

The Frequency and Severity of Nausea and Vomiting during Pregnancy and its Association with Psychosocial Health

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ARTICLE INFO	ABSTRACT
<i>Article type:</i> Original article	Background & aim: The present study aimed to evaluate the frequency and severity of nausea and vomiting during pregnancy (NVP) and to investigate the association between psychosocial health and the severity of NVP.
<i>Article History:</i> Received: 05-Jan-2015 Accepted: 09-May-2015	Methods: This cross-sectional study was performed on 200 eligible pregnant women with nausea and vomiting at three prenatal care centers in Kashan, Iran. The participants completed demographic and pregnancy-related questionnaire, Beck Depression Inventory-Short Form, Winnfield Tiygmann social support questionnaire and Paykel scale of stressful life events. the severity of NVP was also recorded. ANOVA and Kruskal-Wallis tests were used to determine the relationship between different variables. P-value less than 0.05 was considered statistically significant.
<i>Key words:</i> Nausea and Vomiting Pregnancy Psychosocial Health	Results: The frequency of NVP was estimated at 71.5%. In total, 19%, 45.5% and 7% of these cases had mild, moderate and severe NVP, respectively. The severity of NVP was significantly associated with depression level (P=0.01). However, there was no correlation between the level of social support and unpleasant life events with severity of NVP. Conclusion: According to the results of this study women with more severe NVP experienced a higher level of depression, compared to others. However, social support and other factors were not correlated with the severity of NVP.

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Introduction

Nausea and vomiting during pregnancy (NVP) is the most disturbing symptom in 80% of all pregnancies (1-3). The prevalence of mild, moderate and severe NVP has been reported to be 50-60.8%, 32-34% and 10.8-17%, respectively (4). Severe and prolonged NVP may result in hyperemesis gravidarum. Moreover, it may lead to maternal weight loss, severe dehydration, electrolyte imbalance and formation of ketones in urine (5).

Women, hospitalized due to NVP, do not experience a normal weight gain during pregnancy; this leads to low birth weight and intrauterine growth restriction (6-7). Moreover, the severity of NVP may affect the physical and emotional status of pregnant women and

influence their maternal role, as well as their quality of life (8-11).

According to World Health Organization (WHO), several factors including stressors, social relations, stressful life events, anxiety, depression and social support influence one's health (12). However, limited information is available regarding psychopathological factors, associated with pregnancy outcomes (13).

Stress is not evaluated during routine prenatal care. As a result, maternal stress level during pregnancy is undetermined and the associated effects on maternal health cannot be estimated. Overall, stress, anxiety and depression are associated with several diseases including cardiovascular, autoimmune and skin conditions (14).

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According to WHO, social support is a mediating factor, affecting one's emotional status (12). In fact, perceived social support is an individual's perception of the support received from the family, friends and others (15). Previous studies have shown that mortality rate decreases among people with an extended social network (16). It is believed that social support results in social adaptation, appropriate response to stressors, stress reduction and promotion of physical and psychological health (17-19).

According to the above-mentioned findings, prenatal care providers should be aware of predisposing factors for NVP in order to provide effective care and promote maternal and fetal health during pregnancy. However, the available data on the relationship between NVP and psychosocial health are controversial. In this regard, Kuo et al. (2007) reported that pregnant women with mild NVP had significantly lower stress, compared to pregnant women with severe NVP.

On the other hand, according to a previous study, social support and maternal psychosocial adaptation were not significantly correlated with the severity of NVP (20). However, these two studies reported that severe NVP, associated with high perceived stress, may be mediated by social support (21-22). Considering the mentioned points, the aim of this study was to evaluate the relationship between NVP and psychosocial health among Iranian women.

Materials and Methods

Sample design and participants

This cross-sectional study was conducted on all pregnant women, referring to three healthcare centers of Kashan, Iran during 2009-2010.

The inclusion criteria were as follows: 1) 19-45 years of age; 2) gestational age of 6-16 weeks; 3) singleton pregnancy; 4) being a Muslim; and 5) fluency in Persian language. The exclusion criteria were as follows: 1) use of medications during pregnancy other than supplements and multivitamins; 2) history of diagnosed chronic, infectious diseases; 3) prior history of conditions such as diabetes and abnormal blood pressure; and 4) history of complications such as haemorrhage and uterine contractions.

In this study, convenience sampling method was applied. Consent forms were obtained from eligible participants. The subjects were justified about the purpose and method of the study and were ensured about the confidentiality of the findings. Finally, qualified and eligible women, who agreed to complete the questionnaires, were introduced to the study.

Data collection tools

Demographic and pregnancy-related characteristics including age, spouse's educational level, gestational age, gravidity, history of abortion and pregnancy planning (planned or unintended) were collected. In this study, years of formal education were considered as a measure of socioeconomic status. In fact, previous studies conducted in Iran have shown that educational level could be an appropriate measure for evaluating the socioeconomic status of Iranians (23).

Beck Depression Inventory-Short Form (BDI-SF) (13 questions), which is a comprehensive and reliable tool for depression evaluation, was applied in this study. Psychometric properties of BDI have been verified in Iranian population (24). In the present study, the score of nine or higher was considered as a sign of depression.

The severity of NVP was classified as mild (no interference with one's activity level or concentration), moderate (sometimes interfering with one's activity or concentration) and severe (inability in performing activities or concentration) (25).

Social support was evaluated, using Winnfield Tiyygmann's social support scale, which has been adjusted with regard to Iranian culture. The validity and reliability of this questionnaire have been previously confirmed. This scale consists of 16 items including 10 questions, graded as "high", "moderate" and "low". According to the participant's responses, the scores range from 0 to 3; the total score is the sum of scores for each question. In this study, based on the obtained scores, the subjects were divided into three groups: low social support (score 0-10), moderate social support (score 11-20) and high social support (score 21-30). The second part of the questionnaire (6 items) is concerned with postpartum social support

(yes/no) (26-27). This section was omitted since the participants in the present study were pregnant women.

Paykel scale of stressful life events was used for evaluating the events over the last year. The validity and reliability of this scale have been previously confirmed. For this purpose, Tomyians et al. selected 51 items out of 69 events, which were found to be adaptable in our country; in this study, these events were considered, as well (27).

Data analysis

Data were presented as number and percentage, unless otherwise indicated. Group comparisons were carried out, using ANOVA and Kruskal-Wallis tests if necessary. Multiple linear regression test was applied to identify variables which contributed to the variability of NVP severity. P-value less than 0.05 was considered statistically significant. Statistical analysis was performed, using SPSS version 21.0 (SPSS Inc., Chicago, IL, USA).

Ethical considerations

This study was approved by the Ethics Committee of Kashan University of Medical Sciences.

Results

Socio-demographic characteristics

Overall, 200 pregnant women were included in this study over one year. The mean (SD) age of participants and gestational age were 25.1 ± 5.5 years and 140.06 ± 37.90 days, respectively. The majority of women had no academic education ($n=158$, 79%). The participants' socio-demographic characteristics and pregnancy history are presented in Table 1.

The prevalence of NVP was estimated at 71.5%. Overall, 105 cases (52.5%) presented with moderate to severe NVP (Figure 1).

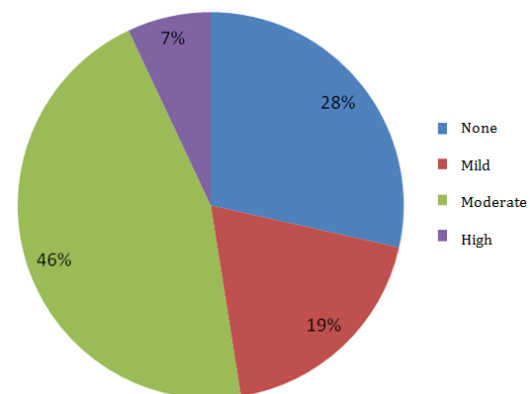


Figure 1. Frequency distribution of participants with different severities of NVP (n=200)

Table 1. Socio-demographic and psychosocial characteristics of participants (n=200)

Demographic characteristics		
Age (years)		25.89±5.50
Mother's education	Less than university education	158 (79.00)
	Academic education	42 (21.00)
Partner's education	Less than university education	162 (81.00)
	Academic education	38 (19.00)
Gravidity		1.85±1.05
Abortion	Yes	162 (81.00)
	No	38 (19.00)
Plan for pregnancy	Yes	159 (79.50)
	No	41 (20.50)
Gestational age (days)		140.06±37.90
Psychosocial health		
Depression status	No	118 (59)
	Mild	55 (27.5)
	Moderate	22 (11)
	Severe	5 (2.5)
Social support status	Low	26 (13)
	Moderate	108 (54)
	Severe	65 (32.5)
Unpleasant life events	0-6 events	191 (95.5)
	7-13 events	9 (4.5)

Table 2. Comparison of the severity of NVP and different variables (n=200)

Variables	Severity of NVP				P	
	No	Mild	Moderate	Severe		
Age (years)	26.31±5.11	27.31±6.55	25.27±5.36	24.37±4.18	0.16	
Gestational age (days)	131.05±58.85	154.05±63.37	174.05±60.70	109.21±50.33	0.28	
Mother's education	Less than university education	44 (77.2)	29 (76.3)	76 (83.5)	9 (64.3)	0.18
	Academic education	13 (22.8)	9 (23.7)	15 (16.5)	5 (35.7)	
Spouse's education	Less than university education	45 (78.9)	31 (81.6)	74 (81.3)	12 (85.7)	0.70
	Academic education	12 (21.1)	7 (18.4)	17 (18.7)	2 (14.3)	
Gravidity		1.68±0.71	2.07±1.40	1.91±1.09	1.50±0.65	0.16
Plan for pregnancy	No	7 (12.3)	12 (31.6)	20 (22)	2 (14.3)	0.13
	Yes	50 (87.7)	26 (68.4)	71 (78)	12 (85.7)	
Abortion	Yes	50 (87.7)	29 (76.3)	70 (76.9)	13 (92.9)	0.18
	No	7 (12.3)	9 (23.7)	21 (23.1)	1 (7.1)	
Depression score		4.10±3.83	3.89±3.50	4.61±3.85	7.78±7.15	0.01
Social support	Low	10 (17.5)	3 (8.10)	10 (11)	3 (3)	0.50
	Moderate	31 (54.4)	21 (56.75)	49 (53.8)	7 (3.5)	
	Severe	16 (28.1)	13 (35.13)	32 (35.2)	4 (2)	
Unpleasant life events		2.24±2.47	1.65±1.54	1.96±2.39	2.71±1.68	0.28

Quantitative and qualitative variables are presented as number (percentage) and mean±SD, respectively.

Psychosocial health status

Most pregnant women (54%) were reported to have moderate social support. Among the participants, 53% had experienced at least 1-3 unpleasant events over the past year. The prevalence of depression in the present study was 41% and the majority of subjects (27.5%) had mild depression (Table 1).

The impact of socio-demographic characteristics and psychosocial health on NVP

Table 1 shows the distribution of participants with different severities of NVP, based on demographic characteristics, depression level, unpleasant life events and social support. The obtained results showed a significant difference between the severity of NVP and depression score ($P=0.01$) (Table 2). However, the severity of NVP was not correlated with the level of social support ($P=0.50$) or unpleasant life events ($P=0.28$). Moreover, according to multiple regression analysis, depression score was a significant predictor of NVP severity ($B=0.09$, 95% CI: 0.003-0.041, $P=0.02$).

Discussion

In this study, the prevalence of NVP was estimated at 71.5%. In total, 19%, 45.5% and 7% of these cases had mild, moderate and severe NVP, respectively. In this regard, in a

study by Chou et al. (2008) on Taiwanese pregnant women, the prevalence of mild, moderate and severe nausea was reported to be 28.8%, 36.2% and 12.3%, respectively (21); consistent with the present study, most of the participants had moderate NVP. Also, in a study by Soltani et al. (2004) on 700 pregnant women (during 6-16 weeks of pregnancy), the prevalence of NVP was reported to be 69.8% in Hamadan, Iran (28).

The results of the present study did not show a significant statistical relationship between maternal age and NVP, which was consistent with the findings reported by Norani Saaededin et al. (2003), who indicated no significant association between maternal age and NVP (29).

The etiology of NVP is multi-factorial and factors predisposing pregnant women to NVP have not been fully recognized. Unlike other studies reporting a relationship between NVP and maternal education (2-30), the present research did not indicate such an association. This finding was in accordance with two previous studies which suggested no correlation between NVP and educational level (31-32).

Our findings showed no significant association between the severity of NVP, unplanned pregnancy or abortion. These findings were in agreement with the results reported by Chou (2001) (1) and in contrast with the findings reported by FitzGerald, who

concluded that women with an unplanned or undesired pregnancy tended to have a more severe NVP (32).

Individuals are physical, psychological beings and physiological factors play a considerable role in determining their health (33). The prevalence of depression was estimated at 41% in this study. The higher prevalence of depression in this study and previous research in Iran, compared to other countries, is noticeable. For instance, in a systematic review, the prevalence of depression during pregnancy was reported to be 6.5-12.9% during different trimesters (34).

The remarkable difference between the global prevalence of depression and the rate reported in Iran (in this study and previous research) may be due to factors such as lifestyle differences in various regions, use of different depression tests and variations in the sample size.

Some studies have shown that the scores obtained by BDI are significantly higher than those attained by Edinburgh Depression Scale. The reason behind this difference lies in the greater number of questions related to the somatic aspect of depression in BDI, compared to Edinburgh scale. Therefore, due to the presence of multiple somatic disorders in pregnant women, depression may be misdiagnosed.

Some signs of depression such as sleep disorders, weight gain and energy reduction may be also present in a normal pregnancy, resulting in a complicated diagnosis of depression. Therefore, although Beck et al. suggested that a score of nine or higher is indicative of depression, it is recommended that a higher threshold be considered for pregnant women, since somatic signs in pregnant women can increase the obtained score in this test (35-36).

The present study showed that the higher level of depression was related to more severe symptoms of NVP. Also, women with severe or moderate nausea reported higher levels of depression, compared to those with mild nausea. These findings were consistent with the results reported by Swallow et al., who indicated that pregnant women with frequent nausea and vomiting experience more depression (37); this may be related to the feeling of loneliness and loss of control.

According to our findings, the severity of NVP was not correlated with social support or unpleasant life events. In this regard, Kuo et al. (2007) reported that pregnant women with mild NVP had a significantly lower stress level, compared to those with severe NVP. However, the severity of NVP was not significantly correlated with social support or maternal psychosocial adaptation (20). This finding differed from the results reported by two previous studies, which indicated that severe NVP, associated with high perceived stress level, may be mediated by social support (21-22).

The discrepancies between other studies and the present research may be due to differences in the cultural background of pregnant women, use of different tests for evaluating social support and unpleasant life events, and differences in the sample size. Evaluation of different populations and settings in future might increase our understanding of this issue.

One of the limitations of the present study was the application of a cross-sectional method. Although this study explored a common problem among pregnant women and provided useful data on this subject, the possible statistical relationship cannot be confirmed. Moreover, use of convenience sampling method may limit the generalizability of our findings to the whole population of pregnant women.

Another limitation in this study was that although Beck questionnaire is valid and reliable for pregnant women, its validity and reliability have not been confirmed in case of NVP. Also, the limited sample size was another shortcoming of this study; this in turn limited the generalizability of the data. Finally, performing a longitudinal evaluation and precise control of subjects' mental status were not possible before pregnancy or after NVP. For a more thorough understanding of the relationship between psychosocial health and NVP, further research is recommended.

Conclusion

The findings of the present study provided a deeper understanding of the relationship between NVP and psychosocial status. The results showed that women with more severe NVP experienced a higher level of depression, whereas social support and unpleasant life

events were not associated with the severity of NVP. Considering the importance of NVP and its relation with depression, further studies and application of accurate tools for estimating the prevalence of depression in pregnancy are recommended. Moreover, if this relationship is approved, the integration of mental health care and prenatal care programs is suggested. Also, more support should be provided for helping mothers cope with pregnancy problems. In addition, mothers should be trained on how to control these problems and improve their health and communication skills. Finally, the needs of mothers during pregnancy should be highlighted and those who are at greater risks and require further interventions should be identified.

Conflict of Interest

The authors declare no conflicts of interest.

References

1. Chou FH. The adaptation to pregnancy in Taiwanese women who experience different severities of nausea and vomiting [PhD thesis]. Texas: University of Texas at Austin; 2001.
2. Lacroix R, Eason E, Melzack R. Nausea and vomiting during pregnancy: A prospective study of its frequency, intensity, and patterns of change. *American Journal of Obstetrics and Gynecology*. 2000; 182(4):931-937.
3. Chou FH, Lin LL, Cooney AT, Walker LO, Riggs MW. Psychosocial factors related to nausea, vomiting, and fatigue in early pregnancy. *Journal of Nursing Scholarship*. 2003; 35(2):119-125.
4. Jarnfelt-Samsioe A, Eriksson B, Waldenstrom J, Samsioe G. Some new aspects on emesis gravidarum: Relations to clinical data, serum electrolytes, total protein and creatinine. *Gynecologic and Obstetric Investigation*. 1985; 19(4):174-186.
5. Chandra K, Magee L, Einarson A, Koren G. Nausea and vomiting in pregnancy: result of a survey that identified intervention used by women to alleviate their symptom. *Journal of Psychosomatic Obstetrics and Gynaecology*. 2003; 24(2):71-75.
6. Lippincott W. Nausea and vomiting in pregnancy. *The Journal of Perinatal & Neonatal Nursing*. 2004; 18(4):312-328.
7. Chin RKH, Lao TT. Low birth weight and hyperemesis gravidarum. *European Journal of Obstetrics, Gynecology, and Reproductive Biology*. 1989; 28(3):179-183.
8. Deuchar N. Nausea and vomiting in pregnancy: A review of the problem with particular regard to psychological and social aspects. *British Journal of Obstetrics and Gynaecology*. 1995; 102(1):6-8.
9. O'Brien B, Naber S. Nausea and vomiting during pregnancy: effects on the quality of women's lives. *Birth*. 1992; 19(3):138-143.
10. Attard CL, Kohli MA, Coleman S, Bradley C, Hux M, Atanackovic G, et al. The burden of illness of severe nausea and vomiting of pregnancy in the United States. *American Journal of Obstetrics And Gynecology*. 2002; 186(5 suppl): 220-227.
11. Meighan M, Wood AF. The impact of hyperemesis gravidarum on maternal role assumption. *Journal of obstetric, gynecologic, and neonatal nursing*. 2005; 34(2):172-179.
12. Solar Orielle, Irwin Alec. A conceptual framework for action on the social determinants of health. Geneva: World Health Organization; 2010.P.1-65.
13. Chung TK, Lau TK, Yip AS, Chiu HF, Lee DT. Antepartum depressive symptomatology is associated with adverse obstetric and neonatal outcomes. *Psychosomatic Medicine*. 2001;63(5):830-834.
14. Nelson DB, Grisso JA, Joffe MM, Brensinger C, Shaw L, Datner E. Does stress influence early pregnancy loss? . *Annals of Epidemiology*. 2003;13(4):223-229.
15. Coventry WL, Gillespie NA, Heath AC, Martin NG. Perceived social support in a large community sample--age and sex differences. *Social Psychiatry and Psychiatric Epidemiology*. 2004;39(8):625-636.
16. Reblin M, Uchino BN. Social and emotional support and its implication for health. *Current Opinion in Psychiatry*. 2008;21(2):201-205.
17. Ye XQ, Chen WQ, Lin JX, Wang RP, Zhang ZH, Yang X, et al. Effect of social support on psychological-stress-induced anxiety and depressive symptoms in patients receiving peritoneal dialysis. *Journal of Psychosomatic Research*. 2008;65(2):157-164.
18. Moak ZB, Agrawal A. The association between perceived interpersonal social support and physical and mental health: results from the National Epidemiological Survey on Alcohol and Related Conditions. *Journal of Public Health*. 2010;32(2):191-201.
19. Landman-Peeters KM, Hartman CA, van der Pompe G, den Boer JA, Minderaa RB, Ormel J. Gender differences in the relation between social support, problems in parent-offspring communication, and depression and anxiety. *Social Science & Medicine*. 2005;60(11):2549-2559.
20. Kuo SH, Wang RH, Tseng HC, Jian SY, Chou FH. A comparison of different severities of nausea and vomiting during pregnancy relative to stress, social support, and maternal adaptation. *Journal of Midwifery & Women's Health*. 2007;52(1):e1-e7.

21. Chou FH, Avant KC, Kuo SH, Fetzer SJ. Relationships between nausea and vomiting, perceived stress, social support, pregnancy planning, and psychosocial adaptation in a sample of mothers: a questionnaire survey. *International Journal of Nursing Studies*. 2008;45(8):1185-1191.
22. Tan PC, Vani S, Lim BK, Omar SZ. Anxiety and depression in hyperemesis gravidarum: prevalence, risk factors and correlation with clinical severity. *European Journal of Obstetrics, Gynecology, and Reproductive Biology*. 2010;149(2):153-158.
23. Donyavi T, Naieni KH, Nedjat S, Vahdaninia M, Najafi M, Montazeri A. Socioeconomic status and mortality after acute myocardial infarction: a study from Iran. *International Journal for Equity In Health*. 2011;10(1):9.
24. Grey Gras M. Leader for psychology assessment [P. Sharifi H, M. Nikkhah, trans]. Tehran: Badr pub; 1994. p.73.[Persian].
25. DiIorio CK, Van Lier DJ. Nausea and vomiting in pregnancy. In: Funk SG, Tornquist EM, Champagne MT, Copp LA, Wiese RA, editors. *Key aspects of comfort: Management of pain, fatigue, nausea*. New York: Springer; 1989. p.259-266.
26. Wine field H, Winfield A, Tiygemann M. Social support and psychological well-being in young adults. The multi-dimensional support scale. *Journal of Personality Assessment*. 1992; 58(1):198-210.
27. Tomyians J. Evaluation of depression in pregnant women which in educational hospitals related to Shahid Beheshti Medical university [MS thesis]. Tehran: Shahid Beheshti Medical university; 1999.
28. Soltani A, Danesh Kajori M, Safari SH, Hoseeni F. Frequency and severity of nausea and vomiting in pregnancy and the related factors among pregnant women. *Iran Journal of Nursing*. 2007; 19(48):95-102.
29. Norani Saaededin SH. Evaluation related factors to nausea and vomiting during first trimester of pregnancy. *Iran Journal of Nursing*. 2003; 17(37):8-11.
30. Klebanoff MA, Koslowe PA, Kaslow R, Rhoads GG. Epidemiology of vomiting in early pregnancy. *Obstetrics and Gynecology*. 1985;66(5):612-616.
31. O'Brien B, Zhou Q. Variables related to nausea and vomiting during pregnancy. *Birth* 1995;22(2):93-100.
32. FitzGerald CM. Nausea and vomiting in pregnancy. *The British journal of medical psychology*. 1984;57:159-65.
33. Bagheri M. Psycho disorder in delivery and after delivery. *Nursing and Midwifery Journal*. 1993; 1(2):7-45.
34. Gavin NI, Gaynes BN, Lohr KN, Meltzer-Brody S, Gartlehner G, Swinson T. Perinatal depression: a systematic review of prevalence and incidence. *Obstetrics and Gynecology*. 2005;106(5 Pt 1):1071-83.
35. Miller LJ, Shah A. Major mental illness during pregnancy. *Primary Care Update for ob/gyns*. 1999; 6(5):163-168.
36. Holcomb WL Jr, Stone LS, Lustman PJ, Gavard JA, Mostello DJ. Screening for depression in pregnancy: characteristics of the beck depression inventory. *Obstetrics and Gynecology*. 1996;88(6):1021-25.
37. Swallow BL, Lindow SW, Masson EA, Hay DM. Psychological health in early pregnancy: Relationship with nausea and vomiting. *Journal of Obstetrics and Gynaecology*. 2004;24(1):28-32.