

Prevalence and correlates of complementary and alternative medicine utilization among infertile women attending selected fertility clinics in Khartoum state

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Abstract

Infertility poses multifaceted challenges, prompting many women to explore complementary and alternative medicine (CAM). This study investigated CAM prevalence and types

among infertile women in Khartoum. A descriptive cross-sectional study was conducted, involving 253 women. Data was collected through structured interviews, and descriptive and inferential statistics, with a significance level set at $p > 0.05$. The mean age of the participants was 31.59 ± 6.9 years, with 53.8% being graduates, 54.5% diagnosed with primary infertility, and 45.5% with secondary infertility. CAM usage was reported by 52.2% of participants, with herbal treatments being the most prevalent (e.g., fenugreek 26.9%, argell 20.2%). Spiritual healing (11.4%) and folkloric methods (9.5%) were also noted. Most users (76.5%) did not disclose CAM usage to healthcare providers, citing beliefs in safety (56.8%) and effectiveness (39.4%). Family (72%) and friends (46%) significantly influenced CAM use. Infertility duration and rural residence were associated with CAM usage ($p = 0.002$). The study underscores a high prevalence of CAM usage among Sudanese infertile women, primarily herbal remedies, and emphasizes the importance of healthcare providers engaging patients in CAM utilization.

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Key words: CAM, alternative medicine, herbal medicine, infertility, women.

Contributions: ME, FAN, conception or design of the work, drafting of the article, critical revision of the article, final approval; ME, data collection, data analysis, and interpretation. The authors state that no artificial intelligence-assisted technologies (such as Large Language Models, chatbots, or image creators) were used in the production of submitted work.

Conflict of interest: the authors declare that they have no competing interests.

Ethics approval and consent to participate: ethical approval from the Khartoum Faculty of Nursing University Sciences institutional review board was obtained.

Informed consent: informed consent from each research candidate was obtained, and confidentiality was maintained.

Funding: none.

Availability of data and materials: not applicable.

Acknowledgments: the authors praise Allah the Almighty for giving us the determination and the strength to complete this study. They would like to express appreciation and gratitude to the fertility center's staff members, managers, and the participants for their cooperation and also, to acknowledge the University of Khartoum, faculty of Nursing Sciences, faculty, and staff for their cooperation.

Received: 29 January 2024.

Accepted: 19 April 2024.

Early access: 12 June 2024.

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Healthcare in Low-resource Settings 2024; 12:12319

doi:10.4081/hls.2024.12319

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Introduction

Infertility is generally defined as not being able to get pregnant (conceive) after one year (or longer) of unprotected sex. About 6% of married women aged 15-44 in the United States are unable to get pregnant after one year of trying (infertility).¹ The World Health Organization (WHO) demographic studies also show that in Sub-Saharan Africa, more than 30% of women aged 25-49 suffer from secondary infertility.² WHO defined traditional medicine as “diverse health practices, approaches, knowledge, and belief incorporating plant, animal, mineral base medicine, spiritual therapies, and exercises applied singularly or in combination to maintain wellbeing, as well as to treat, diagnose, or prevent illness. The term complementary/alternative/non-conventional medicine is used interchangeably with traditional medicine in some countries”.³ As efforts to have a child fail, couples experience several socio-emotional outcomes in which, women endure more painful emotional experiences because in many countries, being a woman means to be a mother. In addition, psychological outcomes incurred by couples as a result of infertility treatment and costs impose more pressure on them for Assisted Reproductive Technologies (ARTs), such as *In Vitro* Fertilization (IVF). Nevertheless, couples have a greater tendency toward natural treatments than aggressive ones such as IVF. As much as ARTs are not always successful, couples are inclined to experience treatments other than conventional ones, including Complementary and Alternative Medicine (CAM).⁴ People facing infertility concerns are increasingly turning to the use of ARTs.

However, successful treatment outcomes are far from certain because 68.5% of IVF cycles do not result in a live birth. These high failure rates lead many couples to look for ways to improve their chances of achieving conception.⁵ CAM includes diagnostic, therapeutic, and preventive methods that complement conventional treatments. Convenient access and lower costs of such treatments have increased their application in different populations.⁴ The various types of CAM offered, along with the increasing market for alternative fertility products, make it significant to have a broader understanding of the effectiveness of these treatments.

CAM supposedly offers couples a way to improve outcomes and/or decrease stress and anxiety levels during treatment. CAM is also used to incorporate cultural traditions of health and fertility as well as increase feelings of hope and control during a biomedical fertility treatment plan. Some patients also use CAM as an alternative to ARTs, although most fertility patients use CAM in addition to biomedical fertility treatment.⁵

Justification

The findings of this study will redound to the benefit of both healthcare providers and infertile women and will uncover critical areas in Sudanese culture. We could not find any study in Sudan that explored the use of CAM for the treatment of infertility. However, various complementary therapies, including spiritual and herbal methods, are well known among the community in Sudan.

Statement of the problem

Infertility is a public health issue. The stigma, costs, and uncertainty associated with biomedical fertility treatments often entice those who have problems conceiving to use CAM.⁶ Despite the popularity of traditional and complementary medicine, evidence of its safety and efficacy remains inconclusive.⁷ In Sudan, the success rate of ARTs claimed by fertility centers is between 25-30%, which is low. Currently, there are two significant barriers to infertility care mentioned by all centers: high cost and inaccessibility. Moreover, the average Sudanese couple cannot afford ARTs without support.⁸ A large sector of the Sudanese population uses traditional and religious medicine to meet their primary healthcare needs. In addition to being accessible and affordable, it is part of their belief system. Despite reported and unreported complications in traditional practice, people seek traditional healers regularly and confide in them; they respect them and hold them in high regard.⁹ The literature shows widespread use of CAM among infertile women. Studies indicated that 49.6% of women in Iran, and 36.5% in Sierra Leone used herbal medicine for infertility treatment.^{11,19} Despite the widespread use of CAM, only 8% and 3% of users reported discussing the issue with their doctors, educators or nurses, respectively.¹⁰ In the current study, the researchers propose to investigate the use of CAM and its determinant factors among Sudanese infertile women.

Aims and objectives

As previously mentioned, the general objective is to study CAM utilization and its determinant factors among Sudanese infertile women attending governmental fertility clinics in Khartoum state in 2020.

The specific objectives include: i) to measure the percentage of infertile women attending fertility centers who use CAM; ii) to identify the types of CAM methods used for fertility enhancement; iii) to identify infertile women's perception of the effect of CAM on their health status.

Materials and Methods

Study design and setting

This study has an exploratory cross-sectional descriptive, clinic-based design. It was conducted at five randomly selected fertility centers in Khartoum state, Sudan (Elneel Fertility Center, Maternal Health, Gynecology, Obstetrics and IVF Center, Royal Care Hospital, Elsir Abulhassan Fertility Center, Saad Abulela Hospital) from March to December 2020.

Study population

The study population included infertile females who attended a fertility center at the time of the study. The inclusion criteria were being Sudanese and a female of reproductive age, with primary or secondary infertility.

Sample technique and sample size

Study participants were selected using the convenient sampling method. In order to estimate the sample size, Equation 1 was used:

$$n = \frac{z^2 \times p(1-p)}{d^2} \quad [\text{Eq. 1}]$$

where n is the desired sample size and z is the standard normal deviation of 1.96 at a 95% confidence interval. In order to estimate the sample size, the values of p and $1-p$ were considered 0.5. The value of d was 0.05 at a confidence level of 99% and z -score was 1.95. Based on Equation 1, the estimated sample size was 240. In addition, considering the probability of dropouts, 20 extra participants were added.

Data collection method

A structured face-to-face interview using a questionnaire was done by trained survey team members; their training included methods of asking the questions, providing an appropriate explanation about the types of CAM modalities available, and documenting the answers based on the questionnaire.

Data collection tool

For gathering information, a researcher-made questionnaire based on the literature, previous research, and the researcher's knowledge and experience was used. The questionnaire consists of three parts: i) Demographic data form (including age, education, occupation, income, living place, having other chronic diseases, marital history, infertility history, infertility cause, infertility treatment, and having children); ii) Data related to infertility; iii) Data related to CAM (herbs, folklore, and spiritual healings).

Data analysis

Statistical Package for the Social Sciences (SPSS) (IBM, Armonk, NY, USA) was employed for data analysis. Frequencies for each variable were generated and organized into tables using SPSS. A chi-square test was used to determine the association between the independent variables and demographic characteristics; $p \leq 0.05$ was considered statistically significant.

Ethical considerations

Ethical approval from the Khartoum Faculty of Nursing University Sciences Institutional Review Board was obtained. Informed consent from each research candidate was obtained, and confidentiality was kept.

Results

Demographic and disease characteristics

The current study is an investigation of Sudanese women, use of CAM for infertility treatment. Sudan is a well-known country for its population heterogeneity. Different tribes are well-mixed in the Sudanese community. This indeed ensures the versatility of the study place.

In total, 264 infertile women were invited to participate in the study from 4 different infertility centers in Khartoum State, Sudan. Of these, 253 (95.8%) agreed to participate; they all completed the questionnaire. The mean age of participants was 31.59±6.9 years (range 17-50 years) (Table 1).

When the educational status was examined, it was found that most of the women were graduates (53.8%) and secondary school graduates (26.9%); additionally, 73.1% of the participants lived in urban areas whereas the rest lived in rural as well as suburban areas (3.8% and 23.1%, respectively). The majority of the participants (54.5%) were diagnosed with primary infertility, whereas the rest of them (115, 45.5%) were diagnosed with secondary infertility. The etiologies of infertility were as follows: female infertility for 111 (43.9%) participants, male infertility for 22 (8.7%), combined infertility for 29 (11.5%), and unexplained or unknown infertility for 91 (36.0%). Moreover, the length of infertility was 5±4.2 years. The sociodemographic and reproductive characteristics of the study participants are detailed in Tables 1 and 2.

Complementary and alternative medicine use

Results showed that of the 253 participants, 51.4% reported that they had used complementary therapies for the treatment of infertility. Approximately 90% of them revealed that their reason for using such treatments was for the treatment of infertility; meanwhile, other reasons were to promote health and decrease stress (12.9% and 2.3%, respectively).

Based on the results, among CAM, herbal treatments were the most prevalent (Table 3): fenugreek (26.9%), followed by argell (20.2%), gingergrass, and cinnamon (19% for each). The rest of the practices are spiritual healing, represented in Roquia (Quran) at 6.7% and Faki's help at 4.7%. Folkloric practices are shown in Table 4. As regards the perception of CAM among women who used it for infertility treatment, virtually 60% of them agreed that complementary medicines are safe for their health, while almost 40% think that herbal medicines are effective for treating infertility. About 80% of participants did not disclose to their healthcare provider that they were using CAM. 70% of them used CAM due to a recommendation by family, about 46% by friends, whereas 10% based on a suggestion from their healthcare providers (doctors, nurses, and pharmacists).

A logistic regression model was constructed to assess associations between independent factors and complementary management. Demographic, reproductive, and complementary medicine-use characteristics were incorporated into the model. In the multivariate linear regression analysis, following adjustment for other variables, residence and length of infertility were observed to have

Table 1. Demographic data of the participants (n=253).

Variable	Total (%)	T & CAM users (%)	T & CAM non-users (%)
Age, years			
Mean	31.59	32.2±6.8	30.9
Standard deviation	6.900	6.8	7
Minimum	17	17	18
Maximum	50	50	50
Education			
Basic	18 (7.1)	8 (6.2)	10 (8.1)
Secondary	57 (22.5)	35(26.9)	22 (17.9)
Graduate	137 (54.2)	70(53.8)	67 (54.5)
Postgraduate	30 (11.9)	12(9.2)	18 (14.6)
Uneducated	11 (4.3)	5(3.8)	6 (4.9)
Religion			
Islam	249 (98.4)	130 (100)	119 (96.7)
Christian	3 (1.2)	0 (0)	3 (2.4)
Other	1 (0.4)	0 (0)	1 (0.8)
Residence area			
Rural	13 (5.1)	5 (3.8)	8 (6.5)
Urban	198 (78.3)	95 (73.1)	103 (83.7)
Suburban	42 (16.6)	30 (23.1)	12 (9.8)
Residence state			
North	26 (10.3)	14 (10.8)	12 (9.8)
South	9 (3.6)	4 (3.1)	5 (4.1)
East	20 (7.9)	13 (10.0)	7 (5.7)
West	13 (5.1)	6 (4.6)	7 (5.7)
Middle	184 (72.7)	93 (71.5)	91 (74.0)
Origin			
North	100 (39.5)	51 (39.2)	49 (39.8)
South	10 (4.0)	5 (3.8)	5 (4.1)
East	21 (8.3)	16 (12.3)	5 (4.1)
West	33 (13.0)	17 (13.1)	16 (13.0)
Middle	89 (35.2)	41 (31.5)	48 (39.0)

an independent positive association; age, cause of infertility, and type of infertility did not have an impact on the decision to use CAM; no other significant associations were observed.

Discussion

The study found that nearly half (52.2%) of infertile women utilized CAM alongside conventional medical treatments. Various studies have reported different frequencies of CAM usage among infertile individuals. Comparing our findings to those of Dehghan et al.¹¹ conducted in Iran, we observed a usage rate of 49.6%. This corresponds closely with the results of studies by Özkan et al.¹² and Bardaweel et al.¹³, which reported CAM usage rates of 50% and 44.7% among infertile individuals, respectively. Conversely, higher consumption of complementary treatments (76.2%) was noted in studies from Uganda¹⁴ and Turkey¹⁵. Nevertheless, some studies reported lower percentages of CAM use, such as 41% in Lebanon¹⁶ and 36.5% in Sierra Leone¹⁹. Fata *et al.* reported the lowest frequencies, with only 35.8% of infertile couples using CAM¹⁷. Such disagreement might be due to sociocultural and economic differences between countries, public recognition, easy access to such treatments, and the degree of cultural pressure to have children; nonetheless, according to this study, Sudanese women remain among those who consume a considerable amount of CAM, comparable to other studies. This may be due to the stigma, costs, and uncertainty associated with ARTs,¹² which are valid in most African countries where CAM is one of the primary sources of healthcare because of its cultural and historical influ-

ences.⁸ The significant sociodemographic variables associated with complementary and alternative treatment (CMT) use in the present study were the length of infertility ($p=0.002$), alongside the residence ($p=0.002$) whether urban or rural. A woman living in a rural area is more likely to use CAM, this is valid, especially in Sudan, where the rural society, family members, and surroundings exert great pressure on the couple to have a child; moreover, the woman's most, and sometimes sole role, is to rear children. The study did not find any relationship between education levels and using CAM, which is similar to a study done in Turkey.¹⁸ Other sociodemographic characteristics were not statistically significant in contrast to other studies conducted in Uganda and Turkey,^{12,14} which found education and age may influence the decision to use CAM. The study showed that women cited family and friends (72.1% and 45.9%, respectively) as key influencers in their decision to use herbal medicine; this is similar to a study conducted in Sierra Leone and Jordan.^{21,19} Based on the results, among CAM, herbal treatments were the most prevalent: fenugreek (26.9%), followed by argell (20.2%), gingergrass and cinnamon (19% for each). This is similar to a study done in Jordan which found that 30% use herbs. Generally, the common belief in herb safety is largely attributed to an obvious misconception based on the fact that herbs and herbal products come from 'nature' and are therefore 'naturally safe' or 'intrinsically harmless' (Figure 1).¹³ However, the risk of adverse effects increases with the fact that the choice to use herbal medicine was greatly influenced by people with low levels of knowledge about the safety and efficacy of herbal remedies, which is in line with findings from Lebanon and Sierra Leone.^{16,19} Other folkloric methods are aubergine fruits, cumin seeds, and dates kept under the bed (4.7%), cupping (2.0%)

Table 2. Obstetric and gynecologic information of the infertile women (n=253).

Variable	All participants (%)	T & CAM users (%)	T & CAM non-users (%)
Length of marriage			
Mean	6.91	7.74	6.03
Standard deviation	5.009	5.351	4.475
Minimum	1	1	1
Maximum	25	25	25
Length of infertility			
Mean	5.05	5.86	4.18
Standard deviation	4.257	4.977	3.126
Minimum	1	1	1
Maximum	30	30	15
Type of infertility			
Primary	138 (54.5)	(56.9)	
Secondary	115 (45.5)	(43.1)	
Cause of infertility			
Male	22 (8.7)	12 (9.2)	
Female	111 (43.9)	59 (45.4)	
Both	29 (11.5)	16 (12.3)	
Unknown or undiagnosed	91 (36.0)	43 (33.1)	
Used CAM for infertility			
Yes	130 (51.4)	-	-
No	123 (48.6)	-	-
Reported taking CAM to care providers			
Yes	32 (12.6)	-	-
No	221 (87.4)	-	-
Recommending others to use CAM (attitude)			
Yes	99 (39.1)		
No	153 (60.5)		

music therapy (1.6%), and pieces of coin or qarad worn (1.2%). Spiritual methods were also used (Faki's help, 4.7%; Roquia, 6.7%). Figure 2 illustrates that both psychological and physiological benefits were anticipated among women from traditional practices, such as achieving conception and reducing stress. These findings align with prior literature^{11,17}

In this study, it is apparent that there was a low disclosure rate of herbal medicine use among users; nearly 80% of CAM users reported that they did not tell their healthcare provider about taking CAM. This is comparable to studies in Uganda and Sierra Leone.^{14,19} The reasons for nondisclosure were that healthcare providers failed to ask and the thought that it was not necessary to divulge such information, which resonates with the current literature on the nature of physician-patient communication regarding herbal medicine use in Africa.²⁰ Other reasons for nondisclosure cited in the literature included fear of health providers' reactions that can potentially undermine care and perceived lack of support and understanding from conventional healthcare providers. Effective communication between patients and providers is essential to achieving the desired goal of infertility care, the absence of which can negatively affect patients' treatment outcomes.¹⁹ Therefore, healthcare providers should be aware of this and initiate

a discussion with their patients about the use of alternative medical care, ensuring it is free from prejudice and based on mutual respect. As regards the perception of herbal medicine use among women seeking care for infertility, about half of the participants reported using CAM for the reason that it is safe as well as effective. This is similar to that observed in the literature.^{11,16,19}

Table 3. The herbal methods used by the study participants (n=253).

Method	%
Fenugreek	26.9
Argell	20.2
Ginger grass	19
Cinnamon	19
Common sage	11.9
Sesame	10.7
Marjoram	10.7
Aashab	9.9
Honey and its products	9.1
Arabic gum	7.1
Mint	4.7
Clove	4.7
Black seed	4.7
Costus	4
Nutritional advice	2.8
Mugworts	2.4
Olive oil	2
Dates	2
Cress	2
Liquor ice	1.6
Kef maryam	1.6
Ginger	1.6
Binali herbs	1.6
Vitamins supplements	1.2
Alum	1.2
Indian almond	0.8
Fennel	0.4
Corton seed	0.4

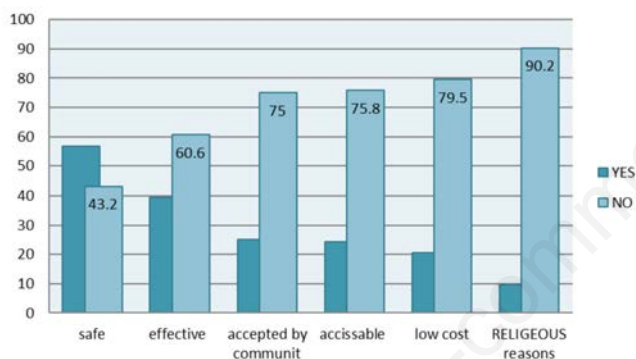


Figure 1. Factors leading to the usage of complementary and alternative medicine by infertile women (n=253).

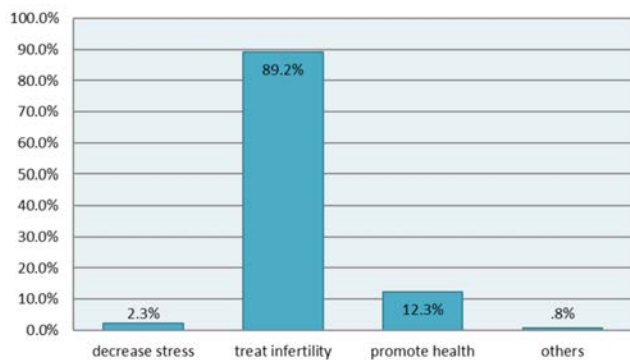


Figure 2. Reason for using complementary and alternative medicine by infertile women (n=253).

Table 4. Folkloric methods and spiritual methods used by infertile women (n=253).

Folkloric methods	%
Aubergine fruits, cumin seeds and dates kept under the bed	4.7
Cupping	2.0
Music therapy	1.6
Pieces of coin or Qarad worn	1.2
Spiritual methods	%
Faki's help	4.7
Roquia	6.7

Conclusions

In conclusion, CAM use among infertile women seeking medical assistance for their infertility condition was common, and herbal treatments were the most prevalent type. The most important factor affecting the satisfaction of infertile individuals with CAM was their belief in the safety of such treatments. Healthcare providers providing fertility care should be attentive to the health-seeking behavior of patients under their care and initiate dialogue with patients on their risks and benefits.

Recommendations

Further studies, intended to identify the benefits or harm to patients seeking infertility treatment, are required. Intensive hormonal treatment and exposure to anesthetic agents might potentially interact with some CMT.

Study strengths and limitations

The major limitation of this study was the sample frame, which included women from one state in Sudan. Moreover, it was conducted in fertility clinics; due to budget and time constraints, this may underestimate the actual utilization rate, as there is potential bias. As a consequence, further studies should be conducted in society. Nevertheless, this study presents the first empirical evidence of CAM use among women seeking infertility care in Sudan; furthermore, it will help provide the basis for further studies to be conducted.

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