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Women and medicinal plants: a systematic review in the field of ethnobotany

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ABSTRACT. This study delves into the intricate relationship between women and medicinal plants, underscoring their historical and cultural roles mainly in 11 different countries. By specifically examining the impact of social impositions on gender in healthcare and the use of medicinal plants, the research critiques the perspectives that have marginalized both women and nature. To address these issues, ethnobotanical studies should promote research that encompasses the gender. Conducting a systematic review on Women and Medicinal Plants, the research explores key aspects in ethnobotanical studies: botanical knowledge, transmission of knowledge, medicinal plants used in women's reproductive health, access to healthcare, and the primary knowledge holders. The bibliographic survey, utilizing the Capes database, reveals 205 plant species with 32 medicinal uses for women's health. *Rute chalepensis* L. (rue) was mentioned four times for abortion, labor contraction, facilitating childbirth, and placental expulsion. In relation to women's reproductive health, different plants have been used by women and traditional practitioners worldwide. The use of medicinal plants can be associated with social vulnerability in marginalized communities by society which do not have easy access to public health, so they rely on alternative methods such as homemade remedies. Although knowledge about medicinal plants is an intellectual task developed by women, in some societies, such as capitalist societies, gender roles will evolve into specific knowledge, such as the task of family health care. The triple workload is not beneficial to women. Traditional knowledge, when allied with sustainability, can promote gender equality by transmitting intergenerational botanical knowledge without gender distinction and by reclaiming cultivation practices beneficial to the environment, biodiversity, and human health. The study invites ethnobotanical researchers to investigate gender dynamics within their studies. The results of this work can contribute to future research on women and medicinal plants.

Keywords: women healthcare; gender; ethnobotany; traditional knowledge.

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Introduction

Historically, women have maintained a close relationship with medicinal plants, making use of them to manage their health (Nergard et al., 2015). During the Middle Ages, women exercised autonomy over their reproduction and sexuality, employing medicinal herbs for various purposes, including stimulating menstruation, facilitating childbirth, conducting abortions, or preparing 'sterility potions' for inducing female sterility (Federici, 2017). Traditional knowledge of medicinal plants is related to range of experience, gender and traditions that people have preserved, evolved and learned through generations (Flavier, Navarri, & Warren, 1995).

The prohibition on the contraceptive use of plants deprived many women of this knowledge, which had been passed down through generations. In some instances, this knowledge did not disappear but rather became illegal (Federici, 2017). The anthropocentric and Eurocentric vision, originating in Western Europe, led to the irrational exploitation of nature by Christians. This ideology persists, challenging the deconstruction of the perspective that places human beings, especially men, (Keith, 1993) above nature and women.

During the Witch Hunts, female knowledge about healing, love potions and traditional practices for reproductive control, were shared among women of different ethnic and cultural background, crossing colonial and racial borders (Federici, 2017). Although some knowledge accumulated over time has been lost, traditional medicine is still practiced and valued in some societies, and various plants are used by women and practitioners (Yemele et al., 2015; El-Ghazouani, El-Ouahmani, Teixidor-Toneu, Yacoubi, & Zekhnini, 2021).

The common use of herbs (yuyos) as contraceptives in Paraguay reflects that older women with more children tend to use yuyos more, while those in rural areas and with higher education are less likely to (Bull, 1998). The interest in plant sources of contraceptives suggests the importance of incorporating native concepts of conception or contraception to enhance pharmacological evaluation programs (Elisabetsky & Posey, 1989).

Variables such as gender, generation, ethnicity, race and class, should be incorporated into the study of plants and humans, because they affect the dynamics of medicinal knowledge. This paradigm shift has interested several scientists in documenting traditional or popular female-based knowledge of medicinal plants (Tranfield, Denyer, & Smart, 2003). The dual role of women as providers of family food and care, can be related to gender differences knowledge in medicinal plants (Alqethami, Hawkins, & Teixidor-Toneu, 2017; Tng, Singhal, & Kshetrimayum, 2021).

The documentation of knowledge about medicinal plants should be preserved through research records (El-Ghazouani et al., 2021) that consider the culture and diversity of medicinal plants. Ethnobotany plays a fundamental role, seeking to understand how specific groups obtain resources from plants (Lucena, Albuquerque, Lucena, & Ferreira, 2020). The intention is to break with hegemonic academic knowledge, recognizing other knowledge beyond the walls of academia, such as traditional knowledge based on medicinal plants.

While the field is not a panacea for environmental problems, some scientists have engaged with environmental, cultural, and social issues. Science has emerged with new conceptions of knowledge, sparking a growing interest in documenting them (Wolverton, Nolan, & Ahmed, 2014). Based on an alternative gynecology to invasive medical treatments and the pharmaceutical industry, a group published a compilation of alternative gynecological knowledge called ‘Our Bodies Ourselves’ (Puleo, 2002). This work addressed women's knowledge of their bodies, denounced the excessive ‘medicalization’ of the phases of women's lives (birth, menarche, reproductive life, menopause, aging), highlighted the right of all patients to know the controversies surrounding the proposed treatments, and rescued traditional health knowledge and practices (Siliprandi, 2009).

The aim of this work is to conduct a systematic review on Women and Medicinal Plants through bibliographical survey in ethnobotanical studies. Drawing from knowledge of alternative methods of women's health, it addresses issues such as candidiasis, abortion, childbirth, menstrual cramps, among other problems that affect women and can be treated with medicinal plants. Additionally, it seeks to observe whether these studies discuss dynamics involving gender and medicinal plants, such as the sexual division of labor, the transmission of knowledge, and access to health.

Materials and methods

A systematic review was carried out on Women and Medicinal Plants in the field of ethnobotany based on four questions: What are the main species of medicinal plants reported for indications of women's health? How do women access the UBS? What is the transmission of knowledge regarding medicinal plants? And who possesses the greatest knowledge of medicinal plants?

The study was based on the work proposed by Tranfield et al. (2003), following The Cochrane Collaboration's and National Health Service Dissemination, which consists of: 1- Planning the review (identifying the need for the study, preparing the purpose of the review, and developing a protocol); 2- Conducting the review (identifying research, selecting studies, assessing the quality of studies, extracting data, and synthesizing them); finally, 3- Reporting and disseminating (pointing out and recommending, finding evidence for practice) (Tranfield et al., 2003). We also adhered to the Prisma recommendation (Preferred Reporting Items for Systematic Reviews and Meta-Analyses), which comprises a list of 27 items and a flowchart on article selection (Figure 1 - Moher, Liberati, Tetzlaff, Altman, & Prisma Group, 2009). The aim of Prisma is to assist authors in reporting systematic reviews and meta-analyses (Moher et al., 2009). Prisma is used in the Medical Sciences (Tranfield et al., 2003) and is currently applicable in any area to enhance the transparency of research (Torres-Avilez; Medeiros; Albuquerque, 2016). The new Prisma website (https://www.prisma-statement.org/) is designed to help authors transparently report why their systematic review was done, what methods they used, and what they found (Prisma, 2021).

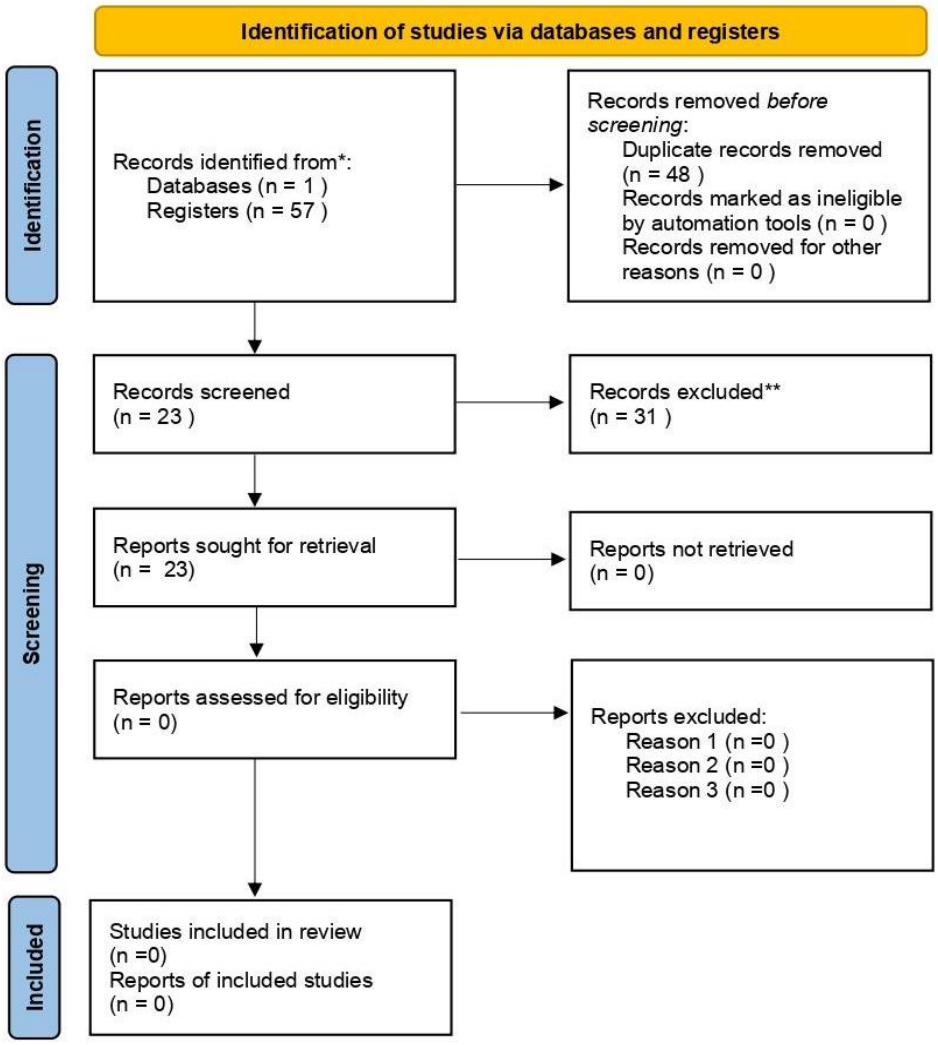

Figure 1. New Preferred Reporting Items for Systematic Reviews and Meta-Analyses (Prisma) website (https://www.prisma-statement.org/) 2020.

Planning a systematic review

The database used for this review was Periodic Capes (*Coordenação de Aperfeiçoamento de Pessoal de Nível Superior*) (https://www-periodicos-capes-gov-br.ezl.periodicos.capes.gov.br/), with the words 'Women' and 'Medicinal Plants' present in the title of the articles. The search generated 57 peer-reviewed articles, of which 23 were selected due to their relevance to ethnobotany and ethnopharmacology in English (21) and Portuguese (2). The exclusion criteria were as follows: nine were duplicates, and thirty-one were not ethnobotanical studies. Among the four selected articles, three were from Brazil and one from Mexico, in Spanish. The further exclusion criteria included: seven duplicates, twenty non-ethnobotanical studies, three not found, and two literature reviews (Figure 1).

The search was conducted between October and November, 2021 in Portuguese on the Capes Portal database, with the last search carried out on November 21, 2021. The study was limited to peer-reviewed articles and ethnobotanical studies based on specific inclusion criteria. For de topic on Women and Medicinal Plants in Reproductive Health, only plants with scientific names and their traditional and/or popular indications were considered (Sharma, 2000; Martínez, 2008; Panyaphu et al., 2011; Malan & Neuba, 2011; Medina, Corona, Fernández, & Contreras, 2011; Mata, Sousa, Perazzo, & Carvalho, 2012; Razafindraibe et al., 2013; Nergard et al., 2015; Yemele et al., 2015; Santoso, Jumari, & Utami, 2019; El-Ghazouani et al., 2021; Koman, Kpan, Yao, & Ouattara, 2021; Farias et al., 2021). The included articles were ethnobotanical in nature, focusing on women, to ascertain the medicinal plants known to women for women's health. Additionally, the analysis covered active search descriptors related to the sexual division of labor, access to health care, knowledge of medicinal plants between genders and the transmission of knowledge.

Results and discussion

Women and medicinal plants

The twenty-three articles were reviewed and analyzed based on four aspects: 1- What are the main medicinal plants documented for the use of women's reproductive health; 2- How is women's access to UBS (Basic Health Unit); 3- How is the transmission of knowledge about medicinal plants; and finally, 4- Who possesses greater knowledge about medicinal plants. We believe these questions are essential to investigate the relationship between women and medicinal plants and, therefore, can help better understand this dynamic. The results for each of these questions are presented below.

Medicinal plants in women's health

Regarding plants used for women's health, two hundred and five different species were identified (Table 1). The research highlighted taxonomy, indications for ailments, and the respective authors who documented the traditional and popular knowledge of the studied communities. The intention was to compile empirical knowledge regarding the use of medicinal plants for women's health.

In this work, thirty-two medicinal uses for women were recorded concerning the use of medicinal plants. Thus, identified medicinal plants used for issues such as abortion, placental adhesion, pre-conception, anti-fertility, placental positioning, increased fertility, increased secretion of vaginal products, postpartum bath, colic, labor contraction, contraception, convulsions during labor, fetal development, birth-related disorders, postpartum pain, facilitating labor, placental expulsion, pregnancy, urinary infection, uterine infection, women's infertility, uterine inflammation, vaginal inflammation, leucorrhea, pregnancy maintenance, menopause, menstruation, birth, preventing abortion, postpartum, hip problems, removing a live or stillborn child from the uterus, reducing labor pain, ovarian cycle rupture, abortion symptoms, and postpartum tonic.

From the investigated literature, some plants were mentioned as gynecological without specifying their purpose (Alqethami et al., 2017), or the plants were not botanically identified, only by their popular names. For example, fennel is mentioned for cramps (Goulart, Ayres, & Alvim, 2004), rosewood that can be used for various indications (Oliveira, 2015; Farias et al., 2021), as well as lemon balm, lemongrass, thick mint, and fennel (Oliveira, 2015). However, the research is insufficient concerning botanical identification. Zampirolli, Oliveira, Mariani, Meira, and Meira (2017) consider the plants mentioned taxonomically but examined their effects in the literature without reporting empirical knowledge, so these plants were not considered either. For ethnobotanical research it is crucial to identify the plants botanically and describe their respective indications because some species can be toxic to humans (Lorenzi & Matos, 2021). Moreover, their therapeutic indication is also indispensable in these studies, as the primary goal of ethnobotany is to safeguard this knowledge (Lorenzi & Matos, 2021).

It is interesting to note traditional therapeutic practices related to reproductive health involving various cultures. Among them are temazcal baths (a Turkish bath practiced since pre-Hispanic times, mainly indicated after childbirth) with foliar (plants are shaken and beaten with them on the body), complemented by teas or chalk (Medina et al., 2011). The plants used in the fumigation are cherimoya (*Annona cherimola* Mill.), ash (*Fraxinus* sp.), laurel (*Litsea glaucescen* Kunth.), peach (*Prunus persica* (L.) Batsch.), capulin (*Prunus serotina* Ehrenb.), santa maria (*Tanacetum parthenium*), and azomiato (*S. salignus*), *Macropanax dispermus* (Bl.) Kuntze (Medina et al., 2011). These practices are developed by and for women, documented in Coyomeapan, a municipality in Mexico. As there are no longer midwives in the area, they aid before and after childbirth for the treatment of back or waist pain (Medina et al., 2011). Another postpartum herb bath therapeutic practice was documented in Mien in China and Thailand, which found that the genera *Acorus*, *Ficus*, *Smilax*, and *Schefflera* are commonly used, and *Basella* sp is the most common (Panyaphu et al., 2011).

Some plants stand out for being mentioned more than twice. This is the case with *Ruta chalepensis* L. (rue), belonging to the Rutaceae family, which appears 4 times for different indications and even contradictory ones, such as abortion (Martínez, 2008), labor contraction (Medina et al., 2011), facilitating labor (Martínez, 2008), and placental evacuation (Martínez, 2008). Another plant worth mentioning due to its various indications is *Tripodanthus flagellaris* (bird catcher) belonging to the Loranthaceae family, appearing three times for abortion, facilitating labor, and placental evacuation (Martínez, 2008). Lastly, *Zanthoxylum rhoifolium* Lam. (anteater flesh), belonging to the Rutaceae family, appears three times for menstrual cramps, uterine inflammation, and vaginal inflammation (Farias et al., 2021). The indication that received the most diverse plants was to facilitate labor and induce labor (Sharma, 2000; Martínez, 2008; Malan & Neuba, 2011; Razafindraibe et al., 2013; Yemele et al., 2015; Koman et al., 2021).

Table 1. List of medicinal plants for women's reproductive health documented by country.

Country	Medicinal Plants	Total	State
Argentina	*Anemia tomentosa* (Sav.) Sw *var. tomentosa; Lippia turbinata* Griseb; *Ilex paraguariensis;* *Margyricarpus pinnatus* (Lam.) Kuntze; *Morrenia brachystephana; Ruta chalepensis* L.; *Solanum tuberosum; Tanacetum parthenium; Tripodantgus flagellaris* (Cham. & Schltdl) Tiegh; *Trixis divaricata* (Kunth) Spreng; *urtica urens; Zea mays* (Martínez, 2008).	12	Criollo women living in the hills of the province of Córdoba (Martínez, 2008).
India	*Adhatoda zeylanica* Medic; *Allium cepa* Linn; *Achyranthes aspera* Linn; *Argemone mexicana* L.; *Abrus precatorius* Linn; *Cynodon dactylon* (L.) Pers; *Datura metel* Linn; *Emblica officinalis* Gaertn; *Datura metel* Linn; *Diplocyclos palmatus* (Linn) Jeffrey; *Euphorbia nerifolia* Linn; *Ficus benghalensis* Linn; *Michelia champaca* Linn; *Mentha arvensis* Linn; *Ricinus communis* Linn; *Sarace indica* Linn; *Withania somnifera* (Lin) Duna (Sharma, 2000).	17	Rural Women of Shahjahanpur District, located in the state of Uttar Pradesh (U.P) (Sharma, 2000).
Mali	*Mitragyna inermis; Parkia biglobosa* (Nergard et al., 2015)	2	Women at health care centers of Mali, West-Africa (Nergard et al., 2015).
Cameroon	*Aloe buettneri; Comelina benghalensis; Hibiscus noldea; Hibiscus rosa sinensis; Kalanchoe crenata; Sida veronicifolia* (Yemele et al., 2015)	6	Pregnant women's in Menoua Division-West Cameroon (Yemele et al., 2015).
Indonesia	*Acorus calamus* L.; *Alpinia galanga* (L.); *Alstonia scholaris* Linn; *Alstonia scholaris* Linn; *Areca catechu* L.; *Bixa orellana* L.; *Costus speciosus; Dianella nemerosa* Lam; *Drynaria sparsisora* (Desv.) T. Moore.; *Justicia gendarussa* Burm.f; *Kaempferia galanga* L.; *Mapania cuspi- data* (Miq.) Uittien; *Piper betle* L.; *Psychotria viridis* Ruiz & Pav; *Sauropus androgynus* (L.) Merr; *-Tectaria herpetocaulos; Vallisneria americana* Michx; *Zingiber officinale* Rosc. (Santoso et al., 2019).	18	Pregnant and Postpartum Women in Dayak Tomun of The Lopus Village Lamandau Regency of Central Kalimantan (Santoso et al., 2019).
Morocco	*Artemisia herba alba asso; Carum carvi* L.; *Cinnamomum cassia* (L.) J. Presl; *Cuminum cyminum* L. *Crocus sativus* L.; *Lepidium sativum* L.; *Foenicum vulgare L.*; *Nigella sativa* L.; *Trigonella foenum graceum* L.; *Lavandula angustifolia* Mill; *Lavandula dentata* L.; *Phoenix dactylifera ; Rosmarinus officinalis* L.; *Mentha suaveolens* Ehrhart; *Mentha pulegium* L.; *Origanum vulgare subsp.* Hirtum (Link) letsw (Eddouks, Hebi, & Ajebli, 2020).	18	Women in the South East of Morocco (El-Ghazouani et al., 2021).
Thailand	*Annona cherimola* Mill; *Anredera cordifolia* (Ten.) steenis; *Basella alba* L.; *Cnestis palala* (Lour.); *Dianella ensifolia* (L.) Red; *Gouania leptostachya* DC. var. leptostachya; *Gynura divaricata* (L.) DC; *Fraxinus* sp.; *Litsea glaucescen Kunth.*; *Macropanax dispermus* (Bl.) Kuntze; *Olex imbricate* Roxb. Toe; *Oroxylum indicum* (L.) Bth. Ex Kurz; *Psychotria sp.; Prunus persica* (L.) Batsch; *Prunus serotina* Ehrenb; *Poikilospermum suaveolens* Merr; *Polygonum dissitifloru; Talinum triandulare; Tanacetum parthenium* (Panyaphu et al., 2011).	18	The Mien (Yao) from Northern Thailand (Panyaphu et al., 2011).
Madagascar	*Annona reticulata* L.; *Aphloia theiformis* (Vahl) Benn; *Asteropeia micraster* Hallier f; *Asteropeia multiflora* Thouars; *Barringtonia racemosa* (L.) Spreng; *Cajanus cajan* (L.) Huth; *Cinnamosma madagascariensis* Danguy; *Citrus sinensis* (L.) Osbeck; Hafatraina; *Colocasia esculenta* (L.) Schott; *Colocasia esculenta* (L.) Schott; *Cnestis palala* (Lour.); *Dianella ensifolia* (L.) Red; *Dracaena reflexa* Lam.; *Cucurbita maxima* Duchesne; *Carica papaya* L.; *Croton noronhae* Bail; *Cynodon dactylon* (L.) Pers; *Cyperus papyrus subsp. madagascariensis* (Willd.) Kük; *Dracaena reflexa var. cernu*a (Jacq.) Baker; *Emilia sp.; Emirnense* (Baker) Labat & G.E. Schatz; *Erica sp; Erythroxylum ferrugineum* Cav; *Hedychium coronarium* J. Koenig; *Ipomoea batatas* (L.) Lam; *Ficus reflexa* Thunb; *Ficus polita subsp. polita Intsia bijuga (*Colebr.) Kuntze; *Lycopodiella cernua* (L.) Pic. Serm.; *Jatropha curcas* L.; *Lygodium lanceolatum* Desv; *Lycopodium clavatum* L.; *Melaleuca; Mimosa pudica* L.; *Morella spathulata* (Mirb.) Verdc. & Polhill; *Morella spathulata* (Mirb.) Verdc. & Polhill; *Musa × paradisiaca* L.; *Nepenthes madagascariensis* Poir; *Nymphaea nouchali* Burm; *Paederia foetida* L. *Pycreus mundtii* Cherm; *Ocimum gratissimum* L. Romba; *Olax emirnensis* Baker; *Ophioglossum* L. *Persea americana* Mill.; *Phyllanthus sp; Pittosporum verticillatum* Bojer; *Sarcolaena multiflora* Thouars Hela*; Schefflera sp*. Pentopetia; *Syzygium emirnense (Baker)* Labat & G. E. Schatz; *Syzygium aromaticum* (L.) Merr. & L.M. Perry; *Syzygium bernieri* (Drake) Labat & G. E. Schatz; *Tambourissa castri- delphinii; Trema orientalis* (L.) Blume; *Voacanga thouarsii* Roem. & Schult; *Typhonodorum lindleyanum* Schott (Razafindraibe et al., 2013).	55	Women from Agnalaha littoral forest (Southeastern Madagascar) (Razafindraibe et al., 2013).

Ivory Cost	*Adansonia digitata* L.; *Ageratum conyzoides* L.; *Alternanthera pungens* Kunth; *Annona senegalensis* Pers.; *Anogeissus leiocarpus* (DC.) Guill. & Perr. *Arachis hypogaea* L.; *Argemone mexicana* L.; *Aspilia africana* (Pers.) Adams ssp. Africana; *Aspilia bussei* O. Hoffm. & Muschler; *Azadiractha indica* A. Juss. *Blighia sapida* K. D. Koenig; *Bombax costatum* Pellegr. & Vuillet; *Calotropis procera* (Ait.) Ait. f.; *Capsicum annuum* L.; *Capsicum frutescens* L.; *Carapa procera* (DC.) De wilde; *Cassia occidentalis; Citrus limon* Burn. f.; *Cola nitida* (Vent.) Schott & Endl.; *Combretum glutinosum* Perr. ex DC.; *Combretum micramthum* G. Don; *Cymbopogon citratus* (DC.) Stapf; *Cyperus esculentus* L.; *Euphorbia hirta* L.; *Ficus exasperata* Vahl; *Ficus sur* Forsk.; *Heliotropium indicum* L.; *Jatropha curcas* Linn.; *Jatropha gossypiifolila* L.; *Kigelia africana* (Lam.) Benth.; *Maranthe robusta* (Oliv.) Prance; *Ocimum americanum* L.; *Parkia biglobosa* (Jacq.) Benth; *Phyllanthus amarus* Schum. & Thonn.; *Pìliostigma thonningii* (Schum.) Millne-Redhead; *Piper guineense* Schum. & Thonn; *Portulaca oleracea* L.; *Psidium guajava* L.; *Scoparia dulcis* L.; *Semodium adscendens* (Sw.) DC.; *Senna alata* (L.) Roxb.; *Senna hirsuta* (L.) H.S. Irwin & Barneby; *Senna occidentalis* (L.) Link.; *Trema guineensis* (Schum. & Thonn) Ficalho; *Trema orientalis* (L.) Blume; *Uvaria trotilis* A. Chev. ex Hutch. & Dalziel; *Vitellaria paradoxa* C.F. Gaertn.; *Xylopia aethiopica* (Dunal) A. Rich; *Zanthoxylum zanthoxyloides* (Lam.) Zepern. & Timler; *Zingiber officinale* Rosc. (Koman et al., 2021).	60	Djimini women in Dabakala (Center-North of Côte d'Ivoire) (Koman et al., 2021).
	Ageratum conyzoides L.; *Cyathula prostrata; Ficus exasperata, Desmodium adscendens Heliospermum indicum* L.; *Hoslundia opposita, Solenostemon monostachyus; Sparganophorus sparganophora; Spondias mombin; Voacanga africana* (Malan & Neuba, 2011).		Traditional practices from Eastern Côte d'Ivoire (Malan & Neuba, 2011).
Brazil	*Inga sp.* (Mata et al., 2012) *Erygium foetidum;* L.; *Plantago major* L.; *Morus nigra* L.; *Schinus terebinthifolium* Raddi; *Zanthoxylum rhoifolium* Lam. (Farias et al., 2021).	12	Wajãpi women from the State of Amapa (Brazil). (Mata et al., 2012).
	Schinus terebinthifolium Raddi; *Erygium foetidum* L.; *Morus nigra* L; *Plantago major* L.; *Zanthoxylum rhoifolium* Lam. (Farias et al., 2021).	12	Women in quilombola communities of the Recôncavo Baiano (Farias et al., 2021).
Mexico	*Lippia alba* Miller N.E Br. *Annona cherimola* Mill., fresno (*Fraxinus* sp.), *Cyperus hermafroditus* (Janq) Standl; *Litsea glaucescen Kunth;* Montanoa tometosa Cerv.; Rosmarinus officinalis L.; Ruta chapelensis; *Prunus persica* (L.) Batsch.; *Prunus serotina* Ehrenb; *Tanacetum parthenium; S. salignus; Macropanax dispermus* (Bl.) Kuntze (Medina et al., 2011).	12	Indigenous women and men from Coyomeapan, Puebla (Medina et al., 2011).

It is essential for the government and institutions to conduct research to investigate the therapeutic and toxicological potential of commonly used plants, as well as to value their use. Research into the therapeutic and toxicological potential of commonly used plants is crucial for validating their use, particularly for women's reproductive health issues. Many plants are used by women and traditional practitioners worldwide, however, most of these plants have not been biologically investigated to confirm their popular use (Yemele et al., 2015). Therefore, this work aimed to emphasize the diversity of plants and indications used by women to systematize an arsenal of medicinal plants for women's reproductive health through a literature review, not yet conducted in the literature.

About the systematic review: access to public health

Another factor investigated in the review was to observe the communities' access to health. For example, whether the lack of access to health was related to the use of medicinal plants.

Women in Menoua-Oeste in Cameroon resort to the use of medicinal plants because gynecological treatments performed by conventional medicine require surgeries (such as for malposition babies), which are unaffordable. Therefore, they turn to traditional midwives who use medicinal plants and can reposition the fetus or baby in the womb (Yemele et al., 2015).

The indigenous women in Coyomepan, Mexico, reported that when access to healthcare is possible, medicinal services encourage communities to abandon the use of medicinal plants (Medina et al., 2011). Despite claiming to be open to traditional practices, medical professionals do not prescribe medicinal plants for treatment, as observed among Criollo women in Argentina, largely due to a lack of familiarity with these plants (Martínez, 2008).

In Brazil, when citizens face health issues, they can turn to public healthcare, However, in Rio Branco, the Basic Health Unit is underfunded, underequipped, and understaffed, limiting access to healthcare (Wayland

& Walker, 2014). Although free health posts do exist, access for rural communities is scared. Therefore, the use of medicinal plants is an alternative for families to cope with the lack of access to healthcare (Wayland & Walker, 2014; Oliveira, 2015; Farias et al., 2021).

The use of medicinal plants by populations suggests that vulnerable communities benefit the most from this practice. Beyond being of cultural knowledge, it is also a solution to the problem of limited access to quality public healthcare. The research investigated here indicates the need for public policies aimed at rural communities on the rational use of medicinal plants, addressing potential toxic effects, side effects, and the use of plants during pregnancy.

Transmission of knowledge

Empirical knowledge regarding medicinal plants often constitutes a familial legacy, passed down from ancestors, including parents and grandparents (Farias, Ayres, & Alvim, 2008; Rangel & Bragança, 2009; Oliveira, 2015; Araújo, Santiago, Peixoto, Oliveira, & Coutinho, 2016; Farias et al., 2021). This knowledge acquisition extends to interaction with neighbors (Oliveira, 2015), friends (Saber et al., 2019), specialists, or traders (Malan & Neuba, 2011). Notably, during pregnancy, 48% prefer advice from family and friends, while 27.8% consult traditional medicine practitioners (Nergard et al., 2015).

Maternal knowledge is observed to be passed down to daughters, encompassing childcare and health prevention associated with plant use (Medina et al., 2011; Alqethami et al., 2017). Additional sources of plant knowledge include insights from elderly women, information from medicinal plant books, and exposure to TV programs (Alqethami et al., 2017). In indigenous communities, oral transmission plays a crucial role, as seen in Kalimantan and other societies where knowledge is preserved by herbalists and shamans (Panyaphu et al., 2011; Santoso et al., 2019).

Concerns are raised in regions like Thailand (Mien) about diminishing healthcare through medicinal plants due to modernization, with younger generations showing reduced interest (Panyaphu et al., 2011). Informally, mothers and grandmothers take on responsibilities for healthcare (Mata et al., 2012).

Traditional knowledge of medicinal plants and gender

An exploration of whether men or women possess greater knowledge of medicinal plants reveals diverse scenarios. Medicinal plants are an integral part of life for residents of a quilombola community in Vitória da Conquista, Bahia, in Brazil (Oliveira, 2015). In southwestern Morocco, traditional medicine is practiced by herbalists and healers, elderly women who care for women's and children's health (El-Ghazouani et al., 2021).

In an indigenous community on Borneo Island, Indonesia, shamans and midwives, knowledgeable in treating pregnant women and childbirth with medicinal plants, are the professionals in this context (Santoso et al., 2019).

Surveyed women frequently identify older family members, particularly women, as having superior knowledge of medicinal plants (Oliveira, 2015). Distinct knowledge is observed between women and herbalists in Agadir, Morocco, with women often having unique knowledge in terms of species used and preparation methods (El-Ghazouani et al., 2021). Cultivation of medicinal plants correlates with increased knowledge, particularly among older women (Wayland & Walker, 2014).

While women demonstrate specific knowledge of plants due to historical realities and gender roles, men receive more societal recognition. Challenges, such as the need for government certificates, limit the role of traditional midwives, whereas men or herbalists face no such constraints (Medina et al., 2011). Despite societal recognition disparities, women actively participate in healthcare roles (Razafindraibe et al., 2013; Alqethami et al., 2017).

Traditional knowledge, when coupled with sustainability and gender equality, can be promoted through intergenerational knowledge transfer, reducing reliance on industrialized medicine, and highlighting traditional practices.

Gender division of labor

Studies on the gender division of labor shed light on its influence on women's knowledge of medicinal plants (Medina, Corona, Fernández, & Contreras, 2011; Oliveira, 2015; Farias et al., 2021). Women commonly administer medicinal plants within families (Wayland & Walker, 2014). The division involves men collecting plants, while women handle drying, storage, and preparation, or, in challenging terrains, men may handle collection (Mata et al., 2012; Razafindraibe et al., 2013; Oliveira, 2015).

Notably, herbs are often cultivated near the kitchen, reflecting women's primary role in plant management (Oliveira, 2015; Farias et al., 2021). Surveyed women often point to themselves as having superior knowledge, rooted in historical roles assigning women domestic and caregiving responsibilities, including the use of medicinal plants (Oliveira, 2015).

For de Farias et al. (2021), the gender division of labor is considered beneficial for family labor. However, Medina et al. (2011) demonstrate how women are impacted by the triple burden of work. In this scenario, indigenous women in Coyomeapan work at home, outside, and care for their families, totaling 16 hours of work per day, while men work 12 hours, disregarding the triple burden and the female overload.

Women possess ancestral knowledge of alternative health methods, with such knowledge often not officially recognized, leading to the prohibition of traditional midwives despite their intellectual contributions (Medina et al., 2011; Farias et al., 2021).

In some instances, gender roles shape specific knowledge areas, highlighting how the gender division of tasks contributes to unequal power relations. Women undertake domestic and caregiving roles, while men are primarily assigned to the public sphere, perpetuating an imbalance in responsibilities and workloads (Oliveira, 2015).

In some societies, gender roles can develop into specific knowledge areas, such as the preparation of homemade remedies based on plants. Although this is intellectual work performed by women, the heavy burden of responsibility and labor may not be beneficial to women and can perpetuate the inequality of power between man and women.

Conclusion

Women play an important social and ecological role in the management of medicinal plants, Additionally, culturally, women are responsible for their own health care, the health of their families, and domestic tasks. They are at the forefront of safeguarding and transmitting knowledge about the manipulation of flora, ensuring food sovereignty and security through food production and cultivation. Given these facts, women have a greater dependence on natural resources to carry out the vital functions for the family and community.

According to the bibliographic survey conducted, 6 published works were identified with the keyword ‘women’ and ‘medicinal plants’ in the title in Brazil (Farias et al., 2008; Rangel & Bragança, 2009; Mata et al., 2012; Wayland & Walker, 2014; Araújo et al., 2016; Zampirolli et al., 2017). Nevertheless, it was observed that women possess rich empirical knowledge regarding their reproductive health. A total of 205 different medicinal plants used exclusively for thirty-two female reproductive health indications were identified.

The use of medicinal plants can be associated with social vulnerability wherein traditional populations marginalized by society do not have easy access to public health.

It is also evident that in rural areas, women have been recovering and reconstructing knowledge that was previously undervalued. The work of providing food and healing is carried out by them as productive work. However, in some societies, this can reveal gender inequality, where the heavy burden of responsibility and labor may not be beneficial to women and can perpetuate the inequality of power between men and women.

The critical role of women in managing medicinal plants is underscored, emphasizing the interconnectedness of traditional knowledge, sustainability, and gender equality. Recognition and preservation of women's empirical knowledge are advocated, promoting traditional knowledge, sustainability, and gender equality through the intergenerational transfer of knowledge.

The conclusion highlights the dependence of women on natural resources for essential functions vital for survival, family, and community well-being. The text calls for a thorough exploration of gender and ethnobotany to study alternative gynecology based on medicinal plants.

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