Perception of Pregnant Women regarding Folic Acid Intake

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Abstract

Background: Folic acid plays a basic role in fetal growth, development and prevents fetal malformations. Pregnant woman's perception regarding folic acid supplementation is critical**. Aim:** This study aimed to assess perception of pregnant women regarding folic acid intake. **Design:** A descriptive design was utilized to fulfill the aim of the current study. **Setting:** The study was conducted at Obstetric and Gynecological Outpatient Clinic in Benha university Hospital**. Sampling:** A Purposive sample of 240 pregnant women**. Tools:** Two tools were used: A structured interviewing questionnaire which consisted of four parts: Demographic characteristics, obstetrics history, knowledge of pregnant women about folic acid intake and Modified likert scale to assess attitude towards folic acid intake**. Results**: More than two thirds of studied pregnant women had poor knowledge regarding folic acid intake. Only less than one third had positive attitude regarding folic acid intake. **Conclusion**: There was highly positive correlation between total knowledge and total attitude score regarding folic acid intake among pregnant women. **Recommendations**: Application of an educational program to improve perception of pregnant women regarding folic acid intake. Containing education program for pregnant women regarding benefits and safety of folic acid supplementation during pregnancy

Keywords: Folic acid, Perception, Pregnant women.

Introduction

Pregnancy constitutes a major life event for all women that cause physiological and psychosocial changes. Pregnancy is a process and series of changes that take place in a woman's organs and tissues because of a developing fetus **(Asselmann et al., 2020).**

Pregnancy is a normal process which a pregnant woman is typically able to manage most of the problems or issues that occur with some support from healthcare providers. Most women progress through pregnancy without complications, requiring little specialized medical or nursing intervention, yet prenatal care is essential for the health and well-being of both the pregnant woman and the developing fetus **(Funk et al., 2021).**

Folic acid vitamin is vital in natural form or multivitamin preparations. Folic acid was thought to be much better absorbed than naturally occurring foliate. Foliate is found naturally in a wide variety of foods **(Sobczyńska, 2019)**. Folic acid is vitamin B9 and helps decrease the risk of having a new born with certain birth defects of the brain and spinal cord especially before getting pregnant **(Jalambadani et al., 2020)**.

Nutritional folate consumption is not sufficient for optimal reduction risk of neural tube defects. Therefore, many countries encourage women to take folic acid before pregnancy **(Moser et al., 2019).** Folic acid is very important because it can help prevent

some major birth defects of the baby such as anencephaly and spina bifida **(Niguse, 2019).**

In addition, folic acid deficiency on pregnancy lead to complications such as congenital heart disease, preeclampsia, pregnancy loss, placental abruption, preterm labor, and multiple pregnancies has reported. Folic acid daily intake is 400 µg received from vitamin supplementation and fortified food to decrease the risk of neural tube defects. In high-risk pregnancies (previously affected) the dose is recommended for 1-3 months prior to conception and first three month during pregnancy **(Argyridis, 2019).**

The World Health Organization has recommended having daily oral iron and folic acid supplementation with 30 mg to 60 mg of iron and 0.4 mg folic acid for pregnant and postnatal women to prevent maternal anemia, puerperal sepsis, low birth weight, and preterm birth **(King et al., 2021).**

Some factors have been associated with intake of folic acid supplementation during pregnancy, including maternal age, educational status, marital status, employment status, the number of prior pregnancies and income, whether the pregnancy was planned or unplanned, and the level of knowledge and awareness of the importance of folic acid supplementation before and during pregnancy **(Wald et al., 2020).**

Perception is the process of selecting, organizing, and interpreting information from our senses. Selection: Focusing attention on certain sights, sounds, tastes, touches, or smells in environment. Organization: Taking the information selected organizing it into a coherent pattern in mind. Interpretation: Assigning meaning to the information selected by calling to mind relevant, familiar information to make sense of what are hearing or seeing **(Sarwar and Alsaggaf, 2022).**

Nurses play basic role in educating women about folic acid, but also have an exceptional opportunity to influence women's behaviors regarding folic acid intake and food selection, including dispelling myths about vitamin consumption, providing strategies for overcoming barriers associated with daily use of folic acid, and helping women make healthy food choices **(Lu et al., 2020).**

Moreover, education about folate consumption is an important component of nutrition deficiency prevention, nurses are in a key position to carry out health education, because have continuous contact with women, and usually most accessible source of information for woman. To facilitate this process, nurses can act as educators concerning dietary intake, weight management, and potentially harmful nutritional practices **(Zelalem, et al., 2019).**

Significance of the study:

Maternal folic acid deficiency is associated with birth defect recommend as a serious, worldwide health concern increase knowledge and positive attitude of pregnant women regarding folic acid intake help to prevent complication (Tan et al., 2018). Neural tube defects (NTDS) have an incidence of 1-5 per 1000 live births over world. The two most common neural tube defects are spina bifida and anencephaly **(Kumar et al., 2020).**

The incidence of NTDs in the United States is approximately one per 1,000 pregnancies. Approximately one third of 4,000 pregnancies with NTDs end with spontaneous or induced abortion, so there are about 2,500 live births with NTD annually in the US **(Shamsuddin et al., 2019).**

Each year, 300.000 to 400.000 infants worldwide are born with spinabifida and anencephaly. In Egypt the frequency of congenital malformations (CMs) among children aged 0–18 years was 2%. The estimated incidence of CMs of the Central

Nervous System (CNS) is 26.92%. Anomalies of CNS are considered the most common anomalies in live born and still born in Egypt as well as in other countries **(Alshahwani and Abdullah, 2019).**

Therefore, pregnant women's perception for folic acid supplementation is critical for prevention congenital malformation. Also, to the best of our knowledge, there is no researches have been conducted about perception of pregnant woman regarding folic acid intake at the University of Benha. So, this study was conducted to assess perception of pregnant women regarding folic acid intake.

Aim of the study

This study aims to assess perception of pregnant women regarding folic acid intake

Study Questions:

- What is the knowledge level of pregnant women regarding folic acid intake?
- What is the attitude level of pregnant women regarding folic acid intake?
- Is there correlation between knowledge and attitude level of pregnant women regarding folic acid intake?

Subjects and Method

Study design:

A descriptive design was utilized to fulfill the aim of the current study.

This design helps the investigator to describe and document aspects of a situation as it naturally occurs. As well, this design helps to establish future research **(Silyeyew, 2019).**

Setting of the study:

The study was conducted at obstetrics and gynecological out-patient clinic in Benha University Hos Sampling:

Sampling type: A Purposive sample was used in the study**.**

Sampling size: A total of 240 pregnant women.

Inclusion criteria:

- Pregnant women < 12 weeks.
- Not had any children with neural tube defects.
- Willing to participate in the study.

Tools of data collection:

Two tools were used for data collection.

Tool I: A Structured Interviewing Questionnaire: It was designed by the researcher after reviewing the related literatures **(Elzaki and Motawei., 2019., Atblowi and Alomayri .,2018; ;Koirala and Pokharel., 2018) .** It was written in an Arabic language and included three parts:

Part 1: Demographic characteristics of pregnant women included (age, education level, and residence, occupational and monthly income).

Part 2: Obstetric history of pregnant women included (gravidity, parity, mode of delivery, number of abortion and gestational age).

Part3: Pregnant women's knowledge regarding folic acid intake it included two sections that consisted of 15 items:

Section one: knowledge about folic acid included (11) items (definition of folic acid, time of intake folic acid, dose recommended of folic acid, importance of folic acid, foods rich of folic acid, maintain the value of folic acid in dietary natural sources, cases of increase folic acid, symptoms of folic acid increase if taken without a prescription, causes of folic acid deficiency, symptoms of folic acid deficiency and complications of folic acid deficiency).

Section two: knowledge about neural tube defects included (4) items (definition of neural tube defects, causes, complications and prevention methods of neural tube defects).

Scoring system of knowledge:

The complete correct answer was scored as (3) and incomplete correct answer was scored as (2) and wrong answer was scored as (1). Total score ranged from (15- 45). These

scores was summed and converted into a percent score.

- Good knowledge if score ≥ 75% (34 < 45).
- Average knowledge if score from 50 > 75 % (23<34).
- Poor knowledge if score < 50% (15<23).

Tool II: Modified likert scale

It was developed by **Mcleod, (2008)** and adapted by the researcher to assess the attitude of pregnant women regarding folic acid intake included(14) items positive attitude and negative.

Scoring system of attitude:

Each item was related based on three point likert scale agree, uncertain and disagree and was scored 3, 2 and 1 respectively. Total score ranged from (14 – 42). The scoring was reversed for negative statements; the scores of the items were summed up and will be converted into a percentage score.

Total attitude score classified into two categories as following:

- Positive attitude if score ≥ 60% (25 < 42).
- Negative attitude if score < 60% (14 < 25).

Tools validity and reliability

Tools of data collection were reviewed by three panel expertise of two professor of Obstetrics and Gynecological Nursing and one obstetrics and gynecological medical faculty of nursing Benha University to test content validity. According to jury opinions the tools was clear, feasible and there was no ambiguity in the language. No modifications were done. Reliability was done by Cronbach's alpha test which revealed that each of tools consisted of relatively homogenous items as indicated by moderate to high reliability of each tool. The internal consistency was for knowledge 0.86 and it was for attitude 0.82.

Ethical considerations:

The study approval was obtained from the Scientific Research Ethical Committee at Faculty of Nursing Benha University before starting the study. Oral consent was obtained from each studied pregnant woman who participates in the study. Each pregnant woman was informed about the purpose and benefits the study. Confidentiality was ensured throughout the study, where personal data were not disclosed, and pregnant women was assured that all data will be used only for the research purpose. No harm or any physical, social or psychological risk for participants. Freedom to withdraw from study.

Pilot study:

The pilot study was conducted on 10 % of the total sample (24 pregnant women) to test the clarity, feasibility and applicability of the study tools, estimate the time required to fill in the questionnaires. Based on the results of the pilot study, no modifications were done in the tools of data collection. So, the pilot sample was included in the main study sample.

Field work:

- The study was started by reviewing current and related literature. Also, theoretical knowledge of various aspects of the study using books, articles, periodicals, magazines, and internet to develop tools for data collection.
- The study was carried out from the beginning of June 2021 till the end of November, 2021covering six months.
- The researcher visited the previous mentioned setting for three days per week (Sunday, Tuesday, and Thursday) started from 9 am to 12pm. At the beginning of the interview the researcher greeted and introduced herself to each pregnant woman.
- Then, the researcher was explained the purpose and aim of study briefly to each pregnant woman and oral consent obtained from each pregnant woman for participating the study.
- A Structure interviewing questionnaire used tool I to collect demographic data and obstetric history, also assessed knowledge of women

regarding folic acid intake and neural tube defects which took 15- 20 minutes.

- Assess attitude of pregnant women regarding folic acid intake and neural tube defects using modified likert scale tool II which took 10- 15 minutes.
- The researcher met 3-4 pregnant women per day and the total time of data collection 25-35 minutes.

Statistical analysis:

The data were coded, computed and statistically analyzed by using Statistical Package of Social Sciences version SPSS 25program. Data were presented as frequency and percentages (qualitative variables) and mean and standard deviation (quantitative continuous variables). Correlation coefficient was calculated between knowledge, and attitude scores. A statistically significant difference was considered at p-value ($P \leq 0.05$), and a highly statistically significant difference was considered at p-value ($p \leq .001$).

Limitations of study:

There was limited of the local and national researcher that studied the current topic of the study. Occasionally, the waiting place of the obstetrics and gynecology outpatient clinic was crowded and noisy, which required more time and effort to conduct the study.

Results:

Table (1) shows that 52.1% of studied sample were in age group 25 <30 years old with mean± SD of 26.75 ± 4.21 years. Regarding educational level, 80.0% of them had secondary education. Also, 87.9% were living in rural area. And 72.9% of them were house wife. Considering monthly income 57.9% had not enough income.

Table (2) illustrates that 67.5%, 52.1%, 76.6%, 85.0% of studied pregnant women didn't know (time of intake of folic acid ,dose recommended of folic acid , symptoms of increase folic acid , symptoms of folic acid deficiency) respectively. Also, 54.5%, 66.6%, 65.8%, 62.5%, 53.3% of them had incomplete correct answer about definition of folic acid, importance of folic acid , foods rich of folic acid, cases of increase folic acid, causes of folic acid deficiency respectively**.**

Table (3) shows that 68.4%, 67.5%, 63.7%, 65.4% of the studied pregnant women reported don't know answers regarding (definition of neural tube defects, causes of neural tube defects, complication of neural tube defects, prevention of neural tube defects respectively.

Table (4) clarifies that 54.6%, 55.8% of studied sample agreed that (Eating foods rich in folic acid can make a generally healthy person, Could eat a diet rich in folic acid all the time if tried) respectively. Meanwhile 56.6%, 53.7%, 65.0%, 49.5%, 68.7%, 61.7%, 58.3%, 55.8%, 62.1% of studied sample had neutral answer (Folic acid is very important for preventing neural tube defects before pregnancy, If didn't eat a diet rich in folic acid before pregnancy, Having neural tube defects will leave a child disabled for life, neural tube defects are a very serious and avoidable condition, Complications in a baby with neural tube defects are severe and can lead to death, Having a baby with a neural tube defect would be very expensive, It is not easy to find folic acid supplements, It's easy to get the recommended amount of folic acid, Eating a diet rich in folic acid would be expensive,) respectively. Also, 46.7%, 51.2% of studied sample had disagreed (If don't have a family history of neural tube defects not at risk of having a baby with a neural tube defect, Folic acid supplements are inexpensive) respectively.

Table (5) illustrates that there was highly positive correlation between total knowledge and attitude score regarding folic acid intake among pregnant women ($p \leq 0.001$).

Table (1): Distribution of the studied pregnant women according to demographic characteristics (n=240)

Demographic characteristics	n=240	
	No	%
Age (years)		
< 20	24	10.0
20 < 25	73	30.4
25 < 30	125	52.1
≥ 35	18	7.5
Mean ± SD	26.75 ± 4.21	
Educational level		
Primary school	26	10.8
Secondary school	192	80.0
High education	22	9.2
Residence		
Rural	211	87.9
Urban	29	12.1
Occupation		
Working	65	27.1
House wife	175	72.9
Monthly income		
Enough	101	42.1
Not enough	139	57.9

Table (2): Distribution of the studied pregnant women according to knowledge regarding folic acid (n=240)

Variables	Complete correct answer		Incomplete correct answer		Don't know	
	No.	%	No.	%	No.	%
Definition of Folic acid	63	26.3	131	54.5	46	19.2
Time of Intake of folic acid	34	14.2	44	18.3	162	67.5
Dose recommended of folic acid	17	7.1	98	40.8	125	52.1
Important of folic acid	21	8.8	160	66.6	59	24.6
Foods rich of folic acid	25	10.4	158	65.8	57	23.8
Maintain the value of folic acid in dietary	67	27.9	75	31.3	98	40.8
Cases of Increase folic acid	18	7.5	150	62.5	72	30.0
Symptoms of increase folic acid	16	6.7	40	16.7	184	76.6
Causes of folic acid Deficiency	25	10.4	128	53.3	87	36.3
Symptoms of folic acid Deficiency	17	7.1	19	7.9	204	85.0
Complication of folic acid Deficiency	73	30.4	55	22.9	112	46.7

Table (3): Distribution of the studied pregnant women according to knowledge regarding Neural tube defects (n=240)

Variables	Complete correct answer		Incomplete correct answer		Don't know	
	No.	%	No.	%	No.	%
Definition of Neural tube defects	8	3.3	68	28.3	164	68.4
Causes of neural tube defects	12	5.0	66	27.5	162	67.5
Complication of neural tube defects	10	4.2	77	32.1	153	63.7
Prevention of neural tube defects	35	14.6	48	20.0	157	65.4

Table (4): Distribution of the studied pregnant women according to attitude toward folic acid intake (n=240)

Items	Agree		Neutral		Disagree	
	No.	%	No.	%	No.	%
Folic acid is very important for preventing neural tube defects before pregnancy.	45	18.8	136	56.6	59	24.6
If didn't eat a diet rich in folic acid before pregnancy, might have a baby with neural tube defects.	63	26.3	129	53.7	48	20.0
Eating more foods rich in folic acid can prevent or reduce the risk of having a baby with a neural tube.	67	27.9	72	30.0	101	42.1
If don't have a family history of neural tube defects, not at risk of having a baby with a neural tube defect.	25	10.4	103	42.9	112	46.7
Having neural tube defects will leave a child disabled for life.	77	32.1	156	65.0	7	2.9
Neural tube defects are a very serious and avoidable condition.	15	6.3	119	49.5	106	44.2
Complications in a baby with neural tube defects are severe and can lead to death.	70	29.2	165	68.7	5	2.1
Having a baby with a neural tube defect would be very expensive.	92	38.3	148	61.7	0	0.0
Eating foods rich in folic acid can make a generally healthy person.	131	54.6	98	40.8	11	4.6
It is not easy to find folic acid supplements.	17	7.1	140	58.3	83	34.6
Folic acid supplements are inexpensive.	22	9.2	95	39.6	123	51.2
It's easy to get the recommended amount of folic acid.	19	7.9	134	55.8	87	36.3
Eating a diet rich in folic acid would be expensive.	65	27.1	149	62.1	26	10.8
Could eat a diet rich in folic acid all the time if tried.	134	55.8	94	39.2	12	5.0

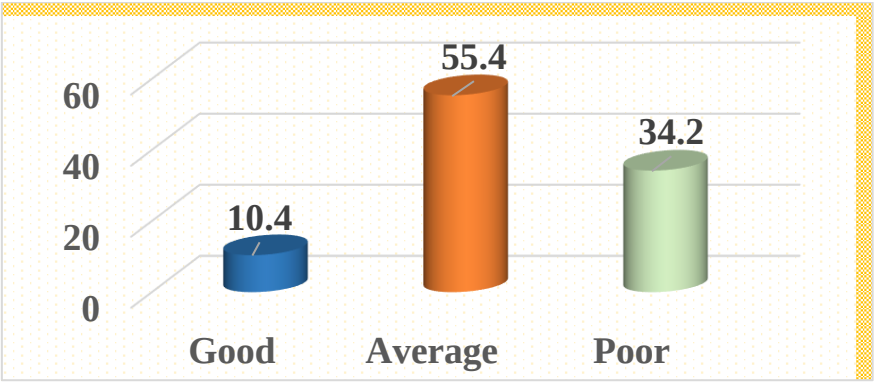

Figure (1): Distribution of the studied pregnant women according to level of knowledge about Folic acid (n=240)

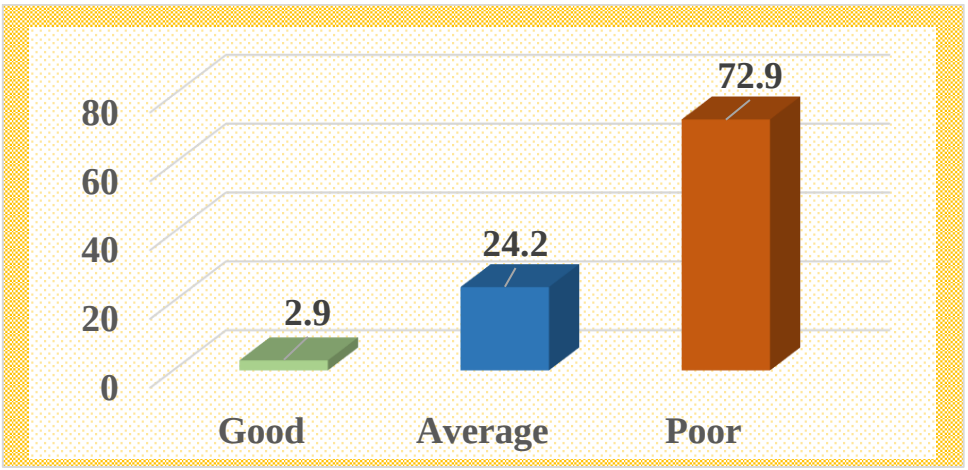

Figure (2): Distribution of the studied pregnant women according to level of total knowledge about neural tube defects (n=240)

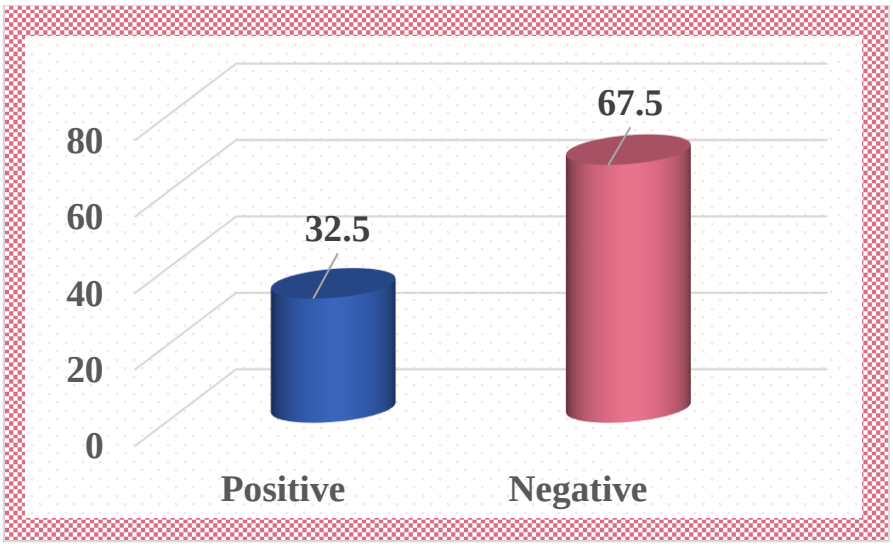

Figure (3): Distribution of the studied pregnant women according to level of total attitude toward folic acid intake (n=240)

Table (5): Correlation between studied pregnant women total knowledge and attitude scores regarding folic acid intake (n=240)

Variable	Total knowledge score	
	r	P value
Total attitude score	0.584	0.000**

****A highly statistical significant difference (P ≤ 0.001)**

Discussion

Regarding demographic characteristics of the studied pregnant women, the current study revealed that more than half of the studied sample ranged in age from 25 to less than 30 years old with mean ± SD 26.75 ± 4.21 years. This result was similar to a study conducted by **Mamo et al., (2021)** to assess "Adherence to prenatal iron–folic acid supplementation and associated factors among pregnant women attending antenatal care services in Dilla town, South Ethiopia" and stated that the mean age of the studied pregnant women was (27.5 ± 5.1) years and most participants were between 25 and 34 years of age.

Concerning educational level, the present study showed that more than three quarters of the studied pregnant women had secondary education. This may be due to the low socioeconomic status of mothers who have not completed education and they prefer to stay at home to take care of children. This result matched with **Kamau et al., (2018**), who carried out a study about "Counseling on iron and folic acid supplementation is associated with improved knowledge among pregnant women in a rural county of Kenya" found that the most proportion of the studied sample had completed secondary education and beyond.

As regards residence, the present study reported that most of the studied pregnant women were living in rural area. This may be due to most women live in rural area around benha university hospital result also agreed with a study performed by **Sailaja et al. (2019),** who studied "Effect of structured teaching program on Folic Acid supplements in the prevention of congenital anomalies among undergraduate students in a selected college, Tirupathi" demonstrated that the majority of the studied sample residing in the rural areas.

Regarding to occupation, the current study represented that less than three quarters of the studied pregnant women were house wives. This result might be due to social beliefs which play an important role, such as considering women's work outside the home unnecessary. This result was in the same line with a study by **AlDuraibi and Al-Mutawa, (2020)**, who studied "Knowledge and awareness of folic acid usage in Saudi pregnant women in Riyadh city from 2019-2020" and reported that most of the studied pregnant women were unemployment.

Related to monthly income, the current study found that more than half of the studied pregnant women had not enough income. This finding disagreed with **Al Arifi et al., (2022)**, who carried out a study entitled "Knowledge and Practice of Childbearing Women in Saudi Arabia towards Folic Acid Supplement" and reported that more than two-thirds of the studied women had income meets family needs. This may be due to different social levels in countries.

Concerning the studied pregnant women's total knowledge about folic acid intake, the present study revealed that nearly

three quarter of the studied pregnant women had poor level of total knowledge about folic acid. Less than one quarter of them had average level and the minority of them had good level. This is answered the first research question which stated what is the knowledge level of pregnant women regarding folic acid intake? This result is in agreement with **Goshu et al., (2018)** who studied "Women's awareness and associated factors on preconception folic acid supplementation in Adet, Northwestern Ethiopia and revealed that the minority of participants had good knowledge on preconception folic acid supplementation.

Regarding level of knowledge about folic acid. The present study clarified that more than half of the studied pregnant women had average knowledge, more than one third of them had poor and about one tenth of them had good level of knowledge. This result is nearly similar to **Koirala and Pokharel, (2018).** Who studied "Assessing the level of knowledge in the pre-conception use of Folic Acid supplement among primigravida women "and showed that the minority of total respondents had good knowledge about pre-conception folic acid benefits.

Regarding knowledge of the studied pregnant women about folic acid, the present study declared that most didn't know symptoms of folic acid deficiency. This result was contrasted with **Kamau et al. (2019),** who carried out a study entitled "Maternal knowledge on iron and folic acid supplementation and associated factors among pregnant women in a rural county in Kenya" and declared that the studied pregnant women were most knowledgeable on effects of not taking enough folate.

In addition, the current study represented that more than two thirds of the studied pregnant women had incomplete correct answer about importance of folic acid. This result was consistent with **Sun et al., (2018),** who conducted a study to assess "knowledge, attitude and practice of folic acid supplement status in women of childbearing age in Dongguan city" and established that the most of the studied women knew that folic acid could prevent birth defects.

Regarding knowledge about neural tube defects, the current study demonstrated that almost three quarters of the studied pregnant women had poor knowledge, nearly one quarter of them had average level and the minority of them had good knowledge. This may be related to most sample had secondary education of the pregnant women) These findings were congruent with **Babgi et al., (2019**), who studied "Awareness of risk factors and preventive measures for neural tube defects: Perception towards pregnancy termination in the Saudi population" and stated that two-thirds of the studied women were not aware of neural tube defects.

According to knowledge of the studied pregnant women about neural tube defects, the present study illustrated that more than two thirds of the studied pregnant women didn't know what neural tube defects. This result was disagreed with **Al-Mohaithef et al., (2021**). who conducted a study entitled "Folic acid awareness and usage among females at Saudi Electronic University in Jeddah, Saudi Arabia" and mentioned that nearly two-thirds of the studied sample knew about neural tube defects.

The current study represented that more than half of the studied pregnant women agreed with "Eating foods rich in folic acid can make a generally healthy person and it's easy to get the recommended amount of folic acid". This result was in the same line with **Sadiq and Hussein, (2022)** who carried out a study entitled "Assessment of knowledge and attitudes among pregnant women towards folic acid intake during pregnancy in a sample of women attending primary health care centers

in Babylon province" and mentioned that a higher percentage of women agreed that eating foods rich in folic acid can make a generally healthy person and it's easy to get the recommended amount of folic acid.

Concerning the studied pregnant women's total attitude toward folic acid intake, the present study illustrated that more than two thirds of sample had negative attitude toward folic acid intake while nearly one third of them had positive attitude. This may be due to inadequate fevel of knowledge and awareness of the pregnant women regarding folic acid intake. This is answered the second research question which stated what is the attitude level of pregnant women regarding folic acid intake? These findings contrasted **Ali and Lefta, (2018)** who conducted a study entitled "assessment of knowledge and attitudes among pregnant women towards folic acid intake during pregnancy in al-Diwaniya province" and declared that the majority of the pregnant women had positive attitudes toward uses of folic acid during pregnancy.

Additionally, the current study clarified that more than half of the studied pregnant women was neutral with "If didn't eat a diet rich in folic acid before pregnancy, might have a baby with neural tube defects and Folic acid is very important for preventing neural tube defects before pregnancy". This finding was in contrast with **Mabuza et al., (2021)** who conducted a study about "Assessment of Knowledge and awareness of pregnant on uses folic acid" and showed that less than two-thirds of pregnant women agreed that folic acid can protect from congenital abnormalities.

These findings agreed with **Adebo et al. (2017)** who carried out a study to assess "Knowledge and intake of folic acid among pregnant women attending a secondary health facility in Nigeria" and reported that there was significant association between age and knowledge of folic acid (P 0.046). in addition, regarding occupation (more knowledge in employment status).

Also, these findings agreed with **Begashaw et al., (2022**) who carried out a study to assess "Preconception of folic acid supplementation knowledge among Ethiopian women reproductive age group in areas with high burden of neural tube defects: a community based cross-sectional study" and reported that knowledge score was significantly associated with level of education. residency, and occupation of pregnant women ($P<0.05$).

Additionally, these results were in accordance with **Kim et al., (2018)**. Who studied "Awareness, knowledge, and use of folic acid among non-pregnant Korean women of childbearing age" and informed that age and education were the factors associated with knowledge of the studied women. On other hand the result contrast the study by Sadiq and Hussein, (2022) who found that there was no significant association between the level of education and knowledge of the studied women. Also, these results contrasted with **Al-Mohaithef et al., (2021)** who stated that there was no significant relation between the studied women level of education and knowledge.

These results were in harmony with **Li et al., (2019)** who carried out a study to assess "Knowledge, attitude and practice level of women at the periconceptional period" and found that socio-demographic characteristics of the studied women affect the side the adopting. But these results disagreed with **Boakye Vladom at (2020)** who studied Preconception are awareness, knowledg attitude and practice of pregnant women, tamale west hospital" and reported that none of the independent variables had statical association with attitude of the pregnant women.

Finally, the present study illustrated that there was highly positive correlation

between total knowledge and attitude of the pregnant women regarding folic acid intake. This is result answered the third research question which stated is their correlation between knowledge and attitude level of pregnant women regarding folic acid intake? This can be explained by the knowledge level that women had which may change the women attitudes and control women behavior. This result was in agreement with **Gamboa et al., (2020)** who carried out a study about "Interpersonal communication campaign promoting knowledge attitude, intention, and consumption of iron folic acid tablets and iron rich foods among pregnant Indonesian women and declared that negative attitudes scores of pregnant women decreased with theincreased level of knowledge regarding folic acid intake,

Finally, in view of the above-mentioned findings the study questions were answered.

Conclusion:

More than two thirds of studied pregnant women had poor knowledge and negative attitude regarding folic acid intake. There was highly positive correlation between total knowledge and attitude scores regarding folic acid intake among pregnant women. The study results findings answered the research questions and achieved the aim of the study

Recommendations

- Application of an educational program to improve perception of pregnant women regarding folic acid intake.
- Improving awareness and attitude about folic acid intake through disseminating booklet and posters.
- Containing education program for pregnant women regarding benefits and safety of folic acid supplementation during pregnancy.

Further studies to be performed:

- Reapplication of study on a large sample for generalizing the findings.
- Assess the existing maternity nurse's knowledge about important intake folic acid

References:

Adebo, O. O., Dairo, D. M., Ndikom, C. M., and Adejumo, P. O., (2017). Knowledge and uptake of folic acid among pregnant women attending a secondary health facility in Nigeria. British Journal of Midwifery, 25(6), 358-364

Al Arifi, M. N., Alqahtani, A. M., Alotaibi, A. N., Babelghaith, S. D., Alwhaibi, A., Alsanea, S., and Al-Arifi, N. M., (2022). Knowledge and Practice of Childbearing Women in Saudi Arabia towards Folic Acid Supplement—Evidence from a Cross-Sectional Study. Nutrients, 14(2), 357.

Alblowi, S, A., and Alomayri, M, H., (2018). Assessment of Knowledge, Awareness, and Behavior of Folic Acid Use among Females during the Childbearing Period in Tabuk City-2017, The Egyptian Journal of Hospital Medicine, 70(7):1242-1247.

AlDuraibi, S., and Al-Mutawa, J., (2020). Knowledge and awareness of folic acid usage in Saudi pregnant women in Riyadh city from 2019-2020. Journal of Family Medicine and Primary Care, 9(10), 5158

Ali, F. H., and Lefta, R. M., (2018). assessment of knowledge and attitudes among pregnant women's toward folic acid intake during pregnancy in al-diwaniya province.

Al-Mohaithef, M., Alaslani, H., Javed, N. B., and Chandramohan, S., (2021). Folic acid awareness and usage among females at Saudi Electronic University in Jeddah, Saudi Arabia. SAGE open medicine, 9, 20503121211059682.

Alshahwani, S. M., and Abdullah, S. A., (2019). Neural tube defects: Incidence and

types. The Medical Journal of Tikrit University, 25(1), 104-114

Argyridis, S., (2019). Folic acid in pregnancy, Obstetrics, Gynaecology & Reproductive Medicine, 29(4):118-120.

Asselmann, E., Kunas, S. L., Wittchen, H. U., and Martini, J., (2020). Maternal personality, social support, and changes in depressive, anxiety, and stress symptoms during pregnancy and after delivery: A prospective-longitudinal study. Plos one, 15(8), e0237609.

Babgi, M. A., Al-Jifree, H. M., AlShehri, O. A., Khan, M. A., Khogeer, A. N., and Alqurashi, M. A., (2019). Awareness of risk factors and preventive measures for neural tube defects: Perception towards pregnancy termination in the Saudi population. Journal of Neonatal-Perinatal Medicine, 12(2), 195-201.

Begashaw, B., Tariku, Z., and Berhane, A., (2022). Preconception of folic acid supplementation knowledge among Ethiopian women reproductive age group in areas with high burden of neural tube defects: a community based cross-sectional study. Journal of Nutritional Science, 11.

Boakye-Yiadom, A., Sagru-Larr, E., Oduro, E., Asumadu, O., Saah, J, and Asare, R. (2020). Preconception care: awareness, knowledge, attitude And practice of pregnant women, tamale west hospital. American Journal Of Health, Medicine And Nursing Practice, 5(1), 66-83**.**

Elzaki, B. E., and Motawei, A. M., (2019). Assessment of Knowledge, Dietary Habits and Nutritional Status among Mansoura University Students, Journal of Food and Dairy Sciences, 10(9):337-348.

Funk, A. L., Lu, Y., Yoshida, K., Zhao, T., Boucheron, P., van Holten, J., and Shimakawa, Y., (2021). Efficacy and safety of antiviral prophylaxis during pregnancy to prevent mother-to-child transmission of hepatitis B virus: a systematic review and meta-analysis. The Lancet Infectious Diseases, 21(1), 70 84.

Gamboa, E., Broadbent, E., Quintana, N., Callaway, S., Donoso, P., Linehan, M., and Crookston, B. T., (2020). Interpersonal communication campaign promoting knowledge, attitude, intention, and consumption of iron folic acid tablets and iron rich foods among pregnant Indonesian women. Asia Pacific Journal of Clinical Nutrition, 29(3), 545-551.

Goshu, Y. A., Liyeh, T. M., Ayele, A. S., Zeleke, L. B., and Kassie, Y. T., (2018). Women's awareness and associated factors on preconception folic acid supplementation in Adet, Northwestern Ethiopia, 2016: Implication of reproductive health, Journal of nutrition and metabolism. 1-7.

Jalambadani, Z., Delavari Heravi, M., and Noori Sistani, M., (2020). Folic acid consumption based on the theory of planned behavior in pregnant women, Journal of Obstetrics and Gynecology, 40(1):37-39.

Kamau, M. W., Mirie, W., and Kimani, S. T., (2019). Maternal knowledge on iron and folic acid supplementation and associated factors among pregnant women in a rural county in Kenya. International journal of Africa nursing sciences, 10, 74-80.

Kamau, M., Kimani, S., and Mirie, W. (2018). Counselling on iron and folic acid supplementation (IFAS) is associated with improved knowledge among pregnant women in a rural county of Kenya: a cross-sectional study. AAS Open Research, 1.

Kim, M. J., Kim, J., Hwang, E. J., Song, Y., Kim, H., and Hyun, T., (2018). Awareness, knowledge, and use of folic acid among non-pregnant Korean women of childbearing age. Nutrition research and practice, 12(1), 78-84.

Kim, M. J., Kim, J., Hwang, E. J., Song, Y., Kim, H., and Hyun, T., (2018). Awareness, knowledge, and use of folic acid among non-

pregnant Korean women of childbearing age. Nutrition research and practice, 12(1), 78-84.

King, S. E., Yeh, P. T., Rhee, D. K., Tuncalp, Ö., Rogers, L. M., and Narasimhan, M., (2021). Self-management of iron and folic acid supplementation during pre-pregnancy, pregnancy and postnatal periods: a systematic review. BMJ global health, 6(5), e005531**.**

Koirala, S., and Pokharel, S., (2018). Assessing the level of knowledge in the pre-conceptional use of Folic Acid supplement among primigravida women, Kathmandu Univ Med J, 64(4), 306-10.

Kumar, M., Hasija, A., Garg, N., Mishra, R., and Chaudhary, S. R., (2020). Relative Prevalence and Outcome of Fetal Neural Tube Defect in a Developing Country. The Journal of Obstetrics and Gynecology of India, 70(3), 195-201.

Li, D., Huang, L., Yang, W., Qi, C., Shang, L., Xin, J., and Chung, M. C., (2019). Knowledge, attitude and practice level of women at the periconceptional period: a cross-sectional study in Shaanxi China. BMC pregnancy and childbirth, 19(1), 1-12.

Lu, H., Zhao, Y., and While, A., (2020). Job satisfaction among hospital nurses: a literature review, International journal of nursing studies, 94(1):21 -31.

Mabuza, G. N., Waits, A., Nkoka, O., and Chien, L. Y., (2021). Prevalence of iron and folic acid supplements consumption and associated factors among pregnant women in Eswatini: a multicenter cross-sectional study. BMC Pregnancy and Childbirth, 21(1), 1-10.

Mamo, T. T., Ashenafi, E., Gube, A. A., and Bekele, T., (2021). Adherence to prenatal iron–folic acid supplementation and associated factors among pregnant women attending antenatal care services in Dilla town, South Ethiopia. Medicine Access@ Point of Care, 5, 23992026211008805.

Mcleod, E., (2008) Subwavelength direct-write nanopatterning using optically trapped microspheres. Nature nanotechnology 3(7), 413-417.

Moser, S. S., Rabinovitch, M., Rotem, R., Koren, G., Shalev, V., and Chodick, G., (2019). Parity and the use of folic acid supplementation during pregnancy, BMJ Nutrition, Prevention & Health, 1-5

Niguse , (2019). Adherence rate to iron folic acid supplementation among pregnant women. bioRxiv preprint doi: https://doi.org/10.1101/535534;

Sadiq, Z. A., and Hussein, H. K., (2022). Assessment of knowledge and attitudes among pregnant women's towards folic acid intake during pregnancy in a sample of women attending primary health care centers in Babylon province. Medical Journal of Babylon, 19(2), 142.

Sailaja, P, Kiran, C. U, and Varalakshmi, K., (2019). Effect of structured teaching programme on Folic Acid supplements in the prevention of congenital anomalies among undergraduate students in a selected college, Tirupathi, Journal of Nursing and Health Science, 8 (5), 34-41. https://doi.org/10.9790/1959-0805063441.

Sarwar, S., and Alsaggaf, M. I., (2022). The willingness and perception of people regarding green roofs installation. Environmental Science and Pollution Research, 27(20), 25703-25714.

Sileyew, K.J.,(2019). Research design and methodology (pp. 1-12). Rijeka: IntechOpen.

Sobczyńska-Malefora, A., (2019). Methods for assessment of folate (Vitamin B9), Laboratory Assessment of Vitamin Status, 1st ed., Academic Press, pp., 219-264.

Shamsuddin, H., Raudenbush, C. L., Sciba, B. L., Zhou, Y. P., Mast, T. C., Greaves, W. L. and Straus, W., (2019). Evaluation of neural tube defects (NTDs) after exposure to raltegravir during pregnancy. Journal of

acquired immune deficiency syndromes (1999), 81(3), 247.

Sun, X.Y., Chen, B., Pu, Y.D., Chen, X.M., and Han, L.X., (2018). A cross-sectional study on the knowledge, attitude and practice of folic acid supplement status in women of childbearing age in Dongguan city. Biomedical Journal;1:6.

Tan ,B.,Hans, V.,Azwany,N.,And soon, L., (2018). The general public's knowledge and perceptions of preconception folic acid intake for preventive of birth defects, International Journal of Public Health and Clinical Scienes,5(1).

Wald, N. J., Morris, J. K., and Blakemore, C., (2020). Urgent need for folic acid fortification of flour and grains: response to the 2019 UK Government's public consultation, Archives of Disease in Childhood,105(1):6-9.

Yamashita, T., Roces, R. E. D., Ladines-Llave, C., Tuliao, M. T. R., Kamau, M. W., Yamada, C., and Matsuo, H., (2021). Maternal knowledge associated with the prevalence of iron and folic acid supplementation among pregnant women in Muntinlupa, Philippines: A cross-sectional study. Patient preference and adherence, 15, 501.

Zelalem, A., Endeshaw, M., Ayenew, M., Shiferaw, S., and Yirgu, R., (2019). 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):265-274.

ادراك السيدات الحوامل تجاه تناول حمض الفوليك

نريمان مجدي كامل فهيم - هند عبدالله السيد عفيفي - سمية عودة عبد المنعم - همت مصطفى البنا

حمض الفوليك (فيتامين ب 9) مهم في تكوين خلايا الدم الحمراء ونمو الخلايا الصحية ووظيفتها. تعتبر المغذيات ضرورية أثناء الحمل المبكر لتقليل مخاطر العيوب الخلقية في الدماغ والعمود الفقري. حمض الفوليك مهم جدًا لأنه يساعد في منع بعض العيوب الخلقية الرئيسية في دماغ المولود الجديد (انعدام الدماغ) والعمود الفقري (السنسنة المشقوقة). لذا هدفت هذه الدراسة إلى تقييم ادراك السيدات الحوامل تجاه تناول حمض الفوليك. وقد أجريت الدراسة في العيادة الخارجية لأمراض النساء والتوليد بمستشفيات جامعة بنها. و تم استخدام عينة هادفة في الدراسة باجمالي 240 امرأة حامل في الدراسة الحالية باستخدام معايير الاشتمال. وقد أظهرت النتائج بأن أكثر من ثلثي النساء الحوامل المدروسات لديهن معرفة ضعيفة وموقف سلبي فيما يتعلق بتناول حمض الفوليك. واوصت الدراسة بتطبيق برنامج تعليمي لتحسين إدراك المرأة الحامل فيما يتعلق بتناول حمض الفوليك.