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"" وَلَئِن شَكَرتُم لازيدنَّكُم""

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In the name of Allah, we announce our arrival and praise be to Allah who has granted us the pleasure of achievement and success. He has made beginnings easy for us and allowed us to reach the end. The journey was neither short nor the dream easy, but by the grace of Allah, we have accomplished it.

I dedicate the fruit of my success to:

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To my paradise in this world, my companion on the path, my first supporter, my beloved and cherished refuge, my joy. I ask Allah to protect you and bless you with health, happiness, and well-being. O Lord, protect **my mother**

To my support in this world after my parents, to the mountains standing behind me, my siblings, my refuge, my security. May Allah guide your steps and light your path. O Lord, protect **my brothers**

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Dedication

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من لم يشكر الناس لم يشكر الله ومن أهدى اليكم معروفا فكافؤوه وان لم تستطيعوا فادعوا له

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الملخص

يُعتبر تكيس المبايض لدى النساء مشكلة صحية عامة رئيسية، حيث يتجه الكثير من المرضى بالجزائر إلى الأدوية العشبية للتخفيف من حدته. تهدف هذه الدراسة إلى تقدير فعالية النباتات الطبية المستعملة في الطب التقليدي لمعالجة التكيس في مدينة سطيف بالجزائر، من خلال دراسة ببليوغرافية يليها استبيان عرقي نباتي، تم إجراؤه بشكل ورقي وإلكتروني، حيث استهدف المرضى في ولاية سطيف وبعض الولايات الأخرى. تمت الإجابة على الاستبيان من قبل 75 مريضة، 42.67٪ منهن متزوجات و57.33٪ عازبات، بحيث 28٪ يعانين من تأخر في الحمل، و70.67٪ يعانين من اضطرابات في الدورة الشهرية. كشف الاستبيان عن 10 أنواع من النباتات التي تهم المجتمع العلمي، حيث تصدر نبات القطف *(Atriplex halimus)* قائمة الأنواع الأكثر شيوعًا في الطب التقليدي لعلاج متلازمة تكيس المبايض بنسبة 51.06٪. حيث أثبت هذا النبات فعاليته العلاجية ضد التكيس المبيضي. كما استخدم 76٪ من المرضى الطب التقليدي بنبات واحد، في حين استخدم 24٪ مزيجًا من النباتات، بناءً على نتائج هذه الدراسة. يبرز هذا البحث أهمية البحث العلمي في تثمين الاستخدام التقليدي للنباتات في معالجة مشاكل الصحة الإنجابية كتكيس المبايض.

الكلمات المفاتيح: النباتات الطبية، الطب التقليدي، استبيان ومتلازمة تكيس المبايض.

Abstract

Polycystic ovarian syndrome (PCOS) is a significant public health concern among women, leading many patients in Algeria to turn to herbal therapies for relief from its severity. This study aims to evaluate the efficacy of medicinal plants utilized in traditional medicine for the treatment of Polycystic Ovary Syndrome (PCOS) in Setif, Algeria. This will be accomplished by a comprehensive assessment of relevant literature, followed by an ethnobotanical survey that focuses on plant-based remedies. The survey will be conducted using both paper and electronic methods, targeting patients residing in Setif as well as neighboring localities. The study was conducted with a sample size of 75 patients. Among them, 42.67% were married and 57.33% were unmarried. Additionally, 28% of the patients reported experiencing infertility, while 70.67% reported having menstrual abnormalities. The investigation revealed 10 botanical species of scientific significance, with *Atriplex halimus* being the most prevalent plant, accounting for 51.06% of traditional medicinal use in treating PCOS. This herb has demonstrated medicinal effectiveness against PCOS. The survey found that 76% of patients relied on a solitary plant in traditional medicine, whilst 24% utilized a mixture of plants. This study emphasizes the significance of scientific research in understanding the traditional utilization of herbs for resolving reproductive health concerns such as PCOS.

Keywords: Medicinal plants, polycystic ovary syndrome, survey, and traditional medicine.

Résumé

Le syndrome des ovaires polykystiques (SOPK) est une préoccupation majeure de santé publique chez les femmes, conduisant de nombreux patients en Algérie à se tourner vers des thérapies à base de plantes pour soulager sa gravité. Cette étude vise à évaluer l'efficacité des plantes médicinales utilisées dans la médecine traditionnelle pour le traitement du syndrome des ovaires polykystiques à Sétif, en Algérie. Cela sera accompli par une évaluation approfondie de la littérature pertinente, suivie d'une enquête ethnobotanique axée sur les remèdes à base de plantes. L'enquête sera menée à l'aide de méthodes à la fois papier et électroniques, ciblant les patients résidant à Sétif ainsi que dans les localités environnantes. L'étude a été réalisée sur un échantillon de 75 patients. Parmi eux, 42,67% étaient mariés et 57,33% étaient célibataires. De plus, 28% des patients ont signalé des problèmes d'infertilité, tandis que 70,67% ont déclaré avoir des anomalies menstruelles. L'enquête a révélé 10 espèces botaniques d'importance scientifique, *Atriplex halimus* étant la plante la plus répandue, représentant 51,06% de l'utilisation de la médecine traditionnelle dans le traitement du SOPK. Cette plante a démontré son efficacité médicinale contre le SOPK. L'enquête a montré que 76% des patients utilisaient une plante unique en médecine traditionnelle, tandis que 24% utilisaient un mélange de plantes. Cette étude souligne l'importance de la recherche scientifique dans la compréhension de l'utilisation traditionnelle des herbes pour résoudre les problèmes de santé reproductive tels que le SOPK.

Mots-clés : Plantes médicinales, syndrome des ovaires poly-kystiques, enquête et médecine traditionnelle.

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ABBREVIATIONS LIST

BPA:	Bisphenol A.
COCS:	Combined oral contraceptive.
Ctscan:	Computed tomography.
E1 :	Estrone.
E2:	Estradiol.
E3 :	Estriol.
FSH:	Follicle-Stimulating Hormone.
GHIH:	Growth Hormone Inhibiting Hormone.
GnRH :	Gonadotropin Releasing Hormone.
GnRH-R:	Gonadotropin Releasing Hormone Receptors.
Gp:	Glycoprotein.
HA :	Hyperandrogenism.
HPO:	Hypoyhalamus-Pituitary-Ovarian.
IGF:	Insulin-like Growth Factor.
INSL:	Insuline-Like.
LH :	Luteinizing Hormone.
MRI:	Magnetic Resonance Imaging.
Mfg:	Ferriman-Gallwey.
PIH :	Prolactine Inhibiting Hormone.
PCOS:	Polycystic Ovary Syndrome.
SHBG:	Sex Hormone-Binding Globulin.

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Introduction

The body of a woman is distinguished by the female reproductive system, with the ovary being one of its key organs. The ovary is responsible for the production of ova and sex hormones such as estrogen, which is secreted by the follicles, and progesterone, which is secreted by the corpus luteum. These hormones play an important role in the development of female characteristics during puberty.

The ovary undergoes cyclic modifications under the influence of pituitary gonadotropins, which ensure the development and release of a mature ovum in the middle of each menstrual cycle, as well as the production of ovarian hormones that control this cycle. In the proliferative phase of the menstrual cycle, some follicles grow larger until one reaches maturity and releases its single ovum into the fallopian tube (ovulation). Up until this point, the follicle also produces estrogen. Later, it changes into the corpus luteum, which produces progesterone until the start of the subsequent cycle, at which point it atrophies to form a residual fibrous corpus albicans. Pregnancy is typically the only event that disrupts this regular sequence of modifications, as the corpus luteum remains intact until the end of the first trimester.

However, this sequence can be interrupted at any stage, leading to the formation of small cysts in the ovary, a condition known as polycystic ovary syndrome (PCOS). Most often, these are spontaneously resolutive functional cysts that require simple ultrasound monitoring. Organic ovarian cysts have a diverse histological nature. The most common types are serous and mucinous cysts derived from the epithelial lining of the ovary, endometriomas associated with pelvic endometriosis, and dermoid cysts developed from the germ cells of the ovary **(Raiga, 2006).**

In terms of treatment, medicinal plants play a crucial role in managing polycystic ovary syndrome. Despite technological advancements and significant progress in the field of pharmacy, traditional medicine holds a prominent and popular position among affected women. Indeed, while modern medicine has proven effective in treatment, traditional medicine, based on beliefs predating scientific development and empirical evidence, also has its place.This is the case for plants such as *Atriplex halimus, Origanum majorana,* and *Salvia officinalis*, which have been scientifically proven to have therapeutic activity against ovarian diseases in general and polycystic ovary syndrome in particular.

This study aims to enumerate the medicinal plants used in the treatment of polycystic ovary syndrome in Algerian folk medicine, with the goal of preserving national heritage and contributing to its transmission across generations.

The bibliographic research consists of three chapters:

- Overview of the Ovary: Its parts, characteristics, and its relationship with the hormonal system.
- Theoretical Study on Types of Cysts: Particularly focusing on polycystic ovary syndrome (PCOS).
- Descriptive Study of Common Plants Used in the Treatment of Ovarian Cysts: Examining various medicinal plants known for their therapeutic properties in treating ovarian cysts.

The field study consists of a directed survey to enumerate the commonly used plants by women affected by PCOS for medical purposes, particularly in Algerian traditional medicine.

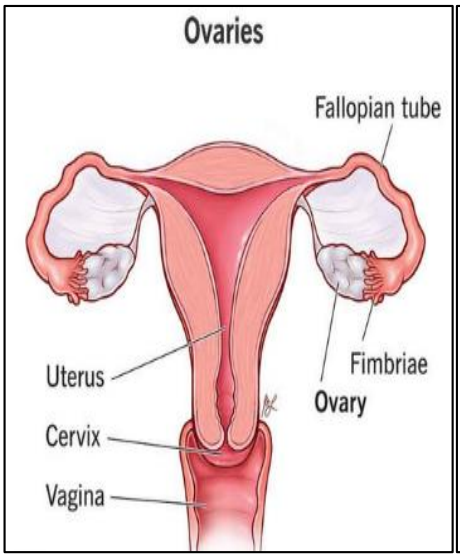
CHAPTER I: The ovary

I. Ovary

The ovaries are the primary female gonads. Typically, human females are born with a pair of ovaries. These two glands, resembling a Greek olive in size, play a crucial role in transmitting our genetic material and consequently ensure the ongoing existence of the human race. These glands are responsible for synthesizing female gametes and releasing hormones that are essential for feminization and reproduction **(Zietarska, 2011)**.

I.1. Anatomy

The ovary is a bilateral gland in the pelvic cavity that serves as the female gonad. The object's dimensions for women are around 3 cm in length, 2 cm in breadth, and 1 cm in thickness. Its weight is approximately 8 grams. The substance has a solid and dense texture, and its color combines pink and white. A lumbo-ovarian ligament connects the ovaries to the lumbar wall, while a utero-ovarian ligament connects them to the uterus **(Michel, 2015)**. The broad uterus ligament is a peritoneal fold that envelops and supports the fallopian tubes, uterus, and vagina **(Fig.01)**. The mesovarium suspends the ovary between the uterus and the pelvic wall, allowing blood vessels and nerves to pass through the ovary. The abdominal aorta is the source of a few ovarian arteries. In addition to the uterine arteries, there is a branch and a significant venous plexus **(Michel, 2015)**.



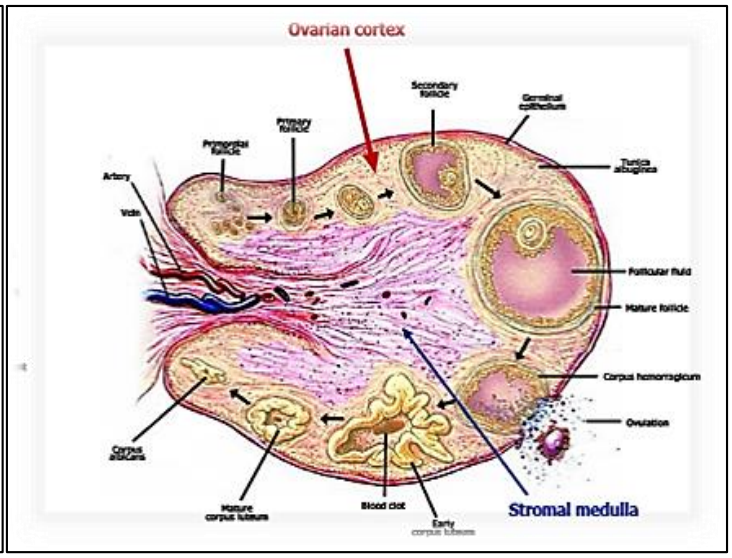


Fig. 01: Ovary anatomy **(Zık *et al.*, 2019).** **Fig 02:** Ovaryhistology **(Petraglia *et al.*, 2008).**

I.2. Histology

The ovary's histology involves understanding its microscopic structure and the arrangement of its various tissues and cells **(Fig. 02)**:

- **Outer Layer (Germinal Epithelium):** This is the outermost layer of the ovary. It consists of a single layer of cuboidal cells known as the germinal epithelium. Despite its name, it doesn't give rise to gametes, but instead serves as a protective covering for the ovary **(Anastacio, 2014).**
- **Tunica Albuginea:** Beneath the germinal epithelium lies a layer of dense connective tissue called the tunica albuginea. It provides structural support to the ovary and serves as a boundary between the outer cortex and the inner medulla **(Canis *et al*., 2007; Anastasio, 2014).**
- **Cortex:** The outer region of the ovary is called the cortex. It contains ovarian follicles at various stages of development These follicles include primordial follicles (the earliest stage), primary follicles, secondary follicles, tertiary follicles (also known as antral follicles), and Graafian follicles (mature follicles ready to release an egg). The cortex is also home to structures like the corpus luteum (formed from a ruptured follicle after ovulation) and the corpus albicans which is a scar tissue remnant of the corpus luteum.
- **Medulla:** The inner region of the ovary is called the medulla. It consists of loose connective tissue, blood vessels, lymphatic vessels, and nerves. The medulla plays a crucial role in supplying nutrients and oxygen to the ovarian follicles and other structures within the ovary **(Cerine, 2022)**.

I.3. Physiology

The ovary performs two main functions - an exocrine role involving the release of viable eggs, and an endocrine function involving the production and release of sex steroid hormones like estrogen and progesterone **(Sherwood, 2006)**. These hormones regulate processes like follicular development, ovulation, and pregnancy. Its first function is hormonal production, which changes drastically at puberty. In response to rising levels of GnRH from the hypothalamus, the ovaries begin secreting increasing amounts of hormones like estrogen, testosterone, inhibin, and progesterone, creating the hypothalamic-pituitary-ovarian (HPO) axis **(Petraglia *et al*., 2008).**

The ovary's second function is housing the egg cells, or oocytes, which begin developing in utero and pause until puberty. The pituitary LH surge during ovulation matures the ovum. Antral follicles measuring 2-9mm in size develop, with one becoming dominant while the others degenerate **(Schmidt *et al*., 2007).**

I.3.1. Ovarian cycle

The menstrual cycle is a set of physiological phenomena in which women prepare their bodies for potential fertilization. The usualduration of the menstrual cycle is 28 days, but it can be longer or shorter and is not always regular. It begins at puberty and ends at menopause **(Hawkins *et al*., 2008; Beverly *et al*., 2018).**

The menstrual cycle consists of three distinct phases **(Hawkins *et al*., 2008; Beverly *et al*., 2018)**:

- **The follicular phase**: lasts approximately 14 days, starting on the first day of the last period. During this phase, several ovocytes enveloped in their ovarian follicle, a cell that resembles a small sac, begin their maturation under the influence of the pituitary hormone (FSH). The pituitary hormone (FSH) will expel only one of them.
- **Ovulation:** During these 24 to 48 hours that mark the middle of the ovarian cycle, the secretion of luteinizing hormone (LH) rises significantly. Its function is to cause the follicle to rupture and the mature ovum to expel. This is referred to as ovulation. In the hours following ovulation, the ovum moves to the fallopian tube, where it awaits fertilization or degeneration.
- **The luteal phase:** constitutes the final part of the ovarian cycle. This period between ovulation and the following menstruation lasts between 12 and 14 days. During the luteal phase and under the influence of hormonal impregnation, the ovarian follicle transforms into a gland named after its pigmentation: the corpus luteum.

This yellow body is a key element from the perspective of a future pregnancy. Indeed, by secreting estrogen and progesterone, it prepares the uterine mucosa (endometrium) to receive the egg in case of fertilization. This is why it thickens significantly during the second part of the cycle, which continues until the 20th day.

I.3.2. Hormonal system

Ovarian hormones refer to the hormones that are synthesized by the ovaries, which are integral components of the female reproductive system. The main ovarian hormones consist of estrogen, progesterone, and testosterone. Furthermore, the ovaries secrete several other hormones, including inhibin, relaxin, and androstenedione **(Table I).**

Table I: Ovary hormonal system.

Hormones	Types/ precursor	Biosynthetic site	Functions
Estrogen (Fang, 2001; Heath, 2008)	✓ Steroid hormone Precursor: ✓ Estrone (E1) ✓ Estradiol (E2) ✓ Estriol (E3)	✓ The ovaries ✓ The placenta ✓ The adrenal glands.	✓ Ovogenesis. ✓ Follicle maturation. ✓ The development of female secondary sexual characteristics, growth spurts, and the activity of reproductive organs.
Progesterone (Brooker, 2001).	✓ Steroid hormone.	✓ The corpus luteum (the granulosa cells of the Graafian follicle).	✓ Hormone of gestation ✓ The preparation and maintenance of pregnancy. ✓ Promotes the growth of the endometrium and breasts ✓ Induces changes in cervical mucus ✓ Inhibits uterine muscle activity.
Testosterone (Tostain *et al*., 2004 ; Philipe *et al*., 2009 ; Clarisse , 2013 ; Meyer, 2016 ; Mahamadou, 2019 ; Coquen, 2022).	✓ The main circulating androgen. ✓ Is the main sex hormone in men. ✓ It belongs to the family of androgens, also known as anabolic steroid.	✓ The ovaries. ✓ The adrenal glands. ✓ Secreted predominantly at the level of leyding interstitial cells of the testicle.	✓ Play a crucial role in the sexual differentiation of the nervous system ✓ Intermediate in the metabolism of steroids that leads to the production of female hormones.
Inhibin (Johnson and Everitt, 2002)	✓ Peptide hormone or ▪ Types: Somatostatins (GHIH), ▪ PIH (prolactin inhibiting hormone), ▪ Dopamine.	✓ By the granulosa cells of the developing follicle. ✓ After ovulation,by the corpus luteum.	✓ Act on the pituitary gland, stimulating the release of the pituitary hormones. ✓ Inhibit the secretion of FSH and to a lesser extent LH.
Relaxin (Chartrel and Vaudry, 2002 ; Ivell and Bathgate, 2002; Johnson *et al*., 2002 ; Goh *et al*., 2013)	✓ Heterodimeric polypeptide hormone belonging to the insulin superfamily ✓ Type : ▪ Insulin ▪ IGF-I& II ▪ Relaxine -1,2,3 ▪ Relaxine like factor ▪ INSL 4,5, and 6.	✓ Corpus luteum ✓ Placenta	✓ Promote the expression of endothelial growth factor in the uterine. ✓ Involved in the development of new blood vessels essential for embryonic growth. ✓ Continue to relax the smooth muscles of the uterus.
Androstenedione (Shackleton *et al*., 1997; Malaviya and Gomes, 2008; Badawy *et al*., 2021)	✓ Steroidal hormone. ✓ Precursor: Androstenedione or 4-Androstene-3-17-dione (4A).	✓ Adrenals glande. ✓ The gonade.	✓ Act as precursors in the esterogen and testosterone hormones production.

I.3.3. Regulation of the female reproductive system by the hypothalamo-pituitary axis

The hypothalamo-hypophyso-gonadal axis, or gonadotropic axis, consists of three interconnected structures - the hypothalamus, pituitary gland, and gonads. The synchronization and regulation of these three components ensures the reproductive function **(Fig.03)**. Although the specific mechanisms regulating reproductive activity may vary among species, hypothalamic GnRH neurons remain the conductors of the axis activity **(Ayrout, 2018).**

Gonadropin-releasing hormone (GnRH) is a ten-amino acid peptidic neurohormone with a highly conserved sequence in Mammals **(Duittoz and Prévot, 2014).** This GnRH plays a crucial role in driving the activity of the hypothalamo-hypophyso-gonadal axis and ultimately regulating reproductive processes. The tight coordination between the hypothalamus, pituitary, and gonads, mediated by GnRH and other key hormones, is essential for maintaining proper reproductive function.

I.3.3.1. Mechanism of action of GnRH

Gonadotropin-releasing hormone is released in a pulsatile manner by neurons and reaches the pituitary gland via the hypothalamo-hypophyseal portal system. It acts at the pituitary level through a specific receptor (GnRH-R) located on the surface of gonadotrope cells. The binding of GnRH to its receptor initiates a cascade of intracellular signaling that involves several proteins, activating the transcription of genes encoding luteinizing hormone (LH) and follicle-stimulating hormone (FSH) and/or the release of these hormones. Gonadotropin-releasing hormone receptors (GnRHRs) are 7-transmembrane domain receptors, similar to G protein-coupled receptors, found in the membranes of gonadotrope cells of the pituitary gland. In humans, there are two GnRHR subtypes **(Knobil *et al*., 1981):**

1. GnRHR1: This receptor is expressed in gonadotrope cells and primarily regulates the synthesis and secretion of LH and FSH.
2. GnRHR2: The functioning of this receptor is not fully understood, but it is expressed in the uterus and ovaries.

The hypothalamus secretes GnRH, which stimulates the production of gonadotropins**:**

- ✓ FSH promotes the development of ovarian follicles.
- ✓ LH triggers ovulation from a mature follicle and promotes the formation of the corpus luteum from the ruptured follicle**.**

FSH and LH are heterodimeric glycoprotein hormones that stimulate the sex glands (gonads). These gonadotropin hormones are produced by gonadotrope cells and regulate the functioning of the gonads. Each gonadotropin is composed of a common α-subunit and a hormone-specific β-subunit (FSHβ, LHβ) **(Jiang *et al*., 2014).**

I.3.3.2. At the ovarian level

At the ovarian level, the gonads secrete sex hormones that act on target organs by binding to receptors, allowing them to control their secretion through feedback mechanisms **(Blin, 2013).** In the ovarian follicles, granulosa cells produce estrogens by transforming androgens under luteinizing hormone (LH) stimulation. Estrogens have an autocrine action, increasing their production and that of inhibin, which inhibits the secretion of follicle-stimulating hormone (FSH)**.** Inhibin also enhances the stimulating action of LH on the theca cells, promoting androgen synthesis. LH also stimulates progesterone synthesis from the corpus luteum**.** In women, cyclical variations in ovarian estrogen and progesterone levels cause negative and positive feedback on the hypothalamo-pituitary complex, leading to the LH surge and ovulation **(Blin, 2013).** These cyclical changes in estrogen and progesterone levels coordinate with the endometrial cycle, preparing the uterus for potential implantation after fertilization **(Furelaud *et al*., 2009).** Progesterone is the hormone of gestation essential for maintaining pregnancy; it promotes endometrial growth, changes in cervical mucus, and inhibits uterine muscle activity **(Brooker, 2001).** Estrogens are essential for reproductive function, playing roles in oogenesis, sexual characteristics, and the activity of reproductive organs **(Fang, 2001; Heath, 2008).**

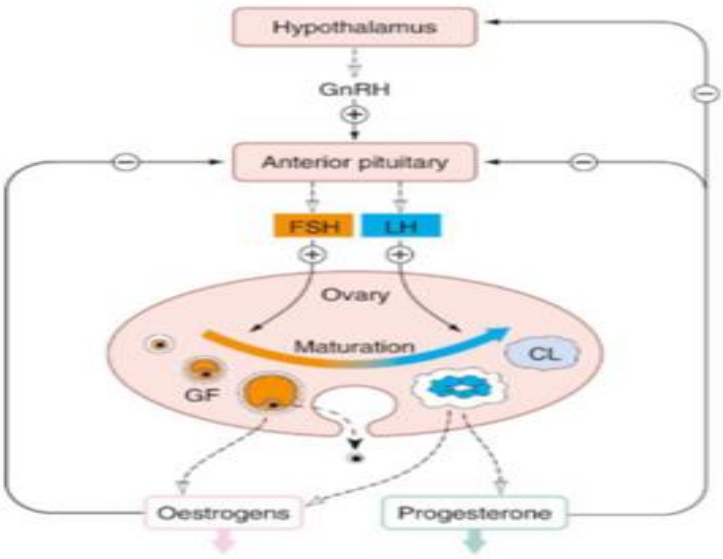


Fig. 03: Hypothalamo-hypophysaire axis **(Douxfils, 2020).**

Chapter II: Ovarian Cysts

I. Ovarian Cysts

An ovarian cyst is an abnormal collection of fluid enclosed by a membrane and located inside an ovary. The size of an ovarian cyst varies greatly (from a few millimeters to several centimeters in diameter). An ovary with multiple cysts is called polycystic **(Larousse Medical, 2006).**

I.1. Classification

Ovarian cysts can be classified based on their origin, nature, and specific characteristics. There are two types of cysts: functional cysts and organic cysts **(Horde, 2019).**

I.1.1. Functional cysts

A functional cyst is a type of cyst that is surrounded by follicular and thecal cells, which may have varying degrees of luteinization. It can be either a follicular cyst, a luteal cyst, or a corpus luteum cyst. The luteal cyst can be distinguished from the follicular cyst by the abundance of voluminous granulosa cells and small luteinized thecal cells that are filled with cholesterol, which form a circumferential yellow layer **(Bazot *et al*., 2004)**.

A. Follicular cysts

The follicular cyst is located inside the ovary, measuring between 3 and 8 cm and filled with fluid. It is a single, round-shaped cyst with a thin wall and a single cavity. It is a type of ovarian cyst that forms from a dominant follicle, which is the one that develops the most in preparation for ovulation **(Fig. 04)**. This follicle develops abnormally because it does not receive the necessary LH hormonal peak to trigger ovulation, resulting in continuous stimulation of gonadotropin hormones and excessive follicle growth **(Bazot *et al*., 2016).**

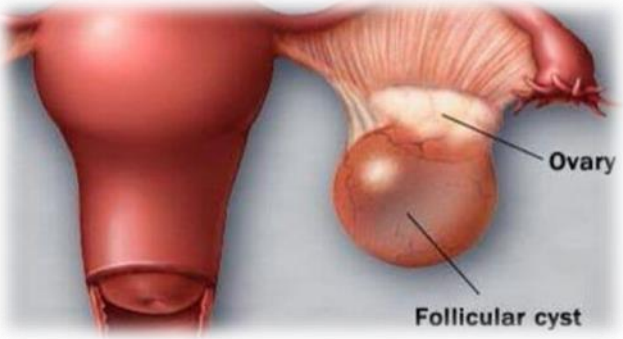


Fig. 04 : Follicular cyst diagram **(Audebert, 2013).**

B. Hemorrhagic luteal cysts

The hemorrhagic luteal cyst, also called a corpus luteum cyst **(Fig.05),** is a type of ovarian cyst that originates from the corpus luteum, an endocrine gland that develops during ovulation and secretes progesterone during the luteal phase of the menstrual cycle. However, a

corpus luteum cyst may form if there is excessive bleeding inside the corpus luteum, whether menstrual or gestational. The corpus luteum cyst is yellow in color, thick, and includes blood (a cholesterol-related condition). During pregnancy, its size can increase to up to 10 cm, although it typically ranges from 3 to 5 cm **(Bazot *et al*., 2016).**



Fig.05: Lutein cyst **(Nathan *et al*., 2003)**.

I.1.1. Benign organic cysts

These cysts form in the surface epithelium (ovarian epithelial tumors), specialized stroma (tumors of the spinal cord), or germ cells (ovarian germ cell tumors). Though they can have a small amount of malignancy, these tumors are usually benign **(Reid *et al*. 2017).**

A. Serous cysts

The most common operative cysts, known as serous cystadenomas, represent about 25 to 35% of all cases. These cysts have walls lined with ciliated columnar epithelium, resembling the cells found in the fallopian tubes **(Fig. 06).** Approximately 25 to 30% of serous cysts occur bilaterally. These cysts generally contain clear serous fluid **(Raiga *et al.*, 2006).**

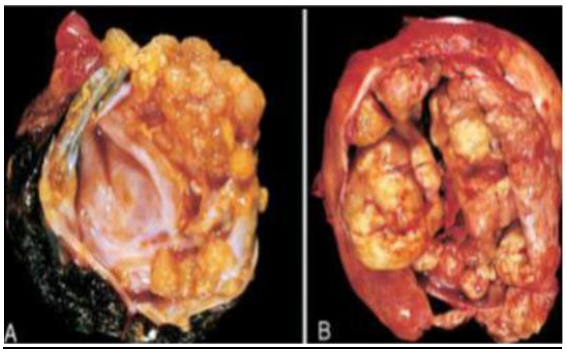


Fig.06: Serous or papillary cystadenoma of the ovary **(Rosai and Ackerman, 2004).**

B. Mucinous cyst

Mucinous cystadenomas are cystic tumors that occur in about 10 to 15% of operated cyst cases. These tumors are lined with mucus-producing epithelium, which can be either endocervical type or enteroid type with goblet cells. The lining may also have a papillary appearance **(Fig. 07**). Mucinous cystadenomas contain a thick, sticky fluid **(Raiga *et al*., 2006).**

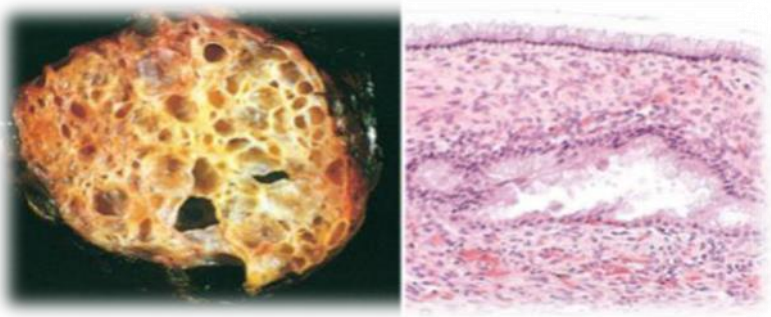


Fig.07: Mucinous cyst **(Rosai and Ackerman, 2004).**

C. Endometriomas

The cyst's contents consist of a thick, chocolate-brown liquid that contains blood. Endometriomas are most commonly associated with other lesions of pelvic endometriosis **(Fig. 08),** which are responsible for pelvic pain and infertility **(Raiga *et al*., 2006)**.



Fig.08: Endometriotic avarian cyst **(Raiga *et al*.,2006).**

D. Mature dermoid cysts or teratomas.

Mature teratomas represent 90% of benign ovarian tumors in children, with diagnosis typically occurring between the ages of 6 and 11 years. In 8 to 15% of cases, these tumors are bilateral and present as complex masses composed of a cystic part and a mural nodule, which often contains fat and calcifications **(Fig.09).** Unusual forms of this disease can be diagnosed using a CT scan (Computed Tomography) or MRI (Magnetic Resonance Imaging) **(Balu *et al*., 2008)**.



Fig.09 : Ovarian dermoid cyst **(Boudhraa *et al*., 2009).**

I.2. Poly Cystic Ovary Syndrome

Polycystic ovary syndrome (PCOS), also known as ovarian dystrophy or micropolycystic ovary syndrome, is a highly prevalent endocrine disorder among women of reproductive age, with a prevalence in adults ranging from 5-20% and approximately 6% in adolescents **(Yildiz *et al*., 2012)**.

PCOS is characterized as an ovarian dysfunction and is a heterogeneous reproductive disorder with hormonal and metabolic implications. It is a common endocrine disorder that directly causes an ovulatory infertility in females of reproductive age **(Hestiantoro *et al*., 2018).**

Symptoms of PCOS can include excessive growth of facial and body hair, acne, mood swings, fertility disorders, and weight gain **(Druet, 2018)**. It encompasses a set of symptoms that affect a woman's reproductive and cardiac health, significantly impacting her overall health and lifestyle **(Trimèche *et al*., 2004).**

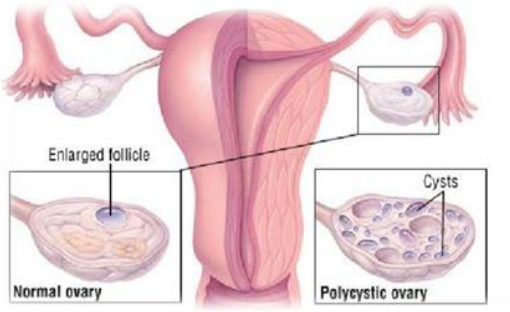


Fig.10: Morphological differences between a normal and a polycystic ovary **(Harvard Health, 2019).**

I.2.1. Etiology

The exact etiology of PCOS is not fully understood and is likely multifactorial in nature, involving a combination of genetic, epigenetic, and environmental factors **(Conway *et al*., 2014).**

At the genetic level, PCOS is not considered to be caused by a single responsible gene. Rather, it is viewed as a complex polygenic condition, where an association of several genetic variants, each with a small degree of risk, may contribute to the development of the disorder **(Dumesic *et al*., 2015)**. The candidate genes that were explored are those involved in the synthesis and action of steroid hormones, those involved in carbohydrate metabolism, and those involved in the action and regulation of gonadotropins. These candidate genes were selected because they could account for certain characteristics of polycystic ovary syndrome **(Torre and Fernandez, 2007)**.

In addition to genetic factors, epigenetic and environmental influences are also thought to play a role in PCOS. Obesity is often associated with PCOS, but its exact relationship is not entirely clear. Some evidence suggests that obesity may exacerbate the reproductive and metabolic disorders associated with PCOS, rather than being a direct cause **(Torre and Fernandez, 2007**).

Other environmental and lifestyle factors, such as diet, physical activity, and certain medications (such as second-generation antipsychotics or valproic acid), may also contribute to the development or worsening of PCOS by influencing factors like insulin resistance **(Doretto, 2020).**

Additionally, exposure to certain environmental chemicals, such as bisphenol A (BPA), has been observed to be higher in individuals with PCOS, and may potentially play a role in the pathogenesis of the condition.

I.2.2. Epidemiology

PCOS is a highly prevalent condition, affecting approximately 1 in 10 women, or 10% of the female population. It is the most common endocrinopathy in women of reproductive age, affecting around 1 in 10 women in France **(Inserme, 2019)**, and between 5-20% of women worldwide, including 6-18% of adolescents **(Letombe *et al*., 2019; Peña *et al*., 2020).**

This syndrome exhibits high rates of ovulatory disorders (90%) and hirsutism (90-95%) **(Benchimol, 2014)**. Interestingly, the association between PCOS and obesity appears to be higher in the United States, where around 80% of women with PCOS are affected by obesity, compared to only 50%, in Europe. This difference may be related to the overall higher prevalence of obesity in the US **(Sirman and Pate, 2014).**

I.2.3. Pathophysiology

The pathophysiology of PCOS is complex, reflecting the interactions between genetic, metabolic, fetal, and environmental factors. PCOS is likely a heterogeneous disorder, with multiple perturbations leading to a variety of clinical phenotypes in affected women **(Sirman and Pate, 2014).**

Among the prominent factors involved in the pathophysiology of PCOS are presented in table II and figure 10:

- Disordered gonadotropin secretion, with elevated mean LH, low or low-normal FSH, and a persistently rapid frequency of GnRH pulse secretion **(Zumoff *et al.*, 1983)**.
- Hyperandrogenism (HA).

- Insulin resistance and hyperinsulinemia.
- Ovarian dysfunction and follicular arrest.

The relative importance of these various factors may vary among individual women diagnosed with PCOS. The complexity and heterogeneity of the underlying mechanisms continue to be an area of active research **(Sirman and Pate, 2014).**

Table II: Mechanisms of action of some factors inpathophysiology of PCOS.

Factors	Mechanisms
Hyperandrogenism	• Excessive production of androgens, primarily testosterone **(Peigné *et al.*, 2013; Declaye *et al.*, 2017)**. • Involves increased activity of enzymes like cytochrome P450 c17 and 17-HSD in theca cells, leading to increased androgen synthesis (**Wood *et al.*, 2003)**. • Hyperinsulinemia contributes by potentiating androgen synthesis and reducing sex hormone-binding globulin (SHBG), increasing free testosterone **(Torre and Fernandez, 2007)** .
Follicular Dysfunction	• Dysregulation of the hypothalamic-pituitary-ovarian axis leads to an inversion of the normal FSH/LH ratio. • High LH stimulates excessive androgen production and proliferation of thecal and stromal cells (**Catteau *et al.*, 2019**). • Low FSH impairs follicular maturation, leading to follicular arrest and anovulation. • Excess androgens disrupt normal folliculogenesis by promoting growth of small follicles while opposing atresia **(Dewailly *et al.*, 2020).**
Menstrual Cycle Disturbances	• Irregular, infrequent menstrual cycles due to anovulation or dysovulation **(Teede *et al.*, 2018)**. • Lengthening of the follicular phase, with a normal 14-day luteal phase **(Bazot *et al.*, 2016)** • Amenorrhea, either secondary (absence for ≥3-6 months) or primary (no menarche by age 16) **(Torre and Fernandez, 2007)**
Metabolic Complications	• Increased risk of metabolic syndrome, including abdominal obesity, hypertension, dyslipidemia, and insulin resistance/type 2 diabetes **(Cooney and Dokras, 2018; Hoeger *et al.*, 2021; Fu *et al.*, 2023)** • Presence of ≥3 of the established criteria confirms metabolic syndrome**(Delarue *et al.*, 2006)**.

The key complications of PCOS include infertility **(Wang *et al.*, 2019)**, cardiovascular disease **(Delarue *et al.*, 2006)**, and an elevated risk of certain gynecological cancers,

particularly endometrial cancer **(Haoula *et al.*, 2012)**. Effective management of PCOS is crucial to reduce these serious health consequences.

I.2.4. Diagnostic

The key diagnostic for hirsutism, acne, and alopecia in the context of polycystic ovary syndrome (PCOS):

- **Hirsutism:**

Hirsutism is characterized by excessive terminal hair growth in a male pattern distribution, commonly appearing on the face, chest, back, and other areas **(Rosenfield, 2005)**. Its severity is assessed using the modified Ferriman-Gallwey (mFG) score, which evaluates hair growth across nine body areas **(Yildiz *et al*., 2010)**.

- **Acne:**

Acne in PCOS presents as a combination of retentional (comedones) and inflammatory (papules, pustules) lesions primarily on the face, neck, back, and chest. It results from hormonal imbalance, particularly excess androgen production and increased sebum **(Peigné *et al.*, 2013)**.

- **Alopecia (hair loss):**

Androgenetic alopecia in PCOS manifests as reduced hair density in the central scalp area, with progressive widening of the midline. Its frequency and severity typically increase with age, affecting approximately 20-30% of adult PCOS patients **(Carmina *et al.*, 2019).** Evaluation is done using the Ludwig scale, which grades alopecia from I (least severe) to III (most severe) **(Lizneva *et al*., 2016; Shapiro, 2007).**

- **Imaging:**

Pelvic ultrasound is essential for diagnosing PCOS by assessing excess follicles and decreased ovarian reserve, which are primary diagnostic criteria **(Catteau-Jonard *et al*., 2019).** While CT/MRI imaging is not routinely necessary, it can be beneficial to rule out other ovarian abnormalities like dermoid cysts **(Raiga *et al*., 2015).** Endovaginal ultrasound is preferred for visualizing typical PCOS ovarian morphology **(Bazot *et al.*,2014)**.

I.2.5. Polycystic ovary syndrome management

The choice of treatment depends on the individual patient's symptoms, response to prior therapies, and consideration of risks and benefits. A multifaceted approach combining lifestyle, contraceptive, and anti-androgen treatments is often most effective.

1. Lifestyle modifications

Incorporating lifestyle alterations, such as engaging in customized exercise routines and making nutritional adjustments, plays a crucial role in effectively controlling PCOS. The purpose of these adjustments is to rectify metabolic dysregulation and enhance reproductive outcomes by restoring ovulatory function. Studies suggest that even a small reduction in weight can result in substantial enhancements in hormone levels, regularity of menstrual cycles, and fertility among women diagnosed with PCOS **(Tolino *et al.*, 2005)**. Consequently, lifestyle changes are frequently advised as an initial measure in the treatment of PCOS, enhancing general health and reproductive well-being.

2. Contraceptives

Combined oral contraceptives (COCs) serve as a cornerstone in managing the symptoms of PCOS, particularly hyperandrogenism-related issues like hirsutism and acne. By suppressing ovarian androgen production and modulating hormone levels, COCs effectively alleviate these symptoms **(Fauser *et al.*, 2012)**. They work through an antigonadotropic mechanism, regulating menstrual cycles and reducing the clinical manifestations of excess androgens. However, the use of COCs requires careful consideration of individual health histories, particularly concerning potential risks such as thrombosis, which should be evaluated in consultation with healthcare providers **(Vrbíková & Cibula, 2005)**.

3. Antiandrogens

Antiandrogen therapies play a crucial role in managing PCOS symptoms, particularly those related to hyperandrogenism. Clomiphene citrate, a first-line medication, stimulates ovulation in a significant percentage of cases, ranging from 60% to 80%, thereby improving fertility outcomes **(Merviel *et al.*, 2017)**. Metformin, known for its insulin-sensitizing properties, is often prescribed to enhance ovulatory function, especially when combined with clomiphene or used as a monotherapy in insulin-resistant PCOS patients **(Nasri & Rafieaian-Kopaei, 2014)**. Myo-inositol, another insulin sensitizer, shows promise in improving oocyte quality and reproductive outcomes in PCOS patients **(Stimou *et al.*, 2023**). These medications are pivotal in addressing the hormonal imbalances that characterize PCOS and are tailored based on individual patient needs and responses.

5. Androgen-blocking Medications:

Androgen-blocking medications are essential for managing hyperandrogenism symptoms in PCOS. Cyproterone acetate, an antiandrogen that blocks androgen receptors, effectively reduces hirsutism by inhibiting the effects of androgens on hair follicles **(Moghetti**

***et al*., 2000)**. Spironolactone, a diuretic with anti-androgen properties, is also used to treat hirsutism and acne, offering an alternative or complementary therapy to COCs **(Moghetti *et al*., 2000)**. Additionally, topical minoxidil may be prescribed to promote hair growth in cases of androgenetic alopecia associated with PCOS, though it does not address the underlying hormonal imbalance **(Moghetti *et al*., 2000).** These medications provide targeted relief from hyperandrogenic symptoms, enhancing both cosmetic outcomes and overall quality of life for PCOS patients.

6. Dietary supplements

Dietary supplements containing calcium, vitamin E, and zinc may provide benefits for PCOS patients by helping to regulate insulin, androgens, and metabolism. The evidence for magnesium in PCOS is less clear. Overall, targeted supplementation may be a useful adjunct to other PCOS management strategies. The table below summarizes the key mechanisms by which these dietary supplements may provide benefits for women with PCOS.

Table III: Key treatment mechanisms involved dietary supplements.

Supplement	**Mechanisms of action against PCOS**
Calcium **(Günalan *et al.*,2018)**	- Involved in oocyte maturation and follicular development and helps regulate insulin levels.
Magnesium **(Günalan *et al.*,2018)**	- Facilitates calcium entry into cells. - Potential impact on depression, hypertension, cardiovascular disease, and diabetes, but no specific studies in PCOS context.
Vitamin E **(Tefagh *et al.*,2022)**	- Acts as an antioxidant. - Promotes increase in SHBG levels. - Decreases androgen levels. - Improves insulin resistance.
Zinc e.g. Effizinc®, Rubozinc®) **(Fernandez *et al.*, 2004)**	- Allows proper function of enzymes involved in lipid, carbohydrate, and protein metabolism. - Helps reduce hyperinsulinemia. - Supports glycemic and lipid regulation. - May help prevent type 2 diabetes and reduce cardiovascular disease risk.

7. Surgical Treatment or Ovarian Drilling

Ovarian drilling is a minimally invasive surgical procedure performed via laparoscopy or fertiloscopy to treat PCOS-related infertility. It involves making small perforations or "drilling" into the ovaries using either heat (diathermic coagulation) or laser techniques **(Fernandez *et al.*, 2004)**. The exact mechanism of how this improves PCOS symptoms is unknown, but it has been shown to: restore ovulatory cycles in around 70% of cases, and result in a pregnancy rate of about 34% within 6 months **(Bayram *et al.*, 2004)**.

Ovarian drilling is indicated as an alternative to gonadotropin therapy for PCOS-related infertility in patients' resistant to clomiphene citrate (CLOMID) **(Thessaloniki, 2008)**. Even if spontaneous pregnancy does not occur within 6 months, ovarian drilling can still facilitate a better response to subsequent ovarian stimulation with gonadotropins, potentially with fewer side effects **(Tozer *et al.*, 2001)**.

Chapter III: Phytotherapy of PCOS

I. Phytotherapy of PCOS

Phytotherapy, derived from the Greek roots "phyton" (plant) and "therapeia" (treatment), refers to the science of medicinal plants or treatment through plants. It encompasses the use of plant-derived medications for the treatment of diseases, a practice grounded in both traditional observation and modern scientific analysis, affirming the therapeutic properties recognized for millennia **(Gayet, 2013).**

I.1. Phytotherapy types

The field of natural and plant-based therapies includes various practices **(Balta *et al.*, 2023)**:

- **Aromatherapy**: The use of aromatic plant extracts and essential oils for healing and wellness purposes.
- **Gemmotherapy**: A form of phytotherapy that uses extracts from the buds and young shoots of plants.
- **Homeopathy**: A system of alternative medicine based on the principale of treating "like with like," using highly diluted substances.
- **Phytobalneotherapy**: The use of medicinal plants in baths for therapeutic effects.
- **Flower therapy**: The use of flower essences to balance physical and emotional conditions.
- **Herbalism or classical phytotherapy**: The practice of using whole plants or plant extracts for medicinal purposes.

In phytotherapy, there are several methods of preparing plants, each tailored to the treatment of different diseases infusion, decoction, and maceration.

II. Polycystic ovary phytotherapy

Phytotherapy offers several potential options for managing polycystic ovary syndrome (PCOS). The most commonly used plants and herbs in phytotherapy for PCOS, along with their proposed benefits, includes: *Atriplex halimus, Salvia officinalis, Origanum majorana L,….*

According to **Liu and Mao (2013),** the potential effects of these plants on ovarian cysts may be due to:

- **Anti-inflammatory Properties**: The presence of flavonoids and phenols may contribute to its anti-inflammatory effects, which could help reduce inflammation associated with ovarian cysts.
- **Antioxidant Activity**: The high levels of vitamins A, C, and E, along with flavonoids, provide strong antioxidant properties. Antioxidants help in reducing oxidative stress, which can be beneficial in managing ovarian cysts by preventing cellular damage.
- **Hormonal Regulation**: Traditional medicine often uses plants with phytoestrogenic properties to regulate hormonal imbalances, a common cause of ovarian cysts. While there's no specific evidence indicating that they have phytoestrogenic compounds, the overall effect on hormone regulation may be inferred from its traditional use.
- **Detoxification**: The presence of saponins and alkaloids may aid in detoxifying the body, potentially reducing the formation and growth of cysts by eliminating toxins and promoting overall health.

Additionally, research has shown that various plants known for their efficacy in treating ovarian cysts, highlighting their active constituents and the scientific evidence supporting their use. The table below show the phytochemical compounds and mechanisms through which these plants exert their effects **(Table IV)**.

Table IV: Plants with potential effects against ovarian cysts **(Lakshmi *et al.*, 2023)**.

Scientific Name	Main compound	Mechanisms
Herbs That Increase Ovulatory Cycles		
Vitex agnuscastus ***(***Verbenaceae***)***	Flavonoids such as luteolin, casticin, apigenin, 3-methylkaempferol, and diterpenoid viteagnusin.	By blocking dopamine-2 (D-2) receptors and lengthening ovulatory cycles, the diterpenoid viteagnusin and flavonoids such as apigenin, 3-methylkaempferol, luteolin, and casticin contribute significantly to the suppression of prolactin levels **(chen *et al.*, 2011)**. Furthermore, the flavonoid apigenin's specific activity on the estrogen receptor-β (ERβ) will aid in the stimulation of ovulatory cycles **(Shishodia *et al.*, 2007)**.

Curcuma longa ***(Zingeberaceae)***	Curcuminoids include desmethoxycurcumin (6–19.4%), bisdemethoxycurcumin (0.30–9.10%), and curcumin (diferuloylmethane) (71.50–94%).	Increases the levels of estradiol and decreases progesterone in the blood in women with PCOS **(Jimenez *et al.*, 2016)**.
Herbs with Anti-Androgen Properties		
Glycyrrhiza glabra ***(Fabaceae)***	The main phytoestrogens in liquorice are glabridin, glabrene, liquiritigenin, isoliquiritin, and liquiritin **(Yang *et al.*, 2018)**.	Flavonoids have been shown to have a beneficial effect on the production of insulin, which lowers blood sugar and helps cure PCOS **(Baby *et al.*, 2016)**.
Linum Usitatissimum ***(Linaceae)***	comprises 25% proteins, 6–10% mucilage, 30%–40% fixed oils, and lignans as well as saturated and unsaturated fatty acids. Secoisolariciresinol and Secoisolariciresinol Diglycoside-SDG are two major lignans, and l-galactose, d-xylose, d-galacturonic acid, and l-rhamnose are abundant in the fiber's mucilage.	- The body's production of estrogen is regulated by the secondary metabolites of lignum, which also support menstruation and fertility (**Jelodar *et al.*, 2018)**. - Decrease blood levels of elevated testosterone and significantly lower androgen levels, which are helpful in treating PCOS **(Aziz *et al.*, 2021)**. -PCOS symptoms like hirsutism and hyperandrogenism are also lessened by flaxseed. Preclinical research verified that adding flaxseed to the diet improved the development of the corpus luteum, decreased the amount of cysts in ovarian follicles, and decreased androgen levels in female rats **(Kamel, 2013)**.
Mentha spicata ***(Labiatae)***	includes flavonoids and their analogues, such as catechin, rutin, xanthomicrol, quercetin-4-glucoside, 5,6-dihydroxy-7,8,3,4-tetramethoxyflavone, and carotenoids, such as lutein. sideritoflavone, ladanein, gallocatechin-gallate, sorbifolin, thymosin, hesperidin, and thymonin eriodictyol-7-O-glucoside, 5-O-demethylnobiletin, luteolin-7-O-rutinoside, isorhoifolin, and narirutin **(Aires *et al.*, 2016)**.	- lowered the degree of hirsutism and the levels of both free and total testosterones. -By decreasing atretic follicles and increasing graafian follicles, spearmint helps PCOS patients with ovarian cysts **(Rooney *et al.*, 2014; Wang *et al.*, 2016)**. - *Mentha* controls the blood levels of FSH and LH. -It may be helpful in treating PCOS based on this blood regulation of LH/FSH.

		- A number of preclinical investigations have demonstrated the anti-androgen effects of spearmint **(Lima *et al.*, 2015)**.
Cocus nucifera ***(Arecaceae)***	- The oil is mostly composed of lauric acid and alphatocopherol; in the case of roots, it also contains a wealth of phenolic compounds, including flavonoids and saponins **(Costa *et al.*, 2010)**. Thus, it includes skimmiwallin, isoskimmiwallin, and lupeol methyl ether.	- *C. nucifera* controls sex hormone levels in the blood, including FSH and LH. - Preclinical studies have demonstrated the beneficial effects of cocos nucifera on the size and quantity of ovarian cysts in PCOS patients. - This plant contains methyl (9Z,12Z)-9,12-octadecadienoate, a lipid with anti-androgenic qualities **(Erosa *et al.*, 2002)**. - In India, menstrual cycle disorders are treated with oral infusions of a coconut inflorescence **(Bhandary *et al.*, 1995)**.
Punica granatum ***(Punicaceae)***	Vitamins B2, C, and B1, sugars, organic acids, folic acid, and pantothenic acid	- *Punica granatum* consumption lowers PCOS-related problems **(Yadav *et al.*, 2020)**. -The blood levels of free testosterone, serum estrogen, and androstenedione hormone returned to normal in women who incorporated Punica granatum into their regular diet **(Hossein *et al.*, 2015)**.
Herbs That Promote FSH and Decrease LH Secretions		
Cinnamomum zeylanicum ***(Lauraceae)***	Including procyanidins like caryophyllene, cinnamaldehyde, cinnamyl acetate, pinene, hydrocarbon, benzyl benzoate, phellandrene, safrole, cymene, and cineol, as well as cinnamyl alcohol, linalool, eugenol, eugenol acetate, methyl eugenol, and benzaldehyde **(Jayaprakasha *et al.*, 2002)**.	1. Improved insulin sensitivity, decreased IGF-1, increased IGFBP-1, down-regulated T, and improved insulin resistance as a result of tyrosine phosphatase inhibition in PCOS rats. 2. Activities that are hepatoprotective, antioxidant, anti-obesity, anti-hyperlipidemic, and antidiabetic **(Azin *et al.*, 2022)**.

Pimpinella anisum L ***(****Apiaceae*)	Trans-pseudo isoeugenol 2-methylbutyrate (1.3%), trans-anethole, anisketone, anisaldehyde, and methyl chloride.	-1. Reduction of PCOS symptoms in rats through modifications to the ovarian tissue's histomorphologies. -2. Improved the PCOS hormone profile (FSH, LH) **(Mahood *et al.*, 2012).**
Trigonella foenum-graecum *(Fabaceae)*	B-pinene, β-caryophyllene, neryl acetate, and camphor.	-1. Elevated levels of FSH and LH, as well as a slight decline in the LH/FSH ratio. -2. Effective in reducing PCOS symptoms and exhibiting broad-spectrum safety and effectiveness **(Swaroop *et al.,* 2015).**

Chapter IV:

Survey on phytotherapy of ovarian cysts

I. Survey on phytotherapy of ovarian cysts

I.1. Materials and methods

I.1.1 Materials

This observational study aimed to identify and enumerate Algeria's different medicinal plants traditionally used to treat ovarian cysts. An ethnobotanical survey was conducted in the region of Setif for four months (February to May 2024) through various means, such as an online platform at this link: https://docs.google.com/forms/d/e/1FAIpQLSdyRDHYDTzfIrTyRutgw_WMaNgNh0gv7u2E7TGeH5PoxZbOCA/viewform?usp=sharing, and paper-based distribution near to gynecologists, the student library, herbalists in the city of Setif primarily, and other provinces. It is written in Arabic and English languages (Annex I).

I.1.2. Methods

This study's material consists of a pre-designed survey (electronic and paper-based) composed of five sections, each containing a comprehensive set of questions to collect data on women with the disease and the biologically active plants used in treatment.

1. **General information**
   - Residence location.
   - Educational level.
   - Age.
   - Family situation.

2. Ovarian cysts information
   - Type of ovarian cysts.
   - Types of disorders associated to ovarian cysts.

3. Plant's information
   - Form (only one plant or mixture).
   - Name of plant.
   - Used part (whole part, seeds, leaves, flowers, stems, fruits, roots).
   - State of plant used (fresh, dried).
   - Form of remedy (whole part, powder, oil …).

4. Plant's preparation
   - Preparation method (infusion, decoction, maceration, …).
   - Plant's application (oral, suppository, …).
   - Frequency (once a day, twice a day, three times a day, …).
   - Duration of treatment.

5. Plant's effects
   - Purposes of using medicinal plants (curative, preventive).
   - Relived symptoms.
   - Side effect.
   - Parallel processing and others diseases.
   - Recommendations.

I.1.3. Data Analysis

The data from this ethnobotanical survey were captured and structured in a database using Excel software (version 2019). Several tables were created to organize the information, which was then processed and analyzed to produce various diagrams. These visual representations facilitated a clearer understanding of the distribution and usage patterns of medicinal plants in treating ovarian cysts within the surveyed population.

I.2. Results and discussion

The survey ensured the confidentiality of all patient information, adhering to strict privacy standards to protect participants' identities and personal health data. Conducting the survey online offered several advantages, including broader reach, convenience for participants, and efficient data collection and analysis. This approach allowed for the inclusion of a diverse population, making the findings more comprehensive and representative of the region.

This study involved 75 patients with ovarian cysts. The analysis revealed a variety of medicinal plants traditionally used in the region to manage ovarian cyst. These plants, their frequency of use, and the specific conditions they were used to treat were systematically documented. The study highlighted the significant role of traditional medicine in local healthcare practices and provided a valuable reference for further research into the efficacy and potential integration of these medicinal plants into broader healthcare strategies.

I.2.1 Frequency of the disease in the studied sample

The frequency of polycystic ovary syndrome (PCOS) in the studied sample involved a total of 67 women from Setif province, 3 from Algiers province, and one each from Tipaza, Oran, Mostaghanem, Batna, and Bordj Bou Arreridj. This study showed that the distribution of PCOS was determined as follows: 89.33% in Setif, 04% in Algiers, and 01.33% collectively in the other provinces. These subjects confirmed their diagnosis of PCOS, as illustrated in Figure 11.

According to the findings of Soltane and Daas (2022), PCOS is prevalent not only in Biskra province but also in various other Algerian and international provinces. This widespread occurrence indicates that the disease is a significant concern at both national and global levels.

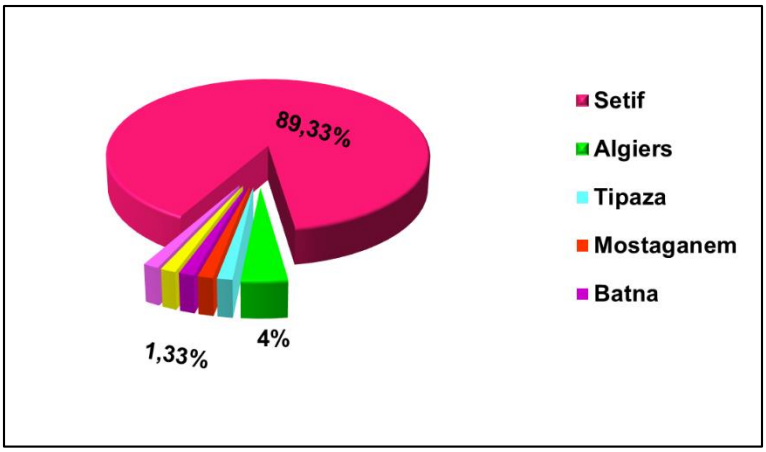


Fig. 11 : Distribution of surveyed women according to the region.

I.2.2 General information of polycystic subjects

A. Age

According to the obtained results, this study show that the most age categories affected and sensitive to polycystic ovary syndrome are represented by those between 21 and 30 years old, accounting for 65.33%. This is followed by the category between 31 and 45 years old, accounting for 18.67%. While, the categories, between 15 and 20 years old, account for 13.33%, and those between 46 and 55 years old represents menopause, with only 2.67% being less affected by this condition **(Fig. 12)**.

Through this study, it becomes clear that PCOS affects patients in their optimal reproductive age, where ovulation is accelerated and ovarian hormonal secretions (progesterone, estrogens) are increased. These findings are similar to those of Torre *et al*. (2007) and are also consistent with those of Gourbesville *et al*. (2019), who have shown that PCOS is primarily diagnosed in women of reproductive age.

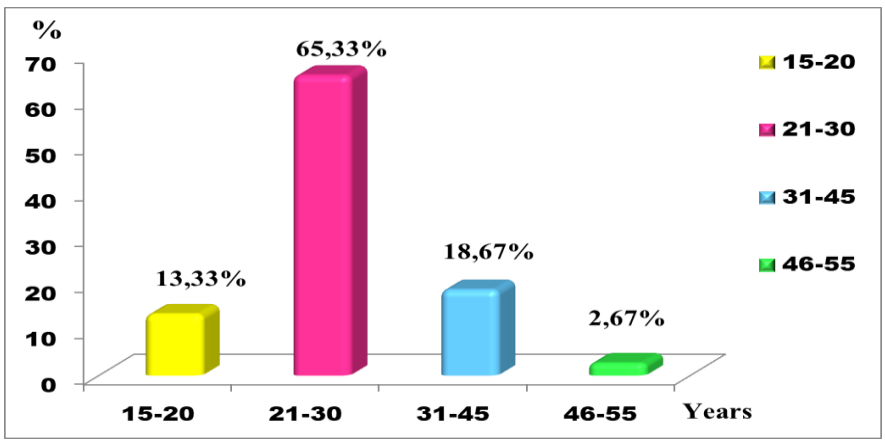


Fig.12: Distribution of interviewed women according to age.

B. Education level

The obtained results show that the distribution among users of medicinal plants is as follows: 40% have bachelor's degrees, 29.3% have master's degrees, 17.3% have a high school diploma, 12% do not have a high school degree, and 1.33% are illiterate. This distribution is illustrated in **Fig. 13**.

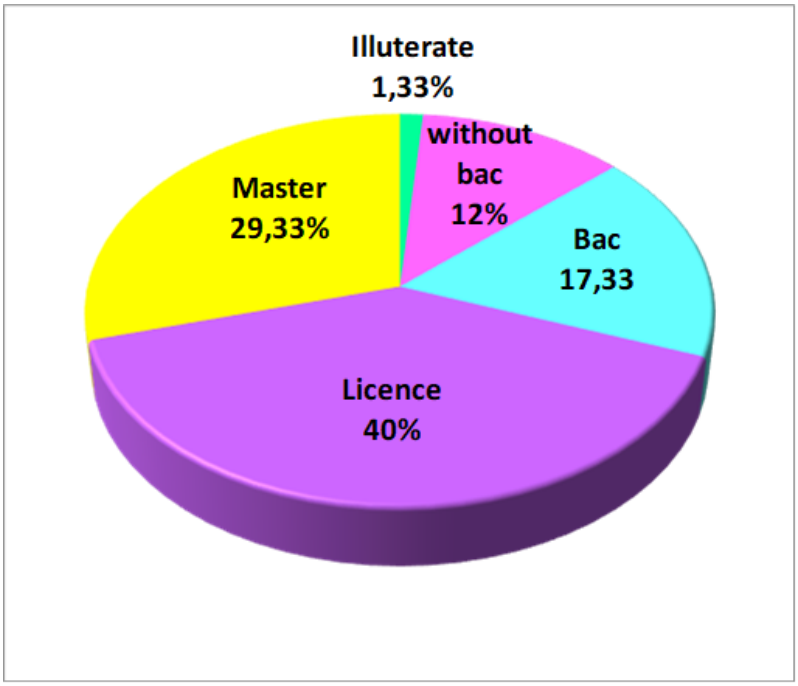


Fig. 13: Distribution of women surveyed according to the education level.

These results align closely with those reported by Boukharouba and Bourogaa (2021), indicating that individuals with a high academic level represent the majority at 52%, compared to other educational levels. This relatively high rate, directly linked to the educational attainment of the individuals studied, underscores that most medicinal plant users have attained university degrees or possess an advanced academic background. These results reflect their academic culture and their preference for plant-based treatments as a means to reduce or minimize the use of synthetic medications.

C. Family situation

Upon examining the obtained results, it is observed that married women utilize medicinal plants less frequently, accounting for 42.67%, compared to single women, who represent 57.33% **(Fig. 14)**. These findings align with those reported by Belloua and Djoudi (2021), whose data showed that the majority of patients were single (53%) while 47% were married.

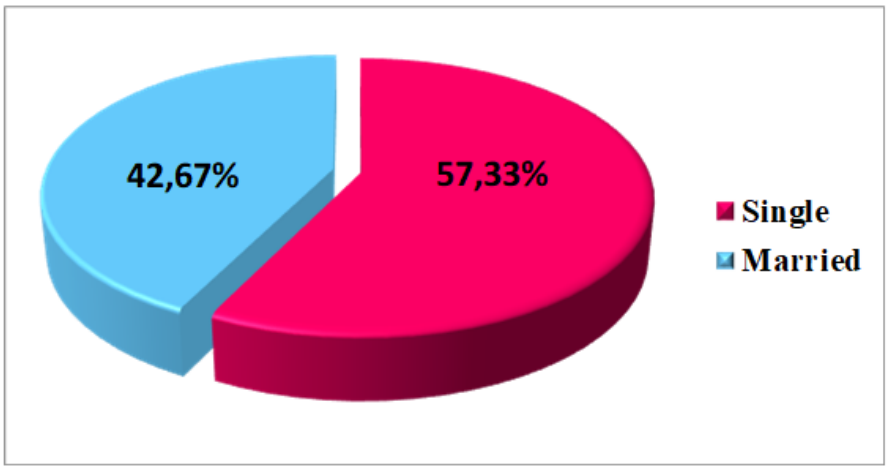


Fig.14: Distribution of surveyed women according to their family situation.

These results could argue that polycystic ovary syndrome (PCOS), is linked to some factors such as stress, dietary habits, lack of physical and sexual activity, and lifestyle choices, which appears to be more prevalent among single individuals.

D. Type of cyst

In the studied population, it is found that 80% of female patients have functional cysts, while 20% suffer from pathological cysts **(Fig. 15).**

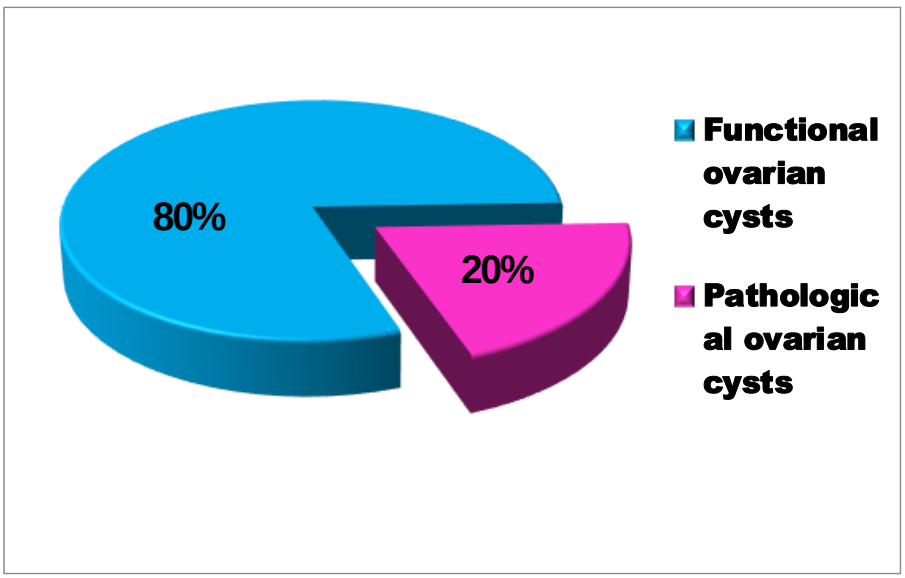


Fig.15: Frequency of cysts types.

E. Disruptions caused by PCOS

This study revealed that the majority of women, accounting for 70.67%, suffer from menstrual disorders, while 28% experience fertility delays. A further 1.33% display various disruptions to a lesser degree **(Fig. 16)**.

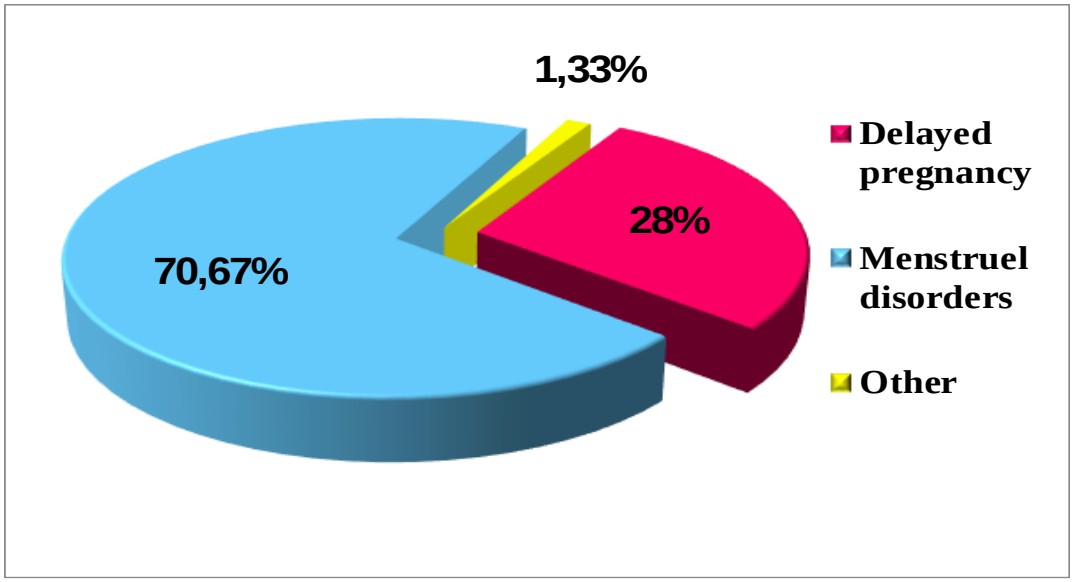


Fig. 16: Disturbances experienced by women surveyed due to PCOS.

F. **According to the Trust and satisfaction of the population in the use of phytotherapy**

According to the studied sample, 97.33% of female patients with PCOS use medicinal plants, indicating a strong preference for this treatment due to its perceived effectiveness against ovarian diseases. In contrast, only 2.67% prefer to use medications and similar treatments (**Fig. 17).**

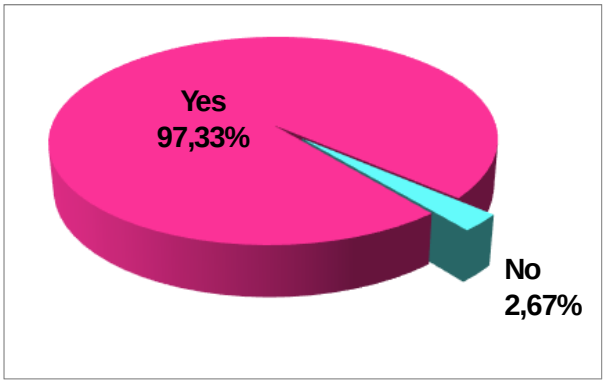


Fig. 17: Confidence and satisfaction of the population regarding the use of phytotherapy.

I.2.3. Ethnopharmacological analysis

1. Botanical analysis

A. According to the plants used as remedies

According to the obtained results, *Atriplex halimus* (القطف) is the most commonly used plant, accounting for 51.06% of use, this due to its considerable effectiveness in treating numerous diseases. *Origanum majorana* (البردقوش) follows at 19.14%, while 17.02% of women

use *Salvia officinalis* (الميرامية) for its relief of menopause-related disorders and regulation of the menstrual cycle. *Vitex agnus-castus* (كف مريم) , *Urtica urens* (نبات الحريق) *Rubus fruticosus* (توت العليق), *Ocimum basilicum* (الريحان) , and *Saussurea costus* (القسط الهندي) , *Anchusa officinalis* (لسان الثور), and *Cinnamomum verum* (القرفة) account for 2.12% of the remaining usage **(Fig. 18).**

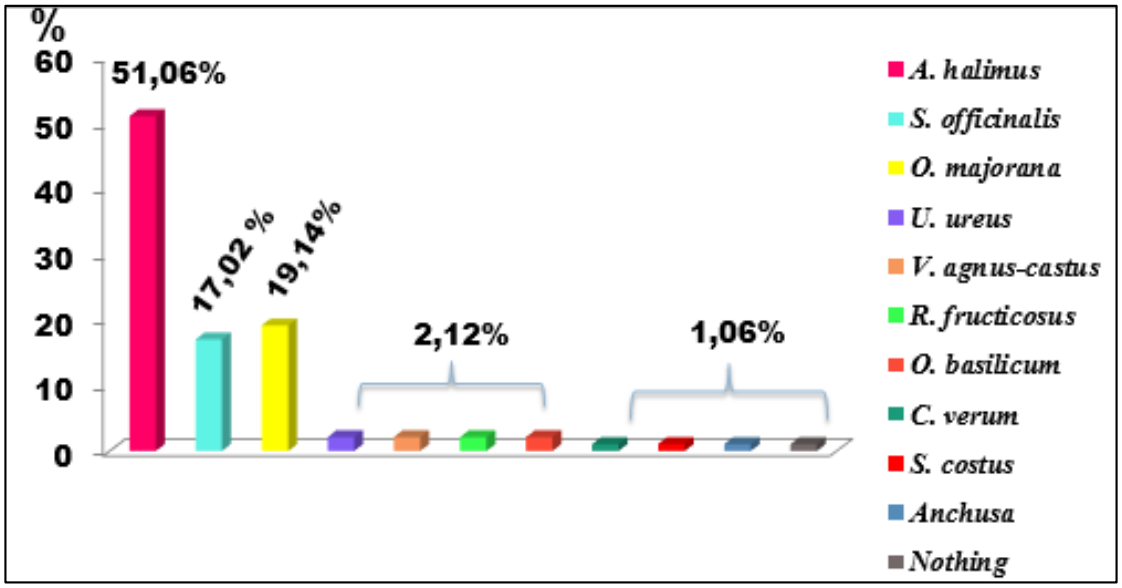


Fig. 18: Frequency of different plants used as treatment for PCOS.

B. According to the form of the used plants

In this study, 24% of the interviewed women preferred a combination of herbs, while 76% preferred a single herb **(Fig. 19).**

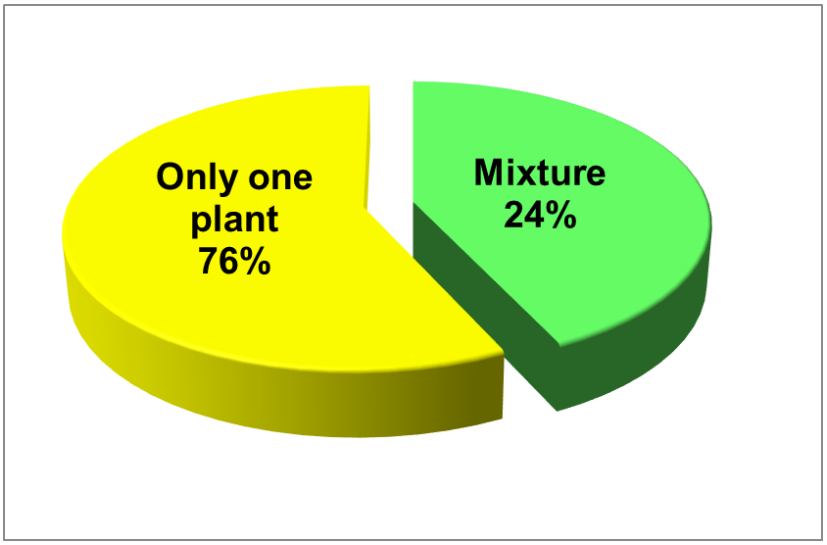


Fig. 19: Frequency of distribution of plants according to the form used of plant.

The use of a mixture of plants is often attributed to the synergistic effects of their bioactive components. However, in traditional plant usage, it is generally preferred to use plants individually to avoid potential secondary effects and the risk of mixture toxicity.

C. According to the part of the plant used

The results of this study show that Women affected by PCOS utilized five parts of the plant: the whole plant, leaves, stems, seeds, and fruits. The analysis revealed that leaves were the most commonly used part, accounting for 88% of preferences, while the entire plant was used by 8% of participants. Stems, seeds, and fruits were used to a lesser extent **(Fig. 20)**. These findings are consistent with those of Bouziani and Sidi Ali (2018), who reported that leaves, at 32.56%, were the most frequently used portion. Leaves are also recognized as the site of photochemical reactions that promote the biosynthesis and sometimes storage of secondary metabolites, thereby concentrating active principles in this organ (Bahassan *et al*., 2014).

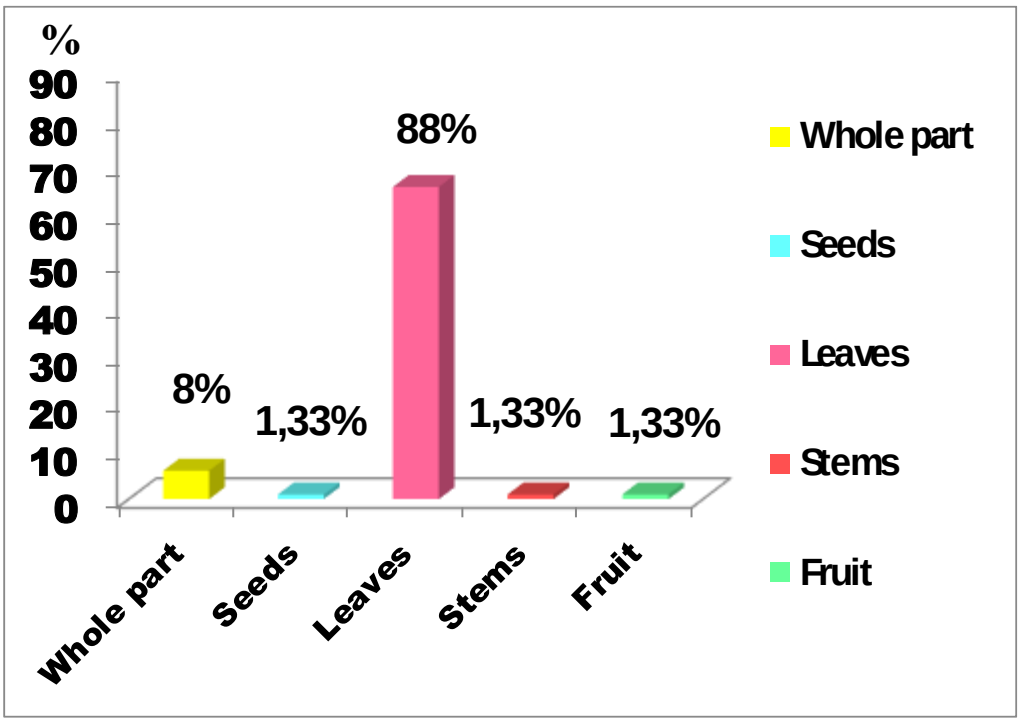


Fig. 20: Frequency of the parts used of the plants.

D. According to the states of plants used

In the data analysis of this study, it was observed that 92% of female patients with PCOS use medicinal plants in their dried state, while 8% use them in their fresh state **(Fig. 21).**

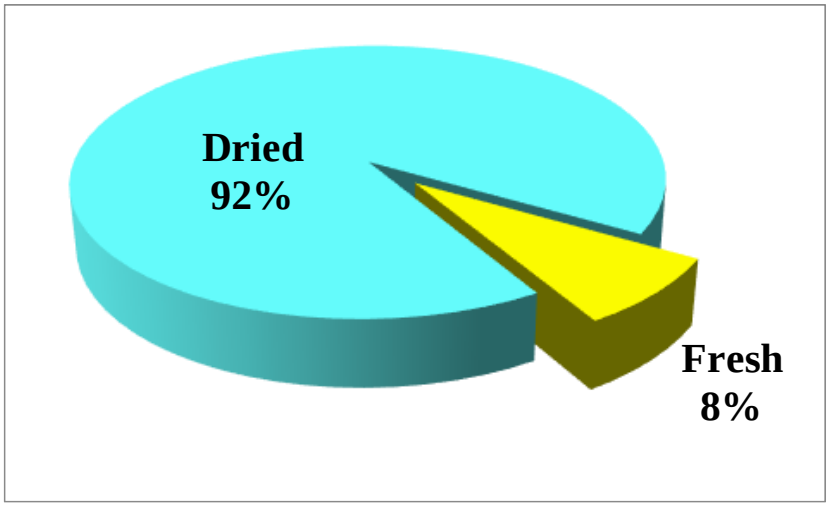


Fig. 21: Frequency of the states of plant used by women with PCOS.

Based on the results of this study, it can be inferred that the primary factor influencing these ratios is the local population's inability to access fresh plants consistently throughout the year. This leads to the necessity of importing them from their native regions and drying them to preserve their active components, thereby ensuring availability throughout the year.

E. According to the different forms of plants used

During this investigation, it was found that patients utilized various forms of plants to administer phytotherapeutic remedies. The whole plant accounted for 93.3%, while powder represented 4%, and oil was used by 1.3% of women affected by ovarian cysts **(Fig. 22).**

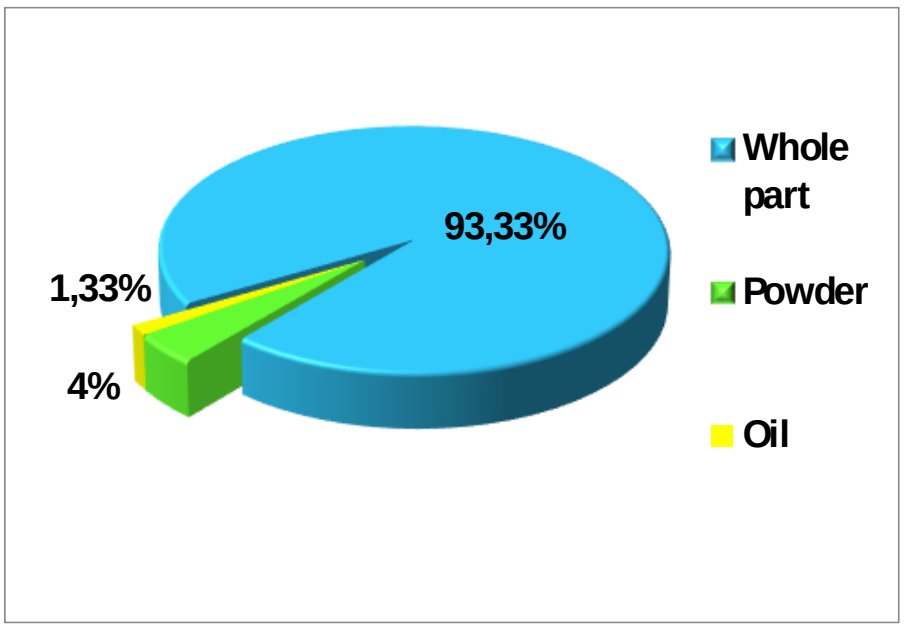


Fig. 22: Frequency of the different forms of plants used.

2. Pharmacological analysis

A. According to the method of preparation

The results of this study indicate that the most widely used preparation method is decoction, with 61.3% of patients using it, followed by maceration, which is used by 34.6%. While, infusion is the least commonly used method, representing only 4% **(Fig. 23).**

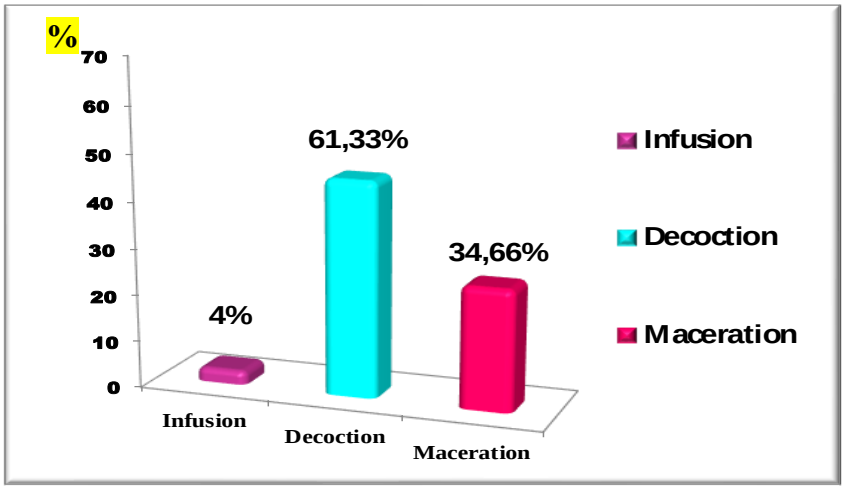


Fig.23: Distribution of the plants' preparation modes used.

The frequent use of decoction can be attributed to its effectiveness in extracting active ingredients and mitigating or neutralizing the toxic effects of certain formulations **(Benlamdini *et al*., 2014).**

B. According to the mode of application

The results depicted in figure 23 show that 98.66% of the women in this study consume medicinal plants orally, with the remaining 1.33% using them in suppository form **(Fig.24).** According to Dibong *et al*. (2011), oral administration in aqueous form is the most prevalent (94.44%) for medicinal plants.

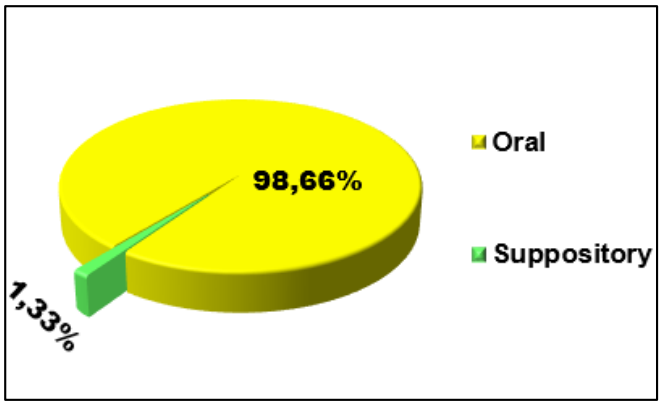


Fig. 24: Frequency of administration routes.

C. According to the dosages

During this investigation, phytotherapeutic remedies were administered at various frequencies. Approximately 53.3% of patients took their remedy once daily, typically in the evening. Another 36% took it twice daily, once in the morning and once in the evening before bedtime. Additionally, 8% reported taking the remedy three times a day, while 2.66% followed other dosing schedules **(Fig. 25).**

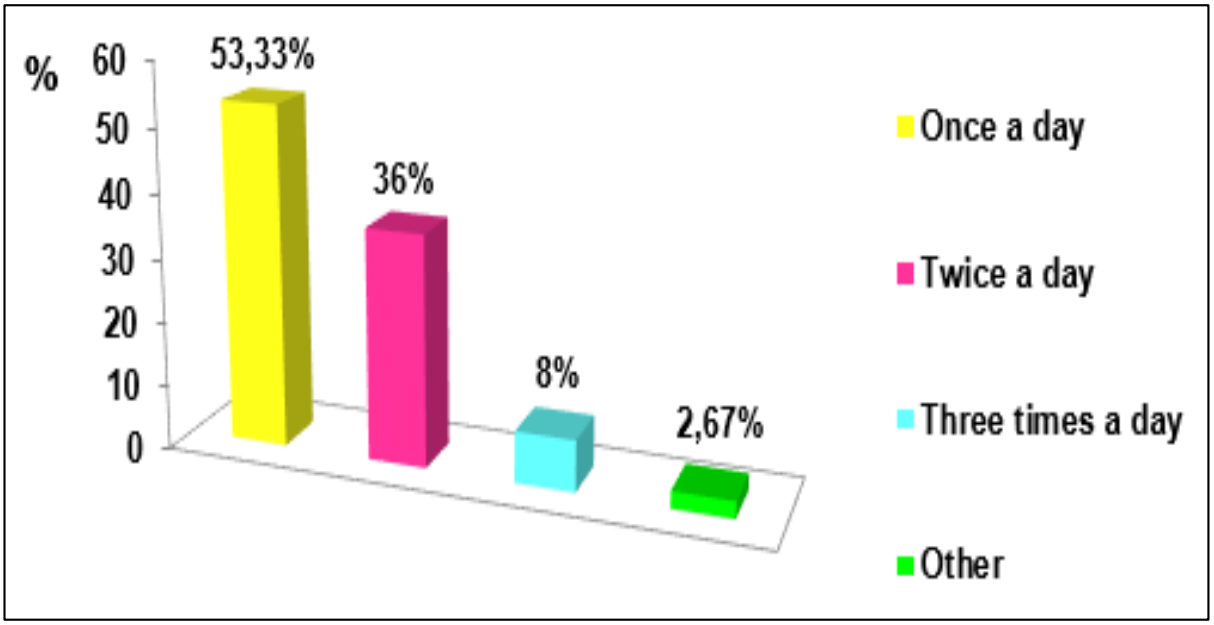


Fig. 25: Dosage of the phytotherapeutic remedy.

D. According to the duration of treatment

The duration of treatment varied from days to years, with the following results: The majority of cases required long treatment periods, with one month being the most common duration at 29.3%. It was followed by two months at 24% and three months at 14.66%. Other patients followed shorter treatment periods, including 45 days (4%), 40 days (2.66%), 12 days (2.66%), and 10 days (2.66%). A week-long treatment was observed at a rate of 1.3%, as were 20 days and 21 days, each also at 1.3%. Some treatments extended over many years, accounting for 12% of cases **(Fig. 26).**

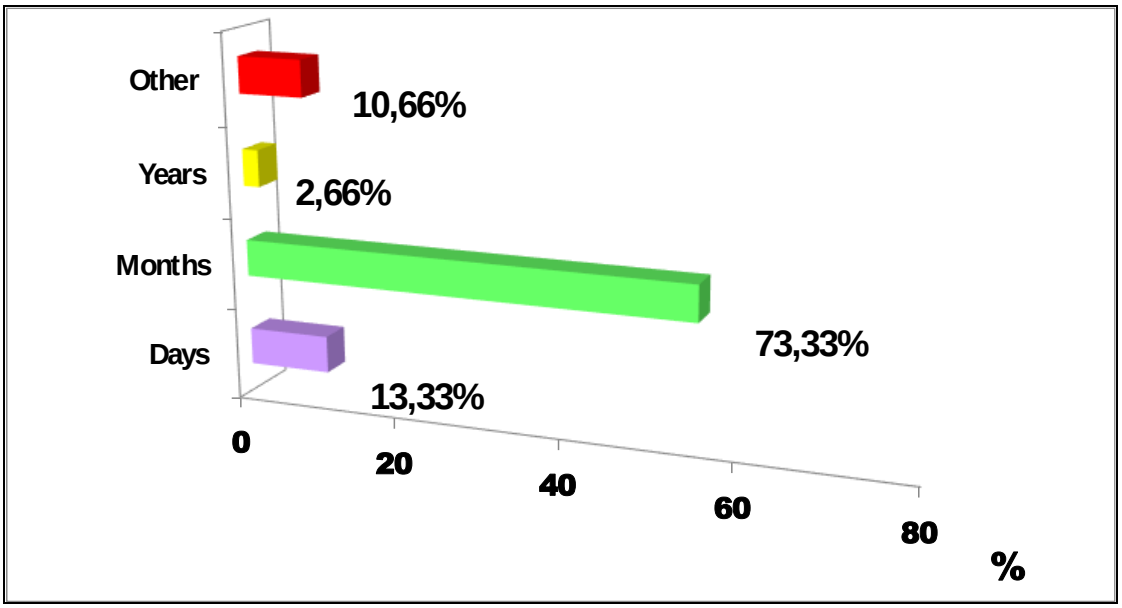


Fig. 26: The different durations of treatment.

E. According to the sources of medicinal plants

The results of this study show that various sources inform the use of traditional treatments based on medicinal plants. The most common source, used by approximately 53.33% of the women interviewed in our survey, is daily life experiences and exchanges of ideas within their environment. Additionally, 40% of women obtained their treatment methods through the advice of an herbalist. A smaller proportion, 5.3%, acquired knowledge by reading biology books. A meager percentage, 1.3%, follows other methods **(Fig. 27).**

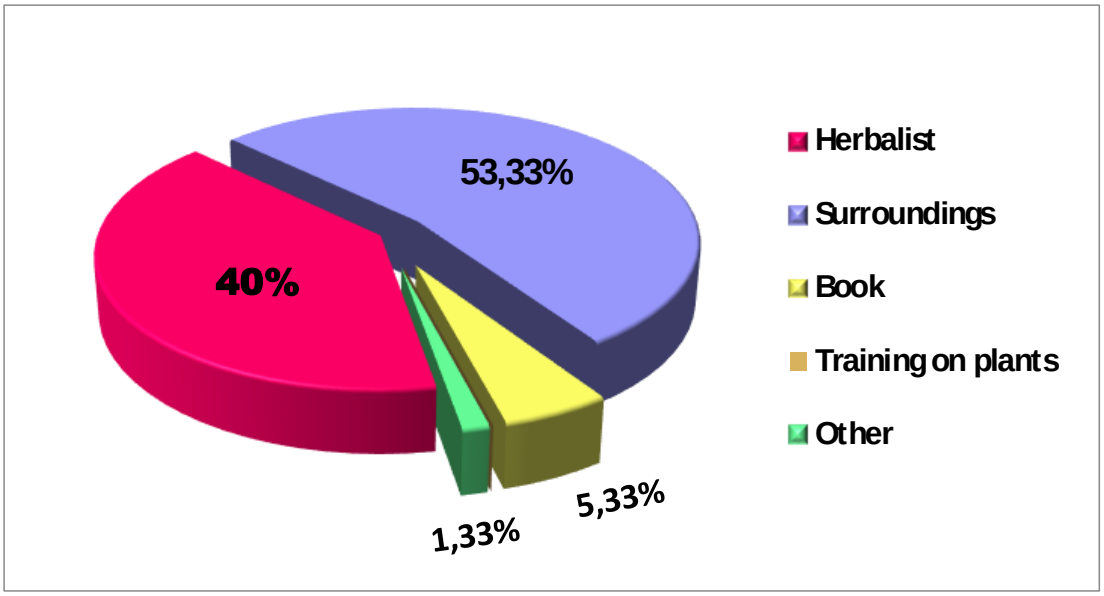


Fig. 27: Sources of used plants.

F. According to the purpose of medicinal plants use

The results show that a very high rate of 96% of women use phytotherapy for curative purposes, while a lower rate of 4% use it for preventive purposes **(Fig. 28).** These results indicate that the majority of patients use medicinal plants primarily for health needs. In contrast, a smaller group prefers the preventive properties of these herbs to avoid familial history associated with the syndrome.

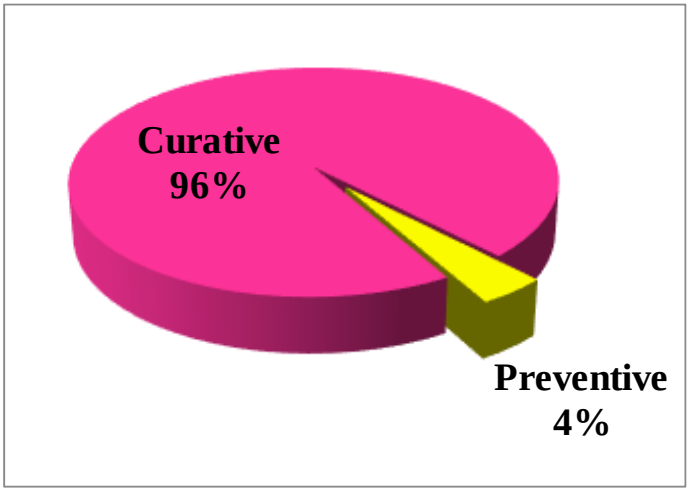


Fig.28: Percentages of purpose of traditional medicine.

I.2.4. Traditional post-treatment side with medicinal plants

A. According to the reduced symptoms

The results of this study indicate that 40.81% of the female population studied reported an alleviation of symptoms, primarily through the regularization of their menstrual cycles. Additionally, 20.40% experienced a complete disappearance of ovarian cysts, and 10.20% noted a reduction in cyst size. Furthermore, 12.24% of the women regained reproductive function after experiencing delays in conception. Other alleviated symptoms included a 7.14% reduction in monthly pain, a decrease in excessive hair loss (1.02%), and a relative improvement in skin condition (1.02%). However, 7.14% of the women did not notice any alleviated symptoms after undergoing traditional treatments **(Fig.29).**

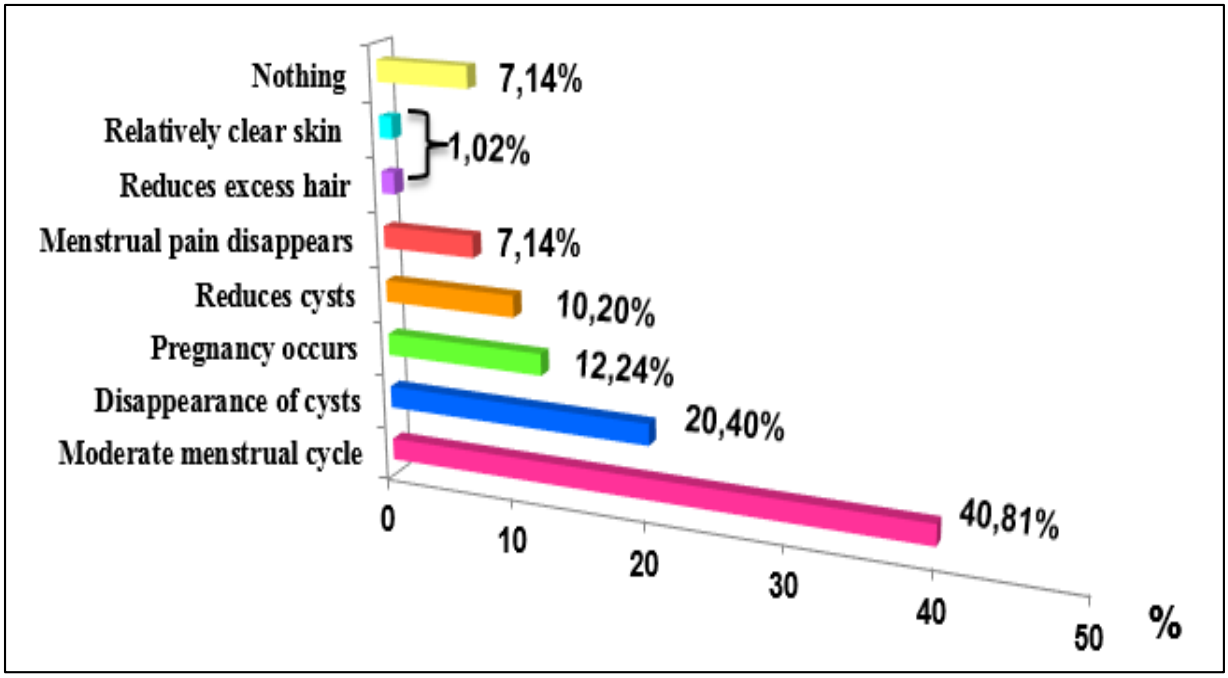


Fig. 29: Percentages of reduced symptoms after phytotherapy.

B. Secondary effect of phytotherapy

This study indicates that only six women (representing 8%) out of the 92% who used medicinal plants for PCOS treatment reported experiencing side effects. These side effects included hypertension (5.33%) and hypotension (2.66%), as illustrated in the following diagram **(Fig. 30).**

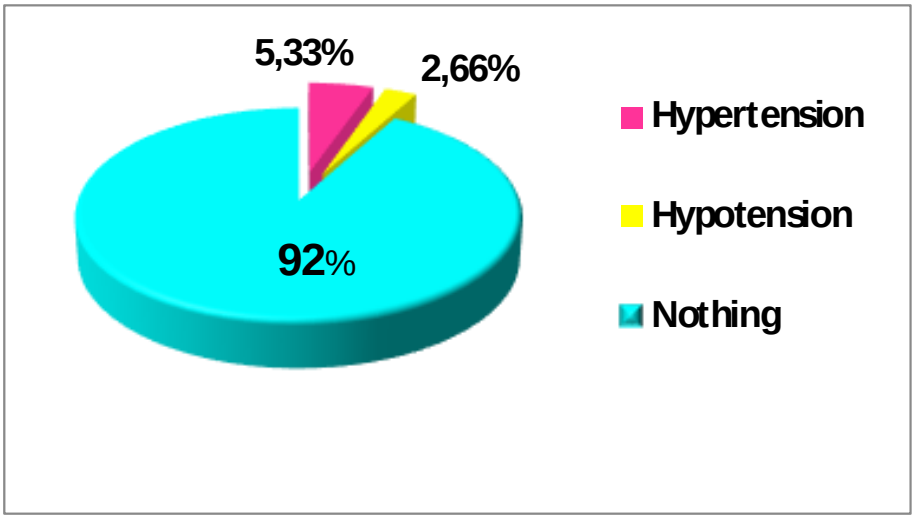


Fig. 30: Various side effects due to phytoterapy treatment for PCOS.

These findings indicate that although medicinal herbs are generally well-tolerated for managing PCOS, a small subset of users may encounter notable alterations in blood pressure. Therefore, it is imperative for healthcare personnel to closely monitor the blood pressure of patients undergoing these treatments. Moreover, the results emphasize the necessity for further investigation to gain a deeper comprehension of the root causes of these adverse effects and to pinpoint the particular plants or substances that may be accountable. In summary, the study highlights the potential advantages of using medicinal herbs for treating PCOS, while also stressing the significance of careful and supervised usage.

C. According to the medical treatment used by patients with PCOS

The results of this study indicate that 48 women interviewed in the survey (representing 62.33%) reported not using any medical treatment, compared to others who used various medications. Among those who used medications, 19.48% used Duphaston, 6.49% used the pill, 2.59% used Fytomax, 1.29% used a diet and Clomiphene Citrate, and 6.49% used other medications **(Fig. 31)**

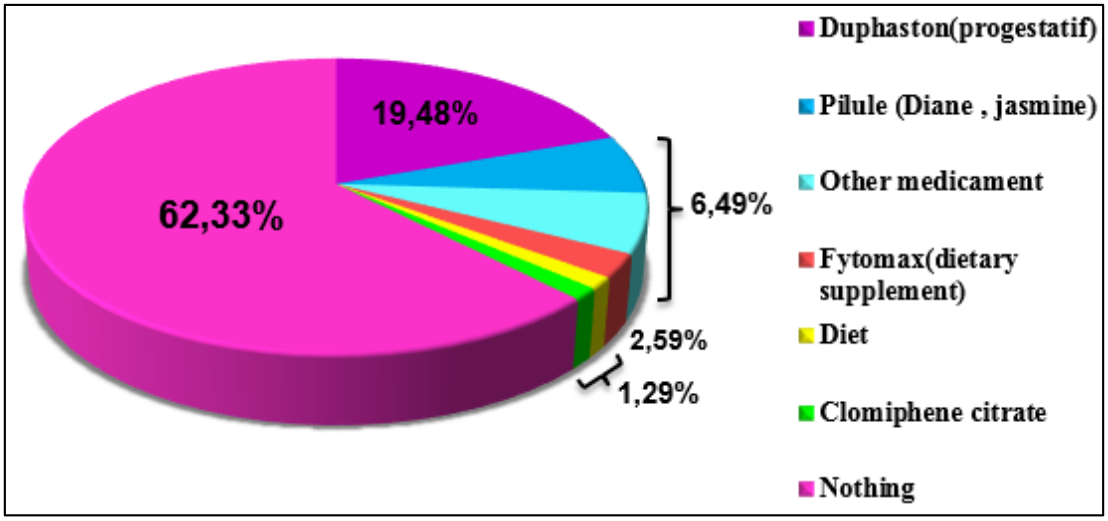


Fig. 31: Percentages of different medical treatments.

D. Based on the parallel medical history

The results of this survey show that women experienced other health issues during treatment with medicinal herbs. These included thyroid gland disorders (1.33%), anemia, breast fibroids, and diabetes (each at 2.66%). However, 90.66% of the women reported no additional diseases during treatment **(Fig. 32).**

The study of Mirian *et al*. (2018) recorded thyroid disorders in 18 to 40% of women with PCOS, which is consistent with the findings observed in our study population. According to **Bayona *et al*. (2022),** the combined prevalence of PCOS in type 1 diabetes (T1D) was 26%.

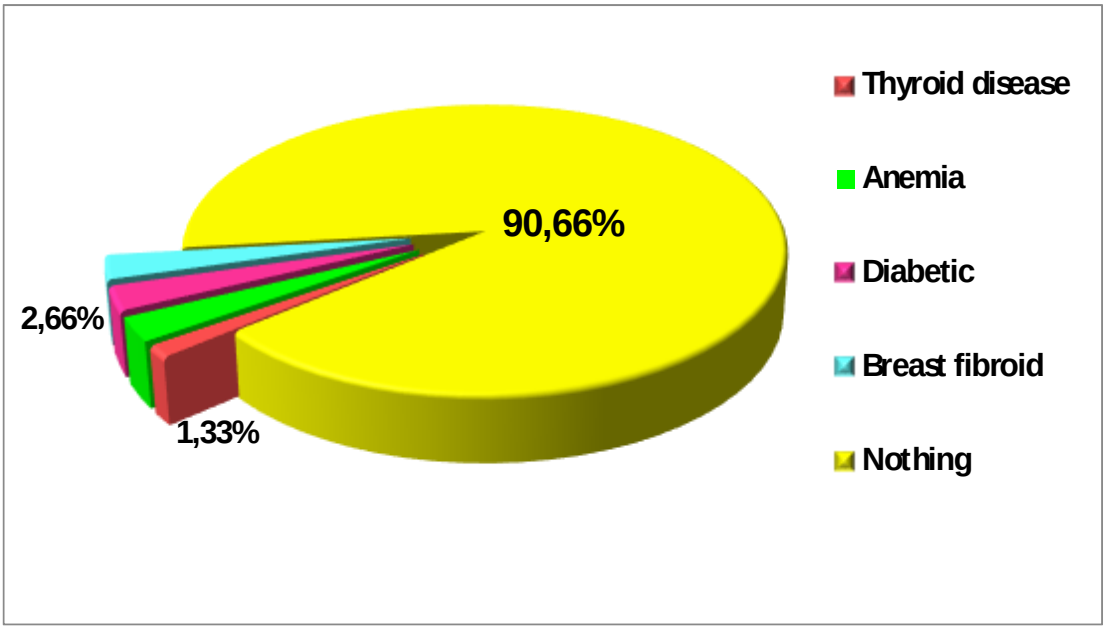


Fig**. 32**: Other parallel health issues affecting women before phytotherapy.

I.2.5. Recommendations

The results of this study indicate that 97.33% of the studied population recommended a traditional treatment approach based on medicinal plants to other patients due to the beneficial effects of the active principles of these plants in managing gynecological disorders. However, 2.66% did not recommend this approach due to its side effects and inefficiency in relieving their symptoms **(Fig. 33)**.

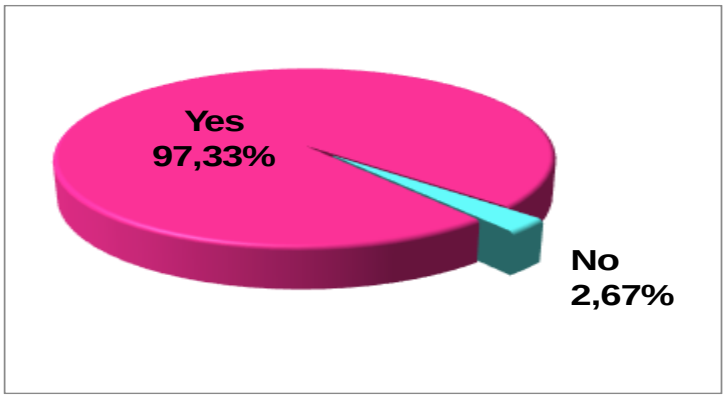


Fig. 33 Patients recommendations of using traditional treatment.

Conclusion and perspectives

The ongoing study in Algeria focuses on exploring the potential therapeutic benefits of indigenous medicinal plants for treating Polycystic Ovary Syndrome (PCOS). Our survey, conducted primarily in Setif province among gynecologists and female students aged 15 to 55, identified a diverse range of plant species obtained from herbalists and various sources, with *Atriplex halimus* prominently mentioned. This research underscores the widespread use of medicinal plants throughout Algeria for treating multiple conditions, including PCOS. Approximately 10 plants with specific therapeutic capabilities for PCOS were identified, each offering additional health benefits.

Data collection and analysis have facilitated the documentation of oral community knowledge into a catalog detailing plant uses and therapeutic applications. These plants, including leaves, fruits, and underground parts, are typically prepared through methods such as infusion, decoction, and grinding, and are predominantly administered orally one to three times daily. Many women prefer dried plant forms, influenced by familial traditions, cultural norms, media influence, or advice from herbalists and literature.

Despite their popularity, misconceptions persist regarding the safety and efficacy of herbal therapies compared to conventional medicines, leading to widespread self-medication practices. Our survey highlighted concerns such as potential adverse effects like hypotension and hypertension associated with certain plants, particularly concerning for pregnant women. Addressing these challenges requires comprehensive education on plant safety and proper usage, integrating traditional knowledge with modern medical insights to promote safer healthcare practices.

Integrating traditional medical practices with modern healthcare systems not only preserves cultural heritage but also expands treatment options for complex diseases like PCOS. Collaborative efforts can enhance understanding and acceptance of traditional treatments while ensuring their safe and effective integration. Further research into the therapeutic properties of Algerian medicinal plants holds promise for discovering new therapies or validating traditional practices, potentially leading to the development of innovative pharmaceuticals or complementary therapies with global health benefits.

To dispel misunderstandings about herbal medications, comprehensive health education programs are essential. Educating healthcare providers and the public about potential risks and

benefits can facilitate informed decision-making and improve healthcare safety. Establishing robust regulatory frameworks for herbal medicines is crucial to ensure their quality, safety, and effectiveness, including protocols for cultivation, harvesting, preparation, and distribution, as well as monitoring adverse effects and interactions with conventional pharmaceuticals.

Engaging local communities, herbalists, and traditional healers in healthcare initiatives fosters mutual understanding and cooperation, strengthening community-based healthcare systems rooted in local knowledge and resources. By integrating these perspectives, stakeholders can effectively utilize Algeria's rich diversity of medicinal plants to enhance healthcare outcomes while respecting and preserving cultural traditions.

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ANNEX

Link of survey:

https://docs.google.com/forms/d/1cUJ9LHwHVXDyI9cKJnvuoOHvGNbsqqfjh9b8b6vVSes/viewform?edit_requested=true.

University Ferhat ABBAS setif-1
Faculty of natural and life science
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جامعة فرحات عباس سطيف-1
كلية علوم الطبيعة و الحياة
تخصص بيوكيمياء تطبيقية
المشرف(ة) : خيثر ح

Survey on phytotherapy of Ovarian Cyst

استطلاع حول العلاج بالنباتات الطبية لتكيس المبايض

This quiz is developed as part of the preparation of a Master's thesis on the use of medicinal plants in the treatment of ovarian cysts in Algeria, specifically in Sétif.
I kindly request you to respond to this survey.

هذا الاستبيان معد في إطار إعداد مذكرة ماستر حول استخدام النباتات الطبية في علاج تكيس المبايض في الجزائر وتحديدا في سطيف.
أطلب منكم أن تتكرموا بالإجابة على هذا الاستبيان

1. **Adresse e-mail ***
   .....

2. **Where do you live?** ***أين تعيش؟**
   a. State of Setif ولاية سطيف
   b.Autre: .....

3. **Educational level** ***المستوي التعليمي**
   a. Illiterate غير متعلم
   b. without Bac بدون بكالوريا
   c. Bac بكالوريا
   d. Licence ليسانس
   e. Master ماستر
   f. Doctorat دكتوراه

4. **Your age** *** عمرك**
   a. 15 -20 years
   b. 21-30 years
   c. 31-45 years
   d. 46-55 years
   e. Older than 55 years.

5. **Familly situation** ***الحالة الاجتماعية**
   a. Single عازبة
   b. Married متزوجة
   c. Widowed ارملة
   d. Divorced مطلقة

6. **Type of Ovarian Cysts you suffer from.**
   نوع تكيس المبايض الذي تعاني منه
   a. Functional ovarian cyst
      تكيسات المبيض الوظيفية
   b. Pathological ovarian cysts
      تكيسات المبيض المرضية
   c. Autre : .....

7. **Disorders that you suffered** ***الإضطرابات التي عانيتي منها**
   a. Delayed pregnancy تأخر الحمل
   b. Menstrual disorder إضطراب الدورة الشهرية
   c. Autre : .....

8. **Do you use medicinal plants (traditional remedy) in the treatment of ovarian cysts?**
   ***هل استعملت النباتات الطبية (العلاج التقليدي) في علاج تكيس المبايض؟**
   a. Yes نعم
   b. No لا

9. **If yes, this traditional remedy is in form**
   *** إذا كانت الإجابة بنعم، فإن العلاج التقليدي في شكل**
   a. Mixture of plants مزيج من النباتات
   b. Only one plant نبتة واحدة فقط

10. **Name of plant(s) used** *** اسم النبات المستخدم**
    .....

11. **The part of the plant** *** الجزء المستخدم من النبات**
    a. Whole plant نبات كامل
    b. Seeds بذو ر
    c. Leaves أوراق
    d. Flowers أزهار
    e. Stems ساق
    f. Fruit فاكهة
    g. Roots جذور

12. **State of the plant used** *** حالة النبات المستخدم**
    Fresh نبات طازج
    a. Dried مجفف

13. Form of the medicinal plant used
*شكل النبات المستعمل

a. Whole part جزء كامل
b. Powder مسحوق
c. Oil زيت
d. Autre : .....

14. Preparation method of the remedy
* طريقة تحضير العلاج التقليدي

a. Infusion تسريب
b. Decoction مغلي
c. Maceration النقع
d. Autre : .....

15. Application of the traditional remedy
* تطبيق العلاج التقليدي

a. Oral عن طريق الفم
b. Suppository تحميلة
c. Autre : .....

6. At what frequency (dosage) (كم مرة الجرعة)*

a. Once a day مرة واحدة في اليوم
b. Twice a day مرتين في اليوم
c. Three times a day ثلاث مرات في اليوم
d. Autre : .....

17. How long time of treatment?
*ماهي فترة العلاج ؟

.....

18. How did you learn to use this plant in the treatment of ovarian cyst?
كيف تعلمت استخدام هذه النباتات في علاج تكيس المبايض ؟

a. Herbalist المعالج بالأعشاب
b. Surroundings المحيط
c. Book الكتب
d. Training on Medicinal Plants التدريب على النباتات الطبية

19. Effects of traditional treatment
تأثيرات العلاج التقليدي

.....

20. You use medicinal plants for purposes
*هل تستخدم النباتات الطبية باعتبارها

a. Curative علاجية
b. Preventive وقائية

21. Did you experience relief of symptoms after taking this traditional remedy?
*هل شعرت بتخفيف الأعراض بعد تناول هذا العلاج التقليدي ؟

a. Yes نعم
b. No لا

22. What are the relieved symptoms?
ما هي الأعراض المخففة ؟

.....

23. Have you observed any side effects during the administration of this traditional remedy?
*هل لاحظت أي آثار جانبية اثناء تناول هذا العلاج التقليدي ؟

a. Yes نعم
b. No لا

24. If yes, what are these side effects. إذا كانت الإجابة بنعم ، فماهي الآثار الجانبية.

.....

25. Before using traditional remedy, what is the type of parallel processing used?
قبل استخدام العلاج التقليدي ما هو نوع العلاج المتوازي المستخدم ؟

.....

26. Do you have any other diseases? List them.
هل لديك أي أمراض أخرى ؟ أذكرهم*

.....

27. Do you recommend other patients to use this traditional remedy in the treatment of ovarian cysts?
هل تنصح المرضى الآخرين باستخدام هذا العلاج التقليدي في علاج تكيس المبايض *

a. Yes نعم
b. No لا

Students :
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الملخص

يُعتبر تكيس المبايض لدى النساء مشكلة صحية عامة رئيسية، حيث يعود الكثير من المرضى بالجزائر إلى الأدوية العشبية للتخفيف من حدته. تهدف هذه الدراسة إلى تقدير قيمة النباتات الطبية المستخدمة في الطب التقليدي لمعالجة التكيس في مدينة سطيف بالجزائر، من خلال دراسة ببليوغرافية يليها استبيان عرقي نباتي، تم إجراؤه بشكل ورقي وإلكتروني، حيث استهدف المرضى في ولاية سطيف وبعض الولايات الأخرى. تم الإجابة على الاستبيان من قبل 75 مريضة، 42.67٪ منهن متزوجات و57.33٪ عازبات، ومنهن 28٪ يعانين من تأخر في الحمل، و70.67٪ يعانين من اضطرابات في الدورة الشهرية. كشف الاستبيان عن 10 أنواع من النباتات التي تهم المجتمع العلمي، حيث تصدر نبات القطف قائمة الأنواع الأكثر شيوعًا في الطب التقليدي لعلاج متلازمة تكيس المبايض بنسبة 51.06٪. أثبت هذا النبات فعاليته العلاجية ضد التكيس المبيضي. استخدم 76٪ من المرضى الطب التقليدي بنبات واحد، في حين استخدم 24٪ مزيجًا من النباتات، بناءً على نتائج هذه الدراسة. يبرز هذا البحث أهمية البحث العلمي في تثمين الاستخدام التقليدي للنباتات في معالجة مشاكل الصحة الإنجابية كتكيس المبايض.

الكلمات المفاتيح: النباتات الطبية، الطب التقليدي، استبيان، متلازمة تكيس المبايض.

Abstract

Polycystic ovarian syndrome (PCOS) is a significant public health concern among women, leading many patients in Algeria to turn to herbal therapies for relief from its severity. This study seeks to evaluate the efficacy of medicinal plants utilized in traditional medicine for the treatment of Polycystic Ovary Syndrome (PCOS) in Setif, Algeria. This will be accomplished by a comprehensive assessment of relevant literature, followed by an ethnobotanical survey that focuses on plant-based remedies. The survey will be conducted using both paper and electronic methods, targeting patients residing in Setif as well as neighboring localities. The study was conducted with a sample size of 75 patients. Among them, 42.67% were married and 57.33% were unmarried. Additionally, 28% of the patients reported experiencing infertility, while 70.67% reported having menstrual abnormalities. The investigation revealed 10 botanical species of scientific significance, with *Atriplex halimus* being the most prevalent plant, accounting for 51.06% of traditional medicinal use in treating PCOS. This herb has demonstrated medicinal effectiveness against PCOS. The survey found that 76% of patients relied on a solitary plant in traditional medicine, whilst 24% utilized a mixture of plants. This study emphasizes the significance of scientific research in understanding the traditional utilization of herbs for resolving reproductive health concerns such as PCOS.

Keywords: Medicinal plants, polycystic ovary syndrome, survey, traditional medicine.

Résumé

Le syndrome des ovaires polykystiques (SOPK) est une préoccupation majeure de santé publique chez les femmes, conduisant de nombreux patients en Algérie à se tourner vers des thérapies à base de plantes pour soulager sa gravité. Cette étude vise à évaluer l'efficacité des plantes médicinales utilisées dans la médecine traditionnelle pour le traitement du syndrome des ovaires polykystiques à Sétif, en Algérie. Cela sera accompli par une évaluation approfondie de la littérature pertinente, suivie d'une enquête ethnobotanique axée sur les remèdes à base de plantes. L'enquête sera menée à l'aide de méthodes à la fois papier et électroniques, ciblant les patients résidant à Sétif ainsi que dans les localités environnantes. L'étude a été réalisée sur un échantillon de 75 patients. Parmi eux, 42,67% étaient mariés et 57,33% étaient célibataires. De plus, 28% des patients ont signalé des problèmes d'infertilité, tandis que 70,67% ont déclaré avoir des anomalies menstruelles. L'enquête a révélé 10 espèces botaniques d'importance scientifique, Atriplex halimus étant la plante la plus répandue, représentant 51,06% de l'utilisation de la médecine traditionnelle dans le traitement du SOPK. Cette plante a démontré son efficacité médicinale contre le SOPK. L'enquête a montré que 76% des patients utilisaient une plante unique en médecine traditionnelle, tandis que 24% utilisaient un mélange de plantes. Cette étude souligne l'importance de la recherche scientifique dans la compréhension de l'utilisation traditionnelle des herbes pour résoudre les problèmes de santé reproductive tels que le SOPK.

Mots-clés : Plantes médicinales, syndrome des ovaires poly-kystiques, enquête, médecine traditionnelle.

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