

# Socio-economic, cultural and demographic profile of a group of Moroccan anaemic pregnant women

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## Abstract

**Background:** Anemia is a major public health problem in Morocco especially among vulnerable groups including pregnant women. Several studies have confirmed that anemia is associated with demographic, socioeconomic and cultural factors.

**Objective:** The objective of this study is to describe the socioeconomic, cultural and demographic profile of a group of anemic pregnant women and to determine the conditions influencing the development of anemia in the Moroccan context

**Methods:** A retrospective cross-sectional study was conducted by structured interview among a group of Moroccan pregnant women (300 of anemic women and 425 of non-anemic). Data were collected on biodemographic and socio-economic variables, the socio-cultural conditions of the women, the characteristics of the pregnancy and information relating to anemia.

**Results:** Using the WHO classification criterion according to the severity of anemia, 40.6%, 56.6% and 2.8% of anaemic women were respectively mildly, moderately and severely anemic. Primiparity, unemployment, lower socio-economic level and illiteracy, were found to be associated with the development of anemia in pregnant women.

**Conclusion:** In Morocco, nutritional problems hamper human development and improvement of health status. Knowledge of the strictness of deficiencies and factors associated are necessary to develop adapted strategies intervention to the national context.

**Keywords:** Anemia, pregnant women, socioeconomic factors, Morocco.

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## Introduction

Anemia is one of the ten most serious problems in the world<sup>1,2</sup>. It is the most common form of micronutrient deficiency. Anemia affects physical growth, cognitive development, reproduction, and physical work capacity. Pregnant women and children are the most vulnerable

groups. In fact, anemia increases morbidity and maternal mortality, postpartum hemorrhage and it is a factor in fetal growth retardation<sup>3</sup>. The World Health Organization reports that 51% of pregnant women in the world have anemia; 30% in developed countries and 40 to 80% in developing countries with 57.1% in Africa<sup>4</sup>. Given the importance of this disease worldwide, many countries are implementing interventions to reduce it, particularly among the most vulnerable groups.

In this study, we proposed to determine socioeconomic, cultural and demographic profile among a group of anemic pregnant women in comparison with a group of non-anemic pregnant women in Morocco

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## Subjects and methods

### Study area:

Our survey was conducted in Essaouira province, one of the eight provinces of the Marrakech-Safi region<sup>5</sup>. It is divided into 52 rural communes and 5 urban communes. According to the last census of the population in Morocco (2014)<sup>5</sup>, the population of the province is 450 527, with 23% in urban and 77% in rural areas. This is very representative of the rural character of the Marrakech-Safi region of which 57% of the population lives in rural areas<sup>6</sup>. Essaouira experienced economic stagnation for a long time<sup>7</sup>. Economic activity is based mainly on crafts, fishing and tourism, which constitute the sectors of activity that generate the most revenue<sup>5</sup>. Activity rate in the province is 45.7%, comparable to the national rate (47.6%)<sup>5</sup> with large disparities between men (79.8%) and women (11.7%)<sup>6</sup>. For illiteracy, the province of Essaouira has a rate of 48.9% of the illiterate population of which 60.1% are women<sup>6</sup>. Poverty and vulnerability rates are highest than the national level; they reach respectively 9.1% and 22.2%<sup>8</sup>.

### Methods

For this survey, conducted from February 2015 to January 2016, we carried out a retrospective cross-sectional study by structured interview among 300 pregnant anemic women who presented at health centers (urban and rural) for pre-natal consultation. The study population was 300 anemic pregnant women of haemoglobin concentration <11 g/dL, as cases, and 425 non-anemic pregnant women of haemoglobin concentration >11 g/dL, as controls.

The interview had two sections. In the first section, we collected information about anemia (pre-existing anemia, type of anemia, hemoglobin value). The definition of anemia adopted in this study is that defined by the World Health Organization as a hemoglobin value of less than 11 g / dl in pregnant women<sup>9</sup>. On hemograms, the mean value of Hemoglobin, were recorded and used to evaluate the severity of anemia.

Anemic pregnant women were further categorized as women with mild anemia, moderate anemia and severe anemia which corresponds to Haemoglobin value 10–10.9 g/dl, 7–9.9 g/dl, and lower than 7 g/dl respectively<sup>9</sup>. Anemia during pregnancy is diagnosed during prenatal consultation according to functional signs, following which a biological checkup (blood count) is asked of the woman. After confirmation of anemia, management is proposed according to a well-defined protocol in which

the curative supplementation is prescribed according to the Hemoglobin level.

In the second section, questions addressed to women were related to the woman's personal data (area of residence, age, educational level, economic activity, socio-professional categories (SPC of women and their husband) according to 4 modalities<sup>10</sup>, (SPC1: traders and those exercising a liberal profession; SPC2: managers and civil servants; SPC3: employees, workers, farmers, fishermen, laborers, hairdressers; SPC4 : without profession), number of children, household type, information about pregnancy (first age of pregnancy, gestational age, medical care) and parity.

To determine factors influencing anemia we compared the demographic, socioeconomic and sociocultural conditions of a group of anemic women with the same conditions of another group of pregnant women but non-anemic (425 women).

### Data analysis

Statistical processing was carried out by using the SPSS software, version 10. Frequencies, percentages, means and standard déviations (SD) were used to summarize descriptive statistics. Bivariate analysis was used to identify factors independently associated with the anemia. Associations were measured in Odds ratio (OR) with 95% confidence intervals (95% CI) using binary logistic regression.

### Ethical considerations

In the absence of an ethics committee in our area, our study was conducted in full respect of local ethical considerations, namely obtaining the authorizations of the Ministry of Moroccan Health. After informing women of the aims of the research, we asked for their consent and their agreement to participate in this study. All participants provided informed consent and all data were collected under anonymity.

## Results

### Anemia characteristic among pregnant women

All the women in this retrospective cross sectional study are monitored in the Health Centers of the Essaouira Province. The prevalence of anemia among this group was 41.37%. Only 5% of these women had anemia before pregnancy. The hemoglobin value of a group of anemic women varies between 5.7g / dl and 10.9g / dl, with an average of 9.7g / dl (SD = 1.02). Using the WHO classification criterion according to the severity of ane-

mia, 40.6%, 56.6% and 2.8% of women were respectively mildly, moderately and severely anemic.

### Demographic, socioeconomic and cultural profile of pregnant women

Women in this study are recruited in urban (360 women) and rural area (365 women). Their age varies from 17 to 45 years, with an average of 26.6 years (SD= 6.2 years). According to the table I, 52.4% of women came from urban area. The distribution of women by age group shows that the age group between 18 and 40 (the normal reproductive age) is the most dominant (87.4%). Age groups under 18 and over 40 (extreme ages for pregnancy) are less represented. 69.7% of women are illiterate (29.3%) or primary school level (40.3%) and the majority of them are inactive (87.9%). The socio-economic level of women depends on the husband's income. In analyzing the socio-professional categories of husbands, among the 98.7% of active spouses, SPC3 is the most represented (80%), followed by SPC2 (11.7%), while SPC1 represents only 6%. We classified them into two groups, a high socioeconomic level group consisting of spouses

from SPC1 and SPC2 representing 27.1%, and a low socioeconomic level group including spouses from SPC3 and SPC4 representing 72.9% who would be qualified as a socioeconomic disadvantaged group. Nuclear families represent 83.1% of households. The number of children per woman varies between 0 and 6, with an average of 2 children per woman. This fertility rate is comparable to the national rate of 2.2 children per woman. Thus, 81.6% of women are multiparous. Age at first marriage ranges from 19 to 38 years with an average of 23.4 years (25.7% nationally), and 91.6% of women had their first pregnancy before the age of 30 years. Gestational age is distributed based on weeks of amenorrhea; 13% of women are in the first quarter, 43.7% are in the second quarter and 43.7% are in the third quarter

The examination of the results by group of anemic and non-anemic women (table I) shows that anemia is more important among women with rural origin 65.4% (against 42.1% for non-anemic women), illiterate women 37% (against 23.8% for women non-anemic), inactive women 94% (compared with 83.5% for non-anemic women) and women belonging low socio-economic level group 81% (compared to 66.8% for non-anemic women).

**Table I:** Biodemographic, socio-economic and cultural characteristics of pregnant women

| Variables           | Modalities     | All |      | Anemic |      | Not anemic |      |
|---------------------|----------------|-----|------|--------|------|------------|------|
|                     |                | n   | %    | n      | %    | n          | %    |
| Area of residence   | Urban          | 291 | 52.4 | 45     | 34.6 | 246        | 57.9 |
|                     | Rural          | 264 | 47.6 | 85     | 65.4 | 179        | 42.1 |
| Age per years       | Less18         | 50  | 6.9  | 24     | 8.0  | 26         | 6.1  |
|                     | Between18 & 40 | 634 | 87.5 | 269    | 89.7 | 365        | 85.9 |
|                     | More 40 ans    | 41  | 5.6  | 7      | 2.3  | 34         | 8.0  |
| Instruction level   | illiterate     | 212 | 29.4 | 111    | 37.0 | 101        | 23.8 |
|                     | Primaryschool  | 292 | 40.3 | 86     | 28.7 | 206        | 48.6 |
|                     | High school    | 159 | 21.9 | 77     | 25.6 | 82         | 19.3 |
|                     | University     | 61  | 8.4  | 26     | 8.7  | 35         | 8.3  |
| Economic activity   | Inactive       | 637 | 87.9 | 282    | 94.0 | 355        | 83.5 |
|                     | Active         | 88  | 12.1 | 18     | 6.0  | 70         | 16.5 |
| Socio-economiclevel | High (SPC1&2)  | 189 | 27.1 | 57     | 19.0 | 132        | 33.2 |
|                     | Low (SPC3&4)   | 509 | 72.9 | 243    | 81.0 | 266        | 66.8 |
| Family type         | Nuclear        | 456 | 83.1 | 250    | 84.2 | 206        | 81.7 |
|                     | Extended       | 93  | 16.9 | 47     | 15.8 | 46         | 18.3 |
| Parity              | Primiparous    | 133 | 18.4 | 107    | 35.7 | 26         | 6.0  |
|                     | Multiparous    | 592 | 81.6 | 193    | 64.3 | 399        | 94.0 |

As for parity, anemic women are more primiparous 35.7% compared to only 6% in non-anemic women. Results of table II shows a high statistically significant difference

for origin, education and activity, socio-economic level and parity, and a moderate significant difference for age. However, in the study area, primiparity seemed to be the most important risk factor for anemia with OR of 8.5.

**Table II:** Association between bio-demographic, socio-economic and cultural characteristics and anemia among pregnant women

| Variables            | Modalities      | Anemic | Not     | Pearson<br>$\chi^2$ | P<br>value        | OR<br>95% CI |
|----------------------|-----------------|--------|---------|---------------------|-------------------|--------------|
|                      |                 | %      | anemic% |                     |                   |              |
| Origin               | Urban           | 34.6   | 57.9    | 21.60               | P<0.001<br>***    | 0.3852       |
|                      | Rural           | 65.4   | 42.1    |                     |                   |              |
| Age group            | Less18Y         | 8.0    | 6.1     | 11,17               | P=0.004<br>**     | 1.2525       |
|                      | Between18 & 40Y | 89.7   | 85.9    |                     |                   |              |
|                      | More than 40 Y  | 2.3    | 8.0     |                     |                   |              |
| Instruction level    | illiterate      | 37.0   | 23.8    | 30.94               | P<0.001<br>***    | 1.8782       |
|                      | Primaryschool   | 28.7   | 48.6    |                     |                   |              |
|                      | High school     | 25.6   | 19.3    |                     |                   |              |
|                      | University      | 8.7    | 8.3     |                     |                   |              |
| Activity             | Inactive        | 94.0   | 83.5    | 18.07               | P<0.001<br>***    | 3.0892       |
|                      | Active          | 6.0    | 16.5    |                     |                   |              |
| Socio-economic level | High (SPC1&2)   | 19.0   | 33.2    | 17.38               | P<0.001<br>***    | 0.4727       |
|                      | Low (SPC3&4)    | 81.0   | 66.8    |                     |                   |              |
| Family type          | Nuclear         | 84.2   | 81.7    | 0.57                | P=0.45<br>No sign | 1.1878       |
|                      | Compound        | 15.8   | 18.3    |                     |                   |              |
| Parity               | Primiparous     | 35.7   | 6.0     | 102.50              | P<0.001<br>***    | 8.508        |
|                      | Multiparous     | 64.3   | 94.0    |                     |                   |              |

*odds ratios and 95% CI, obtained from binary logistic regression model*

## Discussion

Anemia during pregnancy is very common, especially in developing countries where it affects 50 to 80% of patients<sup>2,11</sup>. The anemia prevalence recorded for this group of 41.4% implies that it is a public health problem in this region. According World Health Organization<sup>9</sup>, our group is qualified as a population with severe anemia (more than 40%). Our results are in agreement with the results of other studies, 43.4% in Algeria<sup>12</sup> 45.4% in Egypt<sup>4</sup>, and 43.2% in Cameroon<sup>13</sup>, but they are higher than other regions in Morocco: 16.8% in Temara city<sup>14</sup> and 14.4% in Casablanca<sup>15</sup>. This difference is explained by disparities in living conditions between regions in Morocco, and the repercussions of the precarious living conditions on the population health, especially in rural area<sup>16</sup>. In fact, our area study contains 77% of the population

living in rural area<sup>5</sup> and has the highest poverty and vulnerability rates respectively 9.1% and 22.2%<sup>8</sup>

Mild and moderate form of anemia among this group is the most represented. This is in agreement with results of others studies, in Morocco<sup>17,18</sup>, in Algeria<sup>12</sup>, In Mauritania<sup>19</sup> and in Senegal<sup>20</sup>. However, pregnancy anemia, even moderate, when it is related to iron deficient, is a risk factor for preterm birth, and a growth retardation of newborn<sup>12,21</sup>.

Several studies have confirmed the association of anemia with demographic, socioeconomic and cultural factors<sup>22,23,14,12,18,24</sup>. The present study has shown that the rural origin of the woman, her young age, illiteracy and low educational attainment, inactivity, low socioeconomic status and primiparity are the determinants that pro-

mote the development of anemia in pregnant women. The same results were found by others<sup>22,23,24,25</sup>. In fact, the education level of women has been recognized by demographers as a means of reducing maternal mortality. It allows better access to information and the application of health recommendations. The activity and the favorable socio-economic level determine living standards, allow for good food availability and better access to health systems. Unfavorable socio-economic conditions have a negative impact on the health of individuals, particularly vulnerable groups. They promote diseases and nutritional deficiencies.

Age has also a statistically significant effect on the occurrence of anemia in this study, it is a remarkable risk factor of anemia. The same result is reported by the Baidy and his collaborators<sup>19</sup>. In fact, anemia is more important in young women, especially because young age is associated with primiparity which are determinants that significantly influence anemia. Rural provenance is often correlated with anemia.

### Conclusion

In Morocco, despite improved living conditions, food availability, increased female education, access to health care, encouragement of family planning, and efforts in the health field in general, anemia continues to be a major public health problem, with large disparities between regions. Regional knowledge of the prevalence, severity of deficiencies and associated factors is needed to develop intervention strategies adapted to local and regional contexts.

### Conflict of interest

No conflict of interest declared by the authors.

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