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Scientific Research Publishing

Health, 2023, 15, 1202-1217
https://www.scirp.org/journal/health
ISSN Online: 1949-5005
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Knowledge, Attitudes, and Practices Relating to Food and Nutrition among Pregnant Women Attending Antenatal Clinics at Menontin Hospital (Benin)

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How to cite this paper: Sossa, C.J., Salami, L., Metonnou, C.G., Tozoukan, E., Azandjeme, C., Mongbo, V. and Paraïso, M.N. (2023) Knowledge, Attitudes, and Practices Relating to Food and Nutrition among Pregnant Women Attending Antenatal Clinics at Menontin Hospital (Benin). *Health*, **15**, 1202-1217.
https://doi.org/10.4236/health.2023.1511080

Received: August 26, 2023
Accepted: November 6, 2023
Published: November 9, 2023

Abstract

Introduction: Pregnancy is a critical period during which environmental factors such as nutrition can affect the optimal development of the fetus. This study aims to evaluate the knowledge, attitudes, and practices in food and nutrition among pregnant women in antenatal consultation at Menontin Hospital in 2021. **Methods:** This was a cross-sectional, descriptive study including 96 pregnant women at Menontin Hospital in Cotonou. Variables including socio-anthropological data, level of knowledge of nutritional requirements and their consequences on malnutrition, and description of physical activity practices were collected using a questionnaire and data on pregnant women's dietary practices, macronutrient consumption, and fruit and vegetable consumption were documented using a food frequency questionnaire. **Results:** The majority of pregnant women (88%) were unaware of their nutrient needs during pregnancy. Only 49.6% of them took at least three meals and two snacks a day, and 45% practiced less than 30 minutes of physical activity per day. The consumption of carbohydrates, proteins, and lipids were respectively in the proportions of 36.5%, 50%, and 38.5%. It was also found that 48% of pregnant women did not consume fruits and vegetables daily. **Conclusion:** The pregnant women followed in the Mènontin area hospital had a low level of knowledge in terms of food and nutrition during pregnancy. Consequently, their attitudes and practices were unfavorable to good nutrition for both the mother and the child.

Keywords

Knowledge, Attitudes, Practices, Nutrition, Pregnancy, Bénin

1. Introduction

The nutritional status of pregnant women can have a major influence on the health of the fetus, infant, and mother [1]. Deficiencies in micronutrients such as calcium, iron, vitamin A, and iodine can lead to health problems in the mother and pregnancy complications that can endanger both mother and child. Low maternal weight gain during pregnancy, due to inadequate nutrition, increases the risk of preterm delivery, low birth weight, and congenital anomalies [2]. Maternal undernutrition is a major problem, particularly in developing countries, where it also contributes to maternal mortality [3]. In terms of health, malnutrition can be a source of complications for women during pregnancy, childbirth, and the postpartum period. It has adverse effects on the health of infants and is also an underlying cause of more than a third of deaths in children under five, and more than a fifth of maternal deaths [4]. The WHO reports that 38% of pregnant women worldwide have anemia, with a rate between 20% and 25% in developed countries and 56% in developing countries [5]. Micronutrient malnutrition is particularly worrying in pregnant women, as their nutritional status is a major determinant of the health of the fetus and, subsequently, the child. Micronutrient deficiency is a recognized cause of intrauterine growth retardation [6]. In developing countries, a newborn who has suffered intra-uterine growth retardation runs a risk of neonatal and infant death two to three times higher than a healthy newborn. In addition to the risks to immediate survival, stunted growth in utero predisposes them to cognitive deficits, reduced physical capacity, increased risk of disease throughout life and even chronic diet-related illnesses [7]. Worldwide, it is estimated that between 15% and 20% of newborns are underweight, representing 20 million cases each year [8]. In Africa, prevalence is 13.7%, with 15.2% in West Africa, 14.2% in South Africa, 13.4% in East Africa, 12.5% in Central Africa and 12.2% in North Africa [9]. In the West African sub-region, the prevalence of FPN varies from 13.4% in Burkina-Faso [10], 12.0% in Senegal [11] to 10.2% in Ghana [12]. In Benin, according to data from the 2017-2018 Demographic and Health Survey (DHS), around 12% of newborns had LBW [13]. The WHO has set a target of a 30% reduction in the number of LBW children by 2025, a reduction of 3% per year from 2012 rates [14]. In Benin, the 2014 Multiple Indicator Cluster Survey (MICS) revealed that the prevalence of low birth weight was 12% and that of stunting in children under 5 was 34% [15]. These results have remained almost unchanged over four years, according to the EDSB 2017-2018, which reports that more than a third of Beninese children under the age of five are stunted, *i.e.* a prevalence of 34% [2]. The Littoral department does not remain on the sidelines of these detrimental find-

ings where there is 19% stunting among children under 5 in Cotonou versus 36% in rural areas. The same applies to specific type 1 nutrient deficiencies (iron, vitamin A, zinc, and iodine) [13]. The prevalence of anemia in women is higher in Cotonou than in rural areas (61% versus 58%). In Benin, 72% of children aged between 6 and 59 months are anaemic [13]. This situation persists despite the numerous nutritional education and communication sessions carried out and supported by the International Community, the Government, and Non-Governmental Organisations (NGOs) with a view to meeting the nutritional needs of pregnant women, women in labor, newborns, and infants. The situation is worrying and has disastrous consequences for the development of Benin's young people, who are the guarantors of the country's future development. The antenatal visit is an important opportunity to communicate with pregnant women and provide them with certain care and nutritional information that is essential for their health and well-being, as well as that of their unborn child. In Benin, this opportunity is not taken to provide pregnant women with nutritional advice in only 45% of cases [16]. In Benin, almost 8 out of ten births (78%) take place in a health facility, a high rate compared with the average for West and Central Africa (46%) [17]. In addition to this high rate of assisted childbirth, there is still a high level of maternal deaths [18] in the country. Lack of access to good education and information is also a cause of malnutrition. Without better and more accessible information strategies and education programs, people cannot become aware of malnutrition and acquire the skills and attitudes needed to combat it [19]. It is therefore plausible that the causes of this situation are a lack of knowledge of good nutritional practices on the part of pregnant women and the service providers involved in their prenatal care. The aim of this study is to evaluate the knowledge, attitudes, and practices in food and nutrition among pregnant women attending antenatal consultations at the Menontin Hospital in 2021 in order to define corrective action.

2. Framework and Methods

2.1. Study Framework

This study took place at the Zone Hospital of Mènontin. The Mènontin Hospital is a non-profit medico-social structure. As part of the social dimension of the Structural Adjustment Program, the World Bank and the Government of Benin have initiated the Urban Rehabilitation and Management Project for the cities of Cotonou and Porto-Novo. The Mènontin Hospital is located in the 9th district precisely in the Cotonou V health zone of which it is today the Zone Hospital. It is the first public hospital contracted by the Beninese state. The 9th arrondissement covers an area of 15km^2 and is limited to the North by Cotonou I, to the South by Lake Nokoué, to the East by Cotonou IV and I, and to the West by Cotonou VI. This geographical location gives it a pivotal position between the city of Cotonou and the city councils of Ouidah and Abomey-Calavi. The Mènontin Hospital is run by 248 agents of all categories, including 203 perma-

nent staff and 45 service providers. The number of antenatal consultations in 2020 was 6159.

2.2. Type of Study

This was a cross-sectional and descriptive study of the knowledge, attitudes, and practices in food and nutrition of pregnant women followed in consultation at the Zone Hospital of Mènontin.

2.3. Study Period

The study took place in May 2021.

2.4. Study Population

The study population was made up of the primary targets, which are pregnant women followed in consultation at the Mènontin Zone Hospital.

2.5. Inclusion Criteria

Pregnants who have already benefited from at least one prenatal consultation at the Mènontin Zone Hospital before July 28, 2021, the start date of data collection, and midwives and gynecologists involved in the management of prenatal consultations having given their consent were included in the study.

2.6. Exclusion Criteria

Women who had at least one antenatal consultation at the Menontin area hospital but who had a medical condition preventing data collection.

2.7. Sampling

2.7.1. Sampling Method and Technique

The non-probability sampling method was used for all targets. We used this sampling technique for the convenience of pregnant women. For midwives and gynecologists, the purposive sampling technique was used. This sampling technique made it possible to select 96 pregnant women during the data collection period.

2.7.2. Study Variables

The variables of this study were classified into three groups: socio-demographic and obstetrical variables, variables related to knowledge, attitudes, and nutritional practices of pregnant women, and variables related to nutrition knowledge of their service providers.

2.7.3. Socio-Demographic and Obstetric Variables

Age, gender, ethnicity, level of education, occupation, gravidity, and parity were documented by a questionnaire. The level of education took into account the uneducated, the literate, the primary, secondary, and higher levels. Gravidity took into account the number of times the pregnant woman carried a pregnancy

and parity the number of times the pregnant woman had already given birth.

Level of education was recorded by interview during the administration of the questionnaire with modalities such as none, literate, primary level, secondary level, and higher level.

The occupation was documented during the administration of the questionnaire with the following modalities: civil servant/manager, shopkeeper/dealer, housewife, craftswoman, pupil/student, and others.

Gesticity, *i.e.* the number of times the woman had carried a pregnancy, was documented by interview and classified into two categories: number of pregnancies between 1 and 5, then 5 to 8.

Parity, *i.e.* the number of times the woman had given birth, was documented by questionnaire administration and classified into two categories: between 0 and 4, then over 5.

2.7.4. Variables Related to Knowledge, Attitudes, and Nutritional Practices of Pregnant Women

The level of knowledge of the woman was determined by a questionnaire. The questions include: have you ever received advice on the diet/nutrition of pregnant women? If yes, how did you receive information on the diet/nutrition of pregnant women? The personal advice you received from the health worker related to what aspects of nutrition? The quantity of food or meals, the quality of food or meals, or a particular diet? What foods do pregnant women need most for their health and that of their babies? What are the consequences of malnutrition on the health of the mother, what are the consequences of malnutrition on the health of the baby?

The attitudes of pregnant women were assessed through the following questions: Have eating habits changed after the advice of providers? Do you manage to take the balanced meals recommended by the providers? How many meals do you take per day? Whether the meals were prepared at home or bought outside and the daily practice of at least 30 minutes of physical activity.

The food practices of pregnant were assessed with the food frequency questionnaire tool on the consumption of the last seven days before the survey on cereals and tubers, animal proteins, vegetable proteins, lipids, dairy products and derivatives then fruits and vegetables, sugary drinks and sweets, alcohol, the use of tobacco and derivatives.

2.7.5. Variables Related to the Knowledge of Providers in Charge of Prenatal Consultations

The aspects of knowledge documented were knowledge of the pregnant woman's diet, knowledge of the sources of nutrients, knowledge of the consequences of malnutrition in the pregnant woman on her health and that of her baby, and knowledge of nutritional counseling.

2.8. Data Analysis

The data collected on the basis of the questionnaires was analyzed using SPSS

software. A descriptive analysis made it possible to express the results in the form of numbers and percentages for qualitative variables or median and inter-quartile range (IQI) for quantitative variables. The results of the food frequency questionnaire were processed monthly to classify pregnant according to their intake.

3. Results

A total of 98 pregnant women meeting the inclusion criteria and did antenatal consultation during the study period were identified. Among them, 96 participated in this study and 02 cases of refusal were recorded. 14 midwives and six gynecologists were informed.

3.1. Description of Socio-Demographic Factors and Gyneco-Obstetric History

Table 1 presents the socio-demographic characteristics of the pregnant and the data relating to the gynecological-obstetric history such as Gravidity and parity.

3.2. Knowledge of Pregnant

The majority of pregnant women (88%) were unaware of their nutrient needs during pregnancy. The same observation was made on the knowledge of the consequences of malnutrition on the state of health of pregnant women where 76.8% answered negatively. Nevertheless, the majority of pregnant women (73.6%) knew the importance of practicing physical activity during gestation. Table 2 presents details on the knowledge of pregnancy.

3.3. Daily Physical Activity in Pregnant

This study shows that 45% of pregnant dams did not engage in at least 30 minutes of physical activity every day (Figure 1).

3.4. Description of the Food and Nutrition Attitudes of Pregnant Women

A total of 90% of pregnant women declared to have changed their eating habits in terms of the quantity and quality of meals consumed to cover the needs of their bodies and that of their babies. In fact, those who had not changed mentioned either professional difficulties (the locality where they practice their profession does not offer a variety of meals), or because they did not need it (because they felt they had good eating habits).

3.5. Description of the Food and Nutrition Practices of Pregnant Followed in Prenatal Consultation at the Mènontin Area Hospital

The number of daily meals consumed has been illustrated in the figure below (Figure 2). It shows that 29.2% of pregnant ate more than three meals and two snacks daily.

The analysis of Table 3 showed that 36.5% of the pregnant women had a daily consumption of carbohydrates up to 2 times. Lipids were taken once (01) a day by 38.5% of the pregnant women surveyed and 50% of the pregnant women

Table 1. Sociodemographic and obstetrical characteristics of pregnant.

Variables	Numbers (n = 96)	Percentage %
Age group (years)		
15 - 34	85	88.5
>34	11	11.5
Ethnic group		
Fon and related	48	50.0
Adja and related	36	37.5
Bariba and related	3	3.1
Yoruba and related	8	8.4
Others	1	1.0
Residence		
Urban	28	29.2
Rural	68	70.8
Level of education		
None	10	10.4
Literate	7	7.3
Primary	10	10.4
Secondary	43	44.8
Higher	26	27.1
Profession		
Civil servant/Executive	23	23.9
Saleswoman	28	29.2
Housewife	6	6.3
Craftswoman	23	23.9
Pupil/Student	7	7.3
Other	9	9.4
Gravidity		
1 - 5	94	97.9
5 - 8	2	2.1
Parity		
0 - 4	90	93.7
>5	6	6.3

Table 2. Pregnant surveyed according to their knowledge of nutritional needs and the consequences of malnutrition.

Variables	Numbers	Percentage %
Knowledge of nutrient requirements		
Yes	14	12
No	82	88
Knowledge of the consequences of malnutrition on the health of mothers and babies		
Yes	25	23.2
No	71	76.8
Knowledge of physical activity during pregnancy		
Yes	90	93.8
No	6	6.2

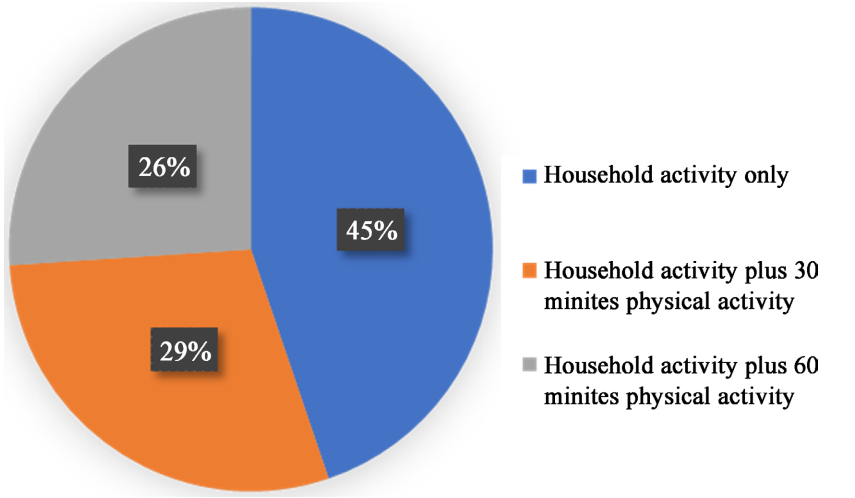

Figure 1. Distribution of pregnant surveyed on the daily practice of physical activity, Mènontin Zone Hospital in 2021 (n = 96).

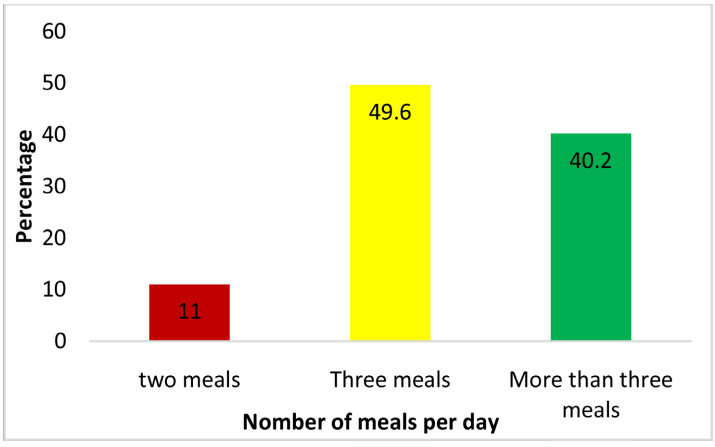

Figure 2. Distribution of pregnant women surveyed according to the number of meals consumed per day, Mènontin Zone Hospital in 2021 (n = 96).

Table 3. Distribution of pregnant surveyed according to macronutrient consumption, Mènontin Zone Hospital in 2021 (n = 96).

Food consumed	Weekly consumption	Daily consumption	Numbers	Percentage %
Carbohydrates (Cereals and tubers)	<7	0	9	9.4
	7	1	49	51
	14	2	35	36.5
	21	3	3	3.1
Lipids	<7	0	59	61.5
	7	1	37	38.5
	14	0	0	0
Animal proteins	<7	0	30	31.3
	7	1	48	50
	14	2	15	31.3
	21	3	3	15.6
Beans	<7	0	93	96.9
	7	1	2	2.1
	14	2	0	0
	21	3	1	1
Milk and milk derivatives	<7	0	93	96.9
	7	1	3	3.1
	14	2	0	0
	21	3	0	0

surveyed took an animal protein once (01) a day.

3.6. Daily Consumption of Fruits and Vegetables

Pregnant women's consumption of foods rich in vitamins, mineral salts, and trace elements (fruits and vegetables) is summarized in Figure 3.

3.7. Service Providers' Knowledge of Gestational Nutrition

A total of 20 providers, including 6 gynecologists and 14 midwives who monitor pregnant women, were surveyed. Table 4 shows that 11 providers had knowledge of the nutritional needs of pregnant women, 10 knew the sources of macronutrients and 20% knew the sources of vitamins, minerals and trace elements. Similarly, 40% and 65% knew respectively about the consequences of malnutrition on the health of the mother and the baby.

4. Discussion

This study aimed to assess knowledge, attitudes, and practices in food and nutrition

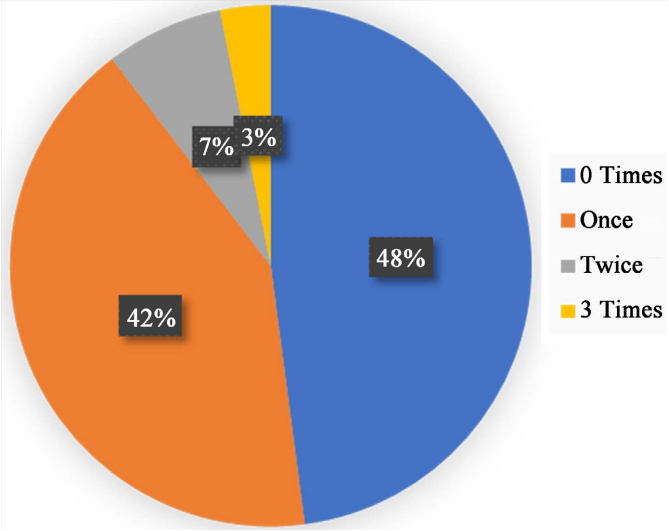

Figure 3. Distribution of pregnant surveyed according to fruit and vegetable daily consumption in Mènontin Zone Hospital 2021 (n = 96).

Table 4. Distribution of surveyed providers according to knowledge of the nutritional needs of pregnant women.

Variables	Numbers	Percentage %
Knowledge of the nutritional needs of pregnant women (macro and micronutrients)		
Yes	11	55
No	9	45
Connaissances des sources des macronutriments		
Yes	10	50
No	10	50
Knowledge of the sources of micronutrients		
Yes	4	20
No	16	80
Consequences of malnutrition on the mother's health		
Yes	8	40
No	12	60
Consequences of malnutrition on a baby's health		
Yes	13	65
No	7	35

among pregnant women in antenatal consultation at Menontin Hospital. The majority of pregnant women (88%) were unaware of their nutrient requirements during pregnancy. The same was true of knowledge of the consequences of malnutrition on the health of pregnant women, where 76.8% responded negatively. In a case-control study of pregnant women carried out in Malawi in 2021 to improve their level of knowledge about food and nutrition, many more women in the intervention group (58.4%) than in the controls (23.6%) had a low

score for nutritional knowledge at the start of the study [1]. These results are similar, and the low levels of knowledge among pregnant women demonstrate the limitations of healthcare professionals in providing nutritional and dietary advice to pregnant women. Nutritional education plays a central role in efforts to change nutritional behavior and can improve the level of nutritional and dietary knowledge of the participants in this study. Nutritional knowledge of pregnant women provides the necessary skills to understand and interpret information about foods and their nutrients, and then the ability to apply this information to make appropriate food choices [20] [21]. In this study, 69% of pregnant women had received advice on diet during pregnancy. Of these, 38% said they had received nutritional advice from health professionals. This proportion is higher than that found in the study by Houndégla *et al.*, in which only 24.6% had received advice on diet and nutrition during pregnancy from health workers at the Cotonou Mother and Child Hospital [22]. The high proportion obtained in the present study could be explained by the nature of the health facilities. In fact, the study of Houndégla *et al.* took place in a public hospital, whereas ours took place in a private health facility where patient follow-up is more rigorous in order to maintain or increase the number of patients. Furthermore, the sample size could justify this difference in proportion, as 96 pregnant women took part in this study, whereas the Houdégla study was carried out on 176 pregnant women. However, this proportion of 38% is very low to guarantee good monitoring of the nutritional status of pregnant women in terms of diet and nutrition, As for the daily frequency of meals. Pregnancy is a physiological state that leads to an increase in nutritional requirements, so it is advisable to increase food intake in terms of meal frequency. Pregnant women should therefore add two snacks to their three meals [4]. The results of the present study showed that few pregnant women covered their nutritional requirements, with the intention of preventing glycaemic disorders. During pregnancy, nutritional problems can have an impact on both the mother's health and that of the fetus, which is why special attention is needed [23]. An inadequate diet during pregnancy can lead to various nutritional deficiencies, such as anemia. Optimal coverage of nutritional requirements is therefore a crucial element of pregnancy that should not be neglected [24]. A national study of Ghanaian women of childbearing age reported deficiencies in micronutrients such as iron, vitamin A, and folates in proportions of 13.7%, 1.5%, and 53.8% respectively [25]. In Benin, studies by Alaofè *et al.* reported that 11.3% and 17.7% of women of childbearing age were deficient in iron and vitamin A respectively [26]. These studies clearly show that pregnant women had poor coverage of nutrient requirements well before gestation. A comparative study of micronutrient intervention strategies to meet micronutrient needs in Ghana and Benin reported that fortification programs appear to be the most important to ensure micronutrient coverage as very few micronutrient needs were covered by the diets themselves. The authors of this study suggest that coordinated implementation of nutritional programs, including fortification, biofortification, supplementation, and promotion of nutrient-rich foods,

combined with strict quality control of fortified foods, is warranted to reduce the high prevalence of micronutrient deficiencies in pregnant women [27].

In addition, almost half (45%) of the pregnant women in the study were physically active for less than 30 minutes a day. This prevalence was slightly lower than the 59.5% reported by Petigny *et al.* [28]. Studies by Uchenna *et al.* among pregnant women in South Africa reported that most had negative beliefs that physical activity during pregnancy increased body temperature (64.5%) and that pregnancy was a time to rest and abstain from physical activity (56.5%) [29]. On the other hand, scientific evidence has shown that physical activity during pregnancy is beneficial for both mother and unborn child. The benefits include reducing excessive gestational weight gain and reducing the risk of gestational diabetes. [30] [31] [32] [33]. This scientific evidence justifies the important role of physical activity in the health of the mother and the fetus; therefore, designing educational interventions to encourage, promote and support pregnant women is necessary.

The study also showed that 3.1% of pregnant women ate at least three meals a day containing carbohydrates (cereals, roots, and tubers). Similarly, 50% of pregnant women consumed animal proteins on a daily basis Agli *et al.* [34] reported in a study of the nutritional status of 417 pregnant women that 14.80%, 20.70% and 64.50% of them consumed proteins, lipids, and carbohydrates respectively. This variability in proportions could be explained by the different data collection techniques used in the two studies. The present study used the food frequency questionnaire technique, whereas the study by Agli *et al.* used the 24-hour recall technique. This variability could also be explained by the different sample sizes of the two studies. This study enrolled 96 participants whereas the Agli *et al.* study selected 417 pregnant women. Fetal growth, increases in various tissue and blood volumes, extracellular and amniotic fluids, maternal fat, and placental weight were associated with increased maternal dietary requirements. To create a positive energy balance, pre-gestation energy intakes should be increased by 360 and 475 kcal in the second and third trimesters respectively. Pregnant women should therefore increase their protein and fat intake during the second and third trimesters [35]. Lower macronutrient intakes expose the mother to undernutrition and the fetus to low birth weight, which in turn can lead to the development of chronic diseases in adulthood [36].

The WHO recommendations on the daily consumption of five portions of fruit and vegetables were not respected by the pregnant women surveyed in the present study. Nearly half (49%) did not consume one portion of fruit a day. Some studies have shown higher prevalence of fruit and vegetable consumption, such as those by Kérékou *et al.* in Benin in 2015 [37] and the national survey in Togo in 2011 [38], where the prevalences were 82.9% and 90% respectively. In contrast, in Guinea-Conakry the prevalence of fruit and vegetable consumption was 79.3% [39]. This variation in the prevalence of fruit consumption could be justified by the difference in the study populations. The present study focused on pregnant women in a health facility, whereas the other studies were conducted

among the general population. In addition, the level of education of the participants in this study could explain the low consumption of daily fruit and vegetables, as better-educated people are better informed about the benefits of eating fruit and vegetables [40]. Only 27.1% of pregnant women in this study had a tertiary level of education. Added to this is the phenomenon of notional transition, which is increasingly leading people to make obesogenic food choices.

5. Conclusion

This study showed that the majority of pregnant were unaware of their nutritional needs during pregnancy. The food and nutrition knowledge, attitudes, and practices of pregnant followed at the Mènontin Zone Hospital were insufficient and could affect the health of the pregnant and their fetuses. It would be worthwhile subjecting pregnant to nutritional education sessions to improve their level of knowledge about food and nutrition, which would enable them to make appropriate food choices for their health and that of their future baby.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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