

Perception of traditional and alternative medicine practitioners regarding the risks of *Abrus precatorius* use in Muchache-Massinga, Mozambique

Percepção dos praticantes da medicina tradicional e alternativa do povoado de Muchache-Massinga-Moçambique sobre os riscos do uso da *Abrus precatorius* no Tratamento de diversas Enfermidades

Percepción de los practicantes de medicina tradicional y alternativa del poblado de Muchache-Massinga-Mozambique sobre los riesgos del uso de *Abrus precatorius* en el tratamiento de diversas enfermedades

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Abstract

Background and Aim: In Mozambique, approximately 70% of the population relies on traditional medicine for primary healthcare. *Abrus precatorius* is widely used by Traditional and Alternative Medicine Practitioners to treat epilepsy and menstrual irregularities, despite containing abrin, one of the most lethal toxins known. This study aimed to assess the risk perception of TAMPs regarding the medicinal use of *A. precatorius* in Mozambique. **Methodology:** A cross-sectional mixed-methods study was conducted. A sample of 148 TAMPs was selected via non-probability convenience sampling. Quantitative data were analyzed using IBM SPSS Statistics version 25, applying descriptive statistical methods. **Results:** The mean age of participants was 49.6 years. The sociodemographic profile revealed a predominantly older population (72% aged ≥ 55 years), female (56%), and with low levels of formal education (38% with no formal schooling). A high prevalence of reported adverse reactions was observed, including constipation (95.3%), fainting (89.9%), nausea (84.5%), and miscarriage (45.3%). Knowledge transmission is governed by a healing mystique, in which efficacy is validated through family traditions and spiritual revelations. A marked “terminological blindness” was identified, whereby practitioners recognize the physical potency of the seeds however lack awareness of the biochemical nature of abrin. **Conclusions:** The medicinal use of *A. precatorius* in Muchache represents a critical public health risk rooted in the tension between ancestral traditions and clinical safety. The reliance on spiritual validation obscures the lethal nature of abrin, leading to a selective interpretation of toxic side effects as therapeutic success.

Keywords: *Abrus precatorius*; Traditional Medicine; Risk Perception; Mozambique.

Resumo

Contexto e Objetivo: Em Moçambique, cerca de 70% da população depende da medicina tradicional para cuidados primários de saúde. *Abrus precatorius* é amplamente utilizado por praticantes de Medicina Tradicional e Alternativa no tratamento de epilepsia e irregularidades menstruais, apesar de conter abrina, uma toxina altamente letal. Este estudo avaliou a percepção de risco associada ao seu uso medicinal em Muchache, distrito de Massinga, Moçambique. **Metodologia:** Realizou-se um estudo transversal com abordagem de métodos mistos, envolvendo 148 praticantes selecionados por amostragem por conveniência. Os dados quantitativos foram analisados com o IBM SPSS Statistics versão 25, utilizando estatística descritiva. **Resultados:** A idade média dos participantes foi de 49,6 anos, predominando indivíduos com ≥ 55 anos (72%), do sexo feminino (56%) e com baixa escolaridade (38% sem instrução formal). Observou-se elevada frequência de reações adversas, como obstipação (95,3%), desmaios (89,9%), náuseas (84,5%) e aborto espontâneo (45,3%). A transmissão do conhecimento ocorre principalmente por tradições familiares e crenças espirituais. Identificou-se uma cegueira terminológica, na qual os praticantes reconhecem os efeitos físicos da planta, mas desconhecem a natureza bioquímica da abrina. **Conclusões:** O uso de *A. precatorius* representa um risco significativo para a saúde pública, refletindo o conflito entre práticas tradicionais e segurança clínica. A validação espiritual contribui para a subvalorização dos efeitos tóxicos, frequentemente interpretados como sinais de eficácia terapêutica.

Palavras-chave: *Abrus precatorius*; Medicina Tradicional; Percepção de Risco; Moçambique.

Resumen

Contexto y Objetivo: En Mozambique, alrededor del 70% de la población depende de la medicina tradicional para la atención primaria de salud. *Abrus precatorius* es ampliamente utilizado por practicantes de Medicina Tradicional y Alternativa para tratar la epilepsia y las irregularidades menstruales, a pesar de contener abrina, una toxina altamente letal. Este estudio evaluó la percepción de riesgo asociada a su uso medicinal en Muchache, distrito de Massinga, Mozambique. **Metodología:** Se realizó un estudio transversal con enfoque de métodos mixtos, que incluyó a 148 practicantes seleccionados mediante muestreo por conveniencia. Los datos cuantitativos fueron analizados utilizando IBM SPSS Statistics versión 25, aplicando estadística descriptiva. **Resultados:** La edad media de los participantes fue de 49,6 años, con predominio de personas de ≥ 55 años (72%), de sexo femenino (56%) y con bajo nivel educativo (38% sin escolarización formal). Se observó una alta frecuencia de reacciones adversas, como estreñimiento (95,3%), desmayos (89,9%), náuseas (84,5%) y aborto espontáneo (45,3%). La transmisión del conocimiento ocurre principalmente a través de tradiciones familiares y creencias espirituales. Se identificó una ceguera terminológica, en la cual los practicantes reconocen los efectos físicos de la planta, pero desconocen la naturaleza bioquímica de la abrina. **Conclusiones:** El uso de *A. precatorius* representa un riesgo significativo para la salud pública, reflejando el

conflicto entre las prácticas tradicionales y la seguridad clínica. La validación espiritual contribuye a la subestimación de los efectos tóxicos, a menudo interpretados como señales de eficacia terapéutica.

Palabras clave: *Abrus precatorius*; Medicina Tradicional; Percepción de Riesgo; Mozambique.

1. Introduction

The medicinal use of plants is one of the oldest therapeutic practices of humanity, with archaeological records dating back to approximately 60,000 BC (Almeida et al., 2018; Bruschi et al., 2011; Siteo & Van Wyk, 2024). Since prehistoric times, human populations have relied on natural resources to prevent and treat diseases, and this knowledge has been transmitted empirically within communities as traditional knowledge (Barbosa et al., 2020; Bruschi et al., 2011). According to the World Health Organization (WHO), about 80% of the global population uses medicinal plants as part of primary health care, particularly in developing countries (WHO, 2022). Over the past two decades, the use of traditional medicine has increased worldwide, with prevalence ranging from 42% in Belgium to 90% in the United Kingdom, and from 60% in Uganda to 90% in Ethiopia (Kidane et al., 2018). This growing demand has raised international concerns regarding the safety, quality, and regulation of medicinal plant products, resulting in global efforts to establish standards for their evaluation, production and use (Ndhlala et al., 2013; Shazia Tabasum, 2018).

In many low- and middle-income countries, limited access to conventional health services reinforces dependence on traditional medicine (Bruschi et al., 2011; JOZANE, 2020; Manuel et al., 2020). In Mozambique, geographical barriers, shortages of health professionals and medical supplies, and long distances to health facilities contribute significantly to this reliance (Barbosa et al., 2020; Bruschi et al., 2011; Manuel et al., 2020; Razão et al., 2024; Siteo & Van Wyk, 2024). Approximately 70% of the population depends on medicinal plants for primary health care, supported by the country's rich biodiversity (Balogun & Ashafa, 2019; Mahomoodally, 2013; Razão et al., 2024), which includes about 5,500 plant species, of which 800 have medicinal use (Siteo & Van Wyk, 2024; Van Wyk, 2015). However, there is a widespread belief that natural products are inherently safe, which may lead to inappropriate use and increased risk of toxicity (Khumalo et al., 2022; Ndhlala et al., 2013). *Abrus precatorius*, a plant commonly used for treating several conditions such as epilepsy, bilharzia, gastrointestinal disorders and menstrual regulation, is known to contain highly toxic compounds such as abrin and agglutinin (Chinsembu, 2016; Reddy Palvai et al., 2014; Shazia Tabasum, 2018; Umamahesh & Veeresham, 2016). Despite this, it continues to be widely used at community level, raising serious concerns about potential adverse effects and public health risks, especially in rural settings with limited health system oversight (Chinsembu, 2016).

This study aimed to assess the risk perception of TAMPs regarding the medicinal use of *A. precatorius* in Muchache, Massinga District.

2. Methodology

Study period and location

The study was conducted between January and March 2025 in the village of Muchache, located in the Lionzuane locality, Massinga District, Inhambane Province, Mozambique. The study setting is characterized as a rural community where traditional medicine plays a primary role in healthcare due to the considerable distance (approximately 25 km) to the nearest formal health facilities. The selection of this area was strategic, justified by the high prevalence of *Abrus precatorius* use in local socio-cultural practices and its status as a key geographic point for the activities of Traditional and Alternative Medicine Practitioners (TAMPs) in the district.

Study Design and Sampling Methods

This research adopted a cross-sectional, exploratory-descriptive study design (Risemberg et al., 2026), utilizing a mixed-methods approach, both qualitative and quantitative (Hansen et al., 2016; Lindsay-Smith et al., 2019), using descriptive statistics with data classes, mean values, absolute frequency in quantity, and relative percentage frequency (Marshall & Jonker, 2010; Perez-Vicente & Exposito Ruiz, 2009). The target population consisted of TAMPs active in the region. A sample of 148 participants was selected through non-probability convenience sampling, based on their availability and involvement in the use of *Abrus precatorius* for medicinal purposes.

Data collection and analysis

Data collection

Data were collected at the study site in accordance with the approved research protocol. Prior to each interview, the interviewer explained the objectives of the study to all Traditional and Alternative Medicine Practitioners (TAMPs), emphasizing ethical principles such as confidentiality, anonymity, and voluntary participation. Participants were informed that their identities would not be linked to the information provided and that the data would be used exclusively for research purposes. They were also reminded of their right to withdraw from the interview or the study at any time without any consequences.

The study was conducted within the community of Muchache, specifically targeting the households and traditional consultation spaces of the practitioners. These settings play a key role in the provision of primary healthcare and the preservation of ethnobotanical knowledge in rural areas, where the use of medicinal plants like *Abrus precatorius* is deeply rooted. This setting was intentionally selected due to the high concentration of TAMPs and the observed high frequency of *Abrus precatorius* administration, making it representative of the broader context of traditional medicine practices and associated toxicological risks in the Massinga District.

Data were collected through semi-structured individual interviews, consistent with the mixed-methods nature of the study. This method allowed for an in-depth exploration of participants' perceptions and experiences related to the risks, benefits, and toxicity of *Abrus precatorius*. The interviews followed a pre-established interview guide composed of both closed-ended and open-ended questions, enabling both quantitative consistency across the 148 participants and qualitative flexibility to probe emerging themes. The questions focused on understanding the practitioners' knowledge of the plant's chemical composition (specifically abrin), their methods of preparation, and their experiences regarding adverse reactions in patients.

Interviews were conducted in private and quiet locations chosen by the participants within the village to ensure confidentiality and comfort, with interaction occurring exclusively between the researcher and each participant. Each interview lasted approximately 15 to 25 minutes, allowing sufficient time for practitioners to freely express their traditional knowledge without interruption.

The interview guide was pre-tested to assess the clarity, relevance, and appropriateness of the vocabulary, ensuring it was accessible to participants with lower formal education levels and the structure of the questions. A pilot interview was conducted to ensure that the instrument effectively captured the information necessary to address the study objectives, such as the distinction between spiritual revelation and oral transmission of knowledge, and minor adjustments were made accordingly.

Data Analysis

Content analysis was conducted following an inductive qualitative approach, in which categories and analytical frameworks emerged directly from the empirical data rather than being predetermined by a theoretical model. All interviews were transcribed verbatim and imported into MAXQDA software for systematic analysis.

The analysis proceeded in sequential stages. First, the transcripts were read repeatedly to achieve familiarization with the data regarding traditional practices and plant toxicity. Subsequently, open coding was performed, during which meaningful segments of text (recording units) related to the perception of risks associated with *Abrus precatorius* were identified and labeled. Codes expressing similar meanings were then compared and grouped, allowing patterns and recurring themes to emerge across the practitioners' narratives.

Based on this process, an analytical reference framework was inductively developed from the data. This framework consisted of thematic categories and subcategories that reflected the practitioners' shared perceptions and experiences and served as an organizing structure for the analysis. The framework was constructed during the analysis phase and refined iteratively as new codes were compared with existing ones. It guided the systematization of the data by linking recording units to broader analytical categories, thereby ensuring coherence between the empirical findings and the study objectives.

The final categories included: ethnobotanical knowledge and transmission, toxicological awareness of abrin, management of adverse reactions, and institutional relationship with in Association of Traditional Healers of Mozambique (AMETRAMO) and the health system. These categories directly addressed the study objectives by capturing key dimensions influencing the risk perception of Traditional and Alternative Medicine Practitioners (TAMPs) regarding the use of *Abrus precatorius*.

All sociodemographic data from the interviews were digitized and exported to the Statistical Package for the Social Sciences (SPSS) version 25.0, to estimate the percentages of participants' sociodemographic variables, such as: age groups, gender, educational level, professional occupation (peasantry), and registration status in Association of Traditional Healers of Mozambique.

Ethical Approval

The study was conducted in strict adherence to bioethical standards and the Declaration of Helsinki. The research protocol was submitted to and approved by the Institutional Bioethics Committee for Health of Gaza (CIBS-Gaza) under reference 76/CIBS-Gaza/2024, registered as number 80/CIBS-Gaza/2024 on December 12, 2024. All participants provided voluntary informed consent after being briefed on the study's objectives, risks, and benefits. In compliance with ethical standards, data anonymity and confidentiality were guaranteed. All participants formalized their consent by signing the Informed Consent Form (ICF) or by providing a fingerprint, after being duly informed about the objectives, procedures, and the voluntary nature of their participation.

3. Results and Discussion

Sociodemographic Profile of the Participants

The study analyzed a total of 148 Traditional and Alternative Medicine Practitioners (TAMPs) in Muchache. The sociodemographic profile revealed a predominantly elderly, female, and informally educated population, with a high degree of institutional detachment.

The mean age was approximately 50 years (SD = 19.2), indicating that the sample of traditional medicine practitioners is highly diverse, ranging from young adults to elders. This demographic profile is consistent with this field of study in Mozambique.

The 72-year gap between the youngest and oldest practitioners demonstrates that knowledge regarding *Abrus precatorius* (sissana) is cross-generational, spanning multiple age cohorts.

The mean age of 49.6 years is strongly supported by Bruschi, who conducted an ethnobotanical study in the Chokwe district of Gaza Province, Mozambique. They found that while deep expertise resides with the elders, the active workforce of healers includes a broad middle-aged demographic. This ensures that the community has constant access to primary healthcare (Bruschi et al., 2011).

The high standard deviation and the presence of 18-year-old practitioners align with Ribeiro (Senkoro et al., 2019). These authors argue that in Mozambique, the "calling" to become a healer Moreover happens early in life, However the mastery of toxic plants like *Abrus precatorius* (sissana) is a "lifelong process." The 72-year range you found is a classic indicator of Biocultural Resilience, a concept explored by Maffi (Brahmi et al., 2025; Martin Ikhoyameh, 2024) and applied to African traditional medicine (Williams et al., 2013).

The age analysis demonstrated a significant concentration of practitioners in the older cohorts; 72% (n=106) of the participants were aged 55 years or older, with the 55–75 age group being the most representative (43%). Conversely, the younger demographic (18–35 years) accounted for only 10% of the sample. Regarding gender, a feminine predominance was observed, with women comprising 56% (n=83) of the total practitioners, suggesting a gender-based pattern in the preservation of traditional healing practices in rural Inhambane (Table 1).

The primary economic activity reported was subsistence farming (peasantry), practiced by 66% (n=98) of the participants. Educational levels were notably low: 38% (n=56) of TAMPs had no formal education, and only 3% (n=5) had attained higher education. This low educational attainment is a critical factor in the analysis of risk perception, as it Moreover correlates with a lack of access to formal toxicological information (Table 1).

Institutionalization through the national association (AMETRAMO) remains limited, with 60% (n=89) of practitioners operating without official registration. Regarding the acquisition of ethnobotanical knowledge, oral transmission from elders was the most frequent source (56%), followed by spiritual revelation (29%). Combined, these non-formal sources account for 85% of the knowledge base used for the administration of *Abrus precatorius*, highlighting the absence of standardized pharmacological training within the community (Table 1).

Table 1 - Sociodemographic Profile of TAMPs in Muchache Village.

Variable	Categories	Frequency(n)	%
Age Group (years)	18 – 35	15	10
	35 – 55	27	18
	55 – 75	64	43
	> 75	42	29
Gender	Female	83	56
	Male	65	44
Occupation	Peasant	98	66
	Public/private Employee	12	8
	Others	38	26
Education Level	No formal education	56	38
	Primary Education	46	32
	Secondary Education	41	28
	Higher Education	5	3

AMETRAMO Registration	Not registered	89	60
	Registered	59	40
Source of Knowledge	Oral transmission	83	56
	Spiritual revelation	43	29
	Own experience	22	15

Source: Research data (2025).

A total of 148 Traditional and Alternative Medicine Practitioners (TAMPs) participated in the study. Most were female (56%), confirming a trend toward feminization of traditional medicine practice in the study area. This finding is consistent with previous studies reporting a higher involvement of women in traditional healthcare practices (Brahmi et al., 2025).

Regarding age, the majority of practitioners were between 55 and 75 years old (43%), followed by those over 75 years (29%). Younger practitioners aged 18–35 years represented only 10% of the sample. This pattern suggests that traditional medical knowledge is predominantly held by older adults (Bruschi et al., 2011), supporting the assertion that older individuals are more strongly associated with traditional therapeutic practices (Kudzinesta et al., 2020; Senkoro et al., 2019).

In terms of education, most participants had no formal education (38%) or only primary education (31%), whereas only a minority had secondary or higher education. Similar findings were reported, that traditional medicinal knowledge is mainly transmitted orally and preserved among less formally educated populations (Khumalo et al., 2022; Manuel et al., 2020). Most practitioners were subsistence farmers (66%), and more than 60% were not registered with the Mozambican Association of Traditional Medicine (AMETRAMO), indicating a largely informal and unregulated practice context (Razão et al., 2024).

The main source of knowledge about medicinal plants was interpersonal transmission (56%), followed by spiritual revelation (29%) and personal experience (15%), reflecting the intergenerational and cultural nature of ethnomedicinal knowledge systems.

Adverse Reactions Reported by TAMPs

The study identified a wide spectrum of adverse reactions associated with the use of *Abrus precatorius* in the village of Muchache. According to the cumulative data, gastrointestinal and neurological symptoms were the most prevalent among patients treated by the practitioners.

The analysis of adverse reactions reported by Traditional and Alternative Medicine Practitioners (TAMPs) reveals a multisystemic toxicity profile associated with the use of *Abrus precatorius*. The quantitative data, consolidated in Table 2, indicate a sharp prevalence of neurological and gastrointestinal symptoms among the treated population.

The reactions with the highest statistical representation were constipation (95.3%), fainting (89.9%), and nausea (84.5%). The high incidence of fainting and visual disturbances (81.8%) suggests a significant neurotoxic impact, possibly related to the toxicokinetics of abrin. Within the gastrointestinal domain, in addition to constipation, a critical frequency of diarrhea (81.1%), stomach pain (79.1%), and vomiting (77.0%) was observed. These findings are consistent with the clinical presentation of severe gastric mucosal irritation and the inhibition of cellular protein synthesis characteristic of this species.

Although appearing with lower relative frequency compared to gastric symptoms, miscarriage (Miscarriage / Spontaneous abortion) was reported by 45.3% of practitioners. This data is of extreme relevance to local public health, confirming the plant's teratogenic or abortifacient potential, which is already empirically recognized by TAMPs. Headaches (41.2%) and dizziness (73.0%) complete the framework of common adverse reactions, reinforcing the systemic nature of exposure to the plant's toxic compounds.

Table 2 - Frequency of Adverse Reactions Associated with *Abrus precatorius* Use (n=148).

Adverse Reaction	Frequency (n)	%
Constipation	141	95.3
Syncope / Loss of consciousness (Desmaios)	133	89.9
Others (Unspecified)	135	91.2
Nausea	125	84.5
Allergies	123	83.1
Visual Problems	121	81.8
Diarrhea	120	81.1
Stomach Pain	117	79.1
Vomiting	114	77.0
Dizziness (Tonturas)	108	73.0
Miscarriage / Spontaneous abortion	67	45.3
Headache	61	41.2

Source: Research data (2025).

The reported frequencies of constipation (95.3%), nausea (84.5%), and vomiting (77.0%) align with recent studies in South Africa, Nigeria, Zambia and Ethiopia, which identify *Abrus precatorius* as a potent gastrointestinal irritant (Awodele & Osulale, 2015; Chinsebu, 2016; Kidane et al., 2018; Williams et al., 2013). According to Reddy, abrin a Type II Ribosome-Inactivating Protein (RIP) triggers a cascade of cellular death in the gastric mucosa, leading to the symptoms reported by the TAMPs (Reddy Palvai et al., 2014; Shazia Tabasum, 2018; Umamahesh & Veeresham, 2016).

A critical point of discussion is the interpretation of diarrhea (81.1%) as a cleansing process. Mahomoodally argues that in many sub-Saharan traditional systems, the induction of emesis and purgation is viewed as therapeutic (Mahomoodally, 2013). However, scientific literature confirms that these are, in fact, signs of severe enterocyte damage and dehydration, which can lead to hypovolemic shock if not managed clinically (Balogun & Ashafa, 2019; Beyer et al., 2009).

The high incidence of Syncope / Loss of consciousness (89.9%), visual problems (81.8%), and dizziness (73.0%) reported in this study points toward significant neurotoxicity. Recent research on poisonous plants in Southern Africa indicates that abrin can cross the blood-brain barrier or cause secondary neurological distress through severe electrolyte imbalance (Awodele & Osulale, 2015; Ndhlala et al., 2013). The "Syncope / Loss of consciousness" (desmaios) reported by practitioners likely represents episodes of acute hypotension or transient loss of consciousness due to systemic toxicity, a phenomenon also documented in clinical case reports of accidental ingestion in East Africa (Brahmi et al., 2025; Kidane et al., 2018).

The report of Miscarriage / Spontaneous abortion (45.3%) by practitioners in Muchache is a major public health concern. Studies conducted in Africa, demonstrated that *A. precatorius* extracts possess potent oxytocic properties, inducing uterine contractions (Reddy Palvai et al., 2014; Umamahesh & Veeresham, 2016). This empirical knowledge among TAMPs in Mozambique confirms the plant's high risk for pregnant women, as the margin between a "therapeutic" dose and a lethal abortifacient dose is virtually non-existent due to the variable concentration of abrin in the seeds (Razão et al., 2024).

The qualitative finding that the raw seed is the most hazardous organ is scientifically validated. Some studies conducted in Africa, analyzed traditional processing methods in Africa and found that heat (boiling) can partially denature the abrin protein, reducing toxicity (Beyer et al., 2009; Ndhlala et al., 2013). However, the common practice in Muchache of using raw seeds Moreover without standardized measurement poses a high risk of lethal intoxication, as the tegument of the seed, if damaged, releases one of the most deadly toxins known to man.

Ethnobotanical Knowledge and Transmission

Ethnobotanical Knowledge and Transmission This category explores how knowledge about *Abrus precatorius* is acquired and passed on.

Testimonies:

"I Acquired/Inherited knowledge about plants from my grandfather and my father. They did not Elucidate/Detail poisons to me, only how to cure stomach aches and skin diseases. It is a traditional knowledge passed down from generation to generation" (P12).

"Moreover the plant appears to me in a dream. The spirit is what Reveals/Manifests that this plant serves to treat that specific disease. I don't need to read books; the spirit guides my hand" (P45).

"I learned from other masters at AMETRAMO and in the community. We observe what the elders do and we Replicate/Reproduce. That is how the knowledge does Knowledge preservation" (P88).

Oral and spiritual transmission (dreams) is the pillar of traditional medicine in Muchache. This finding is corroborated by Maroyi, conducted in Southern Africa, which describes "traditional knowledge" as a belief system where efficacy is validated by ancestry rather than clinical trials (Alfred, 2024). However, the exclusive reliance on orality creates safety gaps, as details regarding lethal dosages or specific chemical compounds tend to be omitted in favor of the "healing mystique."

Toxicological Awareness of Abrin

Toxicological Awareness of Abrin This category analyzes the practitioners' perception specifically regarding abrin, the plant's deadly toxin.

Testimonies:

"I have never heard of abrin. To me, the plant is a medicine. If it is used with care and respect, it does not harm anyone" (P08).

"I know that the red and black seed is Highly potent/Potently toxic. If a child chews that, they can die, However I didn't know it had a poison with a scientific name inside it" (P102).

"We use the roots and the leaves. We keep the seeds for ornaments or necklaces because we know that if they enter the blood or the Gastrointestinal tract, it is hazardous" (P31).

There is a selective "toxicological blindness": practitioners recognize the physical danger of the seed However are unaware of the biochemical nature of abrin. According to Alfred in Nigeria, the underestimation of the chemical risk of *Abrus precatorius* is a public health issue in rural African communities (Kidane et al., 2018). The literature in Africa highlights that abrin is one of the most potent known toxins (a ribosome-inactivating protein), and the lack of terminological awareness prevents TAMPs from understanding that even minimal doses can cause irreversible damage (Beyer et al., 2009; Ndhkala et al., 2013).

Management of Adverse Reactions

The adverse reactions reported by practitioners coincide with the clinical symptoms of abrin poisoning; however, they are frequently interpreted through a mystical lens.

Participant Testimony:

"When the patient vomits or has diarrhea after taking the tea, we say that the plant is Detoxifying/Purging from the body. It is the sign that the healing has begun" (Practitioner, 49 years old).

Clinically, vomiting and hemorrhagic diarrhea are the initial signs of multi-organ failure induced by abrin (Reddy Palvai et al., 2014; Umamahesh & Veeresham, 2016). The cultural interpretation of "purification" or "cleansing" represents a critical public health risk, as it delays the search for emergency hospital assistance. In cases of Abrus poisoning, immediate hemodynamic support is vital a measure that is nonexistent in the traditional management described by TAMPs (Shazia Tabasum, 2018).

Institutional Relationship with AMETRAMO and the Health System

This category explores the connection between traditional practices and formal health authorities.

Testimonies:

"I am not in AMETRAMO because they Geographical barriers / Remote access in the village, and here in Muchache, no one comes looking for us to register. I Unaffiliated practice in my backyard" (P15).

"I try to work with the hospital. If the patient does not improve in three days, I tell them to go to the doctor. However the doctor does not like knowing that they took roots first" (P67).

"AMETRAMO should teach us more about which plants are poisonous and which are not. We want to learn, However we are Institutional neglect / Marginalization" (P140).

Formal exclusion (60% of participants are unregistered) severely hinders pharmacovigilance efforts. As discussed by WHO Africa (WHO, 2022), the lack of institutional integration in Mozambique creates a parallel and unregulated healthcare system. The stigma and lack of communication between TAMPs and the National Health System (SNS) prevent cases of Abrus poisoning from being properly reported and treated. Literature suggests that formalization through associations such as AMETRAMO is the primary pathway for disseminating botanical safety protocols and establishing a collaborative referral system (Bruschi et al., 2011; Manuel et al., 2020; Razão et al., 2024; Senkoro et al., 2019; Siteo & Van Wyk, 2024).

Public Health Implications

The widespread use of Abrus precatorius in a context of low risk awareness poses a significant public health concern. The combination of high toxicity, prolonged administration, vulnerable users, and lack of regulation creates conditions conducive to preventable poisoning and adverse health outcomes.

Therefore, there is an urgent need for culturally sensitive educational programs, improved regulation of traditional medicine practices, and integration of traditional practitioners into formal health systems to enhance safety, monitoring, and community health outcomes.

Study Limitations

This study has some limitations that should be considered when interpreting the results. The use of non-probability convenience sampling limits the generalizability of the findings to all Traditional and Alternative Medicine Practitioners (TAMPs) in Mozambique or even the entire Inhambane province, as the data reflects the specific sociocultural reality of the Muchache village.

The study relied on self-reported data, which may be subject to social desirability bias. Since Abrus precatorius is known for its potency, some practitioners might have underestimated or omitted reports of adverse reactions to avoid professional stigma or institutional sanctions. Third, recall bias may have affected the accuracy of the reported clinical outcomes, as practitioners had to rely on memory regarding past patient treatments.

The research did not include a toxicological laboratory analysis of the plant samples used by the practitioners. Therefore, it was not possible to quantify the exact concentration of abrin in the local preparations, which may vary according to the soil, season, and part of the plant used (roots, leaves, or seeds).

4. Conclusions

The medicinal use of *Abrus precatorius* in Muchache represents a significant public health risk. The study proves that the practitioners' perception is skewed by a lack of terminological awareness regarding abrin, leading to the hazardous use of raw seeds. To bridge this gap, it is not enough to provide formal education; there must be a "dialogue of knowledges" where health authorities and AMETRAMO work together. This study provides a comprehensive analysis of the risk perception among Traditional and Alternative Medicine Practitioners (TAMPs) in Muchache-Massinga, highlighting a critical tension between ancestral healing traditions and clinical safety. The integration of mixed-methods data reveals that while *Abrus precatorius* is a pillar of local pharmacopeia, its administration is governed by a "toxicological blindness" that jeopardizes patient safety.

The study demonstrates that practitioners' risk perception is influenced by limited awareness of the toxicological properties of abrin, leading to unsafe practices such as the use of raw seeds. Addressing this gap requires more than formal education; it necessitates a culturally sensitive "dialogue of knowledges" between health authorities and traditional practitioners.

The study confirms the severity of this disconnect. The high prevalence of Syncope / Loss of consciousness (89.9%), gastrointestinal distress (over 77%), and miscarriages (45.3%) reported by TAMPs provides empirical evidence of the plant's multisystemic toxicity. The profiles of the practitioners mostly elderly, informally educated, and largely unregistered with AMETRAMO (60%) further highlight an institutional vacuum where toxic plants are administered without standardized posology or official oversight.

Competing interests

The authors declare that they have no competing interests.

Authors' contribution

All authors contributed equally.

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