



Comparison of Mental Health and Self-Efficacy of Mothers with Preterm and Term Infants: A Case-Control Study

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Received 2018 November 06; Revised 2019 March 26; Accepted 2019 April 01.

Abstract

Background: Parental adjustment with the birth of a preterm baby is often associated with stress, anxiety, and concern.

Objectives: This study aimed to compare mental health and self-efficacy of mothers with preterm and term infants.

Methods: This case-control study was conducted on 108 women visiting the healthcare centers of Tabriz (36 mothers with preterm infants as the case group and 72 mothers with term infants as the control group) in 2018. The participants were selected by clustering sampling. The general health questionnaire-28 (GHQ-28) and the maternal self-efficacy questionnaire (MSQ) were used to collect data. The multivariate linear regression model was used for data analysis.

Results: The mean self-efficacy score was 30.5 ± 5.6 in the case group and 29.1 ± 4.1 in the control group from the attainable score of 10 to 40. The mean total score of mental health was 27.5 ± 7.5 in the case group and 26.1 ± 8.2 in the control group ranging from 28 to 84. Moreover, 69.4% of the mothers in the case group and 66.7% in the control group had mental health disorder with no significant difference between them ($P = 0.771$). There was no significant difference between the groups in terms of self-efficacy (0.168) and mental health (0.930) based on the multivariate linear regression model with adjusting the variables of mother and spouse's age and gestational age.

Conclusions: The results showed a high prevalence of mental health disorder in both groups without significant difference between the groups. This shows the importance of taking measures to improve the mental health of mothers with preterm and term infants.

Keywords: Self-Efficacy, Mental Health, Infant, Preterm, Term Birth

1. Background

A preterm infant is a baby born before 37 weeks of gestation (1). Annually more than 6.9% (12 million newborns) are born before the due date, which accounts for 10% - 12% of the total number of births in the world. The prevalence of preterm labor was 11.7% of live births in the United States in 2012 (2). Preterm infants are prone to problems such as the lack of growth and nutritional deficiencies (3). These infants are seven times more likely to develop evolutionary problems compared to term infants (4). In addition to routine care, preterm or low-weight infants require more care after discharge (5). Birth of preterm infants affects mother-baby interaction by disrupting a mother's thinking ability and creating tension (6).

Acceptance of maternal role is a challenge during any woman's lifetime in which mothers not only face the tasks of the maternal role but also with the changes in their

physiology (7). Parents of preterm infants often have problems regarding taking care of the baby, as well as in cooperating with the health team, due to their high levels of anxiety, which can delay the emotional relationship between the mother and the baby. Such mothers might look worried and disappointed and get hurt mentally due to failure to complete the usual gestational period and uncertainty about the infant's health (8).

As a dimension of health, mental health is not considered the lack of mental illness, rather it is the ability to adapt to the environmental conditions and to respond appropriately to life's problems and incidents (9). Some of the signs of mental health include the compatibility of individuals with themselves and others, a relatively fair judgment in dealing with issues, tolerance of critics, and proper response to problems (10). The physical and mental health of mothers can directly affect the physical and mental health of the family and children (11). Researchers

believe that pregnant women with low or negative mental health at the gestational age of 22 - 24 weeks are very likely to have a preterm infant (12). Maternal self-efficacy is one of the factors affecting maternal mental health during postpartum (13).

Parental self-efficacy is defined as the belief or judgment on the parents' competence and ability to play a successful and effective role. This construct is known with various terms, including the mother's self-confidence, mother's self-esteem, and parental competence (14). Self-efficacy and awareness of father and mother about a baby evolution via creating appropriate behaviors is a good predictor for playing the parental role (7). According to Bandura's theory, difficult tasks such as taking care of premature infants may weaken self-efficacy by reducing the likelihood of success (15). Maternal self-efficacy is a reason for successful breastfeeding (16).

2. Objectives

Since poor mental health of mothers adversely affects infants' health and development (17), and maternal self-efficacy plays an important role in the proper functioning of parental tasks (7), and according to studies, there was no study comparing mental health and self-efficacy in mothers of term and premature infants, the present research intended to compare the two variables of mental health and self-efficacy in mothers of preterm and term infants.

3. Methods

3.1. Study Design and Participants

This case-control study was conducted on 108 women visiting the healthcare centers of Tabriz in 2018. The inclusion criteria were mothers of preterm or term infants who visited the vaccination unit of Tabriz healthcare centers for vaccination of two-month-old infants, no history of preterm labor, willingness to participate in the study, and age of above 18 years. The exclusion criteria were a history of mental illness or depression before or during pregnancy according to the mother, the occurrence of stressful events during and after pregnancy, such as the death of one of the relatives, divorce, and major abnormalities in the newborn.

According to the studies of Behnam Vashani et al. (18) and Sehhatie et al. (19) and based on the mental health variable, and considering $m_1=35.3$ and $sd_1=12.9$ in mothers of preterm infants, $m_2=24.6$ and $sd_2=14.3$ in mothers of term infants and one-sided $\alpha = 0.05$ and the power = %95, 36 mothers were enrolled in the case group and twice this amount (72 mothers) in the control group.

3.2. Sampling

After obtaining the required permission from the Ethics Committee of Tabriz University of Medical Sciences (IR.TBZMED.REC.1397.274), the mothers were selected by cluster sampling. That is, firstly, one-third of Tabriz healthcare centers were randomly selected using the website www.random.org. Thus the researcher referred to the selected healthcare centers and after presenting the referral letter attended at the vaccination unit of health centers for sampling, where she purposefully selected the mothers of two-month-old infants. The mothers were evaluated in terms of inclusion criteria and if they were eligible and willing to participate in the study, the research objectives were fully explained to them and written consent was obtained. The mothers were then assigned to the case and control groups based on the term or preterm birth of their infants. Sampling was continued until the completion of 36 mothers with preterm infants and 72 mothers with term infants. The sociodemographic characteristics, standard mental health, and maternal self-efficacy questionnaires were completed by the researcher via an interview with mothers. The possible confounding factors were controlled by statistical tests.

3.3. Data Collection Tool

In this study, the sociodemographic characteristics, standard mental health (GHQ-28 = general health questionnaire), and maternal self-efficacy (MSQ = maternal self-efficacy questionnaire) questionnaires were completed by the researcher via an interview with mothers.

The socio-demographic questionnaire included questions about the age of mother and her husband, education of mother and her husband, occupation of mother and her husband, economic status, number of pregnancies, and so on. Content and face validity were used to determine the validity of the sociodemographic questionnaire.

Maternal self-efficacy questionnaire (MSQ) measures the mother's ability to care for her baby and has 10 items, 9 of which are related to maternal activity and one is a general item. The items are scored based on 4-point Likert scale (1 = worse than others, 2 = relatively worse than others, 3 = as good as the others, 4 = better than others), higher scores indicating a higher maternal self-efficacy (20, 21). The validity of the questionnaire was confirmed with an $\alpha = 0.79$ in a pilot study by Teti and Gelfand (22), and an $\alpha = 0.86$ in the study of Sanders and Woolley (23). Fathi et al. studied the psychometric properties of the questionnaire in Iran and reported $\alpha = 0.89$, ICC = 0.98, the content validity index as 0.92, and the content validity ratio as 0.94 (13).

Mental health was measured with general health questionnaire (GHQ-28). The questionnaire was developed by

Goldberg in 1972 aiming to identify mental disorders in various centers and environments. It has 28 items, which are scored from 0 to 3 according to Likert scale (0 = not at all, 1 = as usual, 2 = more than ever, 3 = much more than ever). The questionnaire consists of four 7-item scales in which items 1 - 7 assess physical symptoms, 8 - 14 anxiety disorder, 15 - 21 social function disorder, and 22 - 28 depression. The score ranges from zero to 84, higher scores indicate mental health worsening (24). Validity and reliability of this questionnaire in Iran were determined by Cronbach's alpha as $> 82\%$ (25).

To determine the reliability of the maternal self-efficacy and mental health questionnaires, test-retest analysis was conducted on 20 mothers at an interval of two weeks. The intra-class correlation coefficient for maternal self-efficacy and mental health questionnaires were determined to be 0.872 and 0.985, respectively, indicating the desired reliability of the standard maternal self-efficacy and mental health questionnaires.

3.4. Data Analyses

To analyze the results, SPSS software version 24 was used. The normal distribution of quantitative data was examined using the Kolmogorov-Smirnov test, the total score of mental health and the physical subdomain of mental health had a normal distribution, while the remaining variables were abnormally distributed. The independent *t*, Mann-Whitney U, and chi-square tests in bivariate analysis and linear regression model in the multivariate analysis by adjusting the confounding variables were used to compare the mean scores of mental health and maternal self-efficacy between the groups.

4. Results

There was no significant difference between the two groups of case and control, except for the mother's age and the gestational age. The mean age of the participants was 27.3 ± 6.5 years in the case group and 28.2 ± 1.5 years in the control group. The mean gestational age was 34.2 ± 2.8 weeks in the case group and 38.9 ± 0.8 weeks in the control group. In both groups, the most prevalent type of delivery was cesarean section. Approximately one-third of mothers (33.3%) in the case group had two children and more than half of mothers (56.9%) in the control group had one child. Most mothers in both groups were housewives and had a diploma. Both groups were at a moderate level in terms of income adequacy. The majority of participants in both groups were happy to be pregnant, were happy with their newborn's sex, and were assisted in taking care of their baby (Table 1).

The mean self-efficacy score was 30.5 ± 5.6 in the case group and 29.1 ± 4.1 in the control group ranging from 10 to 40, and there was no significant difference between the groups in terms of self-efficacy based on Mann-Whitney U test ($P = 0.723$). The mean total score of mental health was 27.5 ± 7.5 in the case group 26.1 ± 8.2 in the control group ranging from 28 to 84 and there was no significant difference in mental health score between the groups based on independent-*t* test ($P = 0.380$). The participants in both groups had the highest mean score in the subdomain of anxiety and the lowest mean score in the subdomain of depression. There was no significant statistical difference in mental health subdomains between the two groups ($P < 0.05$). Moreover, 69.4% of the mothers had a mental disorder in the case group and 66.7% in the control group with no significant difference between them ($P = 0.771$) (Table 2).

There was no significant difference between the groups in terms of self-efficacy (0.168) and mental health (0.930) based on the multivariate linear regression model with adjusting the variables of mother and spouse's age and gestational age (Table 3).

5. Discussion

The study results showed no significant difference between the self-efficacy and mental health of mothers with preterm and term infants at two months old. Also, mental health disorder was prevalent in the two groups.

There was no significant difference in maternal self-efficacy between the case and control groups. The present research is consistent with a study by Spielman and Taubman-Ben-Ari (26) conducted in the hospitals of Israel Ramat Gan city on 49 preterm infants and 50 term infants using parental self-efficacy questionnaire that showed no significant difference in parental self-efficacy in preterm and term infants. According to this study, the mothers of these infants had not a lower self-efficacy than the mothers of term infants, because preterm infants were not at serious risk and hence their help was less required. In the present study, mothers of preterm infants had no difference with mothers of term infants in terms of self-efficacy because the critical period of the infancy was finished and the infants were discharged.

A study by Gross et al. (27) was also conducted at Chicago city center hospitals on 62 preterm infants and 70 term infants. In this study, the data of 12-month and 36-month infants were collected using toddler care questionnaire (TCQ) and the results showed no difference between mothers of preterm and term infants in terms of maternal self-efficacy, which was derived from Bandura's self-efficacy theory, and mothers need to have practical understanding

Table 2. Comparison of Mental Health and Self-Efficacy of Mothers with Preterm (Case Group) and Term (Control Group) Infants Based on Bivariate Tests

Variables	Case Group (N = 36)		Control Group (N = 72)		P Value
	Mean \pm SD	Median (25% - 75%)	Mean \pm SD	Median (25% - 75%)	
Perceived self-efficacy (Score range: 10 - 40)	30.5 \pm 5.6	29 (28 - 31)	29.1 \pm 4.1	30 (27.2 - 31)	0.723 ^a
Total mental health score (Score range: 0 - 84)	27.5 \pm 7.5	27 (23.2 - 32)	26.1 \pm 8.2	26 (22.2 - 32)	0.380 ^b
Somatic symptoms (Score range: 0 - 21)	8.2 \pm 1.1	8 (7 - 9)	7.1 \pm 3.1	8 (7 - 10.7)	0.660 ^b
Anxiety disorder (Score range: 0 - 21)	8.1 \pm 2.8	8 (7 - 9)	7.8 \pm 3.4	8 (7 - 9.7)	0.784 ^a
Social Functional Disorders (Score range: 0 - 21)	8.5 \pm 2.6	9 (7 - 9)	8.2 \pm 2.1	8 (7 - 9.7)	0.768 ^a
Depression (Score range: 0 - 21)	2.7 \pm 2.7	2 (0.25 - 5.5)	2.1 \pm 2.1	1 (0 - 3)	0.418 ^a

^aMann-Whitney U test^bIndependent t-test**Table 3.** Comparison of Self-Efficacy and Mental Health Between Two Groups Based on Multivariate Linear Regression Model with Control of Mother's Age, Gestational Age, and Spouse's Age

Variable	Mental Health		Self-Efficacy	
	B (95% CI)	P Value	B (95% CI)	P Value
Group				
Case	0.01 (-0.29 to 0.31)	0.930	2.05 (-0.89 to 4.97)	0.168
Control (Reference)	0		0	
Mother's age	-0.00 (-0.03 to 0.03)	0.950	0.39 (0.12 to 0.67)	0.005
Gestational age	-0.01 (-0.06 to 0.04)	0.749	0.08 (-0.41 to 0.57)	0.748
Spouse's age	-0.01 (-0.04 to 0.02)	0.549	-0.19 (-0.47 to 0.08)	0.163

and support to achieve self-efficacy, regardless of their gestational age at labor. However, the mother's previous experience of infant care among the mothers of preterm infants is a factor affecting their self-efficacy. Although in this study, primiparous mothers with preterm or term infants have been compared, the results of this study are consistent with that of the present study.

Our results also showed no difference in terms of mental health between the two groups of mothers with preterm and term infants. The results of the following studies are inconsistent with the findings of the present study. This result may be owing to the fact that the late preterm infants (gestational age of 34 - 37 weeks) were examined in the present study. Also, the lack of significant difference between the groups may arise from differences in the tool and the time of the study as well as the low sample size of case group in our study.

A study was conducted by Treyvaud et al. (28) at the Royal Melbourne Hospital in Australia on 177 preterm and 69 term infants, in which the parental mental health questionnaire, derived from the general health questionnaire, and the infant-toddler social-emotional assessment (ITSEA) as a screening tool for early childhood social-emotional development, were used. The study results

showed that 26% of the parents with preterm infants and 12% of the parents with term infants were exposed to psychological problems at the child's age of 2 years and there was a significant difference between the two groups. This study is not consistent with the present research, probably owing to the fact that the preterm infants were examined at the gestational age of 34 - 37 weeks in the present study, while in the study of Treyvaud et al., very preterm infants were investigated. The results of a study by Miles et al. in 2007 that examined depression in mothers with preterm infants showed that 63% of mothers with hospitalized preterm infants had significant depressive symptoms, while the rate of depression was decreased by 26 percent 22 months after the birth (29). The results of the above study are inconsistent with that of the present study, which can be attributed to the focus of this study on the depression of mothers with hospitalized preterm infants.

A cohort study by Gulamani et al. in 2013 was conducted in Pakistan on 170 mothers with term infants and 34 mothers with preterm infants 6 weeks after the delivery to investigate the postpartum depression (PPD) using General health questionnaire and Edinburgh postnatal depression scale (EPDS). The results showed a significant difference between the mothers of term and preterm infants

in terms of depression score (30), which are inconsistent with the results of the present study. This inconsistency can arise from the difference in the research environment, and according to the researchers of the above study, from the lack of local resources in supporting the mothers of preterm infants.

A study in Tehran, Iran by Khanjari et al. (6) was conducted on 50 mothers with preterm infants and 50 mothers with term-infants, using the World Health Organization quality of life questionnaire (BREF-WHOQOL) and the maternal sense of coherence (SOC) questionnaire. The results showed that in the group of mothers with term infants, physical health was higher than mothers with preterm infants. In addition, mothers of preterm infants were more at risk for psychological stress compared to the mothers of term infants. Although the mean score of social relationships in mothers of term infants was slightly higher, the mothers of preterm infants improved themselves in the dimension of social affairs at the two-month age of their baby and keep this condition as good as mothers of term infants (6). The inconsistency between the results of this study and that of Kanjari et al. may arise from the difference in the tool and the time of the study.

The use of standard tools for measuring mental health and maternal self-efficacy was one of the strengths of this research. The limitations of this study include the small sample size and examination of mothers only when their infants are two-month-old, which limits the generalization only to the mothers with infants of below two months. Therefore, since mothers at 2-month-old of their preterm infant have passed the critical caring period or their babies have been discharged, it is suggested that the variables of self-efficacy and mental health should be investigated shortly after birth.

5.1. Conclusions

The study results showed no difference between mothers of preterm and term infants in terms of mental health and self-efficacy as well as a high prevalence of mental health disorders in both groups. This shows the importance of taking measures to improve the mental health of mothers with preterm and term infants. Therefore, to strengthen self-efficacy and improve maternal mental health, it seems necessary to provide the parents, especially mothers, with educational and supportive interventions during pregnancy and postpartum.

Acknowledgments

We hereby wish to thank Student Research Committee of Tabriz University of Medical Sciences to support this research, all participants in this study and personnel at the

healthcare centers in Tabriz for their sincere cooperation in sampling.

Footnotes

Authors' Contribution: Shiva Havizari contributed to the study design, data collection, data interpretation and writing the manuscript. Mojghan Mirghafourvand contributed to study design, data analysis, data interpretation and revising the manuscript.

Conflict of Interests: The authors declare no conflict of interest.

Ethical Approval: This study was approved by the Ethics Committee of Tabriz University of Medical Sciences (IR.TBZMED.REC.1397.274).

Funding/Support: Financial support was provided by the deputy of research of Tabriz University of Medical Sciences.

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Table 1. Socio-Demographic Characteristics of the Participants^a

Variables	Case Group (N = 36)	Control Group (N = 72)	P Value
Age	27.3 ± 6.5	28.2 ± 5.1	0.022 ^b
Gestational age	34.2 ± 2.8	38.9 ± 0.8	< 0.001 ^b
Husband age	32.4 ± 6.3	32.8 ± 5.2	0.055 ^b
Type of delivery			0.781 ^c
Vaginal	15 (41.7)	28 (38.9)	
Cesarean section	21 (58.3)	44 (61.1)	
Gravid			0.383 ^d
1	16 (44.4)	41 (56.9)	
2	17 (47.2)	24 (32.3)	
≥ 3	3 (8.3)	7 (9.7)	
Parity			0.343 ^c
1	17 (47.2)	41 (56.9)	
2	17 (47.2)	24 (33.3)	
3	2 (5.6)	7 (9.7)	
Live child number			0.470 ^c
1	18 (50.0)	41 (56.9)	
2	16 (44.4)	24 (33.3)	
3	2 (5.6)	7 (9.7)	
Occupation			1.000 ^d
Housewife	32 (88.9)	63 (87.5)	
Employed	4 (11.1)	9 (12.5)	
Level of education			0.915 ^e
Illiterate	0 (0.0)	4 (5.6)	
Elementary	3 (8.3)	0 (0.0)	
Secondary	2 (5.6)	7 (9.7)	
High school	3 (8.3)	7 (9.7)	
Diploma	16 (44.4)	27 (37.5)	
University	12 (33.3)	27 (37.5)	
Spouse's education			0.523 ^c
Illiterate	0 (0.0)	1 (1.4)	
Elementary	3 (8.3)	2 (2.8)	
Secondary	4 (11.1)	12 (16.7)	
High school	16 (44.4)	19 (26.4)	
University	11 (30.6)	34 (47.2)	
Spouse's occupation			0.702 ^d
Unemployed	0 (0.0)	1 (1.4)	
Manual worker	5 (13.9)	6 (8.3)	
Employee	10 (27.8)	24 (33.3)	
Shopkeeper	3 (8.3)	3 (4.2)	

Self-employment	18 (50.0)	38 (52.8)	
Adequacy of monthly income			0.416 ^e
Quite enough	2 (5.6)	5 (6.9)	
Somewhat enough	34 (94.4)	62 (86.1)	
Not enough at all	0 (0.0)	5 (6.9)	
Willingness to pregnancy			0.378
Yes	33 (91.7)	61 (84.7)	
No	3 (8.3)	11 (15.3)	
Infant's favorite sex			1.000 ^d
Yes	35 (97.2)	69 (95.8)	
No	1 (2.8)	3 (4.2)	
Having help in taking care of the baby			0.750 ^c
Yes	28 (77.8)	54 (75.0)	
No	8 (22.2)	18 (25.0)	
Referring to the health center for postpartum care			1.000 ^c
Yes	31 (86.1)	62 (86.1)	
No	5 (13.9)	10 (13.9)	

^aValues are expressed as mean \pm SD.

^bIndependent *t*-test

^cChi-square

^dFisher's exact test

^eChi-square for trend