Saudi Pharmaceutical Journal 31 (2023) 101821

HOSTED BY

Contents lists available at ScienceDirect

Saudi Pharmaceutical Journal

journal homepage: www.sciencedirect.com

Original article

Nausea and Vomiting of Pregnancy in Saudi Females: A Cross-Sectional Study

Nora A. Alkhudair [1,*], Ziyad Alrabiah [1], Rana Almohaimeed, Fowad Khurshid, Abdulaziz Alhossan

Department of Clinical Pharmacy, College of Pharmacy, King Saud University, Riyadh, Saudi Arabia

ARTICLE INFO

Article history:
Received 10 September 2023
Accepted 8 October 2023
Available online 12 October 2023

Keywords:
Pregnancy
Nausea
Vomiting
Saudi
Female

ABSTRACT

Background: Nausea and vomiting of pregnancy (NVP) is a frequently reported medical condition during pregnancy. However, no studies have evaluated its impact on women's ability to perform acts of daily living in the Saudi population. Hence, this study aimed to explore the impact of NVP on the day-to-day functions of pregnant women in Saudi Arabia.

Methods: This cross-sectional online survey study was conducted between March 18, 2019, and April 17, 2019. Pregnant females and new mothers were asked to complete an anonymous online questionnaire.

Results: A total of 591 women with NVP participated in the study. Pregnant women at the time of the survey were 233 (39.4 %), and 358 (60.6 %) were new mothers who had a child under the age of 1 year. Most participants, 556 (94.1 %), reported experiencing NVP symptoms at some time during their pregnancies. NVP symptoms were most predominant during the first trimester, as experienced by 420 (75.5 %) women. NVP severely affected daily activities in 45.4 % of participants. About 58 % of the women reported that they might never consider getting pregnant again because of NVP.

Conclusions: Our study found that most Saudi women suffered from NVP during their pregnancies. Additionally, NVP impacts women's daily-life functioning and their desire to become pregnant again. This warrants further studies to explore NVP socioeconomical impact on Saudi women.

1. Introduction

Nausea and vomiting of pregnancy (NVP) is a frequently reported medical condition during pregnancy (Bustos et al., 2017). Between 50 % and 80 % of women with normal pregnancies have experienced NVP of varying severity (American College of Obstetricians and Gynecologists, 2015). NVP causes significant morbidity in 30 % of pregnancies (Gadsby & Barnie-Adshead, 2011). The symptoms of NVP range from minor to acute, affecting 1 %–1.5 % of pregnant women (Einarson et al., 2013).

Although NVP is not linked to an increased risk of negative pregnancy outcomes, it substantially impacts pregnant women's lives (Wood et al., 2013). NVP has been found to lower quality of life (QOL), making it difficult for many pregnant women to perform basic acts of daily living. A comprehensive review of existing research into the impact NVP has on women's QOL, particularly their capacity to maintain social and professional commitments, found that NVP significantly lowers QOL and negatively impacts social, occupational, and household life (Wood et al., 2013). In addition, a cross-sectional study performed in Norway to investigate the influence of NVP on daily life functioning and intention to have further children again found that NVP had a significant detrimental influence on women's lives by lowering pregnant women's QOL (Heitmann et al., 2017). Furthermore, an observational, multicenter, prospective cohort study performed in the United States similarly found that severe NVP does have a profound effect on a woman's life and can severely reduce a woman's QOL and ability to function (Attard et al., 2002).

To the best of our knowledge, there is insufficient information available in Saudi Arabia about the symptoms of NVP and their impact on women's everyday activities. Thus, this study aimed to explore the impact of NVP on Day-to-day functions among pregnant women in Saudi Arabia.

* Corresponding author at: Department of Clinical Pharmacy, College of Pharmacy, King Saud University, Riyadh, Saudi Arabia.
E-mail address: naalkhudair@ksu.edu.sa (N.A. Alkhudair).
[1] These authors have contributed equally to this work.

Peer review under responsibility of King Saud University.

Production and hosting by Elsevier

https://doi.org/10.1016/j.jsps.2023.101821

2. Methods

This cross-sectional survey study was conducted between March 18, 2019 and April 17, 2019. This study was approved by the institutional review board at King Saud University [E-22–7363]. Pregnant females and new mothers with children under the age of 1 year were asked to fill out an anonymous online questionnaire. Google Form, an online survey platform, was selected as it was user-friendly and compatible with different web browsers, computer configurations, and Internet services (Mondal et al., 2018). An invitation message was also shared with friends, communities, and family members with a URL link to the survey. Survey response collection options include using a weblink, embedding a survey on a website, or posting a weblink on social sites.

2.1. Validation of the survey

The contents of the survey were discussed and screened for appropriateness. After finalizing the contents, all items were translated into Arabic using a forward–backward method. A pilot was performed on 50 participants before and after translation to ensure the validity.

2.2. Contents of the survey

The survey included demographic information (i.e., age, education, smoking habits, and working status). Other collected variables included past medical history and chronic illnesses, such as allergies, diabetes (type 1 or 2), asthma, cardiovascular diseases, epilepsy, muscular or skeletal issues, or hyper or hypothyroidism. In addition, women's insights on the NVP symptoms' impact on their daily living activities were collected. Using a five-point Likert scale, the questionnaire also inquired about the participants' desire to become pregnant again. The data were entered into Predictive Analytics Software (PASW) Advanced Statistics version 20 (formerly called SPSS Advance Statistics, SPSS Inc., Chicago, Illinois) licensed to King Saud University.

3. Results

A total of 591 women with NVP filled out the survey and were included in the study. Most of the participants, 321 (54.3 %), were in the age range of 20–30; a larger proportion of the study participants, 384 (65 %), had higher levels of education (bachelor's degree or higher) and more than half of the participants, 311 (52.6 %), had a daily routine commitment, such as studying or working. Two hundred Thirty-three (39.4 %) of the participants were pregnant at the time of participation, and 358 (60.6 %) were new mothers with a child under the age of 1 year. Participants were asked about any chronic diseases or specific conditions they had, and the majority, 404 (68.4 %), reported being healthy and not having any diseases or conditions. Nevertheless, when studying chronically ill patients, we found that the most prevalent condition was allergy (10 %), followed by asthma (5.9 %) and thyroid dysfunction (5.9 %). Other demographic details are shown in Table 1.

The prevalence of NVP symptoms was relatively high. A total of 556 (94.1 %) participants reported experiencing NVP symptoms at some time during their pregnancies. NVP symptoms were most predominant during the first trimester; approximately 75 % of the women who experienced NVP reported that symptoms occurred during their first trimesters (Table 2).

Participants who were pregnant when completing the questionnaire gave perceptive answers when asked about their NVP symptoms during the previous 24 h. Regarding whether they had experienced a sensation of nausea (feelings of being nauseated or sick to the stomach due to NVP), 68.6 % of them reported having experienced such a sensation (Table 2). Another question they

Table 1
Demographic characteristics of the survey population (n = 591).

Characteristics	Frequency	Percentage (%)
Age (Years)		
20–25	185	31.3
26–30	136	23.0
31–35	120	20.3
36–40	103	17.4
>40	47	8.0
Education		
No basic education	5	0.8
Primary School	6	1.0
Secondary School	114	19.3
Intermediate School	22	3.7
Diploma	47	8.0
Bachelor degree	370	62.6
Master degree or above	14	2.4
Prefer not to answer	13	2.2
Employment status		
Student	124	21.0
Housewife	280	47.4
Employed	187	31.6
Smoking		
No	459	77.7
Yes	12	2.0
lives in a smoking environment	120	20.3
Pregnancy status		
Currently pregnant	233	39.4
New mother with a child < 1 year	358	60.6
Pregnancy stages		
First trimester	88	37.8
Second trimester	82	35.2
Third trimester	63	27.0
New mother - age of their youngest child		
3 months or younger	41	11.4
4–6 months	50	14.0
7–9 months	45	12.6
10–12 months	222	62.0

Table 2
Symptoms of NVP experienced by the survey population.

Characteristics	Frequency	Percentage (%)
NVP symptoms (n = 591)		
Always	243	41.1
Frequently	225	38.1
Rare	88	14.9
Never	35	5.9
NVP symptoms - Pregnancy stages (n = 556)		
First trimester	420	75.5
Second trimester	93	16.7
Third trimester	43	7.7
NVP symptoms- Previous 24 hr (n = 233)		
Feelings of nausea due to NVP		
1 h or less	61	26.2
2–3 h	46	19.7
4–6 h	21	9.0
More than 6 h	32	13.7
Never felt	73	31.3
Feeling of retching or dry heaves due to NVP		
1–2 times	163	70.0
3–4 times	39	16.7
5–6 times	15	6.4
7 times or more	16	6.9
Vomit or thrown up due to NVP		
1–2 times	60	25.7
3–4 times	17	7.3
5–6 times	7	3.0
7 times or more	12	5.1
Did not throw up at all	137	58.9

were asked concerned the sensation of being about to vomit without bringing anything up, which is called retching, and 163 (70 %) of participants reported feeling this sensation once or twice during the previous 24 h. Likewise, when asked if they had vomited or thrown up in the previous 24 h, more than 58 % of the pregnant women in the study said they had not. In contrast, about one-fourth reported vomiting once or twice during the previous 24 h.

Regarding the effects of nausea and vomiting on their daily activities (Table 3), 418 participants responded; of these, 190 (45.5 %) women reported that NVP had severely affected their daily functions (Fig. 1). When the women were asked whether NVP would impact their decisions to get pregnant again, 248 (42 %) said they would not consider NVP symptoms as a reason not to get pregnant again (Table 3). The majority remaining 343 (58 %) participants reported that they might never consider getting pregnant again because of NVP (Fig. 2).

During pregnancy, the supplement option most commonly used was the combination of folic acid, iron, and multivitamins (26.4 %). Folic acid was the most predominant supplement used as monotherapy (24.27 %).

Table 3
Effects of NVP on daily functions and getting pregnant again.

Characteristics	Frequency	Percentage (%)
Effects of NVP on daily function (n = 418)		
Severely affected	190	45.5
Moderately affected	137	32.8
Rarely affected	44	10.5
Not affected	47	11.2
Effects of NVP on getting pregnant again (n = 591)		
No	248	42.0
Yes	195	33.0
Maybe	148	25.0

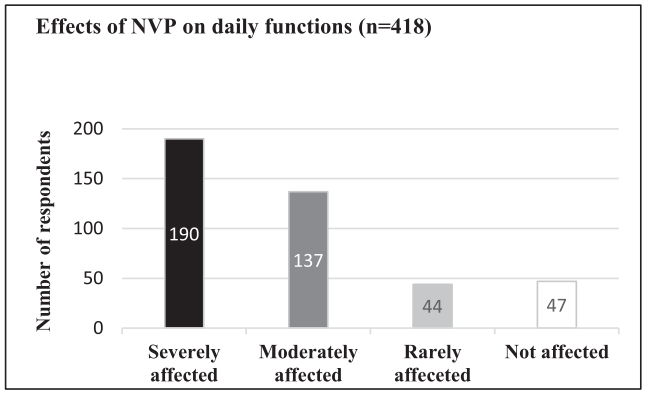

Fig. 1. Effect of NVP on daily functions.

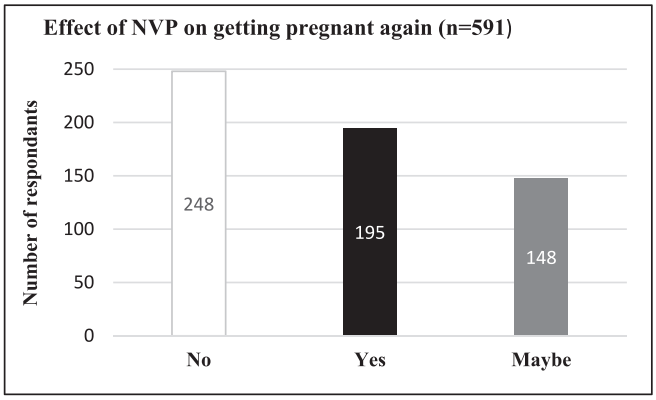

Fig. 2. Effect of NVP on getting pregnant again.

4. Discussion

Mild to severe nausea and/or retching with or without vomiting during the first trimester of pregnancy is common. In this study, three-fourths of the women experienced NVP symptoms during their first trimester. In line with our findings, studies contributing to the epidemiology of NVP have reported that 50 %–90 % of pregnant women experience nausea and vomiting during their first trimesters (Arsenault et al., 2002; O'Brien & Zhou, 1995; Pepper & Roberts, 2006).

In this study, we attempted to characterize participant's symptoms of NVP during the previous 24 h. In this study, the sensation of nausea was experienced by two-thirds of the study population. A majority (70 %) of the participants reported retching one or two times, and more than half of the pregnant women had not vomited during this period. Furthermore, a prospective study of NVP in the United Kingdom found that among the 80 % of women who had symptoms, 28 % had experienced nausea only, whereas 52 % had experienced nausea and vomiting (Gadsby et al., 1993).

NVP symptoms can have profound effects on daily life functioning and have been found to have essential effects on women's ability to perform everyday activities. Expressions of irritability, lowered mood, tearfulness, anxiety, and sleep disorders can affect the daily lives of pregnant women and their families (Deuchar, 1995; Mazzota et al., 1997). In this study, about half of the women reported that NVP had severely affected their daily functioning. Several observational studies have reported the detrimental effects of nausea and vomiting on women's day-to-day activities, relationships, use of health care resources, and need for time off work. Findings from an Australian study suggested that nausea and vomiting during the early stages of pregnancy profoundly impact women's general sense of well-being and their day-to-day life activities (Smith et al., 2000). In addition, a multicenter, prospective cohort study performed in the United States concluded that NVP can severely reduce a woman's ability to function (Attard et al., 2002). In contrast, regarding independence and being able to do things by themselves, half of the participants in this study articulated satisfaction and believed that NVP did not affect their abilities to take care of themselves or their children and other dependents. Other studies have reported different findings, showing that NVP had negative impacts on the essential activities of pregnant women, including their abilities to care for themselves and others who rely on them (Chou et al., 2006; Isbir & Mete, 2013; Power et al., 2010).

NVP symptoms are distressing and debilitating for some women and can severely impact a woman's willingness to get pregnant again. About three-fifths of the participants in this study reported that they might consider never getting pregnant again because of NVP. A cross-sectional population-based study of 712 Norwegian women, (Heitmann et al., 2017) also found that 3 in 4 (76 %) women would consider not getting pregnant again.

Several health organizations have recommended supplementation with folic acid and iron specifically, either before or during pregnancy (American Academy of Pediatrics & American College of Obstetricians and Gynecologists, 2002; Kaiser & Allen, 2008). A combination of folic acid, iron, and multivitamins were the most used supplements in this study population. Most pregnant women use dietary supplements at some point during their pregnancies. (Al Essa et al., 2019) conducted a cross-sectional study using a convenience sample of pregnant women in Saudi Arabia and demonstrated that the prevalence of supplementation with folic acid, iron, and multivitamins was considerably high. That study also reported that folic acid was taken by nearly all pregnant women, nearly 85 % of the participants used iron, and more than half consumed multivitamins. Furthermore, (Cogswell et al.,

2003) reported that 72 % of the pregnant women sampled reported taking iron dietary supplements. A nationally representative, cross-sectional survey in the United States reported that 74 % of the pregnant women had taken either a multivitamin or a multimineral supplement containing folic acid, and 73 % had taken an iron-containing supplement (Branum et al., 2013). The results of that study also demonstrated that folic acid supplement use was associated with improved folate status. Similarly, another study explored correlates of optimal RBC folate concentrations and characteristics of folic acid supplement users in a sample of Canadian women of childbearing age. This study reported that 25 % of the participants had used a folic acid supplement and that the supplement's use was the most significant predictor of achieving optimal RBC folate concentrations in the women sampled (Colapinto et al., 2012).

The limitations of our survey relate mainly to the sampling method, in which pregnant females and new mothers were asked to fill out an online questionnaire. This method did not represent a true probability sample because it excluded people who did not have access to computers for survey-taking purposes. Another limitation of this study was a matter of timing because most participants were not currently pregnant, and most were new mothers, with their youngest children being 10 months to 1 year old. Hence, all of the participant's experiences with NVP relied heavily on the accuracy of their recollection. As a result, there may have been some recall bias.

Most of our participants experienced NVP, which is moderate to severe and possibly needed therapeutic interventions. More data on the self-care of NVP, including using OTC and herbal products, would be beneficial in assessing treatment appropriateness. Exploring healthcare providers' approaches to treating pregnant women suffering from NVP in different healthcare settings is essential to identify barriers and challenges of NVP treatment. NVP might waste pregnant women's time (i.e., inability to do things by themselves), affect their productivity, increase the use of healthcare resources (e.g., hospitalization and outpatient visits), and the need for drug therapy. Studying the overall economic impact of NVP in Saudi Arabia would give us insight into its financial challenges and provide a broad view to stakeholders.

5. Conclusion

The majority of women suffer from NVP at some time during their pregnancies. This study shows that NVP impacts women's daily life functioning and their desire to become pregnant again. Furthermore, this study is the first to assess the impacts of NVP on these outcomes in the Saudi population.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Acknowledgement

We would like to thank King Saud University, Riyadh, Saudi Arabia, for supporting this research project, Researchers Supporting Project number (RSPD2023R1033).

References

Al Essa, M., Alissa, A., Alanizi, A., Bustami, R., Almogbel, F., Alzuwayed, O., Abo Moti, M., Alsadoun, N., Alshammari, W., Albekairy, A., Al Harbi, S., Alhokail, M., Gramish, J., 2019. Pregnant women's use and attitude toward herbal, vitamin, and mineral supplements in an academic tertiary care center, Riyadh, Saudi Arabia. Saudi Pharma. J. 27 (1), 138–144. https://doi.org/10.1016/j.jsps.2018.09.007.

American Academy of Pediatrics, & American College of Obstetricians and Gynecologists. (2002). Guidelines for perinatal care. In *Amer College of Obstetricians*.

American College of Obstetricians and Gynecologists. (2015). Practice Bulletin No. 153: Nausea and vomiting of pregnancy. *Obstetrics & Gynecology*, *126*(3), e12–e24. https://doi.org/10.1097/aog.0000000000002456.

Arsenault, M.-Y., Lane, C.A., MacKinnon, C.J., Bartellas, E., Cargill, Y.M., Klein, M.C., Martel, M.-J., Sprague, A.E., Wilson, A.K., 2002. The management of nausea and vomiting of pregnancy. J. Obstet. Gynaecol. Can. 24 (10), 817–831.

Attard, C.L., Kohli, M.A., Coleman, S., Bradley, C., Hux, M., Atanackovic, G., Torrance, G.W., 2002. The burden of illness of severe nausea and vomiting of pregnancy in the United States. Am. J. Obstet. Gynecol. 186 (5), 220–227. https://doi.org/10.1067/mob.2002.122605.

Bustos, M., Venkataramanan, R., Caritis, S., 2017. Nausea and vomiting of pregnancy - What's new? Auton. Neurosci. 202, 62–72. https://doi.org/10.1016/j.autneu.2016.05.002.

Chou, F.H., Chen, C.H., Kuo, S.H., Tzeng, Y.L., 2006. Experience of Taiwanese women living with nausea and vomiting during pregnancy. J. Midwifery Womens Health 51 (5), 370–375. https://doi.org/10.1016/j.jmwh.2006.04.009.

Cogswell, M.E., Kettel-Khan, L., Ramakrishnan, U., 2003. Iron supplement use among women in the United States: Science, policy and practice. J. Nutr. 133 (6), 1974–1977. https://doi.org/10.1093/jn/133.6.1974s.

Colapinto, C.K., O'Connor, D.L., Dubois, L., Tremblay, M.S., 2012. Folic acid supplement use is the most significant predictor of folate concentrations in Canadian women of childbearing age. Appl. Physiol. Nutr. Metab. 37 (2), 284–292. https://doi.org/10.1139/H11-161.

Deuchar, N., 1995. Nausea and vomiting in pregnancy - A review of the problem with particular regard to psychological and social aspects. Br. J. Obstet. Gynaecol. 102 (1), 6–8.

Einarson, T.R., Piwko, C., Koren, G., 2013. Quantifying the global rates of nausea and vomiting of pregnancy: A meta-analysis. J. Popul. Ther. Clin. Pharmacol. 20 (2), 171–183.

Gadsby, R., Barnie-Adshead, A.M., 2011. Nausea and vomiting of pregnancy. Pregnancy Sickness Support.

Gadsby, R., Barnie-Adshead, A.M., Jagger, C., 1993. A prospective study of nausea and vomiting during pregnancy. Br. J. Gen. Pract. 43 (371), 245–248.

Heitmann, K., Nordeng, H., Havnen, G.C., Solheimsnes, A., Holst, L., 2017. The burden of nausea and vomiting during pregnancy: severe impacts on quality of life, daily life functioning and willingness to become pregnant again - results from a cross-sectional study. BMC Pregnancy Childbirth 17 (1). 75. https://doi.org/10.1186/s12884-017-1249-0.

Isbir, G.G., Mete, S., 2013. Experiences with nausea and vomiting during pregnancy in Turkish women based on Roy adaptation model: A content analysis. Asian Nurs. Res. 7 (4), 175–181. https://doi.org/10.1016/j.anr.2013.09.006.

Kaiser, L., Allen, L.H., 2008. Position of the American Dietetic Association: nutrition and lifestyle for a healthy pregnancy outcome. J. Am. Diet. Assoc. 108 (3), 553–561. https://doi.org/10.1016/j.jada.2008.01.030.

Mazzota, P., Magee, L., Koren, G., 1997. Therapeutic abortions due to severe morning sickness - Unacceptable combination. Can. Fam. Physician 43, 1055–1057.

Mondal, H., Mondal, S., Ghosal, T., Mondal, S., 2018. Using google forms for medical survey: A technical note. Int. J. Clin. Experimental Physiol. 5 (4), 216–218. https://doi.org/10.5530/ijcep.2018.5.4.26.

O'Brien, B., Zhou, Q., 1995. Variables related to nausea and vomiting during pregnancy. Birth 22 (2), 93–100. https://doi.org/10.1111/j.1523-536X.1995.tb00566.x.

Pepper, G.V., Roberts, S.C., 2006. Rates of nausea and vomiting in pregnancy and dietary characteristics across populations. Proc. R. Soc. B Biol. Sci. 273 (1601), 2675–2679. https://doi.org/10.1098/rspb.2006.3633.

Power, Z., Thomson, A.M., Waterman, H., 2010. Understanding the stigma of hyperemesis gravidarum: Qualitative findings from an action research study. Birth 37 (3), 237–244. https://doi.org/10.1111/j.1523-536X.2010.00411.x.

Smith, C., Crowther, C., Beilby, J., Dandeaux, J., 2000. The impact of nausea and vomiting on women: A burden of early pregnancy. Austr. New Zealand J. Obstet. Gynaecol. 40 (4), 397–401. https://doi.org/10.1111/j.1479-828X.2000.tb01167.x.

Wood, H., McKellar, L.V., Lightbody, M., 2013. Nausea and vomiting in pregnancy: Blooming or bloomin' awful? A review of the literature. Women Birth 26 (2), 100–104. https://doi.org/10.1016/j.wombi.2012.10.001.