Original Research

Comparison Of Biological, Cognitive, and Happiness Features Among Mothers of Low Birth Weight and Optimal Weight Infants

Shirin Taherian[1*]

1. Master of General Psychology, Semnan Azad University, Iran.

***Corresponding Author: Shirin Taherian,** Master of General Psychology, Semnan Azad University. E-mail:shirintaherian00@gmail.com. Orcid No: https://orcid.org/0000-0001-9724-6354

Abstract:

Background:

The purpose of present study was to compare biological, cognitive, happiness and spiritual health factors and marital satisfaction among mothers of low birth weight and optimal weight infants in Semnan during 1396-97 school year.

Method: The research method of present study is causal-comparative type of descriptive analysis (post-event). In addition, the present study is based on a fundamental targeting criterion. In order to sampling, 50 people among statistical population of each group were selected through simple random method. Afrouz Biological and Cognitive characteristics scale, Oxford Happiness Questionnaire, Palutzian & Ellison Spiritual Health Questionnaire and Afrooz Marital Satisfaction Scale were used in order to evaluate the research variables. In the present study, descriptive-analytical method was used for statistical analysis. In the descriptive part, multiple logistic regression analysis or Pearson discriminant and correlation analysis were used in SPSS software**.**

Result: The findings of Chapter Four showed that there is no significant difference between mothers of low birth weight infants and mothers of infants with optimal weight in terms of age and education ($P>0.05$).

Conclusion: Kermanshah mothers with low birth weight infants are significantly more than mothers with optimal weight infants.

Keywords: Biological and Cognitive Characteristics, Happiness, Spiritual Health, Marital Satisfaction, Low Birth Weight Infants, Optimal Weight Infants.

Submitted: 13 January 2021, Revised: 19 February 2021, Accepted: 27 February 2021

[Downloaded from intjmi.com on 2026-10-16]

[DOR: 20.1001.1.23222913.2021.10.1.8.2]

Introduction

Birth weight is recognized to predict the health and growth of the baby. Weight is one of the most important indicators of health, because low weight children are more prone to death and failure compared to other children (1). In recent years, following the advancement of technology, especially in the field of pregnancy treatments and intensive care of infants, the chances of survival of very low birth weight infants have increased, but these infants need special care and treatment to survive and be healthy.

There are several factors associated with low birth weight, including the role of biological characteristics such as maternal age at pregnancy, health care, nutrition, drug use, delivery interval, and socioeconomic status. (2). The effects of parents' age on the probability of increasing the birth of children with various disabilities and anomalies have always been considered in various studies (3). Increasing maternal age with the occurrence of chromosomal abnormalities such as Down syndrome, brain disorders, dyslexia, retardation, etc. have been considered (4). Along with biological features, another feature called cognitive features can be considered. Cognitive characteristics of parents includes level of education, cognitive abilities, level of awareness of prenatal care. Human is a purposeful creature and seeks happiness, fortune and bliss, and he/she does not feel happiness and joy until he/she achieves what he/she wants. Real happiness depends on human beings meet their inner and hidden needs in a way that society and its usual norms accept (5). Humans are multidimensional beings, and ignoring each of the dimensions removes a vital part of humanity that has a significant impact on the whole of life. One of the most important aspects of human existence is spirituality and includes a set of values, attitudes and hopes that connect a person to a superior being and link it with health, feeling good and healing (6).

1- Comparing the age of mothers of low birth weight infants with mothers of optimal weight infants in Semnan.
2- Comparing the education in mothers of low birth weight infants with mothers of optimal weight infants in Semnan.
3- Comparing the happiness factors in mothers of low birth weight infants with mothers of optimal weight infants in Semnan.

Research questions

1- Is there a significant difference between the age of mothers of low birth weight infants and mothers of optimal weight infants in Semnan?
2- Is there a significant difference between the education of mothers of low birth weight infants and mothers of optimal weight infants in Semnan?
3- Is there a significant difference between happiness factors in mothers of low birth weight infants and mothers of optimal weight infants in Semnan?

Theoretical Foundations

Low weight and optimal weight of infants at birth

Infants born weighing less than 2,500 grams (Barbara, 2009)(3) and the optimal weight of infants born weighing more than 2,500 grams.

Education of parents

Maternal education has a significant effect on the birth weight of the baby due to its positive effects on the individual's health, behaviors during pregnancy and the general situation of the family (7). The likelihood of low birth weight decreases as the father's level of education increases, and increasing the father's level of education also reduces the impact of the mother's education on the risk of low birth weight (8).

Happiness

Happiness refers to a person's judgment of the degree of crucifixion of his whole quality of life; In other words, happiness means how much one loves his own life.

[Downloaded from intjmi.com on 2026-10-16]

[DOR: 20.1001.1.23222913.2021.10.1.8.2]

Happiness and its presence in a good life has always been at the heart of philosophical, religious, and research mediations, with research on the factors influencing happiness in the 1980s going so far as to link Costa and Mac to emotional stability. Personality traits are also largely genetic, the above claim was made as they stated that it predicts extraversion, happiness and life satisfaction for the next 13 years (9).

Even now, people are looking for ways to increase their happiness. However, sociologists have recently begun to study happiness as an Indian system. It is widely believed that psychology is a therapeutic profession that emphasizes the relief of mental illness, pathology, and disability, and that health is the first condition of happiness (10). Some also think that researching positive emotions is an extravagant goal in understanding human suffering (11).

Zarbakhsh Bahri, (1391)(2) in a study conducted in Guilan province with the aim of comparing gestational age, height, weight gain during pregnancy, distance between pregnancies, economic status, nutritional status and general health of mothers of low birth weight infants and mothers of normal infants found there was a significant difference between the two groups in all factors. In a study conducted in Yazd by Ross et al. (2014)(6) entitled "Comparison of growth indices of five-year-old children with and without a history of low birth weight who examined and compared growth indices in children in the two groups NBN and IBM," The mean of all growth indices in the NBW group at different ages was significantly higher than the LBW group, severe and short stature was higher in five-year-old children with a history of low birth weight. The frequency of weight loss in children in the LBW group was higher NBN was more common in girls with a history of low birth weight than in boys.

Bahrami (1393)(11) examined the average weight of 3076 infants born by natural childbirth in Qazvin and concluded that infants born in spring and winter weigh significantly more at birth comparing with infants born in summer. Silva (2010)(9) in a descriptive-analytical study on pregnant mothers concluded that the provision of psychological services reduces mood problems and postpartum anxiety of pregnant mothers and significantly increases the weight of newborns. A study conducted by Khan, Talebian et al (1392) (10) in Karachi with the aim of determining the prevalence of low birth weight infants and determining the frequency of cell line factors in Ney Hospital showed that during the study period, 10.6% of low birth weight infants were born. 67% of mothers did not receive prenatal care, 26% of mothers weighed less than 50 kg and 37% of mothers were less than 5 feet tall. The results showed that low social and economic status, anemia, short stature and lower than average weight were associated with low birth weight.

Methods and material

The method of the present study is descriptive-analytical of scientific-comparative type (post-event). In addition, the present study is based on the criterion of targeting of the fundamental type. The statistical population of this study consisted of pregnant women with low birth weight and mothers with normal weight infants referred to hospitals in Semnan in 1396-97. In order to sampling from the statistical population, 50 people from each group were selected by the number of bases by simple random method. In the present study, descriptive-analytical method was used for statistical analysis. In the descriptive part, multiple logistic regression analysis or Pearson discrimination and correlation analysis in SPSS software was used.

Result

In this section, research questions are analyzed with the relevant statistical tests along with the assumptions of these tests.

Question 1: Is there a significant difference between the age of mothers of low birth weight

[Downloaded from intjmi.com on 2026-10-16]

[DOR: 20.1001.1.23222913.2021.10.1.8.2]

infants and mothers of optimal weight infants in Semnan?

Independent statistical test was used to examine the research question. For this purpose, first the hypotheses of this test including the normality of the distribution of research variables and the homogeneity of variance of the groups were investigated.

1- The assumption of normality of the distribution of variables: In the studied groups, a single group Kolmogorov-Smirnov test was examined. The results of this test are reported in Table 1.

As reported in Table 1, the significance level of Kolmogorov-smearing Z statistic for both groups is greater than 0.05 (p <0.05). This means that the age distribution in the two groups is not significantly different from the normal distribution, so the distribution of these characteristics is normal.

1, Homogeneity of variance of error of dependent variables in groups: The same scatter assumption requires that few dependent variables have the same scatter levels across the range of independent variables (continuous with a class). A new test was used to examine this category. If the assumption of equality of variances is established, the results of the first row in the test are used, and if the assumption of inequality is established, the results of the second row are used.

As you can see in Table 2, the significance level of Levin f statistic is more than 0.05, so there is no significant difference between the variances of the errors of the two groups, and all are assumed. Therefore, t-statistic was reported in the first row of test output in Table 3.

Based on the findings in Table 3 (t = 0.19, p> 0.05), the null hypothesis that there is no significant difference between the age groups is confirmed and the research hypothesis is rejected, so we can say that there is no significant difference between the ages of mothers with low birth weight infants and mothers with optimal weight infants.

Question 2: Is there a significant difference between the education of mothers of low birth weight infants and mothers of optimal weight infants in Semnan?

Chi-square test was used to examine the research question. The results are reported below.

According to the results of Table 4, the amount of chi-square obtained from comparing the frequencies of the two groups in the three variables of education is equal to 5.79, which is statistically significant (p = 0.05), therefore in terms of education there is a significant difference between mothers of low birth weight infants and mothers of optimal weight infants in Semnan.

Question 3: Is there a significant difference between happiness factors in mothers of low birth weight infants and mothers of optimal weight infants in Semnan?

In order to test this question, multivariate analysis of variance was used. Before performing this test, its hypotheses were first reviewed and reported.

Multivariate analysis of variance assumptions

1. Free distribution in groups is normal: In order to test this assumption, Kolmogorov-Smirnov single group test was used.

As reported in Table 5, the significance level of Kolmogorov-Smirnov Z statistic for both groups in all satisfaction factors is 0.05 (p> 0.05). This means that the distribution of satisfaction factors in the two groups is not significantly different from the normal distribution, so the distribution of these characteristics is normal.

2. Homogeneity of variance Errors of dependent variables in groups: The same dispersion assumption requires that

Table1: Results of Kolmogorov-Smrinov test to investigate the normality of age distribution by groups

[Downloaded from intjmi.com on 2026-10-16]

[DOR: 20.1001.1.23222913.2021.10.1.8.2]

groups / Variables	mothers of low-birth-weight infants		mothers of optimal weight infants	
	Significance	Statistics z	Significance	Statistics z
age	0.08	1.25	0.08	1.26

Table 2: Levin test to evaluate the sensitivity of age error variance in groups

variable	Significance level	Statistics f Levin
age	0.76	0.08

Table 3: Independent test results to compare the mean age in the groups

variable	Significance level	Degrees of freedom	statistics t	Mean difference
Age	0.84	48	0.19	0.04

dependent variables have the same scatter levels across the range of independent variables (continuous or stratified). To test this assumption, a new test was used.

As you can see in Table 6, the significance level of Levin f statistic for marital satisfaction and communication is greater than 0.05, so there is no significant difference between the variance of errors between the two groups and the condition of homogeneity of variance of errors is established. However, in the case of ideal distortion and conflict resolution, the significance level of F statistic is less than 0.05 and the assumption of homogeneity of variance of errors is not established. Therefore, caution should be exercised in interpreting the results of the analysis of variance test for these characteristics and the alpha level (p> 0.025) should be used when evaluating the F ratio.

3. Homogeneity of variance-covariance matrices: In order to investigate the equality of variance-covariance matrices, M-box test was used. If the significance level of this statistic is greater than 0.001, the assumption of equality of covariance matrices is accepted. The results of this test are reported in Table 4-13.

The results reported in the M statistical table show a significant box (P <0.001) which indicates the inequality of variance-covariance matrices. Due to the violation of the same dispersion assumption when interpreting the multivariate F ratio, Pillai's Trace should be used.

1. Adequacy of correlation between dependent variables: For this purpose, Bartlett Test of Sphericity was used. If the significance level of this statistic is less than 201. This assumption is true (P <0.001). The results of this test are reported in Table 8.

Bartlett Test of Sphericity in Table 8 has shown a significance level of less than 0.001 and indicates a sufficient correlation between the dependent variables to continue the analysis. The results of multivariate analysis of variance are reported to compare satisfaction factors in the two groups.

Table 9 shows the multivariate test results. Due to the inequality of the covariance matrices, a Pillai's Trace is reported. As can be seen (Pillai's Trace = 0.25 and P <0.05, F = 55.6). Based on these results, we can reject the null hypothesis that there is no difference between the mean of the studied groups (mothers with low birth weight and infants with optimal weight) in dependent variables (satisfaction factors) and conclude that there is a significant difference in at least one of Satisfaction factors. We also observe that 25% of the total variance of the dependent variables is explained by

Table4: Chi-square test results to compare the frequency of the two groups in terms of education variables

[Downloaded from intjmi.com on 2026-10-16]

[DOR: 20.1001.1.23222913.2021.10.1.8.2]

variable	categories	group	Significance level	Chi-square
education	Diploma	9	0.05	5.79
	Bachelor	14		
	MA	2		

Table5: Results of Kolmogorov-Smrinov test to evaluate the normality of the satisfaction distribution and its dimensions by groups

groups / Variables	mothers of low birth weight infants		mothers of optimal weight infants	
	Significance level	Statistics z	Significance level	Statistics z
Ideal distortion	0.09	1.24	0.74	0.68
Marital Satisfaction	0.20	1.06	0.40	0.89
connections	0.52	0.81	0.11	1.19
Conflict resolution	0.45	0.85	0.22	1.04
Total Satisfaction	0.31	0.96	0.22	1.04

Table 6: Levin test to examine the variance of satisfaction error and its dimensions in groups

variable	Significance level	Degree of freedom 2	Degree of freedom 1	Statistics f Levin
Ideal distortion	0.002	48	1	10.24
Marital Satisfaction	0.84	48	1	0.03
connections	0.28	48	1	1.15
Conflict resolution	0.001	48	1	15.50
Total Satisfaction	0.20	48	1	1.61

group differences according to the quadratic squares. Also, 99% statistical power indicates the adequacy of the sample size for testing the null hypothesis and the test power in identifying the real effect. Because the effect of multivariate was statistically significant, we can continue the separate univariate F test for each of the satisfaction factors. The results of this test are reported in Table 10.

Discussion

Results of the main research questions: Is there a significant difference between bio-cognitive factors, happiness and spiritual health, marital satisfaction in mothers of low birth weight infants and mothers of optimal birth weight infants in Semnan?

The findings of Chapter Four showed that there is no significant difference between mothers of low birth weight infants and mothers of optimal weight infants in terms of age and education. There is a significant difference between the two groups in terms of happiness, religious health, and spiritual health. There are also results that show that there is a significant difference between the components of satisfaction between the two groups in terms of ideal distortion, communication and conflict resolution, but no significant difference was observed between the two groups in terms of marital satisfaction.

Table 7: Results of Equality Test of Covariance Matrices

Significance level	Df_2	Df_1	F	Box's M
0.001	38668.73	15	3.17	50.42

[Downloaded from intjmi.com on 2026-10-16]

[DOR: 20.1001.1.23222913.2021.10.1.8.2]

Table 8: Results of M-box Adequacy test of correlation between dependent variables

Significance level	df	Chi-square	Probability ratio
0.001	14	45.22	0.000

Table 9: Results of multivariate analysis of variance of groups in satisfaction and satisfaction dimensions

Multivariate test	Test power	Square parabola price	Significance level	Statistics F	Value
Pillai's Trace	0.99	0.25	0.001	6.55	0.25
Wilks Lambda	0.99	0.25	0.001	6.55	0.74
Hoteling effect	0.99	0.25	0.001	6.55	0.34
Roy's Largest Root	0.99	0.25	0.001	6.55	0.34

Table10: Results of one-way analysis of variance and satisfaction dimensions

variable	Significance level	F	Average squares	Degrees of freedom	Total squares
Ideal distortion	0.001	14.85	295.84	1	295.84
Marital Satisfaction	0.25	1.31	24.01	1	24.01
connections	0.01	5.81	82.81	1	82.81
Conflict resolution	0.005	8.43	207.36	1	207.36
Total Satisfaction	0.01	2.15	65.610	1	65.610

Sub-question 1: Is there a significant difference between the age of mothers of low birth weight infants and mothers of optimal weight infants in Semnan?

The findings of Chapter 4 showed that there is no significant difference between age in mothers with low birth weight infants and mothers with optimal weight infants.

This finding is consistent with the findings of Zarbakhsh Bahri, Hosseinian, (1391) (2) in a study conducted in Gilan province with the aim of comparing gestational age, height, weight gain during pregnancy, distance between pregnancies, economic status, nutritional status and general health of mothers of low birth weight infants and mothers of optimal infants were significantly different in all factors. Also, in Bahrami (1392)(11) study conducted in Ahvaz, there was no significant difference between the variables related to mother's age, father's age at marriage, father's general health and consanguineous marriages. Also, other biological variables such as maternal age at marriage and maternal general health were not significantly associated with the frequency of more than one exceptional child and consanguineous marriage.

Explaining this finding and considering the conditions of today's society where a large number of women become pregnant over the age of 35, the factors of which are education, marriage at an older age than in the past and the desire to have more children during life, the higher prevalence of infertility and progress in infertility treatments. Women over the age of 35 are more likely to develop chronic high blood pressure, gestational hypertension, diabetes and macrosomia. While the risk of a prolonged pregnancy is lower. Fetal complications are also increased before preterm delivery, low birth weight and intrauterine growth retardation(6).

Sub-question 2: Is there a significant difference between the education of mothers of low birth weight infants and mothers of optimal weight infants in Semnan?

[Downloaded from intjmi.com on 2026-10-16]

[DOR: 20.1001.1.23222913.2021.10.1.8.2]

The findings of Chapter 4 showed that there is a significant difference between education in mothers with low birth weight infants and mothers of optimal weight infants.

This finding is consistent with the findings of Hezar Jaribi et al. (1388) (5) that were performed on women in Qom and showed no significant relationship between iron deficiency anemia, age, occupation, education, number of deliveries and the interval between pregnancies.

This seems to be due to the level of information and education even in the group of housewives.

Explaining this finding, it can be said that education plays an important role in many theories of fertility transition. A significant part of the demographic literature is devoted to examining the role of women's education in continuous fertility decline. Ross et al (2014) (6) consider increasing the level of education, as the main force behind fertility retrieval. Education, especially women's education, is considered to be the main force behind fertility recovery. Education is one of the main determinants of the position of women and modernity in society, which is inversely related to fertility. Silva (2010) (9) considers the position of women as one of the main determinants of fertility decline in developing countries. Nevertheless, Shagi believes that there is no agreement on the socioeconomic factors influencing the inverse relationship between education and fertility in the explanations provided for developments in women's independence, the opportunity cost of childbearing, and exposure to western values are emphasized(1).

Sub-question 3: Is there a significant difference between happiness factors in mothers of low birth weight infants and mothers of optimal weight infants in Semnan?

Conclusion

Findings of Chapter 4 showed that there is a significant difference between happiness in mothers with low birth weight infants and mothers with optimal weight infants and according to the average table of Kermanshah mothers with low birth weight infants are significantly more than mothers with optimal weight infants.

References

1. Shagi TJ, Maternal depression. J Am Med Asoc, 2010;295:1376-1378.

2. Zarbakhsh Bahri, Mohammad Reza, Analytical study and comparison of biological, cognitive, psychosocial and environmental characteristics of parents of low birth weight infants in urban and rural areas of Guilan province, PhD thesis in psychology and education of exceptional children, Tehran: Islamic Azad University, Research Sciences Branch.1391. (in persian)

3. Barbara-Klein EK, Mitchel D. Knudtson K, Kristine E, Lee R. Parent's attained age and biomarkers of aging in their children. Arch Gerontol Geriatric 2009,49:284-94.

4. Richenberg A, Gross R Advancing parental age autism. Arch Gen Psychol 2006;63:1026-32.

5. Hezar Jaribi, Jafar and Austin Fashan, Parvaneh. , Investigating the factors affecting social vitality with emphasis on Tehran province, Applied Sociology,1388, 33(1). (in persian)

6. Ross L. Leeuwen RV, Baldacchino D. Student nurses perceptions of spirituality and comnetence in delivering spiritual care: A Europen pilot study. Nurse Education today. 2014; 34: 697-702.

7. Talebian, Mohammad Hassan et al. The effect of maternal biological and psychological risk factors on neonatal underweight in Isfahan, Journal of Health System Research, 1392; 9 (10) 1138-1148. (in persian)

8. Eslami F. Behforuz A. Sajadi A. Shaker I Nelson textbook of pediatrics, Tehran, Arjmand; 1372:3.

9. Silva AAm Vasconcelos AGG Bettiol H: Barbieri MA Socioeconomic status-birth weighte maternal smoking during pregnancy and adiposity in early adult life: an analysis using structural equation modeling. Cadernos de saude publica 2010;26(1): 15-29.

10. Tahdhibi, Mehdi; Bahraini, Nima. Evaluation of nutritional status of premature and normal low birth weight infants in relation to their growth in Al-Zahra and Shahid Beheshti hospitals. Master Thesis of Isfahan University of Medical Sciences, 1387. (in persian)

11. Bahrami, Nasim; Soleimani, Mohammad Ali. Investigation of some factors related to macrosomia and low birth weight Journal of Urmia School of Nursing and Midwifery,1392; 12 (2) 55. (in persian)

[Downloaded from intjmi.com on 2026-10-16]

[DOR: 20.1001.1.23222913.2021.10.1.8.2]