

Nutritional Status of HIV-Positive Pregnant Women in Luanda, Angola

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Abstract

During pregnancy, maternal intake of nutrients and their nutritional status affects both mother and baby. Good nutritional status plays an important role for a healthy pregnancy, for this it is necessary that the pregnant woman have a healthy diet to assist in weight gain.

Objective: To evaluate the pregestational and gestational nutritional status of HIV-positive women.

Methods: This is a cross-sectional and descriptive study, conducted from August to November 2018 in which 171 HIV-positive pregnant women were selected at random, in order of arrival and submitted to nutritional assessment through the Global Subjective Evaluation, whose data collected, were analyzed using EpiInfo software version 7.2.

Results: From the main results found it was observed the presence of maternal nutritional eutrophic, considering the pre-gestational Body Mass Index (BMI) of 107 (62.56%), and the gestational BMI of 94 (54.97%). It was found 31(18.12%) of pre-gestational overweight and 54 (28.07%) of overweight during pregnancy, and it was also observed that 12 (7%) of pregnant women were obese before pregnancy and 15 (15.28%) became obese during pregnancy. A significant association was found between pregestational BMI, height ($p=0.0001$), gestational BMI, current weight ($p=0.0003$), brachial perimeter ($p=0.002$), and uterine height ($p=0.005$).

Conclusion: The results of this study indicate the need to develop nutritional care programs for HIV-positive women, in order to ensure an adequacy of their nutritional status.

Introduction

Pregnancy is a period that imposes increased nutritional needs, and adequate nutrition is paramount for the health of the mother and the unborn child, when women must consume specific foods, variety, and quantity, taking into account cultural dietary guides and practices to meet energy and nutritional needs, and weight gain recommendations [1]. Despite the need for increased energy intake during pregnancy, women living in underdeveloped countries are often exposed to food insecurity and, to long-term malnutrition; food insecurity combined with malnutrition can affect the growth and development of the fetus [2]. Food insecurity is present in the lives of pregnant women in Africa because a large proportion of these women are responsible for family income and, during the period of pregnancy, their potential for income gain decreases, leading to a period of vulnerability and, in many cases, food insecurity leads to depression, a factor that impairs the well-being of both mother and baby [3].

The World Health Organization (2016) has published recommendations on prenatal care for a positive pregnancy experience, where it recommends that in undernourished populations, women receive nutritional education during pregnancy, guiding them to increase their daily energy and protein intake to reduce the risk of low birth weight newborns. The same document also recommends a daily oral

supplementation of iron and folic acid with 30 to 60 mg of elemental iron and 400µg (0.4 mg) of folic acid in order to avoid anaemia of mothers, puerperal infection, low birth weight and premature birth [4].

The presence of Human Immunodeficiency Virus (HIV) in the pregnancy does not reduce positive feelings about motherhood, but imposes many fears and strict care to prevent vertical transmission, particularly during birth [5]. When a HIV- positive woman becomes pregnant, some additional aspects must be considered in relation to her nutritional status, because the energetic demands of this woman are determined by the high energetic expenditure of rest, in the occurrence of infection and by the physiological adjustments proper to the gestational process, so that the increase in nutritional needs should reflect both the demands of pregnancy and infection [6]. Nutritional alterations, such as weight loss and protein reduction are common in HIV infection, alterations that lead to malnutrition, which results in a weakened immune system, requiring multivitamin supplementation during pregnancy and in the postpartum period, which significantly improve the hematological status of HIV-infected women as well as their children [7]. Experiences of guilt and fear of transmitting HIV to the child add to the health policies and actions that contribute to motherhood prophylaxis [5], the challenge posed by the HIV/AIDS epidemic in Africa, Angola, through the support of UNAIDS and the UN, support the initiative of the 37 First Ladies of African countries, whose program named "Born Free to Shine" has sought to offer treatment conditions to HIV-positive pregnant women in order to reduce the rate of mother-to-child transmission of HIV by offering them quality and humane care services [8].

It is estimated that between 223.350 and 290.000 adults over the age of 15 live with HIV in Angola, in addition to almost 30.000 children, in a prevalence of 2.34% among adults aged 15-49. It is estimated that women living with HIV, having a higher prevalence among young women (15-24 years = 0.9%), and about 15.575 pregnant women test positive for HIV each year, in a national average prevalence of 15-49 age group in 2.8%, being higher in the urban area (3%) than in the rural area (1.6%) [9].

Hence the need to carry out this study, with the objective of conducting nutritional assessment in the pre-gestational and gestational stages of HIV-positive women, in order to verify how much the results of these assessments may indicate risks of morbidity and mortality in these women, taking into account the various changes that guess the HIV infection and the maternal nutritional status, and the fact that there is no nutritional monitoring directed to these pregnant women in Angola until the time of the study.

Methods

Data were collected from August to November 2018, in a cross-sectional and descriptive study designed to evaluate nutritional status of HIV- positive pregnant women in a current antenatal care at a secondary healthcare level in Luanda, Angola, based on an estimated prevalence of 5.94% (data collected from the Department of Statistics of the secondary healthcare facility), 95% confidence level and 5% sampling error. An increase of 20% was employed for possible cases of loss or refusal [10].

The project was approved under the Protocol n^o 1, by the Committee on Ethics in Research in Human Beings of the Catholic University of Angola, with the purpose of safeguarding the rights and dignity of research subjects, and all participants signed an Informed Consent Term as a sign of acceptance of participation in the research.

Sample was selected by a simple random, in order of arrival, considering the number of pregnant women needed to compose the sample. The classification proposed by Goldstein et al (2018) [11] was used to classify the anthropometric nutritional status. The criterion for calculating gestational age was based on the parameters of Kim ID, Han ID and Kim (2019) [12]. The results found were stored in a database, using the Microsoft Office Excel spreadsheet, and were treated with the Epi info software by CDC Atlanta version 7.2.

Results

171 HIV- positive pregnant women participated in the study and according to Table 1, age varied between 19 and 42 years, with 53 (93.57 %) being of Angolan nationality, 110 (67%) coming mostly from the Central Northern region, 16 (10%) coming from Eastern Angola. It should also be noted that 11 (7%) of pregnant women came from the provinces of Congo Brazzaville (3) and Congo Kinshasa (8). Of these, 147 (85.96%) were in an unrecognized partnership, 120 (70.18%) had between 1 and 3 children and 99 (58.48%) had an informal job.

Table n^o. 1: Sociodemographic data of HIV-positive pregnant women.

<i>Variables</i>	<i>Standard</i>	<i>Frequency</i>	<i>(%)</i>
<i>Age</i>	19 to 26 years	33	19.30
	27 to 34 years	85	49.71
	35 to 42 years	53	30.99
<i>Country</i>	Angola	160	93.57
	Congo Kinshasa Congo Brazzaville	8	5.11
		3	1.74
<i>Region of origin</i>	North South	14	8
	North Center West East	4	2
	Central Region	110	67
		5	3
		16	10
<i>Marital status</i>	Single Married	6	3.51
	Union not recognized	18	10.53
		147	85.96
<i>Number of children</i>	1 to 3 Children	120	70.18
	4 to 6 Children	40	23.39
	≥ 7 Children	3	1.75
	Without Children	8	4.68
<i>Type of work activity</i>	Formal Informal	33	20.47
	Unemployed	99	58.48
		39	21.05

Table 2 mirrors the anthropometric data of pregnant women HIV positive who participated in the study, 88 (51.45%) of the participants in the study were between 1.59 m and 1.66 m in height and the average was 162.75 m. About 71 (41.51%) weighed between 56 and 68 kg, and the average pre-gestational weight was 60.77 kg. In relation to the current weight, 83 (48.52%) being the average of 65.7 kg. A majority of pregnant women with eutrophic pre-gestational BMI were observed in 83 (62.56%), with an overweight

index of 31 (18.12%). The majority of pregnant women presented a eutrophic gestational BMI in 94 (54.97%), also highlighting the rate of overweight which was 54 (28.07%). The general averages of pre-gestational BMI and gestational BMI were 22.54 and 24.30 respectively. As for the brachial perimeter, 84 (49.12%) were between 27 cm and 32 cm, with a mean brachial perimeter of 29.59 cm. Uterine height from 11 cm to 25 cm was present in 75 (43.83%) of pregnant women, with an average of 25.97 cm.

Table 2: Anthropometric parameters of HIV-positive pregnant women.

Variables	Standard	Frequency	(%)	Average	Standard Deviation
Height (m)	1.45-1.59	40	23.39	162.75	5.83
	1.59-1.66	88	51.45		
	1.67-1.79	43	25.16		
Pre-gestational weight (kg)	36-55	59	34.50	60.77	12.30
	56-68	71	41.51		
	69-91	41	23.99		
Current weight (kg)	39-61	60	35.09	657	12.39
	62-76	83	48.52		
	77-99	28	16.39		
Pre-gestational BMI	Low Weight	21	12.27	22.54	4.09
	Eutrophy	107	62.56		
	Overweight	31	18.12		
	Obesity	12	7.00		
Gestational BMI	Low Weight	8	4.68	24.30	4.09
	Eutrophy	94	54.97		
	Overweight	54	28.07		
	Obesity	15	15.28		
Brachial perimeter (cm)	20-26	44	25.73	29.59	4.15
	27-32	84	49.12		
	33-39	43	25.14		
Uterine height (cm)	≤25	75	43.83	25.97	7.54
	26-32	59	34.48		
	≥39	37	21.62		

Table 3 presents the analysis by correlation and simple linear regression between the variables related to the pre-gestational and gestational nutritional status of the study participants. There was a strong and positive correlation between the variable current weight and pre-gestational BMI (RR=0.9) and current weight and gestational BMI (RR=0.8) there was also a strong and positive correlation between the variable brachial perimeter and pre-gestational BMI (RR=0.8), and current weight and gestational BMI (RR=0.6) there was also a strong positive correlation between pre-gestational BMI and gestational BMI

(RR= 0.8) the statistical association between pre-gestational and gestational BMI was ($p=0.01$). A statistically significant association was observed between pregestational BMI and height ($p=0.0001$) and current weight ($p=0.007$), and between gestational BMI height ($p=0.02$), current weight ($p=0.0003$), brachial perimeter ($p=0.002$) and uterine height ($p=0.005$).

Table 3: Correlation and simple linear regression of the Body Mass Index (BMI) in relation to the other variables.

<i>Pre-gestational BMI</i>			<i>Gestational BMI</i>	
<i>Variables</i>	<i>r</i>	<i>P</i>	<i>r</i>	<i>P</i>
<i>Pre-gestational weight</i>	0.2	≥ 0.07	0.1	≥ 0.6
<i>Current weight</i>	0.9	≥ 0.007	0.8	≥ 0.0003
<i>Brachial perimeter</i>	0.7	≥ 0.3	0.6	≥ 0.002
<i>Uterine height</i>	0.09	≥ 0.2	0.2	≥ 0.005

Table 4 reflects the daily consumption of nutrients by pregnant women, which consisted mostly of carbohydrates (47%) and, in their minority, of vitamins (9%).

Table 4: Nutrient consumption classified by average intake from one to four portions in 24 hours

<i>Variables</i>	<i>Frequency (per day)</i>	<i>(%)</i>
<i>Carbohydrates</i>	Up to four portions a day	47
<i>Proteins</i>	Two to three portions a day	29
<i>Lipids</i>	Three to four portions a day	15
<i>Vitamins</i>	One to two portions a day	9

Figure 2 describes that 131(76.61%) of the pregnant women who participated in the study were aware that they were HIV-positive before the onset of pregnancy and 40 (23.39%) of the pregnant women were aware that they were HIV-positive after the onset of pregnancy.

Discussion

This study presents a description of the anthropometric, sociodemographic and clinical characteristics of pregnant women with HIV-AIDS of the prenatal care system at secondary healthcare level in Luanda, Angola. Taking into account the socio-demographic data of pregnant women it was highlighted that most of the participants in the study (58.48%) practiced an informal activity, which is an important indicator in

the labor profile in which the majority of the country's population and women in the study (58.48%) are found, in informality. In Angola, there is a significant difference in wage levels across sectors and, in many cases, wages are not sufficient to ensure a decent life for workers and their families. In turn, the informal economy is characterized by precarious working conditions, which include not only low wages, but also scarcity of labor rights and lack of social coverage or protection, where most women are unemployed (24.9%) [13].

Based on the anthropometric data of the study participants and taking into account the pre-gestational body mass index (BMI), it was observed that although most women in the pre-gestational (62.56%) and gestational (54.97%) stages were in a state of eutrophic, a good representation of pregnant women was found to be overweight (28.07%) and obese (15.28%), which indicates the need for supervision and nutritional counseling, since overweight in these women may not be associated with a balanced diet in terms of nutrients, as we see in Table 4, which reflects that the diet during pregnancy was rich in carbohydrates (47%) at the expense of low vitamin intake (9%). Although there are several factors that may influence the food intake of pregnant women, we chose the two most predominant, first the cultural factor, because in sub-Saharan Africa a diet based on cassava derivatives predominates, and second the income, taking into account that the socioeconomic level of women in underdeveloped countries means that at some point of the month there is not enough money to buy food, thus increasing food insecurity during pregnancy, which becomes a challenge to an appropriate diet in terms of quality and quantity [2].

Regarding the characteristics of maternal nutritional status, a strong and positive correlation was observed between the variable current weight and pre-gestational BMI (RR=0.9) and current weight and gestational BMI (RR=0.8), as well as significant statistical differences with respect to pre-gestational BMI and current weight ($p \leq 0.007$), and between gestational BMI and current weight ($p \leq 0.0003$), which corroborates with the pattern of food consumption of the women in the study, as well as in the data of the study carried out by Brandão et al. (2011) [6] in which observed significant associations in relation to the statistical difference found statistically significant results between pregestational BMI and pregestational weight ($p < 0.01$), and in the evaluation during pregnancy was observed statistical difference in relation to gestational BMI and current weight ($p < 0.05$).

Of the pregnant women who participated in the study, 131 (76.61%) were aware of their serological status before pregnancy, which can mean a positive advantage, so that most of them (99.42%) had regular antiretroviral treatment (ART) and nutritional supplementation (97.66%) (Unpublished data), and decrease the possibility of the baby being born HIV positive. It recommends the use of ART during breastfeeding for all HIV-positive women in the prevention of mother-to-child transmission, regardless of the CD4 + cell count. In addition, for this to happen, nurse women should be guided about the harms of HIV transmission through breast milk, while being aware of the benefits of exclusive breastfeeding as a strategy in preventing mother-to-child transmission. The mechanism that leads mothers to choose exclusive breastfeeding is mainly the desire for child survival, and this process occurs in the best way when the woman receives the necessary support from her partner and health professionals, during the

process and then, when the time comes for the introduction of other foods, assertive choices are made that do not harm the child's nutrition [14].

Conclusion

During the elaboration of the work we could see that the pregnant women who participated in the study have their anthropometric indexes measured by the prenatal program, but do not receive from health professionals of the health unit a feedback of such information and even nutritional guidance during pregnancy. Thus, we drew attention to the need to expand nutritional care to HIV-positive pregnant women in Angola, through the creation of a scheme of nutritional follow-up throughout the prenatal and also suggest that studies be conducted to verify the relationship between the nutritional status of pregnant women, associated with adherence to antiretroviral treatment and viral load dosage, as well as the impact of these factors as propitiators of breastfeeding by HIV-positive women.

Declarations

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Figures

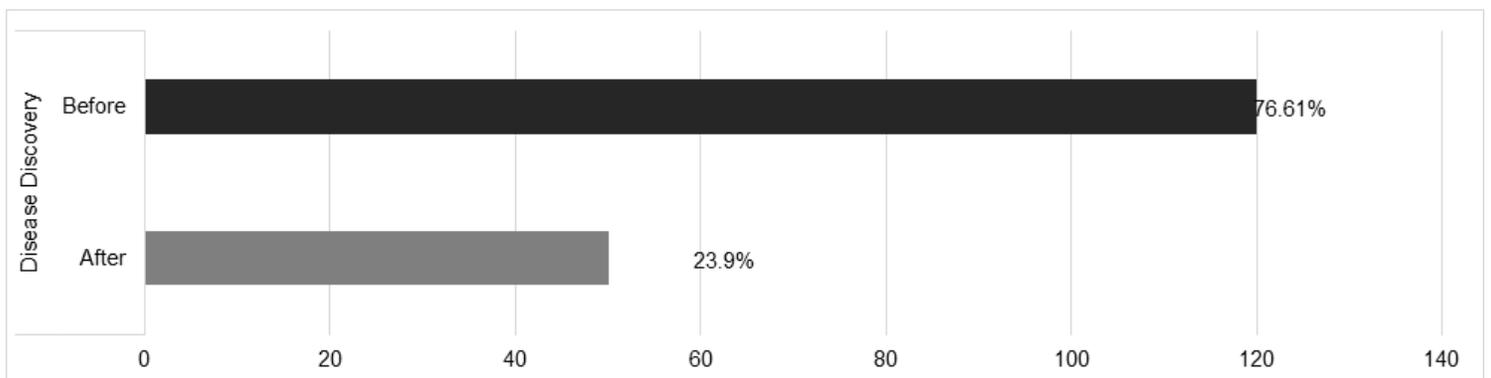


Figure 1

Data on serological knowledge of study participants before pregnancy and after pregnancy.