothers had less anxiety and were more relaxed. It can be argued that the group of mothers who received pregnancy training were more likely to take care of themselves and their babies, thereby improving the health indicators of infants compared to the control group (although the difference was not statistically significant).

In the current study, religious principles related to pregnancy care improved the women's knowledge and attitude and decreased their anxiety. The study intervention was also effective in some infant physical growth indices, such as height and head circumference at birth.

In a study by Dalmida *et al.* in Latin America, the relationship between spirituality, weight, and mental factors of infants was investigated. The results of that study indicated a reverse relationship between religious and spiritual variables and perceived stress and depression symptoms.^[30] Similarly, another study was conducted in Brazil which shows that insufficient training of the mother could influence the infant's height.^[31]

The results of the present study revealed no significant difference between the two groups regarding weight, but height and head circumference improved in the intervention group compared to the control group.

Kreuter *et al.* revealed that training programs and interventions were effective when they were culturally appropriate to the populations being trained. Besides, choosing a strategy accepted by the people of the community will usually be compatible with culture and education.^[32] Lack of increase in the infants' weight in this study might be due to the fact that in addition

Table 2: Mean and standard deviation of infant physical growth indices since 1-3 months of age

| Variables | Mean±SD | | P |
|--------------------|---------------|--------------|--------|
| | Control | Intervention | |
| Weight | | | |
| At birth | 3167.50±472.1 | 3172.5±451.9 | 0.751 |
| 1 month | 3914.7±771.8 | 3998±535.1 | 0.262 |
| 3 months | 5340.7±807 | 6411.4±694.8 | 0.120 |
| Height | | | |
| At birth | 49.88±3.29 | 60.14±66.13 | 0.069 |
| 1 month | 51.57±3.52 | 52.09±2.70 | 0.368 |
| 3 months | 55.76±4.43 | 56.78±3.23 | 0.428 |
| Head circumference | | | |
| At birth | 32.97±6.98 | 34.61±1.51 | 0.026* |
| 1 month | 36.16±6.57 | 36.57±1.53 | 0.153 |
| 3 months | 38.83±6.28 | 39.80±1.92 | 0.173 |

SD=Standard deviation, *Significance

Table 3: Mean and standard deviation of infant development indices at 1 month of age in the two groups

| Dimensions | Development indices (months) | Mean±SD | | P |
|-------------------------------|------------------------------|-----------|--------------|-------|
| | | Control | Intervention | |
| Gross motor dimension | 1 | 1.33±0.34 | 1.22±0.18 | 0.407 |
| | 3 | 1.01±0.25 | 1.09±0.35 | 0.668 |
| Language dimension | 1 | 1.73±0.27 | 1.26±0.36 | 0.605 |
| | 3 | 1.17±0.22 | 1.17±0.22 | 0.239 |
| Adaptive mild motor dimension | 1 | 1.51±0.33 | 1.07±0.21 | 0.429 |
| | 3 | 1.2±0.62 | 1.2±0.57 | 0.602 |
| Individual–social dimension | 1 | 1.51±0.33 | 1.07±0.21 | 0.392 |
| | 3 | 1.11±0.27 | 1.12±0.25 | 0.559 |

SD=Standard deviation

to change in the women's subjective norms, the viewpoints of husbands, friends, and health staff are also the determinants of prevalence and continuation of breastfeeding. Nonetheless, the present study was only conducted on mothers. It should also be noted that although knowledge is needed for behavior change, nutritional behavior change is not necessarily related to knowledge. When a person performs a new health behavior, he/she believes that he/she has certain health benefits.^[33] Burr *et al.* in England^[34] also indicated that in spite of providing the pregnant women with the essential knowledge, no improvement was observed in their nutritional behavior. For this reason, to formulate proper health beliefs in educational programs, the risks and consequences of neglecting educational issues should be more emphasized. Several researches showed that different factors such as lifestyles, social beliefs, economic issues, and access to food also affected the failure of training programs.^[34-36]

A study showed that there was a negative correlation between the mother's mental status and anxiety and the infant's weight.^[37] Training in our study was based on the protocols developed by the multidisciplinary team. Therefore, religious education seems to reduce anxiety and increase the knowledge of mothers about prenatal care. Other studies that used training showed reduced anxiety.^[38,39] Despite increased awareness and reduction of maternal anxiety, there was no significant difference between the birth weight and other health indicators in our study. However, in the study conducted by Van Hus *et al.*,^[40] the statistically significant difference between the two groups is probably due to other factors that impact the training such as the issues of health and nutrition, maternal age, unwanted pregnancy, social support, and the children; these variables in our study were not evaluated.

The findings of the current study revealed no significant difference in developmental growth index between the two groups at birth and 3 months after birth. However, it revealed a significant relationship between religious knowledge before delivery and some infant's growth and development dimensions at 1 and 3 months of age.

A study was carried out on the infants living in nurseries in Mashhad entitled: "The effect of evidence-based care package on the development of motor skills." Their result was different from that of our study because there was no significant relationship between the two groups after 6 weeks of implementation of the educational package. At week 8, motor development was improved in the intervention group, and the difference was statistically significant. The intervention method of this study is different from our intervention study method.^[41] The toys were chosen to stimulate the motor skills. Furthermore, in

the educational package above, the interaction of the child and his/her caregiver, which is effective in developing developmental motor skills, was predicted. It seems to be the reason why in their intervention, a significant effect was shown.

In another study, which was conducted at a higher age, children's motor skills improved; but in our study, considering the age of the child, there was no use of toys. Similar studies have not been found to compare the results over the past 20 years.^[42]

Various studies have shown that maternal psychological health can have a negative effect on the neonatal cognitive development, mother-infant interactions, and physical and behavioral impairment of the newborn.^[43-49]

In the present study, the researchers attempted to reduce the pregnant women's anxiety by religious principles. According to the results, religiosity led to pregnant women's tranquility and improved development of cognitive, language, and fine motor skills at 1 and 3 months of age. Also, the intervention group developed more with respect to individual, social, and major motor skills at the age of 3 months compared to the control group.

Overall, the above-mentioned studies showed that acquisition of developmental skills, disregarding the age of the baby, depends on other factors; particularly, cultural influences of the environment on their lives, their parents, relatives, and other people are also important.^[50] However, the relationship between the parents and children was not investigated in the present study.

According to another research, gender difference was one of the important factors in physical and motor development^[51] that has not been evaluated in this study and was considered as a study limitation. It is also important to note that the participating mothers were enthusiastic to attend the class which was held using group discussions. For future research, it is recommended that the effect of religious education on labor pain and postpartum, maternal and fetal attachment, prenatal care, mental health of the mother and father should be investigated. The same project is suggested to continue for a longer period, for example, 6-12 months.

Conclusion

The study findings demonstrated that religious principles were effective in increase of tranquility, improvement of the mother's nutritional status and breastfeeding, and improvement of some dimensions of the infants' physical growth and development. Given the simplicity, inexpensiveness, and cultural appropriateness of this

training method, it can be performed in treatment centers; it is highly cost-effective even though it might have a slight effect.

Overall, this research can conduct the planners and health policymakers to emphasize the religious beliefs and mental health in health planning and make optimal use of religion in consultation with pregnant women and improvement of infants' physical growth and development.

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Conflicts of interest

There are no conflicts of interest.

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