# ASSOCIATED FACTORS WITH NUTRITIONAL AND DIETARY PRACTICES OF PREGNANT WOMEN IN DUHOK CITY/ KURDISTAN REGION OF IRAQ

RONDIK KHALID MOUSA\* and IMAN YOUSIF ABDULMALEK\*\*

\*College of Nursing, University of Duhok, Kurdistan Region-Iraq

\*\*College of Medicine, University of Duhok, Kurdistan Region-Iraq

(Received: September 11, 2022; Accepted for Publication: November 15, 2022)

### **ABSTRACT**

Background: Pregnancy is the most crucial nutritionally demanding period of every woman's life. The high demand for nutrients to deposit energy in the form of new tissue, the growth of existing maternal tissues such as the breast and uterus, and increased energy requirements for tissue synthesis make pregnant women more vulnerable to malnutrition.

Aim of the Study: To assess the factors associated with the nutritional and dietary practices of pregnant women in Duhok City.

Participants and Methods: A cross-sectional descriptive study was done on 400 randomly selected antenatal mothers at the four primary health care centers and in Duhok hospital for obstetrics and gynecology. Data was collected using a questionnaire from (22nd November 2021 to 2nd April 2022) 4 hours/day, distributed over six days/ week.

Results: The mean age of the participants was  $27.56 \pm 5.104$  years. About two third (63.6%) of the antenatal mothers had a fair nutritional knowledge level. Only (9.3%) of women had a negative attitude, while (90.8%) had a positive attitude. Regarding practiced nutrition, the good intake nutrition was (69.3%), and nearly one-third (30.8%) had acceptable intake. There was a significant association between women who practiced nutrition and their knowledge and attitude toward nutrition (P < 0.001).

Conclusions: Our findings concluded that most of the study subjects had a fair knowledge of nutrition during pregnancy. In addition, good knowledge and attitude about maternal nutrition usually affect nutritional practices during pregnancy.

**KEYWORDS:** Knowledge, nutrition, attitude, practice, pregnancy

# INTRODUCTION

Pregnancy is the most crucial nutritionally demanding period of every woman's life. The nutritional deficiency was responsible for 1.5 million deaths in women and children worldwide in 2010. Adequate dietary intake during pregnancy is essential to achieve a healthy pregnancy. The nutritional needs of pregnant women will increase, so nutrition deficiency is harmful to both the mother and the fetus (Nana and Zema, 2018).

Insufficient nutrition may lead to inadequate nutrition to reach the fetus, intrauterine growth retardation, preterm labor, some inherited malformations, pregnancy complications and growth retardation later. In addition, poor maternal nutrition during pregnancy has multiple long-term adverse effects on mother and offspring health, including maternal anemia, postpartum complications, and increased

neonatal morbidity and mortality (Lander, et al., 2019).

In the antenatal period, the nutritional demand of women upsurges to compensate for physiological and psychological changes and nutritional computations by the growing fetus for energy, macro and micronutrients (Meija & Rezeberga, 2017). However, many women, whether in preconception or even during pregnancy, do not get enough nutrients in their diets, a particularly prevalent problem in the world's poorest regions (Koletzko, *et al.*, 2012). Moreover, women of reproductive age living in under-resourced environments in low-and middle-income countries are at particularly high risk of inadequate nutrition, especially of critical micronutrients (Lander, *et al.*, 2019).

Nutrition knowledge is essential in creating cognizance of sample nutrition intake among pregnant women. Lack of knowledge of sufficient nutrition is stated as an instant cause of malnutrition. So, pregnant women are expected to have adequate knowledge to meet their increased dietary demands and attain optimal nutritional status during pregnancy (Gezimu, *et al.*,2022)

Thus, low intake of essential nutrients such as protein, energy, vitamins C, Vitamin A, and iron due to inappropriate nutrition practices, together with environmental factors, socioeconomic factors, and infections, are common causes of maternal mortality, low birth weight, and intrauterine growth retardation (Lee, *et al.*, 2017). In addition, many conditions, such as preeclampsia, anemia, neural tube defects, depression, and cognitive dysfunction, are associated with a lack of proper intake of folic acid, iron, calcium, vitamin D, and Iodine (Beluska-Turkan, *et al.*,2019).

Dietary practice is defined as observable actions or behavior of nutritional habits and can be classified as having good and poor dietary practices. The incidence of dietary inadequacies due to dietary habits and patterns in pregnancy is higher during pregnancy when compared to any other stage of the life cycle. Different scholars discovered that many women in developing countries restrict their food intake during pregnancy for various reasons, such as having smaller infants that can carry a lower risk of delivery complications, cultural reasons, and perceived severity of delivery complications. At the same time, big babies make delivery difficult (Lander, *et al.*, 2019).

World Health Organization (WHO) antenatal standards recommendations related to 5 types of interventions. A healthy eating and physically active style of life are promoted to prevent excessive Gestational Weight Gain (GWG). In the malnourished population, balanced energy and protein intake are recommended to avoid Low Birth Weight (LBW), Small for Gestational Age (SGA), and stillbirths. Doses of iron and folate supplementation are given with possible daily or intermittent routines. Supplementation of vitamin A is suggested to be restricted only to areas where vitamin A deficiency is a substantial public health problem. The recommendation of calcium supplementation is limited to the population with low calcium intake. Vitamin B6, zinc, multi-nutrient supplements, and vitamin D supplementation are not advocated as routine procedures. Avoiding caffeine is suggested for women with high consumption (Danielewicz, et al.,2017)

A severe problem of maternal undernutrition is evident in most countries in sub-Saharan Africa, South-central and Southeastern Asia. Ethiopia is one of the countries with a very high burden of maternal and child undernutrition (Nana and Zema,2018). About 60% of South Asian women have underweight children due to a lack of healthy food and nutrition during childhood (Rizwan and Huda, 2021).

Knowledgeable about nutrition during pregnancy was low in many studies conducted in 2013 in East Wollega, Ethiopia (64.4%) and in 2012 in Malaysia (70%) (Daba *et al.*, 2013) and (Mitra *et al.*, 2012). In addition, eating fresh vegetables and daily milk consumption practices are low in other studies conducted in America and Ethiopia (58.9 and 42.7%), respectively (Tenaw, *et al.*,2018).

Maternal nutrition is a crucial factor for the mother's health and fetal development. Women's malnutrition (of any kind) not only affects their health but also can potentially harm their infants' health. The study aims to assess the factors associated with the nutritional and dietary practices of pregnant women in Duhok city.

# **METHOD**

Design of the Study: A cross-sectional descriptive study was done for pregnant women in Duhok city to detect the associated factors which affect their nutritional and dietary practices.

Setting of the Study: The study was applied in four primary health care centers, which were selected using a simple random sampling, including; (Bahdinan, Mohammed Salih Boti, Zanest and Kazi Mohammed out of 14 PHCCs in Duhok), and Duhok hospital for obstetrics and gynecology.

Sample of the Study: The sample of the study was selected by using a simple random sampling that included 400 pregnant women in Duhok city. The inclusion criteria for the current study were pregnant women aged 18-40 years old, primigravida or multigravida, women who are in the first, second, and third trimesters, while the exclusion criteria were pregnant women who refuse to participate, and pregnant women with known chronic diseases. The researcher attends the primary health care centers four days/week (50 women from each center) based on a study plan and two days for Duhok hospital (200 women).

Time of the Study: The data was collected by the researcher from (22nd November 2021 to 2nd April 2022) on 4 hours/ day basis, distributed over six days/ week.

Ethical Considerations reference NO:24102021-10-5. The study proposal was formally approved by the Duhok Directorate of Health's Ethical Committee. In order to facilitate the researcher's work, a written request for agreement was issued to the hospital.

Tools for data collection: The questionnaire's validity was determined by a panel of eight experts from various domains, who evaluated the questionnaire's contents. For the revision and adjustment, all professional views and opinions were taken into consideration. The questionnaire was well-organized and constructed, according to the majority of specialists.

The survey's reliability and consistency were determined using the Guttman split-half coefficients. Split-half for the survey knowledge was 0.958, and for the attitude 0.650 and 0.981, indicating that the test was reliable.

Concerning practice; it was assessed by looking at the women's actions towards Nutrition to find if they have eaten fruits on a daily basis, ate one serving of citrus fruit daily, ate vegetables daily, and ate at least one egg daily •

- Acceptable intake (30-41)
- Good intake (42-54)

The scores of Social Economic Status (SES) were arranged according to the study done in Erbil city and adapted by (Shabu & Al-Tawil.,2012). With his modification, the score

levels were assessed and classified into three classes;

- Low (12-24)
- Moderate (25-37)
- High (38-50)

Statistical procedures: The statistical data analysis of the present study was done after entering to (SPSS) version 23. There were two approaches for assessing the result: the first one was a descriptive data analysis approach (Frequency and percentage), and the second one was the inferential data analysis approach (Chisquare test and Fisher's exact test), Chi-square test of association was used to compare the proportions. When the expected count of more than 20% of the cells of the table was less than 5, Fisher's exact test was used), while the P value of  $\leq 0.05$  was considered statistically significant.

# **RESULTS**

Table 1 shows that the Mean age of the respondents was  $27.56 \pm 5.104$ , with a range of 17-38 years. About half of the women (49.3%) were (24-30) years old and lived in urban areas, 50%. The majority of women, 69.5%, were overweight, and 72.5% were unemployed or Housewives. Regarding the family type, 58.3% of them were nuclear families. The results showed that more than two third 67.8% a) year were of moderate socioeconomic status (SES) only (10.3%)of high and a SES.

**Table (1 ):-** Distribution of the Study Sample According to their Socio-demographic Characteristics (n=400)

Socio-demographic Characteristics		cio-demographic Characteristics Freq (%)	
Age	17-23 Years	88 (22)	27.56 (5.104)
-	24-30 Years	197 (49.3)	, ,
	31-38 Years	115 (28.7)	
Education	Illiterate and Read/Write	80 (20)	
	Primary School	170 (42.5)	
	Intermediate School	55 (13.8)	
	Secondary School	26 (6.5)	
	Institute graduated	21 (5.2)	
	University or Higher	48 (12)	
Occupation	Employed	110 (27.5)	
	Housewife	290 (72.5)	
Residency	Urban	200 (50)	
	Rural	123 (30.8)	
	Sub-urban	56 (14)	
	Camp	21 (5.2)	
Religion	Muslim	268 (67)	
	Cristian	45 (11.2)	
	Yezidi	87 (21.8)	

Type of family	Nuclear	233 (58.3)	
,,	Extended	167 (41.7)	
Family Size	<5	203 (50.7)	
•	>=5	197 (49.3)	
BMI	Healthy weight (BMI 18.5-24.9)	82 (20.5)	26.22 (2.680)
	Overweight (BMI 25-29.9)	278 (69.5)	, ,
	Obese (BMI 30 or more)	40 (10)	
Economic status	Low (12-24)	41 (10.2)	33.53 (8.742)
	Moderate (25-37)	271 (67.8)	
	High (38-50)	88 (22)	

According to Table 2, the vast majority of the participants (99.8%) were married, while the divorced and separated were only (0.3%). Relate to the age at marriage; the Mean age was 20.75±3.312, and about one-half of the sample (45.5%) were in the group of (20-24 years old). Regarding the period of marriage (55%) were in the group 1-6 years. The overall Mean parity

was, and most of them (47.8%) were in the group of paras (2-4). Those who didn't get nutritional education were (86.8), while in the clinic (5.5%) and PHCC were (7.8%). As to the receiving antenatal care, most of the women (98%) were received. About the number of ANC visits, half of the women (42.5%%) were in a group (4-6) visits) acceptable ANC.

**Table(2):-**Distribution of the Study Sample According to their Obstetrical Characteristics (No. =400)

Table(2)Distribution of t	, , ,		Characteristics (No. –400)		
Past obstetric history		Freq.	Per cent	Mean (SD)	
Marital	Married	399	(99.8)	` /	
	Divorced	1	(0.3)		
Age at marriage	10-14 Years	4	1	20.75	
9	15-19 Years	158	39.5	(3.312)	
	20-24 Years	182	45.5	,	
	25-30 Years	56	14		
Marriage period	1-6 years	220	55	6.83	
• .	7-12 years	135	33.8	(5.040)	
	13-18 years	28	7	` ,	
	19-23 years	17	4.2		
Para	Para (0)	77	19.2		
	Primi para	92	23		
	Multi para (2-4)	191	47.8		
	Grand multi para (≥ 5)	40	10		
Abortion	No abortion	339	84.8		
	Abortion 1-2	61	15.2		
Gestational age	First trimester 0-12	6	1.4		
· ·	Second trimester 13-26	169	42.3		
	Third trimester 27-40	225	56.3		
Got Nutritional Education	No	347	86.8		
	Clinic	22	5.4		
	PHCC	31	7.8		
Receiving antenatal care	Yes	392	98		
S .	No	8	2		
Place of receiving antenatal care	No	8	2		
3	PCHC	95	23.8		
	Private clinic	82	20.4		
	Hospital ANC	99	24.8		
	Combined	116	29		
Number of ANC visits	No Visit	8	2		
	Poor ANC (1-2 visits)	59	14.7		
	Acceptable ANC (4 – 6 visits)	170	42.5		
	Good ANC (≥ 7 visits)	163	40.8		

Regarding whether participants had practiced nutrition, a small number of them (7.5%) ate a piece of fish every day, while (32.8%) reported that they hadn't eaten a piece of fish every day. among those women who had practiced the (93.8%) had a regular eat three meals every day,

while (5.5%) of them had irregular, (67%) had eaten rice on a daily basis, while (13.5%) hadn't, and (52.3%) had practiced eating fruits on a daily basis, and the percentage (50.2%) eat vegetables daily while (12.5%) hadn't as noted in Table 3.

Table (3):-Practice about Nutrition

Dietary practices of the pregnant women		Freq (%)	Mean of score	Sig.
Do you eat three meals every day?	No	22 (5.5)	2.88	H.S
, ,	Some times	3 (0.8)		
	Yes	375 (93.8)		
Do you eat rice on a daily basis?	No	54 (13.5)	2.54	H.S
,	Some times	78 (19.5)		
	Yes	268 (67)		
Do you eat six servings of enriched, whole-grain bread and cereals	No	171 (42.8)	1.89	S
daily?	Some times	104 (26)		
,	Yes	125 (31.3)		
Do you eat fruits on a daily basis?	No	42 (10.5)	2.42	H.S
,	Some times	149 (37.3)		
	Yes	209 (52.3)		
Do you eat one serving of citrus fruit daily?	No	37 (9.3)	2.54	H.S
so you out one conving or our act man daily.	Some times	112 (28)	2.01	
	Yes	251 (62.7)		
Do you eat vegetables daily?	No	50 (12.5)	2.38	H.S
50 you out rogotables daily.	Some times	149 (37.3)	2.00	
	Yes	201 (50.2)		
Do you eat at least one egg daily?	No	110 (27.5)	2.19	S
bo you can an least one egg daily:	Some times	106 (26.5)	2.10	U
	Yes	184 (46)		
Do you eat a piece of fish every day?	No	131 (32.8)	1.75	S
Do you eat a piece of lish every day?	Some times	239 (59.8)	1.73	3
	Yes	30 (7.5)		
Do you eat one piece of chicken without skin daily?	No	97 (24.3)	1.93	S
Do you eat one piece of chicken without skill daily?	Some times	233 (58.3)	1.93	3
	Yes	70 (17.5)		
Do you take three servings of nonfat or low-fat milk or milk products		` '	2.00	S
	No Como timos	96 (24)	2.08	3
every day?	Some times	177 (44.3)		
Danis and an distribution and a second at 0	Yes	127 (31.8)	0.44	
Do you eat cooked dried beans and peas every day?	No Como dimens	26 (6.5)	2.14	S
	Some times	294 (73.5)		
Device and True to these combines of extending large extends to the	Yes	80 (20)	0.00	
Do you eat Two to three servings of extra-lean meats daily?	No	39 (9.8)	2.26	S
	Some times	218 (54.5)		
	Yes	143 (35.8)	0.47	
Do you take sweeteners in your daily meals?	No	18 (4.5)	2.17	S
	Some times	296 (74)		
	Yes	86 (21.5)		
Do you drink 2 liters of water on a daily basis?	No	7 (1.8)	2.48	H.S
	Some times	193 (48.3)		
	Yes	200 (50)		
Do you eat a snack between meals?	No	16 (4)	2.71	H.S
	Some times	86 (21.5)		
	Yes	298 (74.5)		
Do you avoid caffeine during pregnancy?	Some times	68 (17)	2.83	H.S
	Yes	332 (83)		
Do you avoid alcohol during pregnancy?	No	7 (1.8)	2.96	H.S
	Some times	2(0.5)		
	Yes	391 (97.8)		
Do you avoid smoking during the current pregnancy?	Some times	27 (6.8)	2.93	H.S
- · · · · ·	Yes	373 (93.3)		

With regard to (400) women who practiced Nutrition, the good intake of Nutrition was in (69.3 %), and one-third of them (30.8 %) had acceptable intake, as shown in the Table 4.

**Table(4):-** The Reasons for taking Nutrition among Women Practiced (N=400)

		Freq (%)	Mean (SD)
Practice	Acceptable intake (30-41) Good intake (42-54)	123 (30.8) 277 (69.3)	43.05 (4.776)

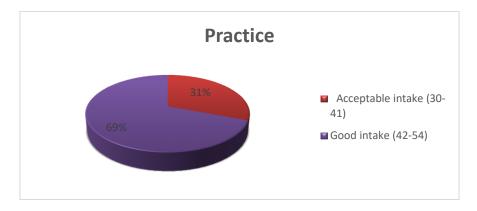


Fig.( 1):- Grading of Practiced Nutrition

All the items of Knowledge and attitude considered as the factors that affect the pregnant women's practice toward nutrition, there was a

significant association between women who practiced nutrition and their knowledge and attitude toward nutrition, as shown in Table 5.

**Table (5):** Factors that Affect the Women's Practice towards Nutrition in Pregnancy of the Study Sample

		Knowledge	Attitude
Practice	Pearson Correlation	.347**	0.141**
	Sig. (2-tailed)	< 0.001	0.005

<sup>\*\*.</sup> Correlation is significant at the 0.01 level (2-tailed).

There was a statistically significant association between the Sociodemographic characteristics of the study sample and nutritional practice regarding their age,

education, occupation, residency, religion, BMI and economic status, as shown in Table 6. The type and the size of the family were with no significant association.

**Table (6) :-**The Significant Association between the Sociodemographic Characteristics of the Study Sample and Nutritional Practice

	Sociodemographic	Nutritional	Nutritional Practice	
		Acceptable intake	Good intake	
Age	17-23 Years	26	62	< 0.001*
	24-30 Years	78	119	
	31-38 Years	19	96	
Education	Illiterate and Read/Write	26	54	< 0.001*
	Primary School	43	127	
	Intermediate School	33	22	
	Secondary School	10	16	
	Institute graduated	1	20	
	University or Higher	10	38	
Occupation	Employed	46	64	0.003*
	Housewife	77	213	
Residency	Urban	52	148	< 0.001*
•	Rural	51	72	
	Sub-urban	20	36	
	Camp	0	21	
Religion	Muslim	77	191	< 0.001*
<b>G</b>	Cristian	1	44	
	Yezidi	45	42	
BMI	Healthy weight	18	64	0.033*
	Overweight	87	191	
	Obese	18	22	
Economic status	Low (12-24)	4	37	0.001*
	Moderate (25-37)	98	173	
	High (38-50)	21	67	

There was a statistically significant association between Obstetrical Characteristics about nutritional practice regarding their marriage period, got nutritional education and Number of ANC visits, as shown in Table 7.

There was no statistically significant about their marital age at marriage, gravida, para, abortion, gestational age, receiving antenatal care and place of receiving antenatal care.

**Table (7):-** Significant Association between Obstetrical Characteristics and Nutritional Practice of the Study Sample

0	bstetrical Characteristics	Nutritional Practice		P. Value
		Acceptable intake	Good intake	
Marriage period	1-6 years	66	154	0.022*
	7-12 years	49	86	
	13-18 years	8	20	
	19-23 years	0	17	
Got Nutritional	No	116	231	0.001*
Education	Clinic	7	15	
	PHCC	0	31	
Number of ANC	No Visit	4	4	0.008*
visits	Poor ANC (1-2 visits)	25	34	
	Acceptable ANC (4 - 6 visits)	58	112	
	Good ANC (≥ 7 visits)	36	127	

### DISCUSSIONS

The current study showed that the mean age of the studied sample was  $27.56 \pm 5.104$  years; this result was similar to that obtained by an Egyptian study which was done by Alkalash *et al.* (2021), in the mean age of pregnant women  $26.5\pm 5.6$  years.

Regarding the education level of the participants in this study revealed that nearly half of them had a primary education level; this was in agreement with a study done by Ehissan and Dhia AL Deen (2019) in Baghdad, where (46.2%) of women had the same education. Most of the participants (72.5%) were housewives, this finding was also identified by a former study in Baghdad which mentioned that the majority of the participants (79.8%) were housewives.

In the current study, the mean age of the women at marriage was  $20.75 \pm 3.312$  years; this result went in line with data obtained by an Egyptian study which was done by Alkalash *et al.*, (2021), in which the mean age of them at marriage was  $19.71\pm 2.78$  years.

About one-half of the participant (47.8%) were multi-gravida, and one-fifth was primigravida, which was different from the study in Baghdad by Ehissan and Dhia AL Deen (2019) in which more than one-quarter of participants (30.4%) were primigravida. However, a higher figure was reported by Patel *et al.* (2018) in India, who reported that (50.3%) of women were primigravida.

Regarding the stage of pregnancy, more than half of the studied sample (56.3%) were in the

third trimester on the day of the interview, and the main purpose of the visit was to follow up on their pregnancy; these results different from the findings obtained in a previous study in Baghdad by Ehissan and Dhia AL Deen (2019), in which more than half of them were (51.4%) in the second trimester.

Knowledge about diet during pregnancy plays a central role in determining women's dietary practices Girard and Oludea (2012). Knowledge was significantly related to nutritional practices in the findings, which is consistent with previous literature in Malaysia by Ikhsan *et al.* (2018).

This study showed that (74.5%) of the respondents did practice the habit of eating snacks between meals during their pregnancy, revealing that the frequency of snack consumption per day increased during pregnancy which is different from the study conducted in Ethiopia by Beyene *et al.* (2013).

Our results were different from a study performed by Alkalash *et al.* in Egypt, which indicated that half of the women (50.0%) reported eating fruits and vegetables rarely per week. A partially equal percentage drank one cup of milk per day (48.7%), and (32.0%) ate sweets two to three times per week. This finding is in the same line with Zelalem *et al.* (2017). Meanwhile, consistent with this study were half of the women (52.3 %) and (50.2%) reported eating fruits and vegetables per day, a partially equal percentage drank one cup of milk per day (31.8%), and (21.5%) were eating sweets two to three times per day. The differences in the diet

of the communities and the knowledge difference may create these disparities.

In this study, the likelihood of having appropriate dietary practice increased with increased maternal knowledge about diet during pregnancy. All respondents in the qualitative study claimed a lack of knowledge as a barrier that hampers the dietary practices of pregnant women. This finding agrees with the study findings in Bahir Dar Town by Nana and Zema (2018). However, a study finding in Cameron by Nchang *et al.* (significant caps between 2016) reported that the women had satisfactory knowledge of adequate nutrition but significant gaps in translation into practice which is different from what this study found.

As confirmed in studies in Iranian households by Heshmat et al. (2016), the socio-economic variation in intake can be associated with nutritional knowledge as a partial mediator in improving diet. The result of this study revealed that healthy eating was significantly associated with knowledge and the possibility of meeting current recommendations for fruit, vegetable and fat intake. It showed that food purchasing differences due to household income is related to the diet via food-cost concern.

The findings of this study identified that family size has no statistical association with the nutrition practices of mothers during pregnancy. Relative to the family size of > 5 had less nutrition practice during pregnancy, which is different to the study conducted in Ethiopia by Beyene et al. (2013), that the family size has a strong statistical association with the nutrition practices of mothers during pregnancy (P<0.001). Relative to the pregnant women with family size 1-2, women with a family size of > 5had less likely nutrition practice during pregnancy which is similar to the study conducted in Accra, Ghana, the household size was a predictor of nutrient intake practice in pregnant women (Koryo-Dabrah et al., 2012) <sup>24</sup>. On the other side the study in Ethiopia by Tsegaye et al. (2020) mentioned that pregnant mothers whose family size ranges from 1 to 3 were 5.66 times more likely to have good dietary practice than those who have a family size of  $\geq 7$ . And mothers who had family sizes 4–6 were 2.84 times more likely to have good dietary practice than those who had  $\geq 7$ . This finding is supported by the study conducted in Illu Aba Bora Zone, Southwest Ethiopia; increased family size may adversely affect the nutritional status of every member of the household,

including pregnant mothers. Because the larger the family size the lesser food availability to each person within the household, which affects nutritional practice.

This study found that the mother's educational status was significantly associated with the dietary practices of pregnant women (P< 0.001). This may suggest that the mother's education increases her awareness, knowledge, access to information, and attitude about nutrition practice by reading some materials, following media, and attentively following her ANC care. This result is in line with a study conducted in America by Fouda *et al.* (2012).

The study also found that pregnancy interval and a good ANC (≥ 7 visits) were significantly associated with the dietary practices of pregnant women (P=0.008), similar to the study conducted in Ethiopia (2022) by Yismaw & Teklu. This may be nutrition-related practice because that advice and health promotion activities in the previous pregnancy will be resumed since it happened in the last few years ago. The number of ANC visits was associated with good knowledge of pregnant women in this study; this result disagreement with the study done in Kenya by Perumal et al. (2013) reported that the nutrition knowledge level of those attending ANC was not significantly varied from those not attending ANC.

# **CONCLUSIONS**

Based on the findings of the present study, all the items of knowledge and attitude considered as the factors that affect the pregnant women's practice toward nutrition, there was a significant association between women who practiced nutrition and their knowledge and attitude toward nutrition.

### REFERENCES

Alkalash SH, ELnady RT, Khalil NA and Hegazy NN (2021). Dietary Practice and Nutritional Status Among Pregnant Women Attending Antenatal Care of Egyptian, Rural Family Health Unit. *The Egyptian Journal of Hospital Medicine*, 83:1030-37. DOI: (http://creativecommons.org/licenses/by/4.0/).

Beluska-Turkan K, Korczak R, Hartell B, Moskal K,Maukonen J, E D, Alexander et al (2019)
.Nutritional Gaps and Supplementation in the First 1000 Days. *Nutrients*,11(2891): 1-50. DOI:10.3390/nu11122891.

- Beyene F, Gemede HF and Daba G (2013).

  Assessment of Nutritional Practices of Pregnant Mothers on Maternal Nutrition and Associated Factors in Guto Gida Woreda, East Wollega Zone, Ethiopia. *Star journal*, 2(3):105-13.
- Daba G, Beyene F& Fekadu H (2013). Assessment of Knowledge of Pregnant Mothers on Maternal Nutrition and Associated Factors in Guto Gida Woreda, East Wollega Zone, Ethiopia. *Journal of Nutrition & Food Sciences*,3(6):2-7. DOI: 10.4172/2155-9600.1000235.
- Danielewicz H, Myszczyszyn G, Dębińska A, Myszkal A, Boznański A & Hirnle L (2017). Diet in pregnancy—more than food. *European Journal of Pediatrics*, 176(12):1573–79. DOI 10.1007/s00431-017-3026-5.
- Ehissan HA and Dhia AL Deen L (2019). Assessment of antenatal knowledge and learning needs of pregnant women attending primary health care centers in Baghdad. *Iraqi Journal of Community Medicine*;32(2):33-41.
- Fouda LM, Ahmed MH and Shehab NS (2012).

  Nutritional Awareness of Women during Pregnancy. *Journal of American Science*, 8(7):494-502. DOI:
  - http://www.jofamericanscience.org.
- Girard AW, Oludea O (2012). Nutrition education and counselling provided during pregnancy: effects on maternal, neonatal and child health outcomes. *Paediatr Perinat Epidemiol*, 26(1):191–204.
- Gezimu W, Bekele F, Habte G (2022). Pregnant mothers' knowledge, attitude, practice and its predictors towards nutrition in public hospitals of Southern Ethiopia: A multicenter cross-sectional study. *SAGE Open Medicine*,10:1-10. DOI: org/10.1177/20503121221085843.
- Heshmat R, Salehi F, Qorbani M, Rostami M, Shafiee G, and Zeinab Ahadi Z et al (2016). Economic inequality in nutritional knowledge, attitude and practice of Iranian households: The NUTRI-KAP study. *Medical Journal of the Islamic Republic of Iran (MJIRI)*, 30:426.1-8.
- Ikhsan LN, Nasaruddin NAM, Othman F, Aziz KHA and Ismail H (2018). Nutritional Knowledge, Attitude and Practice among Antenatal and Postnatal Mothers in Hospital Tengku Ampuan Afzan (Htaa), Kuantan, Pahang.

- IIUM Medical Journal Malaysia,17(1):1-7. DOI:10.31436/imjm. v17i1.1028.
- Koletzko B, Brands B, Poston L,Godfrey K,
  Demmelmair H (2012) . Early nutrition
  programming of long-term health.

  Proceedings of the Nutrition Society ,71:371–
  8. DOI: 10.1017/S0029665112000596.
- Koryo-Dabrah A, Nti CA & Adanu R (2012). Dietary Practices and Nutrient Intakes of Pregnant Women in Accra, Ghana. *Journal Biological Sciences*, 4(4): 358-65. DOI: ISSN: 2041-0778.
- Lander RL, Hambidge KM, Westcott JE, Tejeda G, Diba TS, Mastiholi SC, et al (2019). Pregnant Women in Four Low-Middle Income Countries Have a High Prevalence of Inadequate Dietary Intakes That Are Improved by Dietary Diversity. *Nutrients*, 11(7):1-15. DOI: org/10.3390/nu11071560.
- Lee A, Newton M, Radcliffe J, Belski R (2017).

  Pregnancy nutrition knowledge and experiences of pregnant women and antenatal care clinicians: A mixed methods approach.

  Women and Birth,31(4): 269-77. DOI: org/10.1016/j.wombi.2017.10.010.
- Meija L& Rezeberga D (2017). Proper maternal nutrition during pregnancy planning and pregnancy: a healthy start in life. Recommendations for healthcare specialists ,1-29. Available from: <a href="https://www.euro.who.int/">https://www.euro.who.int/</a> data/assets/pdf\_file/0003/337566/Maternal-nutrition-Eng.
- Mitra M, Wan A, Manan W, Affizal A, Mohd S (2012). Dietary Knowledge and Behaviors in a Sample of Malay Pregnant Women. *UMT 11th International Annual Symposium on Sustainability Science and Management*. 09th-11th July, Terengganu, Malaysia.
- Nana A & Zema T (2018). Dietary practices and associated factors during pregnancy in northwestern Ethiopia. *BMC Pregnancy and Childbirth*, 18(183):1-8. DOI:org/10.1186/s12884-018-1822-1.
- Nchang Mugyia AS, Tanya ANK, Njotang PN, Ndombo PK (2016). Knowledge and attitudes of pregnant mothers towards maternal dietary practices during pregnancy at the Etoug-Ebe Baptist Hospital Yaounde. *Health Sci Dis*, 17(2):24–9.

- Patel B, GurmeetP, SinalkarD, PandyaK, Mahe nA, SinghN (2018). A study on knowledge and practices of antenatal care among pregnant women attending antenatal clinic at a Tertiary Care Hospital of Pune, MaharashtraYear, Medical Journal of Dr. *D.Y.Patil University*, 9 (3): 354-62.
- Perumal N, Cole DC, Ouédraogo HZ, Sindi K, Loechl C, Low J, et al (2013). Health and nutrition knowledge, attitudes and practices of pregnant women attending and not-attending ANC clinics in Western Kenya: a cross-sectional analysis. *BMC Pregnancy and Childbirth*.13(146): 2-12. DOI: <a href="http://www.biomedcentral.com/1471-2393/13/146">http://www.biomedcentral.com/1471-2393/13/146</a>.
- Rizwan AAM &Huda MS (2021). Knowledge and Attitude towards Nutrition among Pregnant women in Rural areas of Dhaka city, Bangladesh. *International Journal of Science and Business*, 5(7): 272-9. DOI:10.5281/zenodo.4904558.
- Shabu SA & Al-Tawil NG (2012). Prevalence of Childhood Obesity Among a Sample of Basic Education School Children in Erbil City. *Middle East Journal of Family Medicine*; 10 (10): 4-13.

- Tenaw Z, Arega M & Tachbele E (2018). Nutritional knowledge, attitude and practices among pregnant women who attend antenatal care at public hospitals of Addis Ababa, Ethiopia. International Journal of Nursing and Midwifery, 10(7):81-9. DOI:10.5897/IJNM2017.0289.
- Tsegaye D, Tamiru D and Belachew T (2020). Factors Associated with Dietary Practice and Nutritional Status of Pregnant Women in Rural Communities of Illu Aba Bor Zone, Southwest Ethiopia. *Nutrition and Dietary Supplements*, 12: 103-12.
- Yismaw WS & Teklu TS (2022). Nutritional practice of pregnant women in Buno Bedele zone, Ethiopia: a community based cross-sectional study. *Reproductive Health volume*, 19(84)2-7. DOI: org/10.1186/s12978-022-01390-1.
- Zelalem A, Endeshaw M, Ayenew M et al (2017): Effect of nutrition education on pregnancy-specific nutrition knowledge and healthy dietary practice among pregnant women in Addis Ababa. *Clinics in Mother and Child Health*, 14(3):265-69. DOI: 10.4172/2090-7214.1000265

فاکتەرێن گرێدای خوارن و خوراکێ ژنێن دوگيان ل باژێرێ دهۅٚکێ/ کوردستان- عيراق

يوخته

باکگراوه ند و ئارمانج: دوگیانی دهمهکی گهلهک گرنکه ژلایی خوارنی د ژیانا ههر ژنا دوگیان دا. بلندبوونا داخوازیی ل سهر ژیّدهریّن خوارنی ب مهرهما هیّزی بو پیّکئینانا شانهییّن نوی و وهرهرا کوّما شانهییّن ژنان وهکو مهمکا و مالبچووکی و گوهوّرینیّن دگهل دوگیانیی پهیدادبن، دبیت ببنه نهگهر ژنیّن دوگیان پتربهرهه قی ههبیت تووشی به دخوراکیی ببا.

ئا رمانجا قەكولىنى:ھەلسەنگاندنا فاكتەرىن گرىداى پراكتىكىن خوارنى و خوراكى ل دەڤ ژنین دوگیان ل باژیری دھۆكی.

رێک وپشکداری: ئەڤ قەکۆلینا دانەنیاسینا پشکەکێ ھاتیە ئەنجامدان ل سەر 400 ژنان کو ب شێوەکێ بێپایین ( عشوائی) ل چار بنگەھێن ساخلەمیا دەستپێکێ یێن چاڤدێریا دوگیانان ھاتیە کرن ئەوژی:

( بنگههێ بههدینان و بنگههێ محمد سالح بوٚتی و بنگههێ زانست دگهل بنکههێ قازی محمد) ژ سهرجهمێ 14 بنگههێن چاڤدێریا دهستپێکێ ل دهوٚکئ و ههروهسا ل نهخوٚشخانا دهوٚک یا ژنان و زاروٚکبوونێ، پاش داتا هاتنه کوٚمکرن ب رێیا رڵپرسیهکا تایبهت ژ ( 22ل نوٚقهمبهرا 2021 ههتا 2ێ ئهپرێلا 2022) ل سهر بنیاتێ چار دهمژمێران د روٚژێ دا کو حهفتیانه شهش روٚژبوونٚ.

ئەنجام: ژیێ ناڤنجی یێ پشکدارێن ڤەکۆلینێ دناڤبەرا 27′56+\_5.104 سالبوون، سێتکا وان ( 63.6%) ژ دایکان بتری زاروٚک ببیت، ئاستێ پێزانین وان یێن خوراکیێ یێ هەڤسەنگ بوو و ب تنێ ( 9.3%) هتلویستهکێ پوٚزەتیڤ هەبوو.

دەربارەى پراكتىكىن خوراكىي، پراكتىكاخوارنا خوارنى يا باشبوو دگەل ( 69.3%) و ل دۆرێن (30.8%) پراكتىكەكا پەسەنكرى ھەبوو، ھەروەسا ھەقبەنديەكا ژمێركارى يا بەرچاڤ دنافبەرا وان ژنان دا ھەبوو يىنى خودان پراكتىكەكا باش يا خوارنى (P>0.001) و دناقبەرا خالێن پپزانين و ھەلويستان دا بۆ ھەميان لى ھەمبەر خوارنى كو ھەردو ب گرنگترين فاكتەرێن ھەقالكاريى دگەل پراكتىكىن خوارنى دھێنە زانين. دەرئەنجام: ئەنجامان دياركر كو پتريا ژنين قەكۆلين ب خۆقەدگريت، ئاستەكى ناڤنجى ژ زانياريان دەربارى خوارنى د دەمى دوگيانيى دا ھەبوو، پتريا جاران ژى ھەلويست و پیزانین باش كارتیكرن ل ھەمبەر خوارنى د پراكتىكىن خوراكىي دا ل دەمى دوگيانىي ھەيە.

العوامل المرتبطة بالممارسات التغذوية والغذائية للنساء الحوامل في مدينة دهوك / كردستان العراق

### الخلاصة

الخلفية: الحمل هو الفترة الأكثر أهمية من الناحية التغذوية في حياة كل امرأة. إن ارتفاع الطلب على العناصر الغذائية لإيداع الطاقة في تكوين أنسجة جديدة ، ونموأنسجة الأمهات مثل الثدي والرحم والتغييرات المصاحبة للحمل قد يجعل النساء الحوامل أكثرعرضة لسوء التغذية.

الهدف من الدراسة: تقييم العوامل المرتبطة بالممارسات التغذوية والغذائية للنساء الحوامل في مدينة دهوك.

الطرق والأساليب: أجريت هذه الدراسة الوصفية المقطعية على 400 من النساء اللاتي تم اختياهن عشوائيا في اربعة من المراكزالصحية الاولية لرعاية الحوامل: مركز بهدينان ومركزمحمد صالح بوتي ومركززانست ومركزقاضي محمد) من أصل 14 من مراكزالرعاية الصحية الأولية في دهوك) وفي مستشفى دهوك للتوليد وأمراض النساء ايضا. تم جمع البيانات باستخدام استبيان خاص من (22 نوفمبر 2021 إلى 2 أبريل 2022) على أساس 4 ساعات في اليوم ، موزعة على 6 أيام من كل أسبوع.

النتائج: كان متوسط عمر المشاركات في الدراسة  $27.56 \pm 5.104 \pm 5.104$  سنة, وحوالي ثلثي (63.6) من الأمهات قبل الولادة لديهن مستوى معرفة تغذوية معتدل وفقط (9.3) من النساء لديهن موقف سلبي ، في حين أن 90.8) كان لديهن موقف إيجابى.

وفيما يتعلق بالممارسات التغذوية، كانت ممارسة تناول التغذية الجيدة في (69.3)) منهن، وما يقرب من ثلثهن (30.8)) كان لديهن ممارسة تغذوية مقبولة. كما كان هناك ارتباط احصائي ملحوظ بين النساء اللواتي صاحبات الممارسات التغذوية الجيدة (P < 0.001)وبين نقاط المعارف والمواقف لكل منهن تجاه التغذية واللذان يعتبران من اهم العوامل المصاحبة لممارساتهم التغذوية.

الاستنتاجات: بينت النتائج إلى أن غالبية النساء اللاتي شملتهم الدراسة لديهم مستوى متوسط من المعرفة تجاه التغذية أثناءالحمل، وعادة ما تؤثر المعرفة والمواقف الجيدة تجاه التغذية على الممارسات التغذوية أثناء الحمل.