RESEARCH ARTICLE

Autism seminary for public engagement: evaluation of knowledge and attitudes of traditional medical practitioners in Mali [version 1; peer review: awaiting peer review]

Modibo Sangare, Bakary Dembele, Amadou Toure, Seidina Diakite, Gordon Awandare, Modibo Kouyate, Seydou Doumbia, Mahamadou Diakite, Arouna Togora, Souleymane Coulibaly, Housseini Dolo

1Faculty of Medicine and Odontostomatology, University of Sciences, Techniques and Technologies of Bamako, Bamako, Bamako, BP1805, Mali
2West African center for cell biology of infectious pathogens, University of Ghana, Accra, Ghana, Ghana
3Department of Pediatricians, University Hospital Gabriel Toure, Bamako, Bamako, BP1805, Mali
4Faculty of Pharmacy, University of Sciences, Techniques and Technologies of Bamako, Bamako, Bamako, BP1805, Mali

Abstract

Background: Autism spectrum disorders (ASD) are stigmatizing in Africa and traditional medical practitioners occupy the first line of diagnosis and treatment due to the cultural perception of ASD, and the scarcity of conventional health services in Mali. We aimed to assess the knowledge, attitudes, and practices (KAP) concerning autism among traditional medical practitioners in Bamako, Mali.

Methods: We conducted a 6-week cross-sectional survey following a 1-day autism awareness seminary on September 9th, 2017 in Bamako. A questionnaire was designed to assess the KAP regarding autism. To assess their practices, parents of autistic children were asked about their experiences with traditional medical practitioners.

Results: Of the 37 study participants 67.60% were males and 56.8% had not heard about autism before the seminary. After the seminary, 73% claimed to understand the diagnosis criteria of autism, but only 16.2% could recall symptoms from all the three domains (reciprocal social interaction, verbal and nonverbal communication, and stereotyped behaviors/restricted interests) of a child development impaired by autism. Of traditional medical practitioners, 73% believed autism was caused by devils, God’s will, bad luck and divine punishment of maternal misbehavior; 65% were used to treating mental illness, and 78.4% felt traditional healing was the only treatment option in autism. Negative attitudes towards autistic children were present in 18.9%, suggesting a very strong cultural mindset on autism.

Conclusion: Knowledge on autism was poor among traditional medical practitioners. A culturally tailored autism public engagement strategy is necessary to positively change the mindset of Malian traditional medical practitioners.
Keywords
autism, traditional medical practitioners, knowledge, attitudes, practices

Corresponding author: Modibo Sangare (mouadib@gwu.edu)

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Introduction

Despite autism spectrum disorders (ASD) being ubiquitous in Africa (Bayou et al., 2008; Honikman et al., 2012; Longe, 1976; Samu, 1984), of the psychiatric disorders, ASD are poorly understood, neglected and stigmatizing across the continent (Abdullah & Brown, 2011; Stuart, 2005). Unlike in other continents, apart from those who had an autistic parent, most Africans are totally unaware of ASD. The lack of awareness of the general public regarding the symptoms, diagnosis and care of individuals with ASD (Arif et al., 2013) is mainly due to cultural beliefs and the scarcity of health services available to autistic families in sub-Saharan Africa. Successful management of children with ASD depends on early screening, diagnosis and psychosocial interventions (Guler et al., 2018), but in the African context, autistic children may have late or no diagnosis at all. Epilepsy is the most common comorbidity of ASD. Similar to epilepsy, the ethno-medical model or cultural representation of ASD in Africa may vary among different ethnic groups within the same country, but also between urban and rural settings (Pilard et al., 1992). The representation of local populations of a disease or disorder determines their demand for care and research services on a disease or disorder. Since Mali has a long tradition of the use of medicinal plants and incantations in treating mental illnesses, traditional medical practitioners (TMP) in Mali are on the first line of diagnosis and care for autistic families. However, cases of mismanagement of autistic children during the traditional medical practice has been reported based on word-of-mouth from parents of autistic children. No data are currently available that have assessed knowledge, attitudes and practices of TMP on ASD in Mali. In Mali, it is important to move on two fronts simultaneously (i) to establish a 2-way street collaboration between conventional and traditional medical practitioners and (ii) to conduct ASD awareness campaigns in the general population. The present study has focused on TMP as part of a general campaign for ASD public engagement in the general population, health professionals and school teachers.

Combining herbal medicines with conventional treatment seem to have a positive effect on the treatment of ASD in children (Bang et al., 2017). Traditional, complementary and alternative medicine in Sub-Saharan Africa are used in female reproductive health, hypertension, HIV, and tuberculosis to name a few (James et al., 2018). Poor-quality control and safety of medicinal plants represents a major obstacle that limits their proper and wider use. A major contributing factor is that traditional medical practices are still kept in secrecy, with poor to no written guidelines, and few reports or documentation of adverse reactions (Ozioma & Chinwe, 2019). Oyebode et al. reported that use of TM was less frequent than previously thought in Ghana, and South Africa, and therefore they raised doubts over the utility of seeking to harness TM for population health needs (Oyebode et al., 2016). Even though, available data may not suggest that herbal medicines are effective as an add-on treatment for ASD symptoms (Gasparotto et al., 2018), we echo the WHO Traditional Medicine Strategy 2014–23 to value the work of TMP especially in ASD and related conditions. In addition to determining the knowledge, attitudes, and practices (KAP) towards ASD of TMP’s, this study aimed to initiate interaction between our ASD research team and TMP to facilitate successful future collaboration.

Methods

We, the ASD research team at the Faculty of Medicine and Odonto Stomatology (FMOS), held 1-day autism awareness seminar for traditional medical practitioners on September 9th, 2017 at the FMOS in Bamako, Mali. The National Federation of Traditional Medical Practitioners in Mali (FeMATH) chose 40 members to participate to the seminar. Only those who were reachable after the seminar, who consented and fully responded to all the items on the study questionnaire, were included. We explained in French and Bambara, the most spoken local languages, the symptoms, risk factors, and treatment options during an oral presentation. The translation from French to Bambara was meant to minimize the effect of the language barrier in the transmission of your message on ASD to the TPM. From September 9th to October 14th, 2017, we conducted a 6-week cross-sectional survey to assess the knowledge, attitudes and practices of the participants using our study questionnaire (see extended data (Sangare, 2019)). Prior to its use, our study questionnaire was evaluated by a medical anthropologist of the department of public health at the FMOS and it was administered to 20 adult volunteers to check the completeness of the responses. On September 21st, 2018, a seminar was held at the FMOS to train in ASD screening 15 ambassadors of autism in Mali including malaria researchers at the Malaria Research and Training Center (MRTC) at the FMOS, an ex-minister of higher education and scientific research of Mali and famous female journalists of the national TV and radio stations. During seminar, six (6) parents of autistic of the association Djiguia gave testimonials in live before private and national TV. A professional journalist and a medical student interviewed before the media four of the six parents of autistic children about their experiences with traditional medical practitioners. While the journalist asked the questions and recorded all the interviews using a Dictaphone, the medical student wrote the answers to the questions in the space provided on the study questionnaire. Data were analyzed using SPSS version 20.0. Trend chi square was used to detect any difference between the traditional medical practitioners categorized by number of years of practice (< 7 years (n=2), 8–20 years (n=13), 21–40 years (n=17) and ≥40 years (n=5)).

Our study protocol (along the consent form and questionnaires) was approved by the IRB at the FMOS on August 23rd, 2016. Each participated traditional medical practitioner was consented and compensated for his/her participation to the seminar. As convened with the FeMATH and agreed by the participants, the compensation for the participation to the survey onwards was given to the FeMATH. The rates for compensation were approved by the IRB to prevent undue coercion. Personal identifiers were not collected at the time of the survey. In addition to compensation for participation to our study, the round-trip (Downtown Bamako-FMOS-Downtown Bamako) transport fee was reimbursed for the parents of autistic children.

Results and discussion

In this study, we surveyed 92.5% (37/40) of the attendees among the traditional medical practitioners who participated to our ASD awareness seminary (see underlying data (Sangare, 2019)). The sex ratio was 2 Males for 1 female (Figure 1). We were aware of the possibility of selection bias when we addressed an invitation...
letter to the FeMATH. We understood that the most literate would be selected. In addition, this study was conducted in an urban setting. Therefore, our results may not be representative of the traditional medical practitioners across the country. Nevertheless, the ultimate goal of this autism awareness seminar was to initiate collaboration with traditional medical practitioners for a number of reasons. First, the general population strongly adheres to the cultural perception of autism. In Mali, ASD is explained by supernatural causes such as a curse, a divine punishment for a disobedient spouse, a spirit possession or the anger of devils. Similar supernatural explanation of child developmental disorders was found to be common among nursing staff in Ethiopia (Tilahun et al., 2016). Consequently, traditional medical practitioners are involved in initial autism diagnosis and treatment in Mali. Second, health literacy regarding autism, even among health professionals, is low, and the scarcity of appropriate health services available to autistic families drives parents towards traditional therapy. Third, traditional therapy is so embedded in Malian culture that it is used concomitantly with conventional medicine. Medicinal plants are integral part of the health care system in Mali. As long as the lack of public awareness towards children with autism persists in Mali, it is better to collaborate and cooperate with traditional medical practitioners for successful ASD research. There are, however, numerous challenges to overcome.

After the 1-day autism awareness seminar, only 16.2% (6/37) could recall symptoms from all the three domains of a child development affected in autism (Table 1), but 73% (27/37) claimed to understand the diagnosis criteria of autism (Table 2). Of course, one day of training is not sufficient, and it is unrealistic to expect every Malian traditional healer to understand autism from the training. People are aware of autism, but many do not fully understand the struggle of children with autism (Gray, 1993; Shamsudin & Rahman, 2014). In the past three years, our experience in Mali is that a talk given by a health professional on ASD in simple terminology for lay people is less effective than the testimonials of the parents of autistic children about their daily struggle. ASD is a complex subject, even for physicians. A tailored autism training program (Mohamed Nur Adli et al., 2017) will allow us to select some trainees as focal points to collaborate with the ASD research team. They will be likely to better understand ASD and be more empathetic towards autistic children compared to their friends, families and their colleagues.

![Figure 1. Distribution of traditional medical practitioners by gender.](image)

### Table 1. Knowledge of traditional medical practitioners on autism and treatment of mental illnesses.

<table>
<thead>
<tr>
<th>Questions (Q)</th>
<th>Response</th>
<th>Experience of traditional medical practitioners (years of practice) N=37</th>
<th>Statistics</th>
<th>2 for trend, p value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>≤ 7</td>
<td>8 – 20</td>
<td>21 – 40</td>
</tr>
<tr>
<td>Q1. Did you hear about autism before the seminar?</td>
<td>Yes</td>
<td>0 (0%)</td>
<td>5 (38.5%)</td>
<td>9 (52.9%)</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>2 (100%)</td>
<td>8 (61.5%)</td>
<td>8 (47.1%)</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>2 (100%)</td>
<td>13 (100%)</td>
<td>17 (100%)</td>
</tr>
<tr>
<td>Q2. Did you understand how autism is diagnosed?</td>
<td>Yes</td>
<td>0 (0%)</td>
<td>10 (76.9%)</td>
<td>14 (82.4%)</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>2 (100%)</td>
<td>3 (23.1%)</td>
<td>3 (17.6%)</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>2 (100%)</td>
<td>13 (100%)</td>
<td>17 (100%)</td>
</tr>
<tr>
<td>Q3. Do you treat mental illnesses?</td>
<td>Yes</td>
<td>1 (50%)</td>
<td>7 (53.8%)</td>
<td>12 (70.6%)</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>1 (50%)</td>
<td>6 (46.2%)</td>
<td>5 (29.4%)</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>2 (100%)</td>
<td>13 (100%)</td>
<td>17 (100%)</td>
</tr>
<tr>
<td>Q4. What are the symptoms of the triad of autism?*</td>
<td>Excellent</td>
<td>0 (0%)</td>
<td>3 (23.1%)</td>
<td>3 (17.6%)</td>
</tr>
<tr>
<td></td>
<td>Correct</td>
<td>0 (0%)</td>
<td>8 (61.5%)</td>
<td>11 (64.7%)</td>
</tr>
<tr>
<td></td>
<td>Incorrect</td>
<td>2 (100%)</td>
<td>2 (15.4%)</td>
<td>3 (17.6%)</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>2 (100%)</td>
<td>13 (100%)</td>
<td>17 (100%)</td>
</tr>
</tbody>
</table>

*Citation of symptoms in three domains (excellent), in two domains (correct), one domain or less (incorrect).
The majority of the traditional medical practitioners (65%, 24/37) were used to treating mental illness (Table 1), and 78.4% (29/37) thought autism was treatable solely through traditional therapy (Table 3). The majority of attendees believed autism was caused by devils, god’s will, bad luck and divine punishment of maternal misbehavior (Table 2). These findings were quite illustrative of the hard tasks ahead for a successful collaboration with traditional medical practitioners. We identified several take-away lessons from the seminar. First, any training program for traditional medical practitioners should initially address the cultural representation of autism in Mali. In many developing countries, people strongly believe that traditional medical practitioners can treat mental illness, and even prefer them to psychiatrists (Bener & Ghuloum, 2011). Second, a possible conflict of interest may exist here. Despite the seminar attendance, some traditional medical practitioners still felt they are more qualified to diagnose and care for autistic families. The financial gain from caring for such families may be crucial in perpetuating such mindset. Finally, the group of attendees who were able to recall the triad of autism symptoms will be a good start for further training and collaboration for referrals. People who know the signs and symptoms of autism and/or live with an autistic individual are more likely to be aware of ASD (Anwar et al., 2018).

Negative attitudes towards autistic children were present in 18.9% (7/37) suggesting a very strong cultural prejudice towards autism (Table 2). The testimonials of the parents of autistic children may not be representative of traditional medical practitioners, but their persisting negative attitudes after an ASD training seminar are concerning. This could be a double-edged sword, on one hand traditional medical practitioners may learn about ASD, change their mindset and practices and collaborate in ASD research as expected. On the other hand, they may use the knowledge gained to advertise their services as such without any subsequent collaboration. This way, they will use the conventional medicine approach to explain in local radio stations the signs and symptoms of the disease, but they revert back to the traditional therapy approach for treatment. There is precedence for this scenario, having already occurred with chronic medical or surgical conditions such as diabetes, high blood pressure, asthma and hemorrhoids in Africa (Abondo-Ngono et al., 2015).

To establish if experience had an effect on attitudes and knowledge on autism, correlation between the number of years of experience with the knowledge and attitudes of the traditional medical practitioners was tested. No significant association was identified, however, for traditional medical practitioners who had 8 years or more of experience the cultural perception of autism in ASD research as expected. On the other hand, they may use the knowledge gained to advertise their services as such without any subsequent collaboration. This way, they will use the conventional medicine approach to explain in local radio stations the signs and symptoms of the disease, but they revert back to the traditional therapy approach for treatment. There is precedence for this scenario, having already occurred with chronic medical or surgical conditions such as diabetes, high blood pressure, asthma and hemorrhoids in Africa (Abondo-Ngono et al., 2015).

### Table 2. Attitudes and beliefs of traditional medical practitioners about their perceived causes of autism.

<table>
<thead>
<tr>
<th>Traditional medical practitioners</th>
<th>Experience of traditional medical practitioners (years of practice) N=37</th>
<th>Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Less than 7</td>
<td>8 – 20</td>
</tr>
<tr>
<td>Perceived causes of autism</td>
<td>Conform*</td>
<td>Not conform**</td>
</tr>
<tr>
<td></td>
<td>n (%)</td>
<td>n (%)</td>
</tr>
<tr>
<td></td>
<td>0 (0%)</td>
<td>2 (15.4%)</td>
</tr>
<tr>
<td>Attitudes towards an autistic child</td>
<td>Positive</td>
<td>Negative</td>
</tr>
<tr>
<td></td>
<td>n (%)</td>
<td>n (%)</td>
</tr>
<tr>
<td></td>
<td>0 (0%)</td>
<td>2 (15.4%)</td>
</tr>
<tr>
<td>An autistic child brings to the parents</td>
<td>wealth</td>
<td>poverty</td>
</tr>
<tr>
<td></td>
<td>n (%)</td>
<td>n (%)</td>
</tr>
<tr>
<td></td>
<td>0 (0%)</td>
<td>0 (0%)</td>
</tr>
</tbody>
</table>

*Conform: in line with evidence-based biomedical (environmental or biological) causes of ASD

**Not conform: preternatural causes such as ancestral spirits, enemies, sin or the devil, divine punishment, curse, etc…

\[ P = 0.62 \]
traditional medical practitioners could be more suitable for autism training, while the most experienced would be more inclined to collaborate in medical plant screening to value their products. Such collaboration could drastically change, in a positive manner, the current experience of parents of autistic children with traditional medical practitioners in Mali.

“My son is 14 years old. I spent a good fortune in sacrifices and consultation fees with traditional medical practitioners. However, I saw no positive change in my child behavior. For instance, he has been attending first grade since he was seven and he is still dependent on us.” a father of an autistic child in Mali

“My son is 12 years old. A friend of mine told me that my son was possessed and advised me to contact a traditional healer abroad. I spent three days and three nights in a dense forest in Guinea. My son had to bear the hardship to late night rituals. I paid a red cow for the healer and lots of money for no result. There is nothing more expensive for a child, but I was exhausted financially. The autism project was relieving for me personally.” a father of an autistic child in Mali

“My son is 18 years old. At birth, he did not cry. I spent weeks at a hospital in Gabon. In his early infancy, I remarked he was very different from other kids. Despite my Muslim faith, I frequented a church seeking for cure for my son. I had to take baths with blessed water and spend hours naked inside the church. Our family economy was ruined and my husband asked me to bring our child back home to Bamako three years ago. My mom has been helping me to care for the child. My family in law abandoned me. A traditional healer buried my son once up to his neck for three hours. I could not bear his sufferings and asked to have my son back even if he was not cured. The healer said, “Take your son, but I am not accountable for the treatment fees.” I am wrongly mislabeled as a bad person. I did not do anything wrong to deserve such treatment from people.” a mother of an autistic child in Mali

“My son is 16 years old. I spend $100 in drug prescription every month. I tried every traditional healing option without success. Once, a healer asked my wife and I to bring our child in the forest for special rituals. According to him, our child would undergo a ritual after which he would be either cured or metamorphosed into a serpent. We decided not to risk the life of our child. I gave countless animals for sacrifice and spent plenty of money of traditional treatment. I will be contented with the medical prescription.” a father of an autistic child in Mali

It is obvious from the testimonials above that parents of autistic children use the services of traditional medical practitioners in Mali. The financial and emotional burdens of such services outweigh by far the expected benefits of the treatment.

**Conclusion**

Training traditional medical practitioners in ASD could empower them with useful medical knowledge. They can collaborate with conventional medical practitioners and the ASD research team in Mali. Such collaboration could lead to screening medicinal plants they use to treat mental illnesses for therapeutic benefit, as these. Medicinal plants may have as yet undetermined indications in the symptomatic treatment of ASD.

**Data availability**

**Underlying data**


This project contains the following underlying data:

- Database Traditional Medical Practitioner_FINAL_.Bakary_Dembele_21.12.18.xlsx (Questionnaire responses from participants)
Extended data

This project contains the following extended data:

- Study questionnaire. 04-10-2019. docx.docx (study questionnaire)

Data are available under the terms of the Creative Commons Attribution 4.0 International license (CC-BY 4.0).

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We acknowledge the students and research assistants at the Famos who helped Dembele B to conduct the survey. We thank the FeMATH for the collaboration and the association “Djiguiya” for sharing their personal hardship through their journey to seek care and care for their autistic children. A special thanks to both Mr Marignouma Konate, our communication specialist and Mr Benjamin Sagala, the professional journalist for the media coverage and helping with the interview.

References