



Psychosocial Factors of Post-operative Pain Intensity in Women Undergoing Cesarean Section

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Abstract

Background: Little evidence has noted that psychological factors are risk factors of post-operative pain intensity in women undergoing cesarean section.

Objectives: The aim of study was to determine predictive psychosocial factors for post-cesarean pain intensity using assessment of depression, anxiety, self-efficacy, and quality of relationship.

Methods: This prospective descriptive-analytic study was carried out on 150 healthy women scheduled for cesarean section under spinal anesthesia. The day before the surgery, the patients completed three questionnaires including Hospital Anxiety and Depression Scale (HADS), and General Self-efficacy. Also, 24 hours after the surgery, the intensity of pain in the patients was assessed with filling McGill Pain Questionnaire (MPQ). Linear regression was used to predict the factors of pain intensity.

Results: The anxiety was a positive predictor of pain intensity of women after C-section ($\beta = 0.022$, $P = 0.014$). However, depression score, and self-efficacy were not predicting factors of pain intensity of women after C-section.

Conclusions: Preoperative anxiety increases post-operative pain intensity in women undergoing cesarean section.

Keywords: Pain, Operation, Cesarean Section, Depression Anxiety, Psychosocial

1. Background

Cesarean delivery is one of the most common surgical procedures in women with steadily increasing rates worldwide (1). There is a high prevalence of C-section in both developed and developing countries (2, 3). A recent meta-analysis reported overall rate of C-section as 13 - 19% in nine South and South-East Asian countries (4). A review reported the rate of C-section 12 to 72% in various cities of Iran (5). Although C-section can have benefits, it has its own side effects. Post-operative pain is one of the side effects of C-section which occurs in 20% of the women (6).

Moderate to severe post-operative pain in women undergoing C-section is associated with undesirable adverse events. It affects the performance of daily activities of women (7), and negatively influences women's ability to care for their newborn, to create the first mother-child attachment, and the ability to efficient breastfeeding (8). Also, it contributes to persistent post-operative pain (9).

Some evidence has reported that post-operative pain increases the risk of developing postpartum depression (10, 11).

Interestingly, a growing body of evidence has reported that post-operative pain after C-section is composed of a combination of psychological, maternal, anesthetic, and obstetric factors (12, 13). Literature has noted that some psychological factors such as depression, anxiety, and fear of pain are correlated with post-operative pain (14, 15). Also, evidence supports that both persistent and acute post-operative pain cesarean section are associated with the presence of mental disorders (10, 16). Meanwhile, antenatal and postnatal period is critical in development or aggravation of mental disorders (17-20). Although previous studies have explained some psychological factors that can influence perception of pain anticipation spirituality, pain threshold, and anxiety (12-14, 21-23), other psychosocial factors should be investigated further.

To address the gaps of the knowledge about psychoso-

cial factors influencing post-operative pain after cesarean section, this study aimed to describe the five psychological factors predicting the pain after C-section. To the best of our knowledge, this is the first study investigating the relationship between four psychosocial factors and pain intensity perception of women after C-section.

2. Objectives

The aims of the study were to test whether preoperative psychosocial factors including depression, anxiety, self-efficacy, and quality of relationship could predict pain intensity following C-section. We hypothesized that these psychosocial factors would predict women's intensity pain following C-section.

3. Methods

3.1. Population Study

This study was approved by the ethics committee of Babol University of Medical Sciences (IR.MUBABOL.HRI.REC.1398.085). All participants signed a written informed consent prior to beginning the study.

The prospective descriptive-analytic study was conducted at two teaching hospitals of Babol University of Medical Sciences. Pregnant women who referred to hospitals for elective C-section were invited to enter the study. Inclusion criteria were age 18 - 45 years, gestational age > 37 weeks, singleton pregnancy, signed written consents for C-section. Pregnant women with chronic opioid use, antidepressant use, allergy to opioids or nonsteroidal anti-inflammatories, recent analgesic medication (less than 48 hours), contraindication to spinal anesthesia, and failed spinal anesthesia requiring conversion to general anesthesia were excluded. All patients received spinal anesthesia with Marcaine 12 mcg. In the postpartum unit, post-operative pain was managed with injection of pethidine 50 mg (24).

Available sampling was used to recruit the women scheduled for cesarean section. Based on pilot information before the start of the study (ratio of anxiety/depression 0.44, $\alpha = 0.05$, and $d = 0.07$), the sample size was estimated 150 persons.

A member of the research team interviewed patients who were candidates for cesarean section, who were at least one hour away from the surgery, in the gynecological surgery unit of the hospital. Then, she offered the eligible individuals a brief explanation of the aims of the study and asked them to complete the questionnaires of the study. After signing informed consent, the patients completed two questionnaires including Hospital Anxiety and Depression Scale (HADS), and General Self-efficacy. Also, the researcher would also visit the patient 24 hours after the operation

and ask them to complete a post-operative pain perception questionnaire. The participants completed McGill Pain Questionnaire (MPQ) at post-operation of the C-section.

3.2. Measurements

3.2.1. McGill Pain Questionnaire

The scale measures the sensory, affective, and evaluative qualities of both acute and chronic pain. MPQ has well-established reliability and validity in previous studies. It consists of 20 word lists. It describes four subscales including pain sensory, pain affective, pain evaluative, and pain miscellaneous subscales. Also, total pain rating is calculated by summing the scores of the four sub-scales (24, 25).

3.2.2. Hospital Anxiety and Depression Scale

It is a self-report tool for detection of anxiety and depressive symptoms. HADS contains 14 items, seven questions for anxiety and seven for depression. Each item has four choices with score of 0 to 3. Each subscale for anxiety or depression ranged within 0 - 21. Also, the total score of all items ranges 0 - 42 (26). We used the validated Persian version of the HASD (27).

3.2.3. General Self-efficacy

It was developed by Sheerer et al. and contains 17 items. Each item ranges from to disagree (1) to agree (5). Higher scores indicate high self-efficacy (28). The total score ranges 17 - 85. The Persian version of the scale was used (28).

3.3. Analysis

Demographic and psychological data were summarized with descriptive statistics mean and standard deviation, range, and number (percentage) as appropriate. Analysis of variance (ANOVA) was used to compare the perception intensity pain in women regarding demographic classifications. Also, we used *t*-Student tests to compare the means and standard deviations concerning history of medical illness among the patients. Finally, stepwise multivariate regression modeling was used to find the predictors of pain intensity perception in women. Dependent variables that were included in the model were the psychological and characteristic variables (depression, anxiety, self-efficacy, satisfaction with the quality of relationship with parents, satisfaction with the quality of relationship with the partner, satisfaction of quality of relationship-Friends, and history of medical illness), which showed a significant correlation with total pain perception intensity in previous bivariate correlations. SPSS version 22 was used to analyze the data. We considered $P < 0.05$ as the level of significance in all analyses

4. Results

Table 1 summarizes the characteristics of the participants. In terms of education, about half of the participants (48.7%) were at the high school level. About half of the women (51.3%) lived in village. Most of the participants were not employed (97.3%).

Table 1. Demographic Characteristics of the Population Study

Variables	No. (%)
Age	
18 - 30	99 (66)
30 - 45	51 (34)
Education	
Primary school	44 (29.3)
High school	73 (48.7)
University	33 (22)
Occupation	
Unemployed	147 (97.3)
Employed	4 (2.7)
Place of life	
Village	77 (51.3)
City	73 (48.7)

The mean of depression and anxiety of the women was under the cut-off of depressive /anxiety symptoms (anxiety/depression score > 7 in HADS). Also, the mean of general self-efficacy was low (mean 36.51 ± 4.8 , range score 1 - 85). The satisfaction of the participants with the quality of relationship with their parents and partners was good. However, satisfaction of the participants with the quality of relationship with their friends was poor (**Table 2**).

Table 2. Mean and Standard Deviation of Psychological Variables in the Participants

Variables	Mean \pm SD
McGill Pain Questionnaire	
Pain sensory	7.96 ± 5.3
Pain affective	3.41 ± 2.2
Pain evaluative	13.41 ± 1.7
pain miscellaneous	9.69 ± 4.2
Total score of pain intensity	51.83 ± 3.2
General self efficiency	36.51 ± 4.8
Hospital Anxiety and Depression Scale	
Anxiety	6.63 ± 3.8
Depression	6.24 ± 3.0
Total score	12.87 ± 5.7

Table 3 compares the mean scores of perception of pain intensity of the women after cesarean section regarding demographic characteristics via ANOVA or *t*-Student tests. Women with level of university education had a lower score of perception pain intensity compared with women with primary school level ($P < 0.05$). The score of perception pain intensity in women with history of infertility was higher than in those without history of infertility ($P = 0.07$). Also, women with a history of medical illness reported higher pain intensity perception than women without history of medical illness. However, factors of age of the women, number of children, number of pregnancy, number of abortion, husband's age, husband's education level, history of hospitalization, and place of living were not associated with the score of pain intensity perception of women after cesarean section ($P < 0.05$).

The results of linear multivariate regression model were shown based on psychological factors (anxiety, depression, and self-efficacy) as the independent variables and total score of perception of pain intensity of women after C-section as dependent variable. The anxiety was a positive predictor of pain intensity of women after C-section ($\beta = 0.22$, $P = 0.014$). On the other hand, history of medical illness was a negative predictor of pain intensity of women after C-section ($\beta = -0.17$, $P = 0.036$). However, depression and score, self-efficacy were not predicting factors of pain intensity of women after C-section (**Table 4**).

5. Discussion

This study was the first to investigate the role of demographic and five psychosocial factors simultaneously predicting post-operative pain intensity in women undergoing cesarean section. The results confirmed the significant role of anxiety and history of medical illness in predicting of post-operative pain intensity after C-section.

In this study, the post-operative pain intensity in women undergoing cesarean section was moderate. In line with our results, a study reported that 51.7% of the women after C-section reported pain as being moderate (29). However, another study reported high pain scores among women undergoing C-section (30). The differences of post-operative pain intensity across studies may be related to different measurement tools for pain assessment and psychosocial differences.

The present study found that the post-cesarean section pain intensity was related to level of education and history of infertility, but no related to age, parity, or place of residence. Also, we revealed that women with a higher education reported lower post-operative pain intensity after C-section. Further research should also explain how the anxiety level affects post-operative cesarean pain; How educational level of women could be associated with pain inten-

Table 3. The Mean and Standard of Perception Pain Intensity of Women After Cesarean Section Regarding to Demographic Characteristics

Variables	Mean \pm SD	P-Value
Age		0.84
18 - 30	51.94 \pm 9.49	
30 - 45	51.61 \pm 10.14	
Education		0.06
Primary school	54.36 \pm 7.88	
High school	51.56 \pm 11	
University	49.03 \pm 8.02	
Number of children		0.38
0	48 \pm 5.47	
1	52.39 \pm 10.48	
2	50.30 \pm 6.32	
Number of pregnancy		0.71
0	48 \pm 5.47	
1	52.30 \pm 11.19	
2	52.27 \pm 8.20	
> 2	50.58 \pm 8.42	
History of abortion		0.27
0	52.15 \pm 10.28	
1	52.81 \pm 7.89	
≥ 2	48.65 \pm 9.03	
History of infertility		0.07
Yes	55.08 \pm 6.53	
No	51.18 \pm 10.10	
Husband's age		0.14
≤ 35	52.43 \pm 10.13	
> 35	50.05 \pm 8.10	
Husband's education level		0.08
Primary school	52.83 \pm 9.36	
High school	49.29 \pm 9.81	
University	53.84 \pm 10.01	
History of hospitalization		0.46
Yes	50 \pm 8.57	
No	52.01 \pm 9.80	
Place of living		0.06
City	50.27 \pm 7.31	
Village	53.30 \pm 11.35	

sity after C-section. In agreement with our results, a study reported that age and parity was not associated with post-cesarean pain intensity (30). However, a previous study found that primipara women had reported higher pain in-

tensity than multipara women (31).

The findings revealed that only preoperative anxiety was a strong positive predictor of the post-operative pain intensity in women undergoing cesarean section, rather than depression or self-efficacy. Some research confirmed our results. A study investigated predictive factors for post-cesarean pain and analgesia through assessing pain threshold and psychological factors. Those results showed that the score of state anxiety was a strong predictor of post-operative pain and analgesic requirement for patients undergoing C-section (32). A cohort study with 1,062 women undergoing C-section investigated the incidence and predicting factors of moderate-severe post-operative pain. That result showed that preoperative anxiety increased the risk of moderate-severe pain after C-section (33). However, in contrast with our results, a study reported that depression was a predictor of post-operative cesarean pain (15).

The important question of these findings was the mechanism of anxiety as a positive predictor of pain intensity in women undergoing C-section. Although the response is not clear, some assumptions are proposed. First, based on theory of "the work of worry," there is association between preoperative stress and patient recovery. The high worry/anxiety levels during the preoperative period would cause elevated pain intensity during the post-operative period (34). Secondly, some experimental studies have confirmed that anxiety may increase the reactivity to pain and causing hyperalgesia (35, 36).

The evidence paves the way for clinical implications. In maternity care clinics, maternity professionals should consider the anxiety level and medical illness on the intensity pain of women who are candidates for C-section. All health care providers could emphasize the negative effects of preoperative anxiety on increasing post-operative cesarean pain. Educating pregnant women who are candidate for C-section about the benefits of decreasing anxiety may be an important facilitating factor for health promotion of women after birth.

5.1. Limitations

There were some limitations in response to which the research generalizability should be considered by caution. First, these results were based on a numeric scale which may overestimate the results compared to the Visual Analog Scale. Secondly, we only assessed the pain, not the usages of analgesic agents to relieve pain. Also, we only assessed the acute pain not chronic pain. Thus, the pain intensity reported by the patients may not completely reflect of the entire pain intensity in post-operative C-section.

5.2. Conclusions

Our study demonstrates that preoperative psychological factors, especially anxiety positively predicted pain

Table 4. Results of Regression

Model	Unstandardized Coefficients		Coefficients Standardized Coefficients Beta	t	Sig.	95.0% Confidence Interval for B	
	B	Std. Error				Lower Bound	Upper Bound
Constant	53.95	12.15		4.43	0.00	29.92	77.98
Depression	-0.43	0.29	-0.13	-1.48	0.13	-1.01	0.11
Anxiety	0.53	0.22	0.22	2.48	0.014	0.11	1.00
Self-efficacy	-0.14	0.16	-0.07	-0.89	0.37	-0.47	0.17

intensity in post-operative C-section. Also, higher education of the women was negatively associated with pain intensity by post-operative C-section. Women with a history of infertility experienced higher pain intensity in post-operative C-section. Our findings suggest that health care professionals help women who are candidate for C-section to decrease the preoperative anxiety level. Further research including an interventional program for decreasing the anxiety would be useful to reduce the intensity of post-operative C-section pain in women.

Footnotes

Authors' Contribution: Fazeleh Samad Marzouni, study conception, data collection, manuscript preparation; Mahbobeh Faramarzi, study conception, supervision, writing/manuscript preparation; Azita Ghanbarpoor, writing/manuscript preparation; Shahram Seyfi, writing/manuscript preparation; Hemmat Gholinia, analysis the data; Hamideh Raie Abasabadi, data collection.

Conflict of Interests: There are no conflicts of interest.

Data Reproducibility: The data presented in this study are openly available in one of the repositories or will be available on request from the corresponding author by this journal representative at any time during submission or after publication. Otherwise, all consequences of possible withdrawal or future retraction will be with the corresponding author.

Ethical Approval: This study was approved by the ethics committee of Babol University of Medical Sciences (IR.MUBABOL.HRI.REC.1398.085; link: ethics.research.ac.ir/EthicsProposalView.php?id=69034).

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Informed Consent: The subjects signed a written informed consent before they enter the study.

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