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COMPLEMENTARY MEDICINE AS A PREDICTOR OF ANEMIA AMONG PREGNANT WOMEN

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Abstract

In 2018, a survey of traditional knowledge about plants was conducted in the Moroccan province of Sidi Kacem, aiming to examine the practices of women who are pregnant in managing gravidic anemia through the use of medicinal plants, as well as to evaluate the prevalence of this practice. The results highlighted the significant importance of traditional family medicine in managing this condition in the region, with a notable usage rate of 41.3% of medicinal plants during pregnancy and childbirth. This previously undocumented usage has contributed to enriching knowledge by shedding light on the properties of the listed species. Additionally, the study identified specific plants used by pregnant women in the province, paving the way for future research, and explored potential synergies between traditional and conventional medicine in managing this condition.

Keywords: Anemia, Pregnant Women, Prevalence, Complementary Medicine, Sidi Kacem, Morocco.

1. INTRODUCTION

Iron deficiency anemia is the most widespread form of malnutrition globally, particularly affecting pregnant women [1]. The limited success in combating this anemia warrants an in-depth analysis of the underlying causes [2,3].

Anemia, defined by the World Health Organization (WHO) as a hemoglobin level below 11g/dl, is one of the most common problems in obstetrics. It is the ultimate expression of an iron deficiency which is the cause in more than 50% of cases; Furthermore, these include infectious causes (malaria and other parasitic infections), other nutritional deficits, sickle cell anemia, aplastic, inflammatory anemia and anemia due to blood loss; very often, the origin is multifactorial [1,3].

Pregnancy, a period marked by significant physiological changes, requires special attention to the health of both the mother and the fetus. Anemia, characterized by a reduction in hemoglobin levels in the blood, remains a common complication during this period [4, 5]. Pregnant women may sometimes expose their health and that of their babies to risks, especially when combining alternative remedies with conventional medical treatments for conditions like anemia [6]. These traditional remedies, rooted in cultural practices and passed down through generations, often provide alternatives to standard medical treatments. This problem can affect the babies after their born leading to psychological disorders like depression and stress impacting their quality of life [7–10] This article examines the practices of pregnant women in managing anemia during pregnancy through the use of medicinal plants. It assesses the prevalence of this practice and explores the motivations of anemic pregnant women to resort to traditional medicine. This analysis highlights the cultural perspectives and implications of this approach for maternal and fetal health [11].

2. MATERIALS AND METHODS

2.1 Location and type of study

The survey was conducted in the province of Sidi Kacem, located within the Rabat-Salé-Kenitra region of Morocco, comprising 24 rural communes and 5 urban communes as per the country's regional administrative division.

2.2 Study population

Our research focused on women who are pregnant who attended prenatal consultations at selected birthing centers and health facilities, which collectively serve approximately 70% of pregnant women seeking prenatal care in the area.

2.3 Sampling and sample size)

The sample size was calculated using Ardilly's formula [12], based on data from the Ministry of Health's 2000 National Survey on Iron Deficiency Anemia, which reported a 37% prevalence of anemia among pregnant Moroccan women. This prevalence resulted in a minimum required sample size of 358 patients. Sampling was conducted sequentially.

2.4 Criteria for inclusion and exclusion

Inclusion criteria encompassed all pregnant women attending prenatal consultations who underwent a complete blood count (CBC). Conversely, those who attended prenatal consultations or delivery without undergoing a complete blood count (CBC) were excluded.

2.5 Moral reflections

Ethical reflections were paramount. Permission was obtained from the medical representative of the Ministry of Health and Social Protection in the province of Sidi Kacem, as well as from the regional director of the Rabat-Salé-Kénitra region, who approved the study. Each participant provided informed consent before inclusion. To maintain confidentiality, data collection forms were coded, and subsequent analysis was conducted thoroughly and anonymously.

2.6 Statistical Analysis

Data collection was facilitated through an anonymous questionnaire covering various aspects such as clinical details, gynecological and obstetrical history (gestational age, parity, and history of abortions), socioeconomic status, eating habits, and the utilization of Indigenous medicine among participants. Subsequently, Data interpretation was conducted using SPSS software. Anemia was defined based on the criteria set forth by the World Health Organization, which indicate a hemoglobin level Hb <11 g/dl in expectant mothers [13]. Based on the severity of anemia, the following distinctions were made:

- According to hemoglobin value: Mild anemia: 9,1 g/dl ≤ Hb <11 g/dl; Moderate anemia: 7g/dl ≤ Hb <9 g/dl; Severe anemia: Hb <7 g/dl;
- According to mean corpuscular volume (MCV) value: Normocytosis: 80 µ3 ≤ VGM < 100 µ3; Microcytosis: VGM < 80 µ3; Macrocytosis: VGM ≥ 100 µ3;
- Based on the mean corpuscular hemoglobin content (MCHC) value: Hypochromic: TCMH< 27 pg; Normochromic: TCMH ≥ 27 pg.

3. RESULTS

3.1 The socioeconomic and demographic characteristics of the participants

This study includes 416 pregnant women, most of whom are being followed in health centers and birthing homes in the province of Sidi Kacem. Some participants had undergone at least one consultation in a general medical practice prior to being referred to health centers. This study was grounded on these data.

Among the women in our sample, 179, or 43.03%, were anemic. The age of our patients ranged from 18 to 48 years and was divided into three categories. On average, each woman had 1.25 children (±1.36), ranging from 0 to 4. All the women in our sample were married, while about 62.02% were illiterate. 73.8% of the patients had social coverage, mainly through RAMED, which accounted for 71.9%. Additionally, 88.7% had a low socioeconomic status, and nearly 98.1% were homemakers. For the geographical context, anemic women were often from rural areas rather than urban, accounting for a proportion of 62 %.

The table and the two graphs that follow show the socioeconomic and demographic characteristics of our study.

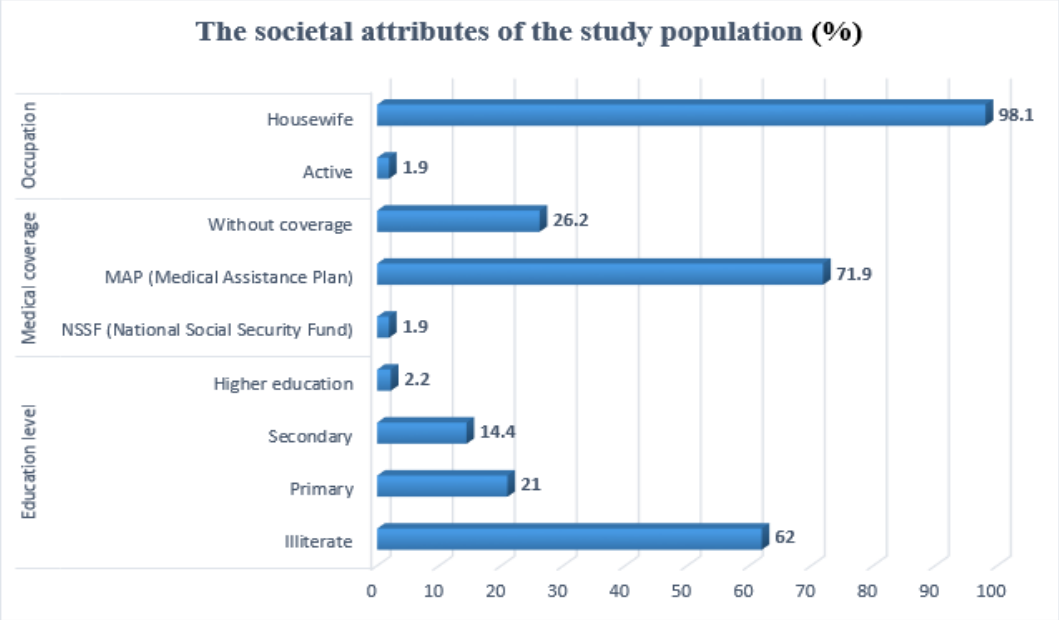

Figure 1: The societal attributes of the study population (n=416)

Table 1: The demographic traits of the study participants(n=416)

Factors	Circumstances	Proportion (%)	Average ± Standard Deviation
Age	[18- 25]	19.2	
	[25- 35]	50	
	> 35	30.8	
Marital status	Married	100	
	Single	0	
	Widow	0	
Number of children			1.25 ± 1.37
Patient's origin	Rural	52.2	
	Urban	47.8	

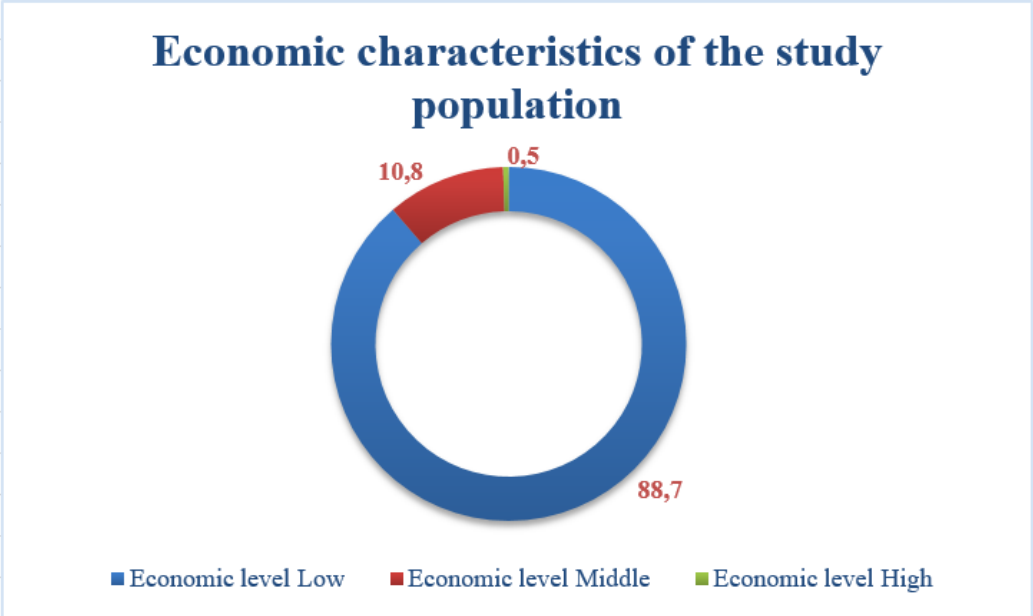

Figure 2: The demographic traits of the study participants(n=416)

3.2 Anemia rate

The prevalence of anemia was 43.03% within the 416 pregnant women enrolled in our study, with a total of 179 diagnosed women. An examination of the women's distribution according to the severity of anemia, based on the WHO classification [14], showed that the mild form was the most common, accounting for 57%, next was the moderate form, accounting for 40.2%. The severe form occurred less frequently, at 2.79%.

3.2 Conventional ways of treating anemia

The conclusions drawn from the analysis of traditional approaches towards anemia highlight intriguing patterns observed among the participants. Approximately 41.32% of participants opted for the use of indigenous medicine upon confirmation of the anemia diagnosis, while 58.6% decided not to use it.

Various herbs and plants were mentioned by those who opted for traditional medicine, including madder (lfowa), Arabian parsley (Al qasbûr), and fenugreek (h'lba), with respective proportions of 17.1%, 2.4%, and 9.6% of cases.

Techrat was the only frequently mentioned traditional medicine method by our participants, with an occurrence of 21.4%. This practice involves superficial micro-incisions on the skin, similar to Hijama therapy, but limited to extracting small amounts of blood.

As well 0.7% of the women in our sample primarily emphasized the lower cost as reasons for choosing traditional medicine, meanwhile, 45.21% cited both lower cost and proximity as the primary reasons.

Regarding the outcomes of traditional treatments, the majority of women, 45.89%, expressed uncertainty regarding their effectiveness.

Table 2: Conventional ways of treating anemia

Variables	Conditions	Total	Percentage (%)
Conventional practices			
The use of ancestral medicine	Yes	416	41.3%
	No		58.7%
Herbs and botanicals employed	h'lba, rejla, bakkoula	416	9.6%
	lfowa		17.1%
	Al qasbûr, h'lba, rejla, bakkoula		2.4%
	rejla, mallow, salq		12.3%
	Zero plants		58.7%
Types of practice	bloodletting	416	21.4%
	No practice		78.6%
Improvement observed after employing these methods	Uncertainty	416	45.9%
	No response		54.1%
Reasons for resorting to ancestral medicine	More economical	416	0.7%
	More economical, Easily accessible		45.2%
	Lack of recourse		54.1%

Various herbs and plants were used by the women who turned to traditional medicine, such as madder (lfowa), fenugreek (h'lba), purslane (rejla), Arabian parsley (al qasbûr), Swiss chard (salq), and mallow (bakkoula). Multiple plants were used simultaneously by our participants, such as (rejla, bakkoula, salq) in 12% of cases, (al qasbûr, h'lba, rejla, bakkoula) in 2%, and (h'lba, rejla, bakkoula) in 10% of cases. This illustrates the variety of methods employed in the utilization of particular plants in alternative medicine.

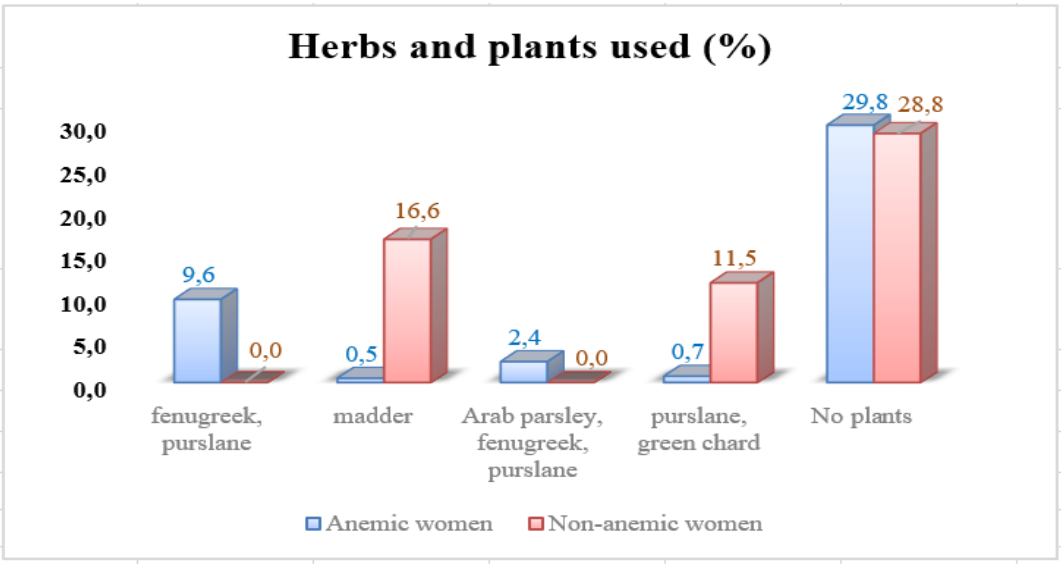

Figure 3: Distribution of Herbs and Plants Used by Pregnant Women, both Anemic and Non-Anemic

The examination of the chi-square test results regarding the links between alternative medicine and anemia has highlighted significant associations with several variables. First, the utilization of conventional medicine by our participants post-diagnosis confirmation proved significant in a statistical sense (p=0.001). Similarly, the specific selection of the herbs and plants utilized demonstrated a notable association (p=0.003). Lastly, the underlying reason for this choice was found to be significantly correlated with anemia (p=0.026).

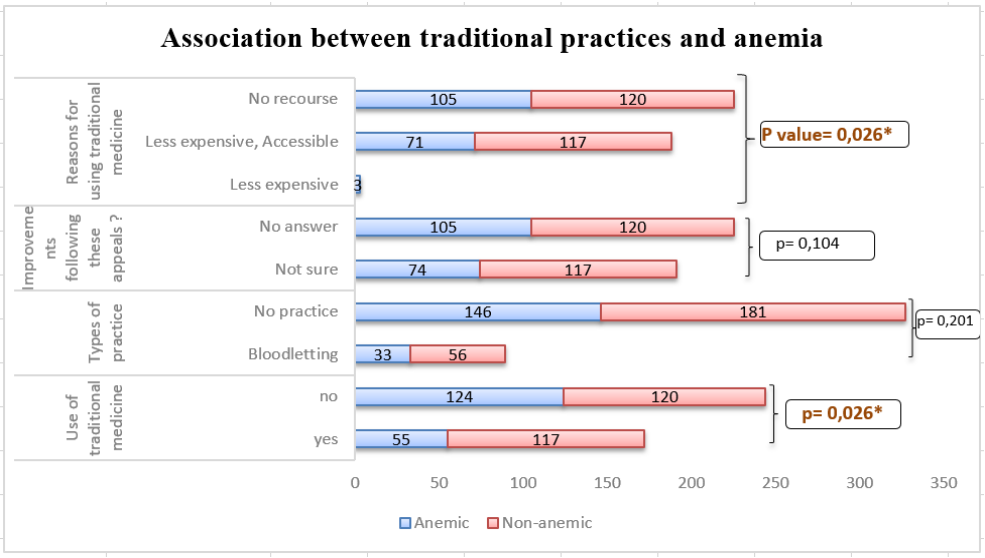

Figure 4: Correlation between ancestral practices and anemia (* Significance is established at p < 0.05)

The logistic regression analysis results revealed significant correlations regarding the use of conventional medicine, specific varieties of herbs and botanicals employed by these participants, and the presence of anemia. Additionally, a not significant correlation was observed among the specific medicinal practices practiced by women, the subsequent enhancements resulting from these interventions, and the factors motivating their utilization. Binary logistic regression.

3.3 Relationship between Academic Performance and Stress Levels

This table presents the results of a correlation analysis between two variables: "Moy - S2 - Last - Year" (Mean of the second semester of the previous year) and "PSS-Total-Score" (Total score on the PSS questionnaire, which assesses perceived stress levels). The Spearman's Rho correlation coefficient is -0.219, indicating a negative correlation between these two variables. In other words, there is an inverse relationship between the mean of the second semester of the previous year and the total score on the PSS questionnaire. When the mean of the second semester increases, the perceived stress score decreases, and vice versa. The p-value (Two-Tailed Significance) is 0.000, which is less than 0.01. This means that the correlation is statistically significant at the 0.01 level (two-tailed). In other words, there is a strong likelihood that the observed correlation is not due to chance.

Table 3: Binary logistic regression analysis of ancestral practices and anemia

	B	S.E	Wald	ddl	P value	Exp(B)
The use of ancestral medicine	-26,13	9220,90	0,00	1	0,008*	0,00
Herbs and botanicals employed	2,05	0,41	25,14	1	0,000*	7,80
Practices of traditional medicine	-6,91	24977,40	0,00	1	1,000	0,00
Improvement observed after employing these methods?	28,19	23213,10	0,00	1	0,999	1,72
Reasons for resorting to ancestral medicine	-26,67	23213,10	0,00	1	0,999	0,00
Constant	-26,13	9220,90	0,00	1	0,998	0,00

4. DISCUSSION

According to the WHO, traditional medicine encompasses the entirety of knowledge and practices, regardless of their scientific validation, aimed at diagnosing, preventing, or treating physical, mental, or social ailments [15–25]. This knowledge is primarily based on practical experience and observations transmitted from one generation to the next, either orally or in writing.

As part of our research, we structured the questionnaire around six main axes. One of these focal points particularly centered on the traditional practices embraced by women to address gestational anemia. The findings showed that 41.32 % of the women opted for alternative medicine subsequently being diagnosed with hematological deficiency. This finding is supported by several studies that confirm the utilization of alternative medicine by expectant mothers for therapeutic objectives, particularly for treating anemia [26]. However, the frequency of this practice differs varies across different nations, as highlighted by various [30]. This variation is often attributed to sociodemographic and cultural factors, according to several studies [31,32].

In our study, we specifically focused on anemia as the primary reason for resorting to traditional medicine. In contrast, other research has explored the use of traditional medicine while pregnant for various causes, like managing nausea and vomiting, facilitating childbirth, and increasing lactation [33,34].

During our research, we found that the plant-based remedies employed by pregnant women to manage hematological deficiency encompassed:

Arabic parsley or coriander, known as "Al qasbûr", stands out for its high concentration of vitamin C, iron, along with assorted minerals like potassium, calcium, and manganese. This plant serves as a counterpart a potent antioxidant due to its content of phenolic acid, vitamin C, and flavonoids, making it a commonly used remedy for anemia [35].

The Green Chard "salq" is rich in beneficial fibers that support intestinal transit, promote a feeling of fullness, optimize mineral absorption, and maintain the balance of the the gut microbiota, while aiding in cholesterol reduction. "Salq" is very rich by iron, potassium, calcium, and vitamin C, thus demonstrating its effectiveness in preventing anemia [36].

Madder, also known as "lfowa," is recommended for treating jaundice, anemia, and skin conditions such as eczema, because of its diuretic effects. Nonetheless, its use is not advised while pregnant, as some research have highlighted potential risks such as congenital abnormalities and an increased risk of miscarriage [37].

"Purslane," also known as "rejla," is strongly advised because of its rich polyunsaturated omega-3 fatty acid content, which are especially advantageous for heart health. Additionally, purslane is an excellent iron source, crucial for oxygen transport, energy processing, immune system and mental faculties, strengthening. It also contains abundant potassium and serves as an excellent source of vitamin C and magnesium [38].

The fenugreek plant, known as "helba," harbors active constituents like steroidal saponin compounds, fibrous materials, and iron [39]. Its iron content elucidates its

application in addressing anemia [40], underscoring its therapeutic potential in hematological disorders.

Mallow, or "Bakkoula": Various studies have revealed that the extract of "Bakkoula" contains a multitude of bioactive compounds, including flavonoids, phenolic derivatives, terpenoids, as well as enzymes such as sulfite oxidase and catalase. It also contains fatty acids, notably beta-carotene, omega-3 and omega-6, and vitamins E and C [41].

Studies using animal models have already demonstrated the teratogenic potential of certain medicinal plants [42–44].

Some research conducted in Morocco, notably by (Nadia et al, 2022), has revealed that the most frequently utilized plants for treating anemia are the following: thyme ("zaater"), green anise ("habet hlawa"), fenugreek ("helba"), garden cress ("hab rchad"), candle millet ("illan"), sesame ("zenjlane"), and flax ("zeriat lkettan").

Most of the plants highlighted in this research possess a prominent place in traditional Moroccan medicine [46]. This highlights the medicinal importance of these plant breeds within Moroccan cultural traditions, as well as their availability and accessibility to the population.

Almost all of our participants cited the accessibility and low cost of traditional medicine as reasons for its use. Furthermore, several researchers have highlighted that the expenses associated with medications and professional services constitutes a financial barrier, thus creating a major obstacle for individuals seeking healthcare, particularly the most disadvantaged [47, 48]. This observation has been noted in Ethiopia as well as in other countries [49]. Faced with this situation, many people opt for self-medication or completely forgo care [50]. Under these conditions, they tend to alleviate perceived symptoms rather than address the underlying causes of their health problems, which can sometimes be related to malnutrition, especially deficiency in iron.

In our research, participants solely utilized medicinal plants orally, a trend observed in several studies. Similarly, other studies have echoed these findings, although some have noted the utilization of different routes of administration [52].

The preference for traditional self-care as the primary option in Africa stems from the cultural importance placed on traditional remedies [16, 53, 54]. Additionally, when coupled with appropriate dietary practices, traditional medicine might be seen as a supplement or as an alternative to allopathic treatments, for both prevention and treatment [44], either before or after childbirth [55].

It's crucial to acknowledge that the frequency of alternative medicine usage among our populace was notable, as recommended by numerous prior research [56]. Our findings, which underscore the importance of alternative medicine, emphasize the imperative for in-depth investigations within our country, particularly considering the abundant variety of therapeutic herbs surpassing 600 breeds [57]. These inquiries hold promise for yielding more dependable and applicable outcomes, thereby significantly contributing to the progression of alternative medicine and its knowledgeable integration into public health initiatives for patients and nurses [58].

5. CONCLUSION

Furthermore, the findings drawn from this inquiry stress the importance of leveraging these findings as a cornerstone for crafting approaches, educational initiatives, and awareness initiatives targeting safer utilization of medicinal plants, especially among expectant mothers. Moreover, comprehensive studies are indispensable for assessing the impacts and hazards linked with plant utilization during pregnancy and childbirth.

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