

Chapter 30

Use of Essential oils for the Treatment of Female Reproductive Disorders

Mahvish Fatima^{1*}, Ume Salma², Razia Kausar³ and Muhammad Akmal Farooq⁴

¹Department of Epidemiology and Public Health, University of Agriculture, Faisalabad, Pakistan

²Department of Zoology, University of Agriculture, Faisalabad, Pakistan

³Department of Anatomy, University of Agriculture Faisalabad, Pakistan

⁴Department of Pharmacy, University of Agriculture, Faisalabad, Pakistan

*Corresponding author: mahvishfatima476@gmail.com

ABSTRACT

Because of their natural healing properties, essential oils have gained attention as complementary therapies for the treatment of female reproductive disorders. Plant essential oils have anti-inflammatory, antibacterial, and hormone-regulating properties that can help improve symptoms such as menstrual disorders, PCOS, infertility, and menopause. Lavender, sage, rose, and geranium oils are often used for menstrual disorders. Lavender and sage can be used to relieve menstrual cramps and regulate menstrual cycles. Cinnamon improves insulin resistance in PCOS and peppermint reduces hirsutism. Geranium oil supports hormonal balance, which is essential for managing PCOS. Sage, geranium, and Roman chamomile are used for infertility. Sage improves fertility by balancing hormones and reducing stress. Geranium oil supports reproductive health and Roman chamomile reduces stress and anxiety that can affect fertility. For menopause symptoms, essential oils can relieve symptoms such as hot flashes, night sweats, and insomnia. Use essential oils like clary sage to balance hormones, peppermint for cooling, and lavender for relaxation and sleep. Use through aromatherapy, topical application or massage. Important safety measures such as dilution and patch testing are necessary to avoid adverse reactions. Essential oils should complement medical treatment. A medical expert, particularly one who specializes in aromatherapy, must be consulted for the safe and efficient application of aromatherapy to treat reproductive disorders.

KEYWORDS

Essential Oils; Reproductive Disorders; Menstrual Disorders; Polycystic Ovary Syndrome; Infertility; Menopausal Symptoms; Hormonal Balance

Received: 12-June-2024

Revised: 18-July-2024

Accepted: 12-Aug-2024



A Publication of
Unique Scientific
Publishers

Cite this Article as: Fatima M, Salma U, Kausar R and Farooq MA, 2024. Use of essential oils for the treatment of female reproductive disorders. In: Zafar MA, Abbas RZ, Imran M, Tahir S and Qamar W (eds), *Complementary and Alternative Medicine: Essential oils*. Unique Scientific Publishers, Faisalabad, Pakistan, pp: 261-268. <https://doi.org/10.47278/book.CAM/2024.458>

INTRODUCTION

Through an assortment of extraction strategies, fundamental oils are natural, normal compounds determined from plant sources. These organisms' therapeutic qualities have been utilized for centuries (Pathania et al., 2021). The application of basic oils to treat women's regenerative clutters has gathered critical academic consideration in later a long time (Bapat, 2022). Surveying the chronicled significance of basic oils within the treatment of women's regenerative clutters is the point of this chapter (Chhabra, 2023). A careful and in-depth analysis will be given, together with an assessment of different methods and the distinguishing proof and basic examination of striking figures that have made noteworthy commitments to this field. Exploring the different benefits and disadvantages related with utilizing fundamental oils to treat women's regenerative disarranges is the point of this paper (Soares et al., 2021). This paper points to investigate conceivable roads for future research improvement in this area. An antiquated civilization's worth of hone can be found within the authentic utilize of fundamental oils to treat women's reproductive disorders. (Auzanneau, 2020). A variety of gynecological disarranges, such as barrenness, postpartum care, and menstrual spasms, were treated with basic oils within the progressed Egyptian civilization. Reestablishing the body's qi, or vitality, to balance and enhancing common physical and mental well-being are objectives of conventional Chinese pharmaceutical, which employments fundamental oils (Patrick, 2023). Fundamental oils have gotten to be increasingly prevalent within the present-day time for treating female regenerative issues. An expanding sum of insightful investigate shows basic oils may be valuable in treating a number of wellbeing issues, such as PMS, fruitlessness, menstrual spasms, and menopausal symptoms (Colles, 2020). Basic oils are viable in treating a number of reproductive disorders such as premenstrual syndrome, menstrual issues, barrenness and menopausal indications. Furthermore, fundamental oils can be utilized in a number of ways, such as fragrance-based treatment, topical application and knead (Patel et al., 2023). Assorted perspectives exist concerning the application of basic oils within the treatment of

female regenerative wellbeing concerns. A number of essential oils can be used in ordinary restorative medicines and are both safe and viable. A point of view states that the use of basic oils ought to as it were be carried out beneath the supervision and direction of a certified healthcare professional (Kumar et al., 2022). The utilization of essential oils to treat female regenerative disarranges could be a theme of noteworthy contention. Thinks about are needed to decide the security and adequacy of basic oils some time recently utilizing them to treat a wide range of sicknesses, indeed in spite of the fact that there's a few prove to back them utilize. Prospects for treating women's regenerative disarranges with fundamental oils are empowering (Chukwu, 2021). More examinations are anticipated to supply more data around the security and viability of fundamental oils within the treatment of a wide extend of sicknesses. This investigate may have imperative repercussions for the creation of advanced treatment approaches for female regenerative clutters. A zone of inquire about that appears guarantee is the application of basic oils to the treatment of female regenerative clutters (Misra et al., 2020). The application of basic oils to different restorative conditions is upheld by experimental prove; be that as it may, extra investigation is required to decide the security and adequacy of these applications. Further examination is anticipated to development information of the restorative application of fundamental oils for the treatment of female regenerative clutters (Baldil, 2021).

Table 1: Different essential oils can be used to treat various reproductive disorders in females

Sr.No	Plant Name	Essential Oil	Application	Treatment of Reproductive Disorders	References
1	Lavandula angustifolia	Lavender	Antispasmodic, anti-inflammatory	Menstrual pain, PMS, menopause symptoms	(Firoozeei et al., 2021)
2	Salvia sclarea	Clary Sage	Hormonal balance, stress relief	Menstrual pain, infertility, menopause symptoms	(Ovidi et al., 2021)
3	Rosa damascena	Rose	Mood-lifting, antispasmodic	Menstrual pain, PMS	(Akram et al., 2020)
4	Pelargonium graveolens	Geranium	Hormonal balance, anti-inflammatory	PMS, PCOS	(Jaradat et al., 2022)
5	Cinnamomum verum	Cinnamon	Improves insulin resistance	PCOS	(Pathak and Sharma, 2021)
6	Mentha piperita	Peppermint	Anti-androgenic, cooling	PCOS, menopause symptoms	(Mahendran and Rahman, 2020)
7	Chamaemelum nobile	Roman Chamomile	Calming, anti-inflammatory	Infertility, stress-related menstrual disorders	(Tai et al., 2020)
8	Cananga odorata	Ylang Ylang	Mood regulation, stress relief	Menstrual pain, PMS	(Jiea et al., 2022)
9	Boswellia carterii	Frankincense	Anti-inflammatory, stress relief	Menstrual pain, PMS	(Huang et al., 2022)
10	Foeniculum vulgare	Fennel	Hormonal regulation, antispasmodic	Menstrual pain, hormonal imbalance	(Mehra et al., 2021)
11	Ocimum basilicum	Basil	Antispasmodic, anti-inflammatory	Menstrual pain, PMS	(Shahrajabian et al., 2020)
12	Thymus vulgaris	Thyme	Hormonal balance, antimicrobial	Menstrual pain, hormonal imbalance	(Silva et al., 2021)
13	Origanum majorana	Marjoram	Antispasmodic, calming	Menstrual pain, PMS	(Bouyahya et al., 2021)
14	Citrus limon	Lemon	Mood-lifting, stress relief	PMS, menopause symptoms	(Paw et al., 2020)
15	Salvia officinalis	Sage	Hormonal balance, antispasmodic	Menstrual pain, menopause symptoms	(Mendes et al., 2020)
16	Eucalyptus globulus	Eucalyptus	Anti-inflammatory, pain relief	Menstrual pain, PMS	(Shala and Gururani, 2021)
17	Juniperus communis	Juniper Berry	Detoxifying, anti-inflammatory	Menstrual pain, PMS	(Goncalves et al., 2022)
18	Cupressus sempervirens	Cypress	Circulation improvement, antispasmodic	Menstrual pain, PMS	(Farahmand, 2020)
19	Citrus aurantium	Neroli	Calming, hormonal balance	PMS, menopause symptoms	(Maksoud et al., 2021)
20	Citrus bergamia	Bergamot	Mood-lifting, stress relief	PMS, menopause symptoms	(Cebi and Erarlan, 2023)

Reproductive Disorders in Females

There are numerous variables that influence the reproductive health of women. These factors can effect physical and mental health of females. Barrenness, menstrual issues, endometriosis, polycystic ovarian disorder (PCOS) and hormonal

awkward nature are among the regenerative conditions that ladies experience on a customary premise (Dinsdale and Crespi, 2021). These disarranges can disturb the fragile adjust of the female regenerative framework and cause indications like sporadic feminine cycle, pelvic torment, trouble conceiving, and other issues. The ectopic expansion of endometrial tissue, which is ordinarily show inside the uterine depression, to destinations exterior the uterus, most commonly including the ovaries, fallopian tubes, and adjoining pelvic structures, is the trademark of endometriosis, a constant and regularly serious restorative condition. Intemperate menstrual dying, extreme cramping, and barrenness seem all result from this phenomenon (Ahmad et al., 2023). Menstrual inconsistencies, raised testosterone levels, and challenges with conception are side effects of Polycystic Ovary Disorder (PCOS), an endocrine clutter stamped by the advancement of modest, fluid-filled blisters on the ovaries. Menstrual issues, moreover called dysmenorrhea, are a common issue that numerous ladies experience and can extend in seriousness from minor distress to horrifying misery (Fabricius, 2020). The uterus contracts muscularly amid the menstrual cycle to help within the lining's common shedding, which causes the spasms that are experienced amid the period. Regenerative complications like temperament swings, unpredictable menstrual cycles, and inconvenience getting pregnant are all connected to hormonal lopsided characteristics, which are characterized by either tall or moo levels of progesterone or estrogen (Hammer, 2023).

Endometriosis and the use of Essential oils

Around the world, endometriosis influences approximately 176 million ladies and may be a diligent and frequently weakening regenerative brokenness. When endometrial tissue, which is regularly restricted to the uterine lining, duplicates exterior of the uterine depth, it regularly influences the ovaries, fallopian tubes, and other pelvic organs (Berek et al., 2021). This condition is known as endometriosis. In spite of the fact that it needs a implies of being removed from the body, the uprooted tissue shows highlights of the endometrium's structure and work, counting thickening, debasement, and feminine cycle (Nobleletort, 2021). Greatly excruciating and sporadic menstrual stream, extreme pelvic torment, and as often as possible barrenness are all conceivable results of this marvel. Numerous ladies with endometriosis are investigating elective and all-encompassing approaches to oversee their indications, in expansion to conventional medicines like hormonal treatments and surgery (Hawkey et al., 2022). Basic oils have picked up footing as a promising complementary treatment for endometriosis, with oils like lavender, clary sage, and chamomile showing anti-inflammatory, pain relieving, and antispasmodic properties that will offer assistance lighten serious pelvic torment and menstrual spasms related with the condition. Investigate proposes that fundamental oils seem possibly direct hormonal awkward nature and restrain the development of endometrial lesions (Forgie, 2021). Fundamental oils can be connected in a assortment of ways to assist with the wide extend of indications that are associated to endometriosis since of their versatile nature. Localized pain relief and inflammation reduction have been demonstrated by applying diluted oils to the lower abdomen, back, and pelvic area. The long-term pain associated with endometriosis often exacerbates symptoms of stress and anxiety, which can be effectively managed by inhaling blends of essential oils (Irshad et al., 2020). Because essential oils may be used in baths, body lotions, and diffusers, incorporating them into regular self-care routines may help some women feel better. Since there is a chance that essential oils will interact with medications and cause negative effects, using them as a complementary therapeutic approach for endometriosis requires careful coordination with healthcare professionals to ensure safe and effective use. In the comprehensive treatment of this complex and often incapacitating reproductive disease, essential oils can be a useful adjunct when used appropriately and customized to the patient's needs (Heshelov, 2023).

Essential oil Treatments of Polycystic Ovarian Syndrome

Five to ten percent of women in the reproductive age range suffer from the complex endocrine disorder known as polycystic ovarian syndrome, or PCOS. The hallmark of polycystic ovarian syndrome (PCOS) is the development of ovarian cysts, which can lead to high testosterone levels, irregular menstruation, hormonal imbalances, and difficulties conceiving (Abraham et al., 2021). A number of comorbidities, including insulin resistance, metabolic disorders, and an increased vulnerability to diseases like type 2 diabetes and cardiovascular disease, are linked to polycystic ovarian syndrome (PCOS) (Maqbool and Gani, 2022). Essential oils are becoming a natural and helpful therapeutic option for more and more women seeking symptom relief from PCOS, even though traditional management usually consists of a regimen of hormonal therapies, lifestyle changes, and sometimes surgical interventions. Inflammation can be reduced, hormonal imbalances can be regulated and ovarian and uterine health can be promoted these are just a few of the therapeutic benefits of several essential oils that have been found to have the potential to alleviate symptoms associated with PCOS (Bunse et al., 2022). Applying essential oils topically, internally, or through inhalation are some of the ways that they can be used to treat Polycystic Ovary Syndrome (PCOS), provided that a licensed healthcare professional is watching over and guiding the process. A few drops of the essential oil of their choice mixed with carrier oil and massaged into the lower abdomen have helped some people find relief (Rao, 2021). A few individuals, on the other hand, select to diffuse the oils all through their homes in an exertion to move forward their common prosperity. The utilize of fundamental oils for polycystic ovarian disorder (PCOS) requires meeting with a healthcare proficient since a few oils have the potential to connected contrarily with drugs or cause side impacts. To completely comprehend the useful impacts of basic oils within the administration of polycystic ovarian disorder (PCOS), more investigate is required (Wang et al., 2020). On the other hand, accessible information recommends that these natural substances might be valuable in an integrator, all-encompassing approach to treating this complex affliction. When ladies with Polycystic Ovary Disorder (PCOS) work at the side therapeutic experts, they

can investigate the helpful benefits of utilizing basic oils as portion of a all-encompassing approach to make strides their regenerative wellbeing and common quality of life (Kumar et al., 2023).

Role of Essential oils in Menstrual Cramps

A number of females are facing menstrual issues like dysmenorrhea, amenorrhea, menorrhagia, oligomenorrhea or premenstrual syndrome (PMS). The withdrawal of the uterus in response to the lining shedding amid the menstrual cycle is capable for the onset of extreme pelvic torments. Delayed utilize of this strategy can cause critical distress because it discharges fiery chemicals into the body (Mizuta et al., 2023). Other than conventional over-the-counter painkillers and hormonal treatments, increasingly ladies are looking into utilizing basic oils as a common arrangement for controlling menstrual spasms. The strength of menstrual cramps may be lessened by the essential oils of chamomile, lavender, and clary sage, which have demonstrated strong anti-inflammatory, analgesic, and antispasmodic qualities (Sigdel et al., 2023). Research indicates that clary sage has relaxant effects on the uterine muscles, which may help ease the discomfort of cramping during menstruation. Thanks to its anxiolytic and sedative properties, lavender oil can help relieve stress and encourage relaxation during the menstrual cycle. Apigenin, an antioxidant compound that has been shown to inhibit prostaglandin production the agents that cause menstrual cramps is one of chamomile's most well-known properties (Demattio, 2020).

The calming scents of these essential oils can be diffused into the surrounding air, or they can be added to a bath in small amounts, or applied topically to the lower abdomen. Women can choose how to incorporate these oils into their self-care routines. Since herbs like fennel and ginger have anti-inflammatory qualities, many people find that drinking herbal tea with these infusions relieves their menstrual pain (Dewanjee et al., 2023). Essential oils can be a powerful natural solution to relieve the often debilitating symptoms of menstrual cramps when used regularly in conjunction with complementary holistic practices like exercise, stress reduction, and healthy eating habits. It is basic to push that, in spite of the fact that fundamental oils are by and large considered secure when utilized capably, individuals with delicate skin or pre-existing restorative conditions ought to utilize caution when including them to their wellness regimen. As with any supplemental treatment, it is best allude to ">to allude to a healthcare supplier some time recently joining fundamental oils into the administration of menstrual issues (Wal et al., 2024).

Essential oil Remedies and Hormonal Imbalances

An sporadic menstrual cycle, temperament swings, changes in weight, and issues getting to be pregnant are fair many of the concerning indications that can emerge from hormonal awkward nature that can have a negative impact on a woman's regenerative wellbeing. The utilize of medicine medicines to treat hormonal lopsided characteristics is the standard in customary treatment strategies; be that as it may, a developing number of ladies are investigating the potential points of interest of fundamental oils as a more characteristic and holistic alternative for overseeing these complex issues (Irshad et al., 2022). There's prove that certain essential oils can adjust hormone generation and reestablish homeostasis within the endocrine system. Studies on clary sage oil have inspected its ability to alter the adjust of progesterone and estrogen, two imperative hormones included within the control of the menstrual cycle and regenerative functions (Critchley et al., 2020). Hot flashes and temperament swings related to the menopausal move can be calmed by fennel oil, which includes a tall concentration of phytoestrogens and has illustrated guarantee in treating side effects regularly connected to hormonal awkward nature. One condition that should particularly concern women with polycystic ovarian syndrome (PCOS) is excessive testosterone synthesis, which thyme oil has shown promise in reducing (Minocha, 2020). Women can investigate various modes of administration, such as topical application, inhalation, and possibly internal consumption, to harness the therapeutic properties of essential oils for addressing hormonal imbalances (under the supervision of a qualified healthcare professional). Diffusion is a method of dispersing essential oils into the environment to promote holistic wellness. Targeted relief can be obtained by applying diluted essential oils to specific areas, such as the lower abdomen, back, or temples, through massage (Bunse et al., 2022).

The use of essential oils to treat hormonal imbalances should be discussed with a healthcare provider because some oils can cause negative side effects or interfere with medication (Ramsey et al., 2020). The processes by which essential oils influence the endocrine system and help to restore hormonal balance are the subject of ongoing research. Thus, among women who are looking for a more all-encompassing approach to managing their reproductive and general health, these natural remedies have become increasingly popular. Women can use essential oils to harness the healing qualities of natural compounds to balance their hormones, reduce associated symptoms, and achieve better balance and health by incorporating them into a holistic self-care routine (Heshelov, 2023).

Potential Benefits of Essential oils and Infertility

After a year of regular, unprotected sexual activity, infertility—which is defined as the inability to become pregnant—is a very personal and often complex issue that affects a significant portion of couples worldwide (Lin et al., 2021). As an alternative to conventional medical interventions like hormone therapy and assisted reproductive technologies, an increasing number of people are turning to holistic and natural ways of improving fertility. Essential oils are currently acknowledged as a potentially beneficial complementary therapy for those who are struggling with infertility. Research on the possible effects of various essential oils on various aspects of fertility has been conducted (Hategekimana and Erler,

2020). Research has indicated that clary sage oil may have a modulatory impact on the menstrual cycle, possibly fostering hormonal homeostasis through adjustments to the concentrations of important hormones like progesterone and estrogen, which are involved in ovulation and implantation directly. Stress and anxiety are known to have a significant impact on both male and female reproductive health (Koyama and Heinbockel, 2020). Ylang-ylang essential oil, with its anxiolytic and mood-enhancing properties, has been found to be helpful in reducing these effects. Studies on frankincense oil's ability to support ovarian and uterine health have been done; these findings may have consequences for raising the chance of a successful conception and implantation (Phelan et al., 2021). Essential oils have the potential to enhance the daily routines of infertile individuals in a variety of ways when included into a comprehensive regimen designed to support fertility. Some efficient ways to harness the potential benefits of these natural compounds are by applying diluted oils topically to the lower abdomen, diffusing them throughout the home, or consuming them internally while under the guidance of a qualified healthcare provider. Before using essential oils for infertility, it is important to understand that you should speak with a healthcare provider because there could be drug interactions or adverse effects (Noh et al., 2020).

Menstrual Disorders and Essential oils of Lavender, Clary Sage, Rose, and Geranium

The utilization of essential oils for addressing reproductive disorders in females has garnered attention as a complementary therapeutic approach. Essential oils, sourced from botanical sources, are purported to possess diverse therapeutic qualities, such as anti-inflammatory, antimicrobial, and hormone-regulating effects (Dosoky and Setzer, 2021). An analysis of the potential applications of essential oils in the treatment of specific reproductive disorders in women reveals that lavender oil, renowned for its sedative properties, has demonstrated efficacy in alleviating menstrual pain (dysmenorrhea) and premenstrual syndrome symptoms through its antispasmodic and anti-inflammatory attributes (Nath, 2024). The nearness of common phytoestrogens is known to contribute to hormone direction, giving potential alleviation from menstrual issues and the foundation of customary menstrual cycles. Since of this substance's capacity to promote disposition, it may moreover offer assistance decrease enthusiastic indications related with premenstrual disorder (PMS) and menstrual torment (Maqbool et al., 2022). Hormone control has been appeared to altogether diminish premenstrual disorder (PMS) indications, such as weakness and temperament swings. Thinks about have shown that affront resistance a issue habitually seen in polycystic ovarian disorder (PCOS) may progress, which may have a positive effect on menstrual cycle direction (Sanchez et al., 2023) The anti-androgenic properties of spironolactone may be advantageous within the administration of hirsutism, a common indication of polycystic ovary disorder (PCOS). It is hypothesized that the advancement of hormonal adjust and decrease of push may possibly increment ripeness. Improving in general hormonal wellbeing is fundamental for legitimate regenerative work. Recognized for its anxiolytic properties, this substance is capable of mitigating stress and anxiety, thereby potentially enhancing fertility (Bashir et al., 2023). Assists in the regulation of hormonal levels, resulting in a decrease in occurrences of hot flashes and nocturnal perspiration. The phenomenon of cooling demonstrating efficacy in mitigating hot flashes. The promotion of relaxation and improvement of sleep can effectively address insomnia commonly experienced during the menopausal transition (Proserpio et al., 2020).

Application Methods

The diffusion of essential oils can offer sustained respiratory benefits through inhalation. The process of diluting essential oils in carrier oils, such as coconut or jojoba oil, and topically applying them to the skin, particularly on the abdomen or lower back, can effectively target the reproductive organs (Mahmoud et al., 2022). The synergistic impacts of integrating essential oils with massage therapy can be attributed to the heightened circulation and increased relaxation that transpire as a result. It is imperative to dilute essential oils prior to topical application in order to prevent potential skin irritation. It is recommended to utilize high-quality, therapeutic-grade essential oils (Soares et al., 2021).

It is advisable to perform a patch test in order to identify and assess potential allergic reactions. Certain essential oils are not advisable for use during pregnancy or lactation. It is advisable to seek guidance from a qualified healthcare professional prior to utilizing the product. An array of reproductive disorders has been acknowledged to benefit from the adjunctive effects of essential oils. They are not meant to replace conventional medical treatments, it is crucial to remember that. Ensuring the safe and effective application of aromatherapy requires consulting with a healthcare professional, especially one with experience in the field (Nguyen, 2020).

Conclusion

When treating a variety of female reproductive disorders, such as irregular menstruation, infertility due to polycystic ovary syndrome and menopausal symptoms, essential oils have been demonstrated to be a useful adjunctive care option. These oils include lavender, sage, rose, geranium, cinnamon, peppermint and chamomile. With programs like aromatherapy, topical application and massage, the use of these natural remedies can be integrated into regular health routines in a flexible manner. Following safety precautions when using essential oils is crucial, as patch testing and appropriate dilution are key to minimizing the risk of adverse effects. For those who are pregnant or nursing, in particular, we advise using premium therapeutic oils and consulting a professional. Even though studies on essential oils and reproductive health have shown promise, conventional medical treatments should not be replaced with essential oils. It may be possible to improve general wellbeing and lessen symptoms related to reproductive disorders by

incorporating essential oils as a supplemental therapeutic intervention under the supervision of a physician skilled in aromatherapy. In addition to additional resources for health care, physical relief, and psychological support, this holistic approach may be able to offer women additional benefits.

REFERENCES

- Abraham Gnanadass, S., Divakar Prabhu, Y., and Valsala Gopalakrishnan, A. (2021). Association of metabolic and inflammatory markers with polycystic ovarian syndrome (PCOS): an update. *Archives of Gynecology and Obstetrics*, 303, 631-643.
- Ahmad, A., Kumar, M., Bhoi, N. R., Badruddeen, Akhtar, J., Khan, M. I., and Ahmad, M. (2023). Diagnosis and management of uterine fibroids: current trends and future strategies. *Journal of Basic and Clinical Physiology and Pharmacology*, 34(3), 291-310.
- Akram, M., Riaz, M., Munir, N., Akhter, N., Zafar, S., Jabeen, F., and Said Khan, F. (2020). Chemical constituents, experimental and clinical pharmacology of *Rosa damascena*: a literature review. *Journal of Pharmacy and Pharmacology*, 72(2), 161-174.
- Auzanneau, M. (2020). *Oil, power, and war: a dark history*. Chelsea Green Publishing.
- Baldil, O. (2021). Building Indecisiveness: People's Health Perceptual and Behavioral Trends in Portugal and Turkey (Doctoral dissertation).
- Bapat, A. (2022). Stem Cells and Recent Advances in Aesthetic and Regenerative Gynecology. *Aesthetic and Regenerative Gynecology*, 327-357.
- Bashir, R., Asrar, M. M., Shah, I. A., Wani, I. A., and Ganie, M. (2023). Do Pleiotropic Effects of Spironolactone in Women with PCOS Make it more than an Anti-androgen? Evidence from a Systematic Review and Meta-analysis. *Current Pharmaceutical Design*, 29(19), 1486-1496.
- Berek, J. S., Renz, M., Kehoe, S., Kumar, L., and Friedlander, M. (2021). Cancer of the ovary, fallopian tube, and peritoneum: 2021 update. *International Journal of Gynecology and Obstetrics*, 155, 61-85.
- Bouyahya, A., Chamkhi, I., Benali, T., Guaouguaou, F. E., Balahbib, A., El Omari, N., and El Menyiy, N. (2021). Traditional use, phytochemistry, toxicology, and pharmacology of *Origanum majorana* L. *Journal of Ethnopharmacology*, 265, 113318.
- Bunse, M., Daniels, R., Gründemann, C., Heilmann, J., Kammerer, D. R., Keusgen, M., and Wink, M. (2022). Essential oils as multicomponent mixtures and their potential for human health and well-being. *Frontiers in Pharmacology*, 13, 956541.
- Bunse, M., Daniels, R., Gründemann, C., Heilmann, J., Kammerer, D. R., Keusgen, M., and Wink, M. (2022). Essential oils as multicomponent mixtures and their potential for human health and well-being. *Frontiers in Pharmacology*, 13, 956541.
- Cebi, N., and Erarslan, A. (2023). Determination of the antifungal, antibacterial activity and volatile compound composition of citrus bergamia peel essential oil. *Foods*, 12(1), 203.
- Chhabra, E. (2023). *Working to Restore: Harnessing the Power of Regenerative Business to Heal the World*. Beacon Press.
- Chukwu, N. (2021). Women As Eco-Activists in Selected Niger Delta Novels and Plays (Doctoral dissertation).
- Colles, S. (2020). *The Art of Ayurvedic Nutrition: Ancient Wisdom for Health, Balance, and Dietary Freedom*. Skyhorse.
- Critchley, H. O., Maybin, J. A., Armstrong, G. M., and Williams, A. R. (2020). Physiology of the endometrium and regulation of menstruation. *Physiological reviews*.
- DeMattio, M. (2020). The Effect Aromatherapy has on a Woman's Perception of her Body and Menstrual Cycle.
- Dewanjee, S., Soheli, M., Hossain, M. S., Ansari, F., Islam, M. T., Sultana, F., and Amin, M. N. (2023). A comprehensive review on clinically proven natural products in the management of nerve pain, with mechanistic insights. *Heliyon*.
- Dinsdale, N. L., and Crespi, B. J. (2021). Endometriosis and polycystic ovary syndrome are diametric disorders. *Evolutionary Applications*, 14(7), 1693-1715.
- Dosoky, N. S., and Setzer, W. N. (2021). Maternal reproductive toxicity of some essential oils and their constituents. *International Journal of Molecular Sciences*, 22(5), 2380.
- Fabricius, A. (2020). Unfeminine, Unhealthy and Unusual: Women's Characterizations of Their PCOS Bodies (Doctoral dissertation, University of Guelph).
- Farahmand, H. (2020). The genus *Cupressus* L. mythology to biotechnology with emphasis on mediterranean cypress (*Cupressus sempervirens* L.). *Horticultural Reviews*, 47, 213-287.
- Firoozeei, T. S., Feizi, A., Rezaeizadeh, H., Zargarani, A., Roohafza, H. R., and Karimi, M. (2021). The antidepressant effects of lavender (*Lavandula angustifolia* Mill.): A systematic review and meta-analysis of randomized controlled clinical trials. *Complementary Therapies in Medicine*, 59, 102679.
- Forgie, M. (2021). Exploring Women's Experiences of Infertility, Reproductive Loss, and Grief (Doctoral dissertation, Université d'Ottawa/University of Ottawa).
- Gonçalves, A. C., Flores-Félix, J. D., Coutinho, P., Alves, G., and Silva, L. R. (2022). Zimbros (*Juniperus communis* L.) as a promising source of bioactive compounds and biomedical activities: A review on recent trends. *International Journal of Molecular Sciences*, 23(6), 3197.
- Hammer, A. J. (2023). *Cycles: The Science of Periods, Why They Matter, and How to Nourish Each Phase*. Shambhala Publications.
- Hategekimana, A., and Erler, F. (2020). Fecundity and fertility inhibition effects of some plant essential oils and their major components against *Acanthoscelides obtectus* Say (Coleoptera: Bruchidae). *Journal of Plant Diseases and*

Protection, 127, 615-623.

- Hawkey, A., Chalmers, K. J., Micheal, S., Diezel, H., and Armour, M. (2022). "A day-to-day struggle": A comparative qualitative study on experiences of women with endometriosis and chronic pelvic pain. *Feminism and Psychology*, 32(4), 482-500.
- Heshelow, E. (2023). *Essential Oils Book For Beginners: Improve Sleep, Energy, Digestion, Skin, and Immune System By Understanding The Power of Essential Oils and The Basics and Science Behind It*. Emma Heshelow.
- Huang, K., Chen, Y., Liang, K., Xu, X., Jiang, J., Liu, M., and Zhou, F. (2022). Review of the chemical composition, pharmacological effects, pharmacokinetics, and quality control of *Boswellia carterii*. *Evidence-Based Complementary and Alternative Medicine*, 2022.
- Irshad, M., Subhani, M. A., Ali, S., and Hussain, A. (2020). Biological importance of essential oils. *Essential Oils-Oils of Nature*, 1, 37-40.
- Irshad, S., Aijaz, A., and Husain, A. (2022). A study of menstruation and stress: the biological and psychological overview on menarche and menstrual disorders. *EPRA International Journal of Multidisciplinary Research (IJMR)*, 8(3), 85-90.
- Jaradat, N., Hawash, M., Qadi, M., Abualhasan, M., Odetallah, A., Qasim, G., and Al-Maharik, N. (2022). Chemical markers and pharmacological characters of *Pelargonium graveolens* essential oil from Palestine. *Molecules*, 27(17), 5721.
- Jiea, C. K., Fuloria, S., Subrimanyan, V., Sekar, M., Sathasivam, K. V., Kayarohanam, S., and Fuloria, N. K. (2022). Phytochemical screening and antioxidant activity of *Cananga odorata* extract. *Research Journal of Pharmacy and Technology*, 15(3), 1230-1234.
- Koyama, S., and Heinbockel, T. (2020). The effects of essential oils and terpenes in relation to their routes of intake and application. *International Journal of Molecular Sciences*, 21(5), 1558.
- Kumar, R., Kaur, L., Hajam, Y. A., Rai, S., Tanshinone, A., Curcumin, and Phytotherapy, R. (2023): A Natural Treatment for Polycystic Ovarian Syndrome. In *Herbal Medicine Applications for Polycystic Ovarian Syndrome* (pp. 213-226). CRC Press.
- Kumar, R., Mirza, M. A., Naseef, P. P., Kuruniyan, M. S., Zakir, F., and Aggarwal, G. (2022). Exploring the potential of natural product-based nanomedicine for maintaining oral health. *Molecules*, 27(5), 1725.
- Lin, T. K., Law, R., Beaman, J., and Foster, D. G. (2021). The impact of the COVID-19 pandemic on economic security and pregnancy intentions among people at risk of pregnancy. *Contraception*, 103(6), 380-385.
- Mahendran, G., and Rahman, L. U. (2020). Ethnomedicinal, phytochemical and pharmacological updates on Peppermint (*Mentha × piperita* L.)—A review. *Phytotherapy Research*, 34(9), 2088-2139.
- Mahmoud, G. A. E., Abdel-Basset, R., Abdel-Sater, M. A., and Sayed, A. G. (2022). Utilization of coconut and jojoba wastes for lipases production by *Aspergillus niger* and applied it for biodiesel production. *Global Nest Journal*, 24(3), 495-504.
- Maksoud, S., Abdel-Massih, R. M., Rajha, H. N., Louka, N., Chemat, F., Barba, F. J., and Debs, E. (2021). Citrus aurantium L. active constituents, biological effects and extraction methods. an updated review. *Molecules*, 26(19), 5832
- Maqbool, M., Ara, I., and Gani, I. (2022). The story of polycystic ovarian syndrome: a challenging disorder with numerous consequences for females of reproductive age. *International Journal of Current Research in Physiology and Pharmacology*, 19-31.
- Maqbool, R., Maqbool, M., Zehravi, M., and Ara, I. (2022). Menstrual distress in females of reproductive age: a literature review. *International Journal of Adolescent Medicine and Health*, 34(2), 11-17.
- Mehra, N., Tamta, G., and Nand, V. (2021). A review on nutritional value, phytochemical and pharmacological attributes of *Foeniculum vulgare* Mill. *Journal of Pharmacognosy and Phytochemistry*, 10(2), 1255-1263.
- Mendes, F. S. F., Garcia, L. M., da Silva Moraes, T., Casemiro, L. A., de Alcantara, C. B., Ambrósio, S. R., and Martins, C. H. G. (2020). Antibacterial activity of *salvia officinalis* L. against periodontopathogens: An in vitro study. *Anaerobe*, 63, 102194.
- Minocha, N. (2020). Polycystic Ovarian Disease or Polycystic Ovarian Syndrome: How to Identify and Manage-A Review. *Archives of Pharmacy Practice*, 11(2).
- Misra, N. N., Dixit, Y., Al-Mallahi, A., Bhullar, M. S., Upadhyay, R., and Martynenko, A. (2020). IoT, big data, and artificial intelligence in agriculture and food industry. *IEEE Internet of things Journal*, 9(9), 6305-6324.
- Mizuta, R., Maeda, N., Tashiro, T., Suzuki, Y., Oda, S., Komiya, M., and Urabe, Y. (2023). Quality of life by dysmenorrhea severity in young and adult Japanese females: A web-based cross-sectional study. *Plos one*, 18(3), e0283130.
- Nath, A. C. (2024) *Unveiling Nature's Remedies: A Comparative Review of Phytochemistry and Pharmacology of Vitex Negundo and Aristolochiatangala*.
- Nguyen, T., Brody, H., Lin, G. H., Rangé, H., Kuraji, R., Ye, C., and Kapila, Y. (2020). Probiotics, including nisin-based probiotics, improve clinical and microbial outcomes relevant to oral and systemic diseases. *Periodontology* 2000, 82(1), 173-185.
- Noble-Letort, S. R. (2021). *Human-Earth Expressions on Integrative Health and Our Environment: Mapping Caves*. Cambridge Scholars Publishing.
- Noh, S., Go, A., Kim, D. B., Park, M., Jeon, H. W., and Kim, B. (2020). Role of antioxidant natural products in management of infertility: a review of their medicinal potential. *Antioxidants*, 9(10), 957.
- Ovidi, E., Laghezza Masci, V., Zambelli, M., Tiezzi, A., Vitalini, S., and Garzoli, S. (2021). *Laurus nobilis*, *Salvia sclarea* and *Salvia officinalis* essential oils and hydrolates: Evaluation of liquid and vapor phase chemical composition and biological activities. *Plants*, 10(4), 707.
- Patel, M. P., Vyas, A. S., Bharadia, P. D., Patel, J. K., and Patel, D. H. (2023). Urogenital System Disorders and Functional Foods and Nutraceuticals. In *Applications of Functional Foods and Nutraceuticals for Chronic Diseases* (pp. 317-340). CRC

Press.

- Pathak, R., and Sharma, H. (2021). A review on medicinal uses of *Cinnamomum verum* (Cinnamon). *Journal of Drug Delivery and Therapeutics*, 11(6-S), 161-166.
- Pathania, D., Sharma, M., Kumar, S., Thakur, P., Torino, E., Janas, D., and Thakur, S. (2021). Essential oil derived biosynthesis of metallic nano-particles: Implementations above essence. *Sustainable Materials and Technologies*, 30, e00352.
- Patrick, A. (2023). Breast and Gynecological Cancers. In *Women's Health in Britain and America: Texts and Contexts* (pp. 341-449). Cham: Springer International Publishing.
- Paw, M., Begum, T., Gogoi, R., Pandey, S. K., and Lal, M. (2020). Chemical composition of Citrus limon L. Burmf peel essential oil from North East India. *Journal of Essential Oil Bearing Plants*, 23(2), 337-344.
- Phelan, N., Behan, L. A., and Owens, L. (2021). The impact of the COVID-19 pandemic on women's reproductive health. *Frontiers in Endocrinology*, 12, 642755.
- Proserpio, P., Marra, S., Campana, C., Agostoni, E. C., Palagini, L., Nobili, L., and Nappi, R. E. (2020). Insomnia and menopause: a narrative review on mechanisms and treatments. *Climacteric*, 23(6), 539-549.
- Ramsey, J. T., Shropshire, B. C., Nagy, T. R., Chambers, K. D., Li, Y., and Korach, K. S. (2020). Focus: Plant-based medicine and pharmacology: Essential oils and health. *The Yale Journal of Biology and Medicine*, 93(2), 291.
- Rao, S. K. (2021). An insight on polycystic Ovary syndrome (PCOS) and use of herbal medicines as alternative treatment. In *Treating Endocrine and Metabolic Disorders with Herbal Medicines* (pp. 125-163). IGI Global.
- Sanchez, B. N., Kraemer, W. J., and Maresh, C. M. (2023). Premenstrual Syndrome and exercise: a narrative review. *Women*, 3(2), 348-364.
- Shahrajabian, M. H., Sun, W., and Cheng, Q. (2020). Chemical components and pharmacological benefits of Basil (*Ocimum basilicum*): A review. *International Journal of Food Properties*, 23(1), 1961-1970.
- Shala, A. Y., and Gururani, M. A. (2021). Phytochemical properties and diverse beneficial roles of *Eucalyptus globulus* Labill.: A review. *Horticulturae*, 7(11), 450.
- Sigdel, D., Joshi, A., Thapa, T., Koirala, P., and Sharma, K. (2023). Prevalence and predictors of dysmenorrhoea and its effects among adolescent girls in Chitwan, Nepal. *Journal of Chitwan Medical College*, 13(1), 15-23.
- Silva, A. S., Tewari, D., Sureda, A., Suntar, I., Belwal, T., Battino, M., and Nabavi, S. F. (2021). The evidence of health benefits and food applications of *Thymus vulgaris* L. *Trends in Food Science and Technology*, 117, 218-227.
- Soares, G. A. B. E., Bhattacharya, T., Chakrabarti, T., Tagde, P., and Cavalu, S. (2021). Exploring pharmacological mechanisms of essential oils on the central nervous system. *Plants*, 11(1), 21.
- Tai, Y., Ling, C., Wang, C., Wang, H., Su, L., Yang, L., and Yuan, Y. (2020). Analysis of terpenoid biosynthesis pathways in German chamomile (*Matricaria recutita*) and Roman chamomile (*Chamaemelum nobile*) based on co-expression networks. *Genomics*, 112(2), 1055-1064.
- Wal, P., Gupta, D., Wal, A., Pandey, S. S., and Krishnan, K. (2024). A Wholistic Approach to Non-Pharmacological Intervention for Primary Dysmenorrhea. *Current Women's Health Reviews*, 20(1), 21-34
- Wang, T., Sha, L., Li, Y., Zhu, L., Wang, Z., Li, K., and Wang, H. (2020). Dietary α -Linolenic acid-rich flaxseed oil exerts beneficial effects on polycystic ovary syndrome through sex steroid hormones—microbiota—inflammation axis in rats. *Frontiers in Endocrinology*, 11, 524221