

**Maternal Vertigo Unveiled: A Cross-Sectional Analysis of Pregnancy-Related Dizziness**Dipty Ojha<sup>1\*</sup>, Shashank Ojha<sup>2</sup><sup>1</sup>Assistant Professor, Dept. of Obstetrics and Gynaecology, United Institute of Medical Sciences, Prayagraj, India<sup>2</sup>Assistant Professor, Dept. of Otorhinolaryngology, United Institute of Medical Sciences, Prayagraj, India

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**Abstract**

**Background:** Understanding the prevalence and factors associated with vertigo during pregnancy is essential for maternal healthcare providers. This knowledge can inform tailored interventions, ensuring the well-being of both the mother and the developing fetus. Additionally, exploring the relationship between vertigo and other common symptoms like nausea and vomiting is crucial for a holistic understanding of maternal health. This cross-sectional study aims to investigate the prevalence of vertigo during pregnancy, identify associated factors, and explore the potential connection between vertigo and nausea-vomiting.

**Methods:** A questionnaire-based survey was conducted on 560 pregnant women attending a hospital. The questionnaire covered sociodemographic details, pregnancy-related characteristics, vertigo history, associated variables, and the Pregnancy-Unique Quantification of Emesis (PUQE) test for nausea-vomiting. Statistical analyses, including logistic regression, were employed for data interpretation.

**Results:** Of the participants, 37.1% reported a history of vertigo. Factors associated with vertigo included the level of education, number of pregnancies, history of nausea-vomiting during pregnancy, vertigo in previous pregnancies, recent vertigo episodes, physician-diagnosed diseases related to vertigo, hearing impairment, back-neck pain, head trauma, and recent exposure to a depressing event. Spinning vertigo (16.8%), swaying vertigo (17.3%), and orthostatic dizziness (61.5%) were reported, with 62.5% experiencing mild, 26.4% moderate, and 11.1% severe vertigo. The mean PUQE score was  $4.31 \pm 1.84$ . Those with a vertigo history had higher PUQE scores. Accompanying symptoms included nausea-vomiting (25.1%), headaches (18.6%), and stumbling while walking (13.4%).

**Conclusion:** The study highlights a substantial prevalence of vertigo during pregnancy, emphasizing the role of hormonal, physiological, and health-related factors. Notably, pre-pregnancy dizziness emerged as a significant predictor of vertigo during pregnancy. The findings provide valuable insights for healthcare providers, enabling tailored interventions to enhance maternal well-being. The study calls for further research to unravel the intricate mechanisms underlying vertigo during pregnancy, facilitating targeted preventive measures and interventions.

**Keywords:** Pregnancy, Vertigo, Nausea-vomiting, Hormonal fluctuations, Maternal health, PUQE test, Cross-sectional study.

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**Introduction**

Pregnancy represents a critical phase wherein the assessment of disorder symptoms and their treatment is crucial to mitigate potential adverse effects on maternal and infant health. This period witnesses significant physiological and adaptive alterations in various organs and systems, encompassing cardiovascular, respiratory, hematological, gastrointestinal, and endocrine systems, essential for fetal development and delivery [1]. These changes give rise to transient symptoms and complaints. While these issues are temporary, their impact on women's quality of life is substantial, affecting daily routines and influencing

family, social, and professional aspects, leading to a decline in both physical and psychological well-being [2,3].

The hormonal fluctuations observed throughout the menstrual cycle, pregnancy, and menopause can disrupt the equilibrium of labyrinthine fluids, influencing enzymatic processes and neurotransmitter actions. These alterations may manifest without apparent symptoms or can clinically present as vestibular symptoms [4]. Vestibular symptoms encompass experiences such

as vertigo, a sense of imbalance, instability in gait, a feeling of floating, and incidents of falls.

Yet, during pregnancy, these identical symptoms may arise from non-vestibular origins, potentially stemming from hormonal, anatomical, and physiological factors that impact the musculoskeletal system. A significant proportion of pregnant women, surpassing 50%, frequently encounter dizziness or vertigo, particularly in the initial two trimesters of gestation [5,6].

Vertigo, characterized by a sudden sensation of spinning, entails a perception of movement or the illusion that surrounding objects are in motion when, in reality, they are not. It is crucial for healthcare providers to request patients to articulate their experience of dizziness using their own expressions. By paying attention to the patient's description, healthcare professionals can discern the specific type of dizziness and vertigo being experienced.

Otological symptoms commonly emerge due to fluctuations in progesterone and estrogen levels during pregnancy. The hormonal cycle in women undergoes changes following the fertilization of an egg cell by sperm. While hormones play a crucial role in fetal development during pregnancy, their effects extend beyond the uterus, influencing the physiological activities of the entire body. The majority of hormonal changes in pregnancy generally pose no harm to either the mother or the fetus. However, certain changes can become pathological, leading to restlessness, anxiety, and discomfort [7]. While most otological symptoms are minor and temporary, it is crucial for clinicians to identify the underlying causes of these symptoms. This determination is significant in order to offer pregnant women appropriate treatment and reassurance regarding their well-being. Pregnant women enhance their quality of life by steering clear of unnecessary medications and effectively managing these symptoms in a manner that ensures the well-being of the fetus remains unaffected.

The hormonal and physical changes occurring during pregnancy can give rise not only to vertigo but also to nausea and vomiting. Nausea and vomiting are particularly prevalent in the first trimester. The occurrence of nausea and vomiting of pregnancy is reported to range from 50% to 80%. Symptoms can vary from mild nausea to intense vomiting, with the severe manifestation termed hyperemesis gravidarum (HG) [8,9]. HG involves electrolyte imbalances, dehydration, and weight loss. While nausea and vomiting may cause discomfort in their milder forms, in severe cases, they pose a serious threat to both the fetus and the pregnant woman's life. Nausea and vomiting during pregnancy represent significant symptoms that can diminish the quality of life for pregnant women. The etiology of nausea and vomiting appears to be

multifactorial in general. Mechanisms contributing to nausea and vomiting during pregnancy encompass vestibular, olfactory, gastrointestinal stimuli, and hormonal processes within the central nervous system. As a result, women may be more susceptible to nausea and vomiting in various situations or illnesses. However, this aspect has not been extensively explored in the literature. Given that hormonal factors play a role in both vertigo and nausea-vomiting, it appears reasonable to explore a potential association between these conditions [10,11].

Despite the uncertainty surrounding its pathophysiology, the significance of nausea and vomiting as symptoms of vestibular diseases suggests a potential association with the vestibular system. There is limited evidence explaining the impact of hormonal and physical changes during pregnancy on the otolithic organs of the vestibular system. Consequently, the association between vertigo and nausea-vomiting warrants further evaluation [12].

This study was conducted to ascertain the prevalence of vertigo during pregnancy, investigate certain variables believed to be associated, and unveil the connection between vertigo and nausea-vomiting.

#### Material and Methods

This cross-sectional study was conducted on pregnant women who sought medical attention at our Hospital.

Upon reviewing the literature, a questionnaire form was developed to align with the study's objectives. This questionnaire encompassed sociodemographic details of pregnant women, pregnancy-related characteristics, information about certain diseases, the existence of vertigo, its type and severity, variables believed to be associated, the presence of accompanying symptoms in those with a history of vertigo, and the inclusion of PUQE test questions. For this study, the minimum required number of pregnant women was calculated to be 549, considering parameters such as P (probability of finding a significant effect), Comparison P, alpha (significance level), and the power of the test (0.85). In the actual data collection phase, a total of 560 pregnant women who presented to the pregnant follow-up clinic of the hospital and willingly consented to participate formed the study group. Interviews with pregnant women took place in the waiting room of the pregnant follow-up outpatient clinic. Following an explanation of the study's subject and purpose, verbal consent was obtained from pregnant women willing to participate. The prepared questionnaires were then administered to the pregnant women under supervision. This entire process typically lasted about 15–20 minutes.

In this study, women with a history of dizziness during pregnancy were categorized as having "vertigo." Vertigo was further classified as "Spinning vertigo" if it resembled the sensation of riding a merry-go-round, "Swaying vertigo" if it felt like being on a small boat, "Orthostatic dizziness" if it resulted in vision going black upon standing up quickly, and "Unspecific dizziness" if it was identified as a type other than these. The severity of vertigo was categorized as follows: "mild" if it did not hinder the daily tasks and activities of the pregnant woman, "moderate" if it caused difficulty in performing daily tasks and activities, and "severe" if it prevented the completion of daily tasks and activities.

The PUQE test was employed in our study to assess the level of nausea and vomiting in pregnant women. Initially developed by Rhodes et al. in 1984 for evaluating chemotherapy-induced nausea and vomiting, this test has been utilized in various studies to gauge nausea and vomiting during pregnancy. Derived by adaptation from the Rhodes scoring system, the 3-item PUQE test involves questions related to the frequency of nausea attacks,

the occurrences of vomiting, and the number of retching episodes. Scores on the PUQE test can range from 3 to 15, with higher scores indicating more severe levels of nausea and vomiting.

The data were analyzed using the IBM SPSS statistical package program, version 20.0, in a computer environment. The normal distribution of data was assessed using the Shapiro-Wilk test. Various statistical tests, including the Chi-squared test, Logistic Regression Analysis (Wald's Backward Stepwise Regression), Mann-Whitney U test, and Kruskal-Wallis Analysis, were employed for the analyses. A significance level of  $P \leq 0.05$  was considered statistically significant.

## Results

The ages of women in the study group varied from 17 to 44, with a mean age of  $28.41 \pm 5.18$  years. In our study, the number of pregnant women with a history of vertigo was identified as 208 (37.1%). The distribution of those with and without a history of vertigo in the study group based on certain sociodemographic characteristics is presented in Table 1.

**Table 1: Distribution of participants with and without a history of vertigo in the study group based on selected socio-demographic characteristics.**

Socio-demographic Characteristics	No History of Vertigo	History of Vertigo	Total	Statistical Analysis (X <sup>2</sup> ; p)
<b>Age group</b>				
≤24	81 (60.0%)	54 (40.0%)	135	0.799; 0.850
25–29	130 (63.4%)	75 (36.6%)	205	
30–34	93 (65.09%)	50 (35.0%)	143	
≥35	48 (62.3%)	29 (37.7%)	77	
<b>Level of education</b>				
Primary school and lower	80 (60.2%)	53 (39.8%)	133	10.812; 0.013
Secondary school	102 (64.6%)	56 (35.4%)	158	
High school	90 (55.6%)	72 (44.4%)	162	
University	80 (74.8%)	27 (25.2%)	107	
<b>Working status</b>				
Not working	273 (60.7%)	177 (39.3%)	450	4.708; 0.030
Working	79 (71.8%)	31 (28.2%)	110	
<b>Family income status</b>				
Low	17 (68.0%)	8 (32.0%)	25	0.317; 0.853
Middle	246 (62.4%)	148 (37.6%)	394	
High	89 (63.1%)	52 (36.9%)	141	
<b>Smoking</b>				
Non-smoker	307 (62.4%)	185 (37.6%)	492	0.365; 0.546
Smoker	45 (66.2%)	23 (33.8%)	68	
<b>Alcohol consumption</b>				
No	350 (62.9%)	206 (37.1%)	556	Fisher; 0.630
Yes	2 (50.0%)	2 (50.0%)	4	
<b>Total</b>	352 (62.9%)	208 (37.1%)	560	100.0

Among the women in the study group, 183 (32.7%) reported that they had not given birth before, while 174 (31.1%) stated that it was their first pregnancy. A total of 401 women (71.6%) mentioned a history of nausea and vomiting during pregnancy. Furthermore, 114 women (29.8%) had experienced vertigo in their previous pregnancies. Additionally,

160 women (28.6%) in the study group had a history of physician-diagnosed diseases potentially associated with dizziness within the last year. It was observed that 9 women (1.6%) had a hearing impairment, 281 women (50.2%) had recurring back/neck pain within the last year, and 22 women (3.9%) had a history of head trauma within the last

year. The distribution of women with or without a history of vertigo in the study group based on

pregnancy-related characteristics and some diseases is outlined in Table 2.

**Table 2: The categorization of women in the study group based on pregnancy-related factors and certain medical conditions, considering whether they have a history of vertigo or not.**

Characteristics related to pregnancy and some diseases	History of vertigo			Statistical analysis X <sup>2</sup> ; p
	No (%)	Yes (%)	Total	
Number of Childbirths				
0	124 (67.8)	59 (32.2)	183 (32.7)	3.784; 0.151
1	125 (62.8)	74 (37.2)	199 (35.5)	
2 and above	103 (57.9)	75 (42.1)	178 (31.8)	
Number of Pregnancies				
First	119 (68.4)	55 (31.6)	174 (31.1)	<b>8.921; 0.012</b>
Second	115 (66.9)	57 (33.1)	172 (30.7)	
Third and above	118 (55.1)	96 (44.9)	214 (38.2)	
Gestational Week				
35 and below	173 (63.4)	100 (36.6)	273 (48.8)	0.060; 0.806
36 and above	179 (62.4)	108 (37.6)	287 (51.2)	
History of Nausea and Vomiting of Pregnancy				
No	122	37	159	18.303; 0.000
Yes	230	171	401	
History of Dizziness within 3 Months Before Pregnancy				
No	337	140	477	83.711; 0.000
Yes	15	68	83	
History of Dizziness in Previous Pregnancies				
No	205	64	269	92.492; 0.000
Yes	27	87	114	
Obesity before Pregnancy				
No	284	163	447	0.436; 0.509
Yes	68	45	113	
Anemia				
No	143	96	239	1.634; 0.201
Yes	209	112	321	
Hypertension				
No	343	203	546	0.000; 1.000
Yes	9	5	14	
History of Physician-Diagnosed Disease				
No	112	48	160	12.787; 0.012
Flu/Common Cold	204	126	330	
Otitis Media	4	10	14	
Sinusitis	22	13	35	
Tonsillitis	10	11	21	
Hearing Impairment				
No	343	208	551	Fisher; 0.030
Yes	9	0	9	
History of Recurring Back/Neck Pain within the Last 1 Year				
No	197	82	279	14.312; 0.000
Yes	155	126	281	
Motion Sickness during Travel				
No	240	131	371	1.582; 0.209
Yes	112	77	189	
History of a Head Trauma within the Last 1 Year				
No	343	195	538	3.797; 0.050
Yes	9	13	22	
History of a Depressing Event within the Last 1 Year				
No	274	113	387	33.860; 0.000
Yes	78	95	173	
Total	352	208	560	

The outcomes of Logistic Regression Analysis, indicating the factors associated with vertigo in our study, are presented in Table 3. These factors

include the level of education, working status, number of pregnancies, history of nausea and vomiting during pregnancy, history of vertigo in

previous pregnancies, occurrence of vertigo within 3 months before pregnancy, history of physician-diagnosed diseases associated with vertigo within the last year, hearing impairment, the presence of

back-neck pain within the last year, history of head trauma within the last 1 year, and a history of a depressing event within the last 1 year.

**Table 3: Outcomes of the logistic regression model, constructed using the variables identified as being linked to vertigo within the study group, indicate the following associations.**

Variable	$\beta$	SE <sup>a</sup>	P	OR <sup>b</sup>	95%CI <sup>c</sup>
Having a revenue-generating work (reference: working)					
Not working	0.623	0.378	0.099	1.865	0.889–3.912
History of vertigo in previous pregnancies (reference: no)					
Yes	2.111	0.303	0.000	8.257	4.558–14.958
History of vertigo within 3 months before pregnancy (reference: no)					
Yes	2.416	0.443	0.000	11.198	4.695–26.704
History of a depressing event within the last 1 year (reference: no)					
Yes	1.272	0.288	0.000	3.567	2.027–6.278
History of physician-diagnosed disease that may be associated with vertigo within the last 1 year (reference: no)					
- Sinusitis	0.770	0.561	0.170	2.159	0.719–6.484
- Flu/common cold	0.163	0.318	0.608	1.178	0.631–2.197
- Tonsillitis	1.499	0.693	0.031	4.478	1.151–17.425
- Otitis media	0.232	0.882	0.793	1.261	0.224–7.100
Constant	-2.641	0.457	0.000	-	-

Among pregnant women with a history of vertigo in the study group, 35 women (16.8%) reported spinning vertigo, 36 women (17.3%) experienced swaying vertigo, 128 women (61.5%) had orthostatic dizziness, and 9 women (4.3%) reported unspecified dizziness. In terms of severity, 130 women (62.5%) reported mild vertigo, 55 women

(26.4%) reported moderate vertigo, and 23 women (11.1%) reported severe vertigo. The PUQE test scores among pregnant women ranged from 3 to 13, with a mean score of 4.31±1.84 (median: 3.0). The distribution of scores obtained by pregnant women from the PUQE test, based on the presence, type, and severity of vertigo, is presented in Table 4.

**Table 4: Variation in scores acquired by pregnant women on the PUQE test is categorized according to the presence, type, and severity of vertigo.**

Presence, Type, and Severity of Vertigo	n	PUQE Test Score Median (min-max)	Test Value z/KW; P
<b>Vertigo</b>			
- No	352	3.0 (3.0–13.0)	4.853; 0.000
- Yes	208	5.0 (3.0–13.0)	
<b>Type of Vertigo</b>			
- Spinning Vertigo	35	3.0 (3.0–13.0)	3.728; 0.292
- Swaying Vertigo	36	5.0 (3.0–11.0)	
- Orthostatic Dizziness	128	5.0 (3.0–9.0)	
- Unspecific Dizziness	9	3.0 (3.0–7.0)	
<b>Severity of Vertigo</b>			
- Mild	130	4.0 (3.0–13.0)	2.850; 0.241
- Moderate	55	5.0 (3.0–9.0)	
- Severe	23	6.0 (3.0–10.0)	
<b>Total</b>	208	3.0 (3.0–13.0)	

The most frequently reported symptoms by individuals with a history of vertigo were nausea and vomiting (25.1%), headache (18.6%), and stumbling while walking (13.4%). The distribution of accompanying complaints among those with a history of vertigo in the study group is presented in Table 5.

**Table 5: Additional concerns reported by individuals with a background of vertigo in the study cohort.**

Symptom	n	%
Headache	78	18.6
Nausea and vomiting	105	25.1
Hearing loss	5	1.2

Ringling in the ears/tinnitus	42	10.0
Ear pressure	7	1.7
Sensation loss/numbness in limbs	37	8.8
Stumbling while walking	56	13.4
Double vision	16	3.8
Light sensitivity/intolerance of light	28	6.7
Irritation, stinging, and redness in eyes	12	2.9
Excessive sweating	33	7.8
<b>Total</b>	<b>419</b>	<b>100.0</b>
Symptom	n	%
Headache	78	18.6
Nausea and vomiting	105	25.1
Hearing loss	5	1.2

## Discussion

Dizziness/vertigo in women is often associated with hormonal changes and metabolic disorders. Numerous studies have indicated a correlation between vertigo and hormonal fluctuations related to gender. The release of neurotransmitters during pregnancy can alter the biochemical control of the inner ear, potentially leading to increased symptoms. The prevalence of dizziness/vertigo during pregnancy has been reported to range from 10% to 52% in various studies [13-18]. In Scmith et al.'s study involving 82 pregnant women, more than half of them (52%) reported experiencing vertigo [1]. Agampodi et al. observed dizziness in 24% of 466 pregnant women [4]. In our study, 208 pregnant women (37.1%) had a history of vertigo. This suggests that a potential vestibular change linked to hormonal fluctuations during pregnancy might contribute to the occurrence of vertigo.

While some studies indicate an increase in the prevalence of vertigo with age, there is no existing literature reviewing the association between pregnancy-related vertigo and age [19-23]. In our study, no significant difference was observed between age groups of pregnant women concerning vertigo. Regarding the connection between the level of education and vertigo, our study observed a lower incidence of vertigo among pregnant women with a university degree. A study by Rashid and Abed on 150 adults did not find an association between vertigo and the level of education and working status [7]. While our study revealed a higher prevalence of vertigo in those without a revenue-generating job, the logistic regression analysis suggested that unemployment was not a risk factor for vertigo. Li et al. reported in their meta-analysis that there was no association between vertigo and daily life habits such as smoking and alcohol consumption [8]. In line with the meta-analysis by Chen et al. [11], our study found no association between the lifestyles of pregnant women (obesity, alcohol consumption, smoking) and the prevalence of vertigo.

The available studies on pregnancy and vertigo are heterogeneous, limited in number, and of low

quality. Retrospective studies by Wu et al. and Swain et al. reviewed pregnant women experiencing problems related to various vestibular disorders [9]. These studies emphasized the need for case-controlled studies or studies with a large sample size to determine whether pregnancy is a risk factor for the development of vertigo and vestibular disorders. In many studies, variables such as pregnancy, number of childbirths, and history of vertigo or nausea and vomiting before pregnancy were not thoroughly evaluated [24,25]. However, in our study, while there was no association between the prevalence of vertigo and the number of childbirths, the prevalence of vertigo was higher in women who had three or more pregnancies. A case series study conducted in Taiwan suggested that pregnant women of advanced maternal age (34 years or older) and primipara women in the third trimester of pregnancy are more prone to develop vertigo.

The levels of estrogen and progesterone fluctuate during pregnancy. The impact of hormones on vertigo during pregnancy is still uncertain. In a study involving 80 pregnant women, Mgbe et al. found that six women (7.5%) experienced mild vertigo attacks during the first trimester [12]. In another presentation of three cases, Coban et al. reported that all cases were diagnosed with vertigo during the late trimesters when estrogen levels are relatively low and progesterone levels are high [3]. Schmidt et al. discovered that the most common vestibular symptom in pregnant women was vertigo (22.72%) in the first trimester [1]. In our study, there was no association between the gestational week and vertigo.

Vestibular symptoms, including nausea, vomiting, gait instability, dizziness, and vertigo, typically manifest simultaneously. An elevated sense of dizziness or vertigo in women with pregnancy-related nausea can result in vomiting. The interplay of vertigo, nausea, and vomiting can reciprocally influence each other, detrimentally affecting the overall quality of life. A study examining pre-pregnancy and post-pregnancy issues in 449 women

with hyperemesis gravidarum (case group) compared conditions with 459 unaffected women (controls) [24]. In the pre-pregnancy case group, dizziness (4.68%), nausea (4.01%), and vertigo (3.34%) were observed, while their rates in the control group were 1.31%, 0.22%, and 0.65%, respectively. In the post-pregnancy case group, the rates of dizziness, nausea, and vertigo were 12.5%, 4.23%, and 2.67%, while in the control group, the rates were 1.09%, 0.0%, and 0.22%, respectively. In our study, the prevalence of vertigo was higher in those with a history of nausea and vomiting during pregnancy<sup>23</sup>.

The conditions that arise before pregnancy are anticipated to worsen during pregnancy. Numerous studies have demonstrated that the health condition and symptoms of women before pregnancy significantly impact their health during pregnancy. In line with this, having a history of dizziness within three months before pregnancy is identified as a crucial risk factor for vertigo in our study (Odds Ratio: 11.198; P-value: 0.005) [17]. Additionally, it was found that the likelihood of experiencing vertigo was 8.257 times higher in women with a history of dizziness in previous pregnancies compared to those without such a history.

In their meta-analysis of 60 studies encompassing 24 risk factors, Li et al. identified female gender, advanced age, hyperlipidemia, diabetes, hypertension, head trauma, otitis media, and prolonged computer use as risk factors for vertigo [8]. Another meta-analysis by Chen et al., covering 19 studies with 2,618 patients, also established head trauma as a risk factor for vertigo (OR = 3.42; 95% CI, 1.21–9.70; P = 0.02) [11]. Additionally, in a qualitative study involving 31 pregnant women with anemia, Chatterjee et al. found that 11 pregnant women experienced dizziness alongside anemia [19]. In our investigation, the likelihood of experiencing vertigo was 4.478 times greater among those with a recent history of physician-diagnosed tonsillitis. Conversely, individuals with hearing impairment showed a lower prevalence of vertigo, while those with a history of recurring back/neck pain, head trauma within the past year, or exposure to a depressing event within the last year exhibited a higher likelihood of vertigo (OR: 3.567, P: 0.000) (P < 0.05 for each). Interestingly, unlike certain studies, there was no notable difference in vertigo prevalence concerning factors such as obesity, anemia, and hypertension before pregnancy (P > 0.05 for each).

Nausea and vomiting during pregnancy impact around 75–80% of expectant mothers. Agampodi et al. found that 325 (69.7%) out of 466 pregnant women experienced nausea and vomiting. There exists a shared link between pregnancy-related nausea and vomiting and vertigo, both of which

involve vestibular disturbances. Women reporting dizziness or vertigo often experience hyperemesis gravidarum. Symptom relief for both conditions is achieved through activity avoidance. Limited research is available regarding the influence of the vestibular system on nausea and vomiting. Distinguishing between vertigo attacks and common episodes of nausea and vomiting in the first trimester of pregnancy is typically challenging. Our study found that women with a history of vertigo had higher levels of nausea and vomiting. No significant differences were observed in the type and severity of vertigo concerning the level of nausea and vomiting (P > 0.05 for each).

In addition to nausea and vomiting, vertigo may present with various accompanying symptoms. A study on 140 pregnant women by Robbins et al. revealed that 9.3% of women experiencing vertigo also had headaches [24]. In our study, the most commonly reported symptoms by those with a history of vertigo were nausea and vomiting (25.1%), headaches (18.6%), and stumbling while walking (13.4%).

### Conclusion

In conclusion, this study sheds light on the prevalence and factors associated with vertigo during pregnancy, offering crucial insights for maternal healthcare. The findings underscore the multifaceted nature of this phenomenon, implicating hormonal fluctuations, health history, and the number of pregnancies as significant contributors. The identification of a potential link between pre-pregnancy dizziness and increased risk of vertigo during pregnancy highlights the importance of considering pre-existing conditions in maternal care. Healthcare providers can use these findings to tailor interventions and support strategies for pregnant women, ultimately improving their quality of life. The study also emphasizes the need for further research to unravel the intricate interplay of physiological changes during pregnancy and the manifestation of vertigo. Such knowledge can enhance the understanding of maternal health, leading to more effective preventive measures and interventions for pregnant women experiencing vertigo.

### Limitations

While shedding light on vertigo prevalence and associated factors in pregnant women, this study faces limitations. Its cross-sectional nature hinders causal inference, urging the need for longitudinal investigations. Reliance on self-reported data introduces potential recall bias, impacting result accuracy. The study's single-hospital focus may limit generalizability, necessitating broader-spectrum research. The absence of a non-pregnant control group restricts comparative insights.

Furthermore, the study primarily explores vertigo prevalence and associations, leaving room for future investigations into underlying mechanisms and interventions. These limitations emphasize the study's cautious interpretation and underscore areas for extended research to enrich our comprehension of vertigo in pregnancy.

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#### Conflicts of Interest:

The authors declare no conflicts of interest in relation to this research.

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