

Socio-Economic and Cultural Factors Associated with the Nutritional Status of Pregnant Women Attending Antenatal Clinics at the Kalaban-Coro Reference Health Centre in 2022

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DOI: [10.36347/sjams.2023.v11i07.004](https://doi.org/10.36347/sjams.2023.v11i07.004)

| Received: 19.05.2023 | Accepted: 24.06.2023 | Published: 07.07.2023

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Abstract

Original Research Article

The aim of this study was to assess the socio-economic and cultural factors associated with underweight in pregnant women in the Kalaban-coro Health Centre. **Method and material:** This was a cross-sectional analytical study carried out at the Kalaban-coro Reference Health Centre between 03 October and 02 November 2022, involving 280 pregnant women aged between 15 and 49 years. Data were collected by means of a paper questionnaire, then entered on an ODK form and analysed using SPSS 20. We performed a bivariate and multivariate analysis using logistic regression with underweight as the dependent variable and several socio-demographic and economic characteristics of the pregnant women. Statistical tests were used with a significance level of 5%. **Results:** The study enrolled 280 pregnant women with an average age of 26.08 years, and the most common age group was 20 to 25 years (33.9%). The women surveyed had had an average of 3.11 pregnancies, with 2.02 live births and 0.31 deaths of children aged 0-5 years, and the number of live children was 1.76, almost 2 children. Most of the women surveyed (47.86%) were in their 2nd trimester, and 28.2% were first-time mothers. The Bambara ethnic group predominated, with 32.1%. Among our respondents, 39.6% had not attended school. Almost all of these women (92.50%) reported an average standard of living and a monthly income of between $\geq 50,000$ and $< 150,000$. Only 7.9% of pregnant women were physically active. In terms of dietary diversity, 73.2% had eaten fewer than five food groups the day before the survey, so dietary diversity was low. The average weight of the respondents was 67.33 kg, with an average height of 164.48 cm, an average DB of 258.73 mm and an average BMI of 24.88. Estimated using the BMI < 18.5 threshold, the prevalence of underweight was 4.3%. There was also a Spearman correlation between nutritional status and level of education ($P = 0.021$). Regression showed a positive correlation between overall underweight and age at pregnancy ($P=0.017$) and participation in a nutritional awareness and education session ($P=0.019$). **Conclusion:** The study showed that early pregnancy and participation in a nutritional education and awareness session helped to reduce overall underweight among pregnant women attending the Kalaban-coro Csref. On the other hand, breastfeeding during pregnancy was associated with a higher incidence of underweight.

Keywords: Socio-economic factors, nutritional status, pregnant women, Kalaban-coro.

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INTRODUCTION

According to the World Health Organisation (WHO), malnutrition refers to deficiencies, excesses or imbalances in a person's energy and/or nutrient intake

[5]. It is a nutritional state resulting from a diet that is unbalanced in terms of quantity and quality [5]. The transition from the eight Millennium Development Goals (MDGs) to the seventeen Sustainable Development Goals (SDGs) has placed the health and

Citation: Mahamoudou Coulibaly *et al.* Socio-Economic and Cultural Factors Associated with the Nutritional Status of Pregnant Women Attending Antenatal Clinics at the Kalaban-Coro Reference Health Centre in 2022. Sch J App Med Sci, 2023 Jul 11(7): 1192-1199.

well-being of women and adolescent girls at the centre of the Global Agenda. The Rome Declaration states that nutrition policies should promote a diversified, balanced and healthy diet at all stages of life. Special attention should therefore be paid to the first thousand days of life, including the health of adolescent girls, women of childbearing age, pregnant and breastfeeding women, infants and young children [6]. At the 65^{ème} World Health Assembly, the global implementation plan for maternal and child nutrition to 2025 targeted between [5] reducing stunting in children by 40% and reducing anaemia in women of childbearing age by 50% [6]. The diet of pregnant women can have a positive influence not only on the progress of pregnancy and the development of the foetus, but also on the long-term health of both mother and child [1]. According to data from the United Nations Food and Agriculture Organisation (FAO), almost one in eight people in the world, or 928 million people, were suffering from serious food insecurity in 2020. This proportion was more than one person in four in Africa (347 million) [8]. The global acute malnutrition rate is 10% [9]. Among women of childbearing age, the prevalence of acute malnutrition is 4.1%; the prevalence of acute malnutrition (AM) in the Koulikoro region among women of childbearing age (15 to 49) based on BMI (BMI < 230 mm) was 1.4%; the prevalence of underweight (BMI < 18.5) among women aged 15 to 49 was 7.0%. The prevalence of overweight/obesity (BMI ≥ 25) was 21.1% [10]. Certain social and cultural factors can influence the nutrition of pregnant women. The security crisis in Mali has led to an unprecedented fall in household income, compounded by the socio-economic consequences. In-depth knowledge of the causes of maternal undernutrition will prove useful in improving the fight against malnutrition. The aim of this study is to assess the socio-economic and cultural factors associated with the nutritional status of pregnant women in the Kalaban-coro referral health centre.

OBJECTIVE

To determine the socio-economic and cultural factors associated with the nutritional status of pregnant women attending the Kalaban-coro referral health centre.

MATERIALS AND METHODS

This was a quantitative and qualitative analytical cross-sectional study at the Kalaban-coro referral health centre. The target population was pregnant women attending antenatal clinics. Data were collected in the field for 1 month, from 3 October to 2 November 2022. The inclusion criteria were all pregnant women seen in antenatal clinics who agreed to

participate in the study, and the exclusion criteria were pregnant women seen in antenatal clinics who did not wish to participate in the study. The minimum (necessary) size of our sample was calculated using ENA for SMART software on the basis of the following information: i) prevalence of underweight $P = 7.8\%$ (SMART 2021), ii) desired precision $i = 4.1\%$; cluster effect of 1.5%, iv) proportion of non-responding women 3%, v) proportion of pregnant women to be included 23.5% (INSTAT SMART 2021) and vi) average household size 6.9% (INSTAT SMART 2021). The variables collected and studied :Dependent variables s (Nutritional status of pregnant women: underweight in pregnant women determined by BMI) ,Independent variables s (Socio-demographic factors: pregnant women: age, ethnicity, marital status, level of education, profession).Reproductive health factors: age of pregnancy, number of Td; total number of pregnancies, number of children born alive, number of children who died, number of children alive. Socio-economic factors: pregnant woman's source of income, dietary diversity score, number of meals per day, monthly household income, household income level, socio-cultural factors: dietary restrictions. Data collection was cross-sectional, using an individual questionnaire administered to pregnant women. Data were entered using Kobo collect software. Exported to SPSS Statistics version 20, which enabled us to analyse the different variables. Univariate, bivariate and multivariate analyses were used. ENA for SMART was used to determine the sample size. Pearson's chi-square test of independence, Fisher's chi-square test of independence, Spearman's correlation and Pearson's correlation were used at the 5% threshold to measure these relationships. We also carried out a multivariate analysis using logistic regression with the dependent variable: weight insufficiency . The survey was conducted according to the rules of the art and with the informed consent of the respondents. Respect for privacy, including data confidentiality, was also taken into account.

RESULTS

Epidemiological aspects

In this study, the most represented age group was between 20 and 25. The majority ethnic group was Bamanan (32.1%). Of the women surveyed, 62.5% were married in a monogamous relationship. Of the women surveyed, 39.6% had no formal education and 20.4% were literate or had attended Koranic school. Among the women surveyed, housewives were the most represented at 70.71%, followed by shop assistants at 12.5%. These epidemiological aspects are classified in table 1.

Table 1: Epidemiological aspects of socio-economic and cultural factors in relation to the nutritional status of pregnant women seen in consultation at the Kalaban-coro reference health centre (Mali)

Age group	Workforce	Percentage
15 to 19 years old	41	14,7
20 to 25 years	95	33,9
26 to 30 years old	82	29,3
31 to 35 years old	39	13,9
> 35 years	23	8,2
Ethnic groups	Workforce	Percentage (%)
Bamanan	90	32,1
Malinké	14	5,0
Sarakolé	35	12,5
Peulh	47	16,8
Kasonké	5	1,8
Sonrhäi	26	9,3
Dogon	31	11,1
Tamacheque	4	1,4
Arabs/Moorish	3	1,1
Sénoufo	2	0,7
Minianka	6	2,1
Boi	8	2,9
Bozo/somono/sorko	5	1,8
Other	4	1,4
Total	280	100,0
Age group	Workforce	Percentage
Married monogamous	173	62
Married polygamist	20	7
Single	87	31
Education levels	Workforce	Percentage (%)
No	111	39,6
Literate or Koranic	57	20,4
1st fundamental cycle	45	16,1
2nd fundamental cycle	23	8,2
Secondary	21	7,5
Superior	23	8,2
Professions	Workforce	Percentage
housewife,	198	70,71
Employee,	20	7,14
Saleswoman	35	12,50
Retailer,	8	2,86
Pupil/student	19	6,79

Activities/sources of income

The vast majority of the women surveyed (77.1%) had no income and 13.2% earned their living from petty trade. The majority of our respondents had their own living environment (99%). In this study, 99% of respondents cooked 2 to 3 times a week. Almost all

the pregnant women (98.9%) washed dishes and clothes 2 to 3 times a week. The majority of the women surveyed (77.5%) did not do any work in the fields. The activities/sources of income of the pregnant women seen in consultation at the reference health centre are listed in Table 2.

Table 2: Aspects of the activities/sources of income of pregnant women attending consultations at the Kalaban-coro referral health centre (Mali)

Activities/sources of income	Workforce	Percentage (%)
No income	216	77
Small business	37	13,2
Trade	8	2,9
Production and sale of agricultural and market garden produce	1	0,4
Salary	17	6,1

Recoverer	1	0,4
Activities/sources of income	Workforce	Percentage (%)
Own	277	99
near a river/pond	3	1
Activities/sources of income	Workforce	Percentage (%)
Yes Sometimes (2 to 3 times a week)	273	99
Every day	3	1
Washing dishes/clothes	Workforce	Percentage (%)
Yes Sometimes (2 to 3 times a week)	277	98,9
Every day	3	1,1
Work in the countryside	Workforce	Percentage (%)
No	217	77,5
Yes Sometimes (2 to 3 times a week)	2	0,7
Not applicable	61	21,8

Aspects of reproductive health

At the time of the survey, only 2.9% of women were breastfeeding in addition to their pregnancy. Overall, 47.86% of the women surveyed were in the 2nd trimester of pregnancy. Our results show that 40.4% of the women surveyed had not received any TD dose.

Only two food groups, apart from condiments, were consumed by more than 50% of the women surveyed in the last 24 hours. These were starchy foods (99.6%) and animal proteins (70%). These aspects of reproductive health are classified in table3

Table 3: Reproductive health aspects of pregnant women seen in consultation at the Kalaban-coro referral health centre (Mali)

Allaite	Workforce	Percentage (%)
No	272	97,1
Yes	8	2,9
Age of pregnancy in trimesters	Workforce	Percentage (%)
1 ^e quarter	33	11 ,79
2 ^e quarter	134	47,86
3 ^e quarter	113	40,35
Number of Td performed	Workforce	Percentage (%)
Nothing	113	40,4
TD1	78	27,9
TD2 PLUS	89	31,7
Number of children now living	Workforce	Percentage
0	79	28,2
1	55	19,6
2	60	21,4
3	50	17,9
4	20	7,1
5	11	3,9
6	2	0,8
7	3	1,1

Aspects of dietary diversity

A total of 73.2% of the women surveyed had consumed at least 5 food groups, which means that only 26.8% of them had an acceptable dietary diversity. These 73.2% of pregnant women were at risk of malnutrition, with all its consequences for their pregnancy. The primigravida women made up 28.2% of the sample. At the end of our survey, more than 80% of respondents had already taken part in at least one awareness-raising or nutrition education session. More than 60% of the women said that awareness-raising or nutrition education topics such as washing hands with

soap and water or other detergents; breastfeeding; eating a variety of foods; and using supplements had been covered during these sessions. However, only 29.5% of the women had been exposed to the theme of recognising the signs of malnutrition in children. However, it should be emphasised that the audiovisual media, followed by health workers and community relays, were the main channels through which these women received their awareness-raising and nutrition education sessions. The aspects of dietary diversity are classified in table 4.

Table 4: Aspects of dietary diversity among pregnant women attending consultations at the Kalaban-coro referral health centre (Mali).

Food Groups	Percentage	
ATS	12,1%	
LEGUMINES	12,5%	
EGG	15,7%	
MILK_DAIRY PRODUCTS	20,0%	
NUTS AND SEEDS	28,2%	
VEGETABLES	33,6%	
PROD_RICHES_VIT_A	35,4%	
OTHER_FRUIT_LEGUMES	39,3%	
MEAT AND FISH	70,0%	
FECULENTS	99,6%	
SDAIF_ENSANSEPT2020	3,6643	
SDAIF 5 or more food groups	26,8%	
Age of pregnancy in trimesters		
	Workforce	Percentage (%)
Less than 5 food groups	76	27
5 food groups and more	204	73
Participation in a nutrition education awareness session		
	Percentage (%)	
Have you attended a nutritional awareness or education session in the last three (3) months?	87,1%	
The Washing hands with soap or other detergents and Hygiene theme been treated?	95,9%	
The health worker (doctor, nurse, midwife, etc.)	3,8%	
Community health worker or community relay	18,8%	
Agents of an NGO	1,7%	
Audiovisual media and SMS	74,8%	
School/training centre	2,6%	
Other	4,7%	
Has the theme of encouraging/practising breastfeeding been addressed?	87,3%	
The health worker (doctor, nurse, midwife, etc.)	6,6%	
Community health worker or community relay	59,6%	
Agents of an NGO	1,9%	
Audiovisual media and SMS	27,7%	
School/training centre	,9%	
Other	12,7%	
Was the theme of Eating a variety of foods covered?	66,0%	
The health worker (doctor, nurse, midwife, etc.)	7,5%	
Community health worker or community relay	36,6%	
Agents of an NGO	2,5%	
Audiovisual media and SMS	47,2%	
School/training centre	2,5%	
Don't know	11,8%	
Has the topic of recognising the signs of malnutrition in children been covered? 0 = No, 1 = Yes	29,5%	
The health worker (doctor, nurse, midwife, etc.)	5,6%	
Community health worker or community relay	41,7%	
Agents of an NGO	0,0%	
Audiovisual media and SMS	36,1%	
School/training centre	2,8%	
Other	18,1%	
Has the topic of supplementary feeding been addressed?	83,6%	
The health worker (doctor, nurse, midwife, etc.)	9,3%	
Community health worker or community relay	57,8%	
Agents of an NGO	3,9%	
Audiovisual media and SMS	22,1%	
School/training centre	1,5%	
Don't know	17,2%	

Anthropometric aspects

In our study, only 7% of respondents had suffered from toxin infection in the previous 7 days. The majority of respondents (84%) were not physically active. Of the women surveyed, 51.7% stated that their monthly household income was between 50,000 and 150,000 CFA francs. The majority of the women surveyed (92.50%) classified their households as having an average standard of living. In our study, the average weight of the women surveyed was 67.33 kg, their

average height 164.48 cm and an average DB of 258.73 mm. It was found that 4.3% of pregnant women were underweight, including 1.8% who were severely underweight. Of these, 48.6% were of normal nutritional status, while the remainder were either overweight (38.1%) or obese (9.0%): Dietary restrictions during pregnancy Of the women surveyed, 7.9% had declared that they were subject to dietary restrictions. The anthropometric aspects are classified in table 5.

Table 5: Anthropometric aspects of pregnant women seen in consultation at the Kalaban-coro reference health centre (Mali)

Toxiinfection within the last 7 days		Workforce	Percentage (%)	
Yes		20	7	
No		260	93	
Physical activity		Workforce	Percentage (%)	
Yes		45	16	
No		235	84	
Revenue in FCFA		Workforce	Percentage (%)	
< 30 000		15	5,36	
≥30,000 and < 50,000		117	41,79	
≥50,000 and < 150,000		143	51,06	
≥150 000		5	1,79	
Standard of living		Workforce	Percentage (%)	
Rich		7	2,50	
Moyen		259	92,50	
Pauvre		14	5	
	Weight in Kg	Size in (CM)	BMI	PB (mm)
Average	67,33	164,48	24,88	258,73
Median	68,00	164,00	24,88	252,50
Nutritional status		Workforce	Percentage	
IP_SEVERE		5	1,8	
IP_MODEREE		7	2,5	
NORMAL		136	48,6	
OVERWEIGHT		107	38,1	
OBESITY_CLASS1		21	7,5	
OBESITY_CLASS2		3	1,1	
OBESITY_CLASS3		1	0,4	
food prohibitions		Workforce	Percentage	
No		258	92,1	
Yes		22	7,9	

COMMENTS AND DISCUSSIONS

Epidemiological aspects

The majority of the women surveyed (33.9%) were aged between 20 and 25 years; the mean age was 26.08 years, with a standard deviation of ± 6.045. In comparison with a study carried out in Algeria by Kouira Rayane And Djebari Amel [1] in 2015, the results are very similar (mean age 28.98 ± 4.35). This could be explained by the fact that this is the age group in which the greatest number of pregnancies occur in our sociocultural context, as it corresponds to the peak period of sexual activity [11]. This age group is somewhat similar to that of the study conducted by

Nicolette ENMEGNE in 2021, which was 20-29 years, with 64.51% [7]. In comparison, in the study by Fadjine Diarra, the 25-34 age group was the most represented with 48.6% [2].

The Bambara ethnic group was the most represented among pregnant women, with 32.1%. These results are consistent with those of Djakaridja S Traore in 2013, where the Bambara ethnic group was also in the majority at 37.2% [13]. In the present study, 99.7% of respondents were married. This rate is close to that of M H COULIBALY in Bankoumana in 2012 where the majority were also married, i.e. 90.7% [14]. Those not

attending school accounted for 39.6%. This result is comparable to those reported by Koussé Diarra 2018 (53%) [15] and Avodo M 2015 (50%) [16]. This can be explained by the drop in girls' school enrolment in the general population in Mali according to the socio-demographic survey conducted in 2013; this therefore constitutes a risk to pregnancy monitoring and the course of childbirth [15]. In terms of occupation, housewives were in the majority with 70.71%. This could be due to several factors. These results are consistent with those of Korotimi Sanogo in 2011 who had 71.4% housewives [17].

The average monthly household income of our respondents was estimated by 51.7% in the range $\geq 50\,000$ and $< 150\,000$ F CFA. This result is lower than that of Nicolette ENMEGNE where 41.93% had estimated an average monthly income higher than 150,000 F CFA [7]. 99% of respondents were clean. Respectively (99%), 98.9% and 7% did cooking, washing up and field work 2 to 3 times a week. The average standard of living was the most represented in this study with 92.50% unlike that of BINTOU COULIBALY in 2014 who had received 97.2% poor in his studies [3].

Reproductive health aspect

During this survey, only 2.9% of women were breastfeeding. In addition, 40.4% had not received any dose of VAT. Primiparous women were the most represented at 28.2%. This rate is lower than that of Koussé Diarra, which was 38%. [15]. On the other hand, Nicolette ENMEGNE in her study found multiparous women (60%) to be the most represented, followed by primiparous women with 35.71% [7].

Food diversity aspect

In our study, 73.2% of the women surveyed had eaten less than 5 food groups the day before the survey. These results were different in Nicolette ENMEGNE's study, where 70.96% of pregnant women had consumed five or more food groups [7].

As for the various awareness-raising activities, over 80% had already taken part in at least one awareness-raising or nutrition education session. More than 60% said they had covered topics such as: washing hands with soap and water or other detergents; breastfeeding; eating a variety of foods; and complementary feeding. On the other hand, only 29.5% had dealt with the theme of recognising the signs of malnutrition in children. However, it should be noted that the audiovisual media, followed by health workers and community relays, were their main channels of information. In addition, only 7.9% of respondents had suffered from toxin infection during the previous 7 days. This result is lower than that of BAKHOUCHE SARRA and BOUAOUIRA IMANE in 2021 in Algeria, which was 14.66% [18].

Anthropometric aspect

Analysis of the data showed an average weight of 67.33 kg, an average height of 164.48 cm and an average DB of 258.73 mm. The majority of respondents (84%) were not physically active. This result is almost similar to the survey carried out by Nicolette ENMEGNE, where 83.87% of her pregnant dams were also not physically active [7].

In our study, the prevalence of underweight was 4.3%, of which 1.8% was severe. This rate was lower than the 6.5% reported by F Diarra in 2017 [11]. 338.2% of our respondents were overweight and 9.0% were obese, compared with 16.1% and 8.0% respectively for overweight and obesity in F Diarra's 2017 study, [11]. These differences could only be explained by the choice of targets and the study environment. Compared to the results of ENSAN, February 2020, our result of overweight is higher than that obtained in the regions of Sikasso, Mopti and Bamako with respectively 15.65%; 20.76%; 28.20% and as for obesity, it is higher than that obtained in the regions of Sikasso and Mopti with respectively 4.90%; 5.70% and lower than that of Bamako with 18.30% [4]. Globally, although the rate of underweight women has fallen slightly or even negligibly, overweight and obesity are gaining ground, with overweight increasing year on year since 2000. The prevalence of obesity is higher in women than in men (15.1% compared with 11.1%) [19].

Preventing mothers from becoming undernourished can play an important role in avoiding negative pregnancy outcomes and, later, growth retardation in the child [20]. In our study, 12.5% of severely underweight respondents were breastfeeding during pregnancy. In addition, only 1.2% of these women had attended a nutritional awareness or education session in the previous three (3) months, compared with 3.3% for the underweight group as a whole. In terms of pregnancy age, 9.1% of severe underweight women were in their 1st trimester, compared with 12.1% of underweight women overall.

According to Pearson's Chi-square, Fisher's Chi-square, Pearson's correlation and Spearman's correlation statistical tests, pregnancy age in trimester, breastfeeding during pregnancy and participation in a nutrition education session were statistically significantly associated with underweight. Furthermore, according to the logistic regression model, the risk of being underweight decreased with increasing pregnancy age and participation in a nutritional awareness and education session. Also, breastfeeding during pregnancy increases the risk of underweight in pregnant women. Again, according to the logistic regression model, the risk of underweight is higher during the first two trimesters of pregnancy, especially for the severe form in the first trimester. Taking part in a nutritional

awareness and education session would also protect against underweight.

CONCLUSION

This study identified certain nutritional risk factors for pregnant women. These negative risk factors must be strongly taken into account to prevent the risk of underweight and other associated morbidity factors with which they may interact.

Conflict of interest: None

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