



Awareness of Maternal Nutrition during Pregnancy among Women of Childbearing Age Attending Health Facilities in Abakaliki Local Government Area, Ebonyi State

¹Prince Christian Ifeanachor Umoke, ²Roseline Elem Chukwu, ³Mbe Godwin Chukwu,
⁴Rosemary N. C. Onwe, *⁵Maryjoy Umoke

¹Department of Human Kinetics & Health Education, University of Nigeria, Nsukka.

²National Health Insurance Authority, Ebonyi State Office, Abakaliki.

³National Health Insurance Authority, Ebonyi State Office, Abakaliki.

⁴Department of Economics & Development Studies, Alex-Ekwueme Federal University Ndufu-Alike, Ikwo, Ebonyi State.

⁵School Health Services, Ebonyi State Ministry of Health, Abakaliki

*Corresponding author: Maryjoy Umoke, PhD; E-mail: maryjoy4umoke@gmail.com

Abstract

This study evaluated the level of awareness of maternal nutrition during pregnancy among Women of Childbearing Age attending health facilities in Abakaliki Local Government Area, Ebonyi State. The study had five research objectives and five corresponding research questions. The study adopted the study cross sectional survey research design. The data for the study was collected through a structured questionnaire. Data analysis was done using frequency and percentage. Results showed that, women of childbearing age had a very high awareness (85.9%) of good nutrition during pregnancy; Younger women are more aware of good nutrition during pregnancy than older women; Women who have attained secondary and tertiary level of education are more aware of maternal nutrition during pregnancy; urban women are more aware of good nutrition during pregnancy than rural women; and Christian women are more aware of good nutrition during pregnancy than Muslim women. The authors concluded that the level of awareness of maternal nutrition during pregnancy among women of childbearing age attending Health Facilities in Abakaliki Local Government Area of Ebonyi State is good but more awareness creation on good nutrition should be increased especially amongst women of older age, less educated and Moslems.

Keywords: Maternal nutrition, Awareness, Pregnancy, Women of childbearing age, Health facilities.

Introduction

Pregnancy is an important time in the life of any woman. A woman's life is most important during her pregnancy, since she will go through many changes, including physical and psychological ones (Wang, Zou, Ding, & Fang, 2023). From social and medical point of view, pregnancy is a very essential event. Antenatal care is regarded as a crucial function in the delivery of health care. But throughout pregnancy, there may be various issues or complications that endanger both the mother and the foetus' lives. In 2020, the maternal



mortality ratio in the African Region was estimated at 531 deaths per 100 000 live births. Countries with extremely high maternal mortality rates are South Sudan with 1223 deaths, followed by Chad with 1063 deaths and Nigeria with 1047 deaths per 100 000 live births. (WHO, 2023).

For a woman to have a successful pregnancy experience she has to go for antenatal. The major goal of antenatal care are health promotion, disease prevention, dietary advice, early detection and treatment of existing disease and complications, awareness about the danger signs and birth preparedness. Based on that WHO (2016) recommends the number of antenatal visits to eight from four to reduce the antenatal complications. Under nutrition includes being underweight for one's age, being too short for one's age (stunted), being dangerously thin (wasted), and lacking in vitamins and minerals (micronutrient malnutrition). Malnutrition is a general term for poor nutrition, which can refer to either excessive nutrient consumption (over nutrition) or inadequate nutrient consumption or absorption (under nutrition). . Obesity is quickly becoming an issue in developing countries, where undernutrition and micronutrient deficiencies are still common (Tenaw, Arega, & tachbele, 2018). Maternal malnutrition is caused by a lack of food intake, increased energy expenditure, diets low in micronutrients, illnesses, and the demands of pregnancy and lactation. Every day, issues related to pregnancy or childbirth claim the lives of almost 800 women worldwide (Serbesa, Iffa, & Geleto, 2019).

In Nigeria, nutritional disorders are among the main causes of morbidity and mortality. Many women do not get enough micronutrients in their diets during both pregnancy and the reproductive years and are ignorant of the extent to which their nutritional status affects the course of their pregnancies and subsequent births .In Nigeria, 11 per cent of women of reproductive age are undernourished, 17 per cent of women are overweight, and 8 per cent are obese, according to the Demographic and Health Survey. As a result of the country's poor nutrition, obstetric issues including hypertension, anaemia, neural tube anomalies, night blindness, low birth weight, and maternal and prenatal mortality are widespread in Nigeria. The rate of maternal death is 650 per every 100,000 live births. Malnutrition is a major risk factor for many of these fatalities, either directly or indirectly (Fasola, Abosede, & Fasola, 2018)

Pregnancy has an impact on a woman and her family's eating habits and lifestyle. Prenatal diet that is appropriate and proper can promote healthy growth and create the conditions for a baby's first six months of nursing to be successful. The health of the mother and the foetus throughout pregnancy depends on proper diet. Pregnancy brings about a number of changes in a woman's nutritional requirements, some of which are related to the demands of the foetus and others changes that have an impact on food absorption and metabolism (Mazloom, Pournarani, Sadeghi, & Yoshany, 2022).

Increase in consumption of, protein, calcium, folic acid, iodine, and iron should be part of a pregnant woman's diet to prevent underweight. Smoking, drinking excessive amounts of



alcohol, using drugs, poor income of pregnant women leads to chronic conditions, such as diabetes or anaemia is at greater risk for nutritional deficiencies. To guarantee a healthy pregnancy, adequate maternal nutrition knowledge and dietary practises are required before and during pregnancy (Tenaw, Arega, & Tachbele, 2018). In order to lower child and maternal mortality, maternal nutrition education throughout pregnancy is crucial. There is little information on maternal dietary practises and knowledge and attitudes towards nutrition during pregnancy (Sangwan et al, 2022; Kanikwu, Jimmy, & Emesowum, 2021).

In spite of the high prevalence of malnutrition among the pregnant women in Ebonyi State and its health consequences as well as the awareness that has been created to increasing their knowledge of the importance of nutrition especially women of child bearing age, poor nutrition appears to still remain a challenge in Abakaliki Local Government Area, Ebonyi State. It is against this background that study examined the awareness of good nutrition in the area during pregnancy among women of child bearing age.

Purpose of the Study

The main objective of this study was to examine the awareness of maternal nutrition during pregnancy among women of child bearing age attending health facilities in Abakaliki local government area, Ebonyi State. Specifically, this study determined the:

1. awareness level of women of child bearing age on maternal nutrition during pregnancy in Abakaliki Local Government Area of Ebonyi State;
2. awareness level of maternal nutrition during pregnancy among women of child bearing age based on education level;
3. awareness level of maternal nutrition during pregnancy among women of child bearing age based on place of residence.
4. awareness level of maternal nutrition during pregnancy among women of child bearing age based on religion;. and
5. awareness level of maternal nutrition during pregnancy among women of child bearing age based on age.

Research Questions

The following research questions were formulated to guide the study

1. What is the awareness level of women of child bearing age on maternal nutrition during pregnancy in Abakaliki Local Government Area of Ebonyi State?
2. What is the awareness level of maternal nutrition among women of child bearing age based on education level?
3. What is the awareness level of maternal nutrition during pregnancy among women of child bearing age based on place of residence?



4. What is the awareness level of maternal nutrition among women of childbearing age based on religion?
5. What is the awareness level of maternal nutrition among women of childbearing age based on age?

Methods

The study adopted cross-sectional research design. Area of the study is Abakaliki local Government Area which is one of the thirteen Local Government Areas (LGAs) in Ebonyi State and is the state capital with its headquarters at ABakaliki. The predominate language used in the area are Abakaliki dialect, central Igbo language and English Language. The people have many festivals which include new yam festival. The LGA shares boundaries with Ikwo LGA on the South, Ebonyi LGA on the East, and Ezza-South and Ezza-North LGAs on the West. It has primary, secondary and tertiary health care facilities. The study population is women of child bearing age in Abakaliki Local Government Area, Ebonyi State. According to Ebonyi State Ministry of Health (2023). The entire population of women of child bearing age in Abakaliki Local Government Area of Ebonyi State is estimated to be 1,383,973. The sample size is 400 and was determined using Taro Yamane formular. The statistical formula was used thus:

$$n = \frac{N}{1 + N(e)^2}$$

n = Sample size

N = Total Population

e = Degree of confidence interval, in this research study, 95% confident interval was adopted which is equal to 0.05

Substituting and solving for n we have:

$$n = \frac{1383973}{1 + 1383973(0.05)^2}$$

$$n = 399.87$$

$$n = 400$$

Therefore the sample size for the study is 400

This study adopted simple random sampling of balloting without replacement to draw 400 women of child bearing age. The instrument used for data collection is a self-structured questionnaire named Awareness of Maternal Nutrition During Pregnancy among Women of Childbearing Age Attending Health Facilities in Abakaliki Local Government Area, Ebonyi State



Four Hundred copies of the questionnaire were administered directly to the randomly selected respondents on face to face basis with the help of research assistance. The random sampling technique was applied during the researcher visit to different communities in Abakaliki LGA of Ebonyi State. Reliability of the Instrument was achieved through the administration of Twenty copies of the questionnaire to a small community in Abofia in Ebonyi local government area of Ebonyi State being a different local area of the study but of similar characteristics with the study area. Test retest method and alpha value of 0.78 was achieved and this value lies within the bounds $0.5 \leq \text{Reliability Coefficient} < 1$ indicating strong reliability. The data analysis employed for this research work is descriptive statistics and multiple logistic regressions. Descriptive statistics was used to measure the level of awareness of maternal nutrition during pregnancy.

Results

Table 1: Frequencies and Percentages of Awareness Level of Maternal Nutrition During Pregnancy ($n = 400$)

s/n	Items	Yes	No
		f(%)	f(%)
1.	Nutrition/diet refers to adequate consumption of all classes of foods in correct and adequate quantity	227(56.8)	173(43.3)
2.	Does food pattern change during pregnancy?	342(85.5)	58(14.5)
3.	Are you aware about healthy diet during pregnancy?	371(92.8)	29(7.2)
4.	Do you need to improve diet during pregnancy?	379(94.8)	21(5.3)
5.	Can maternal nutrition cause low birth weight and still birth?	333(83.3)	67(16.8)
6.	Does food intake affect pregnancy outcomes?	352(88.0)	48(12.0)
7.	Are complete food grouped into carbohydrate, vitamin, mineral, protein, vegetable, fat and oil, water ?	389(97.3)	11(97.3)
8.	Are the most important food nutrient during pregnancy include protein, carbohydrate, vitamins and minerals.?	353(88.3)	47(11.8)
Overall percentage		85.9	14.1

Results in Table 1 show that overall, women of childbearing age had a very high awareness level (85.9%) of maternal nutrition during pregnancy. Additionally, the table shows that women had very high level of awareness of food groups carbohydrate, vitamin, mineral, protein, vegetable, fat and oil, and water (97.3%), the need to improve diet during pregnancy (94.8%) and the need for healthy diet during pregnancy (92.8%).

Table 2: Awareness Level of Maternal Good Nutrition during Pregnancy among Women of Childbearing Age based on Age ($n = 400$)

		Age							
		15-24 years		25-34 years		35-44 years		45 years & above	
Yes	No	Yes	No	Yes	No	Yes	No		
f(%)	f(%)	f(%)	f(%)	f(%)	f(%)	f(%)	f(%)		



s/n	Items								
1.	Nutrition/diet refers to adequate consumption of all classes of foods in correct and adequate quantity	85(64.4)	47(35.6)	63(52.9)	56(47.1)	50(55.6)	40(44.4)	29(49.2)	30(50.8)
2.	Does food pattern change during pregnancy?	111(84.1)	21(15.9)	110(92.4)	9(7.6)	80(88.9)	10(11.1)	41(69.5)	18(30.5)
3.	Are you aware about healthy diet during pregnancy?	117(88.6)	15(11.4)	115(96.6)	4(3.4)	90(100.0)	0(0.0)	49(83.1)	10(16.9)
4.	Do you need to improve diet during pregnancy?	124(93.9)	8(6.1)	117(98.3)	2(1.7)	84(93.3)	6(6.7)	54(91.5)	5(8.5)
5.	Can maternal nutrition cause low birth weight and still birth?	103(78.0)	29(22.0)	107(89.9)	12(10.1)	82(91.1)	8(8.9)	41(69.5)	18(30.5)
6.	Do food intake affect pregnancy outcomes?	117(88.6)	15(11.4)	107(89.9)	12(10.1)	80(88.9)	10(11.1)	48(81.4)	11(18.6)
7.	Are complete food grouped into carbohydrate, vitamin, mineral, protein, vegetable, fat and oil, and water.?	128(97.0)	4(3.0)	117(98.3)	2(1.7)	88(97.8)	2(2.2)	56(94.9)	3(5.1)
8.	Are the most important food nutrient during pregnancy include protein, carbohydrate, vitamins and minerals?	107(81.1)	25(18.9)	110(92.4)	9(7.6)	86(95.6)	4(4.4)	50(84.7)	9(15.3)
	Overall Percentage	84.5	15.5	88.8	11.2	88.9	11.1	78.0	22.0

Results in Table 2 show that overall, women aged 15-24 years (84.5%), 25-34 years (88.8%), and 35-44 years(88.9%) had a very high level of awareness of maternal nutrition during pregnancy while those aged 45 years and above (78.0%) had a high level of awareness of maternal good nutrition during pregnancy. The results imply that younger women are more aware of maternal good nutrition during pregnancy than older women.



Table 3: Awareness Level of Maternal Nutrition during Pregnancy among Women of Childbearing Age based on Educational Level ($n = 400$)

s/n	Items	Education Level							
		Non-formal educ.		Primary education		Secondary education		Tertiary education	
		Yes f(%)	No f(%)	Yes f(%)	No f(%)	Yes f(%)	No f(%)	Yes f(%)	No f(%)
1.	Nutrition/diet refers to adequate consumption of all classes of foods in correct and adequate quantity	24(57.1)	18(42.9)	13(39.4)	20(60.6)	61(64.2)	34(35.8)	129(56.1)	101(43.9)
2.	Does food pattern change during pregnancy?	21(50.0)	21(50.0)	22(66.7)	11(33.3)	78(82.1)	17(17.9)	221(96.1)	9(3.9)
3.	Are you aware about healthy diet during pregnancy?	28(66.7)	14(33.3)	29(87.9)	4(12.1)	84(88.4)	11(11.6)	230(100.0)	0(0.0)
4.	Do you need to improve diet during pregnancy?	33(78.6)	9(21.4)	25(75.8)	8(24.2)	91(95.8)	4(4.2)	230(100.0)	0(0.0)
5.	Can maternal nutrition cause low birth weight and still birth?	25(59.5)	17(40.5)	22(66.7)	11(33.3)	65(68.4)	30(31.6)	221(96.1)	9(3.9)
6.	Does food	25(59.5)	17(40.5)	28(84.8)	5(15.2)	77(81.1)	18(18.9)	222(96.5)	8(3.5)



intake affect pregnancy outcomes?								
7. Are complete food grouped into carbohydrate, vitamin, mineral, protein, vegetable, fat and oil, water ?	38(90.5)	4(9.5)	29(87.9)	4(12.1)	94(98.9)	1(1.1)	228(99.1)	2(0.9)
8. Are the most important food nutrient during pregnancy include protein, carbohydrate, vitamins and minerals?	27(64.3)	15(35.7)	22(66.7)	11(33.3)	80(84.2)	15(15.8)	224(97.4)	6(2.6)
Overall percentage	65.8	34.2	72.0	28.0	82.9	17.1	92.7	7.30

The result shows that women who have attained the secondary and tertiary level of education are more aware of maternal nutrition during pregnancy (82.9 and 92.7 percent respectively).

Table 4: Awareness level of maternal good nutrition during pregnancy among women of childbearing age based on Residence

s/n	Items	Residence			
		Urban		Rural	
		Yes	No	Yes	No
		f(%)	f(%)	f(%)	f(%)
1.	Nutrition/diet refers to adequate consumption of all classes of foods in correct and adequate quantity	188(59.5)	128(40.5)	45(53.6)	39(46.4)



2.	Does food pattern change during pregnancy?	280(88.6)	36(11.4)	62(73.8)	22(26.2)
3.	Are you aware about healthy diet during pregnancy?	298(94.3)	18(5.7)	73(86.9)	11(13.1)
4.	Do you need to improve diet during pregnancy?	308(97.5)	8(2.5)	71(84.5)	13(15.5)
5.	Can maternal nutrition cause low birth weight and still birth?	271(85.8)	45(14.2)	62(73.8)	22(26.2)
6.	Do food intake affect pregnancy outcomes?	284(89.9)	32(10.1)	68(81.0)	16(19.0)
7.	Are complete food grouped into carbohydrate, vitamin, mineral, protein, vegetable, fat and oil, water?	312(98.7)	4(1.3)	77(91.7)	7(8.3)
8.	Are the most important food nutrient during pregnancy include protein, carbohydrate, vitamins and minerals?	285(90.2)	31(9.8)	68(81.0)	16(19.0)
Overall percentage		88.1	11.9	78.3	21.7

Results in Table 4 show that overall, urban women (88.1%) had a very high level of awareness of maternal good nutrition during pregnancy while rural women (78.3%) had a high level of awareness of maternal good nutrition during pregnancy. The results imply that urban women are more aware of maternal good nutrition during pregnancy than rural women.

Table 5: Awareness Level of Good Nutrition during Pregnancy among Women of Childbearing Age based on Religion (n = 400)

s/n	Items	Religion			
		Christianity		Islam	
		Yes	No	Yes	No
1.	Nutrition/diet refers to adequate consumption of all classes of foods in correct and adequate quantity	217(57.4)	161(42.6)	10(45.5)	12(54.5)
2.	Does food pattern change during pregnancy?	324(85.7)	54(14.3)	18(81.8)	4(18.2)
3.	Are you aware about healthy diet during pregnancy?	353(93.4)	25(6.6)	18(81.8)	4(18.2)
4.	Do you need to improve diet during pregnancy?	363(96.0)	15(4.0)	16(72.7)	6(27.3)
5.	Can maternal nutrition cause low birth weight	317(83.9)	61(16.1)	16(72.7)	6(27.3)



	and still birth?))		
6.	Does food intake affect pregnancy outcomes?	336(88.9	42(11.1)	16(72.7	6(27.3)
))		
7.	The following are the complete food group; carbohydrate, vitamin, mineral, protein, vegetable, fat and oil, and water	373(98.7	5(1.3)	16(72.7	6(27.3)
))		
8.	The foods that are most important during pregnancy include protein, carbohydrate, vitamins and minerals	339(89.7	39(10.3)	14(63.6	8(36.4)
))		
	Overall Percentage	86.7	13.3	70.4	29.6

Results in Table 5 show that overall, Christian women (86.7%) had a very high level of awareness of maternal good nutrition during pregnancy, while Muslim women (70.4%) had a high level of awareness of good nutrition during pregnancy. The results imply that Christian women are more aware of maternal good nutrition during pregnancy than Muslim women.

Discussion

The results showed that women of childbearing age are aware of the proper food to take during pregnancy which is in agreement with the study of Ehwarieme, Amiegheme and Enosekhafoh (2019), and Gezimu, Bekele, and Habte (2022). On age, women of younger age had more knowledge than older women 45years and above which corresponds with the findings of Mazloomy, Pournarani, Sadeghi, and Yoshany (2022), Teweldemedhin, Amanuel, Berhe, Gebreyohans, Tsige, and Habte (2021). Also, women who have attained secondary and tertiary level of education are more aware of maternal nutrition during pregnancy in the study and is in consonance with the works of Teweldemedhin, Amanuel, Berhe, Gebreyohans, Tsige, and Habte (2021). On residence, the result shows that urban women are more aware of good nutrition during pregnancy than rural women. This result is in line with the findings of Dereje, Dessalegn, and Tefera (2020). And lastly based on religion the result shows that Christian women are more aware of good nutrition during pregnancy than Muslim women Tenaw, Arega and Tachbele (2018).

Conclusion

Following from the findings of this study, the authors concluded that the level of awareness of maternal nutrition during pregnancy among women of childbearing age attending health facilities in Abakaliki Local Government Area, Ebonyi State is good, but more effort should be taken to sustain the good lifestyle in the area. Overall, women of childbearing age had a very high awareness level of maternal nutrition during pregnancy especially women aged 15-24 years, unlike the older women 45 years and above. Also, women of childbearing age with secondary and tertiary level of education are more aware of maternal nutrition during pregnancy; urban women had a very high level of awareness of maternal nutrition during



pregnancy compared to rural women, and Christian women had a very high level of awareness of maternal nutrition during pregnancy, while Muslim women had a high level of awareness of good nutrition during pregnancy. However, more awareness creation of good nutrition should be increased especially amongst women of older age less educated and the Moslems.

References

- Adeoya, A.A., Akinnwusi, A.T and Nagatomi, S (2023). Effectiveness of nutrition education in enhancing knowledge and attitude of pupils on choice of school mid-day meal in Ibadan, Nigeria. *Food science and nutrition*.
- Adinma, J.I.B., Umeononihu, O.S. & Umeh, M.N. (2017). Maternal nutrition in Nigeria. *Tropical Journal of Obstetrics and Gynaecology*. 34(2), 79-84.
- Avachat, C. and Birnbaum, A. K. (2022). Women of childbearing age: What antiseizure medications are they taking. *BJCP*, 89, 46-48.
- Belay, W.S., Cherkos, E.A.& Taye, E.B. (2022). Dietary practice during pregnancy and associated factors among pregnant women in Farta district, South Gondar Zone, Northwest Ethiopia, 2021. *Clinical Epidemiology and Global Health*.
- Cunha, J.P. What are the types of pregnancy. Accessed 11th August 2023 https://www.emedicinehealth.com/what_are_the_types_of_pregnancy/.
- Dereje, T., Dessalegn, T. & Tefera, B. (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 Supplement*. Dovepress
- Ehwarieme, A. T., Amiegheme E. F and Enosekhafoh, B. (2019). Knowledge and practice of healthy nutrition among pregnant women attending antenatal clinic at selected private hospitals in Benin City. *International Journal of Nursing and Midwifery*, 11(7), 75-86.
- Esienmoh, E. Ella, R. & Mboho, M. (2018). Cultural Meaning of Childbearing among Women of a Rural Community in Nigeria. *International Journal of Science and Research (IJSR)*, 8(6), 2237-2245.
- Eze, N. M., Maduabum, F. O., Onyeke, N G., Anyaegunam, N. J., Ayogu, C. A., Ezeanwu, B. A., Eseadi, C. (2017). Awareness of food nutritive value and eating practices among Nigerian bank workers implications for nutritional counseling and education. *Medicine*



- Fasola, O., Abosede, O., & Fasola, F. A. (2018). Knowledge, attitude and practice of good nutrition among women of childbearing age in Somolu Local Government, Lagos State. *Journal of public health in Africa*, 9(1), 793. <https://doi.org/10.4081/jphia.2018.793>
- 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, 20503121221085843. <https://doi.org/10.1177/20503121221085843>
- Kanikwu, P.N., Jimmy, J.A. & Emesowum, A.C. (2021). Nutrition in pregnancy and pregnancy outcome in two primary health centres, Okpanam. *Journal of nursing and social sciences related to health illness*, 1-9.
- Khan, K. A., Salem, M., Mohammed, R., Ahmad, R., Abdulkarim, O., Mohammed, T., Iqubal, S. M. S., Khan, A. A., Dawoud, A., Maqbul, M.S., Mayana, N.K and Mubashira, S.(2020). Awareness about the Importance of Nutrition During Pregnancy Among Women in Child Bearing Age: A Quantitative Study Among Urban Women. *Journal of Advanced Pharmaceutical Science and Technology*, 2(3)1.
- Lagadec, N., Steinecker, M., Kapassi, A. Magnier, A.M., Chastang, J. and Robert, S. (2018) Factors influencing the quality of life of pregnant women: a systematic review. *BMC Pregnancy Childbirth* 18, 455. <https://doi.org/10.1186/s12884-018-2087-4>.
- Lim, Z. X., Wong, J.L. Lim, P.Y. & Soon, L.K. (2018). Knowledge of Nutrition during Pregnancy and Associated Factors among Antenatal Mothers. *International Journal of Public Health and Clinical Sciences*, 5(1).
- Mahmoodabad, S.S.M., Marziye, T., Khosravi,H.M., Yoshany, N.& Masoomeh, G K.(2018). Investigation of Knowledge, Attitude and Practice of Pregnant Women regarding Nutrition during Pregnancy in Yazd City. *Journal of Community Health Research*, 7(3), 1334-139.
- Marshall, N. E., Abrams, B., Barbour, L. A., Catalano, P., Christian, P., Friedman, J. E., Hay, W. W., Jr, Hernandez, T. L., Krebs, N. F., Oken, E., Purnell, J. Q., Roberts, J. M., Soltani, H., Wallace, J., & Thornburg, K. L. (2022). The importance of nutrition in pregnancy and lactation: lifelong consequences. *American journal of obstetrics and gynecology*, 226(5), 607–632.



- Mazloom, M. S. S., Pournarani, R., Sadeghi, S., Yoshany, N. (2022). Knowledge, Attitude, and Practice of Iranian Pregnant Women towards Proper Nutrition during Pregnancy. *Health Education and Health Promotion*, 10(1), 9-14.
- McNamara, J., Risi, A., Bird, A.L., Townsend, M.L. and Herbert, J.S. (2022). The role of pregnancy acceptability in maternal mental health and bonding during pregnancy. *BMC Pregnancy Childbirth* 22, 267. <https://doi.org/10.1186/s12884-022-04558-6>.
- Nnam, M.N. (2015). Adequate nutrition for good health – is our environment nutrition friendly?. University of Nigeria 62 Inaugural Lecture.
- Nwagbo, U.V., Okoronkwo, D.J. & Mbah, C.E. (2023). Awareness of food nutritive value and eating behaviors among Peri-Urban vegetable farmers: implications for extension Services and Rural Education. *international journal of agricultural science, research and technology extension and education system*, 13(1), 55-64.
- Olagnero, G., Barretto, L. Wiedemann, A., Terraza, R. Poy, M.S. & López, L (2018). Maternal Understanding Regarding Women Nutrition during Breastfeeding. *Health* 10, 1661- 1672.
- Sangwan, K. S., Kshirsagar, V.D., Parande, M. A., Salunke, N.M., Solanki, K. H., Tambe, M. P. & Pundkar, D. (2022). Knowledge, attitude and practices regarding nutrition among pregnant females visiting the antenatal care outpatient department of a tertiary care hospital, Pune. *International Journal of Community Medicine and Public Health*, 9(2), 902-907.
- Serbesa, M. L., Iffa, M. T., & Geleto, M. (2019). Factors associated with malnutrition among pregnant women and lactating mothers in Miesso Health Center, Ethiopia. *European journal of midwifery*, 3, 13. <https://doi.org/10.18332/ejm/110131>
- Sindhu, S., Vidhya, D., sivankumar, K. & karthiga, M.A. (2017). A study to assess the awareness and knowledge about the maternal nutrition and complications encountered by the antenatal mothers in the rural population. *International Journal of Reproduction, Contraception, Obstetrics and Gynecology*, 6(6), 2532-2535.
- 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), 81-89.



Teweldemedhin, L.G., Amanuel, H.G., Berhe, S.A., Gebreyohans, G. Tsige, Z. & Habte , E. (2021). Effect of nutrition education by health professionals on pregnancy-specific nutrition knowledge and healthy dietary practice among pregnant women in Asmara, Eritrea: a quasi- experimental study. *BMJ Nutrition prevention & Health*.

Wang, W. C., Zou, S. M., Ding, Z., & Fang, J. Y. (2023). Nutritional knowledge, attitude and practices among pregnant females in 2020 Shenzhen China: A cross-sectional study. *Preventive medicine reports*, 32, 102155. <https://doi.org/10.1016/j.pmedr.2023.102155>

World Health Organisation (WHO, 2016). WHO recommendations on antenatal care for a positive pregnancy experience. www.who.int.

Zelalem A, Endeshaw M, Ayenew M, Shiferaw S, Yirgu R (2017) Effect of Nutrition Education on Pregnancy Specific Nutrition Knowledge and Healthy Dietary Practice among Pregnant Women in Addis Ababa. *Clinics Mother Child Health* 14: 265. doi:10.4172/2090-7214.1000265

Zerfu, T.A., & Biadgilign, S. (2018). Pregnant mothers have limited knowledge and poor dietary diversity practices, but favorable attitude towards nutritional recommendations in rural Ethiopia: evidence from community-based study. *BMC Nutrition*, 1-9.