The relationship of childbirth experience with maternal functioning and mental health of Iranian women: A cross-sectional study

Shiva Havizari

Tabriz University of Medical Sciences

Solmaz Ghanbari Homayi

Tabriz University of Medical Sciences

Ommolbanin Eyvazzadeh

Tabriz University of Medical Sciences

Mojgan Mirghafourvand (✉ mirghafourvand@gmail.com)

Tabriz University of Medical Sciences <https://orcid.org/0000-0001-8360-4309>

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Abstract

Background: Childbirth experience is a major outcome of labor, which is always associated with some potential psychological advantages or damages. Given the significant impact of childbirth on maternal role and on physical and mental health of mothers, this study aimed to investigate the relationship of childbirth experience with postpartum maternal functioning and mental health of women.

Methods: This cross-sectional study was carried out on 483 mothers with vaginal childbirth, 4-16 weeks after delivery in health centers of Tabriz-Iran, 2018. The cluster random sampling method was used. The socio-demographic characteristics questionnaire, Questionnaire for Assessing the Childbirth Experience (QACE), Mental Health Inventory (MHI), and Barkin Index of Maternal Functioning (BIMF) were completed through interviews and the obtained data were analyzed using independent t-test, one-way ANOVA, Pearson's correlation test, and the General Linear Model (GLM).

Results: The mean score of childbirth experience was 1.6 (0.4) within the score range of 1-4. The mean score of mental health was 79.1 (15.0) out of 18-108 and maternal functioning was 97.4 (13.0) out of 0-120. Based on the correlation coefficients, there were significant correlations between the total score of mental health and maternal functioning and all its subdomains with childbirth experience ($P<0.001$), also based on GLM results, maternal functioning was significantly correlated with childbirth experience ($P<0.001$), receiving help for infant care ($P<0.001$) and the adequacy of family income ($P=0.006$). Mental health was significantly correlated with childbirth experience ($P<0.001$), complete life-satisfaction ($P<0.001$), and receiving help for infant care ($P=0.025$).

Conclusion: The results showed significant relationships between childbirth experience with maternal functioning, mental health and all their subdomains. Considering these relationships, it seems that supportive care services offered by health care providers can improve mothers' birth experiences and consequently lead to improved postpartum maternal functioning and mental health.

Background

One of the most important developments in women's lives is transition to the maternal stage [1], which is associated with adjustment to new maternal roles and responsibilities, as well as with many physical, social, and psychological changes [2]. Giving birth to a baby is often regarded as a positive and natural event in a woman's life; however, for many women childbirth experience may be a combination of positive and negative (or a series of negative) experiences [3].

Childbirth experience is a significant reality of life that may affect a woman's short/long-term health. Allegedly, 20–48% of women worldwide have reported birth trauma, which is linked with adverse mental health effects on mothers, maternal bond, and infant growth and development [4]. Having a history of psychological disorders, being a first-time mother, and undergoing C-section are identified as risk factors for traumatic childbirth [5]. The first experience of labor affects one's attitude towards subsequent deliveries [6], and negative experiences increase the risk of postpartum depression in the current and

subsequent deliveries [7]. Moreover, mental disorders can have long-term negative effects on mothers and, if left untreated, on children's mental health [8].

According to World Health Organization, mental health is "a state of well-being in which the individual realizes his or her own abilities, can cope with the common stresses of life, can work productively and efficiently, and is able to make a contribution to his or her community" [9]. In developing countries, 1 in 3–5 women experience major mental health problems during pregnancy and after childbirth; however, the ratio is about 10% in developed countries [10]. Women's emotional and mental health significantly influences their perception and experiences of pregnancy and labor [11]. A cohort study was conducted on 175 mothers in Canada one month after childbirth. Based on the results, women's birth experience fails to predict early parenting behaviors; however, mental health significantly predicts positive parenting behaviors one month after childbirth [12].

In addition to the status of depression, mental health characteristics are also affected by other constructs such as maternal functioning, which is measured with regard to a woman's adaptation to her new maternal roles. Childbirth experience influences mothers' perception of infants and their description of postpartum caring behaviors [13]. The studies of Teti et al. indicate that mother's assessment of her child affects early child care behaviors and their mutual relationship, and that her poor understanding of her child is associated with poor behavioral skills and a sense of poor maternal competence [14, 15]. Postpartum functioning significantly influences the establishment and maintenance of a successful mother-child relationship, and a high level of maternal functioning is likely to be associated with positive infant development outcomes. Factors that may affect postpartum functioning in the general population include parity, childbirth experience, type of delivery, and maternal and newborn complications [16].

Few studies have investigated childbirth experiences in Iran. In their qualitative study on childbirth experience of primiparous women in Shiraz, Iran, Vaziri et al. found that these women do not have realistic expectations of natural childbirth. In addition to focusing on maternal and fetal health, their study emphasized the importance of antenatal classes, and increased support for mothers [17]. Given the importance of childbirth experiences and their short/long-term effects on women and infants [18], and also due to a gap in the literature to assess the relationship between the childbirth experience and mental health variables and maternal functioning, this study aimed to investigate the relationship of childbirth experience with maternal functioning and mental health of Iranian women.

Methods

Study design and participants

This cross-sectional descriptive-analytical study was carried out in 2018 in health centers of Tabriz, Iran, on 483 mothers with vaginal childbirth 4–16 weeks after delivery.

Women with a singleton first pregnancy and gestational age of ≥ 38 weeks, normal pregnancy and natural labor, and perfect perceived physical health who were willing to participate in the study were enrolled. The exclusion criteria included suffering from/having a history of mental illnesses, experiencing a stressful life event in the past three months, hospitalized neonate due to a postpartum illness, neonate abnormality, and refusing to complete the questionnaire.

Sample size

Based on the results of Ghanbari-Homayi et al. (2019) study and with considering the Standard Deviation (SD) = 0.73, precision (d) = 0.05 around the mean ($m = 2.71$), $\alpha = 0.05$ and power = 90, the sample size was calculated as 226. With considering the design effect equal with 2 due to cluster sampling method, the final sample size was calculated as 452 and 483 individuals were selected as the final sample to compensate for the potential loss to follow-up [19].

Sampling

After obtaining the approval of the Ethics Committee of Tabriz University of Medical Sciences (ethical code: IR.TBZMED.REC.1397.147), one-fourth of all health centers in Tabriz were selected using the website www.random.org and through cluster random sampling. Using available health records, the list of mothers in their 4–16 postpartum weeks was prepared, and the number of samples per health center was determined randomly using proportional allocation. The researcher called the selected mothers and asked them to attend the respective health center at a specific time. The participants were fully informed about the research objectives. Then, they signed written consent forms and completed the questionnaires.

Data Collection Tool

The data were collected using the socio-demographic, the short form Questionnaire for assessing the Childbirth Experience (QACE), Mental Health Inventory (MHI), and Barkin Index of Maternal Functioning (BIMF).

A researcher-made socio-demographic questionnaire was used to obtain information about mother's age, educational qualifications of mother and her spouse, their job, their income status, infant's gender, pregnancy status (planned or unwanted), *etc.* The content and face validity of this questionnaire was confirmed.

The QACE was used to collect relevant data. The thematic areas of this 13-item tool included feelings (items 1, 2, and 3), relationship with staff (items 4, 5, 6, and 7), first moments with the infant (items 8, 9, and 10), and feelings one month after the delivery (items 11, 12, and 13). Items 8–13 measured the consequences of this experience. The responses included completely (score 1), relatively (score 2), not much (score 3), and not at all (score 4), which were scored using a 4-point Likert scale. The negatively

worded items (including items 1, 12, and 13) were reversely scored; thus, higher scores indicated a more negative experience [20]. The reliability of this questionnaire was measured using test-retest design and by conducting a pilot study on 20 individuals with a two-week interval and it was confirmed by determining intra-class correlation coefficient (ICC = 0.83 (0.56 to 0.93)) and Cronbach's alpha coefficient (0.82).

A questionnaire was used to collect the data related to maternal functioning. The thematic areas of this 20-item tool included self-care (items 2, 11, and 13), infant care (items 12 and 14); mother-child interaction (items 4, 5, and 15); psychological well-being (items 1, 2, 3, 5, 7, 10, 11, 16, 18, and 20); social support (items 6, 8, and 9); management (items 7, 11, 13, 14, 17, and 18), and adjustment (items 17 and 19). The responses included "strongly disagree", "disagree", "somewhat disagree", "no idea", "somewhat agree", "agree", and "strongly agree". The mothers were asked to answer questions based on their feelings over the past two weeks. The negatively worded items (*i.e.* items 16 and 18) were reversely scored and a total maternal functioning score ranged from 0 to 120. Higher total scores indicated higher levels of functioning. The Cronbach's alpha and reliability coefficients of the tool were reported as 0.88 and 0.88 [21], respectively. In the present study, the Cronbach's alpha coefficient of the questionnaire was 0.88, and those of the relevant constructs were 0.78 (maternal competence) and 0.86 (maternal needs), which indicate an acceptable internal consistency. In the test-retest method, the intra-cluster correlation coefficient was 0.85 for the whole questionnaire, and those of maternal needs and maternal competence constructs were 0.89 and 0.88, respectively.

The Mental Health Inventory (MHI) of Veit and Ware was used to collect relevant mental health data. This tool has a short (18 items) and a long (38 items) form. The MHI is superior to other scales (such as the General Health Questionnaire), because it has been designed for normal populations, while the GHQ is a diagnostic tool used for clinical populations. The short form of MHI was used in this study, which is an 18-item screening tool used for measuring mental health in two areas of adults' general health and psychological distress. The responses included always (score 1), often (score 2), most times (score 3), sometimes (score 4), rarely (score 5), and never (score 6). The negatively worded items (*i.e.* items 1, 3, 5, 7, 8, 10, 13, and 15) were reversely scored. The subdomains of "anxiety", "depression", "behavioral control", and "positive affect" consisted of items "4, 6, 10, 11, 18", "2, 9, 12, 14", "5, 8, 16, 17", and "1, 7, 13, 15", respectively. Meybodi et al. [22] and Veit [23] et al. evaluated the psychometric performance of this tool. Cronbach's alpha coefficient was calculated to measure the internal consistency of the tool. The alpha coefficient was 0.93 for the whole inventory, and those of anxiety, depression, behavioral control, and positive affect were 0.84, 0.83, 0.63, and 0.85, respectively. These findings indicated an acceptable internal consistency.

Data analysis

The collected data were analyzed in SPSS 24 software. Skewness and Kurtosis were measured to determine if the qualitative data were normally distributed. In bivariate analysis, Pearson's correlation

tests were conducted to determine the correlation between maternal functioning, mental health and their subdomains with childbirth experience. In addition, one-way ANOVA and independent t-test were performed to determine the relationship between socio-demographic characteristics with maternal functioning and mental health. In multivariate analysis, General Linear Model (GLM) was used to determine the relationship between childbirth experience with maternal functioning and mental health, while the variable of socio-demographic characteristics was considered as the control variables.

Results

The mean weight of the infants was 3129.6 (511.7) gram. Most of the mothers (95.1%) were housewives, and the more than one-third of mothers (36.8) and their spouses (36.2) had a high school diploma. Most families (74.2%) had average income levels. Nearly half of the mothers (40.2%) lived in rented houses, 76.6% of the mothers lived with their spouses, and 76% tended to become pregnant. In 93% of the cases, both mother and father were satisfied with their baby's gender. About two-thirds of the participants (63.2%) received help with childcare (21.5% received help from their spouses and 20.9% from their mothers). About half of the mothers (50.0%) were entirely satisfied with their lives (Table 1).

The mean score of childbirth experience was 1.6 (0.4) within the score range of 1–4. The mean score of mental health was 78.4 (14.9) (out of 18–108). The mean score of mental health and subdomains including anxiety, depression, behavioral control, and positive affect were 21.6 (4.7), 18.7 (4.1), 16.8 (2.8), and 16.9 (4.1), respectively (out of 6–30).

The mean score of maternal functioning was 96.8 (13.0) (out of 0–120), and the mean score of its subdomains included: self-care 14.4 (3.2) (out of 6–18), infant care 11.1 (1.2) (out of 6–12), mother-child interaction 14.9 (2.4) (out of 6–18), psychological well-being 47.0 (6.9) (out of 6–60), social support 13.5 (3.8) (out of 6–18), management 27.6 (5.0) (out of 6–36), and adjustment 10.6 (1.6) (out of 6–12).

Based on the correlation coefficients, there were significant correlations between childbirth experience and the total score of mental health ($P < 0.001$, $r = -0.35$) and all its subdomains ($P < 0.001$, $r = -0.29$ to -0.35). In addition, there were significant relationships between childbirth experience and the total score of maternal functioning ($P < 0.001$, $r = -0.32$) and all its subdomains ($P < 0.001$, $r = -0.16$ to -0.32) (Table 2).

The GLM results showed that maternal functioning had significant relationships with childbirth experience ($P < 0.001$), receiving help for infant care ($P < 0.001$), and the adequacy of family income ($P = 0.006$) (Table 3). According to the Table 4 (GLM results), mental health was significantly correlated with childbirth experience ($P < 0.001$), complete life-satisfaction ($P < 0.001$), and receiving help for infant care ($P = 0.025$).

Discussion

Maternal functioning and mental health scores were relatively desirable, and there were significant relationships between maternal functioning, mental health and all their subdomains with childbirth experience. Maternal functioning and mental health were both correlated with childbirth experience and receiving help for infant care. Also, maternal functioning was significantly correlated with the adequacy of family income and mental health was significantly correlated with complete life-satisfaction.

In the present study, maternal functioning was correlated with childbirth experience. In the study of Bryanton et al. (2009), childbirth experience did not predict early parental behaviors (feeding, protecting from harm, etc.); however, having a vaginal delivery, enjoying a good mental health, and having high educational qualifications were associated with positive maternal behaviors [12]. This is not consistent with the present study, which may be due to the effect of other relevant factors on maternal functioning. In some studies, negative or traumatic childbirth experiences were correlated with mother-child interaction issues [24, 25]. Bell et al. (2018) found that women who experience a positive birth provide the best maternal care and behaviors at 1 and 8 months after birth [26], which is consistent with the present study.

The results of this study showed a significant relationship between mental health and childbirth experience. In their systematic review, Bell et al. (2016) found significant relationships between women's birth experience and postpartum depression in 11 (out of 15) studies [27], which is in line with the present results. A prospective cohort study (2016) showed that negative childbirth experience is associated with aggravated anxiety symptoms in mothers at 2 and 8 months after birth, and that an improvement in birth experience can reduce postpartum anxiety in mothers [28]. Gurber et al. (2017) found that parents' subjective experience of birth facilitates their postpartum psychological adjustment [29], which is consistent with the present study.

There was a significant correlation between receiving help from others and maternal functioning, as mothers who had received postpartum help achieved higher functioning scores. Seighali et al. (2014) found that holding breastfeeding workshops can improve mothers' knowledge and their postpartum functioning [30], which is consistent with the present results. Bryanton et al. (2009) introduced partner support and help as an important determinant of maternal behavior and functioning [12], which is consistent with the present study. In addition, in this study, high family income levels were associated with higher maternal functioning scores.

In another study, Goyal et al. (2010) investigated the risk of depression in first-time mothers with low socioeconomic status (low literacy, low income, etc.). The results showed high prevalence of depression among these mothers [31], and this is in line with the present study, because poor postpartum mental health leads to poor mother-child interaction and poor maternal functioning. In addition, there was a significant relationship between satisfaction with life and postpartum mental health. Salehi et al. (2010) reported a high prevalence of postpartum depression among mothers with marital problems, and argued that marital problems can lead to poor spouse support (provided to mothers and birth attendants) and may cause subsequent postpartum problems [32]. This finding is in line with the present results.

The results indicated a significant relationship between receiving help and mental health. In this regard, Horowitz et al. (2005) stated that poor spouse support is a major cause of postpartum depression [33]. Anderson et al. (2012) conducted a systematic review and identified lack of support (especially by spouse) as an important predictor of PTSD (Post Traumatic Stress Disorder) [34]. Accordingly, studies of Cigoli (2006) and Nicholls (2007) are consistent with the present study [35, 36].

Some of the strengths of this study include the novelty of its subject, its large sample size, and the use of random sampling. The participants were selected among women visiting some urban health centers; therefore, the results cannot be generalized to rural women or to those who undergo cesarean section. The findings can serve as a guide for future studies and can help professionals working in various maternal health centers. Researchers are recommended to conduct studies, especially clinical trials, to improve mothers' adjustment with postnatal conditions and their childbirth experiences.

Conclusions

The results showed significant relationships between maternal functioning, mental health and all their subdomains with childbirth experience. Considering these relationships, it seems that supportive care services offered by health care providers can improve mothers' birth experiences and enhance their self-esteem, trust, respect, and sense of security, and consequently lead to improved postpartum maternal functioning and mental health.

Abbreviations

QACE: Questionnaire for Assessing the Childbirth Experience; MHI: Mental Health Inventory; BIMF: Barkin Index of Maternal Functioning; GLM: General Linear Model.

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Declarations

- Authors contributions
- MM supervised and collaborated on title selection, formulation of problem statement, methodology design, project design, data analysis and final report writing and article writing. SGH collaborated on title selection, formulation of problem statement, methodology design, project design, and final report writing and article writing. SH Contributed to literature review, questionnaire distribution and collection, data analysis and article writing. EO contributed to project design, data collection and prepared the first draft of the manuscript. All authors read and approved the final manuscript.

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- Availability of data and materials
- All data generated or analyzed during this study are included in this published article and its supplementary information files.

Ethics approval and consent to participate

Written informed consent was obtained from all participants. The study received ethical approval from the Tabriz University of Medical Sciences (ethical code: IR.TBZMED.REC.1397.147). The authors assert that the study complies with the Helsinki Declaration of 1975, as revised in 2008 and no organs/tissues were obtained from prisoners and only participants received counseling.

Consent for publication

Not applicable

- Competing interests
- The authors declare that they have no competing interests.

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Tables

Table 1: Demographic characteristics of participants

Variable	Number (Percent)	Variable	Number (Percent)
Weight of newborn*	3129.6 (511.7)	House status	
Gestational age*	38.5 (2.1)	Personal	168 (34.8)
Mother's age*	27.0 (5.4)	Hire	199 (41.2)
Husband's age*	31.9 (5.2)	Parent's House	8 (1.7)
Mother's job		Husband parent's House	106 (21.9)
House wife	462 (95.7)	Organizational house	2 (0.4)
Employed	21 (4.3)	Living with	
Husband's job		Husband	366 (75.8)
Unemployed	10 (2.1)	Alone	4 (0.8)
Worker	148 (30.6)	Family	10 (2.1)
Employee	58 (12.0)	Husband's family	103(21.3)
Self-employee	256 (53.0)	Sex of newborn	
Other	11 (2.3)	Girl	249 (51.6)
Education		Boy	234 (48.4)
Primary school	64 (13.3)	Wanted pregnancy	
Secondary school	94 (19.5)	Yes	363 (75.2)
High school	65 (13.5)	No	120 (24.8)
Diploma	172 (35.6)	Interest in sexuality of newborn	
University	88 (18.2)	None	17 (3.5)
Husband's education		Both me and my husband	449 (93.0)
Primary school	62 (12.8)	Only me	10 (2.1)
Secondary school	114(23.6)	Only my husband	7 (1.4)
High school	51 (10.6)	Receiving help for infant care	
Diploma	178 (36.9)	Yes	301(62.3)
University	78 (16.1)	No	182 (37.7)
Sufficiency of Income		Who help you	
Sufficient	45 (9.3)	Husband	105 (21.7)
Relatively sufficient	364 (75.4)	Mother	100 (20.7)
Insufficient	74 (15.3)	Mother-in-low	66 (13.7)
Satisfaction of life		Sister	7(1.4)
Absolutely	229 (47.4)	Sister-in-low	2 (0.4)
Moderate	247 (51.1)	Other	21 (4.3)
Not at all	7 (1.4)		

*Data was reported as mean (Standard Deviation)

Table 2: Birth experience, maternal functioning and mental health status and relationship between maternal function and mental health and its subscales with birth experience

Variable	Mean (SD)	Achieved score range (Min to Max)	Achievable score range	Relationship with birth experience	
				r*	P*
Birth experience	1.6 (0.4)	1 to 3.5	1 to 4	-	-
Mental health	78.4 (14.9)	28 to 108	18 to 108	-0.35	>0.001
Anxiety	21.6 (4.7)	6 to 30	6 to 30	-0.29	>0.001
Depression	18.7 (4.1)	4 to 24	6 to 30	-0.35	>0.001
Behavior control	16.8 (2.8)	5 to 24	6 to 30	-0.28	>0.001
Positive mood	16.9 (4.1)	5 to 24	6 to 30	-0.32	>0.001
Maternal function	96.8 (13.0)	41 to 120	0 to 120	-0.32	>0.001
Self-care	14.4 (3.2)	2 to 18	6 to 18	-0.28	>0.001
Newborn care	11.1 (1.2)	4 to 12	6 to 12	-0.30	>0.001
Mother child interaction	14.9 (2.4)	7 to 18	6 to 18	-0.21	>0.001
Maternal psychological	47.0 (6.9)	19 to 60	6 to 60	-0.31	>0.001
Social support	13.5 (3.8)	3 to 18	6 to 18	-0.16	0.001
Management	27.6 (5.0)	8 to 36	6 to 36	-0.32	>0.001
Adjustment	10.6 (1.6)	2 to 12	6 to 12	-0.30	>0.001

*The results are based on Pearson correlation test

Table 3: Relationship between birth experience and maternal function based on general linear model

Variable	B (95% CI*)	P
Birth experience	-7.0 (-9.3 to -4.6)	>0.001
Interest in sexuality of newborn		
None	0.5 (-9.3 to 10.4)	0.914
Both me and my husband	6.5 (-1.8 to 14.9)	0.128
Only me	-1.1 (-12.0 to 9.8)	0.842
Only my husband (Reference)	0	
Receiving help for infant care		
Yes	6.1 (4.0 to 8.2)	0.001>
No (Reference)	0	
Satisfaction of life		
Completely	3.5 (-5.1 to 12.2)	0.425
Relatively	-3.8 (-12.5 to 4.8)	0.384
Not at all (Reference)	0	
Sufficiency of income		
Sufficient	-2.4 (-6.7 to 1.9)	0.278
Relatively sufficient	-4.1 (-7.0 to - 1.2)	0.006
Insufficient (Reference)	0	-
Mother's age	-0.1 (-0.4 to 0.1)	0.371
Husband's age	-0.04 (-0.2 to 0.3)	0.788

*95%Confidence Interval

Table 4: Relationship between birth experience and mental health based on general linear model

Variable	B (95% CI *)	P
Birth experience	-9.0 (-11.7 to -6.2)	<0.001
Interest in sexuality of newborn		
None	5.9 (-5.7 to 17.5)	0.318
Both me and my husband	5.9 (-4.0 to 15.7)	0.240
Only me	-1.7 (-14.4 to 11.1)	0.796
Only my husband (Reference)	0	
Receiving help for infant care		
Yes	2.9 (-0.3 to 5.3)	0.025
No (Reference)	0	
Satisfaction of life		
Completely	17.0 (6.6 to 27.5)	0.001
Relatively	9.1 (-1.2 to 19.5)	0.084
Not at all (Reference)	0	
Sufficiency of Income		
Sufficient	1.4 (-3.8 to 6.5)	0.601
Relatively sufficient	1.0 (-2.5 to 4.5)	0.577
Insufficient (Reference)	0	
Mother's age	-0.2 (-0.5 to 0.1)	0.243
Husband's age	0.1 (-0.2 to 0.4)	0.427
Husband's job		
Unemployed	1.7 (-9.7 to 13.1)	0.766
Worker	2.9 (-5.2 to 11.0)	0.477
Employee	-0.2 (-8.3 to 8.9)	0.948
Self-employment	-2.2 (-10.2 to 5.9)	0.594
Other (Reference)	0	

*95%Confidence Interval