Comparison of Herbal Medicines Used for Women’s Menstruation Diseases in Different Areas of the World

Majing Jiao†, Xinqiao Liu†, Yongshen Ren*, Yingzhou Wang, Long Cheng, Yunhui Liang, Yanqiu Li, Tianpei Zhang, Wen Wang and Zhinan Mei

School of Pharmacy, South-Central University for Nationalities, Wuhan, China

Aims: This review aims to compare the use of herbal medicine used to treat women’s menstruation and the prevalence of menstrual diseases in different regions, which reveal the use of herbal medicine globally and provide scientific guidance for improving women’s health.

Materials and Methods: The information available on herbal medicines for women between the years 2000 and 2021 was systematically collected via the library and electronic search systems such as Google Scholar, PubMed, ScienceDirect, and Web of Science as well as secondary resources including books and conference proceedings.

Results: Totally, 571 ethnic medicines commonly used for women’s menstruation health in Asia, Europe, Oceania, Africa, and America were accounted. Zingiber officinale Roscoe (Ginger), Ruta graveolens L. (Common rue), Angelica sinensis (Oliv.) Diels (Angelica sinensis), Foeniculum vulgare Mill (Fennel), Catharanthus roseus (L.) G. Don (Catharanthus roseus) and other medicines which have obvious advantages and long-term usage are utilized in the treatment of menstrual diseases. Family Asteraceae, Lamiaceae, Apiaceae, Fabaceae, and Zingiberaceae are the most common medicinal plant families used for such treatments. In many instances, the application of fresh parts of plants was observed because of the healers’ belief regarding the higher efficiency of the medicine made from fresh plants. Edible plants are used in a wide range of countries.

Conclusion: Women’s menstruation health is directly related to their health condition. Traditional medicines of most ethnic groups have contributed to women’s health care and treatment of gynecological diseases. Practitioners in this field have gained elaborate experience in treatments and medication, and assembled a large number of effective drugs and prescriptions. These experiences have also been inherited and developed by modern clinical application and scientific research. However, the basic research on these drugs is not sufficient, the knowledge of drug use has not been fully popularized, the advantages of drugs have not been fully utilized, and the guiding potential to modern drug research continues to be insufficient. As such, it is necessary to further promote and make a significant contribution to women’s health.

Keywords: herb medicine, ethnomedicine, premenstrual syndrome, dysmenorrhea, amenorrhea, menstrual disorders, women’s health

Abbreviations: CHM, Chinese herbal medicine; JXP, jiawei xiaoyao powder; MD, menstrual diseases; MDs, menstrual disorders; PMS, premenstrual syndrome; TPM, traditional Persian medicine.
1 INTRODUCTION

Herbal medicine has been widely used by women globally and increasingly more have shown the necessity of herbal medicines, both in treating diseases and maintaining health (Homaie Rad et al., 2021; Morehead and McInnis, 2021). Even in the modern world, there continue to be several health issues among women that cannot be cured using modern medicine; and in some regions having no modern medicines, it continues to be necessary to use herbal medicine as an alternative or supplement for women’s health and facilitate their life (Peltzer, 2009).

The menstrual pattern of a woman is indicative of her health status. Generally, menstruation occurs in regular intervals. Menstrual diseases (MD) include premenstrual syndrome (PMS), dysmenorrhea, amenorrhea, and menstrual disorders (MDs) (Kim, 2019). Ethnographic and epidemiological studies demonstrating significant variations in symptoms experienced by women with MDs living in different locales suggest that the expression of this biological event is mediated by many factors, including diet, lifestyle, cultural expectations and behaviors, and individual constitutions (Omani Samani et al., 2018). Hormonal therapy is the main treatment for MDs in modern medicine. However, considering the side effects of modern medicine, there are increasingly and more women who prefer to rely on herbal treatment based on their own traditional/national medicine.

Herbal medicines for women’s menstruation issues are used globally, and their efficacy and safety have been mentioned in previous reviews (Maleki-Saghoon et al., 2018). However, there continues to be a lack of references on the general character and differences for the administration of herbal medicine used by women all around the world. Therefore, this review aims to provide an overview of the significant variations of symptoms experienced by women with MDs in different locales. The plants were categorized into four based on the types of diseases they treat. To the best of our knowledge, this is the first attempt to compile the list of herbal medicines used for women’s menstruation issues globally.

2 METHODOLOGY

2.1 Literature Search on Medicinal Plants for Menstrual Morbidity

We retrieved peer-reviewed scientific articles that documented traditional plant use in the study area related to MD. We followed the categories of menstrual morbidity defined by Harlow and Campbell (2004) and the definition of premenstrual syndrome (PMS) (Gnanasambanthan and Datta, 2019), and classified medicinal plants in four categories: 1) premenstrual syndrome; 2) dysmenorrhea; 3) amenorrhea; 4) menstrual disorders, including irregular cycles, such as a long duration of menstrual flow and excessive, heavy bleeding, (amenorrhagia/polymenorrhagia) or delayed, infrequent menses (oligomenorrhea).

Literature reviews were performed during April-May 2021, using Google Scholar, PubMed, ScienceDirect, Web of Science and the keywords “menstruation,” “amenorrhea,” “arrested menstruation,” “obstructed menses,” “emenagogue,” “dysmenorrhea,” “menses pain,” “menstrual pain,” “menstrual cramps,” “menstrual colic,” “excessive menses,” “excessive menstruation,” “menorrhagia,” “hypomenorrhea,” “oligomenorrhea,” “scanty menses,” “premenstrual syndrome,” “menstrual disorders,” “menses disturbance,” “abnormal menstruation,” “irregular menses” and “metrorrhagia” in combination with “herbs,” “medicinal plants” and “Africa,” “Asia,” “Latin America,” “Oceania,” “Europe” or specific countries in these geographical areas. Additional literature was found in reference lists of collected publications (snowball method). To limit the data to accessible digitized literature, we focused mostly on English literature published from 1980 onwards. Plant use information without a clear definition of the use, i.e., broad descriptions like “gynecological diseases” or “women’s health,” was not included in our review. Our geographical scope was restricted to countries or regions with detailed usage documents of medicinal plants. Our geographical review aimed to spread geographical coverage as much as possible over the continent, and used the most representative papers on this subject for each country/region (preferably the papers published in peer-reviewed journal and citing substantial ethnobotanical practices regarding our subject). The literatures cited in this article are evaluated according to the requirements of the four pillars of best practice in ethnopharmacology (www.frontiersin.org/files/pdf/4_pillars_FULL_TEXT.pdf).

2.2 Methods of Screening Shortlisted Species

Relevant plants from the selected papers were entered in separate excel files for each of the five continents. Columns contained the four usage categories and rows represented the species. Individual cells contained the number of papers in which a particular use category for a particular species was reported. Scientific and author names were validated by the Plant List (http://www.theplantlist.org), and synonyms were merged. The most salient plants were defined as those most frequently cited in the literature (number of papers citing this species) and those mentioned for the most use categories. When describing the different countries and regions alphabetical order was applied in this paper, and Tables involving less than 20 kinds of medicinal plants are placed in the text, and tables involving more than 20 kinds of medicinal plants are provided as Supplementary Material.

3 RESULTS

3.1 Ethnical Herbal Medicine Used for Premenstrual Syndrome

PMS is defined as a condition with emotional, physical, and behavioral symptoms that increase in severity during the luteal phase of the menstrual cycle and resolve by the end of menstruation. By definition, there must be a symptom-free interval after menstruation and before ovulation. Generally, symptoms are observed up to 14 days before the start of menses, causing impairment of life, with anger and irritability...
being the most severe and long lasting symptoms. The exact cause of PMS is unknown (Gnanasambanthan and Datta, 2019). However, studies have shown that 3–8% of menstruating women are affected by PMS and that 15–20% of women meet the criteria for subclinical PMS (O’Brien et al., 2011). A review reported incidences of PMS globally are 40, 85, 46, and 60% for Europe, Africa, Asia, and South America, respectively (Direkvand Moghadam et al., 2013).

The management of PMS is generally performed in a step-wise manner from non-pharmacological strategies, antidepressant medications, and hormonal strategies, with surgical options being considered as a last resort (Walsh et al., 2015). Studies have shown a more sustained but less rapid improvement with the use of selective serotonin reuptake inhibitors (SSRIs). Vitamin B6 is also well-known as the first-line treatment for PMS (Kashanian et al., 2007). However, peripheral neuropathy of pyridoxine is characterized at doses greater than 200 mg/day (Vrolijk et al., 2017). Therefore, herbs with lower costs, better benefits, and lesser side effects have become complementary and alternative treatments for women to improve PMS.

As a concept, PMS was put forward by western medicine doctors 70 years ago, and only a handful of herbal medicines are recorded in Western countries for the treatment (Gnanasambanthan and Datta, 2019). In Western countries, anti-depressive drugs, hormonal treatment, and analgesics dominate the treatment of PMS; and plant extracts such as Vitex agnus-castus is commonly considered as an alternative therapy in English-speaking countries (Weisz and Knaapen, 2009).

In China, the use of Chinese herbal medicine (CHM) is very common in the treatment of PMS. Liver qi stagnation and Yin Blood deficiency are proposed as the most common root causes of PMS, and the fundamental treatment principles for PMS involve measures to regulate Liver qi to resolve stagnation and tone blood (Chou and Morse, 2005). The most common medicines for the relief of PMS are Chaihu (Bupleuri chinense DC.), Xiuling (Cyperus rotundus L.), Danxiao (Angelicae sinensis (Oliv.) Diels), Baishao (Paeonia lactiflora Pall.), and formulas such as Xiao Yao Powder and Jiawei Xiaoyao Powder (JXP). In Taiwan, JXP-centered CHM combinations were most commonly prescribed for PMS. The top 10 most commonly used single herbs for PMS are Cyperus rotundus L., Leonurus japonicus Houtt. (Oriental motherwort), Corydalis yanhusuo (Y. H. Chou and Chun C. Hsu) W. T. Wang ex Z. Y. Su and C. Y. Wu, Salvia miltiorrhiza Bge., Eucommia ulmoides Oliv., Scutellaria baicalensis Georgi, Dipsacus asperoides C. Y. Cheng at T. M. Ai, Cuscuta chinensis Lam. or Cuscuta japonica Choisy, Pueraria lobata (Willd.) Ohwi, Paeonia × suffruticosa Andrews. The top five most commonly used herbal formulas for the treatment of PMS are JXP, Danxiao Shaoxiao Powder, Guizhi Fuling Pills, Wenjing Decoction, and Shaofu Zhuyu Decoction (Chen et al., 2014). The ingredients of these Chinese herbal formulas are listed in Table 1.

In Iran, Salvia officinalis L. extract appears to be more effective in reducing the physical and psychological symptoms associated with PMS, when compared to placebo (Abdnezhad et al., 2019). Vitex agnus-castus L and Hypericum perforatum L. with lower doses of vitamin B6 are well tolerated and effective drugs to treat females with moderate to severe premenstrual syndrome in Iran (Ghazanfarpour et al., 2016). In Persian traditional medicine, saffron (dried stigma of Crocus sativus L.) is used for depression, which has been confirmed by modern medicine to be achieved through a serotonergic mechanism (Agha-Hosseini et al., 2008). A review about treatments in Iran has shown a reduction in PMS symptoms after consumption Hypericum perforatum L. (St. John’s wort), Vitex agnus-castus L. (Chasteberry), Crocus sativus L. (saffron), Ginkgo biloba L. (ginkgo), and soy and Flax (Golmakani et al., 2010). This is consistent with the data that we collected.

In Japan, Kampo medicine is the most preferred treatment choice for PMS. Kampo is a part of the official Japanese medical system and it is used alone or in combination with Western medicine for the treatment of complex health conditions, such as chronic health problems, age-related health problems, and lifestyle or stress-related disorders. We recorded 22 types of kampo’s that are the most commonly used ingredients (single herb) in PMS (Gepstein et al., 2008) as shown in Table 2. Inochinohaha White is considered a medicine primarily used to treat PMS by attenuating anxiety-like behavior through GABA receptor and brain-derived neurotrophic factor expression, which composed of 11 herbs: Angelica sinensis (Oliv.) Diels, Paeonia lactiflora Pall., Atractylodes lancea (Thunb.) DC., Cinnamomum verum J. Presl, Rheum palmatum L., Panax ginseng C. A. Meyer, Cnidium monnieri (L.)CUS, Poria cocos (Schw.) Wolf, Alisma plantago-aquatica L., Paeonia suffruticosu Andr. and Prunus persica (L.) Batsch (Iba et al., 2021).

In Korea, herbal medicines for the treatment of PMS are Hypericum perforatum L. (St. John’s Wort), Odor of Crocus sativus L. (saffron), Vitex agnus-castus L. (Chasteberry), Ginkgo biloba L. (ginkgo), Cirsium japonicum (Thunb.) Fisch. ex DC. (Cirsii Japonici Herba Carbonisata), Elsholtzia splendens Nakai ex F. Maekawa (Jang et al., 2012).

In South Africa, the pharmaceutical application of valerian (Valeriana officinalis L.) for the treatment of PMS is due to its sedative, anticonvulsant, hypnotic effects, and anxiolytic activity (Ghaderi and Jafari, 2014).

In summary, the most commonly used formula for the treatment of PMS in China is JXP. The most commonly used single herbs in the formulation are Cyperus rotundus L. and Angelica sinensis (Oliv.) Diels. In Western countries such as the United States, Vitex agnus-castus L. (chasteberry) and Matricaria chamomilla L. (chamomile) are regarded as the most available herbal alternative therapies.

### 3.2 Ethnic Herbal Medicine Used for Dysmenorrhea

Dysmenorrhea refers to the pain and swelling in the lower abdomen before and after menstruation or during menstruation, accompanied by backache or other discomfort (French, 2005). There are two types of dysmenorrhea: Primary dysmenorrhea refers to pain with no obvious pathological pelvic disease, whereas Secondary dysmenorrhea is caused by underlying pelvic conditions or pathology. Primary dysmenorrhea is considered to be caused by the release of
TABLE 2 | The ingredients of the Chinese herbal formulas.

| Name                        | Number of ingredients | Ingredients                                                                                     | References                  |
|-----------------------------|-----------------------|-----------------------------------------------------------------------------------------------|-----------------------------|
| Danggui Shaoyao Powder      | 6                     | Paeoniae Radix Alba (Paeonia lactiflora Pall.), Chuanxiong Rhizoma (Ligusticum chuanxiong Hort.), Alismatis Rhizoma (Alisma orientale(Sam.)Juzep.), Angelicae Sinensis Radix (Angelica sinensis (Oliv.) Deis), Poria (Poria cocos (Schw.) Wolf), and Atractylodis Rhizonma alba. (Atractylodes macrocephala Koiz.) | Lee HW et al. (2016)         |
| Guizhi Fuling Pills         | 5                     | Cinnamomi Cortex (Cinnamomum cassia Presl), Poria (Poria cocos(Schw.)Wolf), Moutan Cortex (Paonia suffrutcosa Andr.), Paoniae Radix Alba (Paeonia lactiflora Pall.), and Persicae semen (Prunus persica (L.) Batsch) | Sun et al. (2016)           |
| GeGen Decoction             | 7                     | Puerariae Lobatae Radix/Pueraria lobata(Wilk.)Ohwi), Ephedrae Herba (Ephedra sinica Stapf), Cinnamomi Cortex (Cinnamomum cassia Presl), Paoniae Radix Alba (Paeonia lactiflora Pall.), Glycyrrhize Radix Et Rhizoma (Glycyrrhiza uralensis Fisch.), Moutan Cortex (Paonia suffrutcosa Andr.), Gardeniae Fructus (Gardenia jasminoides Ellis), Memnhae Haplocaulys Herba (Menthae canadensis L.) | Chai et al. (2020)          |
| Jiawei Xiaoyao Powder       | 9                     | Bupleuri Radix (Bupleurum chinense DC.), Angelicae Sinensis Radix (Angelica sinensis (Oliv.) Deis), Paoniae Radix Alba (Paeonia lactiflora Pall.), Atractylodis Rhizoma (Atractylodes macrocephala Koiz.), Smilacis Glabrae Rhizoma (Smilax glabra Roxb.), Glycyrrhize Radix Et Rhizoma (Glycyrrhiza uralensis Fisch.), Moutan Cortex (Paonia suffrutcosa Andr.), Gardeniae Fructus (Gardenia jasminoides Ellis), Menthae Haplocaulys Herba (Menthae canadensis L.) | Li et al. (2019)            |
| Shaofu Zhuyu Decoction      | 10                    | Foeniculi Fructus (Foeniculum vulgare Mill.), Rhizoma Zingiberis recens (Zingiber officinale Roscoe), Cinnamomum Cortex (Cinnamomum cassia Presl), Paoniae Radix Alba (Paeonia lactiflora Pall.), Angelicae Sinensis Radix (Angelica sinensis (Oliv.) Deis), Chuanxiong Rhizoma (Ligusticum chuanxiong Hort.), Myrrh (commiphora myrrha Engil.), Corydalis Rhizoma (Corydalis yanhusuo W. T. Wang), Typhae Pollen (Typha angustifolia L.), and Faeces Trogopterpri (Trogopterus xanthipes Milne Edwards) | Lee H et al. (2016)         |
| Wenjing Decoction           | 12                    | Asini Cori Colla (Equis asinus L.), Ophiopogonis Radix (Ophiopogon japonicus (L. f) Ker-Gawl.), Pinelliae Rhizoma (Pinellia ternata (Thunb.) Brert.), Angelicae Sinensis Radix (Angelica sinensis (Oliv.) Deis), Glycyrrhize Radix Et Rhizoma (Glycyrrhiza uralensis Fisch.), Cinnamomum Cortex (Cinnamomum cassia Presl), Paoniae Radix Alba (Paeonia lactiflora Pall.), Chuanxiong Rhizoma (Ligusticum chuanxiong Hort.), Gynostegi Radix Et Rhizoma (Panax ginseng C. A. Mey), Moutan Cortex (Paonia suffrutcosa Andr.), Euodiae Fructus (Euodia rutaecarpa (Juss.) Benth. and Rhizoma Zingiberis recens (Zingiber officinale Roscoe) | Guo et al. (2017)           |
| Xiaoyao Powder              | 8                     | Bupleuri Radix (Bupleurum chinense DC.), Radix Angelicae Sinensis Radix (Angelica sinensis (Oliv.) Deis), Paoniae Radix Alba (Paeonia lactiflora Pall.), Atractylodis Rhizoma (Atractylodes macrocephala Koiz.), Poria (Poria cocos (Schw.) Wolf), Glycyrrhize Radix Et Rhizoma (Glycyrrhiza uralensis Fisch.), Memnhae Haplocaulys Herba (Menthae canadensis L.), and Rhizoma Zingiberis recens (Zingiber officinale Roscoe) | Liu et al. (2021)           |

TABLE 2 | Japanese herbal medicine for treating premenstrual syndrome.

| Family                   | Scientific name                                      | Used part | Habit |
|--------------------------|------------------------------------------------------|-----------|-------|
| Lauraceae                | Cinnamomum cassia (L.) J. Presi                     | Bark      | Tree  |
| Paeoniaceae              | Paeonia lactiflora Pall.                            | Root      | Herb  |
| Rosaceae                 | Prunus persica (L.) Batsch                           | Seed      | Tree  |
| Paeoniaceae              | Paeonia × suffrutcosa Andrews                       | Bark      | Shrub |
| Asteraceae/Compositae    | Atractylodes lancea (Thunb.) DC.                    | Rhizome   | Herb  |
| Alismatensae             | Alisma orientalis (Sam.) Juzep.                     | Rhizome   | Herb  |
| Polyoporidae             | Poria cocos (Schw.) Wolf                            | Root      | Herb  |
| Apiaceae                 | Ligusticum chuanxiong Hort.                         | Rhizome   | Herb  |
| Apicae                   | Angelica acutabla var. lineanloba (Kttag.) Hickio   | Root      | Herb  |
| Papaveraceae             | Corydalis yanhusuo (Y. H. Chou and Chun C. Hsu) W. T. Wang ex Z. Y. Su and C. Y. Wu | Tuber    | Herb  |
| Ostreidae                | Ostrea gigas thunberg                               | Root      | Herb  |
| Fabaceae                 | Glycyrrhiza uralensis Fisch.                         | Root      | Herb  |
| Zingiberaceae            | Amomum villosum var. xanthoides (Wall. ex Baker) T. L. Wu and S. J. Chen | Semen    | Herb  |
| Araiaceae                | Panax ginseng C. A. Meyer                           | Root      | Herb  |
| Araceae                  | Pinellia ternata (Thunb.) Breit                     | Tuber     | Herb  |
| Rutaceae                 | Auranti Nobiles Pericarpium                         | Peel      | Tree  |
| Zingiberaceae            | Zingiber officinale Roscoe                          | Rhizome   | Herb  |
| Polyoporidae             | Polyporus umbellatus                                 | Root      | Herb  |
| Apiaceae                 | Foeniculum vulgare Mill.                            | Seed      | Herb  |
| Zingiberaceae            | Alpinia officinarum Hance                           | Rhizome   | Herb  |
| Rhamniaceae              | Ziziphus jujuba Mill.                               | Fruit     | Tree  |
prostaglandins in the menstrual fluid, which causes uterine contractions and pain. The reported prevalence of dysmenorrhea of any severity varies between 16 and 91% in women of reproductive age (Ju et al., 2014). Females who suffer from dysmenorrhea widely use non-steroidal anti-inflammatory drugs that reduce muscle spasm by inhibiting prostaglandin synthesis and vasopressin secretion (Sosoburam et al., 2019). In Western medicine, the main treatment trends tend to relieve prostaglandins synthesis and suppress their production from biosynthesis.

Native Americans commonly used whole plants of Artemisia californica Less. and fruits of Rhus glabra L. made a decoction to treat dysmenorrhea (Schmid and Moerman, 1998). Native American plants such as black haw (Viburnum prunifolium L.) and Viburnum opulus L. also utilized to treat painful menstruation (Lans et al., 2018).

According to the theories of CHM, the main cause of dysmenorrhea is Qi stasis caused by the invasion of the six exogenous pathogenic factors. Qi stasis results in the blockage of blood flow, which further leads to blood stasis and lumps. GeGen Decoction, Danggui Shaoyao Powder, and Guizhi Fuling Pills are the famous Chinese prescriptions that are widely used in China to treat primary dysmenorrhea (Sosoburam et al., 2019). The ingredients of the Chinese herbal formulas are listed in Table 1. There are six types of Yao medicine used in treating dysmenorrhea, and among these three types of medicinal parts of plants are whole plants. Yao women are the best at using medicine baths to treat gynecological diseases, which is their ancient inheritance method (Long and Li, 2004; Li et al., 2006). As a famous herbal medicine used by Tujia and Miao Nationality, Panax japonicus (T. Nees) C. A. Mey is widely used for treating dysmenorrhea by local people (Deng et al., 2020). In Taiwan, Danggui Shaoyao Powder is the most frequently used formula that is prescribed by CHM doctors in Taiwan for treating menstrual cramps. The research shows that, among women with primary dysmenorrhea, CHM treatment is widely accepted by women in different ages, particularly those aged 21–30 years or those from lower income groups (Pan et al., 2014).

In India, a total of 38 types of herbs for the treatment of dysmenorrhea were collected from four pieces of literature (Jadhav and Bhutani, 2005; Vidyasagar and Prashantkumar, 2007; Bhatia et al., 2015; Das et al., 2015). Plants from the Asteraceae family are the main ones used to prepare dosages in the forms of decoction and infusion. Generally, they are administered orally. The leaf is the most important part of the plant that is used for medicinal purposes. Among them, 23 species are herbs, nine species are trees and two species are shrubs. Vitex negundo L. is the plant with the highest usage frequency. These four plants have been used in more than two countries: Artemisia vulgaris L., Achyranthes aspera L., Matricaria chamomilla L., and Foeniculum vulgare Mill. Artemisia vulgaris L. has been used to treat dysmenorrhea in India, Italy and Vietnam. Its multiple parts are effective in the treatment of dysmenorrhea.

In Italy, a total of 53 types of herbs were noted for the treatment of dysmenorrhea (Motti et al., 2019). The most common family of the plants are Asteraceae. The main forms of dosages are decoction and infusion. The most commonly used route of administration is oral administration. The most common medicinal parts are leaves. Among them, 37 species are herbs, eight species are trees, two species are shrubs and two species are vines. The herbal remedies mostly used for dysmenorrhea disorders are chamomile (Matricaria chamomilla L.), maidenhair fern (Adiantum capillus-veneris L.), yarrow (Achillea millefolium L.), and laurel (Laurus nobilis L.), which are taken orally, or as an infusion or decoction.

In South Africa, 30 types of plants are used to treat dysmenorrhea (Steenkamp, 2003). Roots are the medicinal parts of a majority of herbs. The most common dosage form is decoction. South Africa has a rich species of the herbs and most of them are local and unique species, such as Commelina africana L. Further, most of their names are related to the functional significance of the respective plants, such as Pterocarpus angolensis DC. (bloodwood), which is will used to treat dysmenorrhea, menorrhagia, and related diseases in South Africa. Euclea crispa Thunb. Gurke is administered as enemas.

Herbs used in other countries to treat dysmenorrhea are listed in Table 3. See the Supplementary Material "Dysmenorrhea” for other specific contents.

This section contains a total of 80 families and 217 species of plants from 16 countries and regions that are used for the treatment of dysmenorrhea. Asteraceae is the most commonly used among such species and there are five plants that have records of treating dysmenorrhea in three countries Ruta graveolens L. can treat dysmenorrhea and this is mentioned in two Brazilian documents. Italian women use its aerial parts to make decoctions, while women from Trinidad and Tobago use its leaves. Leaves, flowers, stems, and fruits of Artemisia vulgaris L. are used in India to treat dysmenorrhea and amenorrhea. The fresh whole plant is used by Vietnamese women, while Italian women use its aerial parts to make an infusion to treat dysmenorrhea. Considering Cyperus rotundus L., Indian women use its root and rhizome, while Pakistani women use the whole plant to make a decoction for oral administration and Yunnan Yao women in China use its root. Considering Foeniculum vulgare Mill. (Fennel), Pakistani women use its leaves and fruits orally; Iranian women use its roots, leaves, and fruits; Italian women use a decoction made from its seeds; and Chinese women use its dried and mature fruit. All three countries use the rhizome of Zingiber officinale Roscoe (ginger) to treat menstrual pain but the dosage forms are different: Malaysians make a lotion, Indians make a decoction, and Iranians make a powder.

### 3.3 Ethnic Herbal Medicine Used for Amenorrhea

Amenorrhea (loss of menstrual period) is the absence of menstruation or absence of periods. There are two types of amenorrhea: Primary amenorrhea and Secondary amenorrhea. Primary amenorrhea can be diagnosed if a patient has normal secondary sexual characteristics but no menarche by 16 years of age. Secondary amenorrhea is the absence of menses for 3 months in women with previously normal menstruation and for
| Country/Region | Family            | Scientific name                  | Used part             | Preparation       | Application       | Habit   | References                          |
|----------------|-------------------|----------------------------------|-----------------------|-------------------|-------------------|---------|-------------------------------------|
| America        | Adoxaceae         | Viburnum prunifolium L.          | —                     | —                 | —                 | Shrub   | Lans et al. (2018), Schmid and Moerman (1998) |
| America        | Lauraceae         | Viburnum opulus L.               | —                     | —                 | —                 | Shrub   |                                      |
| America        | Asteraceae        | Artemisia californica Less.      | Whole plant           | Decoction         | —                 | Herb    |                                      |
| America        | Anacardiaceae     | Rhus glabra L.                   | Fruit                 | Decoction         | —                 | Shrub   |                                      |
| Brazil         | Apiaceae          | Coriandrum sativum L.            | Seed                  | Infusion          | —                 | Herb    | Di Stasi et al. (2002), Bieski et al. (2015) |
| Brazil         | Apiaceae          | Pimpinella anisum L.             | —                     | —                 | —                 | Herb    |                                      |
| Brazil         | Aristolochiaceae  | Aristolochia cymbifera Mart. and Zucc. | —                     | —                 | —                 | Shrub   |                                      |
| Brazil         | Asteraceae        | Ageratum conyzoides L.           | Root                  | Infusion          | —                 | Herb    |                                      |
| Brazil         | Euphorbiaceae     | Jatropha curcas L.               | —                     | —                 | —                 | Shrub   |                                      |
| Brazil         | Fabaceae          | Copaifera langsdorffii Desf.    | —                     | —                 | —                 | Tree    |                                      |
| Brazil         | Apiaceae          | Coriandrum sativum L.            | Infusion              | —                 | —                 | Herb    |                                      |
| Brazil         | Lamiaceae         | Hyptis crenata Pohl. Ex. Benth.  | Root                  | Infusion          | —                 | Herb    |                                      |
| Brazil         | Lamiaceae         | Mentha x piperita L.             | —                     | —                 | —                 | Herb    |                                      |
| Brazil         | Lamiaceae         | Orianum majorana L.              | —                     | —                 | —                 | Herb    |                                      |
| Brazil         | Lauraceae         | Cinnamomum verum J. Presl        | —                     | —                 | —                 | Tree    |                                      |
| Brazil, India, Trinidad and, Tobago | Rutaceae        | Ruta graveolens L.               | Aerial part, whole plant (India), leaf (Brazil, India, Trinidad and Tobago) | Infusion (Brazil) | Orally | Herb | Long and Li (2004), Li et al. (2006) |
| Brazil, India, Trinidad and, Tobago | Lamiaceae        | Leonotis nepetifolia (L.) R. Br. | —                     | —                 | —                 | Herb    |                                      |
| China          | Apiaceae          | Angelica dahurica (Fisch. ex Hoffm.) Berth. et Hook. f. ex Franch. et Sav | Root                  | —                 | —                 | Herb    |                                      |
| China          | Araceae           | Acorus tatarinowii Schott        | Whole plant           | Decoction or medicine bath | Topically | Herb |                                      |
| China          | Fabaceae          | Cordalia ferringinea Grah. ex Benth. | Whole plant           | Decoction or medicine bath | Topically | Herb |                                      |
| China          | Lamiaceae         | Bryophyllum pinnatum (L.F.) Oken | Whole plant           | Decoction or medicine bath | Topically | Herb |                                      |
| China          | Lamiaceae         | Leonurus artemisia (Laur.) S. Y. Hu F | Aerial part           | —                 | —                 | Herb    |                                      |
| China          | Ranunculaceae     | Clematis chrysocoma Franch.      | Woody stem            | Decoction or medicine bath | Topically | Herb | Vine | Mirabi et al. (2014) |
| Iran           | Apiaceae          | Echinophora platyloba DC.        | —                     | —                 | —                 | Herb    |                                      |
| Iran           | Asteraceae        | Achilea wilhelmsi L.             | —                     | —                 | —                 | Herb    |                                      |
| Iran           | Lamiaceae         | Stachys lavandulifolia Vahl      | —                     | —                 | —                 | Herb    |                                      |
| Iran           | Lamiaceae         | Zataria multiflora Boiss.        | —                     | —                 | —                 | Herb    |                                      |
| Iran           | Lauraceae         | Cinnamomum verum J.Presl         | —                     | —                 | —                 | Tree    |                                      |
| Iran           | Rhamnaceae        | Cuminum cymarinum L.             | —                     | —                 | —                 | Herb    |                                      |
| Iran           | Valerianaceae     | Valeriana officinalis L.         | —                     | —                 | —                 | Herb    |                                      |
| Iran           | Verbenaceae       | Vitex agnus-castus L.            | —                     | —                 | —                 | Shrub   |                                      |
| Iran           | Asteraceae        | Matricaria chamomilla L.         | —                     | —                 | —                 | Herb    |                                      |
| Iran           | Zingiberaceae     | Zingiber officinalis Roscoe      | Rhizome               | Powder            | Orally           | Herb    |                                      |
| Iran, Pakistan | Apiaceae          | Foeniculum vulgare Mill.         | Root, leaf (Iran, Pakistan), fruit (Iran, Pakistan) | — | Orally (Pakistan) | Herb | Ullah et al. (2014), Aziz et al. (2018), Tariq et al. (2018), Islam et al. (2021) |
| Pakistan       | Asteraceae        | Achilea millefolium L.           | Leaf, root            | Powder + water or milk | —                 | Herb    |                                      |
| Pakistan       | Amaranthaceae     | Achyranthes aspera L.            | —                     | —                 | —                 | Herb    |                                      |
| Pakistan       | Poaceae/ Gramineae | Arundo donax L.                  | Stem, leaf, fruit     | Powder + water or milk | —                 | Herb    |                                      |
(Continued on following page)
TABLE 3 | (Continued) Herbal medicine for treating dysmenorrhea.

| Country/Region | Family | Scientific name | Used part | Preparation | Application | Habit | References |
|----------------|--------|-----------------|-----------|-------------|-------------|-------|------------|
| Pakistan       | Asteraceae | Erigeron bonariensis L. | Whole plants, oil, shoot, leaf | Infusion | — | Herb |
| Pakistan       | Boraginaceae | Arabis hipidissima (Lehm.) A.D.C. | Whole plant | Diffusion and decoction | — | Herb |
| Pakistan       | Convulvulaceae | Ipomoea caracpe R. Br. | Leaf, Root | — | — | Shrub |
| Pakistan       | Cyperaceae | Cyperus rotundus L. | Whole plant (Pakistan), root (India), rhizome | Decoction | — | Herb |
| Pakistan       | Euphorbiaceae | Euphorbia serpens Kunth | Whole plant | — | Orally | Herb |
| Pakistan       | Moraceae | Ficus benghalensis L. | Latex, Bark, Fruit | — | — | Tree |
| Pakistan       | Nyctaginaceae | Boerhavia procumbens | Whole plant | Juice | Orally | Herb |
| Pakistan       | Plantaginaceae | Veronica agrestis L. | Whole plant | Decoction | Orally | Herb |
| Poland         | Asteraceae | Ambrosia elatar L. | Leaf, stem | — | — | Herb |
| Poland         | Asteraceae | Matricaria recutta L. | Aerial part | Infusion | — | Herb |
| Poland         | Asteraceae | Tanacetum parthenium (L.) Sch. Bip | Aerial part, aerial part | Infusion | — | Herb |
| Poland         | Lamiaceae | Cunila microcephala | Leaf, stem | Infusion | — | Herb |
| Poland         | Lamiaceae | Ocimum sp. | Leaf, stem | Infusion | — | Herb |
| Poland         | Asteraceae |楼梯植物 | Leaf, stem | Infusion | — | Herb |
| Poland         | Poaceae/Grass | Saccharum officinarum L. | Leaf | Infusion, mate, poultice | — | Herb |
| Romania        | Rosaceae | Fragnia vesca L. | Leaf | Infusion | — | Herb |
| Romania        | Araliaceae | Hedera helix L. | Leaf, stem | Infusion | Orally | Vine |
| Thailand       | Arevaceae | Acrocalamus L. | Rhizome | — | — | Herb |
| Thailand       | Liliaceae | Allium sativum L. | Clove | — | — | Herb |
| Thailand       | Zingiberaceae | Boesenbergia rotunda (L.) Mansf. | Rhizome | — | — | Herb |
| Thailand       | Zingiberaceae | Curcuma zedoaria (Christm.) Roscoe | Rhizome | — | — | Herb |
| Thailand       | Myristiceae | Myristica fragrans Houtt. | Seed | — | — | Tree |
| Trinidad and Tobago | Myristiceae | Zingiber montanum (J. Koernig) Link ex A. Dett. | Rhizome | — | — | Herb |
| Trinidad and Tobago | Apiceae | Eryngium foetidum L. | Leaf | — | — | Herb |
| Trinidad and Tobago | Asteraceae | Aristolochia triobata L. | Root | — | — | Herb |
| Trinidad and Tobago | Arevaceae | Ambrosia peruviana Willd. | — | — | — | Herb |
| Trinidad and Tobago | Boraginaceae | Cordia curassavica | Leaf | — | — | Herb |
| Trinidad and Tobago | Rubiaceae | Cryptosiphon vahl | Leaf | — | — | Herb |
| Trinidad and Tobago | Fabaceae | Entada polysystachya (L.) DC. | Twigs | — | — | Vine, |
| Trinidad and Tobago | Scrophulariaceae | Caparina biflora L. | Leaf | — | — | Herb |
| Uganda         | Alocaceae | Aloe vera L. | Leaf | Decoction | Orally | Herb |
| Uganda         | Amanthaceae | Aerva lanata (L.) Schult. | Leaf | Decoction | Orally | Herb |
| Uganda         | Asteraceae | Vernonia amygdalina Del. | Leaf, root | Decoction | Orally | Shrub |
| Uganda         | Bignoniaceae | Markhamia lutea K. Schum. | Bark | Decoction | Orally | Tree |
| Uganda         | Caesalpiniaceae | Cassia occidentalis L. | Leaf, root | Decoction | Orally | Herb |
| Uganda         | Chenopodiaceae | Chenopodium opuntiforme DC. | Leaf, bark, stem, seeds | Decoction | Orally | Herb |
| Uganda         | Convolvulaceae | Ipomoea batatas (L.) Lam. | Leaf, root tuber | Decoction | Orally | Herb |
| Uganda         | Euphorbiaceae | Manihot esculenta Crantz. | Leaf | Decoction | Orally | Shrub |
| Uganda         | Fabaceae | Erythrina abyssinica L. | Leaf, bark, flower | Decoction | Orally | Tree |

(Continued on following page)
9 months in women with oligomenorrhea previously (Master-Hunter and Heiman, 2006). Secondary amenorrhea is more common than primary amenorrhea. The normal menstrual cycle involves a complex interaction between the hypothalamic-pituitary-ovarian axis; any disruption in this interaction can cause amenorrhea (Edmonds, 2007). Among women of reproductive age, the prevalence of amenorrhea ranged from approximately 5–13% (Harlow and Campbell, 2004). Hormonal therapy based on estrogen and progesterone compounds is the mainstay of the treatment for such conditions (Bergeron et al., 2010).

In native American herbs used to treat amenorrhea, the roots of *Acorus calamus* L. are made into infusion, while the rhizomes of *Acorus calamus* L. are used for the treatment of amenorrhea in Thailand (Schmid and Moerman, 1998).

CHM often uses herbs that promote blood circulation, remove blood stasis, regulate menstruation and relieve pain to treat amenorrhea. Generally, these herbs can simultaneously treat blood stasis, regulate menstruation and relieve pain to treat dysmenorrhea.

From TPM viewpoint, anatomical and functional disorders (mal-temperaments) system are the main causes of oligomenorrhea and amenorrhea (Rahimi and Ardekani, 2013). The most prevalent temperaments of plants used to treat amenorrhea in Iranian medicine were warm and dry. *Foeniculum vulgare* Mill., *Mentha longifolia* (L.) L., *Paonia lactiflora* Pall., *Sesamum indicum* L., and *Vitex agnus-castus* L. are the five most effective and documented herbs for treating amenorrhea (Moini Jazani et al., 2018).

In South Africa, plants belonging to 15 families are used for the treatment of amenorrhea. The most common plant families reported are the Fabaceae (five species) and Asteraceae (two species). *Asparagus Buchananii* Baker is burnt and its smoke is directed into the vagina. *Boscia Foetida* Schinz shows potential toxicity with hemorrhagic diarrhea. Powdered plant material is also applied to underwear: *Albizia Brevifolia* Schinz, *Brackenridgea Zanguebarica* Oliver, and *Pterocarpus Angolensis* DC. are used for all for the treatment of amenorrhea (Steenkamp, 2003). The roots of *Rhoeicissus Digitata* (L. f.) Gilg and M. Brandt are chopped and mixed with the same number of chopped roots of *Bridelia Cathartica* G. Bertol. and *Peltophorum Africanum* Sond. Four handfuls of the mixed plant material are boiled in 5 L of water for 1 h in a pot with a lid on. Half a cup of the decoction is taken orally two to three times a day (depending on

### Table 3 (Continued) Herbal medicine for treating dysmenorrhea.

| Country/Region | Family         | Scientific name | Used part       | Preparation | Application | Habit  | References         |
|----------------|----------------|-----------------|-----------------|-------------|-------------|--------|-----------------|
| Uganda         | Fabaceae       | *Indigofera arrecta* A. Rich. | Leaf, root     | Decoction   | Orally      | Shrub  |                  |
| Uganda         | Fabaceae       | *Pseudanthia Hookeri* | Leaf            | Decoction   | Orally      | Shrub  |                  |
| Uganda         | Malvaceae      | *Gossypium hirsutum* L. | Root            | Decoction   | Orally      | Herb   |                  |
| Uganda         | Malvaceae      | *Pavonia burchelli* (DC.) R.A. Dyer | Leaf | Decoction | Orally | Shrub  |                  |
| Uganda         | Moraceae       | *Ficus natalensis* Hochst. | Aerial parts, leaf | Decoction  | Orally      | Tree   |                  |
| Uganda         | Myrtaceae      | *Eucalyptus citriodora* Hook. | Leaf, fruit,gum | Decoction   | Orally      | Tree   |                  |
| Uganda         | Myrtaceae      | *Eucalyptus globulus* Labill. | Leaf            | Decoction   | Orally      | Tree   |                  |
| Uganda         | Myrtaceae      | *Eucalyptus grandis* W.Hill. | Leaf            | Decoction   | Orally      | Tree   |                  |
| Uganda         | Umbellifera    | *Daucus carota* L. | Root tuber      | Decoction   | Orally      | Herb   |                  |
| Uganda         | Vitaceae       | *Cyphostenum adenocaulus Wild and Drum.* | Leaf, root | Decoction | Orally | Herb   |                  |
| Uganda         | Zingiberaceae  | *Zingiber officinale* Roscoe | Root tuber     | Decoction   | Orally      | Herb   | Kurian (2012)   |
| Vietnam        | Asteraceae     | *Artemisia vulgaris* L. | Fresh           | —           | —           | Herb   |                  |
| Vietnam        | Apiaceae       | *Centella asiatica* L. | Whole plant     | —           | —           | Herb   |                  |

(Kogure, 2011). The ingredients of the Japanese herbal formulas are listed in Table 4.

Traditional Persian medicine (TPM), as a holistic system of medicine and based on temperament, has been used in Iran since thousands of years ago (Hosseinikhani et al., 2021). Temperament is made of action and reaction of four pivotal elements (fire, air, water, and soil) and creates different characteristics in living things. In TPM, temperament has been classified in different types: hot, cold, wet, and dry (Akhtari et al., 2020). Amenorrhea, oligomenorrhea, and hypomenorrhea are defined as “Ehtebas Tams” in TPM. From TPM viewpoint, anatomical and functional disorders (temperaments) system are the main causes of oligomenorrhea and amenorrhea (Rahimi and Ardekan, 2013). The most prevalent temperaments of plants used to treat amenorrhea in Iranian medicine were warm and dry.
### Table 4: Herbal Medicine for Treating Amenorrhea

| Country/Region | Family          | Scientific name                  | Used part               | Preparation | Application       | Habit  | References                  |
|----------------|-----------------|----------------------------------|-------------------------|-------------|-------------------|--------|-----------------------------|
| America        | Acoraceae       | Acorus calamus L.                | Root                    | Infusion    |                    | Herb   | Schmid and Moerman (1998)   |
| America        | Cannabaceae     | Cannabis sativa L.               | Whole plant             | Decoction   |                    | Tree   |                            |
| America        | Clusiaceae      | Euonymus americana var. coronata| Root                    | Decoction   |                    | Shrub  |                            |
| America        | Fabaceae        | Phaseolus vulgaris subsp. nigra(L.) Ehrh. | Whole plant             | Decoction   |                    | Herb   |                            |
| America        | Flaxaceae       | Linum usitatissimum L.           | Leaf                    | Juice       | Occasionally      | Shrub  |                            |
| Bangladesh     | Amaranthaceae   | Amaranthus spinosus L.           | Root                    | Juice       | Occasionally      | Herb   | Kadir et al. (2014)         |
| Bangladesh     | Apocynaceae     | Catharanthus roseus (L.) G. Don. | Root                    | Juice       | Occasionally      | Subshrub|                            |
| Bangladesh     | Boraginaceae    | Eclipta prostrata L.             | Leaf                    | Juice       |                    | Shrub  |                            |
| Bangladesh     | Malvaceae       | Urena lobata L.                  | Root                    | Juice       | Occasionally      | Subshrub|                            |
| Bangladesh     | Moraceae        | Styrax asper L.                  | Root                    | Juice       | Occasionally      | Shrub  | Tree                       |
| India          | Acanthaceae     | Acanthus spinosus L.             | Root                    | Juice       | Occasionally      | Herb   |                            |
| India          | Apocynaceae     | Croton bonplandianus              | Root                    | Juice       | Occasionally      | Shrub  |                            |
| India          | Arecaceae       | Areca catechu L.                 | Seed                    | Powder + Milk|                   | Tree   |                            |
| India          | Aristolochiaceae| Aristolochia bracteata Ritz.     | Leaf, Seed              | Decoction   |                    | Herb   | Das et al. (2015)           |
| India          | Brassicaceae    | Lepidium sativum L.              | Seed                    | Decoction   |                    | Herb   |                            |
| India          | Brassicaceae    | Raphanus sativus L.              | Seed                    | Powder       |                    | Herb   |                            |
| India          | Capparidaceae   | Capparis spinosa L.              | Root                    | Juice       | Occasionally      | Tree   |                            |
| India          | Cassavaeae      | Manihot utilissima L.            | Root, bark              | Powder + Milk|                   | Tree   |                            |
| India          | Chenopodiaceae  | Chenopodium album L.             | Seed                    | Filtrate    |                    | Herb   |                            |
| Italy          | Rutaceae        | Citrus limon L.                  | Leaf                    | Juice       | Occasionally      | Shrub  | Motti et al. (2019)         |
| Japan          | Acanthaceae     | Acanthus spinosus (Ohwi) Diels*  | Root                    | Decoction   |                    | Herb   | Mochi et al. (2016)         |
| Japan          | Acanthaceae     | Buphthalmus comosumbranum Will.*| Root                    | Powder       |                    | Herb   | Hirose (2011)               |
| Japan          | Asterales/Compositae | Asteraceae sp.              | Root                    | Juice       | Occasionally      | Subshrub|                            |
| Japan          | Asterales/Compositae | Atractylodes lancea (Thunb.) DC.* | Root                    | Juice       | Occasionally      | Shrub  |                            |
| Japan          | Asterales/Compositae | Atractylodes lancea (Thunb.) DC.* | Root                    | Juice       | Occasionally      | Shrub  |                            |
| Japan          | Asterales/Compositae | Atractylodes lancea (Thunb.) DC.* | Root                    | Juice       | Occasionally      | Shrub  |                            |
| Japan          | Asterales/Compositae | Atractylodes lancea (Thunb.) DC.* | Root                    | Juice       | Occasionally      | Shrub  |                            |
| Japan          | Asterales/Compositae | Atractylodes lancea (Thunb.) DC.* | Root                    | Juice       | Occasionally      | Shrub  |                            |
| Japan          | Asterales/Compositae | Atractylodes lancea (Thunb.) DC.* | Root                    | Juice       | Occasionally      | Shrub  |                            |
| Japan          | Asterales/Compositae | Atractylodes lancea (Thunb.) DC.* | Root                    | Juice       | Occasionally      | Shrub  |                            |
| Japan          | Asterales/Compositae | Atractylodes lancea (Thunb.) DC.* | Root                    | Juice       | Occasionally      | Shrub  |                            |
| Japan          | Asterales/Compositae | Atractylodes lancea (Thunb.) DC.* | Root                    | Juice       | Occasionally      | Shrub  |                            |
| Japan          | Asterales/Compositae | Atractylodes lancea (Thunb.) DC.* | Root                    | Juice       | Occasionally      | Shrub  |                            |
| Japan          | Asterales/Compositae | Atractylodes lancea (Thunb.) DC.* | Root                    | Juice       | Occasionally      | Shrub  |                            |
| Japan          | Asterales/Compositae | Atractylodes lancea (Thunb.) DC.* | Root                    | Juice       | Occasionally      | Shrub  |                            |
| Japan          | Asterales/Compositae | Atractylodes lancea (Thunb.) DC.* | Root                    | Juice       | Occasionally      | Shrub  |                            |
| Japan          | Asterales/Compositae | Atractylodes lancea (Thunb.) DC.* | Root                    | Juice       | Occasionally      | Shrub  |                            |
| Japan          | Asterales/Compositae | Atractylodes lancea (Thunb.) DC.* | Root                    | Juice       | Occasionally      | Shrub  |                            |
| Japan          | Asterales/Compositae | Atractylodes lancea (Thunb.) DC.* | Root                    | Juice       | Occasionally      | Shrub  |                            |
| Japan          | Asterales/Compositae | Atractylodes lancea (Thunb.) DC.* | Root                    | Juice       | Occasionally      | Shrub  |                            |
| Japan          | Asterales/Compositae | Atractylodes lancea (Thunb.) DC.* | Root                    | Juice       | Occasionally      | Shrub  |                            |
| Japan          | Asterales/Compositae | Atractylodes lancea (Thunb.) DC.* | Root                    | Juice       | Occasionally      | Shrub  |                            |
| Japan          | Asterales/Compositae | Atractylodes lancea (Thunb.) DC.* | Root                    | Juice       | Occasionally      | Shrub  |                            |
| Japan          | Asterales/Compositae | Atractylodes lancea (Thunb.) DC.* | Root                    | Juice       | Occasionally      | Shrub  |                            |
| Japan          | Asterales/Compositae | Atractylodes lancea (Thunb.) DC.* | Root                    | Juice       | Occasionally      | Shrub  |                            |
| Japan          | Asterales/Compositae | Atractylodes lancea (Thunb.) DC.* | Root                    | Juice       | Occasionally      | Shrub  |                            |
| Japan          | Asterales/Compositae | Atractylodes lancea (Thunb.) DC.* | Root                    | Juice       | Occasionally      | Shrub  |                            |
| Japan          | Asterales/Compositae | Atractylodes lancea (Thunb.) DC.* | Root                    | Juice       | Occasionally      | Shrub  |                            |
| Japan          | Asterales/Compositae | Atractylodes lancea (Thunb.) DC.* | Root                    | Juice       | Occasionally      | Shrub  |                            |
| Japan          | Asterales/Compositae | Atractylodes lancea (Thunb.) DC.* | Root                    | Juice       | Occasionally      | Shrub  |                            |
| Japan          | Asterales/Compositae | Atractylodes lancea (Thunb.) DC.* | Root                    | Juice       | Occasionally      | Shrub  |                            |
| Japan          | Asterales/Compositae | Atractylodes lancea (Thunb.) DC.* | Root                    | Juice       | Occasionally      | Shrub  |                            |
| Japan          | Asterales/Compositae | Atractylodes lancea (Thunb.) DC.* | Root                    | Juice       | Occasionally      | Shrub  |                            |
| Japan          | Asterales/Compositae | Atractylodes lancea (Thunb.) DC.* | Root                    | Juice       | Occasionally      | Shrub  |                            |
| Japan          | Asterales/Compositae | Atractylodes lancea (Thunb.) DC.* | Root                    | Juice       | Occasionally      | Shrub  |                            |
| Japan          | Asterales/Compositae | Atractylodes lancea (Thunb.) DC.* | Root                    | Juice       | Occasionally      | Shrub  |                            |
| Japan          | Asterales/Compositae | Atractylodes lancea (Thunb.) DC.* | Root                    | Juice       | Occasionally      | Shrub  |                            |
### 3.4 Ethnic Herbal Medicine Used for Menstrual Disorders

MDs are some of the most common conditions to affect reproductive-aged women globally. They include abnormal menstrual cycle length, hypomenorrhea, and menorrhagia (Harlow et al., 2000). An epidemiological survey found that 27.2% of women suffered from MDs in five European countries (Fraser et al., 2015). Although estrogen therapy is beneficial in patients with MDs, its side effects such as nausea and vomiting had led to significant distress (Wang et al., 2020).

In America, *Artemisia dracunculus* L. (tarragon), whose whole plants are used for treating irregular menstruation by the Indians of the Missouri River Region, has long been used in traditional Asian medicine such as Myanmar while known as a spice species in Asia, Europe and the America (Ekiert et al., 2021). Native Americans use leaves of *Artemisia vulgaris* L. to treat irregular menstruation, while Italians and Vietnamese use it to treat dysmenorrhea (Schmid and Moerman, 1998).

The traditional Chinese medication experience and modern application of herbal medicine in treating MDs have enhanced people’s recognition of its importance and necessity. Dried products of herbal medicine are often used in traditional Chinese medicine which is convenient for transportation and storage. *Rehmannia glutinosa* (Rehmannia glutinosa Libosch.) and its processed products play an important role in the treatment of irregular menstruation. Modern research shows (Zhang et al., 2008) that Chinese Rehmannia Radix can prevent an inducement of the peripheral microcirculation of various chronic diseases through the improvement of hemorheology. *Chineses angelica* (*Angelica sinensis* (Oliv.) Diels) is a Chinese herbal medicine traditionally used for replenishing blood. Studies have shown that *Angelica sinensis* polysaccharide significantly reduced the apoptosis rate of platelets and had an anti-apoptosis effect on cryopreserved platelet (Nai et al., 2021).

In India, there are 73 species of plants used to treat MDs (Jadhav and Bhutani, 2005; Vidyasagar and Prashantkumar, 2007; Bhatia et al., 2015; Das et al., 2015). The major used family being Fabacae; its leaves and roots are used often. Juice is

| Country/Region | Family | Scientific name | Used part | Preparation | Application | Habit | References |
|----------------|--------|-----------------|-----------|-------------|-------------|-------|------------|
| Japan          | Equidae| Equus asinus    | Skin      | Decoction   | Orally      | Herb  | —          |
| Japan          | Fabaceae| Glycyrrhiza uralensis | Root  | Decoction | Orally | Herb  | —          |
| Japan          | Lauraceae| Cinnamomum cassia | Bark     | Decoction   | Orally | Tree  | —          |
| Japan          | Liliaceae| Ophiopogon japonicus | Tuber  | Decoction | Orally | Herb  | —          |
| Japan          | Ranunculaceae| Paeonia lactiflora | Root    | Decoction | Orally | Herb  | —          |
| Japan          | Ranunculaceae| Paeonia suffruticosa | Bark    | Decoction | Orally | Herb  | —          |
| Pakistan       | Rutaceae| Tetradium ruticarpum | Fruit  | Decoction | Orally | Shrub, Tree  | —          |
| Pakistan       | Zingiberaceae| Zingiber officinale | Rhizome | Decoction | Orally | Herb  | —          |
| Malaysia       | Zingiberaceae| Curcuma longa |——— | —       | —          | Herb  | —          |
| Malaysia       | Zingiberaceae| Curcuma xanthorrhiza |——— | —       | —          | Herb  | —          |
| Pakistan       | Amaranthaceae| Amaranthus spinosus | Whole plant | Decoction | Orally | Herb  | Tariq et al. (2018) |
| Pakistan       | Asphodelaceae| Aloe barbadensis | Leaf, powder + milk | Orally | Herb  | —          |
| Pakistan       | Berberidaceae| Berberis lycium | Root, gum, flower | Powder + milk | Orally | Tree  | —          |
| Pakistan       | Bombacaceae| Bombax ceiba | Root, gum, flower | Powder + milk | Orally | Tree  | —          |
| Pakistan       | Lamiaceae| Ajuga parviflora | Leaf, Root | Powder + water | Orally | Herb  | —          |
| Pakistan       | Ulmaceae | Celtis australis | Fruit, Bark | Decoction + ghee | Orally | Tree  | —          |
| Pakistan       | Urticaceae| Urtica dioica | Whole plant | Powder + water | Orally | Herb  | —          |

Note: a, Kamishoyosan (Chinese name, Jia wei xiao yao san). b, Keishibukuryogan (Chinese name, Gui zhi fu ling wan). c, Tokishakuyakusan (Chinese name, Dang gui shao yao san). d, Unkeito (Chinese name, Wen jing tang).
| Country/Region | Diseases | Family | Scientific name | Used part | Application | Preparation | Habit | References |
|---------------|----------|--------|----------------|-----------|-------------|-------------|-------|------------|
| America       | Menstrual disorders | Asparagaceae | Convallaria majalis | Whole plant | Infusion | Orally | Herb | Besser (2001) |
| America       | Menstrual disorders | Asteraceae | Symphytum officinale | Root | Infusion | Orally | Herb | Reilly and Moerman (1998) |
| America       | Menstrual disorders | Asteraceae | Scrophularia corrugata | Root | Infusion | Orally | Herb | Schmid and Moerman (1998) |
| America       | Menstrual disorders | Asteraceae | Symphytum officinale | Leaf | Infusion | Orally | Herb | Reilly and Moerman (1998) |
| America       | Menstrual disorders | Asteraceae | Symphytum officinale | Whole plant | Infusion | Orally | Herb | Reilly and Moerman (1998) |
| America       | Menstrual disorders | Asteraceae | Symphytum officinale | Leaf | Infusion | Orally | Herb | Reilly and Moerman (1998) |

Continued on following page
### TABLE 5  (Continued) Herbal medicine for treating menstrual disorders.

| Country/Region | Diseases | Family | Used name | Part | Scientific name | Application | Preparation | Habit | References |
|----------------|----------|--------|-----------|------|----------------|-------------|-------------|-------|------------|
| Italy, Korea | Irregular menstrual cycle, menorrhagia (Italy), menstrual disorders (Korea) | Brassicaceae | Acer opalus subsp. obtusatum | Whole plant | Aerial part, whole plant | Italy (Italy), Whole plant (Korea) | Raw, decocation, infusion | Topically, Orally | Herb |
| Italy, Pakistan | Menorrhagia (Pakistan), Menstrual disorder (Pakistan) | Asteraceae | Achillea millefolium | Whole plant | Leaf, flower | Decoction, infussion, tincture | Orally (Italy) | Herb |
| Korea | Irregular menstruation | Asclepiadaceae | Asclepias cordifolia | Root | Root | Brewing | Orally | Herb |
| Korea | Irregular menstruation | Asteraceae | Artemisia argyi | Root | Whole plant | Decoction | Orally | Herb |
| Korea | Irregular Menstruation, menorrhagia | Celastraceae | Celastrus orbiculatus | Root | Root | Extraction | Orally | Herb |
| Korea | Menstrual disorders | Malvaceae | Althaea rosea | Root | Root | Decoction | Orally | Herb |
| Korea | Menstrual disorders, menorrhagia | Rosaceae | Sanguisorba officinalis | Leaf | Leaf | Topically | Orally | Herb |
| Korea | Menstrual disorders | Lamiaceae | Leonurus artemisia | Leaf | Leaf | Decoction | Orally | Herb |
| Malaysia | Menstrual disorders (MDs) | Lamiaceae | Leonurus japonicus | Leaf | Leaf | Decoction | Orally | Herb |
| Malaya Peninsula | Irregular menstruation | Cucurbitaceae | Cucumis sativus | Leaf | Leaf | Decoction | Orally | Tree |
| Malaysia | Abnormal menstruation | Asteraceae | Artemisia argyi | Leaf | Leaf | Decoction | Orally | Herb |
| Malaysia | Emmenagogues | Poaceae | Cymbopogon nardus | Leaf | Leaf | Decoction | Orally | Herb |
| Malaysia | Emmenagogues | Poaceae | Cymbopogon citratus | Leaf | Leaf | Decoction | Orally | Herb |
| Malaysia | Menstrual disorders (MDs) | Lamiaceae | Leonurus japonicus | Leaf | Leaf | Decoction | Orally | Herb |
| Malaysia | Menstrual disorders | Myrtaceae | Myrtus communis | Leaf | Leaf | Decoction | Orally | Herb |
| Malaysia | Menstrual disorders | Malvaceae | Althaea rosea | Root | Root | Decoction | Orally | Herb |
| Malaysia | Menstrual disorders | Rosaceae | Sanguisorba officinalis | Leaf | Leaf | Decoction | Orally | Herb |
| Malaysia, Myanmar | Menstrual disorders (Malaysia), Menstrual disorders (Myanmar) | Malvaceae | Althaea rosea | Root | Root | Decoction | Orally | Herb |
| Myanmar, Thailand | Menstrual disorders | Lamiaceae | Leonurus japonicus | Leaf | Leaf | Decoction | Orally | Herb |
| Myanmar, India | Menstrual disorders (India), Menstrual disorders (India) | Asteraceae | Cardiocrinum giganteum | Leaf | Leaf | Decoction | Orally | Herb |
| Myanmar, Thailand | Menstrual disorders | Malvaceae | Althaea rosea | Root | Root | Decoction | Orally | Herb |
| Myanmar, Thailand | Menstrual disorders | Rosaceae | Sanguisorba officinalis | Leaf | Leaf | Decoction | Orally | Herb |
| Nepal | Menstrual disorders | Malvaceae | Althaea rosea | Root | Root | Decoction | Orally | Herb |
| Nepal | Menstrual disorders | Rosaceae | Sanguisorba officinalis | Leaf | Leaf | Decoction | Orally | Herb |
| Nepal | Menstrual disorders | Myrtaceae | Myrtus communis | Leaf | Leaf | Decoction | Orally | Herb |
| Nepal | Menstrual disorders | Lamiaceae | Leonurus japonicus | Leaf | Leaf | Decoction | Orally | Herb |
| Nepal | Menstrual disorders | Malvaceae | Althaea rosea | Root | Root | Decoction | Orally | Herb |
| Nepal | Menstrual disorders | Rosaceae | Sanguisorba officinalis | Leaf | Leaf | Decoction | Orally | Herb |
| Nepal | Menstrual disorders | Myrtaceae | Myrtus communis | Leaf | Leaf | Decoction | Orally | Herb |
| Nepal | Menstrual disorders | Lamiaceae | Leonurus japonicus | Leaf | Leaf | Decoction | Orally | Herb |

(Continued on following page)
| Country/Region | Diseases | Family | Scientific name | Used part | Preparation | Application | Habit | Reference |
|---------------|----------|--------|----------------|-----------|------------|-------------|-------|-----------|
| Pakistan      | Irregular menstruation, oligomenorrhea | Apiaceae | Foeniculum vulgare Mill. | Leaf, fruit (Irregular menstruation), whole plant (oligoenorrhea) | Topically, orally (Irregular menstruation) | Oral, suppository, lotion, cleansing, and balm | Herb, Tree | Khan (2012) |
| Pakistan      | Regulate the menses | Apiaceae | Bupleurum falcatum L. | Whole plant | Decoction | Oral, suppository, lotion, cleansing, and balm | Herb | Tariq et al. (2013), Tariq et al. (2018) |
| Taiwan        | Irregular menstruation | Zingiberaceae | Curcuma zedoaria (Christm.) Roscoe | Rhizome (Thailand) | Decoction | Oral, suppository, lotion, cleansing, and balm | Herb | Aziz et al. (2018) |
| Vietnam       | Menstrual disorders | Apiaceae | Centella asiatica (L.) Urb. | Whole plant | Decoction | Oral, suppository, lotion, cleansing, and balm | Herb | Tariq et al. (2013), Tariq et al. (2018) |
| Vietnam       | Menstrual disorders | Apocynaceae | Adenia gummifera (Harv.) Harms | Bark, leaf, latex | Decoction | Oral, suppository, lotion, cleansing, and balm | Tree | Tariq et al. (2013), Tariq et al. (2018) |
| Vietnam       | Menstrual disorders | Cyperaceae | Cyperus rotundus L. | Root, Rhizome | Decoction | Oral, suppository, lotion, cleansing, and balm | Herb | Tariq et al. (2013), Tariq et al. (2018) |

The utilization of herbal medicine is increasing every year, which is reflected in the statistics of various countries. A study of participants from 23 countries reveals that 28.9% reported the use of herbal medicines in pregnancy (Kennedy et al., 2013). Approximately 35% of adults in the United States reported current use of herbal medicine (Rashrash et al., 2017). The sale of herbal medicines is growing by 20% annually and forms are the largest growth area in retail pharmacy. The sales of such products have moved from specialty stores to mainline shopping environments (Flanagan, 2001). The popularity of herbal medicine has spawned many health care industries, which have
### TABLE 6 | Herbal medicine products.

| Country/region | Premenstrual syndrome | Dysmenorrhea | Amenorrhea | Menstrual disorders |
|----------------|------------------------|--------------|------------|---------------------|
| America        | Chasteberry Extract (Vitex agnus-castus L.), Rose Otto Essential Oil, Chasteberry and Dong Quai Women’s Monthly Support Supplement | Ginger powder (Zingiber officinale Roscoe) |  |  |
| Australia      | Vitex Agnus-Castus, Evening Primrose (Oenothera biennis L.), St John’s Wort (Hypericum perforatum L.) | Chamomile Tea (Matricaria chamomilla L.), Yarrow Tea (Achillea millefolium L.) |  |  |
| China          | ShuerjingKeli | Yuanhu Zhitong tablet, Tongjing Wan, Tongjingbao Keli | Fuke Tongjing Wan, Extract of Rosa chinensis Jacq. | Angelica Liquid Extract, Danggui Yangxue Wan, Danggui Tiaojing Keli, Fuke Tiaojing Plan, Tiaojing Huoxue Jiaonang, Erzhi Wan |
| India          | Aloe vitals capsules of Planet Ayurveda, Valerian tea | German Chamomile oil (Matricaria chamomilla L.), Essentail oil of fennel (Foeniculum vulgare Mill.), Sweet Marjoram oil (Origanum majorana L.), Lavender oil (Lavandula angustifolia Mill.), Clary Sage oil (Salvia sclarea L.), Coriander (Coriandrum sativum L.) |  |  |
| Iran           | Saffron (Crocus sativus L.) | Chamomile tea (Matricaria chamomilla L.), Ginger (Zingiber officinale Roscoe), Mint tea (Mentha longifolia L.) |  |  |

### FIGURE 1 | Network diagram of compatibility law of Traditional Chinese Medicine.
FIGURE 2 | The number of families and species of plants corresponding to each disease type.

FIGURE 3 | The number of families and species of plants corresponding to each country.

FIGURE 4 | Corresponding proportion of plant medicinal parts.
many herbal products on the market for menstrual problems. Table 6 lists some herbal products from various countries.

Compound Recipes are a major feature of herbal medicine in the treatment of MD. According to the most commonly used traditional Chinese medicine compound (TCMC) in MD showed in Table 1 as an example, there are seven formulae including nonredundant 28 herbs, which totally occurs 57 times, the main herb-pairs and compatibility laws of traditional Chinese medicine prescriptions are listed in Figure 1 as a network diagram obtained by the association rule algorithm-Apriori algorithm.

According to the network, Paeonia lactiflora Pall. was in the central with the most relationship with other herbs; Angelica sinensis (Oliv.) Diels., Zingiber officinale Roscoe., Cinnamomum cassia Presl., Glycyrrhiza uralensis Fisch., Ligusticum chuanxiong Hort., Paeonia suffruticosa Andr., Poria cocos (Schw.) Wolf., and Atractylodes macrocephala Koidz. within the second core layer, with extensive compatibility with other herbs, they are all the backbone medication of TCMC in treating MD.

Among them, according to the theory of TCMC, the Bupleurum-white peony drug pair can regulate menstruation and relieve pain and is also a frequently used drug pair for the treatment of various gynecological diseases. Ginger functions as warming menstruation and is most widely used in TCMC prescriptions for gynecological diseases. It can also be used as a “guiding herb” (which acts as an ingredient added to enhance the efficacy of a dose of medicine), which is of great significance to improve the accuracy and efficacy of the medication. Licorice is commonly used in TCMC. It also plays a role in reconciling the medicinal properties and improving the taste. As such, it has a wide range of applications. Licorice can also play a role in pain relief, which is very beneficial in the relieving gynecological disease symptoms such as dysmenorrhea. Angelica is the holy medicine used in gynecology, Chuanxiong is the holy medicine used to activate blood stasis, and cinnamon functions as warming meridians, and atractylodes functions as drying dampness, invigorating the spleen, and relieving pain, which is of great significance for eliminating the cause of the disease.

As a creative contribution of CHM, the compound medicine experience of CHM has affected the traditional medical development of many countries in East Asia, and it will also provide a reference for the development of other ethnic medicines in the future.

5 DISCUSSION AND CONCLUSION

In this study, we screened 93 literatures on the topic of MD, among which a review “Medicinal plants used for menstrual disorders in Latin America, the Caribbean, sub-Saharan Africa, South and Southeast Asia and their uterine properties: A review” (van Andel et al., 2014) is similar on this theme, it mainly focuses on MDs and pay more attention on adverse reactions of related herbs. In our study, we systematically analyzed the herbal medicines used in countries and regions in treating different MD, compared the medication common characters and differences, and analyzed the
compatibility law of classical prescriptions. As we know, our review is an unprecedented work on comprehensive analysis traditional herbs for MD globally.

Among the herbs used to treat MD, we analyzed 130 families and 571 species of plants used by women from different countries and regions. Among them, 451 are herbs, 178 are trees, 72 are shrubs, 21 are vines, five are climbers and 37 are of other types. The five main families are Asteraceae, Lamiaceae, Apiaceae, Fabaceae, and Zingiberaceae, while the five frequently used plants are Zingiber officinalis Roscoe. (Ginger), Ruta graveolens L. (Common rue), Angelica sinensis (Oliv.) Diels (Angelica sinensis), Foeniculum vulgare Mill. (Fennel), and Catharanthus roseus (L.) G. Don (Catharanthus roseus). The general dosage of these herbs is 3–15 g.

Among them, some herbal medicines can treat three MD concurrently such as: Angelica sinensis (Oliv.) Diels (Angelica sinensis), Foeniculum vulgare Mill Ligusticum chuanxiong Hort., Cyperus rotundus L., Spatholobus suberectus Dunn, Leonurus japonicus Houtt., Salvia miltiorrhiza Bge., Prunus persica (L.) Batsch, Rosa chinensis Jacq., Curcuma longa L. etc. While some herbal medicines that can treat two MD concurrently such as: Ruta graveolens L., Cinnamomum cassia (L.) Presl, Sargentiodoxa cuneata (Oliv.) Rehd. et Wils., Corydalis yanhusuo W. T. Wang, Zingiber officinalis Roscoe.

The number of families and species of plants corresponding to each disease type is listed in Figure 2. Most types of herbs treat MDs, for there are different symptom categories in MDs; however, considering a single symptom, most types of herbs treat dysmenorrhea. The number of herbs in treating PMS is the least in the four categories of MD, mainly because of PMS was proposed the latest.

The number of families and species of plants corresponding to each country and region is listed in Figure 3, which shows that India has the most types of individual herbs used to treat MD. The selected literature indicated that India has more medical plant species resources and medication experience in MD, and it was similar for South Africa, Italy and Myanmar, for some literatures specifically collected and summarized herbs in treating MD in these countries or regions, but the application experience and pharmacological differences of many related plants need further research. In China, there are abundant medication experiences in treating MD, but the number of herbs was not increased indefinitely in a long application history, chiefly due to the concept of combined medication in CHM to solve many complex disease problems.

The usage of medicinal parts is listed in Figure 4, which presents the most commonly used parts which are root, leaf, whole plant, seed, bark, rhizome, fruit, flower, and aerial part. The usage of all the herbal medicines mentioned in the article is listed in Figure 5, which illustrates the three most commonly used preparations are decoction, infusion, and juice. Among the recorded routes of administration, 263 are oral administration and 50 are topical administration. The most commonly used type of dosage forms include decoction, infusion, juice, powder, dry, raw, paste, sitz bath, lotion, balm (Marham), and vaginal suppository. The most frequently used ingredients to match the dosage form are honey, milk, sugar, and other excipients, which may improve the taste of herbal medicines, moisturize the intestines and improve patient compliance for usage.

Among the recorded plants, many have culinary use in the population, such as Coriandrum sativum L. (Coriander Herb), Cuminum cyminum L. (Cumin), Crocus sativus L. (Saffron), Mentha pulegium L. (Pennyroyal), Mentha x piperita L. (Peppermint), Cinnamomum verum J. Presl (Ceylon cinnamon), Zingiber officinalis Roscoe (Ginger), Allium sativum L. (Garlic), Foeniculum vulgare Mill. (Fennel), Capsella bursa-pastoris (Linn.) Medic. (Shepherd’s pursle), Raphanus sativus L. (Radish), and Aiptum graveolens L. (Celery). Edible herbs are used in a wide range of countries or regions or have multiple effects on MD. This may mean that the edibility of herbal medicine has expanded its promotion. As such, it can be spread and applied in many countries and regions.

Some herbs have the same purpose in different countries. For example, ginger (Zingiber officinalis Roscoe) is used to treat dysmenorrhea in India, Iran, and Malaysia; and the coriander herb (Coriandrum sativum L.) can treat menorrhagia in both India and Iran. Some herbs have different uses in different countries, such as Catharanthus roseus (Catharanthus roseus L. G. Don) is used to treat dysmenorrhea in India, amenorrhea in Myanmar, MDs in Vietnam, and as an emmenagogue in Thailand. East Asia, Pakistan, Malaysia, and some other places have recorded using fresh herbs. This may be because local therapists believe that fresh herbs are more effective (Pharmacopoeia Commission, 2020).

The application of some drugs is peculiar to this region. For example, Indian women use Vitex negundo L. to treat dysmenorrhea and amenorrhea, while Iranian women often use pomegranate (Punica granatum L.) to treat menstruation. Chinese women usually use roots of Angelica sinensis (Oliv.) Diels. for curing various MDs. The whole plant of Cirsium souliei (Franch.) Mattf. is applied to treat menorrhagia and the aerial part of Lagotis brevituba Maxim is used for menstrual regulation by Tibetan women (Zhu et al., 2017). Mongols frequently apply the aerial part of Panzeria alaskanachia Kupr. to treat dysmenorrhea (Lei et al., 2017). As a traditional medicine of Uyghur nationality, aerial part of Sausurea involucrata (Kar. et Kir.) Sch. -Bip is used for the treatment of excessive leucorrhea, but in CHM, it is used for irregular menstruation.

The sources of information on women’s use of plants come from herbal works, multi-media, the internet, medical education, ancestral medical inheritance, doctor-patient communication, neighborhood introduction, and self-exploration. For example, the elder Red-headed Yao women in China play an important role in the spread and utility of medicinal plants in treating gynecological diseases to young women. They can classify medicinal plants, and remember their functions and methods of disease treatment transferred to them from their previous generation.

East Asia has a long-standing habit of using herbal medicines, while in Western countries, herbal medicines have always been used as complementary and alternative treatments. In CHM, the specific details of the menstrual cycle (duration, volume, the appearance of flow, etc.) are not only the surface phenomena, which hint at the underlying
causes of MD such as the dysfunction of the internal organs, disharmony of Qi, Blood and Body Fluids, imbalance of the Ren and Du meridians, and the irregularity of Kidney Essence, but symptomatic and causal treatment is required based on these phenomena (Zhou and Qu, 2009). As mentioned above, affected by the culture of Chinese medicine, Japan and South Korea have similar concepts in the treatment of MD, which is also reflected in their medication.

In conclusion, this study compares and summarizes the use of herbal medicines by women in different countries and regions globally. We hope to enlighten people working in these areas, and provide some insight on women’s medication.

AUTHOR CONTRIBUTIONS

YR, MJ, and ZM conceived and designed the review. MJ, XL, YW, LC, YuL, YaL, TZ, WW, and YR wrote and reversed the paper.

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SUPPLEMENTARY MATERIAL

The Supplementary Material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/fphar.2021.751207/full#supplementary-material
