

Relationship between Fetal Sex and pattern of Nausea, Vomiting and Cholasma among Pregnant women at Assuit city

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Abstract

Background: Nausea and vomiting during pregnancy (NVP), is one of the most common complaints of pregnant women. Fetus's gender is one that stimulates these complaints. **Aim:** This study aimed to assess the relationship between fetal sex and pattern of nausea, vomiting and cholasma among pregnant women. **Methods:** Descriptive research design. Sample size included 400 pregnant women in their third trimester, that divided into four groups (primi- gravida with female fetus, primi- gravida with male fetus, multi- gravida with female fetus and multi- gravida with male fetus), each group have one hundred women, The study was conducted at antenatal outpatient clinic, Woman's Health Hospital, Assiut University and Qlta Maternal and Child Health Care center, Assiut, Egypt. Data was collected by using interview questionnaire. **Results:** This study showed there was relationship between gender of the current pregnancy, pattern, onset, time, frequency, end date of nausea, vomiting and cholasma (p-value 0.001, 0.005, 0.001, 0.002, 0.003 and 0.003 respectively). **Conclusion:** This study revealed that NVP and cholasma are more likely to occur among female fetus than male. **Recommendations:** Increase mother's knowledge about the effect of pregnancy hormones related changes on their health through health education program.

Key Words: Cholasma, Fetal Sex, Nausea, Pregnancy & Vomiting.

Introduction

Nausea and vomiting of pregnancy (NVP) or called emesis gravidarum are the most common clinical complaints affecting women in the first trimester. It occurs in up to 70% of pregnant women according to many of studies (Naomi et al., 2019, Paulina et al., 2018, Hyun et al., 2018., & Chortatoset al., 2013). This sickness is generally a mild, self-limited condition that may be controlled with conservative measures (Zare, & Sekhavat, 2013).

Nausea and vomiting symptoms manifest usually a round 4 and 6 weeks of pregnancy and peak between week 8 and 12. Most of the symptoms disappear by week 20 of gestation (Marie, & Radka, 2014). Some thesis emphasize that the role of NVP is to safeguard the pregnant women and embryos from pathogens that eat with food and dietary toxins and women who experience NVP have a lower risk of spontaneous abortion and preterm birth than those without such symptoms (Hinkle et al., 2016, Chortatoset al., 2015 & Korenet al., 2014)

More than 2000 years ago, Hippocrates or Greek medical professions stated that female fetuses give the mother a pale face, whereas a mother carrying a male fetus has a healthier tone to her skin. Some studies notified that pregnant women during first trimester exposed to hyperemesis gravidarum give birth to a higher rate of female newborns than do all mothers (Naomi et al., 2019, Nayak, & Sunanda, 2017, Zare & Sekhavat, 2013 & Christopher et al.,

2012) This related to that the circulating levels of the placental glycoprotein hormone, human chorionic gonadotropin (hCG) are higher in women carrying female versus male fetuses according to some studies (Adibi et al., 2015, Lorzadeh, & Kazemirad., 2013).

Cholasma or melasma is a common skin change influenced by pregnancy hormones as estrogen and progesterone which lead to brownish skin tone (National Institutes of Health, 2016). Before the presence of ultrasound, people came up with all kind of ways to tell whether a pregnant woman carried a boy or girl, one of these methods even involved looking at the skin pigmentation changes often associated with pregnancy (Sarkar & Bansal., 2017). NVP can have a significant impact on family life, on the ability to perform usual daily activities, on social functioning and on stress levels. In addition, the presence and severity of NVP have been shown to have an impact on the quality of life (QOL) of pregnant women so community health nurse play important role to educate mother and increase their awareness related to these health issue.

Significant of the study

There is little recent information on the relation between fetus's genders with NVP. According to previous studies, it has been suggested that elevated human chorionic gonadotropin (HCG) is associated with NVP. Women carrying female fetuses have higher HCG levels than women carrying male fetuses (Veenendaal et al., 2011).

As a result of traditional believes of women in Egyptian society, especially in Upper Egypt, Saying that woman have female fetus more complain of nausea and vomiting and darkness of skin coloration (cholasma) or less beauty than woman have male fetus. So based on scientific method utilize this study to assessed the relation between fetal sex ,NVP and cholasma.

Aim of the study

The present study aimed to

- Assess relationship between fetal sex and pattern of nausea, vomiting and cholasma during pregnancy among primi and multi gravida.

Research Questions

- Is there a relationship between fetal sex and pattern of NVP and cholasma?
- Is pattern of NVP and cholasma differing between primi and multi gravida?

Patient & Methods

Research design: Descriptive research design.

Study setting: The study was conducted at antenatal outpatient clinic, Woman's Health Hospital (a tertiary referral center and one of the largest teaching hospitals in Upper Egypt), Assiut University, Egypt and Qlta Maternal and Child health Care center. Both of them serves all women from rural and urban areas.

Study subjects

The current study recruited 400 pregnant women in their third trimester, classified to one hundred primi-gravida women with female fetus, one hundred primi-gravida women with male fetus, one hundred multi-gravida women with female fetus and one hundred multi-gravida women with male fetus attending to the antenatal outpatient clinic and Qlta Maternal and Child health Care center for antenatal care.

Sample size calculation

It was calculated by Open Epi-Info Statistical Package, Version 7.2.0.1 using the sample size equation for estimation of single proportion. The total numbers of pregnant women who were studied in the selected courses during data collection were 378 pregnant women. It was raised to include 400 pregnant women to compensate the previous classification of cases or refusals. With precision levels 5% where confidence level is 95% and $p < 0.05$.

Inclusion criteria

women in child-bearing period with normal and singleton pregnancies in their third trimester of pregnancy and accepted to take part in the study.

Exclusion criteria

women who had known maternal disease affect pattern of nausea, vomiting and cholasma during

pregnancy as (upper gestational tract disease, vestibular disease, liver disease, or hyperthyroidism).

Tool of the study

Structured interview questionnaire

Data was collected by using interview questionnaire that was designed by researcher included two parts, **part one** involved personal data, and obstetric data as age, address for resident, level of education, occupation, obstetric history and current obstetric data. **Part two** involved data about pattern of nausea and vomiting as onset of symptoms, time of vomiting through the day, frequency of vomiting, end date of vomiting.....etc and observe for women's face for cholasma by the researcher.

Reliability of a tool

The internal consistency of the tool scale was calculated by using Cronbach's Alpha; and it was 0.836.

Validity of questionnaire

Questionnaire was examined and reappraised by a group of specialists in the field of Obstetrics & Gynecological nursing and community health nursing and was assessed in a pilot study. The panel reviewed the instruments for clarity, relevance, comprehensiveness, understanding and applicability.

Operational design

This included the pilot study and data collection phase.

Pilot study

A pilot study was conducted on a sample of 10 % of women (40) attending to antenatal clinic, Woman's Health Hospital, Assiut University and Qlta Maternal and Child health Care centers to test the applicability of the tools and test the clarity of the designated questionnaire as well as to estimate the time needed to answer it. It also helped to test the feasibility and suitability of the study settings. Data obtained from the pilot were analyzed and included from the number of study sample because no essential modifications were done.

Administration design

To carry out the study; the necessary approval was obtained from the director of Woman's Health Hospital and the director of Qlta Maternal and Child HealthCare Center. The researchers explained the aims of the study and requesting permission to use the premise for data collection.

Ethical consideration

The study proposal took agreement from the ethical committee of the faculty of nursing, Assiut University. An official permission to carry out the study was obtained from the responsible authorities. Informed consent was obtained from the study participants after explaining the purpose and nature of the study. Also, assure them that their participation would not be used against them in any way and they

have the right to refuse or to decide to terminate their participation at any time.

Data collection phase

Data were collected from the participant women through interviewed the women attending to outpatient clinics , Qlta Maternal and Child health Care Center individually after explanation the nature of the study and obtained their consent to be included in the study. The researcher informed the participant that their participation is voluntary. Confidentiality and anonymity of subjects were assured by the researcher.

The researchers met all pregnant women in third trimester attending to outpatient clinicsof Women Health Hospital through three days in a week from 8 am to 12,30 pm, great women, introduce self and explain purpose and important of the study. The data collection took about 20 minutes for each participant from February to May 2019 participants classified to

fifty primi-gravida women with female fetus, fifty primi-gravida women with male fetus, fifty multi-gravida women with female fetus and fifty multi-gravida women with male fetus.on the other hand the same number of participant from Qlta Maternal & Child health Care Center data and the collected through three days in a week from 8 am to 12,30 pm from June to October 2019.The whole duration of data collection took about nine months, started from February to October 2019.

Statistical design

Data entry and analysis were done using SPSS version 18 Program statistical software package for social sciences. Data were presented using descriptive statistics in the form of frequencies and percentages. Also, Mean was calculated. Correlation between variables (Pearson correlation) and (t-test) were used statistical significance was considered at P-value ≤ 0.05 .

Results

Table (1): Distribution of pregnant women according to their personal data (n=400).

Personal data	Primigravida male		Primigravida female		p-value	Multigravida male		Multigravida female		P-value	Total	
	No	%	No	%		No	%	No	%			
1)Age: (years)											0.579	400
• Less than 20 years	22	5.5	24	6.0	2	0.5	3	0.75	0.882			
• 20-<35 year	77	19.25	76	19.0	78	19.5	76	19.0				
More than 35 years	1	0.25	0	0.0	20	5.0	21	5.25				
Total	100	25.0	100	25.0	100	25.0	100	25.0				
2)Occupation:											0.421	400
• Employed	6	1.5	9	2.25	7	1.75	9	2.25				
• Not employed	94	23.5	91	22.75	93	23.25	91	22.75				
Total	100	25.0	100	25.0	100	25.0	100	25.0				
3)Residence:											0.519	400
• Urban	24	6.0	28	7.0	33	8.25	30	7.5				
• Rural area	76	19.0	72	18.0	67	16.75	70	17.5				
Total	100	25.0	100	25.0	100	25%	100	25%				
4)Education:											0.113	400
• No education	17	4.25	6	1.5	23	5.75	22	5.5				
Basic education	35	8.75	39	9.75	24	6.0	30	7.5				
• Secondary education	33	8.25	37	9.25	43	10.75	39	9.75				
• University	15	3.75	18	4.5	10	2.5	9	2.25				
Total	100	25.0	100	25.0	100	25.0	100	25.0				

Table (2): Distribution of pregnant women according to current nausea and vomiting data (n=400).

Current nausea and vomiting data	Primigravida male		Primigravida female		p-value	Multigravida male		Multigravida female		P-value	total
	No	%	No	%		No	%	No	%		
1)Pattern of nausea and vomiting											
• No symptoms	14	3.5	11	2.75	.052	31	7.75	10	2.5	.001**	400
• Nausea only	19	4.75	10	2.5		19	4.75	23	5.75		
• Nausea and vomiting	61	15.25	63	15.75		44	11.0	51	12.75		
• Hyperemesis gravidarium	6	1.5	16	4.0		6	1.5	16	4.0		
Total	100	25.0	100	25.0		100	25.0	100	25.0		
2) Onset of symptoms at week											
• No symptoms	14	3.5	11	2.75	.367	31	7.75	10	2.5	.001**	400
• Before 6 week	60	15.0	54	13.5		43	10.75	62	15.5		
• After 6 week	26	6.5	35	8.75		26	6.5	28	7.0		
Total	100	25.0	100	25.0		100	25.0	100	25.0		
3)Time of vomiting											
• No symptoms	14	3.5	11	2.75	.430	31	22.75	10	2.5	.003**	400
• At morning	33	8.25	27	6.75		33	8.25	34	8.5		
• Around the day	53	13.25	62	15.5		36	9.0	56	14.0		
Total	100	25.0	100	25.0		100	25.0	100	25.0		
4)Frequency of vomiting											
• No symptoms	14	3.5	11	2.75	.126	31	7.75	10	2.5	.004**	400
• Nausea only	18	4.5	13	3.25		21	5.25	20	5.0		
• Once	29	7.25	21	5.25		20	5.0	14	3.5		
• More than one	39	9.75	55	13.75		28	7.0	56	14.0		
Total	100	25.0	100	25.0		100	25.0	100	25.0		
5)End date of vomiting											
• No symptoms	14	3.5	11	2.75	.778	31	7.75	10	2.5	.002**	400
• Before or equal 12 week	30	7.5	33	8.25		34	8.5	30	7.5		
• After 12 week	56	14.0	56	14.0		35	8.75	60	15.0		
Total	100	25.0	100	25.0		100	25.0	100	25.0		

(**) highly statistically significant $p < 0.01$

Table (3): Relationship between pregnant women's age and current nausea and vomiting data (n=400).

Current nausea and vomiting data	Age group						Total	P-value
	less than 20 year		20<35 year		more than 35 year			
	No	%	No	%	No	%		
1)Pattern of nausea and vomiting								
• No symptoms	8	2.0	45	11.25	13	3.25	400	.240
• Nausea only	10	2.5	54	13.5	7	1.75		
• Nausea and vomiting	28	7.0	174	43.5	17	4.25		
• Hyperemesis gravidarium	5	1.25	34	8.5	5	1.25		
Total	51	12.75	307	76.75	42	10.5		
2)Onset of symptoms at week								
• No symptoms	8	2.0	45	11.25	13	3.25	400	.027*
• Before 6 week	24	6.0	172	43	23	5.75		
• After 6 week	19	4.75	90	22.5	6	1.5		
Total	51	12.75	307	76.75	42	10.5		
3)Time of vomiting								
• No symptoms	8	2.0	45	11.25	13	3.25	400	.060
• At morning	14	3.5	102	25.5	14	3.5		
• Around the day	29	7.25	160	40.0	15	3.75		
Total	51	12.75	307	76.75	42	10.5		

Current nausea and vomiting data	Age group						Total	P-value
	less than 20 year		20<35 year		more than 35 year			
	No	%	No	%	No	%		
4)Frequency of vomiting							400	.193
• No symptoms	8	2.0	45	11.25	13	3.25		
• Nausea only	11	2.75	53	13.25	7	1.75		
• Once	8	2.0	68	17.0	9	2.25		
• More than one	24	6.0	141	35.25	13	3.25		
Total	51	12.75	307	76.75	42	10.5		
5)End date of vomiting							400	.101
• No symptoms	8	2.0	45	11.25	13	3.25		
• before or equal 12 week	16	4.0	102	25.5	9	2.25		
• after 12 week	27	6.75	160	40.0	20	5.0		
Total	51	12.75	307	76.75	42	10.5		

(*) statistically significant $p < 0.05$

Table (4): Relationship between current gender of baby and nausea and vomiting data (n=400).

Current nausea and vomiting data	Gender of baby of current pregnancy				Total	p-value
	Male		Female			
	No	%	No	%		
1)Pattern of nausea and vomiting					400	.001**
• No symptoms	45	11.25	21	5.25		
• Nausea only	38	9.5	33	8.25		
• Nausea and vomiting	105	26.25	114	28.5		
• Hyperemesis gravidarum	12	3.0	32	8.0		
Total	200	50.0	200	50.0		
2)Onset of symptoms at week					400	.005**
• No symptoms	45	11.25	21	5.25		
• Before 6 week	103	25.75	116	29.0		
• After 6 week	52	13.0	63	15.75		
Total	200	50.0	200	50.0		
3)Time of vomiting					400	.001**
• No symptoms	45	11.25	21	5.25		
• At morning	96	24.0	61	15.25		
• Around the day	86	21.5	118	29.5		
Total	200	50.0	200	50.0		
4)Frequency of vomiting					400	.002**
• No symptoms	45	11.25	21	5.25		
• Nausea only	39	9.75	32	8.0		
• Once	49	12.25	36	9.0		
• More than one	67	16.75	111	27.75		
Total	200	50.0	200	50.0		
5)End date of vomiting					400	.003**
• No symptoms	45	11.25	21	5.25		
• before or equal 12 week	64	16.0	63	15.75		
• after 12 week	91	22.75	116	29.0		
Total	200	50.0	200	50.0		

(**) highly statistically significant $p < 0.01$

Table (5): Relationship between parity and current nausea and vomiting data (n=400).

Current nausea and vomiting data	Parity						Total	P-value
	Non		Pirmipara		Multipara			
	No	%	No	%	No	%		
1)Pattern of nausea and vomiting							400	.046*
• No symptoms	25	6.25	5	1.25	36	9.0		
•Nausea only	29	7.25	9	2.25	33	8.25		
• Nausea and vomiting	124	31.0	18	4.5	77	19.25		
•Hyperemesis gravidarium	22	5.5	6	1.5	16	4.0		
Total	200	50.0	38	9.5	162	40.5		
2)Onset of symptoms at week							400	.098
• No symptoms	25	6.25	5	1.25	36	9.0		
• Before 6 week	114	28.5	19	4.75	86	21.5		
• After 6 week	61	15.25	14	3.5	40	10.0		
Total	200	50.0	38	9.5	162	40.5		
3)Time of vomiting							400	.050*
• No symptoms	25	6.25	5	1.25	36	9.0		
• At morning	60	15.0	15	3.75	55	13.75		
• Around the day	115	28.75	18	4.5	71	17.75		
Total	200	50.0	38	9.5	162	40.5		
4)Frequency of vomiting							400	.100
• No symptoms	25	6.25	5	1.25	36	9.0		
• Nausea only	30	7.5	9	2.25	32	8.0		
• Once	51	12.75	6	1.5	28	7.0		
• More than one	94	23.5	18	4.5	66	16.5		
Total	200	50.0	38	9.5	162	40.5		
5)End date of vomiting							400	.106
• No symptoms	25	6.25	5	1.25	36	9.0		
• before or equal 12 week	63	15.75	15	3.75	49	12.25		
• after 12 week	112	28.0	18	4.5	77	19.25		
Total	200	50.0	38	9.5	162	40.5		

(*) statistically significant $p < 0.05$.

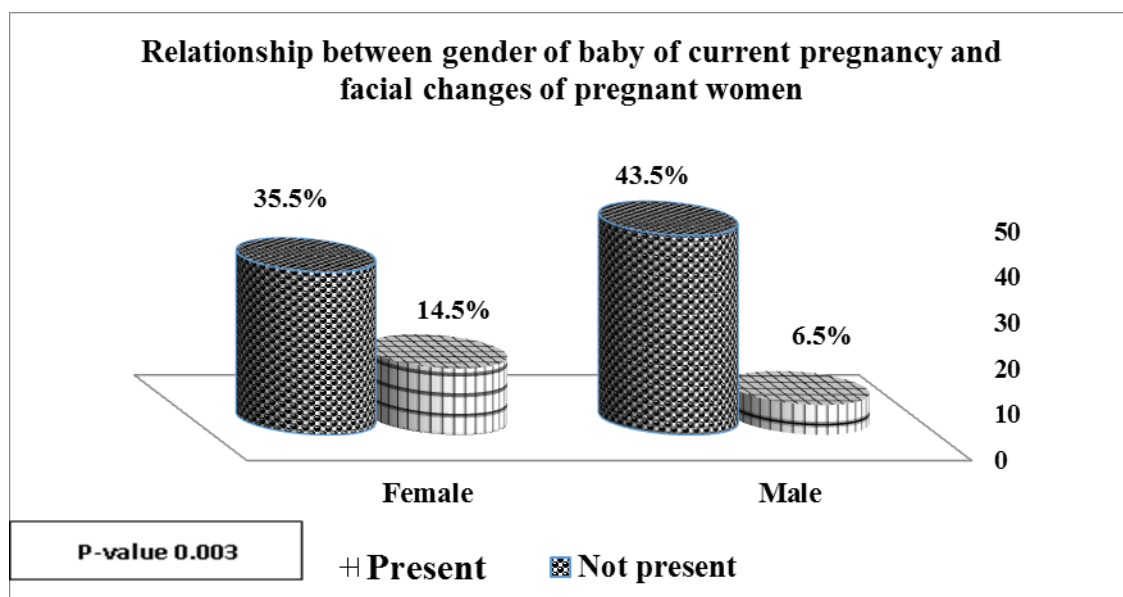


Figure (1): Relationship between gender of baby of current pregnancy and facial changes (cholasma) of pregnant women(n=400).

Table (1): Illustrates that the greater percent of pregnant women were found in age group (20<35years old) with total percent of 76.75%. The great majority (92.25%) of them were not employed, more than two thirds (71.25%), of them were lived in rural areas and more than one third (38%) had secondary school with no significant difference between male and female in primi and multigravida women.

Table (2): States that no significant difference between male and female fetus primigravida women regarding pattern, onset, time, frequency, and end date of nausea and vomiting (p-value 0.052, 0.367, 0.430, 0.126 and 0.778 respectively). On the other hand there are significant difference between male and female fetus multigravida women regarding the same variables and the same sequence (p-value 0.001, 0.001, 0.003, 0.004 and 0.002 respectively).

Table (3): Clears that there is no relationship between age group and pattern, time, frequency, and end date of nausea and vomiting (p-value 0.240, 0.060, and 0.193 respectively). But it also shows that there are relationship between age group and onset of nausea and vomiting (p-value 0.027).

Table (4) Reports that there is relationship between gender of the current pregnancy and pattern, onset, time, frequency, and end date of nausea and vomiting (p-value 0.001, 0.005, 0.001, 0.002, 0.003 respectively).

Table (5): Confirms that there is no relationship between parity and pattern, onset, time, frequency, and end date of nausea and vomiting (p-value 0.046, 0.098, 0.050, 0.100, 0.106 respectively).

Figure (1): Shows that there is relationship between gender of baby of current pregnancy and facial changes of pregnant women (p-value 0.003).

Discussion

The most common complaints affecting pregnant women in the first trimester is NVP. Its cause remains unknown and factors associated with the occurrence of NVP are different (Marie & Radka, 2014). So, this study aim to assess the relationship between fetal sex and pattern of nausea & vomiting and chloasma during pregnancy.

Morning sickness or NVP is common problem during pregnancy (Einarson et al, 2013). Symptoms and pattern of it range from mild nausea to hyperemesis gravidarum. Experiences of NVP vary greatly, but it typically starts between 4th – 6th weeks of gestation, peaks between 8th and 12th weeks, and then disappears by 20th weeks of gestation (Sarah et al., 2017).

Concerning NVP in the present study there was no significant difference between male and female fetuses among primi-gravida women regarding

pattern, onset, time, frequency, and end date of nausea and vomiting (p-value 0.052, 0.367, 0.430, 0.126 and 0.778 respectively) with worsening in frequency of nausea and vomiting in more than half female fetus than nearly two thirds male fetus. On the other hand there was significant difference between male and female multigravida women regarding the same variables and the same sequence (p-value 0.001, 0.001, 0.003, 0.004 and 0.002 respectively).

This is similar to **Vida & Zakeri(2017)**, who applied their study in Tonekabon to determine relation between nausea and vomiting in pregnancy and fetal gender, they revealed that there was significant relation morning sickness and fetal gender (P-value 0.001), also frequency of nausea & vomiting were more in females fetus 55.40% versus 36.18% in male. On the same line **Chortatos et al., (2015)**, who performed their study on Norwegian mothers to compare pregnancy complications and birth outcomes for women experiencing nausea and vomiting in pregnancy, or nausea only, with symptom-free women, and found that, there was relation between fetal gender and nausea and vomiting in pregnancy (P-value 0.001) as well as **Zare & Sekhavat,(2013)**who implemented their study in Iran to identify relationship between fetal sex and NVP and showed that there was relation between fetal gender and nausea and vomiting in pregnancy (P-value 0.03).

Also **Naomi. et al(2019)**, who conducted their study in Japan to compare morning sickness in singleton and twin pregnancies and its relation to fetal sex, they cleared that there was relation between NVP and fetal sex for singleton and twin pregnancies P-value for both <0.001.

During pregnancy some women have a dark irregular patch on their face and forehead that called 'chloasma' or pregnancy mask. Chloasma most commonly to occur when pregnant women exposed to sun (**Pregnancy, Birth & Baby, 2019**).

When looking to relationship between fetal sex of current pregnancy and facial changes (chloasma), it is obvious that there is relationship between fetal sex and chloasma(P-value 0.003). On the same line **pregnancy, Birth & Baby 2019** reported that chloasma occurs due to stimulation of pigment-producing cells by female sex hormones.

As regard relationship between maternal age and NVP, the current study released that there is no relation between age and nausea and vomiting pattern, time, frequency, and end date (p-value 0.240, 0.060, 0.193, and 0.101 respectively).

These findings are on the same line **Pauliina et al., (2018)**, who performed their study in Turku to evaluate the severity of NVP with a structured questionnaire and evaluate associative risk factors,

and revealed that there was no relation between maternal age and NVP (p-value 0.370). Also **Zare & Sekhavat, (2013)** & **Hyun et al., (2018)**, who implemented their study on Koreaon pregnant women to assess association between severity of NVP and pregnancy outcomes and poorer quality of life (QOL),had the same opinion with (p-value 0.3 and 0.160 respectively).

Regarding parity and its relation to NVP, the present study confirms that there is no relationship between parity and pattern, onset, time, frequency, and end date of nausea and vomiting (p-value 0.046, 0.098, 0.050, 0.100, 0.106 respectively).

On the other side **Marie & Radka (2014)**, who performed their study to describe the quality of life (QOL) of women who developed NVP and to identify whether pregnant women's QOL is influenced by the severity of NVP, parity, duration of pregnancy, gynecologic history, age or marital status. They found that there was relation between parity and NVP (p-value 0.001).

The current study revealed that more than three quarters of all groups (primi with male fetus, primi with female fetus, multi with male fetus, and multi with female fetus) have an age group (20<35years old). The great majority of them were not employed ,the nearly three quarters of them were lived in rural areas, more than one third had secondary school education with no significant difference between male and female in primi and multi gravida women.

Ahwinahwi et al., (2016), who applied their study in Nigeria evaluated the health regarding quality of life of women with nausea and vomiting for pregnancy and found that there were similarity between current study and their study in the level of education as secondary education estimated 34.5%, also age group between 21-32 years were 69.7%, but 46.2% of studied women were not employed.

On the other hand, **Hyun et al., (2018)** reported that more than half(59.1%) of studied women have age more than 35 years old and employed. The great majority 91.1% of them have a university level of education. This difference explains difference in location and culture between two places.

According to history of abortion current study reports that the majority of studied women had no abortion, this is in accordance with **Mojgan & Minoor (2015)**who showed that 81.3% of pregnant women had no abortion. But, **Chortatos et al., (2015)**showed that 28.4% of pregnant women had previous still birth or spontaneous abortion.

Conclusion

This study revealed that NVP and cholasma are more likely to occur in female fetus than male.

Recommendation

Increase mothers' knowledge about the effect of pregnancy hormones related changes on their health through health education program.

Acknowledgment

We would like to express our appreciation to all pregnant women included in the study and to all individuals involved in the data collection.

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