Individualized Treatment of Polycystic Ovary Syndrome Based on Symptom Profile and Patient Characteristics

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ABSTARCT

This study investigated Polycystic Ovary Syndrome (PCOD) treatment strategies by analyzing data from 156 patients. The Patient data has been collected from Nangal, Punjab. The collected data included patient demographics (age and gender), cause (if known), and a range of symptoms. Statistical analysis explored relationships between age, gender, and the reported symptoms. The findings from the statistical analysis served as the foundation for proposing a groundbreaking approach to PCOD treatment – tailoring interventions based on the unique symptom profile of each patient. Based on these findings, the study proposes a novel approach to PCOD treatment – tailoring interventions based on the specific symptom profile of each patient. This personalized approach has the potential to improve treatment efficacy and patient outcomes. This research represents a significant step towards individualizing PCOD treatment. By analyzing patient data and proposing a symptom-based treatment, the study has the potential to revolutionize the management of this complex condition.

INTRODUCTION

Reproductive health encompasses physical, mental, and social well-being in all aspects of the reproductive system, not just the absence of disease or infirmity. Polycystic ovary syndrome (PCOS) is the most common endocrine disorder among women of reproductive age worldwide, and it has a significant impact on reproductive health. The prevalence varies by region, ranging from 2.2% to 26%. The syndrome consists of at least two of three conditions: hyperandrogenism, chronic anovulation, and polycystic ovaries. It is often linked to insulin resistance and obesity. PCOS can affect the reproductive, metabolic, and endocrine systems, causing menstrual disorders, endometrial hyperplasia, abnormal uterine bleeding, oligo-ovulation, infertility, and a significant decrease in quality of life. Identifying SRH aspects is crucial for developing a comprehensive and effective healthcare plan.

No comprehensive study has assessed all aspects of SRH (sexual reproductive health) in women with PCOS, including infertility, sexual disorders, pregnancy complications, and quality of life. Ovaries are part of the female reproductive system. Women have two ovaries—one on each side of the uterus. Each ovary is approximately the size and shape of an almond. The ovaries are responsible for egg production and storage.

During ovulation, an ovary releases an egg. If that egg is fertilized by a sperm, a pregnancy may result. Ovaries produce the female hormones estrogen and progesterone. When a woman goes through menopause, her ovaries stop producing hormones and releasing eggs. Polycystic ovary syndrome

(PCOS) is a hormonal imbalance that occurs during reproductive years. The individual with PCOS, they may have periods very frequently. Alternatively, they may experience long-lasting periods, it indicates excess of the hormone androgen in your body. PCOS causes numerous small fluid sacs along the ovary's outer edge. These are known as cysts. The small, fluid-filled cysts contain immature eggs. These are called follicles. The follicles do not regularly release eggs. The exact cause of PCOS remains unknown. Early diagnosis and treatment, combined with weight loss, may reduce the risk of long-term complications like type-2 diabetes and heart disease.

Data from the Survey
Total no. of patients = 156
Number of patients suffering from menses problem = 123
Number of patients with irregularity in menses = 66
No. of patients with Premature menopause =13
No, of patients with Premenstrual syndrome = 13
No. of patients suffering from PCOD = 23
Patients with watery cysts = 21
Patients with solid cysts = 2

Statistical Analysis
The histogram and summary statistics provide a clear view of the age distribution among the individuals in the dataset. The mean age is approximately 26.24 years, with ages ranging from 11 to 54 years. The histogram shows the frequency of different age groups.
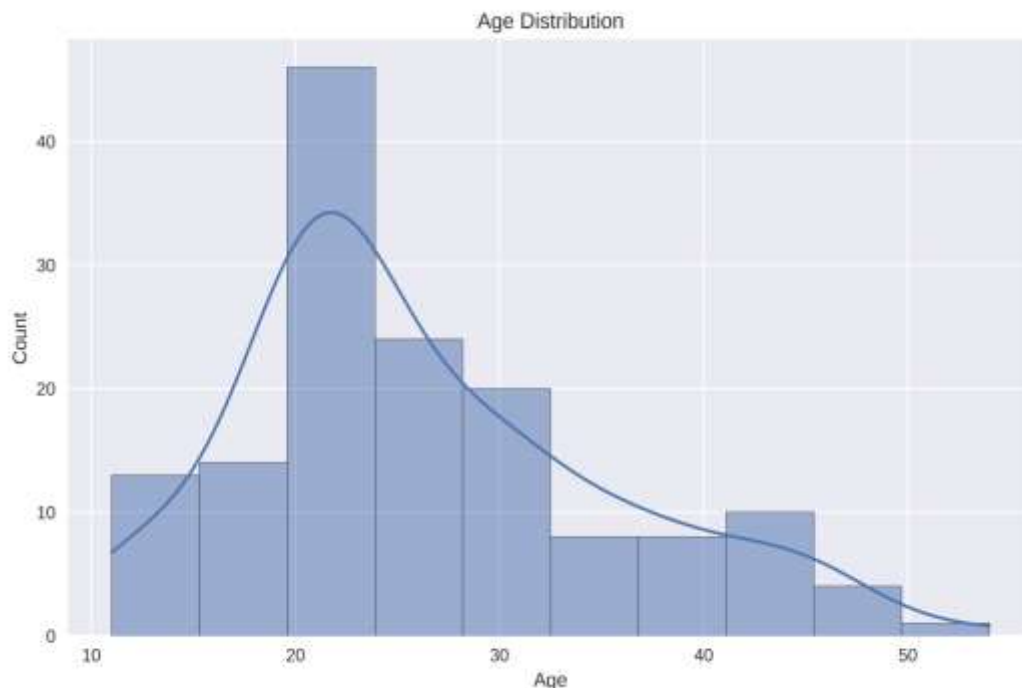

Fig.1: A summary of the age distribution of the dataset

2. Analyze the data regarding irregular periods according to age?

The statistics for individuals with irregular periods:

Total number of individuals with irregular periods: 14
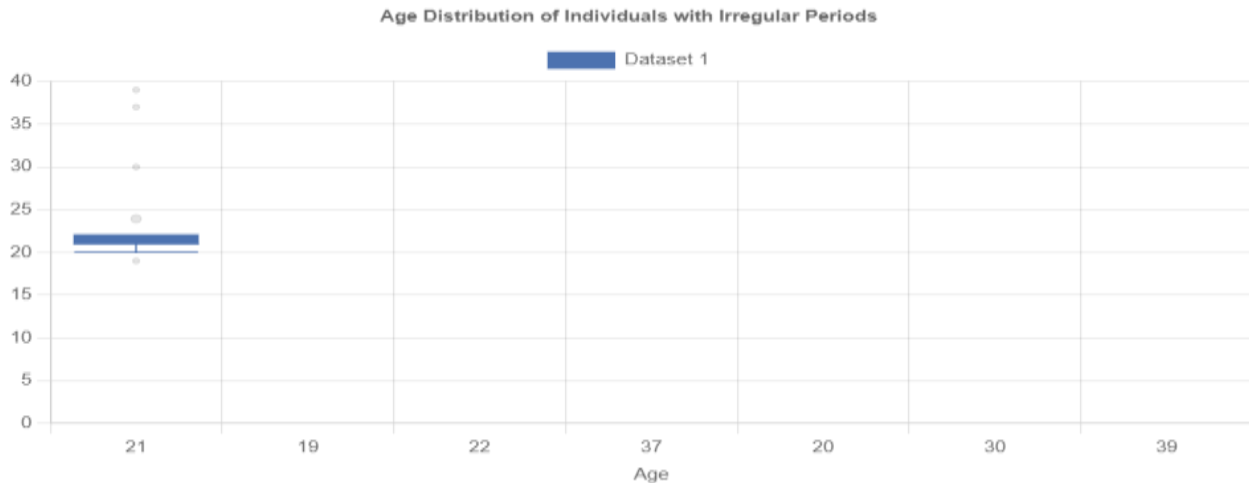Percentage of individuals with irregular periods: 8.75%

Fig 2: The data for individuals with irregular periods

From Figure 2, the graph shows the age distribution of individuals with irregular periods in dataset 1. The x-axis shows the age groups, and the y-axis shows the number of individuals in each age group. The blue bars represent the number of individuals with irregular periods in each age group.

The graph shows that the highest number of individuals with irregular periods is in the 21-25 age groups. This is followed by the 26-30 age groups, and then the 31-35 age groups. There are no individuals with irregular periods in the 36-40 age groups.

The total number of individuals with irregular periods in dataset 1 is 14. The percentage of individuals with irregular periods in dataset 1 is 8.75%.

The graph shows that irregular periods are most common in young women. This is likely because the menstrual cycle is not fully established until a few years after menarche. Other factors that can contribute to irregular periods include stress, weight loss, and polycystic ovary syndrome (PCOS).

3. What are the common symptoms associated with irregular periods?

Based on the analysis, the common symptoms associated with irregular periods are:
1. Back pain
2. Pain
3. Pimples
4. Weakness
5. Dizziness
6. Leg pain
7. Stomach pain
8. Cramps
9. Mood swings
10. Headache

11. Heavy bleeding with excess blood clot

These symptoms can be summarized in the following LaTeX expression:

Common Symptoms={Back pain, Pain, Pimples, Weakness, Dizziness, Leg pain, Stomach pain, Cramps , Mood swings, Headache, Heavy bleeding with excess blood clot}=$\{x1,x2,x3,x4,x5,x6,x7,x8,x9,x10,x11\}$

Common Symptoms

={Back pain, Pain, Pimples, Weakness, Dizziness, Leg pain, Stomach pain, Cramps, Mood swings, Headache, Heavy bleeding with excess blood clot}={x1,x2,x3,x4,x5,x6,x7,x8,x9,x10,x11}

- The set of common symptoms, which includes back pain, pain, pimples, weakness, dizziness, leg pain, stomach pain, cramps, mood swings, headache, and heavy bleeding with excess blood clot, can be represented by the variables x1 through x11 respectively.

4. Analyze the data to find individuals with irregular periods who mention diet or junk food as a cause?
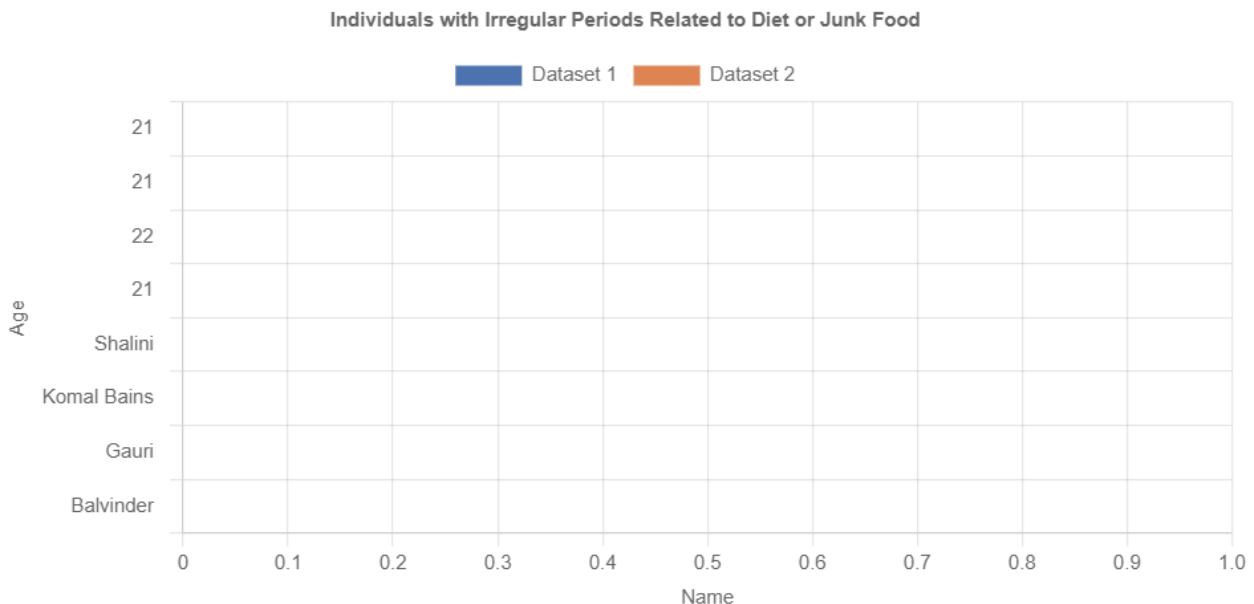

Fig 4:

Total count: 4

From graph 4,the graph shows the age distribution of individuals with irregular periods in dataset 1 and dataset 2 who mentioned diet or junk food as a cause. The x-axis shows the age groups, and the y-axis shows the number of individuals in each age group. The blue bars represent the number of individuals with irregular periods in dataset 1, and the orange bars represent the number of individuals with irregular periods in dataset 2.

The graph shows that the highest number of individuals with irregular periods who mentioned diet or junk food as a cause are in the 21-25 age group in both dataset 1 and dataset 2. This is followed by the 26-30 age group, and then the 31-35 age group. There are no individuals with irregular periods in the 36-40 age group in either dataset.

The total number of individuals with irregular periods who mentioned diet or junk food as a cause in dataset 1 is 3. The total number of individuals with irregular periods who mentioned diet or junk food as a cause in dataset 2 is 5.

The graph shows that irregular periods are most common in young women who mention diet or junk food as a cause. This is likely because the menstrual cycle is not fully established until a few years after menarche. Other factors that can contribute to irregular periods include stress, weight loss, and polycystic ovary syndrome (PCOS).

5. Analyze the irregular periods and symptoms based on the age groups?

Analysis of Irregular Periods and Symptoms by Age Group:

Age Group	Count
13-20	9
20-25	18
25-30	3
30-40	2

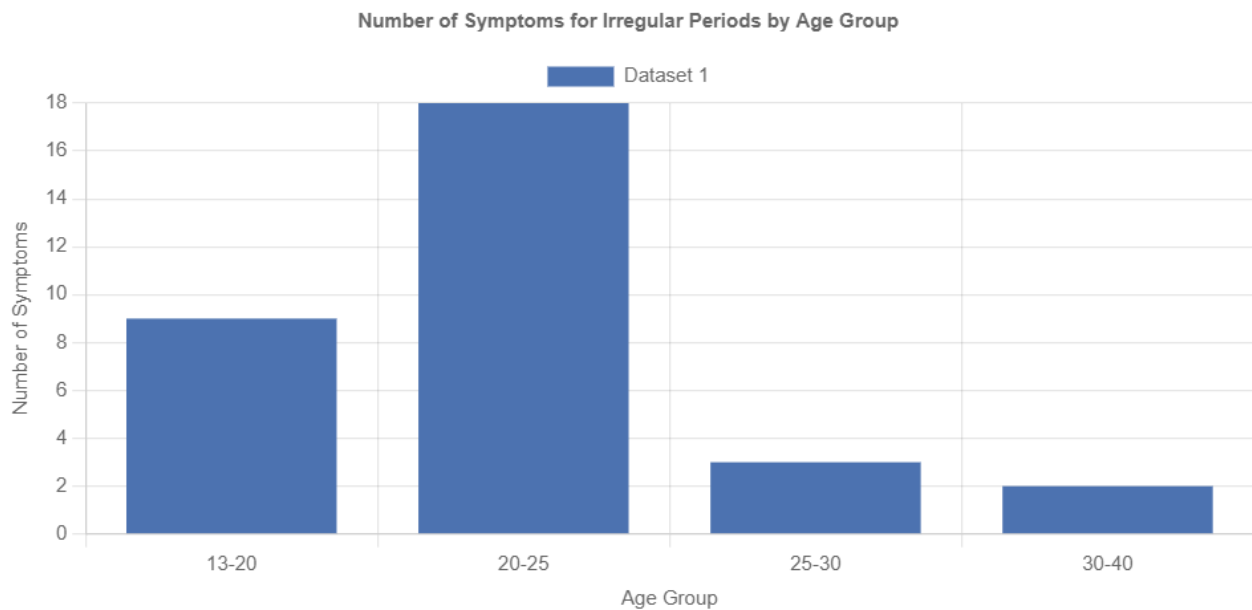**Top Symptoms for each Age Group:**

Top Symptoms for each Age Group:

13-20: Irritation, pimple, legs pain

20-25: Back pain, dizziness , Weakness

25-30: Dizziness, pain, pimples

30-40: Last month heavy bleeding with excess blood clot , Severe pain with vomiting

Number of Symptoms for Irregular Periods by Age Group

The graph shows the number of symptoms for irregular periods by age group. The x-axis shows the age groups, and the y-axis shows the number of symptoms. The blue bars represent the number of symptoms for each age group.

The graph shows that the highest number of symptoms for irregular periods are in the 20-25 age group. This is followed by the 13-20 age group, the 25-30 age group, and the 30-40 age group.

The total number of symptoms for irregular periods in the 20-25 age group is 18. The total number of symptoms for irregular periods in the 13-20 age group is 9. The total number of symptoms for irregular periods in the 25-30 age group is 3. The total number of symptoms for irregular periods in the 30-40 age group is 2.

The graph shows that irregular periods are most common in young women. This is likely because the menstrual cycle is not fully established until a few years after menarche.

Selected Cases With Relevant Treatments

S.NO.	Problem	Total Cases	Treatments	Complication	Ayuvedic Treatments
1.	Irregularity	66 Cases	**Norethindrone** **Flecainide** **Sotalol** (betablockers) **Amiodarone** (at least take 3 months)	Irritation, Backpain, stomach pain, legs pain, Cramps, Dizziness, Acene, Weakness, Vaginal discharge, Low energy, Low BP, Mood swings, Craving of spicy food,Vomiting	Kumaryaseva Ladhvaseva Laxamanauiste
2.	PCOD (total cases)	23 Cases	**Clomiphene:** An oral antiestrogen medication thatcan be used to induce ovulation. **Rosiglitazone:**can help with insulin resistance and hirsutism. **Pioglitazone:**can help with insulin resistance andhirsutism. **Spironolactone:** can helpwith unwanted hair.	Clot, Severe Pain, Cramps, Heavy bleeding, Weight gain, Swelling, Abdominal pain, Headache, Bloating, Fever, Due to Insulin Resistance, Stress, Thyroid	MahayogarajGuggul Vorm Adi Kada Kanchonara Guggul Chandu Prabha Vati Raja ParvorthviVati

			Letrozole (femara): A breast cancer treatment thatcan stimulate the ovaries. **Gonadotropins: Hormone medication given by injection.**		
	PCOD (Waterycyst)	21 Cases	**Narcotic analgesic & NSAIDS, Ibuprofen** It shrinks on their own over time usually in about 1 to 3 months or 8 to 12 weeks.		
	PCOD (Solid cyst)	2 Cases	**Multivitamin, NSAIDS,etc**. Also take 1 to 3months Appears in ultra sound		
3.	PCOS	Cases	**Estrogen-Progestin** combination therapy 30-35 mg **ethinyl estradiol** with form of Progesterone ✦ **Birth control pills** ✦ **Metformin** (2 times a day) Best with healthy diet (Take 6-12 months for improvements)	Fatigue, pain, Urine problem, thinning of hair, Loss of hair, Anger issues, Heavy flow, Infertilityof foetus, Difficulty in getting pregnant	**Nashtapushantah Rosa Pushyanug Rosa**
4.	Premenstrual Syndrome	13 Cases	**Antidepressant:** (SSRI) Fluoxetine,	Pain every month before periods,	DashaMoola

			Irritation,	
		Paroxetine, Sertraline **NSAIDA:** Ibuprofen, NaproxenSodium **Diuretics:** can help with fluid retention	Weakness, Body pain, Fever, Chills, Unwanted hair, Watery eyes, Constipation, Hormonal imbalance	Aloe Veragel with pinch of Black pepper Sukumara Grutham Dadi Madya Grutham
5. Premature Menopause	13 Cases	**HRT (Hormone Replacement Therapy) Estrogen** inlowest dose **Birth ControlPills** (contain estrogen & progesterone with oral contraceptive) **Menopausal hormone therapy**	Night Sweat, Stress, Anxiety, Overthinking, feeling of cold, Skin problems, Vaginal Discharge, Depression, Vaginal discharge, change in bodyodour.	Supari Paka Shathavarigulam Neelibhringadi keram Panchakarma

Advanced Treatment:

1) Immature follicle aspiration:

Immature follicle aspiration (IMFA) is a treatment that can improve abnormal endocrinology, reducethe number of ovarian follicles, and help patients with polycystic ovarian syndrome (PCOS) achieve pregnancy. IMFA is a transvaginal ultrasound-guided procedure that involves using a needle suction device to extract oocytes from follicles. The procedure is usually performed 37 hours after HCG.

2) Laparoscopic ovarian drilling (LOD):

Laparoscopic ovarian drilling (LOD) is a surgical procedure that can help women with polycystic ovary syndrome (PCOS) who are infertile and anovulatory trigger ovulation. During the procedure, a surgeon uses a laser to destroy parts of the ovaries. The surgery is usually performed through a small incision (laparoscopy), with general anesthesia. LOD is as effective as gonadotropins in terms of pregnancy and live birth rates, but without the risks of ovarian hyperstimulation syndrome. (Gonadotropins are hormones that the anterior pituitary gland releases to stimulate the gonads, or sex glands, to increase the production of sex hormones and sperm or ova.)

3.) Diet Modification:

- Eating low-glycemic index foods: These foods are slowly and steadily released into the body as insulin, which helps the body use food for energy instead of storing it as fat.
- Eating high-Fiber foods: These foods help control blood sugar levels.
- Limiting carbohydrates: Because carbohydrates are broken down into sugar, it's helpful to limit how much you consume.
- Avoiding refined carbs: These are found in processed foods, especially white flour, rice, potatoes, and sugar.

- Avoiding sugary drinks: These include soda and juice.
- Omega-3 rich fish, such as salmon, tuna, sardines, and mackerel.
- Olive oil instead of butter or margarine.
- Beans and other protein-rich legumes instead of meat.
- Non-starchy vegetables such as leafy greens.

4.) Oophorectomy : An oophorectomy is a surgical procedure that removes one or both ovaries. The ovaries are reproductive glands that control the menstrual cycle, promote bone and heart health, and containeggs that can lead to pregnancy. The most common reason for an oophorectomy is to remove an ovarian cyst, which can cause pain, bloating, bladder or bowel pressure, and tiredness. Other reasons include family history of ovarian cancer, twisted ovary, or endometriosis. (After surgery pain and swelling in the belly for a few days may experienced, Changes in your bowel movements for a few days, shoulder pain for a day or two).

5.) Assisted reproductive technologies (ART), by the American Centre for Disease Control (CDC) definition, are any fertility-related treatments in which eggs or embryos are manipulated. ARTincludes all fertility treatments in which either eggs or embryos are handled. In general, ART procedures involve surgically removing eggs from a woman's ovaries, combining them with sperm in the laboratory, and returning them to the woman's body or donating them to another woman.

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