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Association between Nausea and Vomiting of Pregnancy and Psychological Factors in Pregnant Women

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Abstract

Background and objectives: On of the most important complaints of a large number of pregnant women is nausea and vomiting which can affect their own health and their growing fetuses. Given the few number of studies on the causes of nausea and vomiting in pregnancy, in particular the role of psychological factors in creating it, this study is aimed to determine the association between nausea and vomiting of pregnancy and psychological factors in pregnant women. Materials & Methods: The present study is a descriptive-correlational study. Participants in the study were 335 healthy single fetus pregnant women with a gestational age of 6-16 weeks referred to various health centers in city of Abadan who had inclusion criteria. Samples were randomly selected. All participants completed the Rhodes Index of Nausea and Vomiting Form 2 (INV- 2), Spielberger's State-Trait Anxiety Inventory and Edinburgh Postnatal Depression Scale (EPDS). Ultimately, the data were analyzed by means of SPSS software. Results: The results indicated a direct and significant relationship between the incidence of nausea and vomiting in pregnancy with the anxiety and depression in pregnant women. Also 62.1 % of participants had nausea and vomiting. Conclusion: Since anxiety and depression in pregnancy can hurt the mother and fetus' health and lead to nausea and vomiting in pregnancy, it is suggested that, beside other examinations performed during pregnancy, psychological problems of the pregnant mother is also detected, referred and treated.

Key words: Anxiety, Depression, Vomiting, Pregnancy

Introduction

Pregnancy is one of the sensitive stages in women's lives (Jafri Dehkordi et al., 2013). This physiological phenomenon significantly changes the mothers body systems. Gastrointestinal tract is one of the systems changed in pregnancy (Narengi, Delavar and Rafiei, 2012), and nausea and vomiting are from the most common digestive disorders in this period (Bustos, Venkataramanan and Caritis, 2017). This common gastrointestinal disorder in pregnancy is due to different factors such as genetic, hormonal and psychological agents (Aksoy et al., 2015).

About 80% to 90% of pregnant women are influenced by nausea and vomiting in pregnancy (Shawahna and Taha, 2017); although these symptoms usually happen during the first three months, in some people, they can persist during pregnancy and influence their quality of life (Bustos, Venkataramanan and Caritis, 2017). Symptoms usually start at the 9th week of pregnancy and stop at the 20th week. 0.3% - 2.3% of cases experience severe nausea and vomiting (Hyperemesis gravidarum), and in 5-22% of cases, symptoms continue during pregnancy (Iliadis et al., 2018). Women with nausea and vomiting have a lower quality of life than that of women without this complication. Beside the negative effects on women's health, it also affects their social, professional and family performance (Faramarzi et al., 2015), and can even cause disorders in the born infant's mood, sleep, nutrition, learning, etc. Nausea and vomiting in pregnancy also leads to impatience, irritability, grief, sleep disorders as well as confusion in pregnant women (Nikibakhsh et al., 2016).

On the other hand, it has been proven that none of a woman's life events may be compared to neurological and glandular changes as well as mental and psychological states of pregnancy and childbirth periods. With a reported incidence of 4 to 29%, depression is another common complication in pregnancy (Pazandeh et al., 2002). Pregnancy period is psychologically considered as the emotional crisis period. Since women tolerate many physical and physiological changes during their pregnancy, they are more affected by various stresses of life in these period (Faramarzi et al., 2015). Anxiety and depression can be described as common health problems that can be one of the agents of nausea and vomiting in pregnancy due to their relevance to occupational, social and biological issues. On the other

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hand, nausea and vomiting are controlled by the nervous system; anxiety may activate nausea and vomiting in pregnancy (Nikibakhsh et al., 2016). The study performed by Iliadis et al. indicated that nausea and vomiting in pregnancy were associated with psychiatric disorders (Iliadis et al., 2018). The study of Tan et al. also expressed that depression symptoms were higher in pregnant women with more nausea and vomiting (Tan et al., 2010). In another study by Kramer et al., they stated a relationship between severe nausea and vomiting and severe depression symptoms (Kramer et al., 2013). Another study also indicated that anxiety disorders were higher in women with nausea and vomiting (Uguz et al., 2012).

Considering the patient's psychosocial aspects is very significant for the nausea and vomiting in pregnancy (Jafri Dehkordi et al., 2013). This complication influences the important aspects of women's life, such as quality of life and their rate of tendency to the next pregnancy (Heitmann et al., 2017), as well as social life, psychological and physical health, job and economic affairs; and its followed depression and anxiety can make it difficult to treat the disease. Researches have revealed that more than 25% of patients change their routine activities (Jafri Dehkordi et al., 2013). Moreover, it has been proven that anxiety and depression in pregnancy may lead to problems in the health of the fetus (Faramarzi et al., 2015) and raise the risk of postpartum depression symptoms (Iliadis et al., 2018).

Paying attention to the severe and wide ranged complications of depression during pregnancy and postpartum periods is very important. There are few researches done on the effect of psychological agents on the creating and intensification of nausea and vomiting in pregnancy. Most of the researches performed in Iran have addressed the prevalence of physical and pathophysiological causes of nausea and vomiting in pregnancy; and there is still little information on the association between psychological agents and the severity of nausea in vomiting (Nikibakhsh et al., 2016).

Hence, this study is aimed to determine the association between nausea and vomiting of pregnancy and psychological factors in pregnant women referring to the health centers in city of Abadan in 2017. By means of the results of these studies, if there is any association, we can present strategies to reduce the anxiety and depression of pregnant women, as well as decreasing nausea and vomiting rate. Furthermore, it seems desirable to consider the psychological factors assessment in pregnancy care.

Materials and Methods:

This is a descriptive-correlational study in which the association between nausea and vomiting of pregnancy and anxiety and depression in pregnant women was investigated. The study population included 335 healthy pregnant women with single fetus pregnancy and at the gestational age of 6-16 weeks referring to various health centers in city of Abadan for receiving prenatal care. The samples were randomly chosen from different centers of the city and evaluated if they had the inclusion criteria of the study. Using the following formula, at the confidence level of 95% and test power of 90% based on r = 0.351 (Nikibakhsh et al., 2016), the number of samples was determined and they were entered into the study during the interval of December 2017 until June 2018.

$$n = \frac{(Z_{1-\frac{\alpha}{2}} + Z_{1-\beta})^2}{\delta_2^0} + 3 \qquad \delta^0 = \frac{1}{2} Ln \frac{1+r}{1-r}$$

Based on references and the opinion of the research team, the inclusion criteria of the research include Iranian identity and residence of Abadan, safe pregnancy age according to the date of the first day of the last menstruation or ultrasound of the first trimester of pregnancy, single fetus pregnancy, minimum literacy of guidance school, absence of physical and psychological diseases, not using anti-nausea and vomiting drugs and tranquilizers, the desired pregnancy, not using fertility methods before pregnancy, lack of a history of infertility before the current pregnancy, lack of a history of misadventure pregnancy such as fetus abnormalities, lack of clinical or paraclinical evidence of abnormal pregnancy like abortion threat, molar pregnancy, ectopic pregnancy, lack of history of two successive abortions before the current pregnancy, lack of auditory and verbal problems as well as mental retardation, lack of smoking and drug and alcohol use by the woman or her spouse, lack of history of stressful events during the last six months, such as death of relatives, separation from her spouse or losing her job, and willingness to participate in the study (Nikibakhsh et al., 2016; Soltani, Golmakani and Mazloom, 2017). For observing the ethical considerations, after explaining the study and ensuring the participants about confidentiality of the collected data, they would be entered the study if they verbally expressed their satisfaction.

For determining the nausea and vomiting status in the research units, Rhodes Index of Nausea and Vomiting Form 2 (INV-2) designed by Rhodes et al. (1986) were used. The questionnaire contains three subscales and eight items related to the status of nausea, vomiting, and retching, in which each question is based on five-item Likert scale. Three questions are about nausea (frequency, severity and duration); three questions about vomiting (frequency, severity, and amount of vomiting); and two questions about retching (frequency and severity). The total score of Rhodes Index of Nausea and Vomiting is 0-32 and it is divided into four categories of without nausea and vomiting, mild, moderate and severe nausea and vomiting. The higher the score obtained from the questionnaire is, the more nausea

and vomiting are indicated, and vice versa (Soltani, Golmakani and Mazloom, 2017). The validity and reliability of this tool have been reported well in the study by Zhou, Obrien, Soeken (2001). In the study by Soltani et al., reliability of the questionnaire has been confirmed by calculating the Cronbach's alpha coefficient of 87% (Soltani, Golmakani and Mazloom, 2017).

To investigate the anxiety status of pregnant women, Spielberger's State-Trait Anxiety Inventory was used. The questionnaire includes 20 sentences for obvious anxiety, measuring one's feelings "at this moment and at the time of responding" as well as 20 sentences for hidden anxiety that measures the ordinary and general emotions of the person. Questions are measured in the four-item Likert scale ranged from one to four, and on the general scale of 20 to 80. Some sentences are scored in reversed order. According to the overall score obtained by the participants, their obvious anxiety is divided into six groups of mild (20-31), moderate to low (32-42), moderate to high ((43-53), relatively severe (54-64), severe (65-75) and very severe (76 and more) and their hidden anxiety is divided into six groups of mild (20-31), moderate to low (32-42), moderate to high (43-53), relatively severe (53-62), severe (63-72) and very severe (73 and more). The Spielberger questionnaire has a well validity and reliability and it has been used in many relevant studies (Nikibakhsh et al., 2016). The reliability of this tool was determined 91% in the study by Shah Hosseini et al. (2008), and 90%in the study by Rouhi et al. (2005).

Furthermore, the Edinburgh Postnatal Depression Scale (EPDS) designed by Cox et al. (1987) was employed to investigate the depression status of the studied population. This tool consists of 10 four-option sentences. Based on its options, each sentence may have a score between 0 and 3. After summing up the scores of all questions, the participants in the study are divided into two groups of non-depressed (score less than 12) and depressed (score 12 and above). The questionnaire has also been used in different relevant studies. (Cox, Holden and Sagovsky, 1987) The reliability of the tool has been reported 88% in the studies of Cox (Bergink et al., 2011) and Kiani et al. (2010).

To collect data, After coordination with the medical faculty of Abadan and taking a license from the ethical committee, and then obtaining a license from health center of the city, and after coordination with the authorities of the health centers, the questionnaires were completed by the studied samples.

Eventually, after scoring, the collected data were analyzed using SPSS software. In order to describe the data, frequency, frequency percentage, mean and standard deviation were employed; and Chi-square test and Spearman correlation coefficient were used in order to determine the association between nausea and vomiting in pregnancy and depression and obvious and hidden anxiety in women.

Results:

The study's findings are presented in Tables 1 to 3 and Chart 1 and 2.

Table 1: Demographic data of all participants

Variable	Group	Frequency	Frequency percentage
Mothers age (year)	14-19	23	6/9
	20-25	111	33/1
	26-30	141	42/1
	More than 30	60	17/9
Pregnancy age (week)	6-9	141	42/1
	10-13	130	38/8
	14-16	64	19/1
Number of pregnancy	1	113	33/7
	2	158	47/2
	3	62	18/5
	More than 3	2	0/6
Education level	Middle School degree	50	14/9
	Diploma	201	60/0
	Academic	84	25/1
Economic situation	Poor	40	11/9
	Middle	204	60/9
	Good	91	27/2

Based on the Table 1, the minimum age of pregnant mothers has been 14 years and most of them have been in the age of 26-30 years. Most pregnant mothers have been at 6-9 weeks, and 47.2% of them have had two pregnancies. Most of them had a diploma degree and were in an average economic situation.

Table 2: Frequency and frequency percentage of research's variables (nausea and vomiting, depression and obvious and hidden anxiety)

	Variable	Frequency	Frequency percentage
Nausea and vomiting	Without nausea and vomiting	127	37/9
	Mild nausea and vomiting	47	14/0
	Medium nausea and vomiting	79	23/6
	Severe nausea and vomiting	82	24/5
Depression	Non-depressed	265	79/1
	Depressed	70	20/9
Obvious anxiety	Mild obvious anxiety	84	25/1
	Moderate to low obvious anxiety	117	34/9
	Moderate to high obvious anxiety	78	23/3
	Relatively severe obvious anxiety	48	14/3
	Severe obvious anxiety	7	2/1
	Very severe obvious anxiety	1	0/3
Hidden anxiety	Mild hidden anxiety	72	21/5
	Moderate to low hidden anxiety	133	39/7
	Moderate to high hidden anxiety	85	25/4
	Relatively severe hidden anxiety	38	11/3
	Severe hidden anxiety	4	1/2
	Very severe hidden anxiety	3	0/9
	Total	335	100/0

In Table 2, the frequency of research's variables has been presented. As observed, 62.1% of mothers had nausea and vomiting. 79.1% of them were not depressed and the mean total depression was 8/66; 34.9% had a moderate to low obvious anxiety, and the mean 6/20 ± total obvious anxiety was 41/02 ± 40/57; 39.7% had moderate to low hidden anxiety and the mean total hidden anxiety was 11/41 ± 10/52.

Table 3 represents the association between the rate of incidence and severity of nausea and vomiting in pregnancy and the obvious and hidden anxiety and depression in pregnant women.

Table 3: Investigation of the association between the incidence and severity of nausea and vomiting in pregnancy and obvious and hidden anxiety and depression in pregnant women

variable	Without nausea and vomiting	Mild nausea and vomiting	Moderate nausea and vomiting	Severe nausea and vomiting	Total	Chi-square test result	Spearman correlation test results
Mild obvious anxiety	47 (56%)	12 (14/3%)	17 (20/2)	8 (9/5%)	84 (100/0%)	X^2=34/503 df=15 P<0/01	R_s=0/291 P<0/01
Moderate to low obvious anxiety	46 (39/3%)	15 (12/9%)	28 (23/9%)	28 (23/9%)	117 (100/0%)		
Moderate to high obvious anxiety	23 (29/5%)	12 (15/4%)	21 (26/9%)	22 (28/2%)	78 (100/0%)		
Relatively severe obvious anxiety	10 (20/8%)	8 (16/7%)	11 (22/9%)	19 (39/6%)	48 (100/0%)		
Severe obvious anxiety	1 (14/3%)	0 (0/0%)	2 (28/6%)	4 (57/1%)	7 (100/0%)		
Very severe obvious anxiety	0 (0/0%)	0 (0/0%)	0 (0/0%)	1 (100/0%)	1 (100/0%)		
Mild hidden anxiety	38 (52/8%)	7 (9/7%)	17 (23/6%)	10 (13/9%)	72 (100/0%)	X^2=36/312 df=15 P<0/01	R_s=0/234 P<0/01
Moderate to low hidden anxiety	53 (39/8%)	24 (18/1%)	22 (16/5%)	34 (25/6%)	133 (100/0%)		
Moderate to high hidden anxiety	26 (30/6%)	10 (11/8%)	31 (36/5%)	18 (21/1%)	85 (100/0%)		

Relatively severe hidden anxiety	10 (26/3%)	6 (15/8%)	7 (18/4%)	15 (39/5%)	38 (100/0%)		
Severe hidden anxiety	0 (0/0%)	0 (0/0%)	1 (25%)	3 (75%)	4 (100/0%)		
Very severe hidden anxiety	0 (0/0%)	0 (0/0%)	1 (33/3%)	2 (66/7%)	3 (100/0%)		
Non-depressed	109 (41/1%)	37 (14%)	61 (23%)	58 (21/9%)	265 (100/0%)	X^2=7/125 df=3 P>0/05	R_s=0/145 P<0/05
Depressed	18 (25/7%)	10 (14/3%)	18 (25/7%)	24 (34/3%)	70 (100/0%)		

As observed in Table 3, 62% of women with obvious anxiety had some degree of nausea and vomiting in pregnancy. The Chi-square test result revealed a significant statistical relationship between nausea and vomiting in pregnancy and obvious anxiety severity (P <0.01). In addition, Spearman correlation test results indicated a linear correlation between nausea and vomiting in pregnancy and obvious anxiety severity (0.291) (P <0.01). The relationship is also clear in Chart 1.

Furthermore, the results of Table 3 express that 62% of women with hidden anxiety also experienced some degree of nausea and vomiting in pregnancy. The Chi-square test result indicates a statistically significant relationship between nausea and vomiting in pregnancy and the hidden anxiety severity (P <0.01). Spearman's correlation test also show a linear correlation of 0.234 between the nausea and vomiting in pregnancy and the hidden anxiety severity (P <0.01). The relationship is also clear in Chart 1.

Table 3 indicates that women with depression also have symptoms of nausea and vomiting in pregnancy; however, the Chi-square test result shows no statistically significant relationship between nausea and vomiting in pregnancy and the depression severity (P> 0.05). Spearman correlation test results revealed a mild direct linear correlation between nausea and vomiting in pregnancy and depression severity (P <0.05, r_s = 0.145). Fig. 2 also confirms the presence of a trend. Maybe the reason for the conflict between the Chi-square and Spearman tests is the weakness of the relationship that cannot be shown by Chi-2.

It should be noted that, there was no significant relationship between the demographic characteristics of the participants and the research variables.

Discussion:

The results of the current study indicated a significant relationship between the rate of incidence and severity of nausea and vomiting in pregnancy and anxiety and depression in pregnant women, showing the higher severity of nausea and vomiting in pregnant women with anxiety and depression. In a 10-year retrospective study, Kjeldgaard et al. stated that nausea and vomiting in pregnancy are associated with depression (Kjeldgaard et al., 2017). In a study on 78 groups of pregnant women with severe and annoying nausea and vomiting, Aksoy et al. expressed that more than a half of women with severe nausea and vomiting had moderate to severe degrees of depression. They also said that psychological distressed were directly associated with nausea and vomiting in pregnancy (Aksoy et al., 2015). Moreover, the study by Niki Bakhsh et al. on 220 pregnant women referring to health centers in city of Tehran showed a direct relationship between the incidence and severity of nausea and vomiting in pregnancy and anxiety and depression (Nikibakhsh et al., 2016).

The study of Koken et al. on 230 women with nausea and vomiting in pregnancy revealed that a relationship between the severity of nausea and vomiting and the severity of anxiety and depression in early pregnancy (Koken et al., 2008). In a retrospective study on about 1,000 pregnant women, Bai et al. also expressed that nausea and vomiting in pregnancy could affect the physical, psychological and emotional aspects of pregnant women's life (Bai et al., 2016). Studies show that mood, anxiety, and personality disorders in pregnancy are more likely in women with nausea and vomiting. In addition, stress is one of the risk factors for nausea and vomiting in pregnancy and the response to stress during pregnancy emerges physically and with nausea (Faramarzi et al., 2015).

Furthermore, Tan et al. in their study expressed that psychological symptoms like anxiety and depression may lead to physical responses; they also found out that the more severe nausea and vomiting the pregnant women had, the more severe depression they experienced (Tan et al., 2010). In their study, Faramarzi et al. said that specific stress in pregnant women is the most important predictor of nausea and vomiting in pregnancy; and studies claim that nausea and vomiting are associated with psychiatric problems (Faramarzi et al., 2015). In a study performed by Iliadis et al., the results indicated a direct relationship between nausea and vomiting in pregnancy and the postpartum depression symptoms; and even with the exclusion of women with previous depression, this relationship remained statistically significant (Iliadis et al., 2018). Nevertheless, in their study's results, Bazzo et al. said that in women with no previous depression, there was no association between nausea and depression symptoms (Bozzo et al., 2011). The inconsistency of the results of this study with those of the present study and other studies may be due to the different number of studied samples.

Given these studies that are mostly in line with the results of the present study, there is an association between anxiety and depression and nausea and vomiting in pregnancy. However, whether psychological disorders are prior to the symptoms or vice versa is unknown. Nausea and vomiting can decrease the absorption of food and play roll in depression; on the other hand, by affecting the gastrointestinal chemical receptors, reduced depression-induced serotonin can stimulate nausea and vomiting. Psychosocial factors like anxiety can also lead to some modifications and nausea and vomiting through stimulation of the chemical receptors in the digestive tract (Nikibakhsh et al., 2016).

Due to the abundant importance of pregnancy period and the necessity of paying attention to maternal and fetal health, which is always a priority in the health sector, and based on the findings of the present study, Psychological Health Units are recommended to examine, treat, and refer the psychological disorders that can cause complications during pregnancy. It is also recommended to control the nausea and vomiting symptoms during pregnancy as a cause of pregnancy depression and even postpartum depression. In this regard, it is also suggested to carry out laboratory and clinical researches to detect the casual relationship between nausea and vomiting in pregnancy and anxiety and depression.

Conclusion

There are direct and significant relationship between the incidence of nausea and vomiting in pregnancy with the anxiety and depression in pregnant women.

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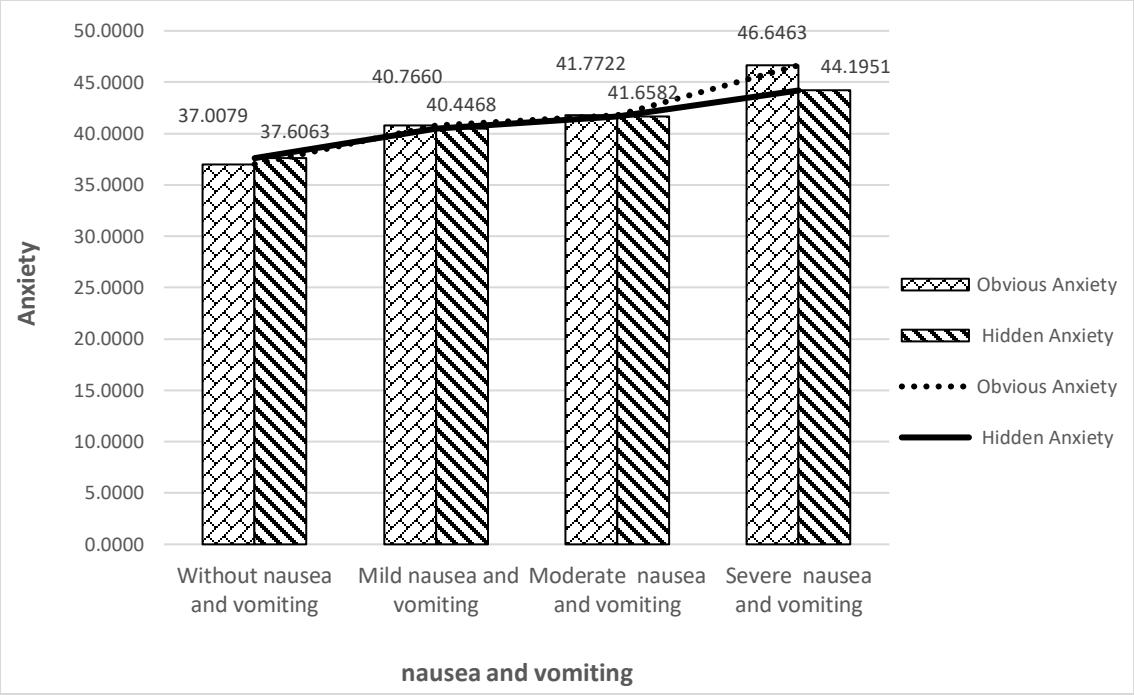

Chart 1: Obvious and hidden anxiety in terms of severity of nausea and vomiting

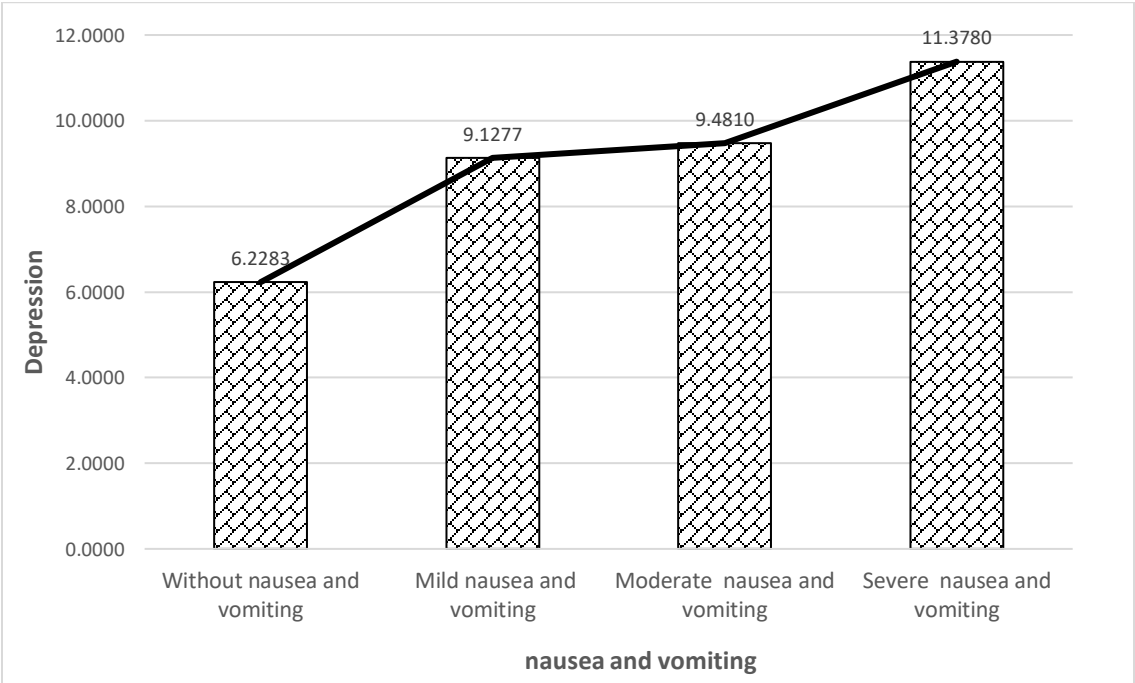

Chart 2: Depression in terms of severity of nausea and vomiting