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Association of Maternal Psychological State with Somatic Symptoms: A Cross-sectional Study

Running title: Psychological State and Somatic Symptoms

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ARTICLE INFO

ORIGINAL ARTICLE

DOI:

10.30468/jbiom.2017.55032

Article History:

Receive Date 2017/02/15

Accept Date 2017/04/07

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Keywords:

Depression, Anxiety,
Pregnancy, Somatization

ABSTRACT

Background & Objective: Individuals with psychological disorders usually present with more somatic symptoms compared to normal individuals. The present study aimed to investigate the association of maternal psychological state with somatic symptoms in pregnant women.

Materials and Methods: This cross-sectional, descriptive-analytical study was conducted on 225 pregnant women referring to eight comprehensive health centers in Sabzevar, Iran in 2016. Subjects were selected via available sampling. The inclusion criterion was singleton pregnancy with an alive, healthy infant, and women with a history of psychological disorders were excluded from the study. Data were collected using demographic questionnaires, general health questionnaire (GHQ-28), and somatic symptom checklist. Data analysis was performed in SPSS version 18 using Chi-square, Fisher's exact test, t-test, and logistic regression analysis.

Results: Mean age of the subjects was 27.7 ± 6.2 years. In addition, 41.7% of the women were primigravida, and 18.2% of the pregnancies were unwanted. Mean score of GHQ-28 was 19.85 ± 13.1 , and 19.1% of the subjects obtained scores with the cutoff point of ≥ 28 . Results of the logistic regression analysis indicated that only four variables 'being a housewife', 'unwanted pregnancy', 'presence of chronic disorders', and 'gestational age of >26 weeks could predict the maternal psychological state independently and significantly. Moreover, results of the logistic regression of the somatic symptoms associated with psychological state indicated that after controlling the effect of unwanted pregnancy, age, and chronic diseases, the presence of psychological issues could predict some somatic symptoms, such as dyspnea, nausea, heartburn, low back pain, and vertigo. In addition, after controlling the effect of age, the presence of maternal psychological disorders could predict at least one somatic symptom during pregnancy.

Conclusion: According to the results, maternal psychological state could predict the somatic symptoms during pregnancy. It is recommended that longitudinal studies be conducted in this regard to investigate the cause and effect relationship between the maternal psychological state and somatic symptoms in pregnancy

Introduction

Pregnancy is associated with several physiological and psychological changes, which may be accompanied by pathological signs. Psychological symptoms are highly common among pregnant women. According to a systematic review, the prevalence of depression in the first, second, and third trimester of pregnancy is 7.4%, 12.8%, and 12%, respectively (1). Furthermore, evaluation of the burden of diseases in 2000 showed that depressive disorders account for 4.46% and 12.1% of lost life years due to premature death and the disabilities associated with depression, respectively.

The prevalence of depressive disorders has been reported to be higher among women compared to men (2). Psychological disorders during pregnancy may affect the maternal ability in self-care and attention to medical recommendations. Moreover, it could lead to several complications, such as poor maternal-fetal attachment (3), low birth weight (4), premature birth, disruption of breastfeeding (5), and offspring depression (6). In addition, depression during pregnancy is considered to be a risk factor for postpartum depression (7). Some studies have reported a higher incidence of depression in pregnancy compared to the postpartum period (8). Number of pregnancies, history of abortion, and unwanted pregnancy are among the other risk factors for depression during pregnancy (9). Although depression is reported to be prevalent in 20% of pregnant women, the majority of the cases remain undiagnosed, and the patients receive no treatment (10).

Lack of screening and somatization (requiring physicians to focus on physical symptoms) are the main causes of undiagnosed psychological disorders in pregnancy. Somatization is a common phenomenon in various populations. According to a systematic review, two-thirds of the individuals with psychological disorders that refer to primary health centers (11) present with physical symptoms as well. Another study in this regard has indicated that somatization may interfere with the diagnosis and treatment of psychological symptoms (12).

On the other hand, the physical symptoms associated with psychological disorders in pregnant women (e.g., fatigue, sleep disorders, loss of appetite) are hardly differentiated from the common discomfort during pregnancy. However, the results of a research demonstrated that depressed pregnant women presented with more physical symptoms compared to those without depression in the first trimester of pregnancy, which complicated the diagnosis of depression (13). Therefore, it could be inferred that somatization causes physicians to pay attention to the physical symptoms of depressed pregnant women rather than their psychological problems. Considering the increasing incidence of psychological disorders, their twofold prevalence in women compared to men, and their effects on women's life in pregnancy and postpartum, the present study aimed to evaluate the association of maternal psychological state with the psychological disorders and physical symptoms in the

pregnant women referring to the comprehensive health centers in Sabzevar, Iran during 2015-2016.

Materials and Methods

This cross-sectional, descriptive-analytical study was conducted in Sabzevar, Iran during February-December 2016. Sabzevar city was divided into four regions based on the socioeconomic status, and two comprehensive health centers were randomly selected in each region. The inclusion criteria of the study were having a positive pregnancy test or a positive pregnancy sign. The pregnant women referring to the selected health centers who met the inclusion criteria were enrolled in the study. Informed consent was obtained from all the subjects prior to participation.

Women with a history of psychological disorders receiving therapy and those presenting with pregnancy complications (e.g., preeclampsia, hydramnios, fetal death, fetal anomalies, and premature rupture of membranes) were excluded from the study. After explaining the objectives of the research and obtaining written informed consent from the participants, they completed a questionnaire consisting of three sections. The first section contained sociodemographic questions, the second section contained obstetric questions, and the third section was the general health questionnaire (GHQ-28).

GHQ-28 was developed by Goldberg and Miller in 1979. This scale consists of four subscales, each contains seven items that are scored based on a three-point Likert scale (zero= Not at All, 3=Always). The subscales

of GHQ-28 include somatic signs, anxiety and insomnia, social function, and depression. The minimum and maximum scores of the scale are zero and 84, respectively, and the cutoff point for the probability of psychological disorders has been estimated at 28 in the Iranian population (14).

Sample size of the study was determined based on the research by Mortazavi, in which the prevalence of psychological disorders was reported to be 42% in pregnant women. With the precision of 0.07, the sample size was determined at 190 subjects, and with the response rate of 85%, the sample size was calculated to be 224.

Data analysis was performed in SPSS version 18 using descriptive and analytical tests, such as Chi-square, t-test, and logistic regression analysis. The study protocol was approved by the Student Research Committee and Ethics Committee of Sabzevar University of Medical Sciences (code: IR.MEDSAB>REC.1394.107).

Results

In total, 225 out of 238 distributed questionnaires were completed by the subjects, and 13 questionnaires were excluded due to incompleteness. Mean age of the participants was 27.7 ± 6.2 years, and approximately 8.1% of the women were housewives. Among the subjects, 15.6% and 18.2% had unplanned and unwanted pregnancy, respectively. In terms of the mode of delivery, 66.2% of the women preferred natural vaginal delivery, while 16.9% of the multiparous women had a history of cesarean.

Mean score of the GHQ-28 was 19.85 ± 13.1 , and 19.1% of the participants had a mean GHQ score of ≥ 28 . Mean scores of the subscales of somatic symptoms, social dysfunction, anxiety, and depression were 4 ± 3 , 7 ± 3 , 5 ± 4 , and 2.1 ± 3 , respectively. Demographic and obstetric variables of the subjects and their correlations with maternal psychological disorders are presented in Table 1.

According to the information in Table 1, there were significant correlation between maternal psychological disorders and nine variables, including maternal employment status, presence of chronic diseases, experience of unwanted pregnancy, low income, gestational age of ≥ 26 weeks, residence status, parity, history of hospitalization, and receiving low/moderate emotional support from the spouse.

Results of logistic regression analysis regarding maternal psychological state and the aforementioned variables indicated that only four variables could predict maternal psychological state independently and significantly (Table 2). Symptoms experienced by the participants during pregnancy are shown in Table 3. Accordingly, 70% of the women mentioned to have experienced at least one symptom, and 39% mentioned two or more symptoms. Moreover, a significant correlation was observed between the presence of psychological issues and manifestation of somatic symptoms (Table 3).

Results of logistic regression analysis regarding the association of somatic symptoms with maternal psychological state demonstrated that after controlling the effect

of unwanted pregnancy, age, and chronic diseases, the presence of a psychological disorder could predict various somatic symptoms, such as dyspnea, nausea, heartburn, low back pain, and vertigo. In addition, after controlling the effect of age, maternal psychological issues were found to predict the presence of at least one somatic symptom (Table 4).

Discussion

Knowledge of the effects of maternal depression on the mother, neonate, and their family has increased in recent decades. However, maternal psychological health during pregnancy has not been adequately explored in clinical research. Somatization could retract the attention of healthcare providers from maternal psychological disorders.

In the present study, we evaluated the correlation of maternal psychological state with somatic symptoms during pregnancy, aiming to realize whether maternal psychological disorders are associated with increased somatic symptoms. According to the obtained results, most somatic symptoms (with the exception of cramps, constipation, edema, and hemorrhoid) were correlated with maternal psychological disorders. As such, the rate of somatic symptoms was higher in the women presenting with psychological issues compared to those without psychological problems. In other words, psychological disorders could predict the manifestation of somatic symptoms during pregnancy. This finding is consistent with the results obtained by Unkers (13).

In the current research, 19% of the participants had a GHQ score of ≥ 28 . In a study conducted by Mortazavi in Shahroud (Iran), 42% of the subjects obtained a GHQ score of ≥ 28 in the third trimester of pregnancy (7). The difference in the mentioned findings could be due to the variations in the gestational age of the samples. In the present study, gestational age was not considered in the selection of the participants.

In another research in this regard, the prevalence of maternal psychological disorders was reported to be higher in the third trimester compared to the first and second trimester of pregnancy (15). According to the present study, the prevalence of somatic symptoms was 2.2-28.9%, and the most prevalent symptoms were reflux (28.9%), nausea (28.9%), and low back pain (28%). In the previous studies in this regard, the prevalence of reflux, low back pain, leg cramp, and nausea has been estimated at 45.5% (16), 57.3% (17), 55% (18), and 60% (19), respectively.

According to the literature, somatic symptoms are the most common presentations of depression. In a study conducted on the patients referring to a primary healthcare center, the majority of the individuals presented with somatic symptoms (19). In a similar research, two-thirds of depressed patients had prominent somatic symptoms (20). Surprisingly, a strong association has been observed between female gender and somatization (21). In addition, cultural factors and patient-physician relationship are speculated

to be involved in the diagnosis of somatization (20).

According to the findings of the current research, being a housewife, presence of chronic diseases, unwanted pregnancy, and the third trimester of pregnancy could predict maternal psychological disorders, which is in congruence with the results of the previous studies in this regard. In a research conducted by Wang, the predisposing factors of maternal depression during pregnancy were reported to be unemployment, low maternal age, current illnesses, and lack of social support (22). Furthermore, the results of a meta-analysis performed in low- and middle-income developing countries showed that exposure to abuse in childhood, history of abuse by a partner, low education level, poor socioeconomic status, lack of social support, and chronic diseases were reported to be the risk factors for depression during pregnancy and postpartum period (23).

Considering the prevalence and consequences of psychological disorders, screening of psychological problems in pregnant women seems crucial, especially in high-risk groups, such as unemployed women, women with unwanted pregnancies, and those with chronic diseases. In addition, women in the third trimester of pregnancy have been shown to be at a high risk of developing psychological disorders and should be screened to reduce the risk of postpartum depression. Considering the association between maternal psychological disorders and somatization, it is recommended that longitudinal studies be

performed to assess the cause and effect relationship between these variables.

Strengths and Limitations

Due to the cross-sectional design of the present study, we were not able to determine the cause and effect of each variable separately. To address this limitation, cohort or case-control studies are recommended. Hypothesizing that psychological disorders were chronic before the manifestation of somatic symptoms, we used the logistic regression analysis to assess whether maternal psychological problems could predict somatic symptoms.

Another limitation of the current research was the use of GHQ-28 for assessing maternal psychological state although it is a screening tool. Women with the score of ≥ 28 had to consult a psychologist so as to confirm the presence of psychological disorders. Therefore, it is suggested that further examination be performed after the screening stage and a proper diagnostic test be applied in the case of the pregnant women susceptible to psychological issues.

The main strength of the present study was the high response rate as a result of sampling by only one researcher.

Conclusion

According to the results, 19% of the women required further assessment by a psychologist to confirm the presence of maternal psychological disorders. Additionally, the most common somatic symptoms among the participants were reflux, low back pain, and nausea, with prevalence of 2.2-28.9%. Our findings

indicated that the prevalence of somatic symptoms was higher in women with psychological issues compared to the normal participants. Therefore, healthcare providers must pay special attention to the somatic symptoms in pregnant women rather than considering them as a common discomfort in pregnancy.

Acknowledgements

This study was approved by the Research Chancellery of Sabzevar University of Medical Sciences, Iran. Hereby, we extend our gratitude to all the participants for assisting us in this research project.

Authors' contributions

R. S.: proposal, data collection; **F.M.:** study design, data analysis, the first draft of the manuscript, manuscript revision, critical revision of the manuscript

Conflicts of interest: None declared.

Ethical Approval

All the procedures were in accordance with the ethical standards of the Institutional Research Committee, Declaration of Helsinki (1964), and the ethical standards in its later amendments.

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Table 1. Demographic and Obstetric Data of Subjects

	GHQ\geq28 (n=43)	GHQ<28 (n=182)	Total	
	Mean\pmSD	Mean\pmSD	Mean\pmSD	P- value
Maternal Age (year)	28.5 \pm 7.1	27.5 \pm 6.0	27.7 \pm 6.2	.322
Age of Spouse (year)	33.0 \pm 7.1	32.9 \pm 6.7	33.0 \pm 6.8	.934
Gestational Age (week)	30.8 \pm 6.6	26.9 \pm 8.9	27.6 \pm 6.8	.002**
Maternal Occupation Status	N (%)	N (%)	N (%)	-
Housewife	40 (93)	146 (80.2)	186 (82.7)	.046*
Maternal Education Level (<12 years)	35 (81.4)	126 (69.2)	161 (71.6)	.112
Education Level of Spouse (<12 years)	34 (79)	128 (70.3)	162 (72)	.251
Nulliparity	15 (34.9)	79 (43.4)	94 (41.8)	.308
History of Abortion	13 (30.2)	49 (26.9)	62 (27.6)	.662
Unwanted Pregnancy (woman's view)	14 (32.6)	27 (14.8)	41 (18.2)	.006**
History of Chronic Diseases f	10 (23.3)	12 (6.6)	22 (9.8)	.003**
Low/Moderate Emotional Support from Spouse	25 (58.1)	71 (39)	96 (42.7)	.023*
Inadequate Income f	9 (20.9)	13 (7.1)	22 (9.8)	.006**
Owner of Residence	29 (67.4)	91 (50)	120 (53.3)	.039*
History of Hospitalization f	12 (27.9)	14 (7.7)	26 (11.6)	.001**
At Least One Somatic Symptom	38 (88.4)	119 (66.1)	57 (70.4)	.004**

*f*Fisher's exact test

Table 2. Results of Logistic Regression Analysis on Maternal Psychological State and Demographic Variables

	OR	CI	P-value
Being a Housewife	3.31	.907-12.05	.070
Unwanted Pregnancy	2.56	5.28-1.24	.011*
Chronic Illness	4.72	13.18-1.69	.003**
Gestational Age of >26 Weeks	3.65	8.95-1.49	.005**

Table 3. Somatic Symptoms of Subjects

Somatic Symptoms	N (%)			P-value
	Total 225 (100)	GHQ≥28 43 (19.1)	GHQ<28 182 (80.9)	
Reflux β	65 (28.9)	17 (41.9)	47 (25.8)	.037*
Nausea and Vomitingβ	65 (28.9)	19 (44.2)	46 (25.3)	.014*
Low Back Painβ	63 (28)	21 (48.8)	42 (23.1)	.001**
Difficulty Sleepingβ	42 (18.7)	15 (34.9)	27 (14.8)	.002**
Heartburnβ	41 (18.2)	14 (32.6)	27 (14.8)	.007**
Crampsβ	39 (17.3)	10 (23.3)	29 (15.9)	.254
Constipationβ	38 (16.9)	8 (18.6)	30 (16.5)	.738
Dyspneaβ	31 (13.8)	14 (32.6)	17 (9.3)	<.001***
Edemaβ	30 (13.3)	5 (11.6)	25 (13.7)	.715
Headache£	26 (11.6)	15 (34.9)	11 (6)	<.001***
Vertigo£	25 (11.1)	12 (27.9)	13 (7.1)	<.001***
Insomnia£	22 (9.8)	8 (18.6)	14 (7.7)	.036*
Lethargy	20 (8.9)	9 (20.9)	11 (6)	.005**
Urinary Infection£	20 (8.9)	10 (23.3)	10 (5.5)	.001**
Vaginal Discharge£	16 (7.1)	8 (18.6)	8 (4.4)	.004**
Blurred Vision£	9 (4)	5 (11.6)	4 (2.2)	.014*
Hemorrhoid£	5 (2.2)	1 (2.3)	4 (2.2)	.659
<i>βFisher's exact test; £Chi-square</i>				

Table 4. Results of Logistic Regression Analysis of Psychological State and Somatic Symptoms

Somatic Symptoms	Independent Variables	OR	CI	P-value
Dyspnea				
	Unwanted Pregnancy	3.12	1.18-6.54	.024*
	GHQ \geq 28	6.44	2.66-15.57	<.001***
Low Back Pain				
	GHQ \geq 28	3.18	1.60-6.35	.001**
Nausea				
	Current Illness	2.76	.96-3.67	.093
	GHQ \geq 28	2.77	1.85-9.01	.006**
Heartburn				
	Unwanted Pregnancy	2.78	1.18-6.54	.020*
	GHQ \geq 28	3.65	8.23-1.62	.002**
Dizziness				
	Unwanted Pregnancy	.46	.19-1.10	.083
	GHQ \geq 28	.26	10.44-1.74	.002**
At Least One Symptom				
	Age \geq 30	1.87	.96-3.67	.067
	GHQ \geq 28	3.70	9.96-1.38	.009**