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Prevalence and Socio-demographic Variations in Traditional Medicine Use: A Study from East Nile Locality, Sudan

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ABSTRACT: Traditional medicine (TM) remains a cornerstone of healthcare in Sudan, across urban and rural settings. We explored TM use and its association with socio-demographic characteristics (age, sex, education, economic status, and residence) in East Nile locality (ShargAlneil), Khartoum State. A survey encompassing 609 households (44.7% rural, 55.3% urban) revealed a high prevalence of TM use: over 80% reported using at least one form. Notably, significant socio-demographic variations emerged. Individuals with higher education leaned towards herbalists ($p<0.05$), while those with lower education favored religious healers ($p<0.05$). Similarly, older adults preferred religious healers ($p<0.05$), while males tended to choose herbalists ($p<0.05$).

The most common ailments preferred to be treated by TM practitioners were spiritual and psychological issues, bone injuries, stomachaches, and headaches. Conversely, conditions like malaria, diabetes, hypertension, and heart disease were primarily preferred to be managed by modern medicine.

This study highlights the widespread use of TM across diverse demographics, with preferences for specific types of practitioners. It also underscores a selective trust in modern medicine for certain diseases. Integrating socio-demographic and cultural perspectives into healthcare delivery can enhance understanding of community needs and guide the development of appropriate interventions. Further research is warranted to delve deeper into the reasons behind these variations in treatment preferences.

KEYWORDS: traditional healing, alternative medicine, socio-economic and healthcare delivery, Africa.

INTRODUCTION

The World Health Organization has estimated that about 80% of the African populations use traditional medicine as their major source of healthcare [(1)]. Sudan is the largest sub-Saharan country in Africa. It has a distinctive geographical location, starting with desert in the north and ending with sub-tropical forests in the south. The longest part of the Nile River runs through Sudan. Also, the Red Sea borders Sudan from the east. This location has allowed Sudan to witness lots of civilizations, cultures, and religions, e.g., the Pharaohs civilization, Islam, and Christianity, in addition to the indigenous African cultures and religions. All of these characteristics make Sudan one of the richest countries with regard to its multiculturalism, ethnicities, and religions. As a result, Sudanese people have been able to develop their own unique skills in maintaining health and treating diseases using herbs, minerals, and animal products. They have also become experts in bone setting and cupping. For treating psychological diseases, the Sudanese have adopted a holistic technique for treatment that combines health with religion, education, and social settings [(2)]. Even though traditional medicine is widely practiced, the Sudanese government has no national policy and/or regulations for the

practice of traditional medicine, and therefore, the government is not optimizing its benefits. There is no systematic data on the different types of traditional medicine or the number or types of traditional healers. There is also no scientific data collected on the number of people using traditional medicine in Sudan, even though many parts of the country lack or have limited access to modern medicine; therefore, traditional medicine fills a gap and is sometimes the only available healthcare service for the Sudanese population, particularly in rural communities.

The term traditional healer is an umbrella concept that includes different types of healers with different types of training and expertise [3]. In Sudan, like in many other countries, traditional healers are also not a homogenous group. Specifically, in Khartoum, the capital of Sudan, traditional healers can be divided into five major groups: herbalists/herb vendors, religious healers, bonesetters, cupping healers, and *ShaikhatAlzar* (spirit possession healers). Along with these available healers, there is a widespread tendency among the Sudanese to use home remedies [4,5]. Many studies have been carried out in Sudan investigating the health-seeking behavior of the Sudanese population, both rural and urban. Nonetheless, most of these studies were limited to examining specific diseases such as malaria, tuberculosis, dental health, diabetes, injuries, broken bones, or mental health [6,7,8,9,10,11,12]. Studies focusing on the broader scope of the use of traditional medicine were very scarce. Therefore, the objectives of this study are to investigate: 1/ The prevalence of the use of different types of traditional medicine and how these relate to the socio-demographics of the population under study, 2/ The reasons behind preferring traditional medicine over modern medicines, 3/ What are the most common diseases that people prefer to consult with traditional healers and 4) What are the top diseases that people mostly prefer to seek guidance from modern medicine?

The site for this study was chosen to be one of the 7 localities comprising Khartoum State, which is the capital of Sudan and the richest state with regard to the availability of modern health facilities and personnel. The results of this study would hopefully assist in the reorientation of health education program planners to improve health-seeking behavior and practices at home, as well as when approaching traditional and/or modern health services. Therefore, there is a need to investigate the extent to which traditional medicine is used in urban and nearby rural areas and the reasons for its use despite the availability of modern health services. This study will also investigate the influence of different socio-demographic backgrounds on the selection of different types of traditional medicine.

METHODS

Study Site and Setting

Khartoum State is the most populated state in Sudan, with a total population of around 8 million [13]. It is geographically centrally located in the country. In terms of economic and educational opportunities, it is the richest state compared to other states in Sudan. Khartoum State is divided into seven administrative localities. The East Nile (*ShargAlneil*) Locality is one of these localities, which was randomly chosen for this study. Its population census is about 1,120,753, with an average number of household members in Sudan of approximately 6.2. Hence, the total number of households is about 180,800.

Study Design and Data Collection

A community household-based cross-sectional survey was conducted in ShargAlneil locality. Calculations of sample size were based on the large sample formula {Z2 * P(1-P)}/e2 (Z = 1.65, P = 0.5, and e = 0.035) = 556. This locality contains 12 administrative units (rural and urban). Approximately 50 households were randomly selected from each unit. The total sample size used was 609 households. The data collection was carried out between May and July 2018. Interviews guided by questionnaires were conducted by 14 trained data collectors. From each household, one participant was interviewed. Because of the time of the survey (9

a.m. to 2 p.m.), interviews were probably performed with nonworking household members. Interviews were focused on the socio-demographic characteristics of households, their usage of traditional medicine, the reasons behind traditional medicine preference, and which diseases are favored to be treated by traditional medicine/healers and which ones are favored to be treated by modern medicine.

Data analysis

The collected data was entered and analyzed using SPSS Version 22. Tables were generated to describe the frequency and percentages. Chi2 analysis was used to check the association between socio-demographic characteristics and the use of traditional medicine and healers. The association was considered significant at a p-value equal to or less than 0.05.

RESULTS AND DISCUSSION

Table 1: Socio-Demographic Characteristics of Respondents Residing in ShargAlneil (Total Number of Households=609)

	Frequency (Percentage)		**Frequency (Percentage)**
Sex		**Age groups (years)**	
Male	135 (22.2%)	20-30	169 (27.7%)
Female	474 (77.8%)	31-40	174 (28.6%)
Rural and urban households		41-50	146 (24.0%)
Male	135 (22.2%)	>60	39 (6.4%)
Female	474 (77.8%)	20-30	169 (27.7%)
House Material Type		**Educational Status**	
Mud	125 (20.5%)	Illiterate/Religious School	156 (25.6%)
Bricks	387 (63.5%)	Elementary - to Intermediate	179 (29.4%)
Cement	97 (16.0%)	High School	150 (24.6%)
Total	**609 (100%)**	University and above	124 (20.4%)
		Total	**609 (100%)**

Socio-demographic characteristics were obtained from 609 households (Table 1). Findings indicated that about three-quarters of the respondents were housewives (77.8%). Mainly because of the interviewing times, which were conducted between 9:00 am and 2:00 pm. During this timeframe, the majority of men were probably at work. Slightly more than half of the respondents reside in urban areas (55.3%). Also, up to 56.3% of the respondent's ages were below 41 years, and 19.7% were above 50 years of age. Up to 55% of the respondents had lower levels of education (illiterate-intermediate schooling). Only 20.4% attended a university. The majority of households belong to the middle socio-economic class, as their houses' building materials indicate (built with bricks). Up to 20.5% of the houses were made of mud (lower socio-economic class).

Table 2: Home Remedy Practices and Types of Traditional Healers Ever Approached

	Frequency (Percentage)		**Frequency (Percentage)**
Home Remedies Use		**Type of Traditional Healer Approached**	
Yes	516 (84.7)	Religious	162 (42.4%)

No	93 (15.3%)	Bonesetters	125 (33.5%)
Approaching Traditional Healers		Herbalists	62 (16.6%)
Yes	373 (61.2%)	Cupping	38 (10.2%)
No	236 (38.8%)	*ShaikhatZar* (Spirit Possession)	2 (0.5%)
Total	**609 (100%)**	**Total**	**609 (100%)**

As shown in Table 2, home remedies were practiced by 85% of the households in ShargAlneil. These findings were similar to those reported by a study carried out at Gaafar Ibnauf Children's Hospital in Khartoum State, where 100 mothers of the patients were interviewed; 70% reported that they had tried home remedies before they came to the hospital [(14)]. Similar results were also reported from Western Sudan [(15)], as well as from other African countries [(16)].

Although common types of home remedies used were mainly spices or traditional juices, more research on the desired pharmacological effects and possible unwanted side effects or toxicity is required to improve the efficacy, safety, and optimal dose needed, as these remedies are common and easily accessible for the majority of the population.

Concerning the type of traditional healers approached, as shown in Table 2, up to about two-thirds (61.2%) of the households' respondents stated that they have visited a traditional healer. Among the 61.2% of respondents, the highest percentage was found to be approaching religious healers (42.4%). Generally, in Sudan, traditional healing is the most prevalent method for treating mentally ill people [(17)]. The treatments usually take different forms, including incantations, food restrictions, and isolation. According to Sorketti [(18)], this was mostly due to a lack of economic resources, inaccessibility to modern medical services, a lack of awareness among the population, and the high cost of psychiatric services, in addition to the limited number of psychiatry specialists [(19)].

The second most popular type of traditional healer was found to be bonesetters (33.5%). As AlSafi [(20)] stated, traditional bonesetters (TBS) are very popular in Sudan; they set broken bones, treat sprains, contusions, and dislocations, and are capable of giving advice on matters related to pain and disabilities in the joints. They massage, wry necks, and treat muscles. Bonesetters may also sometimes advise their clients to eat special foods to speed up the healing progress of the fractured bones. Popular foods include dates, chicken, and lupin (*lupinus termis*). Traditionally, the job of this type of healer is typically inherited within families, from generation to generation. In Sudan, there are only about 90 orthopedic surgeons [(21)]. Therefore, in Sudan, as in many other African countries, TBS would play a significant role in primary fracture care if they got the suitable training through formal collaboration with modern health personnel [(22)].

The third most common type of traditional healers was herbalists (10.2%). Herbalists are expected to be highly knowledgeable about herb efficacy. They usually acquire their knowledge and skills through their families or from wiser and more experienced herbalists. Most herbalists often attain a broad knowledge of plants in a wide range of their geographic locations. They recognize the characteristics of each plant with its nutritive, cosmetic, and medicinal values, as well as which part of the plant is most effective. Although some of the herbs they use have been proven to be potentially effective, in-depth studies to prove their values and the best ways of using them are still needed.

Cupping healers (*hijama* healers) were visited by only 6.2% of household respondents. Cupping can be defined as the procedure of making superficial incisions on the skin and then applying cups under vacuum to draw out blood, lymph, or other fluids present subcutaneously. Typically, in Sudan, as in many developing countries, cups might be made of bones, horns, or metal. Glass or disposable plastic cups are more frequently used in

more developed countries. The effectiveness of cupping in treating diseases was investigated by many researchers, especially in reducing chronic pain severity such as neck pain [23], back pain [24], and migraine headaches [25]. In Sudan, some bone-setters also perform cupping.

Zar healers (spirit possession healers) are the least visited type of healer among the studied households (0.3%). These are mainly spirit possession curers. They are also called *SheikhatZa*r. *Zar* is a type of treatment used mostly by females. It involves treating conditions caused by the evil eye, magic, and/or spirits. The main forms of treatments are dancing ceremonies, sacrifices, the wearing of certain costumes, and special scented fumes and perfumes. The *Zar* parties, in addition to being therapeutic in nature, are also believed to serve social functions. It provides women with music, dancing, food, and a relaxed atmosphere in which they can let off steam [26]. *Zar* is also practiced in many African countries and in the Middle East [27,28].

Table 3: Reasons for Choosing Traditional Medicine/Healers (Total Number of Households: 609)

	Frequency (Percentage)		**Frequency (Percentage)**
Reasons for Use of Traditional Medicine/Healers		**Quality of Treatments of Traditional Healers**	
Previous positive experience	269 (44.2%)	Effective	475 (78.0%)
Advice from relatives	110 (18.1%)	Not effective	73 (12.0%)
Cheaper than modern medicine	81 (13.3%)	Don't Know	61 (10.0%)
Failure of modern medicine in Treatment	77 (12.6%)	**Recommending Traditional Medicine to Others**	
Difficulties in accessing Modern medicine	15 (2.5%)	Yes	456 (74.9%)
Less side effects	6 (1.0%)	No	62 (10.2)

As shown in Table 3, participants explained why they favor the treatments of traditional healers over modern medical services. The most common reason found was their past successful experiences (44.2%), which reflect their strong belief in the effectiveness of traditional medicine. The next most common reason was the advice of relatives (18.1%). Culturally, the Sudanese have strong family and social ties. Hence, it is very common to seek the advice of relatives, especially regarding issues of illness. Therefore, the experiences of relatives can have a great impact on the choice of treatment. This could be strengthened if one of the relatives has gone through the same perceived symptoms and is hence cured. Past experiences can be considered the strongest drive for the use of traditional healers (62.3%) when taking both, the experiences of the respondents and the advice of relatives into account.

Other attributing factors that encouraged households in ShargAlneil to seek the treatments of traditional healers were the low cost (13.3%) as well as the failure of modern medicine to treat some diseases (12.6%). Difficulties in accessing modern medicine (2.5%) (e.g., unavailability of medical doctors, long waiting time, and easier communication with traditional healers). Traditional medicines having relatively fewer side effects were also listed by fewer respondents (1%).

Generally, the perceived efficacy of treatments by traditional healers was found to be very high among ShraghAlneil respondents, as more than three-quarters of the population studied (78%) reported positive perceived effectiveness of traditional medicine treatments, and a high percentage (74.9%) of respondents stated they would advise others to consult with traditional healers. Many previous studies in Sudan have shown similar

results regarding the reasons for using traditional medicine, including cultural beliefs, the lower cost of traditional medicine services, and the avoidance of the side effects of modern treatments [29] in addition to their more convenient accessibility and in some places they are the only available resource service [10].

Table 4: Most common 5 ailments preferred to be treated by traditional medicine and most common 5 ailments preferred to be treated by modern medicine in ShargAlneil

	Frequency (Percentage)		Frequency (Percentage)
Traditional medicine		**Modern medicine**	
Spiritual/ psychological diseases	**183 (30%)**	Malaria	**233 (38.3%)**
Respiratory infections	**181 (29.7)**	Diabetes	**102 (16.7%)**
Bone-setting/ dislocation	**140 (23.0%)**	Respiratory infection	**97 (15.9%)**
Stomachache	**120 (19.7)**	Hypertension	**86 (14.1%)**
Headache	**98 (16.1)**	Heart diseases	**77 (12.6%)**

*Note: each participant can report up to 3 answers (ailments) for the two types of medicines.

Similar to what has been found in Table 2, spiritual and psychological diseases (treated by religious healers), the results from Table 4 again confirmed the strong association between mental health and the strong belief in the treatment of religious healers. This may be due to the belief that in Sudan, mental illnesses are highly associated with supernatural powers in the form of evil forces that can harm people and could interfere with normal behavior. As a result, religious healers have always been important and influential in their communities [30]. This agrees with some previous studies carried out in Sudan by Sorketti [18], who found that more than one-third (41%) of the patients with mental disorders sought the service of a religious healer prior to accessing modern care services. Another hospital-based study, carried out in Khartoum and Algazira States, targeted epilepsy have found that although most of the respondents were educated, the majority approached religious healers for treatment [31].

The second preferred disease listed to be treated by traditional healers is respiratory infections, which also appeared as the third disease preferred to be treated by modern medicine. Traditionally, in Sudan, the term respiratory infection includes many disorders and symptoms. Therefore, further studies exploring the breakdown of this category (e.g., asthma, cough, cold, pneumonia, etc.) are needed. Perhaps, for simple respiratory infections, traditional medicine or healers might be approached, and for complicated respiratory diseases, modern medicine will probably be used.

The third listed disease preferred by ShargAlneil households for treatment by traditional healers or medicine was found to be fractures and dislocations (bonesetters). Idris et al. [10] carried out an investigation on why people prefer traditional bonesetters in Algazira State; they found that up to 38% of the urban communities studied preferred to be treated by traditional bonesetters. Educational status, which ranged from illiterate to university levels, had no impact on this preference, and the reasons listed included belief (27%), low cost (14.1%), and fear of plaster (14.1%).

The fourth and fifth listed diseases by ShargAlneil households to be treated by traditional healers or medicine were stomachaches and headaches. In Sudan, these two diseases are sometimes considered minor or simple diseases. Therefore, the ShargAlneil households may prefer to use home remedies or traditional healers, depending on the severity.

Table 5: Influence of Place of Residence, Age, Gender, Educational level and Economic Class on the Usage of Traditional Medicine/Healer

	Residence (Rural vs. Urban)	Age (20-40years vs. >40)	Sex (Males vs. Females)	Education level (Low vs. High)	Type of house (Low vs. middle vs. High economic Class)
Have you ever used a home remedy?	NS	NS	(P=0.01) 76.3% vs. 87.1%	NS	NS
Have you or any of your family members approached a traditional healer?	NS	NS	(P=0.05) 54.8% vs. 63.1%	NS	NS
Have you or any of your family members approached a religious healer?	NS	(P=0.001) 21.3% vs. 33.3%	NS	(P=0.02) 30.0% vs. 21.9%	NS
Have you or any of your family members approached a traditional bonesetter?	NS	NS	NS	NS	NS
Have you or any of your family members approached a herbalist?	(P=0.001) 5.9% vs. 13.6%	NS	(P=0.02) 15.6% vs. 8.6%	(P=0.02) 8.0% vs. 13.3%	NS
Have you or any of your family members approached a cupping healer?	(P=0.000) 1.5% vs. 10.1%	NS	NS	(P=0.04) 4.6% vs. 8.5%	NS
I prefer traditional healings because of my perceived good experience.	(P=0.000) 51.8% vs. 34.1%	NS	(P=0.04) 31.9% vs. 44.9%	(P=0.05) 45.0% vs. 37.8%	(P=0.04) 46.8% vs. 37.8% vs. 30.9%
I approached traditional healing as a result of an advice from my family.	NS	NS	(P=0.04) 23.7% vs. 16.5%	(P=0.01) 22.0% vs. 14.1%	(P=0.02) 26.6% vs. 16.1% vs. 15.5%
Was your experience with traditional healing a good one?	NS	NS	(P=0.006) 69.6% vs. 80%	(P=0.03) 81.0% vs. 74.1%	NS
Are you going to advice someone to use traditional medicine as a result of your experience?	(P=0.04) 71.3% vs. 78%	NS	(P=0.04) 68.1% vs. 76.8%	(P=0.03) 78.0% vs. 70.0%	(P=0.04) 74.2% vs. 77.7% vs. 64.9%

*Chi^2 analysis, NS =Not Significant *

Low means low level of education (illiterate to intermediate secondary school levels of education), High means higher level of education (high secondary school to university and above levels of education). * Low means low economic class (live in mud houses), middle (houses made of bricks) and high economic class (cement houses).

On the other hand, the diseases for which ShrghAlneil respondents favored treatment through modern medicine included malaria, diabetes, hypertension, and heart diseases. According to the Sudan Federal Ministry of Health [32], these four are among the top 10 diseases requiring hospitalization or visits to health centers and/or among the top ten diseases leading causes of death. Further studies probing the reasons why these diseases have gained the trust of people for treatment by modern medicine need to be carried out.

Table 5 demonstrates the strong association of place of residence, age, gender, educational status, and economic class with the usage of traditional medicine and healers. Generally, the use of traditional medicine differs among socio-demographic groups, and there is a preference for certain types of traditional medicine or healers over others. As evident from the analysis in Table 5, significantly more urban respondents were likely to consult herbalists and/or cupping healers compared to rural respondents. On the other hand, more significantly rural people prefer traditional healers or medicines according to their past perceived good experiences. And tend to advise others. This might be strongly influenced by the closer-knit social ties of the rural compared to the urban, as they tend to live near each other and quickly share their experiences, especially during times of illness. Moreover, there might be considerable pressure to heed the advice of relatives, and in some cases, it might even be obligatory.

More significantly, respondents of older ages in ShargAlneil households reported visiting religious healers compared to respondents of younger ages. Similar results were observed among older household participants practicing religious healings in Saudi Arabia [33].

Table 5 also demonstrates that significantly higher percentages of females compared to males use home remedies, visit traditional healers, and prefer traditional medicine according to their perceived past good experiences. Also, more significantly, females reported that they are going to advise others to use traditional medicine or healers due to their perceived good experiences. On the other hand, more significantly, males compared to females were found to visit herbalists. Males also showed significantly higher use of traditional medicine because of the advice of their family members, and significantly more males stated they had good experiences with traditional medicine. Conversely, contrary to what has been repeatedly reported previously in Sudan that more females use traditional medicine[10,34], among the ShragAlneil population, there are no conclusive figures on the higher number of females using traditional medicine or traditional healers compared to males.

Regarding the influence of educational status (Table 5), the study found that the association of educational status with the use of traditional medicine was sometimes positive and other times negative, depending on the type of traditional medicine or healers. Respondents with higher levels of education were found to be positively associated with consulting with herbalists and cupping healers. Negative associations were observed when consulting with religious healers. Since many herbal medicines have been proven scientifically effective in curing some diseases or maintaining good health [35], many of the well-educated people in Sudan might have automatically assumed that all herbal medicines are safe and would not cause harm even if they failed to cure certain diseases. This is not always true, as many herbs might be toxic [36]. An additional hazardous risk of herbs is also the delay in critical times of starting modern treatments [37]. In addition to some problems that might occur when people use herbal medicines together with prescribed modern medicines, some herbs might interact negatively with drugs [38].

Again, there are no conclusive results regarding high education levels negatively influencing the use of traditional medicine among the ShargAlneil households. Again, these results contradict many previous findings in Sudan [12] as well as in some other African countries such as Ethiopia [39], Eritrea [40], and Zambia [41].

CONCLUSION

This study has revealed that most households in SharghAlneil locality use traditional medicine. Traditional medicine and healers play a major role in the health of Sudanese population, even in the richest parts of the country, in terms of modern health facilities.

Although many previous studies showed that more urban, educated, high socioeconomic classes and men were less likely to use traditional medicine when they were sick, in the current study, both urban and rural households, the educated and the less educated, the lower and higher socio-economic strata, and both men and women use traditional medicine, but their choices differ according to different types of traditional medicine and healers. These differences need further investigation.

The failure of modern medicine to meet the needs of the community is a major drive for the use of traditional medicine. Nevertheless, this community understands the important role played by modern medicine in some diseases. Therefore, it is important to deeply probe into why respondents favor using modern medicine for some diseases, such as malaria, diabetes, hypertension, and heart diseases, but not other diseases, such as psychological diseases, bone-setting, stomachaches, and headaches. Why have traditional healers gained a better reputation for treating these diseases compared to modern medicine? And why has modern medicine failed to achieve a good reputation for treating these diseases?

Till now, the Sudanese government has not established clear policies and legislation regarding the use and practices of traditional medicine, except for midwives, who have received some training and recognition from the modern healthcare system. Sudan is among the first countries in Africa [(42)] to train traditional midwives, who, especially in big cities, must now graduate from a formal training institute to formally practice midwifery. More efforts should be focused on other types of traditional treatments to achieve what midwives have achieved. Therefore, care and training of traditional healers, as well as collaboration with them, are important issues that need further attention from the Sudanese government. Bearing in mind that there is an enormous need for traditional healers and medicine to fill the huge gap that the modern health system cannot fulfill as it covers only about half of the population in Sudan.

Traditional healers are trusted, available, accessible, and self-employed. Therefore, traditional healers must be educated and trained to raise their capacities. In addition to that, the effective skills of bone setters, religious healers, and herbalists in treating some diseases must be studied, recognized, developed, and incorporated into the mainstream of the modern health system. Therefore, modern health care systems must find the best ways to incorporate traditional medicine and healers into their main stream systems.

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