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Maternal morbidity and the use of medicinal herbs in the city of Marrakech, Morocco

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This study is conducted to examine maternal morbidity and the use of medicinal herbs. A total of 181 women, aged 17-45 yrs gave birth in the last 5 yrs preceding the survey, were enrolled. The study was conducted in Marrakech city, Morocco. The rate of maternal morbidity was 38.1%, while 42% of women used medicinal herbs, 48.3% of them after the delivery. Medicinal plants are mostly used by women and consumed as infusion decoction seeking postpartum recovery and getting back in shape. The results show statistical associations between some socio-demographic and health variables and the medicinal herbs utilization. Woman's educational level (illiteracy), primiparous women and the postpartum period were associated with the use of medicinal herbs.

Keywords: Marrakech, Maternal morbidity, Medicinal herbs, Morocco, Women

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Herbal medicine is among the ancient medicines perceived to have therapeutic benefits. Dating back to the fourth century BC, a quote made by Hippocrates who believed in the natural healing process "Nature is the physician of the sick". In fact, for thousands of years, societies have strived in an attempt to develop their own remedies and help with diseases.

The use of traditional medicine is a phenomenon described in several studies in Africa[1]. In Morocco, the species of flora, resulting from a multitude of ecosystems, is known for its traditional therapeutic use, especially in rural areas. It is sought by 70% of the population[2]. These plants are used by the public and practitioners to treat many diseases[3]. Indeed, the use of herbal medicine remains fairly common practice considered by the vulnerable population as the first to be relied on for curative care often without consulting the modern health systems[4,5]. The use of traditional medicine is favored due to the inherent difficulties facing the Moroccan population when accessing modern healthcare system[4].

The use of medicinal herbs to treat maternal complications was observed in many populations[6,7,8]. These complications are a public health problem[9]. The WHO[10] (1993) defines it as a condition in a pregnant woman regardless of the duration or site of the pregnancy, or delivering in less it than 42 days is due to a cause related to or aggravated by the pregnancy or its management, but not from accidental or incidental causes.

In Morocco, 29.2% is the maternal morbidity rate[11]. Furthermore, women use two different care systems to heal disease states related to pregnancy and child birth: The modern biomedical system or the traditional medicine depending on local attitudes and ancestral beliefs[5].

The aim of this study is to assess the frequency of medicinal herbs use, to list the used theses herbs, and to check if maternal morbidity outcomes encourage women to consume medicinal herbs.

We also seek to grasp the possible associations between the use of herbal medicine and socio-demographic and health characteristics of women. Finally a comparison will be made between women's declarations regarding the use of medicinal plants and the point of view of some traditional herbalists (*Attars* or *Achabs*) living in Marrakech.

Methodology

The obtained data is collected through a retrospective investigation based on the direct

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interview technique using a questionnaire. It was conducted on a total of 181 women living in Marrakech from April to July 2014. These women of child bearing age (17-45yrs) visited public health centers for postnatal care, clinical exam, vaccination or care for their children. Women giving birth in the last 5 yrs preceding the survey were enrolled[12].

Data were collected considering socio-demographic characteristics of the studied women and their spouses (age, education level, employment, parity, etc.), maternal morbidities during pregnancy, during or after childbirth and the use of prenatal and postnatal care (Fig. 1).

An inventory of medicinal plants used by women during pregnancy, during or after birth, and the reasons for their use were enquired in the questionnaire.

A sample of each plant cited by the studied women was recovered from the herbalists in the city of Marrakesh. The identification of the plants was done by a Professor in Botany. Each sample was identified by a voucher and kept in the laboratory of human Ecology.

Finally, some traditional herbalists in the city of Marrakech were interviewed about the use of medicinal herbs during pregnancy or after childbirth.

The statistical significance was set at $p<0.05$ and Statistical Package for the Social Sciences (SPSS for Windows, version 10.1) was used for all statistical analysis.

Results

Socio-demographics characteristics of the studied women

The age at the last childbearing ranges from 17 - 49 yrs, an average of 28.2 yrs (SD=6.4). Women aged over 35 yrs in their last childbearing represent 17.7%.

The illiteracy rate among women was 27.1%. For the literate, 21.5% attended primary studies, secondary (39%) and higher (12.4%).While for their spouses, the illiteracy rate was only 6.6%, and 37% reaching a primary level, secondary (41%) and higher (15.4%). All spouses were employed, with 68.5% being workers, craftsmen, employees, drivers, shopkeepers etc… (grouped in the socio-professional category 1: SPC1), and 31.5% were either state functionaries or had liberal professions (grouped in the socio-professional category 2: SPC2). The employment rate of the enrolled women was very low since 91.5 % of them were jobless (Table 1).

Fig. 1 — Map of the study area

Table 1 — Socio-demographics characteristics of the enrolled women and their spouses

Characteristics	Frequency	%
Age group of women		
≤ 24 yrs	57	31.5
25-34 yrs	92	50.8
≥35 yrs	32	17.7
Age group of spouse		
≤ 24 yrs	4	2.2
25-34 yrs	73	40.3
≥ 35 yrs	104	57.5
Women's education level		
Illiterate	49	27.1
Primary	39	21.5
Secondary or more	93	51.4
Spouse's education level		
Illiterate	12	6.6
Primary	67	37.0
Secondary or more	102	56.4
Spouse's socio-professional group		
SPC1 : Workers, craftsmen, drivers, shopkeepers...	124	68.5
SPC2 : State functionaries or had liberal professions	57	31.5
Parity		
1 to 2 children	132	73.0
3 children and more	49	27.0

Furthermore, the parity ranges from one to 13 with an average of 1.9 (SD = 1.03),

Maternal morbidity antenatal and postnatal care

The prevalence of the reported maternal morbidity among the studied women was 38.1%, with 8.8%

Table 2 — Health characteristics of the studied women

Variables	Characteristics	Frequency	%
Maternal morbidity regardless of the period	Present	69	38.1
	Absent	112	61.9
Morbidity during pregnancy	Present	16	8.8
	Absent	165	91.2
Morbidity during childbirth	Present	37	20.2
	Absent	144	79.8
Morbidity after childbirth	Present	20	11.2
	Absent	161	88.8
Antenatal care	Yes	152	84.0
	No	29	16.0
Failed pregnancy	Yes	26	14.4
	No	155	85.6
Child-birth in a health facility	Yes	146	80.6
	No	35	19.4

Table 3 — Distribution of maternal morbidity complications according to the time of its occurrence

Maternal complications	Time of its occurrence		
	during pregnancy	during child birth	after child birth
HP	7.7%	3.9%	-
Vomiting	1.7%,	-	1.1%.
Fever	1.1%,	-	1.7%
Hemorrhage	1.1%	1.7%	4.4%,
Anemia	0.6%.	-	-
Postterm pregnancy	-	5%	-
Caesarean section	-	2.2%,	-
Tears	-	-	0.6%

during pregnancy, 20.2% during delivery and 11.2% after delivery (Table 2).

The most frequent maternal complications reported during pregnancy were: Hypertensive pregnancy (HP) and vomiting. During the child-birth, the reported complications were: the post-term pregnancy, and HP. However, hemorrhages were the most reported complication after delivery (Table 3).

The antenatal rate was 84.0% and 14.4% reported having at least a failed pregnancy (Miscarriage, still-birth). The rate of giving birth in a health facility was 80.6% (Table 2).

Use of medicinal herbs

Forty two per cent of the enrolled women have used herbs to relieve the progress of the pregnancy childbirth and the postpartum period including 7.7% during pregnancy, 4.5% at the time of delivery and 48.3% after delivery. Recourse to medicinal herbs is frequently used after delivery, the most commonly used herbs were: *Nasturtium officinale, Rubia tinctorum and Trigonnella foenum-graecum* representing respectively: 13.3%; 9.4% and 6.1%.The plants consumed by women during pregnancy, during or after childbirth, and the reasons of use are shown in the Table 4.

According to the Moroccan pharmacopoeia, women take 2 or 3 teaspoon per day until the symptoms disappear.

Moreover, studied women used a preparation consisting of twenty plants called *msakhen*: food that warms body. Table 5 shows the plants constituting the *msakhen* preparation. All plants constituting this preparation are dried, ground then mixed with the food (soup ...).

This preparation was widely used after delivery (39.3% of women) and only 1.1% during pregnancy. This finding is consistent with the declarations of the traditional herbalists of Marrakesh city who believed that the use of herbal medicine during pregnancy has harmful effects on the mother as well as her child. However, it is useful after delivery.

Use of medicinal herbs, socio-demographic and health characteristics

We studied correlations between socio-demographic and health characteristics of women and the use of medicinal herbs. Illiterate women and those who were multiparous at the time of this study used significantly medicinal herbs, in comparison with primiparous and educated women.

Similarly, women tended to use more herbal medicine after delivery. However, maternal complications incurred during pregnancy, child-birth and after delivery don't seem to impact this use (Table 6).

Discussion

This study showed that the use of medicinal plants is a common practice in the city of Marrakech. However, these medicinal plants are not motivated by maternal complications.

Indeed, despite the high rate of maternal morbidity that we recorded, the studied women have used medicinal plants to improve the course of pregnancy, childbirth and postpartum. In fact, the majority of women had full package of antenatal care and gave birth in health facilities. This suggests that the occurrence of maternal

Table 4 — Periods and patterns of the use of herbal medicine

Botanical name and local name	English name	Ref. No	Parts used	Administered form	During pregnancy	During labor	After delivery	Reasons of uses
Aloysia triphylla (L'Herit.) Britton ; *Louiza*	Vervain	LHE025	Flower	Infusion	2.8%	2.2%	3.3%	-Against pain caused by labor -Against vomiting -To appease pregnancy - Getting in shape
Nasturtium officinale W.T.Aiton ; *Hab r' chad*	Cresson	LHE008	Seeds	Maceration	-	1.1%	13.3%	- Getting in shape - Initiate and facilitate childbirth
Rubia tinctorum L. ; *Lfowa*	Madder	LHE021	Root	Decoction	0.6%	-	9.4%	- Recover from blood loss during childbirth -Against the cold -Increase breast milk production.
Trigonnella foenum-graecum L. ; *L'halba*	Fenugreek	LHE015	Seeds	Maceration/ Decoction/Powder	0.6%	-	6.1%	-Getting back in shape after delivery
Nigella sativa L. ; *Chanouj*	Nigella	LHE019	Seeds	Decoction/Powder	-	-	2.8%	-Getting back in shape after delivery
Thymus satureioides Coss. & Balansa ; *Za'atar*	Thym	LHE004	Aerial part	Decoction	1.1%	-	-	-To appease pregnancy -Digestive
Cinnamommum zeylanicum Blume ; *Karf a*	Cinnamon	LHE020	Bark	Decoction	-	2.8%	-	- Initiate and facilitate childbirth
Pimpinella anisum L. ; *Nafaa*	Anis	LHE005	Seeds	Decoction/Powder	1.1%	-	-	-Antiemetic
Salvia officinalis L. ; *Salmia*	Sage	LHE024	Flower	Infusion	0.6%	-	-	- Getting in shape
Zingiber officinale (Willdenow) Roscoe ; *Skin jbir*	Ginger	LHE077	Rhizome	Maceration/ Decoction/Powder	0.6%	-	-	-Antiemetic

Ref.: Samples of the enumerated medicinal plants were numbered and conserved in the laboratory of human ecology, Faculty of Science Semlalia Marrakech, Morocco.

complications during pregnancy, during childbirth or after delivery would require the treatment afforded by the modern care system. So, the herbal medicine would essentially need for postpartum recovery excluding morbidity cases during pregnancy and childbirth.

Also, Maghreb women believe that the *msakhen*, the other plants and heating food have harmful effects during pregnancy and can cause abortion[13]. These findings are explained by the convictions of the surveyed women who believe that the use of herbal medicine during pregnancy and child-birth can have adverse effects on pregnancy or they are likely to cause hemorrhages.

The analysis of socio-demographic and health characteristics showed that illiterate women have used mostly the medicinal herbs. This result is consistent with those found by other studies[14]. Illiteracy has been found to be another important determinant associated with the use of medicinal herbs. This has been confirmed by other studies conducted in Marrakesh and its regions[14]. In fact, the education level is an important determinant of reproductive and health behavior[15]. The Moroccan educational system has changed and improved significantly over the past two decades through an explicit commitment to ensure compulsory education for all. However, more progress is still to be

Table 5 — Herbs used in the preparation of *msakhen*

Botanical name and Local name	English name	Ref.
Trigonnella foenum-graecum L. ; *L'halba*	Fenugreek	LHE015
Thymus satureioides Coss. & Balansa; *Za'atar*	Thym	LHE004
Nasturtiumofficinale W.T.Aiton ; *Hab r'chat*	Cresson	LHE008
Rubia tinctorum L. ; *Lfowa*	Madder	LHE021
Piper Longum L. ; *Bzar*	Poivre	LHE016
Aframomum melegueta K.Schum ; *Gouza sahraouia*	Maniguette	LHE003
Mentha piperita (Ehrh.) Briq. ; *Naana'a*	Menthe	LHE010
Mentha pulegium L. ; *Fliyou*	Pouliot	LHE002
Cinnamommum zeylanicum Blume ; *Karfa*	Cannelle	LHE020
Rosmarinusofficinalis L. ; *Azir*	Romarin	LHE007
Elettaria cardamomum L. ; *Kaakalla*	Cardamom	LHE017
Illicumverum Hook.f. ; *Badian*	Badian	LHE009
Panicum miliaceum L. ; *Illan*	Millet	LHE055
Punica granatum L.*; Warkat ramman*	Flower Grenadier	LHE022
Pimpinella anisum L. ; *Nafaa*	Anis	LHE005
Alpinia officinarum Hance ; *Khodanjal*	Galanga	LHE013
Curcuma longa L. ; *Kharkoum*	Curcuma	LHE011
Myristica fragrans Houtt. ; *Lguoza*	Nutmeg	LHE018
Mentha suaveolens subsp Lej. & Courtois ; *Timija*	Peppermint	LHE006
Myristica fragrans Houtt. ; *Bssibissa*	Macis/Muscade Flower	LHE001
Nigella sativa L. ; *Chanouj*	Nigella	LHE019
Lavandula angustifolia Mill. ; *Lakhzama*	Lavender	LHE014
Syzygium aromaticum (L.) Merr. & L.M.Perry ; *Kronfol*	Clove	LHE012

Ref.: Samples of the enumerated medicinal plants were numbered and conserved in the laboratory of human ecology, Faculty of Science Semlalia Marrakech, Morocco

Table 6-— Socio-demographic and health characteristics and the use of medicinal herbs

	Use of the medicinal herbs				χ^2 test
	Yes		No		
	Frequency	%	Frequency	%	
Women's group age					
≤ 24 yrs	21	36.8	36	63.2	1.5 ns
25-34 yrs	40	43.5	52	56.5	
≥35 yrs	16	50.0	16	50.0	
Women's education level					
Illiterate	28	57.1	21	42.9	10.5*
Primary	23	47.9	25	52.1	
Secondary and more	25	29.8	59	70.2	
Spouse's education level					
Illiterate	7	58.3	5	41.7	1.6 ns
Primary	26	38.8	41	61.2	
Secondary and more	43	42.2	59	57.8	
Spouse's socio-professional group					
SPG1 : workers, employees or itinerant trader	54	43.5	70	56.5	1.6 ns
SPG2 : public servants and medium-sized traders	17	35.4	31	64.6	
SPG3 : senior staff and big traders	5	55.6	4	44.4	
Parity					
1 to 2 children	53	38.7	84	61.3	2.5 ns
3 children and more	23	52.3	21	47.7	
Period of using herbs					
During pregnancy	5	5.6	84	94.4	
During child birth	4	4.5	85	95.5	70.9***
After child birth	43	48.3	46	51.7	

Contd

Table 6-— Socio-demographic and health characteristics and the use of medicinal herbs

	Use of the medicinal herbs				
	Yes		No		
	Frequency	%	Frequency	%	
Morbidity during pregnancy					
Present	5	31.3	11	68.8	0.8 ns
Absent	71	43.0	94	57.0	
Morbidity during pregnancy					
Present	7	44.4	9	55.6	0.6 ns
Absent	91	54.9	74	45.1	
Morbidity after child birth					
Present	22	60.0	15	40.0	0.2 ns
Absent	75	51.9	69	48.1	
Primiparous woman					
Yes	2	4.1	47	95.9	21.3***
No	74	56.1	58	43.9	
Antenatal care					
Yes	64	42.1	88	57.9	0.05 ns
No	12	41.4	17	58.6	
Failed pregnancy					
Yes	12	46.2	14	53.8	1.4 ns
No	84	53.9	71	46.1	

*ns : non significant; * : p<0.05 ; ** : p <0.01 ; *** p:<0.001*

achieved for a more balanced distribution of education between Moroccans, including the fight against illiteracy and dropouts[15].

Also, that the use of herbal medicine is less common during pregnancy[7]. First time mothers used less herbal medicine compared to the multiparous women. Fear of adverse effects is the possible reason since it is their first pregnancy which is not the case for multiparous women.

Regarding the use of herbal remedies and maternal morbidity complications, no statistical associations were identified, although several studies have shown that maternal morbidities are the push factor to herbal medicines utilization following the traditional model[6,7,8].

Conclusion

On reading of these results, the rate of maternal morbidity reported as well as the use of medicinal plants is important, respectively 55% and 66%. Nevertheless the use of medicinal plants is not motivated to treat maternal complications during pregnancy or childbirth, but to getting back in shape and not to help with maternal complications. Furthermore, illiterate and primiparous mothers seek medicinal herbs utilization particularly after delivery.

Also, a consistency was found between the declaration of women and those of the traditional herbalists about the use of medicinal herbs.

Studies on animal models will be important to understand the effects of these plants.

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