Medicinal plants used to treat maternal and paediatric health related ailments in the Nkomazi Local Municipality, Mpumalanga province, South Africa

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Ethnobotany Research and Applications 26:74 (2023) - http://dx.doi.org/10.32859/era.26.74.1-16
Manuscript received: 06/09/2023 – Revised manuscript received: 04/12/2023 - Published: 05/12/2023

Research

Abstract

Background: No prior research has explored the use of medicinal plants for treating maternal and paediatric health-related ailments in the Nkomazi Local Municipality. This study aimed to investigate the utilization of medicinal plants by traditional healers in the region for specific maternal and paediatric-related conditions.

Methods: Ethnobotanical data were collected between July 2021 and October 2021 using semi-structured questionnaires and guided field walks with traditional healers. Plants were identified by collecting plant specimens from the wild and existing literature. Quantitative analysis was done through quantitative ethnobotany indices such as relative frequency of citations.

Results: The study documented 19 plant species from 13 families commonly used for maternal and paediatric ailments, with the Fabaceae family being the most prevalent. Roots were the most frequently utilized plant part, followed by bark and leaves. Decoction was the predominant method of preparation, and oral administration was the most common route of administration. The plant species with the highest relative frequency of citation (RFC) were *Capparis tomentosa*, *Grewia monticola*, and *Ximenia caffra*.

Conclusions: Nineteen plant species from thirteen families were identified as commonly used for maternal and paediatric related ailments, in rural communities of the Nkomazi Local Municipality. The study also identified four previously undocumented plant species. The findings underscore the need to educate traditional healers about sustainable harvesting practices and provide potential avenues for scientific investigation and cross-cultural comparisons.

Keywords: Medicinal plants, Maternal healthcare, Paediatric healthcare, traditional.

Background

Maternal healthcare, encompassing the well-being of women during pregnancy, childbirth, and the postnatal period (Abdillahi & Van Staden 2013), constitutes a vital facet of global healthcare initiatives. It encompasses a spectrum of interventions, ranging from family planning and assisted conception to prenatal and postpartum care, all aimed at mitigating maternal and child mortality as well as maternal morbidity (World Health Organization 2010).

Since the early 1990s, maternal health and maternal mortality have garnered global attention (Abdillahi & Van Staden 2013). Addressing maternal health is a key component of Sustainable Development Goal 3 (SDG 3), with the global commitment to reducing the global maternal mortality ratio to below 70 per 100,000 live births (UN Women 2019). The quality of maternal healthcare, both before and after childbirth, significantly impacts the health outcomes of both the mother and the unborn child (Abdillahi & Van Staden 2013).

In many developing nations, complications arising from pregnancy and delivery remain the primary causes of mortality among women of reproductive age (Abdillahi & Van Staden 2013). Alarmingly, a woman succumbs to childbirth-related complications every minute (UNICEF 2016). Notably, the majority of maternal fatalities and injuries result from physiological processes, such as postpartum haemorrhage, rather than underlying medical conditions (Filippi *et al*. 2016). While there has been significant progress, with global maternal mortality decreasing by 38% from 2000 to 2017 (WHO 2019), Sub-Saharan Africa still grapples with a high maternal mortality ratio (Jeong *et al*. 2020).

Despite concerted global efforts to enhance maternal healthcare and reduce maternal mortality, the influence of cultural and traditional health practices persists in many regions of Africa, including South Africa (Abdillahi & Van Staden 2013, de Wet & Ngubane 2014, Mashile *et al*. 2019, Randrianarivony *et al*. 2016). This reliance on traditional practices is deeply rooted in tradition, often perpetuated from generation to generation (Friend-du Preez *et al*. 2013, Ndhlovu *et al*. 2023). Contributing factors include medicine shortages in public healthcare facilities, patients being directed to purchase costly prescriptions from pharmacies, and miscommunication of symptoms by mothers to healthcare practitioners (Mashile *et al*. 2019). Additionally, traditional healthcare providers are believed to employ experiential and spiritual diagnoses alongside conventional medical evaluations (Friend-du Preez *et al*. 2013).

Medicinal plants have historically played a significant role in pregnancy, childbirth, and postpartum care within various rural communities (Surendran *et al*. 2022). They serve a multitude of purposes, such as preventing miscarriages, alleviating abdominal discomfort, morning sickness, and swelling of extremities during pregnancy (Abdillahi & Van Staden 2013). Moreover, these plants are employed during labor to stimulate contractions and facilitate the expulsion of retained placentas (De Boer & Lamxay 2009, Koman *et al*. 2021). Postpartum, medicinal plants are used as purgatives to cleanse the womb, stimulate lactation, reduce postpartum haemorrhage, and alleviate abdominal pains (Abdillahi & Van Staden 2013, Khadim *et al*. 2023). Traditional medicine also features in the treatment of specific paediatric ailments, referred to as "*inyoni*" and "*ibala*," which are believed to be treatable only through traditional methods (Bland *et al*. 2004, Friend-du Preez *et al*. 2013). To the best of our knowledge, no study has been undertaken on medicinal plants used for the treatment of maternal and paediatric health-related ailments in the Nkomazi Local Municipality. Therefore, the study aimed to investigate medicinal plants used by traditional healers in the Nkomazi Local Municipality for the treatment of certain maternal and paediatric-related ailments.

Materials and Methods

Study area

The study was conducted in the Nkomazi Local Municipality (25.7097° S, 31.7195° E) (Fig. 1), situated in the eastern region of the Ehlanzeni administrative district within the Mpumalanga province (Nkomazi Local Municipality 2020). Nkomazi is geographically defined by its borders with Eswatini to the south, Kruger National Park to the north, and Mozambique to the east (Nkomazi Local Municipality 2020). This locality boasts key strategic transportation connections, including a railway and the national road (N4), forming the vital Maputo Corridor linkage with Mozambique. Additionally, it is linked to Eswatini via two provincial roads, R571 and R570 (Nkomazi Local Municipality 2020).

Encompassing an area of 4786.86 square kilometres, Nkomazi constitutes approximately 17% of the land within the Ehlanzeni district (Nkomazi Local Municipality 2020). The administrative structure of the Nkomazi Local Municipality comprises eight traditional authorities, namely Mawewe, Lomshiyo, Kwa-Lugedlane, Mlambo, Hhoyi, Mhlaba, Matsamo, and Siboshwa tribal authorities, along with 43 villages (Nkomazi Local Municipality 2020).

The demographic composition of this area is characterized by a predominant presence of Shangaan and Swati ethnic groups, owing to its proximity to Eswatini and Mozambique (Mkhonto 2018). Notably, the Nkomazi Local Municipality boasts a population of 423,358 residents, accounting for 23% of the Ehlanzeni district's total population and ranking as the fourth-largest population center in the province. This population exhibits an annual growth rate of 1.0% (Nkomazi Local Municipality 2020). High birth rates and substantial immigration from Swaziland and Mozambique contribute significantly to this demographic expansion (Nkomazi Local Municipality 2020).

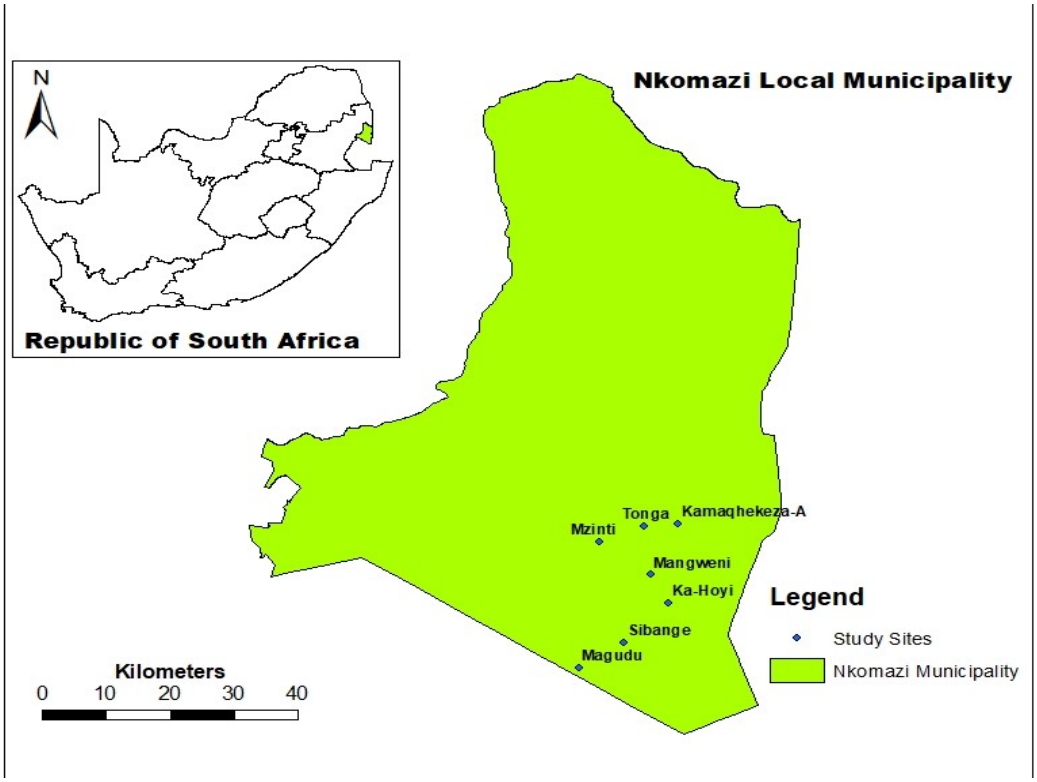

Figure 1. Map of Nkomazi Local Municipality.

Data collection

The research protocol for this project was collaboratively devised by all four authors. Subsequently, the first author personally engaged with potential participants, explaining the study's objectives, and seeking their informed consent before initiating data collection on ethnobotanical practices. Data were acquired through a combination of guided field excursions with traditional healers, semi-structured questionnaires, and direct observations. Throughout the interviews and interactions, local languages, specifically siSwati and Xitsonga, were utilized as the primary means of communication.

This study's primary focus was on traditional healers, making them the target population for ethnobotanical data collection. Using the snowball sampling method, ethnobotanical information was gathered from a total of 10 traditional healers, comprising five diviners and five herbalists. The structured questionnaire, custom-designed for this research, aimed to elicit specific details, including the identification of plant species utilized in the treatment of common maternal and paediatric health conditions, the specific plant parts utilized, modes of administration, and the local terminology associated with these ailments.

Initially, invitations to participate in the study were extended to 25 traditional healers. However, it is worth noting that several declined to participate, citing disinterest or reluctance, while others referred to the sacred nature of traditional healing knowledge, expressing reservations about sharing it with unfamiliar individuals. Consequently, the study ultimately engaged with 10 participants.

Plant Identification

To accurately identify the plants used in traditional healing practices, a comprehensive approach was employed. Initial identification was conducted during interviews and field excursions with the traditional healers, utilizing their native

languages for plant names and descriptions. Voucher samples were systematically collected, adhering to the guidelines outlined by Jain (2010).

However, it's worth noting that some of the plants under investigation were sourced from neighbouring countries such as Mozambique and Eswatini. In such cases, the ability to reliably identify species was challenged by the absence of observable or fresh plant specimens. To overcome this limitation, a dual strategy was implemented. For plants that could be harvested in their natural habitat, plant specimens were collected during field visits conducted in collaboration with traditional healers. Subsequently, taxonomic identification was carried out by consulting experts at the Witwatersrand University C.E. Moss Herbarium. In instances where observable or fresh specimens were not obtainable, ethnobotanical material previously published by esteemed researchers was referenced (Amusan *et al*. 2007, Botha *et al*. 2001, Mbongwa *et al*. 2021, Moeng 2010, Ribeiro *et al*. 2010, Schmidt 2002). This secondary source of information served as a valuable resource for the identification and verification of plant species.

Data Analysis

The wealth of ethnobotanical data collected through various methods, including questionnaires and field walks, was systematically recorded, and organized in Microsoft Excel for systematic analysis. The analytical approach employed encompassed the use of descriptive statistics, which included the calculation of frequencies and percentages. Quantitative analysis was a crucial component of this study, and it was facilitated by applying specific quantitative ethnobotanical indices. One of the key indices utilized in this analysis was the Relative Frequency of Citations. This index served as a valuable tool for quantifying and delineating the utilization patterns of medicinal plants by traditional healers from the Nkomazi Local Municipality.

Relative Frequency of Citations (RFC)

The concept of the Relative Frequency of Citation (RFC), as developed by Tardío and Pardo-de-Santayana (2008), serves as a valuable quantitative measure in ethnobotanical studies. The RFC is designed to gauge the importance of a specific plant species within a given community's traditional knowledge. It quantifies the frequency with which a particular plant species is cited by participants in the study relative to the total number of participants involved.

The RFC is calculated using the following formula:

$$RFCs = FCs / N$$

Where RFCs represent the Relative Frequency of Citation for a specific plant species; FCs stands for the total number of participants who mentioned the use of a particular species; and N signifies the total number of participants who actively participated in the study.

In essence, RFC provides a numeric representation of the prevalence and significance of a plant species in the traditional practices of the community under investigation. While RFC is a valuable metric for assessing the overall importance of a species, it does not consider the different categories of use, focusing solely on the frequency with which the species is cited within the community's knowledge system (Tardío and Pardo-de-Santayana 2008).

Results and discussion

Demography of informants

The traditional healers selected for this study were licensed practitioners renowned for providing healing remedies derived from both plant and animal sources to residents. Within this diverse group of healers, two distinct categories were identified: diviners, often referred to as *Sangomas* and herbalists, known as *emagedla*. Notably, some of the herbalists also engaged in the sale of medicinal plants, serving both diviners and the general public.

The composition of the participant group exhibited gender diversity, comprising both female and male healers. These healers exhibited varying levels of formal and informal education, reflecting the multifaceted nature of their healing practices. An interesting observation was that a significant portion of the interviewed healers were over the age of 45, further highlighting the intergenerational aspect of traditional healing practices and the wealth of knowledge held by these seasoned practitioners.

Table 1. The demographic structure of participants.

Parameter	Specification	Number of participants
Gender	Female	6
	Male	4
Age group (years)	26-35	3
	36-45	2
	>45	5
Level of education	No Schooling	5
	Primary School	2
	Secondary School	2
	Tertiary	1
Cultural group	Swati	6
	Tsonga	4
Traditional healing category	Herbalist	5
	Diviners	5
Years of Experience in traditional healing	<10	4
	11-20	1
	21-30	4
	>30	1

Plant species used for the treatment of maternal and paediatric healthcare

Table 2 provides a comprehensive overview of the 19 medicinal plant species identified from 13 different families that are commonly employed in the treatment of maternal and paediatric ailments. Among these species, the Fabaceae family exhibited the highest prevalence, with four distinct medicinal plant species documented in this study. Following closely, the Hyacinthaceae family was represented by three species, while the Malvaceae family contributed two species, as illustrated in Figure 2.

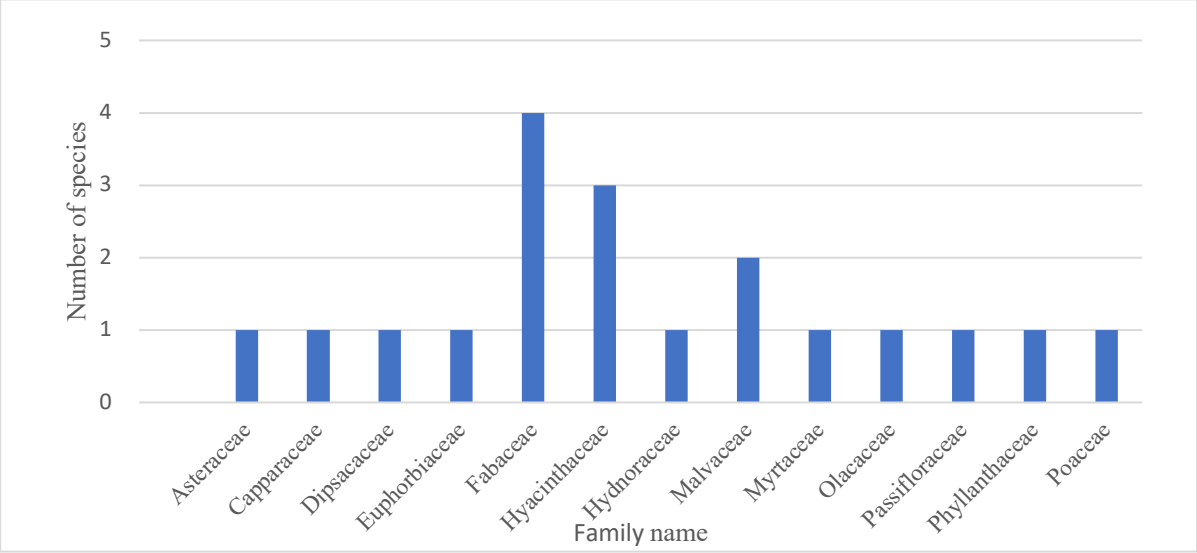

Figure 2. The representation of different plant families used by traditional healers in Nkomazi Local Municipality, Mpumalanga province of South Africa for maternal and paediatric healthcare.

These findings align with prior ethnobotanical studies conducted in South Africa, such as those by Mahwasane *et al*. (2013), Mongalo & Makhafola (2018), and Semenya & Maroyi (2019), as well as in various regions worldwide, including studies by Aumeeruddy & Mahomoodally (2020), Enebeli-Ekwutoziam *et al*. (2021), and Lawal *et al*. (2020), these studies emphasize the Fabaceae family's prominence as the most frequently utilised plant family for medicinal purposes. Moreover, this family has demonstrated remarkable efficacy in treating a wide spectrum of ailments compared to other plant families, as underscored by Van Wyk *et al*. (2008).

Table 2 also presents the Relative Frequency of Citations (RFC) for each medicinal plant species. Notably, the most commonly employed species for maternal and paediatric-related ailments in the Nkomazi Local Municipality are *Capparis tomentosa*, *Grewia monticola*, *and Ximenia caffra*. Furthermore, this study has documented the use of four medicinal plant species (*Dalbergia melanoxylon, Eucalyptus tereticornis, Grewia monticola*, and *Hibiscus pusillus*) for the treatment of maternal and paediatric-related ailments for the first time, representing valuable additions to the existing body of ethnobotanical knowledge.

Plant parts used

In the study, the most frequently utilized plant parts were roots (48%), followed by bark (26%), leaves (11%), whole plants (5%), and bulbs (5%), as shown in Figure 3. Similar findings have been reported by Mathabe *et al*. (2006), Mudau *et al*. (2022), and Mahwasane *et al*. (2013), where roots were identified as the most commonly used plant parts for medicinal purposes. Interviews conducted with traditional healers from the Nkomazi Local Municipality supported this trend, with healers emphasizing that roots possess the greatest healing properties compared to other plant parts. These findings align with the studies by Bhandari *et al*. (2021), Semenya & Maroyi (2012), Masevhe *et al*. (2015), and Neelo *et al*. (2015) where traditional healers expressed a preference for roots due to their belief in the high concentration of potent medicinal properties found in underground plant parts. Chinsembu (2016) and Kunwar *et al*. (2006) also support this view, suggesting that roots and other underground parts are favoured due to their elevated levels of bioactive compounds. Furthermore, one reason for the preference for roots is their availability throughout the year (Neelo *et al*. 2015). However, it is important to note that the unsustainable harvesting of roots and whole plants for medicinal purposes poses a threat to the survival of many medicinal plant species, potentially leading to their extinction, as highlighted by Mudau *et al*. (2022).

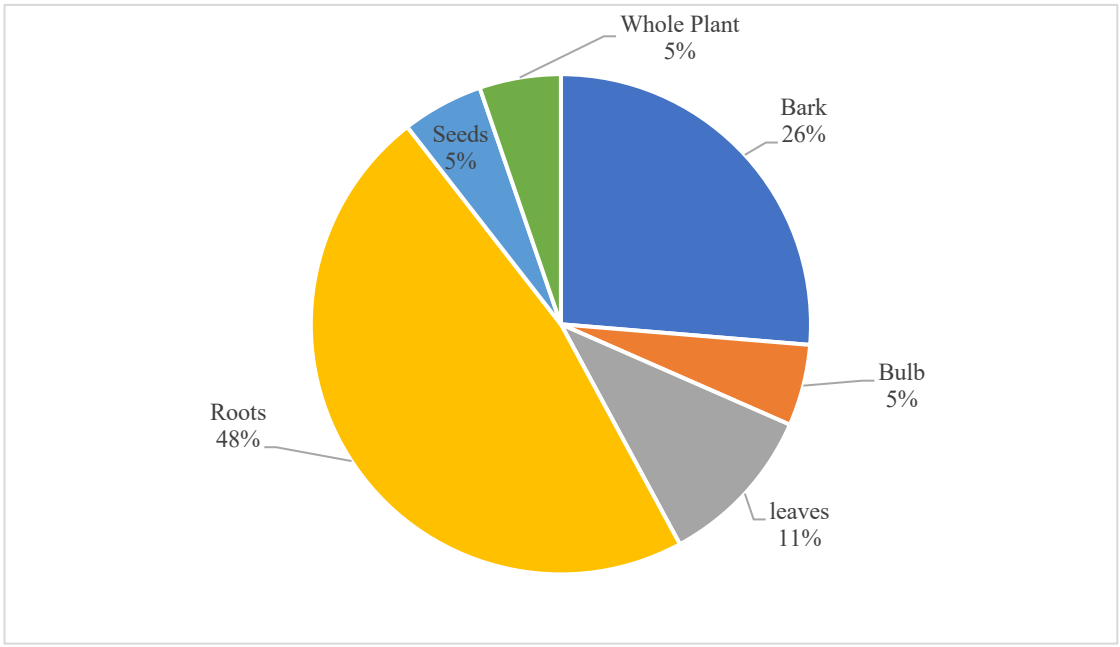

Figure 3. Plant part used for maternal and paediatric healthcare by Nkomazi Local Municipality traditional healers.

Method of preparation and administration

The predominant method of preparation observed in the study was decoction, accounting for 69% of the cases, followed by infusion of powdered forms (21%) and the creation of waist and necklace beads (5%), as illustrated in Figure 4. Decoction has been consistently documented in the existing literature as the most widely employed method of preparation in traditional healing practices. This preference can be attributed to the belief that boiling medicinal plants is the most effective way to extract the bioactive compounds present in the plants (Ahmad *et al*. 2014, Umair *et al*. 2017).

The majority of medicinal plants utilized by traditional healers from the Nkomazi Local Municipality are administered orally, accounting for 95% of the cases. Similar findings have been reported by Grace *et al*. (2003), Khumalo (2018), Mukazayire *et al*. (2011), and Wambugu *et al*. (2011) who observed that oral administration is primarily employed to treat internal ailments using medicinal plants. The prevalence of oral administration aligns with orthodox medicine practices, where oral ingestion is a commonly utilized method (Khumalo 2018).

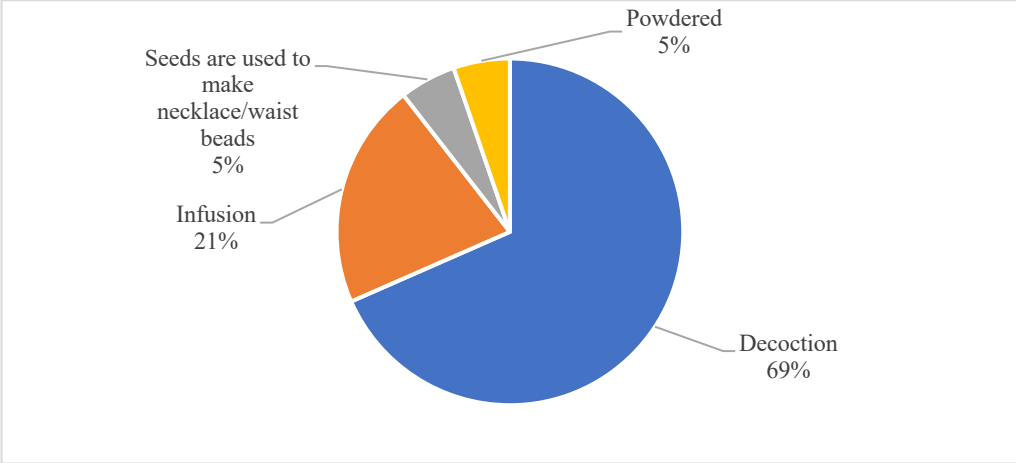

Figure 4. Method of preparation of reported medicinal plants used by Nkomazi Local Municipality traditional healers for maternal and paediatric health-related ailments.

It is worth noting that wearing body ornaments, such as necklaces, represents one of the least common methods of administration. *Coix lacryma-jobi L.* seeds, for instance, are used to create necklaces and waist beads that are worn by babies to aid teething and provide protection against evil spirits.

Relative frequency citation (RFC)

The relative frequency of citation (RFC) refers to the assessment of the importance and relevance of a specific medicinal plant within a particular community (Umair *et al*. 2017). A higher RFC value indicates that local people preserve and pass down their traditional knowledge successfully (Tounekti *et al*. 2019). In the present study, the RFC values varied between 0.8 and 0.4. The plants with the highest RFC values were *Capparis tomentosa* (0.8), *Grewia monticola* (0.8), and *Ximenia caffra* (0.8) (Fig. 5).

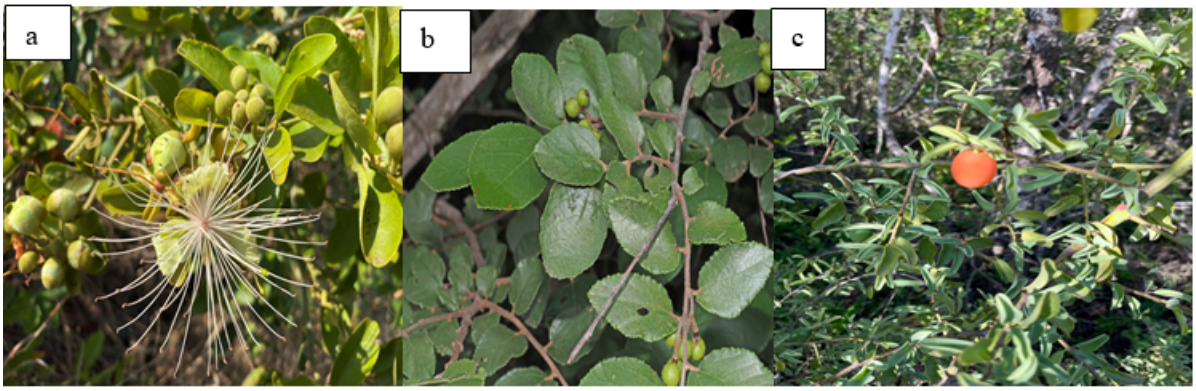

Figure 5. Plants with the highest RFC values a. *Capparis tomentosa*, b. *Grewia monticola* and c. *Ximenia caffra*.

When a medicinal plant species has a high RFC value, it suggests that it is extensively used and there is a consensus regarding its knowledge among the participants (Umair *et al*. 2017). Additionally, these plant species, namely *Capparis tomentosa*, *Grewia monticola*, and *Ximenia caffra*, are widely distributed in the study area and are reportedly used in other regions of the country as well (Chinsembu 2016, Mhlongo & Van Wyk 2019, Pooley 2005, Van Wyk & Van Wyk 1997, Watt & Breyer-Brandwijk 1962). From a botanical perspective, it is difficult to identify common characteristics among the most frequently used medicinal plant species, as they belong to different morphologies, life forms, and families, and contain diverse categories of bioactive compounds. Although there was no official evaluation of the abundance of these species, it is generally believed that those with a high RFC value are plentiful in the study areas and are not considered threatened or rare (Mhlongo 2019).

Table 2. Inventory of medicinal plants used in the treatment of maternal and paediatric health-related ailments in the Nkomazi Local Municipality.

Scientific name	Family	Local name (Sw)= Siswati (X)= Xitsonga	Voucher no	Parts used	Method of Preparation	Method of administration	Diseases treated	Other reported uses for gynaecological disorders	RFC
Brachylaena discolor DC.	Asteraceae	Phahla (Sw)	*	Roots	Decoction	Taken orally	Labour pains Threatened miscarriage	Prevents Miscarriage (Mhlongo & Van Wyk 2019, Van Wyk & Van Wyk 1997).	0,5
Capparis tomentosa Lam.	Capparaceae	Inkunzi-ebomvu (Sw) Nkawa (X)	NK99	Roots	Decoction	Taken orally	Labour pains	Prevent Miscarriage (Chinsembu 2016).	0,8
Scabiosa columbaria L.	Dipsacaceae	Bheka-Mina (Sw)	NK35	Roots	Decoction	Taken orally	Period pains Colic	Colic (Watt & Breyer-Brandwijk 1962). Menstrual pains and easy childbirth (Pooley 2005).	0,7
Jatropha zeyheri Sond.	Euphorbiaceae	Mfelo (Sw) Xidomeja (X)	NK76	Roots	Powdered	Taken orally	Menstrual pains Painful womb Maintains pregnancy	Prenatal care supplements (Hulme 1954, Mashile *et al*. 2019).	0,5
Albizia anthelmintica (A.Rich.) Brongn.	Fabaceae	Umgadankawu (Sw)	NK10	Bark	Decoction	Taken orally	Menstrual pains	Sterility and uterine problems in women (Dlamini 1981, Jiofack *et al*. 2009).	0,5
Albizia versicolor Welw. ex Oliv.	Fabaceae	Sivangatane (Sw) Mbhesu (X)	NK54	Bark	Infusion	Taken orally	Contraceptive	Prevents pregnancy (Nefhere 2019).	0,7
Dalbergia melanoxylon Guill. & Perr.	Fabaceae	Isparati (Sw) Xipalatsi (X)	NK58	Roots	Decoction	Taken orally	Given to women with a history of miscarriage	None found in literature.	0,5
Vachellia robusta (Burch.) Kyal. & Boatwr.	Fabaceae	Umngamanzi (Sw) Mvumbangwenya (X)	NK66	Bark	Decoction	Taken orally	Menstrual pains	Dysmenorrhea (SANBI 2020).	0,5

Merwilla plumbea (Lindl.) Speta	Hyacinthaceae	Inguduza (Sw)	NK08	leaves	Decoction	Taken orally	Labour pains	The bulb is used to treat a sickness called *inyoni* (Libala) that affects babies (Mhlongo 2019). They are also used as purgatives and as ingredients in infusions taken during pregnancy to facilitate easy delivery (Gerstner 1941).	0,5
Bowiea volubilis Harv. Ex Hook. f. subsp. Volubilis	Hyacinthaceae	Gibizisila (Sw)	NK88	leaves	Decoction	Taken orally	Labour pains	Procure abortions, also to ensure easy childbirth (Hutchings 1996). Easy childbirth (Ndawonde *et al*. 2007).	0,7
Schizocarphus nervosus (Burch.) Van der Merwe	Hyacinthaceae	Imbita-yebantwana (Sw)	NK89	Bulbs	Decoction	Taken orally	Used in babies to treat a reddish spot at the back of the head (Libala)	Treatment of inyoni/libala in the Pondoland (Zukulu *et al*. 2012).	0,7
Hydnora africana Thunb.	Hydnoraceae	Mavumbuka (Sw)	*	whole plant	Decoction	Taken orally	Labour pains	Menstrual problems, (Dold & Cocks 2006, Hutchings 1996).	0,5
Grewia monticola Sond.	Malvaceae	Umsiphane (Sw) Nsihane (X)	NK12	Roots	Decoction	Taken orally	Maintains pregnancy Period pains	None found in literature	0,8
Hibiscus pusillus Thunb.	Malvaceae	Uvuma (Sw)	NK37	Bark	Decoction	Taken orally	Helps to facilitate the closing of the fontanelles in infants (Sikhala)	None found in literature.	0,6
Eucalyptus tereticornis Sm.	Myrtaceae	Indlulamitsi (Sw)	NK61	Bark	Decoction	Taken orally	Menstrual pains	None found in literature.	0,7
Ximenia caffra Sond.	Olacaceae	Umtfundvuluka (Sw) Ntsengele-lowu kulu (X)	NK32	Roots	Infusion	Taken orally	Maintains pregnancy	Prenatal (Hulme 1954, Mashile *et al*. 2019).	0,8

Adenia gummifera (Harv.) Harms var. gummifera	Passifloraceae	Upindakumshaye (Sw) Dovosha (X)	NK92	Roots	Infusion	Taken orally	Period pains	dysmenorrhea (Arnold & Gulumian 1984, Hutchings 1996, Mbanjwa 2020, Pooley 1998).	0,6
Antidesma venosum E.Mey. ex Tul.	Phyllanthaceae	Umhlalamuhuhulu (Sw) Mpfalambati (X)	NK55	Roots	Infusion	Taken orally	Period pains	Dysmenorrhoea (Arnold & Gulumian 1984).	0,5
Coix lacryma-jobi L.	Poaceae	Ilozisi (Sw)	NK27	Seeds	Seeds are used to make necklace/waist beads	Worn on the neck or waist	Seeds are used to create a necklace, waist beads (amulet) for children as a protection charm and aids with teething (kuhabula)	Used as a protective charm against teething problems in children (Watt & Breyer-Brandwijk 1962). Used to stop diarrhoea in teething babies (Mhlongo 2019).	0,5

Paediatric uses

Paediatrics refers to the medical care provided to newborns, young children, and adolescents. The age range for paediatric treatment varies across countries, typically encompassing individuals from birth until 18 years old (Abubakar *et al*. 2017). Adult medicine and paediatric medicine differ due to factors such as congenital anomalies, variations in physiological body size, and developmental challenges (Gardiner 2007). The indigenous knowledge of traditional medicine held by mothers plays a significant role in mitigating the impact of infections in children, thus improving their health outcomes (Ndhlovu *et al*. 2023). In the study, four different types of paediatric ailments were reported to be treated using four specific plant species, as outlined in Table 2. Dealing with these conditions can pose a challenge to individuals lacking specialized indigenous knowledge or those who are unfamiliar with South African traditional health concepts (Mhlongo 2019). Nonetheless, efforts were made in the study to provide descriptions of the primary symptoms associated with *Sikhala*, *Libala*, and *Kuhabula* as they manifest in infants.

One of the paediatric ailments addressed by traditional healers in the Nkomazi Local Municipality is the treatment of sunken fontanelle. The term "sunken fontanelles" refers to the depression or concavity observed in the soft spots on infants' heads, known as *sikhala* in the Siswati language. This condition is typically addressed within the first year of a child's development (Mashile 2019). According to cultural beliefs, sunken fontanelles are seen as vulnerable entry points for malevolent spirits, hence the need for immediate treatment (Cocks & Moller 2002). Infants with sunken fontanelles may exhibit symptoms such as loss of appetite, persistent vomiting, sunken eyes, weight loss, and passing green-coloured stools (Tembane 2019). In Western medicine, the *sikhala* condition is not recognized as an illness but rather as a temporary gap between the infant's cranial bones that naturally closes within two months after birth (Tembane 2019). However, in Siswati and Xitsonga cultures, the fontanelle is routinely examined for any abnormalities, including pounding, or bulging, as it is believed that if left untreated, the condition can be fatal for infants (Ramaube 2018, Thwala *et al*. 2012). Traditional healers in the Nkomazi Local Municipality address sunken fontanelle by utilizing *Hibiscus pusillus* as a treatment method.

Infants affected by *libala* typically exhibit a distinctive "red patch on the back of the neck," although it can also manifest in other forms, such as inflammation in the mouth. This condition is believed to cause the affected child's head to be forced backwards, resulting in the bending of the neck while sleeping and sitting (Tembane 2019, Thwala *et al*. 2012). *Schizocarphus nervous* (*imbita-yebantfwana*) is used as a treatment for *libala*. Our findings align with those of Zukulu *et al*. (2012), who also reported the utilization of *Schizocarphus nervous* in treating *inyoni/libala* in the Pondoland region.

Kuhabula refers to the belief that infants can become possessed by evil spirits from their surroundings (Thwala *et al*. 2012). The presence of evil spirits is seen as an additional factor that negatively affects the infants' health. It is believed that infants can acquire evil spirits from their environment, making them more susceptible to illnesses (Ramaube 2018). When a child has not been adequately protected and is exposed to evil spirits, they may experience difficulties falling asleep, frequent startle responses, agitation, and crying during sleep (Mhlongo 2017). As a protective measure against evil spirits, *Coix lacryma-jobi* seeds are worn as amulets around the neck and waist. Roberts (1983) has documented the use of *Coix lacryma-jobi* as a protective charm against evil spirits in infants.

In this study, *Scabiosa columbaria* has been documented as a plant species employed for the treatment of colic in infants. Colic, known as *inkaba* in Siswati, refers to a condition where the weak intestines develop due to the slow healing process of the umbilical cord wound (Mashile 2019). The use of *Scabiosa columbaria* for colic treatment has also been reported in the Zulu and Sotho tribes (Hutchings 1996, Van Wyk & Gericke 2000, Watt & Brandwijk 1962).

Maternal care

Fourteen plant species were documented as treatment for six gynaecological and obstetrics-related ailments (Table 2). Among these, the two most prevalent uses were for dysmenorrhea (n=8) and easing labour pains (n=5). Dysmenorrhea, which refers to painful menstrual cramps, is a common issue affecting a significant percentage of women of reproductive age worldwide and can have a negative impact on their quality of life (Warzecha *et al*. 2020). The traditional healers interviewed in this study noted that women with dysmenorrhea often face difficulties conceiving, as they believe that "women with period pains usually struggle to fall pregnant because their wombs are tied up." This perception aligns with the findings of Mashile *et al*. (2019), where participants similarly expressed the belief that dysmenorrhea-affected women have "tied up" wombs that hinder conception. The present study identified several medicinal plant species for treating dysmenorrhea, including *Grewia monticola*, *Adenia gummifera*, *Antidesma venosum*, *Scabiosa columbaria*, *Jatropha zeyheri*, *Albizia anthelmintica*, *Vachellia robusta*, and *Eucalyptus tereticornis*. *Adenia gummifera*, *Antidesma venosum*, and *Scabiosa*

columbaria were also reported as treatments for dysmenorrhea by Arnold & Gulumian (1984), Hutchings (1996), Pooley (1998), and Mbanjwa (2020).

Brachylaena discolor, *Capparis tomentosa*, *Erythrina lysistemon*, *Bowiea volubili*, and *Merwilla plumbea* were documented as plant species used for easing labour pains. This finding is consistent with previous studies by Chinsembu (2016), Gerstner (1941), Mhlongo & Van Wyk (2019), and Ndawonde *et al*. (2007), which reported the use of *Erythrina lysistemon*, *Capparis tomentosa*, and *Merwilla plumbea* to facilitate the birthing process. *Ximenia caffra*, *Jatropha zeyheri*, and *Grewia monticola* were identified for their use in prenatal care to support and maintain pregnancy. Hulme (1954) and Mashile *et al*. (2019) have previously reported the use of *Ximenia caffra* and *Jatropha zeyheri* as prenatal care supplements in South Africa and Nigeria. It is worth noting that Jatropha zeyheri, *Brachylaena discolor*, and *Grewia monticola* were reported for multiple uses within this category. *Brachylaena discolor* was noted to be used for preventing threatened miscarriage, while *Dalbergia melanoxylon* was used by women with a history of miscarriages to prevent further miscarriages. Similar findings were reported by Mhlongo & Van Wyk (2019) and Van Wyk & Van Wyk (1997) regarding the use of *Brachylaena discolor* by Zulu women to prevent miscarriages. *Albizia versicolor* was recorded as a contraceptive. This aligns with the observations of Nefhere (2019), where Thulamela traditional healers reported the use of *Albizia versicolor* to prevent pregnancy.

Conclusion

The study aimed to document the traditional knowledge of medicinal plants used for treating maternal and paediatric health issues in the rural communities of Nkomazi Local Municipality. A total of 19 plant species from 13 families were identified as commonly used for addressing 9 specific ailments related to maternal and paediatric health. The Relative Frequency of Citations analysis revealed that *Capparis tomentosa*, *Grewia monticola*, and *Ximenia caffra* were the most frequently utilized plants for maternal health-related ailments. Notably, this study also identified four plant species that had not been previously documented for their use in treating maternal and paediatric-related ailments. This new information highlights the importance of recording and preserving indigenous knowledge concerning medicinal plants within local communities. Given that roots are the most commonly harvested plant parts, and their removal can impede the regrowth of perennial species, it is crucial to educate traditional healers about the risks associated with the excessive harvesting of these vegetative organs.

The insights and applications documented in this study offer promising avenues for further scientific exploration, enabling the validation of their efficacy through empirical research. Moreover, future investigations may delve into cross-cultural and geographical comparisons using the inventory of medicinal plants and the knowledge gathered herein, fostering a deeper understanding of the diverse uses of these plant species across different regions and communities.

Declarations

List of abbreviations: Relative Frequency of Citation (RFC).

Ethics approval and consent to participate: Ethical clearance for this study was obtained from the University of the Witwatersrand Human Research Ethics Committee (H21/06/14). All participants provided oral prior informed consent.

Consent for publication: Not Applicable

Funding: This work is based on research supported wholly by the South African National Research Foundation (Grant No: 121923).

Conflicts of interest: The authors declare that there are no conflicts of interest in this article.

Data availability statement: The article includes the graphs and tables that support the findings of the study, and the primary author may provide the original data sets upon request.

Author's contribution: All authors have read and approved the manuscript. Nompendulo Khoza conducted a field survey, gathered, and analysed data, and prepared the manuscript's first draft. Ida Risenga, Shalini Dukhan, and Phil Ramalepe contributed to the research design, field survey, and revision of the drafts.

Acknowledgements

We wish to convey our heartfelt gratitude to the esteemed traditional healers of the Nkomazi Local Municipality, nestled in the Mpumalanga Province of South Africa. Their unwavering generosity in sharing their profound indigenous wisdom surrounding the utilization of medicinal plants has been instrumental in the success of this study.

We would also like to extend our sincere appreciation to the Nkomazi Local Municipality for their gracious permission and support, enabling us to conduct this research. Their cooperation and collaboration were invaluable in our pursuit of preserving and documenting this rich tapestry of traditional knowledge.

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