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Research Article

The Relationship between Nausea-Vomiting Severity and Activity Balance in Pregnancy

Gebelikte Bulantı-Kusma Şiddeti ile Aktivite Denge Arasındaki İlişki

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Abstract

Aim: Nausea and vomiting seen in early pregnancy are among the most common reasons for hospitalization of pregnant women in the first trimester. The aim of this study is to determine the relationship between the severity of nausea-vomiting during pregnancy and activity-specific balance-confidence.

Material and Method: The study was conducted cross-sectionally in a pregnant education class of a public university between June and September 2021. The sample size was calculated as 208 pregnant women according to the effect size calculation and the study was completed with 216 pregnant women. In the collection of data; "Personal Presentation Form", "PUQE Test (Pregnancy- Unique Quantification of Emesis and nausea) "Activity-Specific Balance Confidence Scale" was used. In statistical evaluation; Arithmetic mean, percentile distribution, standard deviation, pearson correlation, linear regression analysis, Cronbach Alpha (α) for reliability analysis, CR (Composite Reliability) and AVE (Average Variance Extracted) were used for validity analysis.

Results: It was determined that the mean PUQE test total score was 6.28±2.60, 62.04% of the pregnant women experienced mild nausea-vomiting, 37.96% of them had moderate nausea-vomiting, and none of the pregnant women had severe nausea-vomiting. The mean ASBCS score was found to be 53.56±26.37. It was determined that the mean ASBCS total score differed statistically according to the PUQE test classification, and the pregnants with moderate nausea and vomiting severity had more activity-specific balance confidence than mild pregnant women ($p<0.05$). It was determined that there was a highly significant negative correlation ($r=-0.760$; $p<0.05$) between the PUQE test mean score and activity-specific balance confidence, and the severity of nausea and vomiting affected activity-specific balance confidence as a result of linear regression analysis.

Conclusion: As a result, it can be said that the severity of nausea and vomiting affects activity-specific balance confidence and as the severity of nausea and vomiting increases, activity-specific balance confidence decreases. Health workers should create a care plan by considering the negative consequences of physical activity insufficiency.

Keywords: Nausea vomiting, pregnancy, activity-specific balance confidence

Öz

Amaç: Erken gebelik döneminde görülen bulantı kusma ilk trimesterdeki gebe kadınların hastanede yatmalarının en yaygın nedenleri arasındadır. Bu araştırmanın amacı, gebelikte bulantı-kusma şiddetinin aktiviteye özgü denge güven arasındaki ilişkiyi belirlemektir.

Materyal ve Metot: Araştırma kesitsel olarak bir kamu üniversitesine bağlı gebe eğitim sınıfında yürütülmüştür. Örneklem büyüklüğü etki büyüklüğü hesaplamasına göre 208 gebe olarak hesaplanmış olup 216 gebe ile çalışma tamamlanmıştır. Verilerin toplanmasında; "Kişisel Tanıtım Formu", "PUQE Testi (Pregnancy- Unique Quantification of Emesis and nausea) "Aktiviteye Özgü Denge Güven Ölçeği" kullanılmıştır. İstatistiksel değerlendirmede; aritmetik ortalama, yüzdelik dağılım, standart sapma, pearson korelasyon, linear regresyon analizi, güvenirlik analizi için Cronbach Alfa (α), Geçerlilik analizinde CR (Composite Reliability) ve AVE (Average Variance Extracted) kullanılmıştır.

Bulgular: APUQE testi toplam puan ortalamasının 6.28 ±2.60 olduğu, gebelerin %62.04'ünün hafif, %37.96'sının orta düzeyde bulantı-kusma yaşadığı, ağır düzeyde ise gebelerin hiçbirinin bulantı-kusma yaşamadığı belirlendi. ASBCS puan ortalamasının ise 53.56 ± 26.37 olduğu belirlendi. PUQE testi sınıflandırılmasına göre ASBCS toplam puan ortalamasının istatiksel açıdan farklılık gösterdiği ve bulantı kusma şiddeti orta düzeyde olan gebelerin hafif düzeyde olan gebelere göre daha fazla aktiviteye özgü denge güvenlerinin daha az olduğu belirlendi ($p<0.05$). PUQE testi puan ortalaması ile aktiviteye özgü denge güven arasında negatif yönde yüksek düzeyde önemli ilişki ($r=-0.760$; $p<0.05$) ve linear regresyon analizi sonucunda bulantı kusma şiddetinin aktiviteye özgü denge güveni etkilediği saptandı.

Sonuç: Sonuç olarak bulantı kusma şiddetinin aktiviteye özgü denge güveni etkilediği ve bulantı kusma şiddeti arttıkça aktiviteye özgü denge güvenin azaldığı söylenebilir. Sağlık çalışanları fiziksel aktivite yetersizliğinin olumsuz sonuçlarını göz önünde bulundurarak bakım planını oluşturmalıdır.

Anahtar Kelimeler: Bulantı kusma, gebelik, aktiviteye özgü denge güven

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INTRODUCTION

Pregnancy is a unique period of life for most women. Multiple hormonal, physiological, and biomechanical changes, such as increased blood volume and heart rate, weight gain and shift in the center of mass, proceed normally in almost all pregnant women (1). However, while physiological changes specific to pregnancy constitute the source of psychological changes, the complaints that occur with these changes can negatively affect the lifestyle of the pregnant woman (2). Nausea and vomiting in early pregnancy are among the most common reasons for hospitalization in the pregnant women in the first trimester (3,4). Although the exact cause of nausea and vomiting is not known yet, some studies have associated this condition with maternal age, sex of the baby, smoking status of the pregnant woman, hormones, the women's psychological state, and the vestibular system (3,5,6). Nausea and vomiting symptoms usually begin in gestational weeks 4-6, peak between gestational weeks 8 and 12, disappear after gestational week 20 (6), and rarely persist until childbirth (7). Symptoms may range from a mild dizziness to persistent vomiting (8). The onset and course of symptoms differ from person to person (9). Studies have shown that besides the effects of nausea and vomiting on general health, family life, work performance, quality of life, and psychosocial health are also affected, and it even increases the susceptibility to depression in the postpartum period (4,7,9). Psychosocial outcomes also affect women's perceptions of their conditions , and most women deny that this condition is psychological (10). It was reported that approximately 50% of pregnant women who experience nausea and vomiting have decreased work efficiency (11), approximately 35% lost work time (11), and 25% lost time from housework (11,12). At the same time, pregnant women with nausea and vomiting complain that their spousal relations are disrupted and they cannot perform their daily physical activities (13). As a matter of fact, maintaining physical activity and exercising during pregnancy have positive effects on the musculoskeletal system, especially the circulatory system and respiratory system, and weight gain. There are also studies suggesting that it increases psychological well-being and reduces the risk of gestational diabetes and preeclampsia (2,14-17). In a retrospective study, it is a remarkable finding that a sedentary life and low physical activity in the pre-pregnancy period increase nausea and vomiting during pregnancy (7). Women's daily physical activities include climbing stairs, walking around the house, getting in and out of the vehicle, walking, climbing a hill, walking on an icy pavement, and reaching for things at head/eye level in the house.

In the literature, there exist studies regarding severity of nausea and vomiting during pregnancy in relation with the psychosocial status (9), quality of life (4), and psychiatric and cognitive problems (18). However, there is no study investigating whether nausea and vomiting affect activity-specific balance and confidence in pregnant women. It is thought that our study result reveals that pregnant women with physical activity deficiency should also be evaluated in terms of nausea and vomiting. In addition, it has been determined that the activity-specific balance confidence scale is a valid and reliable tool that can also be used in pregnant women. For this reason, it is thought that this study will make an important contribution to the literature.

MATERIAL AND METHOD

Research Design and Sample

This cross-sectional study was conducted between June and September 2021 in order to determine the relationship of the severity of nausea and vomiting during pregnancy with the activity-specific balance. The universe of the study consists of pregnant women who attended a pregnant education class where the study was conducted. When the power analysis was performed, the sample size was calculated as 208 pregnant women with 95% confidence interval and 95% representative power. The study was completed with 216 pregnant women who accepted to participate in the study and met the inclusion criteria.

Inclusion criteria:

- Being over 18 years old,
- Being in gestational weeks 6-16,
- Not having a risky pregnancy,
- Not having any health problems preventing communication.

Data Collection Tools

Data were obtained using a Personal Information Form, the Pregnancy- Unique Quantification of Emesis and Nausea (PUQE) and Activity-Specific Balance Confidence (ABC) Scale.

Personal Information Form

The personal information form was prepared by the researcher in line with the relevant literature (9,19,20). In the form, there are questions about the socio-demographic characteristics of the pregnant woman (the women's age, education and employment status, income status and family type), obstetric characteristics (then-current gestational week and pregnancy history), and medical history (history of a chronic disease).

Pregnancy-Unique Quantification of Emesis and Nausea Test (PUQE)

Some assessment tools have been developed in order to objectively evaluate the clinical evaluation in patients with nausea and vomiting. The Rhodes test can be used in the evaluation of pregnancy-related nausea and vomiting (9,21). Although the Rhodes test is considered the gold standard in determining the complaint of nausea and vomiting, the high number of questions may be considered as an indication that it is not useful. On the other hand, the PUQE, which evaluates the severity of nausea-vomiting

during pregnancy and was prepared by adapting the Rhodes scoring system, was found to be as valuable and sensitive as the Rhodes test. (21). In the study conducted by Sucu et al. (2009) in Turkish pregnant women, the PUQE test was found to be an appropriate tool in the evaluation of the severity of nausea and vomiting during pregnancy (22). In the evaluation of the PUQE test, the total scores of 3-6 are considered as mild, 7-12 as moderate, and 13-15 as severe (21). In this study, the Cronbach Alpha (α) value for the PUQE was calculated as 0.841. In addition, the AVE value was calculated as 0.79, and the CR value as 0.92, and it was concluded that the questionnaire was valid and reliable.

Activity-Specific Balance Confidence Scale (ABC Scale)

It is a scale that evaluates how confidently people can perform 16 indoor/outdoor activities. Activities are scored between 0 (not-confident) and 100 (completely confident). A score is obtained by dividing the total score by 16. High scores indicate greater confidence. The Turkish validity study was conducted by Ayhan et al. in 2014 (23). The Cronbach Alpha (α) value was calculated as 0.96. In this study, the Cronbach Alpha (α) value was calculated as 0.957. In addition, the AVE value was calculated as 0.87 and the CR value as 0.93, and it was concluded that the questionnaire used was also valid and reliable for pregnant women.

Data Collection

The data were collected via face-to-face interviews in a pregnant education class offered in a public university between June and September 2021. The interviews lasted an average of 10-15 minutes per person.

Data Analysis

Data analysis was performed with the SPSS (Statistical Program in Social Sciences) 25 program. The Kolmogorov Smirnov Test was used to check whether the data included in the study fit the normal distribution. Since the skewness value of the model was between -2 and +2, it was seen that it yielded a normal distribution (24). Comparisons between the paired groups were made with the significance test (t-test) of the difference between the two means since the data were normally distributed. The homogeneity of variance was checked with Levene's test to decide which test result to use in comparisons ($p>0.05$). In addition, number, percentage, mean, and standard deviation were used for descriptive statistics. Pearson correlation, Cronbach Alpha (α) for reliability analysis, CR (Composite Reliability), and AVE (Average Variance Extracted) were used for validity analysis.

Ethical Considerations

Ethics Committee (Decision No: 2021/2027) approval was obtained to conduct the study. Participants were informed about the study and pregnant women who volunteered for participation were included in the study.

Limitation of the Research

Conducting the study in a single center and excluding women with risky pregnancies prevented the generalization of the study to all pregnant women. In addition, the fact that the majority of the pregnant women who participated in the study group were university graduates prevented commenting on the activity-specific balance scores of the pregnant women with low education levels.

RESULTS

It was determined that 54.6% of the participants included in the study were university graduates, 67.6% did not work, 75.9% lived in the city center, 71.3% had a medium income, and 88% had a nuclear family structure (Table 1).

Table 1. Sociodemographic of the Participating in the Study (n=216)

Variables	Group	n	%
Level of education	Primary school	16	7.4
	Middle School	26	12.0
	High school	56	25.9
	Undergraduate and Postgraduate	118	54.6
Employment Status	Yes	70	32.4
	No	146	67.6
Living Place	Province	164	75.9
	District	30	13.9
	Willage	22	10.2
Economical Situation	Low	58	26.9
	Middle	154	71.3
	High	4	1.9
Family structure	Nuclear Family	190	88.0
		26	12.0
		Mean± Sd	
Age (mean± sd)		28.91 ± 5.12	
Duration of Marriage		5.15 ± 4.69	
Size		159.96 ± 22.54	
Weight		66.37 ± 14.06	
Gestational Week		10.29 ± 2.93	

SD= Standard Deviation

It was found that 51.9% of the participants had their first pregnancy, 17.6% had at least one miscarriage, 83.3% had a planned pregnancy, 82.4% did not receive prenatal education, 14.8% experienced frequent dizziness, 25% had frequent sleep problems, 40.7% had frequent fatigue, 5.6% had frequent heart palpitations, and 14.8% had frequent fear and anxiety (Table 2).

Table 2. Distribution of obstetrical characteristics of pregnants participating in the study (n=216)

Variable	Group	n	%
Number of Pregnancy	One	112	51.9
	Two	40	18.5
	3 And Above	64	29.6
Living Child	No	2	0.9
	One	166	76.9
	2 And Above	48	22.2
Presence Of Abortion	No	178	82.4
	Yes	38	17.6
Planned Pregnancy	Yes	180	83.3
	No	36	16.7
Prenatal Education	Yes	38	17.6
	No	178	82.4
Dizziness	Never	38	17.6
	Rarely	70	32.4
	Sometime	76	35.2
	Often	32	14.8
Sleep Problem	Never	40	18.5
	Rarely	52	24.1
	Sometime	70	32.4
	Often	54	25.0
Weakness	Never	4	1.9
	Rarely	30	13.9
	Sometime	94	43.5
	Often	88	40.7
Heart Palpitations	Never	88	40.7
	Rarely	66	30.6
	Sometime	50	23.1
	Often	12	5.6
Fear Worry	Never	46	21.3
	Rarely	54	25.0
	Sometime	84	38.9
	Often	32	14.8
Total		216	100

The PUQE test classification and total score averages from the PUQE and the ABC scale are given in Table 3. It was determined that 62.04% of the pregnant women had mild nausea-vomiting complaints, 37.96% had moderate nausea-vomiting complaints, and none of the pregnant women had severe nausea and vomiting complaints. The mean PUQE test total score of the pregnant women with nausea and vomiting was 6.28±2.60, and the mean ABC total score was 53.56±26.37 (Table 3).

Table 3. PUQE Classification and Total Point Averages Received from PUQE and ASBCS (n=216)

PUQE Classification	n	%
Mild (3-6 point)	134	62.04
Moderate (7-12 point)	82	37.96
Severe (13-15 point)	0	0
Total	216	100
PUQE Total (mean±sd)	6.28 ±2.60	
ASBCS Total (mean± sd)	53.56 ± 26.37	

PUQE; The Pregnancy-Unique Quantification of Emesis and Nausea Test, ASBCS; Activities Specific Balance Confidence Scale

Comparisons of the ABC scale and the PUQE score averages are presented in Table 4. It was determined that the average ABC scale score of those with a mild PUQE score was 56.05±27.12, and the mean ABC score of those with a moderate score was 49.63±25.06. It was determined that the difference between the groups was statistically significant ($p<0.05$), and the activity-specific balance confidence score was lower in pregnant women with moderate nausea and vomiting (Table 4).

Table 4. ASBCS and PUQE comparison of scale score means

Variable	Group	Mean ± sd	p value
ASBCS	Mild	56.05± 27.12	0.004*
	Moderate	49.63 ± 25.06	

PUQE; The Pregnancy-Unique Quantification of Emesis and Nausea Test, ASBCS; Activities Specific Balance Confidence Scale, sd; Standard Deviation, p; statistical significance, *p<0.05; There is a statistically significant difference between the groups

The relationship between the ABC scale and the PUQE mean scores is presented in Table 5. A statistically significant correlation was found between the ABC scale score and the PUQE score at a high level (r=-0.760) in the negative direction ($p<0.05$, Table 5).

Table 5. ASBCS and PUQE relationship between scale score means

Variable 1	Variable 2	r value	p value
ASBCS	PUQE	-0.760	0.001*

PUQE; The Pregnancy-Unique Quantification of Emesis and Nausea Test, ASBCS; Activities Specific Balance Confidence Scale r; pearson correlation coefficient, p; statistical significance, *p<0.05; There is a statistically significant relationship between the scores

The results of univariate linear regression analysis of the PUQE's interpretation of the ABC scale score means are presented in Table 6. The univariate linear regression model established to test whether the dependent variable, the ABC scale score, was explained by the independent variable, the score from the PUQE scale, was found to be significant (F=21.194, p1<0.05, Table 6). In the established model, it was calculated that both the PUQE score and the constant term had a statistically significant effect on the

ABC scale score (p2<0.05, Table 6). It was determined that a 1-unit change in the PUQE scale score will cause a negative decrease of -4.768 units (β1) on the ABC scale score. It was calculated that 11.0% (R2=0.110) of the participants' ABC scale score is explained by the PUQE score.

Table 6. Univariate Linear Regression Analysis Results for PUQE's Prediction of ASBCS Score Mean

Dependent variable	Independent variable	R2	F Test	p1 value	β1	t Test	p2 Value
ASBCS	Sabit	0.110	21.194	0.001*	27.849	10.212	0.001*
	PUQE				-4.768	4.604	0.001*

Dependent variable; ACBSC score, İndependent variable; PUQE The Pregnancy-Unique Quantification of Emesis and Nausea Test, R2; Explanatory Coefficient, **p1<0.05; F test result for the significance of the model, β1; Non-standardized regression coefficients, *p2<0.05; t test result for the significance of the regression coefficients

DISCUSSION

Although the cause of nausea and vomiting in pregnant women cannot be fully elucidated, it is known that there are many effective factors. Among these factors is the vestibular system (3,5,6). The relationship between nausea and vomiting and the vestibular system in pregnant women draws attention to the difficulties experienced by pregnant women in their daily physical activities (13). It is also noteworthy that women generally reduce the duration of physical activity after conception (25,26). It was reported that only 15% of pregnant women reach the recommended physical activity level (27). Considering the studies examining the severity of nausea and vomiting during pregnancy, it is seen that the level of psychosocial health (9), blood pressure, the level of pain felt in the pelvic girdle, proteinuria (8), quality of life, and the desire to get pregnant again (4) is reported to be adversely affected by the severity of nausea and vomiting. The findings obtained as a result of this study, in which we aimed to determine the relationship between the severity of nausea-vomiting during pregnancy and the activity-specific balance-confidence, were discussed in line with the relevant literature.

It was reported that neurotransmitters released during pregnancy affect the biochemistry of the inner ear, and therefore hormonal abnormalities or changes may cause imbalance complaints in pregnant women (28). These physiological changes are accepted as a substrate for the development of audio-vestibular disorders in pregnant women (29). It was determined that the majority of the pregnant women participating in this study had various problems such as sleep problems, fatigue, heart palpitations, fear, and anxiety. In addition, vertigo symptoms were seen at different levels in the vast majority of the pregnant women. Guannan Bai et al. (2016) stated that 44.4% of the pregnant women had symptoms of fatigue, causing both physical and mental impacts in pregnant women (30). It has been stated that there are patient groups experiencing significant balance problems during pregnancy (28,31). In a study, it was determined that the severity of nausea and vomiting was higher especially in those with a history of motion sickness, migraine, and headache (32). The present finding in this regard agrees with the literature.

It was observed that the mean PUQE total score of the pregnant women participating in the study was 6.28 ± 2.60, and it was observed that 62.04% had mild and 37.96% had moderate levels of complaints, and there was no pregnant woman with severe nausea-vomiting complaints. When the studies in the literature evaluating the severity of nausea and vomiting in pregnant women were examined, it was seen that the PUQE total score averages were 9.05±2.30 (9), 8.44±1.87 and 9.55±2.05 (33), and 5.94±2.67 (34). The difference in the mean scores may be due to the fact that nausea and vomiting are due to many reasons, such as maternal age, gender of the baby, smoking status of the pregnant woman, hormones, psychological and vestibular system, insomnia, and bad mood (3,5,6,34). For this reason, it is thought that studies with large samples are needed to examine the factors affecting nausea and vomiting. In addition, it was found that the majority of the pregnant women experienced mild nausea and vomiting, and this finding was in parallel with the literature (6,34).

It was determined that the total average score of the activity-specific balance confidence scale of the pregnant women participating in the study was 53.56 ± 26.37. It was reported as 63.08±29.58 (35) in the elderly groups with a history of falling and 73.5±20.1 (İşler, 2017) in a study conducted with patients with lower extremity amputation. Since no instance of ABC scale used in pregnancy was found in the literature, it is a remarkable finding that pregnant women with nausea and vomiting during pregnancy have lower activity-specific balance confidence compared to the elderly and patients with lower extremity amputation. In this case, it is thought that pregnant women are at risk in terms of balance and confidence, and family and health professionals who support the pregnant should be more careful in this regard.

It is stated that nausea and vomiting in pregnant women seriously affect the quality of life and the functioning of social, occupational, and domestic daily life (4,36). It is also noteworthy that the effects of nausea and vomiting

increase as the severity of the symptoms increases (4, 36,37). This study is also compatible with the literature that nausea and vomiting symptoms of the pregnant women affect their daily living activities, and their daily life activities are affected more by the increase in the severity of these symptoms. Lacasse et al. and Bai et al. compared pregnant women with and without nausea and vomiting symptoms, and they stated that symptoms of nausea and vomiting significantly affected physical activities (30,38). In addition, Chan et al. stated that nausea and vomiting symptoms had negative effects on physical activities (3). Also, Guannan Bai et al. reported that 33.6% of the pregnant women stated that they experienced daily nausea, 9.6% vomiting, and 44.4% fatigue. In this study, lower scores were obtained in both physical and mental fields in the subjective evaluations of the pregnant women with complaints of nausea, vomiting, and fatigue (30). The research finding is similar to the literature.

In addition, it was determined that a 1-unit change in the PUQE score would cause a negative decrease of -4.768 units (β1) on the ABC scale score. It was calculated that 11.0% (R2= 0.110) of the ABC Score of the participants was explained by the PUQE scale score. These findings show that the severity of nausea and vomiting is an effective variable in decreasing activity-specific balance confidence in pregnant women. It is thought that our study result will contribute to the literature.

CONCLUSION

The results of the research show that the severity of nausea and vomiting during pregnancy is highly correlated with activity balance. This finding can be a guide for health professionals working with pregnant women. Health workers should create a care plan by considering the negative consequences of physical activity insufficiency. In addition, pregnant women with physical activity deficiency should be evaluated in terms of nausea and vomiting. It is thought that as a result of the elimination of these symptoms, some of the pregnant women will reach the desired physical activity levels.

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REFERENCES

1. DiPietro L, Evenson KR, Bloodgood B, et al. Benefits of physical activity during pregnancy and postpartum: an umbrella review. Med Sci Sports Exerc. 2019;51:1292.
2. Aksoy Derya Y, Özşahin Z, Uçar T, et al. The relationship between impact of pregnancy complaints on the life quality of the pregnant women and their psychosocial health level. TJFMPC. 2018;12:171-7.
3. Chan RL, Olshan AF, Savitz DA, et al. Maternal influences on nausea and vomiting in early pregnancy. Maternal Child Health J. 2011;15:122-7.
4. Heitmann K, Nordeng H, Havnen GC, et al. 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. 2017;17:1-12.
5. Kramer J, Bowen A, Stewart N, Muhajarine N. Nausea and vomiting of pregnancy: prevalence, severity and relation to psychosocial health. MCN: Am J Matern Child Nurs. 2013;38:21-7.
6. Lacasse A, Rey E, Ferreira E, et al. Epidemiology of nausea and vomiting of pregnancy: prevalence, severity, determinants, and the importance of race/ethnicity. BMC Pregnancy Childbirth. 2009;9:1-9.
7. Zhang H, Wu S, Feng J, Liu Z. Risk Factors of Prolonged Nausea and Vomiting During Pregnancy. Risk Management and Healthcare Policy. 2020;13:2645.
8. Chortatos A, Haugen M, Iversen PO, et al. Pregnancy complications and birth outcomes among women experiencing nausea only or nausea and vomiting during pregnancy in the Norwegian Mother and Child Cohort Study. BMC Pregnancy Childbirth. 2015;15:1-11.
9. Ay ÇK, Derya YA. The relationship between birth fear and psychosocial health level of nausea-vomiting severity in pregnancy: An example from Turkey. Curr Psychol. 2021:1-11.
10. Locock L, Alexander J, Rozmovits L. Women's responses to nausea and vomiting in pregnancy. Midwifery. 2008;24:143-52.
11. O'Brien B, Naber S. Nausea and vomiting during pregnancy: effects on the quality of women's lives. Birth. 1992;19:138-43.
12. Mazzotta P, Maltepe C, Navioz Y, et al. Attitudes, management and consequences of nausea and vomiting of pregnancy in the United States and Canada. Int J Gynaecol Obstet. 2000;70:359-65.
13. Kıratlı D, Yavan T. Evaluation of nausea and vomiting during pregnancy, affecting factors and coping methods. İKÇÜSBFD. 6:21-9.
14. Çırak Y, Yılmaz GD, Demir YP, et al. Pregnancy physical activity questionnaire (PPAQ): reliability and validity of Turkish version. J Phys Ther Sci. 2015;27:3703-9.
15. Tosun Öç, Okyay Re. Investigation of physical activity changes during pregnancy. HSP. 2018;5:333-41.
16. Khan T, Macaulay S, Norris SA, et al. Physical activity and the risk for gestational diabetes mellitus amongst pregnant women living in Soweto: a study protocol. BMC Womens Health. 2016;1:1-6.
17. Özdemir ÖÇ, Sürmeli M, Özel A, et al. The relation between physical activity and quality of life in pregnancy. Anatol Clin. 2017;22:95-102.
18. Wang H, Rolls ET, Du X, et al. Severe nausea and vomiting

in pregnancy: psychiatric and cognitive problems and brain structure in children. BMC Medicine. 2020;18:1-14.

19. Black FO. Maternal susceptibility to nausea and vomiting of pregnancy: is the vestibular system involved? Am J Obstetrics Gynecol. 2002;186:204-9.
20. Jebali F, Lejri S, Salem A, Grati L. A rare complication of vomiting in pregnancy: Wernicke encephalopathy. Rev Neurol. 2017;17:663-6.
21. Koren G, Boskovic R, Hard M, et al. Motherisk—PUQE (pregnancy-unique quantification of emesis and nausea) scoring system for nausea and vomiting of pregnancy. Am J Obstetrics Gynecol. 2002;186:228-31.
22. Mete S, Büyükkurt S, Evrüke İc, et al. The role of PUQE (Pregnancy-Unique Quantification of Emesis and Nausea) in evaluation of the ındications for ınpatient therapy in pregnants with nausea and vomiting.Turkiye Klinikleri J Gynecol Obst. 2009;19:317-21.
23. Ayhan Ç, Büyükturan Ö, Kırdı N, Yakut Y, Güler Ç. The turkısh versıon of the actıvıtıes specıfic balance confıdence (ABC) scale: ıts cultural adaptatıon, valıdatıon and relıabılıty ın older adults. Turkish Journal of Geriatrics 2014;17:157-63.
24. Alpar, R. Applied statistics and validity reliability, with examples from sports health and educational sciences. Ankara: Detay Publishing, 2010, p. 350.
25. Amezcua-Prieto C, Olmedo-Requena R, Jímenez-Mejías E, et al. Changes in leisure time physical activity during pregnancy compared to the prior year. J Mother Child. 2013;17:632-8.
26. Gaston A, Cramp A. Exercise during pregnancy: a review of patterns and determinants. J Science Med Sport. 2011;14:299-305.
27. Pearce EE, Evenson KR, Downs DS, Steckler A. Strategies to promote physical activity during pregnancy. Am J Lifestyle Med. 2013;7:38-50.
28. Silva Schmidt PM, da Trindade Flores F, Rossi AG, da Silveira AF. Hearing and vestibular complaints during pregnancy. Brazilian J Otorhinolaryngol. 2010;76:29-33.
29. Kumar R, Hayhurst KL, Robson AK. Ear, nose, and throat manifestations during pregnancy. Otolaryngol Head Neck Surg. 2011;145:188-98.
30. Bai G, Korfage IJ, Groen EH-d, Jet al. Associations between nausea, vomiting, fatigue and health-related quality of life of women in early pregnancy: the generation R study. PloS one. 2016;11:e0166133.
31. Bhavana G, Kumar K, Anupriya E. Assessment of otolith function using vestibular evoked myogenic potential in women during pregnancy. Brazilian J Otorhinolaryngol. 2020.
32. Laitinen L, Nurmi M, Ellilä P, et al. Nausea and vomiting of pregnancy: associations with personal history of nausea and affected relatives. Arch Gynecol Obstetrics. 2020;302:947-55.
33. Jafari-Dehkordi E, Hashem-Dabaghian F, Aliasl F, et al. Comparison of quince with vitamin B6 for treatment of nausea and vomiting in pregnancy: a randomised clinical trial. J Obstetrics Gynaecol. 2017;37:1048-52.
34. Kızılırmak A, Timur S. The pregnant women methods in order to cope with nausea-vomiting. FFlorence Nightingale J Nurs. 2011;19:129-34.
35. Kaplan T, Bayramlar K, Maden Ç, et al. Investigation of the effect of footwear suitability on fear of falling in elderly. JETR. 2018;5:167-72.
36. Einarson TR, Piwko C, Koren G. Quantifying the global rates of nausea and vomiting of pregnancy: a meta-analysis. J Popul Ther Clin Pharmacol. 2013;20.
37. Clark S, Hughes B, McDonald SS. The impact of nausea and vomiting of pregnancy on quality of life: report of a national consumer survey and recommendations for improving care. Obstet Gynecol Surv. 2013;68:1-10.
38. Lacasse A, Bérard A. Validation of the nausea and vomiting of pregnancy specific health related quality of life questionnaire. Health Qual Life Outcomes. 2008;6:1-6.