

Evaluation of frequency of nausea and vomiting as well as depression level in pregnant women

S. Sahin¹, K. Ozdemir², A. Unsal³, A.S. Cevrioglu⁴, K.D. Beydag⁵

¹Yıldırım Beyazıt University, Faculty of Health Sciences, Ankara; ²Sakarya University, School of Health Sciences, Sakarya
³Eskisehir Osmangazi University, Medical Faculty, Public Health Department, Eskisehir; ⁴Sakarya University, Medical Faculty,
Department of Obstetrics and Gynecology, Sakarya; ⁵Okan University, Faculty of Health Sciences, Istanbul (Turkey)

Summary

Objective: To determine the frequency of nausea and vomiting in pregnant (NVP) women, review associated factors, and evaluate the depression level. **Materials and Methods:** The study is a cross-sectional research conducted in pregnant women who applied to Sakarya Training and Research Hospital and Sakarya Maternity and Children Hospital between January 13, 2013 and March 23, 2013. The study group consisted of 606 pregnant women who were below 20 weeks gestation and agreed to take part in the study. The questionnaire form prepared in line with the study objective was completed by the pregnant women under supervision. The women who had a complaint of nausea and vomiting at least once a day during their pregnancy were deemed as "having a history of nausea and vomiting". Rhodes index was used to evaluate the severity of nausea and vomiting. Depression level was evaluated with the Beck Depression Inventory. Chi-square test and Spearman's Correlation Analysis were used to analyze the data. Statistical significance value was accepted as $p < 0.05$. **Results:** The age of pregnant women in the study group ranged from 17 to 39 years (mean age: 25.55 ± 4.95). The frequency of having nausea and vomiting in the pregnant women was determined to be 35.1% ($n = 213$). The frequency of having nausea and vomiting was determined to be higher in those with a nuclear family, working women, those with a poor family income, those who used any contraception method before the pregnancy, and those who had a history of nausea and vomiting in their previous pregnancy(ies) ($p < 0.05$ for each). The pregnant women with a history of nausea and vomiting reported that their complaints increased the most with the smell of food as well as perfume/cigarette/body odor. In the women with a history of nausea and vomiting, frequency of depression was significantly higher ($p < 0.05$). A positive relationship was found between the severity of nausea and vomiting and depression level ($p < 0.05$). **Conclusions:** Nausea and vomiting were determined to be a major health problem in pregnancy. Depression frequency was higher in those with a history of nausea and history. The severity of nausea and vomiting increased with higher depression levels. More detailed studies are required to determine the causes of NVP as well as the risk factors.

Key words: Pregnancy; Nausea and vomiting; Rhodes index; Depression.

Introduction

Nausea and vomiting in pregnancy (NVP) are an important pregnancy complication adversely affecting the women's quality of life. While the severity of this complication (also called morning sickness, emesis gravidarum or pregnancy sickness) varies, its frequency ranges from 50% to 70% in the first trimester [1-4]. The symptoms start typically five to six weeks later than the last menstruation, peak around 8-12 weeks, and reduce gradually over time [2-5]. The symptoms range from mild nausea to severe nausea and vomiting [6]. In a study of Munch and Schmitz on severity of nausea and vomiting in pregnancy, 50-60.8% of the pregnant women defined it as mild, 28.4-33% reported it as moderate, and 10.8-17% reported it as severe [7]. Frequency of vomiting in pregnancy was reported to vary by the countries and ethnical groups [6, 8-10].

Hyperemesis gravidarum (HG) is a complication characterized with malnutrition because of nausea and vomiting,

loss of weight by 5%, acid base imbalance, electrolyte imbalance, and ketonuria [11, 12].

Although many studies were conducted on nausea in pregnancy, its reason has not been fully explained yet [10, 13-16]. Some of the researches studying the etiology of NVP emphasized psychological factors. However, both conditions were stated to have a role on the etiology [10, 13, 17].

While thyroid gland disorders, abnormal beta-HCG levels, liver diseases, autonomic dysfunction, and psychological disorders may cause nausea and vomiting in pregnancy, parity, mother's age, planned nature of the pregnancy, and lack of social support were also suggested to cause these complications [3, 18, 19]. Stress, insufficient information about the pregnancy and delivery, problems in family relationships, ambivalent feelings towards pregnancy, low sense of self-worth, lack of family and friend support, lack of acceptance of the wanted child, general sense of unhappiness, and concerns about fetal

Table 1. — *Some socio-demographic characteristics of the pregnant women with and without the history of nausea and vomiting.*

Socio-demographic characteristics		History of nausea and vomiting			Statistical analysis χ^2 ; p
		No n (%)*	Yes n (%)*	Total n (%)**	
Age group	≤ 24	95 (64.2)	53 (35.8)	148 (24.4)	0.383; 0.944
	25-29	128 (64.39)	71 (35.7)	199 (32.8)	
	30-34 118 (66.7)	59 (33.3)	177 (29.2)		
	≥ 35	52 (63.4)	30 (36.6)	82 (13.5)	
Educational status	Primary school and lower	133 (64.6)	73 (35.4)	206 (34.0)	6.117; 0.106
	Secondary school	102 (72.99)	38 (27.1)	140 (23.1)	
	High school	91 (59.5)	62 (40.5)	153 (25.2)	
	University	67 (62.6)	40 (37.4)	107 (17.7)	
Family type	Nuclear	300 (62.5)	180 (37.5)	480 (79.2)	5.600; 0.018
	Extended	93 (73.8)	33 (26.2)	126 (20.8)	
Employment status	Unemployed	310 (68.4)	143 (31.6)	453 (74.8)	10.095; 0.001
	Employed	83 (54.2)	70 (45.8)	153 (25.2)	
Family income	Poor	25 (47.2)	28 (52.8)	53 (8.7)	11.601; 0.003
	Moderate	288 (68.7)	131 (31.3)	419 (69.1)	
	Good	80 (59.7)	54 (40.3)	134 (22.1)	
Social security status	No	41 (71.9)	16 (28.1)	57 (9.4)	1.061; 0.303
	Yes	352 (64.1)	197 (35.9)	549 (90.6)	
Personality type	A	239 (65.3)	127 (34.7)	366 (60.4)	0.082; 0.775
	B	154 (64.2)	86 (35.8)	240 (39.6)	
Smoking	No	329 (64.1)	184 (35.9)	513 (84.7)	1.396; 0.498
	Yes	55 (70.5)	23 (29.5)	78 (12.9)	
History of a physician-diagnosed chronic disease	No	352 (66.0)	181 (34.0)	533 (88.0)	2.748; 0.097
	Yes	41 (56.2)	32 (43.8)	73 (12.0)	
Obesity	No	311 (65.9)	161 (34.1)	472 (77.9)	1.010; 0.315
	Yes	82 (61.2)	52 (38.8)	134 (22.1)	
Total		393 (64.9)	213 (35.1)	606 (100.0)	

* Percentages were calculated based on the line total; ** Percentages were calculated based on the column total.

nutrition may also cause nausea and vomiting in pregnancy [20].

The pregnant women with dehydration and malnutrition due to severe nausea and vomiting whose clinical picture does not improve despite of the treatment efforts also need psychological support [4, 21]. The individuals with nausea and vomiting in pregnancy need professional support. As the etiological factors of nausea and vomiting in pregnancy are not clear, the symptomatic approaches are used. However, the symptomatic approaches fail to fully resolve the problem. Therefore, the etiological factors should be known so as to help pregnant women to deal with nausea and vomiting in pregnancy [19]. The healthcare professionals providing antenatal care should provide the pregnant women with information on pregnancy, delivery, pregnancy complications, and psychological changes during pregnancy. Thus, it can be ensured that the pregnant women would realize their problems and feel better [22]. Particularly, the healthcare professionals should be able to use available resources of social aids for the care of mothers and infants and ensure that these resources are increased when needed. The midwives and nurses can therefore benefit from the resources of social aids for the pregnant women and assist them to cope with their prob-

lems [19].

This study was conducted to determine the frequency of nausea and vomiting, review associated factors, and evaluate the depression level in pregnant women.

Materials and Methods

The study is a cross-sectional research conducted on the pregnant women who applied to Sakarya Training and Research Hospital and Sakarya Maternity and Children Hospital between January 13, 2013 and March 23, 2013.

The number of pregnant women presenting to the pregnancy follow-up polyclinic in a month is 2,500, with a daily average of 120 to 150 pregnant women presenting to the pregnancy follow-up polyclinic at the 11-bed maternity ward of Sakarya Training and Research Hospital and Sakarya Maternity and Children Hospital.

The questionnaire form prepared in line with the study objective included questions on some socio-demographic characteristics of the pregnant women, the history of nausea and vomiting and some variables believed to be associated with it, and the items of Rhodes index of nausea and vomiting and Beck Depression Inventory.

Before starting to collect data, required approvals were obtained from the Provincial Health Directorate and hospital management. Then 606 pregnant women below 20 weeks gestation who applied to the hospitals during the data collection period and agreed to

Table 2. — Some obstetric and gynecological characteristics of the pregnant women with and without the history of nausea and vomiting.

Obstetric/gynecological characteristics		History of nausea and vomiting			Statistical Analysis χ^2 ; p
		No n (%)*	Yes n (%)*	Total n (%)**	
Number of birth	0	164 (67.5)	79 (32.5)	243 (40.1)	7.098; 0.069
	1	134 (61.2)	85 (38.8)	219 (36.1)	
	2	65 (60.7)	42 (39.3)	107 (17.7)	
	3 and more	30 (81.1)	7 (18.9)	37 (6.1)	
Number of pregnancy	1	145 (65.6)	76 (34.4)	221 (36.5)	0.390; 0.823
	2	134 (63.2)	78 (36.8)	212 (35.0)	
	3 and more	114 (65.9)	59 (34.1)	173 (28.5)	
Current pregnancy week	≤ 7	78 (67.2)	38 (32.8)	116 (19.1)	0.363; 0.834
	8-15	190 (64.2)	106 (35.8)	296 (48.8)	
	≥ 16	125 (64.4)	69 (35.6)	194 (32.1)	
Wanted pregnancy	No	37 (66.1)	19 (33.9)	56 (9.29)	0.003; 0.957
	Yes	356 (64.7)	194 (35.3)	550 (90.8)	
Fertility treatment-induced pregnancy	No	351 (64.4)	194 (35.6)	545 (89.9)	0.301; 0.583
	Yes	42 (68.9)	19 (31.1)	61 (10.1)	
Use of drugs in current pregnancy	No	270 (63.8)	153 (36.2)	423 (69.8)	0.641; 0.423
	Yes	123 (67.2)	60 (32.8)	183 (30.2)	
Use of contraceptive method before pregnancy	No	158 (73.5)	57 (26.5)	215 (35.5)	13.300; 0.010
	Coitus interruptus	76 (59.8)	51 (40.2)	127 (21.0)	
	Condom	80 (57.1)	60 (42.9)	140 (23.1)	
	IUD	34 (69.4)	15 (30.6)	49 (8.1)	
	Oral contraceptive	45 (60.0)	30 (40.0)	75 (12.4)	
History of nausea-vomiting in previous pregnancies (n = 394)	No	128 (74.0)	45 (26.0)	173 (43.9)	12.206; 0.000
	Yes	126 (57.0)	95 (43.0)	221 (56.1)	
History of gynecological surgery	No	349 (65.4)	185 (34.6)	534 (88.1)	0.501; 0.479
	Yes	44 (61.1)	28 (38.9)	72 (11.9)	
Menstrual regularity before pregnancy	Irregular	77 (64.2)	43 (35.8)	120 (19.8)	0.031; 0.861
	Regular	316 (65.0)	170 (35.0)	486 (80.2)	
Total	393 (64.9)	213 (35.1)	606 (100.0)		

*: Percentages were calculated based on the line total; **: Percentages were calculated based on the column total.

take part in the study constituted the study group. The pregnant women were interviewed in the waiting room of the hospitals. The pregnant women were informed about the subject and objective of the study, and their verbal consents were taken. Previously prepared questionnaire forms were completed by the pregnant women who agreed to take part in the study under supervision. This procedure lasted for approximately 15-20 minutes.

The women who had a "complaint of nausea and vomiting at least once a day during their pregnancy" were deemed as having a history of nausea and vomiting in the present study. The symptomatology of NVP ranges from mild to severe according to Rhodes *et al.* [23]. Such scoring system for nausea and vomiting was based mainly on a sample of patients receiving cancer chemotherapy. The Turkish version of Rhodes' Score developed for research purposes has highlighted the substantial psychosocial morbidity of nausea and vomiting. It quantifies not just the physical symptoms, but also the stress caused by them [24]. However, this system has been validated only for symptoms that occurred in the past 12 hours [25]. Eight questions were asked of patients and Rhode's score can range from 8 (no symptoms) to 40 (maximal symptoms). Pregnant women who had scores lower than 9 were group 1, mild NVP ranging from 9 to 18, group 2, a moderate NVP from 19 to 32, group 3, and severe NVP score above 32, group 4. Depression level in this study was evaluated with the Beck Depression Inven-

tory. The BDI was developed by Beck *et al.* in 1961 and later modified by Hisli in 1999 to suit the Turkish culture and norms [26, 27]. It is a 21-item self-report inventory on a four-point Likert scale. The inventory scores ranged between 0 and 63 and those with a score of 17 and above were regarded to have "suspected depression".

The women who had any income-generating job (e.g. worker, civil servant, farmer, self-employed etc.) were defined as "employed". The self-perceived family income level was assessed as high, medium, and poor by the patients.

Those who defined themselves as uptight, enthusiastic, hasty, and impatient among the pregnant women were classified in "Type A personality" and those who defined themselves as quiet, calm, patient, and organized were classified in "Type B personality" [28].

Pregnant women who smoked at least one cigarette per day were defined as smokers, whereas nonsmokers were defined as women who had never smoked or who had not smoked in the past six months [29]. Menstruation with equal intervals (from 21 to 35 days) in the period before pregnancy was considered regular menstruation.

Obtained data were assessed with SPSS (version 20.0) Statistical Package Program, Chi-squared test, and Spearman's Correlation Analysis were used for the analyses. Statistical significance value was accepted as $p < 0.05$.

Table 3. — *The distribution of the drugs used by the pregnant women during pregnancy.*

Drug	n	%
Iron supplement	314	47.4
Vitamin	299	45.1
Antibiotics	7	1.1
Analgesics	25	3.8
Insulin	13	1.9
Antiemetic	5	0.7
Total	663	100.0

Table 4. — *The distribution of the factors which increase nausea and vomiting in pregnancy.*

Variables	n	%
Food smells	154	38.0
Weakness	70	17.3
Perfume/cigarette/body odor	137	33.8
Special foods	44	10.9
Total	405	100.0

Table 5. — *Some characteristics of the pregnant women with and without suspected depression.*

Nausea-vomiting characteristics		Suspected depression			Statistical analysis χ^2 ; p
		No n (%)*	Yes n (%)*	Total n (%)**	
History of nausea-vomiting	No	352 (89.6)	41 (10.4)	393 (64.9)	14.001; 0.000
	Yes	167 (78.4)	46 (21.6)	213 (35.1)	
	Total	519 (85.6)	87 (14.4)	606 (100.0)	
Pregnancy month in which nausea and vomiting occur	Month 1	113 (79.6)	29 (20.4)	142 (66.7)	0.377; 0.828
	Month 2	33 (76.7)	10 (23.3)	43 (20.2)	
	Month 3 and later	21 (75.0)	7 (25.0)	28 (13.1)	
	Total	167 (78.4)	46 (21.6)	213 (100.0)	
Time of day when nausea and vomiting peak	Morning	85 (76.6)	26 (23.4)	111 (52.2)	1.120; 0.571
	Evening	21 (75.0)	7 (25.0)	28 (13.1)	
	All day	61 (82.4)	13 (17.6)	74 (34.7)	
	Total	167 (78.4)	46 (21.6)	213 (100.0)	

* Percentages were calculated based on the line total; ** Percentages were calculated based on the column total.

Results

The study group consisted of 606 pregnant women aged from 17 to 39 years (mean age: 25.55 ± 4.95). Of the pregnant women, 148 (24.4%) were aged 24 and below, 199 (32.8%) were aged 25-29, 177 (29.2%) were aged 30-34, and 82 (13.5%) were aged 35 and above. In the present study, the frequency of having nausea and vomiting in the pregnant women was determined to be 35.1% ($n = 213$). Some socio-demographic characteristics of the pregnant women in the study group with and without the history of nausea and vomiting are given in Table 1.

243 (40.1%) women in the study group have not given birth before and it was the first pregnancy in 221 (36.5%) women. The number of women who have not used a contraceptive method before pregnancy was 215 (35.5%). The distribution of the pregnant women with and without a history of nausea and vomiting by some obstetric and gynecological characteristics is given in Table 2.

In the study group, the most commonly used drugs during pregnancy were iron supplements (47.4%) and vitamins (45.1%). The distribution of the drugs used by the pregnant women during pregnancy is given in Table 3.

Smell of food (38.0%) and perfume/cigarette/body odor (33.8%) were among the most frequently reported factors which increased NVP. The distribution of the factors which

increase this complaint in study population with a history of nausea and vomiting is given in Table 4.

Suspected depression was diagnosed in 87 pregnant women (14.4%) in this study. The presence of nausea and vomiting, pregnancy month in which nausea and vomiting occur, and the distribution of nausea and vomiting by the time of day when nausea and vomiting peak in the study population with and without depression are given in Table 5.

The scores obtained from Beck Depression Inventory by the pregnant women in this study ranged from 0 to 43, with a mean score of 8.60 ± 6.43 . The scores obtained from Rhodes Index of Nausea and Vomiting ranged from 8 to 31 (mean score: 12.01 ± 5.64). A positive relationship was found between the severity of nausea and vomiting and depression level in the present study ($r = 0.270$; $p = 0.000$). The distribution of the scores obtained from the index of nausea and vomiting and depression scale by the pregnant women is given in Figure 1.

Discussion

35.1% of the pregnant women in the present study reported nausea and vomiting complication. Some studies noted that the frequency of NVP ranged from 50% to 70% [30, 31]. Gadsby *et al.* stated that 63.2% of the pregnant

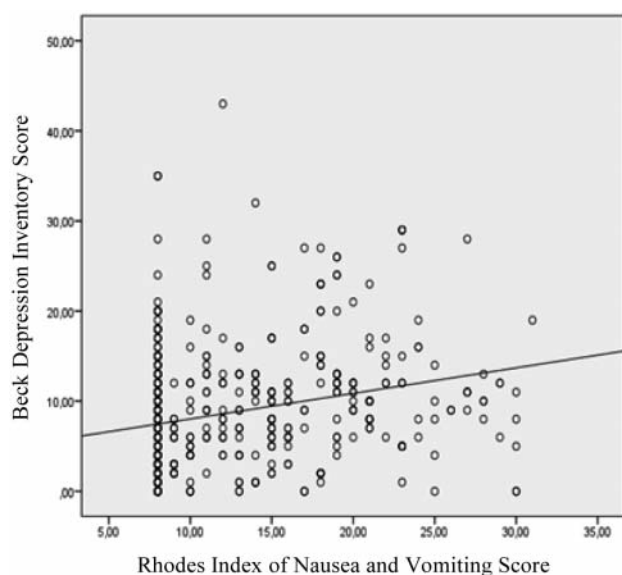


Figure 1. — The distribution of the scores obtained from the index of nausea and vomiting and depression scale by the pregnant women.

women had nausea and vomiting in their previous pregnancies [32]. In the study of Koken *et al.* conducted in Turkey, the frequency of nausea and vomiting was 72.9% [3]. Particularly, the changes in the sense of smell and taste during pregnancy cause the pregnant woman to develop an aversion to some foods and smells. This condition causes an increase in nausea and vomiting complication in the pregnant women and insufficient consumption of nutrients required for fetus [33].

The frequency of nausea and vomiting in pregnant women who are actively engaged with an income-generating job was determined to be higher in the present study ($p < 0.05$). Koken *et al.* reported that nausea and vomiting increase with fatigue and the feeling of nausea and vomiting in pregnant women subsides when they rest. Other studies stated that the nausea and vomiting complication increased mostly in situations like intensive working environment and lack of sleep in pregnant women [3, 10]. It can be argued that working makes a person tired and thus increases nausea and vomiting.

Vomiting is one of the most common physical reactions to stress. Iatrakis *et al.* reported that somatic responses including vomiting were more common in pregnant women under stress [34]. As poor socio-economic status is a stress factor, it is expected to increase nausea and vomiting even more in pregnant women. Accordingly, the frequency of nausea and vomiting was observed to be higher in pregnant women with poor family income ($p < 0.05$).

In the study of Koken *et al.* it was reported that there is no relationship between nausea and vomiting and number of pregnancies, deliveries, and abortions [3]. In the present

study, no difference was found between the number of deliveries and pregnancies and frequency of nausea and vomiting in the study population ($p > 0.05$ for each).

No difference was determined between the frequency of nausea and vomiting and planned or unplanned nature of pregnancy in the study population ($p > 0.05$). Kuo *et al.* reported that the women with severe nausea and vomiting accept the pregnancy less than the women with mild to moderate nausea and vomiting [35].

In this study, the frequency of nausea and vomiting was found to be higher in women with a history of nausea and vomiting in their previous pregnancy/pregnancies ($p < 0.05$). Timur *et al.* reported that the risk of having nausea and vomiting is higher in women with a history of nausea and vomiting in their previous pregnancy/pregnancies. Similarly, many studies claimed that a history of nausea and vomiting in previous pregnancy is a risk factor for having nausea and vomiting in current pregnancy [4, 31, 36].

Smells are one of the most important triggers of nausea and vomiting of pregnancy. Food (particularly meat), coffee, perfume, cigarette, and volatile substances (petroleum products) are the primary smells triggering nausea and vomiting in pregnant women. Hyperactive sense of smell triggered by estrogen level in early pregnancy may contribute to this condition [31, 37]. Consistently, the pregnant women in the present study reported that their complaints increased the most with the smell of food as well as perfume/cigarette/body odor. These results are consistent with the present study.

The frequency of manifesting depressive symptoms in pregnancy may vary by the pregnancy trimester. In the literature, anxiety and depression were reported to occur more in the first and third trimesters compared to the second trimester of the pregnancy [9, 38, 39]. The frequency of depression was determined to be significantly higher in women with a history of nausea and vomiting in the present study ($p < 0.05$). Occurrence of anxiety and depression in the first trimester may be associated with more frequent nausea and vomiting in this period.

A positive relationship was found between the severity of nausea and vomiting and depression level ($p < 0.05$). Ozen *et al.* stated that anxiety level was higher in the pregnant women with HG [30]. In another study, the frequency of anxiety and depression in the pregnant women with HG was reported to be higher compared to the pregnant women without this condition [40]. Kim *et al.* suggested that the quality of life significantly deteriorated in women with HG and such women should be observed in psychiatric terms [41].

Conclusions

Nausea and vomiting were determined to be a major health problem in pregnancy. The pregnant women reported that smell of food and perfume/cigarette/body odor increase

nausea and vomiting. The frequency of nausea and vomiting was found to be higher in the women who used any contraceptive method before pregnancy. Depression frequency was higher in those with a history of nausea and history. The severity of nausea and vomiting increases with higher depression levels. It may be advantageous to perform depression screens in pregnant women and to refer suspected cases to advanced centers for definitive diagnosis and treatment. More detailed studies are required to determine the causes of nausea and vomiting in pregnancy as well as the risk factors.

Limitations

Cross-sectional nature of the study is one of the limitations of this study. Other limitations may include the facts that it was conducted in a single city and hospital and that the scales used for diagnosis of depression fail to provide a definitive diagnosis.

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Address reprint requests to:
S. SAHIN, M.D.
Yıldırım Beyazıt University
Faculty of Health Sciences
Ankara 06550, Sakarya (Turkey)
e-mail: ssahin@sakarya.edu.tr