SUNTEXT REVIEWS

SunText Review of Medical & Clinical Research
ISSN: 2766-4813

Open Access
Research Article
Volume 4:4

Evaluation of Social Demographic, Pregnancy-Related Variables, Medical History and Dietary Pattern: Focus On Pregnant Women under Primary Healthcare Centres in Oluyole LGA, Ibadan, Oyo State

Animasaun OP[*,1,2], Animasaun OS[3,4,5], Akomolafe BK[5], Iyevhobu KO[6], Olurinde OJ[2], Adepoju OT[7], Akanmu MO[4], Omolumen BA[8], Airhomwanbor KO[9], Ade-Balogun TD[10], Courage O[11], Alonge AS[12], Ayodele FL[4,5], Amoo, ED[4], Oladunni O[13], Ogundokun O[14] , Bello LA[4], Ameh DA[1] and James DB[1]

[1]*Biochemistry Department, Ahmadu Bello University, Zaria, Kaduna State*
[2]*Biochemistry Department, Federal University of Agriculture, Abeokuta, Ogun State*
[3]*Nigeria Field Epidemiology and Laboratory Training Programme (NFELTP), Abuja, Nigeria*
[4]*Department of Medical Laboratory Service, Oyo State Primary Health Care Board, Ibadan, Oyo State, Nigeria*
[5]*Lead City University, Ibadan, and Oyo State Primary Health Care Board, Ibadan, Oyo State, Nigeria*
[6]*Department of Medical Microbiology, Ambrose Alli University, Ekpoma, Edo State, Nigeria.*
[7]*Nutrition and Dietetics Department, University of Ibadan, Ibadan, Oyo State*
[8]*Student Outreach Support Staff, University of Chester, Chester, England, United Kingdom.*
[9]*Department of Chemical Pathology, Ambrose Alli University, Ekpoma, Edo State, Nigeria.*
[10]*Evercare Hospital Lekki, Lagos State, Nigeria.*
[11]*Edo Specialist Hospital, Benin City, Edo State, Nigeria.*
[12]*Institute of Human Virology, Nigeria*
[13]*Department of Public Health Adeleke University Ede, Osun State, Nigeria*
[14]*University Canada West, 1461, Granville Street, Vancouver, British Columbia, Canada*

[*]**Corresponding author:** Animasaun OP, Biochemistry Department, Ahmadu Bello University, Zaria, Kaduna State; Biochemistry Department, Federal university of Agriculture, Abeokuta, Ogun State, Nigeria; Tel: +2348067381717; E-mail: olamide4real2020@gmail.com

Received date: 11 August 2023; **Accepted date:** 23 August 2023; **Published date:** 27 August 2023

Citation: Animasaun OP, Animasaun OS, Akomolafe BK, Iyevhobu KO, Olurinde OJ, Adepoju OT, et al. (2023) Evaluation of Social Demographic, Pregnancy-Related Variables, Medical History and Dietary Pattern: Focus On Pregnant Women under Primary Healthcare Centres in Oluyole LGA, Ibadan, Oyo State. SunText Rev Med Clin Res 4(4): 187.

DOI: https://doi.org/10.51737/2766-4813.2023.087

Abstract

Background: Pregnancy is associated with irregular appetite and food intake. This research was aimed at evaluating the social demographic, pregnancy-related variables, medical history, and dietary patterns of pregnant women attending primary healthcare centres (PHCs) in Oluyole local government area (LGA), Ibadan, Oyo state.

Methodology: A cross-sectional survey was conducted on eighty-nine (89) randomly selected pregnant women, ages 20-35 years, in three PHCs; their socio-demographic characteristics, pregnancy-related variables, medical history and dietary information were obtained using pretested semi-structured questionnaires and the data were analysed.

Results: Majority (65.9%) of the pregnant women were above 25 years, and 94.1 % were married; 82.4% of them have had at least one child before their present pregnancy. Sixty-seven percent (67%) of the respondents are self-employed; and 94.1% have formal education. Pregnancy-related variables showed that majority (41.2%) of them were in their second trimester. Assessment of the use of supplements and micronutrients showed that 68.2% and 57.6% have used iron and folic acid supplements respectively; while over

75% have never taken zinc, magnesium, and vitamin A supplements. Majority (96.5%) reported having no family history of any disease; while only few (27.1%) have health insurance cover. Malaria was diagnosed as the most common illness in 76.5% of the pregnant women. Food mostly consumed once daily were fruits and vegetables (98.8%), cereals and its products (54.1%); fish and fish products (36.5%) were consumed 1-3 times weekly while 90.7% of the respondents do consume milk and milk products at least once a week.

Conclusion: There is fair report of intake of micronutrient supplement and good dietary lifestyles as well as abstinence from alcohol and herbal concoctions, however, the pregnant women had poor early registration for antenatal care since most of them either resume at the second or third trimester.

Keywords: Pregnancy; Dietary pattern; supplements; Medical history; Antenatal care

Introduction

Pregnancy is a period between conception and birth during which women encounter a wide range of physical and physiological changes, as a result of rapid growth and cell differentiation, both of the mother and the developing foetus. During pregnancy, both the foetus and the mother are susceptible to alterations in dietary supply, especially of nutrients which are marginal under normal circumstances [1,2]. In pregnancy, the period of intrauterine nourishment, growth and development is the most vulnerable periods which affect nutrition status of foetus [3]. During this time, inadequate stores or intake of micronutrients can have adverse effects on the mother, such as anaemia, hypertension, complications of labour, or even death. Furthermore, the foetus can be affected, resulting in a stillbirth, preterm delivery, intrauterine growth retardation, congenital malformations, reduced immune-competence, and abnormal organ developments [4]. It is common for pregnant women to experience fluctuations in appetite and food intake due to hormonal changes and changes in the gastrointestinal tract as the fetus develops [5]. Nutritional status in early pregnancy may be an important predictor of nutritional risk in late pregnancy [6].

Among the Millennium Development Goals (MDGs) of the United Nations is the elimination of extreme poverty and hunger [7]. Like poverty, under nutrition and micronutrient deficiencies often occur as part of an intergenerational cycle [8]. Pregnant mothers without optimal nutritional intakes have children with suboptimal nutritional status including impaired physical and mental development, setting the infant on a deleterious course of stunting, increased likelihood for infection, and developmental delays [9]. Later in life these children themselves enter their reproductive years at a nutritional disadvantage and the cycle continues [10]. Furthermore, adults with nutritional disadvantages often have a lower work capacity due to the early developmental delays mediated through a lack of education in tackling the disadvantages. Thus, both malnutrition and poverty often track together and operate synergistically. Maintaining a healthy intake of some micronutrients throughout pregnancy has been shown to lower the risk of preterm birth. Nutritional status in early pregnancy may be an important predictor of nutritional risk in late pregnancy. There is paucity of established data on relationship evaluation of social demographic, pregnancy-related variables, medical history and dietary pattern: focus on pregnant women under primary healthcare centres in Oluyole LGA, Ibadan, and Oyo state**.**

Materials and Methods

Study Design

This was a cross-sectional study carried out in three primary health care facilities namely Odo Ona Elewe, Adaramagbo and Ajofeebo in Oluyole local government area of Oyo State. A convenience sampling method was used to select the sample size. An interviewer – administered questionnaire was employed for the study design and blood samples were collected.

Study Area

Oluyole local government area is a local government under Ibadan in Oyo State. Ibadan is located in south-western Nigeria and lies on the geographical coordinate of 10˚ 23˚ 0˚ N, 12˚ 5’ 0” E. It is the capital of Oyo State, and is reputed to be the largest indigenous city in Africa, south of the Sahara. Its population is estimated to be about 3,800,000 according to 2006 estimates. The principal inhabitants of the city are the Yoruba. There are eleven (11) Local Governments in Ibadan Metropolitan area consisting of five urban local governments in the city and six semi-urban local governments in the less developed city. Ibadan North, Ibadan North East, Ibadan North West, Ibadan South East, Ibadan South West constitute the urban Local Government Areas while Akinyele, Egbeda, Ido, Lagelu, Ona Ara, and Oluyole LGAs are the semi-urban LGAs in Ibadan land.

Study Population

The study population comprised of 89 pregnant women (20-35 years) attending three primary healthcare centres in Oluyole local government area of Oyo State. Pregnant women between the ages of 20-35, in their first, second and third trimesters without any medical history of chronic disease, were included in the study

while those with medical history of chronic diseases and above the age of 35 were excluded from this study

Sample Size

The sample size was drawn from three primary healthcare centres in Oluyole LGA, of pregnant women (20-35 years). Considering the prevalence of micronutrient deficiency and allowable error (Precision) of 5%, Dobson formula (n=t2 ((pXq))/d^2) was used for sample size determination [11]. n = Sample size; t =Error risk where t=1.96 at 95% confidence interval; p = Expected prevalence using 21.4% corresponding to p=0; d =absolute desired precision of 5%

$$n = \frac{1.96^2(0.214)(1-0.214)}{(0.05)^2}$$

$$n = 330$$

Sampling Procedure

A combination of multistage and convenience sampling methods were used in the survey. First, the list and names of the primary healthcare centres were obtained from Oluyole LGA Secretariat. From each of the primary healthcare centres eligible respondents were selected from each trimester. All pregnant women who met the inclusion criteria and were willing, were given an equal chance to participate in the study.

Ethical Consideration and Informed Consent

Ethical

Approval (MofH/OyS/HREC/DPRSD/09/2016) was obtained from the ethical committee, Ministry of Health, Oyo State; informed consent of the respondents was obtained prior to administration of questionnaire.

Data Collection

Pretested semi-structured questionnaire allowing the pregnant women to self-report their socioeconomic characteristics, pregnancy related variables, medical history and dietary lifestyle was administered to the respondents. The questionnaire was translated into Yoruba language for those who cannot read English language and two support staff were also recruited for the study.

Statistical Analysis

Data entry was done using Microsoft Excel, followed by export to Statistical Package for Social Sciences (SPSS) version 23 (Chicago, IL, USA) for analysis using both Inferential (One Way ANOVA) and descriptive statistics.

Results

Socio Economic Characteristics of Pregnant Women under Primary Healthcare Centres in Oluyole LGA, Ibadan

Table 1 describes the socioeconomic characteristics of pregnant women under Primary Healthcare Centres in Oluyole LGA, Ibadan. Most of the respondents were married, 3.5% are single parents, while 1.2% were divorced or separated. About 29.4% of them were aged between 20 - 25 years, 36.5% were aged 26-30 years, and 29.4% were aged between 20 - 25 years. In the survey, 51 (60.0%) respondents identified as Christians, and 34 (40.0%) as Muslims. According to their parity information, 82.4% had given birth to a child before their present pregnancy, with 42.4% having one child, 29.4% having two children, and 10.6% having three children or more, while 17.6% did not have any prior birth experience. Also, their spouses were engaged in different occupations: 55 (64.7%) were self-employed, 19 (22.4%) were Civil servants, while only 11 (13%) were engaged in other activities that were not outlined in the questionnaire (Banker, Miner, Clergy and Okada rider). Fifty-seven (67%) among the respondents are self-employed, 10 (11.8%) are full housewives, while 11 (13%) are engaged in activities not captured in the questionnaire (e.g pepper grinder and students). Majority (67.1%) of the respondents' spouses earned above the country's minimum wage (₦ 18,000); 41.2% earned above ₦35,000 and 25.9% earned between ₦26,000 - ₦35,000, while only 5.9% earned between ₦5,000 - ₦10, 000. Assessment of the level of education shows that 80 (94.1%) respondents had a kind of formal education; 41 (48.2% had) tertiary education, 31 (36.5%) had secondary education, 8 (9.4%) primary education, while 4 (4.7%) had informal education (adult education), and 1 (1.2%) had no form of education at all (Table 1) (Figure 1).

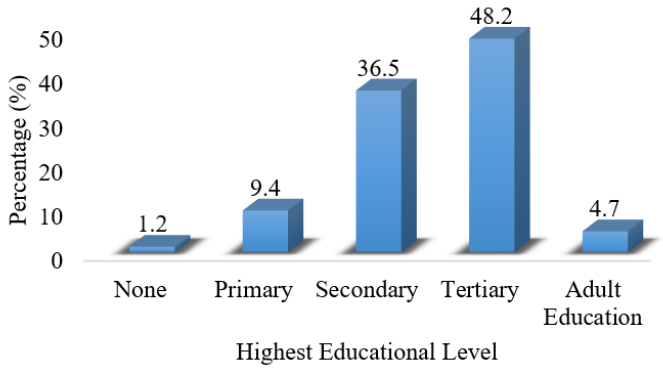

Figure 1: *Percentage Distribution of Educational status of the Pregnant Women in the Study Area.*

Pregnancy Related Variables of Pregnant Women Attending Primary Healthcare Centres in Oluyole Local Government Area of Ibadan.

Table 2 presents the pregnancy-related variables of pregnant women attending Primary Healthcare Centres in Oluyole Local Government Area of Ibadan: 35 (41.2%) of the pregnant women were in their second trimester, 27 (31.8%) in their third trimester, while 23 (27.1%) were in their first trimester. All the respondents have attended antenatal services at one time or the other, with 29 (34.1%) respondents attending once, 23 (27.1%) attending twice, 18 (21.2%) attending thrice and only 1 (1.2%) attending more than four (4) times. With respect to the respondent taking their antenatal drugs, 58 (68.2%) took iron supplement, 49 (57.6%) took folic acid, while 82 (96.5%), 83 (97.6%) and 66 (77.6%) have never taken zinc, magnesium, and vitamin A as at the time of data collection. Majority 70 (82.4%) of the study participants have taken in at one time or the other before their present pregnancy, with 36 (42.4%), 25 (29.4%), 9 (10.6%) have had one, two and 3 and above pregnancies respectively, while 15 (17.6%) have never taken in before now (Table 2).

Medical History of Pregnant Women under Primary Healthcare Centres in Oluyole Local Government Area of Ibadan

Table 3 presents respondent's medical history. A vast majority, 82 (96.5%) of the respondents, reported that they have no family history of any disease and only 3 (3.5%) attest to having a family history of a disease.

Table 1: *Socio-Economic Variables of Pregnant Women under Primary Healthcare Centres in Oluyole Local Government Area of Ibadan.*

CHARACTERISTICS	FREQUENCY	PERCENT (%)
Religion		
Christian	51	60
Islam	34	40.0
Marital status		
Married	80	94.1
Single	3	3.5
Divorced	1	1.2
Separated	1	1.2
Ages (years)		
20 – 25	25	29.4
26 – 30	31	36.5
31 – 35	29	34.1
Parity (Number of Children)		
Nil	15	17.6
One	36	42.4
Two	25	29.4
Three/Four	9	10.6
Husband occupation		
Civil servant	19	22.4
Self-employed	55	64.7
Others	11	13.0
Respondent occupation		
Civil servant	7	8.2
Self-employed	57	67.0
Full housewife	10	11.8
Others (Unemployed)	11	13
Respondent monthly earning		
Less than ₦5, 000	6	7.1
₦5, 000 - ₦10, 000	5	5.9
₦11, 000 - ₦25, 000	17	20.0
₦26,000 - ₦35, 000	22	25.9
More than ₦35, 000	35	41.2
Total	85	100

Table 2: *Pregnancy Related Variables of Pregnant Women under Primary Healthcare Centres in Oluyole Local Government Area of Ibadan.*

CHARACTERISTICS	FREQUENCY	PERCENT (%)
Trimester		

First	23	27.1
Second	35	41.2
Third	27	31.8
Number of antenatal visits		
Once	29	34.1
Twice	23	27.1
Thrice	18	21.2
Four times	14	16.5
> 4 times	1	1.2
Intake of Iron supplement		
Yes	58	68.2
No	27	31.8
Intake of Zinc supplement		
Yes	3	3.5
No	82	96.5
Intake of Folic Acid supplement		
Yes	49	57.6
No	36	42.4
Intake of Vitamin C supplement		
Yes	19	22.4
No	66	77.6
Number of previous pregnancies		
Nil	15	17.6
One	36	42.4
Two	25	29.4
3 and above	9	10.6

Table 3: *Medical History of Pregnant Women Attending Primary Healthcare Centres in Oluyole Local Government Area of Ibadan.*

CHARACTERISTICS	FREQUENCY	PERCENT (%)
Family history of any disease		
Yes	3	3.5
No	82	96.5
Intake herbal supplements/concoction		
Yes	18	21.2
No	67	78.8
Under any Health insurance scheme		
Yes	23	27.1
No	62	72.9
Falling sick during pregnancy		
Frequently	52	61.2
Always	6	7.1
Never	27	31.8
Diagnosed of Malaria during pregnancy		
Yes	65	76.5
No	20	23.5
Diagnosed of Typhoid during pregnancy		
Yes	2	2.4
No	83	97.6

Diagnosed of running stool during pregnancy		
Yes	3	3.5
No	82	96.5
Diagnosed of gestational diabetes during pregnancy		
Yes	2	2.4
No	83	97.6
Diagnosed of pregnancy-induced hypertension during pregnancy		
Yes	2	2.4
No	83	97.6
Occurrence of convulsion or seizure during pregnancy		
Yes	8	9.4
No	77	90.6
Intake alcohol		
Yes	2	2.4
No	83	97.6
Total	85	100

Table 4: *Dietary Pattern of Pregnant Women Attending Primary Healthcare Centres in Oluyole Local Government Area of Ibadan.*

	Frequency (%) of Consumption					
Diet	**Once daily**	**Twice daily**	**1–3 times weekly**	**4-6 times weekly**	**Never**	**Total**
Fruits & Vegetables	40 (47.1)	17 (20.0)	20 (23.5)	7 (8.2)	1 (1.2)	85 (100)
Fruits	26 (30.6)	21 (24.7)	30 (35.3)	8 (9.4)	0 (0)	85 (100)
Cereals & Products	46 (54.1)	19 (22.4)	12 (14.1)	8 (9.4)	0 (0)	85 (100)
Roots & Tubers	25 (29.4)	10 (11.8)	47 (55.3)	3 (3.5)	0 (0)	85 (100)
Meat & Meat products	36 (42.4)	28 (32.9)	17 (20.0)	4 (4.7)	0 (0)	85 (100)
Fish & Fish products	26 (30.6)	24 (28.2)	31 (36.5)	4 (4.7)	0 (0)	85 (100)
Milk & Milks products	31 (36.5)	5 (5.9)	35 (41.2)	6 (7.1)	8 (9.4)	85 (100)

Only 18 (21.2%) take herbal supplements/concoction while 67 (78.8%) do not; .23 (27.1%) have health insurance cover, while 62 (72.9) do not have any health insurance cover. When it comes to the frequency of falling sick during pregnancy, only six respondents (7.1%) reported to always fall sick, 52 (61.2%) reported to fall sick frequently, while 27 (31.8%) had never fallen sick until the time of the survey. Some of the common illnesses that were diagnosed among the pregnant women are malaria, 65 (76.5%), which has the highest occurrence among the pregnant women; typhoid, 2 (2.4%); body pain, 24 (28.2%); diarrhoea (running stool), 3 (3.5%); gestational diabetes, 2 (2.4%); and pregnancy induced hypertension, 2 (2.4%). Most of these women have never experienced any of these illnesses. Eight (9.4%) among the pregnant women reported that they had convulsion or seizure in the course of their pregnancy, while 77 (90.6%) had no such occurrence. Majority (97.6%) of the study participants do not consume alcohol (Table 3).

Dietary Pattern of Pregnant Women Attending Primary Healthcare Centres in Oluyole Local Government Area of Ibadan

Table 4 presents respondents' dietary pattern (frequency of consumption) of some selected food groups of interest. As presented in the table, 84 (98.8%) of the respondents do consume fruits and vegetables every day with 40 (47.1%), 20 (23.5%), 17 (20.0%) and 7 (8.2%) consuming the food group once daily, 1-3 times weekly, twice daily and 4-6 times weekly respectively. As

for the frequency of consumption of fruits alone, all the respondents do consume fruits at least once every week; 30 (35.3%), 26 (30.6%), 21 (24.7%) and 8 (9.4%) do consume fruits 1-3 times weekly, once daily, twice daily and 4-6 times weekly respectively. All the respondent do also eat fish and fish products with the frequency of consumption as follow; 31 (36.5%), 26 (30.6%), 24 (28.2%) and 4 (4.7%) eating fish and fish products 1-3 times weekly, once daily, twice daily and 4-6 times weekly. The final food group is the milk and milk products, 77 (90.7%) of the respondents do consume this food group at least once a week with 35 (41.2%), 31 (36.5%), 6 (7.1%) and 5 (5.9%) consuming it 1-3 times weekly, once daily, 4-6 times weekly and twice daily. However, 8 (9.4%) of the participants do not consume milk and milk products at all i.e. they never consume the food group for one reason or the other (Table 4).

Discussion

Good nutrition is the most powerful factor that can be used to reduce the burden of diseases and death across the life span around the world. This study evaluated the social demographic, pregnancy-related variables, medical history and dietary pattern of pregnant women under Primary Healthcare Centres in Oluyole LGA, Ibadan, and Oyo state. The mean age (28 years) of the respondents in this study is similar to that of a previous study (26 years) conducted among pregnant women visiting PHCs for antenatal care in Ile-Ife in which nearly all the respondents were also married [12]. This might be due to the fact that the Nigerian culture frowns at pregnancy out of wedlock [13]. A higher percentage of the pregnant women in this study has at least a primary education, and ares within the age range of 26-35 years, which is similar to a previous study by where they recorded a higher percentage of participants who were between 20-40 years [14]. The result of this study showed that many of the respondents were self-employed, which is in contrast to the study by where most of the respondents were civil servants. Our study was conducted in a semi urban area populated with most people having a lot of personal businesses. Starting a small-scale business usually do not require huge amount of capital and resources, this may be one of the reasons why many of the respondents were self-employed. The percentage of the pregnant women that were unemployed (11%) is a real reflection of the high rate of unemployment in the country. Majority of our respondents also earn above the country's minimum wage (N18, 000), which is about $ 41.36 USD. Studies have shown that income plays a huge role in the quality of feeding of pregnant women [15]. Most (41.2%) of the respondents earned above N35, 000 (about $97) or less monthly. This is expected because remuneration of workers is generally poor in Nigeria and also because of the recession in the country as of the time of the study. Poor remuneration could seriously affect the standard of living of women, as well as access their necessary foods that could support healthy dietary practices. Antenatal attendance was highest in the second trimester as 41.2% of the respondents were in their second trimester. This compares well with a study carried out by that showed a higher percentage of antenatal attendance in the second trimester, with the first trimester being the lowest [16]. Timely and adequate antenatal care is said to be a cornerstone for preventing complications during pregnancy. Similarly, late first ANC attendance has been reported in Zambia [17]. The use of herbal medicine has increased over the years, and studies have shown that between 65 and 80% of the world's population use herbal medicines as their primary form of health care [18]. This study recorded 21.2% prevalence of herbal medicine consumption among the respondents which also agrees with the study carried out by where they recorded 23.3%-82.3% prevalence of herbal medicine consumption during pregnancy, a higher percentage of our participant having above a secondary education could be responsible for a lower prevalence recorded in this study [19]. Malaria during pregnancy has been reported to reduce birth weight and low birth weight is a major determinant of infant mortality [20]. According to this study, most (76.5%) of respondents had been diagnosed with malaria during pregnancy. This malaria prevalence (76.5%) among these pregnant women was higher than the prevalence of 7.7% reported by Agomo et al. (2009) among pregnant women in Lagos, South-West Nigeria. This study has also shown that a larger percentage of the respondents consume fruits and vegetables (47.1%), cereals and products (54.1%) and meat and meats product (42%) at least once daily; a higher percentage of them consume roots and tubers, fish and fish products and milk and milk products at least one to three times daily. Although on the average, the respondents claim to feed well on consumption of these food groups. The fact that most of them claim to consume most of these food groups per day suggests that they are aware of the importance of adequate and well-balanced diet during pregnancy. This could be a reflection of the health education activities carried out by the health workers during the antenatal clinic. Most (60%) of the respondents often eat more than three times in a day; eating small amounts of food more frequently (in the appropriate combinations and containing the needed nutrients) contributes to the well-being of pregnant women and development of their foetus as well as, has the benefits of helping with some of the uncomfortable side effects of pregnancy including nausea and heartburn. Herbal medicine usage is becoming popular in developing and industrialized countries and studies have showed that 65-80% of the world's population use herbal medicines as their primary form of health care [21]. Unlike for conventional western/allopathic medicines, most developing countries do not subject herbal medicine to rigorous scrutiny in regulation of production, sales, importation, and sometimes safety and efficacy information is lacking [22].

Despite the fact that knowledge of potential side effects of many herbal medicines in pregnancy is limited and that some herbal products may be teratogenic in human and animal models [23]. Data on the extent of women's use of herbal medicines during pregnancy is scanty especially in sub-Sahara Africa; the legislation for distribution and purchase of herbal medicines is not as stringent as it is for conventional medicines [24]. In conclusion, the pregnant women have a good intake of micronutrient supplements, a good dietary lifestyle, and a high level of abstinence from alcohol and herbal concoctions. However, they did not register for antenatal care early, as most of them either resumed during their second or third trimester. We recommend that early antenatal care resumption will help in early detection of abnormalities which can be corrected on time; and that the pregnant women and their family should also consider obtaining health insurance cover [25].

Conflicts of Interest

In compliance with the ICMJE uniform disclosure form, all authors declare the following:

Payment/services info: All authors have declared that no financial support was received from any organization for the submitted work. All authors have declared that they have no financial relationships at present or within the previous three years with any organizations that might have an interest in the submitted work.

Other relationships

All authors have declared that there are no other relationships or activities that could appear to have influenced the submitted work.

Acknowledgements

The authors would like to thank all the technical staffs of St Kenny Research Consult, Ekpoma, and Edo for their excellent assistance and for providing medical writing support/editorial support in accordance with Good Publication Practice (GPP3) guidelines.

References

1. Wikstrom AK, Gunnarsdottir J, Nelander M, Simic M, Stephansson O, Cnattingius S. Prehypertension in pregnancy and risks of small for gestational age infant and stillbirth. Hypertension. 2016; 67: 640-646.
2. ACC/SCN. Fourth Report on the World Nutrition Situation: Nutrition throughout the Life Cycle. Geneva, ACC/SCN in Collaboration with IFPRI.2020
3. Khalafallah AA, Dennis AE. Iron deficiency anaemia in pregnancy and postpartum: pathophysiology and effect of oral versus intravenous iron therapy. J Preg, 2012.
4. Prosser SJ, Barnett AG, Miller YD. Factors promoting or inhibiting normal birth. BMC Preg childbirth. 2018; 18: 1-10.
5. Miller YD, Prosser SJ,Thompson R. Back to normal: a retrospective, cross-sectional study of the multi-factorial determinants of normal birth in Queensland, Australia. Midwifery. 2015; 31: 818-827.
6. Pathak P, Kapil U, Dwivedi SN, Singh R. Serum zinc levels amongst pregnant women in a rural block of Haryana state, India. Asia Pacific J cli nut. 2008; 17: 276-279.
7. UNMP/MDG. United Nations Millennium Project, (2000): Millennium Development Goals. 2000
8. Harika R, Faber M, Samuel F, Kimiywe J, Mulugeta A, Eilander A. Micronutrient status and dietary intake of iron, vitamin A, iodine, folate and zinc in women of reproductive age and pregnant women in Ethiopia, Kenya, Nigeria and South Africa: a systematic review of data from 2005 to 2015. Nut. 2017; 9: 1096.
9. Bailey S, Bailey C, Boivin J, Cheong Y, Reading I, Macklon N. A feasibility study for a randomised controlled trial of the Positive Reappraisal Coping Intervention, a novel supportive technique for recurrent miscarriage. BMJ open.2015; 5: e007322.
10. Gernand AD, Schulze KJ, Stewart CP, West KP, Christian P. Micronutrient deficiencies in pregnancy worldwide: health effects and prevention. Nat Rev End. 2016; 12: 274-289.
11. Schafer M, Brütting C, Baldwin IT, Kallenbach M. High-throughput quantification of more than 100 primary-and secondary-metabolites, and phytohormones by a single solid-phase extraction based sample preparation with analysis by UHPLC–HESI–MS/MS. Plant Meth. 2016; 12: 1-18.
12. Oluleke M, Ogunwale A, Olaleye O, Tubi I, Arulogun O. Practices Relating to Dietary Intake of Pregnant Women Attending Antenatal Clinic at Primary Healthcare Centres in Ile-Ife, Nigeria. J Adv Med Med Res. 2018; 25: 1-12.
13. Vincent OG. Marriage and the Nigerian family: In Nigerian peoples and culture, ed. Sunday Idahosa. G.S.T. Unit. . Benson Idahosa University. Benin, Nigeria. 2016; 56: 366-378.
14. Tajudeen YA, Oladunjoye IO, Mustapha MO, Mustapha ST, Ajide-Bamigboye NT. Tackling the global health threat of arboviruses: An appraisal of the three holistic approaches to health. Health Promotion Perspectives. 2021; 11: 371.
15. Jemide JO, Ene-Obong HN, Edet EE, Udoh EEJIJHS. Association of maternal nutrition knowledge and child feeding practices with nutritional status of children in Calabar South Local Government Area, Cross River State, Nigeria. Int J Home Sci. 2016; 2: 293-298.
16. Uji AB, Efiok EE, Etenikang AS, Obinna NC, Chinedum, NE, Egor OS. Obstetric characteristics of women attending antenatal clinic in a tertiary hospital in Nigeria. Age. 2017.
17. Chewe MM, Muleya MC, Maimbolwa, M. Factors associated with late antenatal care booking among pregnant women in Ndola District, Zambia. Afri J Midwifery Women's Health. 2016; 10: 169-178.
18. Fakeye TO, Adisa R, Musa IE. Attitude and use of herbal medicines among pregnant women in Nigeria. BMC Comp altern med. 2009; 9: 1-7.
19. John LJ, Shantakumari N. Herbal medicines use during pregnancy: a review from the Middle East. Oman med j. 2015; 30: 229.

20. Agomo CO, Oyibo WA, Anorlu RI, Agomo PU. Prevalence of malaria in pregnant women in Lagos, South-West Nigeria. Kor J Parasitol. 2009; 47: 179-183.
21. Frawley J, Adams J, Steel A, Broom A, Gallois C, Sibbritt D. Women's use and self-prescription of herbal medicine during pregnancy: an examination of 1,835 pregnant women. Women's Health Issues. 2015 25: 396-402.
22. Barnes L. Women's experience of childbirth in rural Jharkhand. Eco Politi Weekly. 2007; 62-70.
23. Bruno LO, Simoes RS, Simoes MDJ, Girão MJBC, Grundmann O. Pregnancy and herbal medicines: an unnecessary risk for women's health—a narrative review. Phyt Res. 2018; 32: 796-810.
24. Adisa R, Fakeye T. Assessment of the knowledge of community pharmacists regarding common phytopharmaceuticals sold in South Western Nigeria. Trop J Pharm Res. 2006; 5: 619-625.
25. Spong CY. Defining “term” pregnancy: recommendations from the Defining “Term” Pregnancy Workgroup. Jama. 2013; 309: 2445-2446.