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Research Article

Efficacy Of Topical Application Of Butea Monosperma In The Management Of Polycystic Ovarian Syndrome And Quality Of Life Among Women Who Are Diagnosed With PCOS: A Pilot Study

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Abstract:

Introduction: Polycystic ovarian syndrome (PCOS) is a hormonal disorder characterized by an imbalance of reproductive hormones. It affects a significant number of women worldwide and is associated with various symptoms, including irregular menstruation, hirsutism, acne, and weight gain. Conventional treatments for PCOS, such as oral contraceptives, may have drawbacks and side effects, leading to an increased interest in complementary and alternative medicine (CAM) options. Butea monosperma, an Ayurvedic herb, has shown potential benefits in managing PCOS symptoms, making it a promising alternative treatment. This study aimed to assess the effectiveness of topical application of Butea monosperma in managing PCOS symptoms and improving quality of life.

Objective: The objective of this study was to determine the efficacy of topical application of Butea monosperma in managing PCOS symptoms and improving quality of life in women diagnosed with PCOS.

Methodology: A quasi-experimental, pretest-posttest control design was conducted at a primary health center, with 10 women diagnosed with PCOS. The participants were divided into an experimental group (n=5) and a control group (n=5). Demographic data, PCOS symptoms, and quality of life were assessed using structured questionnaires. The experimental group received topical application of Butea monosperma for 30 days, while the control group received standard treatment. Data were analyzed using descriptive statistics and paired t-tests.

Results: The results indicated a significant decrease in PCOS symptoms and an improvement in quality of life in the experimental group compared to the control group. The mean pretest symptom score in the experimental group was 7.2, which decreased to 5.6 in the posttest, while the control group showed no significant difference in symptom scores. Similarly, the experimental group demonstrated an improvement in quality of life, with a mean pretest score of 7.2 and a posttest score of 7.6, whereas the control group showed no significant difference in quality of life scores.

Conclusion: The findings of this study suggest that topical application of Butea monosperma may be an effective therapeutic option for managing PCOS symptoms and improving quality of life in women diagnosed with PCOS. However, further research is needed to explore its impact on specific symptoms and cyst reduction. Butea monosperma shows promise as a complementary approach to conventional PCOS management.

Keywords: Polycystic ovarian syndrome, topical application, PCOS symptoms, QOL,

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Introduction:

During reproductive age, the ovary makes too much male sex hormone; androgens are hormones that are typically produced in women but in only modest amounts. It is often referred to as polycystic ovarian syndrome (PCOS) and is a hormonal syndrome.

Polycystic ovarian syndrome (PCOS) is a group of small sacs (cysts) filled with liquid that are developed in the ovaries. The exact cause of PCOS is not known. This seems to be a common denominator in PCOS patients: insulin sensitivity. This means that the body's blood glucose level cannot be controlled by insulin. Insulin levels: This can increase androgen levels in the body. Further, it may increase the levels of insulin further and make PCOS even worse. Signs and Symptoms of Polycystic ovary syndrome (PCOS): irregular menses, hirsutism, acne, mood swings, weight gain, and pain. (Deswal et al., 2020).

An estimated 3.4%, or 116 million, of women worldwide may have PCOS. Very little is known from India about the probability of being affected by PCOS. The numbers from WHO are even more bleak: from 1.3 crore to 7.9 crore, women in India are affected—whatever the percentage, finally it is always a woman. Still, too few investigations have been done in India. In South India and Maharashtra, studies reveal prevalences of 9.13% and 22.5%, respectively, by Rotterdam's criteria (10.7% according to Androgen Excess Society standards). (Nhp.gov.in, 2015).

Causes of Polycystic ovary syndrome (PCOS):

The exact cause of polycystic ovary syndrome (PCOS) is not fully understood, but several factors are believed to play a role in its development. Likely genetic factors suggest that PCOS may run in families, indicating a potential hereditary component. Additionally, many women with PCOS have higher-than-normal levels of androgens, or male hormones, in their bloodstream, leading to symptoms like irregular menstruation, acne, and excess hair growth. Insulin resistance, a typical feature seen in PCOS-affected females, can also contribute to the condition, as the cells of the body do not respond normally to insulin. Lifestyle and environmental factors, such as a sedentary lifestyle and poor nutrition, may also play a role in the Development of PCOS.

Pathophysiology:

Hormonal and metabolic disturbances are integral to the pathology of PCOS, which frequently leads to disruptions in the sleep-wake cycle due to the endocrine system's role in regulating this cycle. In PCOS, normal ovarian function is primarily disrupted by hyperandrogenism and elevated levels of luteinizing hormone (LH). An underlying pathologic condition in PCOS is increased gonadotropin-releasing hormone

(GnRH) pulse frequency, favouring the production of LH over FSH. The granulosa cells' inability to convert androgens to oestrogen as a result of the ensuing relative reduction in FSH activity impairs follicle development and causes ovulatory failure. This leads to the formation of numerous cysts in the ovaries. Concurrently, the elevated LH levels stimulate the theca cells to produce more androgens, exacerbating the hormonal imbalance. (Sahu P., 2023)

Currently, oral contraceptives are the mainstay of treatment for PCOS with irregular menstruation, although they have certain drawbacks. Complementary and alternative medicine (CAM), which is frequently employed in clinical practice, has come under increasing scrutiny in recent years. Nowadays, irregular menstruation and PCOS treatment mainly depend on oral contraceptive pills, but there are certain side effects and adverse reactions. Over the past several years, great attention has been given to complementary and alternative medicine (CAM), which has been broadly used in clinical practices.

Butea monosperma, also known as Palash or Flame of the Forest, is a traditional Ayurvedic herb used to treat a variety of ailments, including problems related to the reproductive system. Their varieties of medicinal qualities contribute to its potential advantages for controlling polycystic ovarian syndrome (PCOS). An outline of how Butea monosperma may aid in PCOS therapy is provided below:

Balance of Hormones: Butea monosperma is a source of phytoestrogens, which can help regulate hormone levels. This is especially helpful for PCOS, as hormonal imbalances are a major problem. Menstrual cycle regulation: Women with PCOS frequently experience irregular menstrual periods, which may be helped by the phytoestrogenic qualities. (Gupta et al., 2011)

Anti-Inflammatory Effects: Decrease in Inflammation: PCOS and persistent low-grade inflammation are frequently linked. Significant anti-inflammatory effects have been shown for Butea monosperma (Singh et al., 2010). These qualities may be able to lessen inflammation and hence certain PCOS symptoms.

Effect of Antioxidants: Reduction of Oxidative Stress: Women who have PCOS frequently experience increased levels of oxidative stress. Strong antioxidant qualities found in Butea monosperma can aid in scavenging free radicals, lowering oxidative stress and the harm it causes (Sreelatha and Padma, 2009).

Enhanced Sensitivity to Insulin and Diminished Insulin Resistance: Although there are few specific studies on Butea monosperma's impact on PCOS insulin resistance, its anti-inflammatory and overall health

benefits may help reduce insulin resistance, which is a critical component of PCOS management (Kaur et al., 2004).

Butea monosperma contains hepatoprotective (liver-protecting) characteristics, which can help with liver health detoxification (Patel et al., 2008). Maintaining a healthy liver can help manage PCOS since it is necessary for hormone metabolism and detoxification.

Enhancement of Reproductive Function: Butea monosperma has long been used in Ayurvedic medicine to address disorders related to reproductive health. Women with PCOS-related fertility problems may benefit from it since it is thought to promote overall reproductive health and function (Kumar et al., 2014). According to reports, Butea monosperma flowers have tonic, aphrodisiac, diuretic, astringent, and depurative qualities (Jadhe, et al., 2009). An astringent is a substance that draws water out of tissues, causing them to shrink. Depurative- help to clear and remove metabolic wastes from the body to improve skin conditions of eczema, psoriasis and acne. The objective of this study is to determine the efficacy of topical application of Butea monosperma in managing PCOS symptoms and improving quality of life.

Material and Methods:

A quasi experimental, pretest-posttest control design was conducted at C.H.C Bistrakh, G.B Nagar, Uttar Pradesh with 10 women diagnosed with PCOS to assess the efficacy of topical application of Butea monosperma in managing PCOS symptoms and improving quality of life. 10 women diagnosed with PCOS were selected using purposive sampling technique and allocated into an experimental group (n=5) and a control group (n=5). Women with androgen excess conditions include drug induced androgen excess, Cushing's syndrome, thyroid disease, androgen secreting tumors, hyperprolactinemia and adrenal hyperplasia excluded from the study.

Data collection and outcome measures:

Phase 1: Used a structured questionnaire for demographic data.

Phase 2: Assessed PCOS symptoms using a validated questionnaire.

Phase 3: Measured quality of life with a validated questionnaire.

Intervention

- Plant material: Dried Butea monosperma flowers
- Quantity: 15g
- Vehicle/binder: Water
- Treatment duration: 30 days
- Treatment frequency: Once daily at bedtime
- Application time: 30 minutes
- Method: Topical application on lower abdomen
- Preparation: Obtained from a verified local source, 15g weighed for each use

Implementation of the intervention:

STEP-1: Take one pack of Butea monosperma flower.

STEP-2: Take 50-100 ml of hot water in a small steel container and soak the dried flower until it is soft enough to apply.

STEP-3: Take out the flower from the bowl and squeeze out any extra water.

STEP-4:

- Apply the sock flower on the lower abdomen.
- Keep the medication for a minimum of 30 minutes.
- Because of the body's heat, flowers dry out and fall off; to ensure that the flower remains on the skin for at least 30 minutes, mist it with water every five minutes.
- It needs to be applied at bedtime once a day.
- Also, we may place a small damp cloth or piece of tissue over the flower to make sure it stays on the skin for at least half an hour.
- A daily calendar checklist was kept to verify that the participants were consistently applying.
- Telephone follow-up was used to confirm that the medication was applied as directed

Results

Table: 1. Distribution of demographic factors in terms of frequency and percentage for both the experimental and control groups.

Sample characteristics		Experimental Group (5)		Control Group (5)	
		Frequency	Percentage	Frequency	Percentage
1	Age				
a)	20-30 years	3	60	1	20
b)	31-40 years	2	40	4	80
c)	41-50 years	0	0	0	0
d)	≥50 years	0	0	0	0
2	Educational status				
a)	No formal education	0	0	0	0
b)	10 th	2	40	2	40
c)	12 th	1	20	1	20
d)	UG and above	2	40	2	40
3	Occupation				
a)	House maker	2	40	0	0
b)	Business	0	0	1	20
c)	Government Employee	1	20	2	40

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	d) Private Employee	2	40	2	40
4	Marital status				
	a) Married	2	40	2	40
	b) Unmarried	2	40	2	40
	c) Separated	1	20	1	20
	d) Divorced	0	0	0	0
5	Weight				
	a) Under weight	0	0	0	0
	b) Normal weight	0	0	1	20
	c) Over weight	4	80	4	80
	d) Obese	1	20	0	0
6	Family monthly income				
	a) <50,000	0	0	0	0
	b) 5,0001-1 Lakh	3	60	1	20
	c) 1 Lack-1.5 Lakh	0	0	3	60
	d) >1.5 Lakh	2	40	1	20
7	Types of residence				
	a) Urban	0	0	0	0
	b) Semi urban	2	40	2	40
	c) Rural	1	20	3	60
	d) Semi-rural	2	40	0	0
8	Age of menarche				
	a) ≤11 years	0	0	0	0
	b) 12-14 years	4	80	3	60
	a) ≥15 years	1	20	2	40
9	What is the length of your menstrual cycles?				
	b) Fewer than 21 days	0	0	0	0
	c) 28-35 days	2	40	1	20
	d) 35 -60 days	3	60	4	80
	e) More than 60 days	0	0	0	0
10	How long does the menstrual bleeding last?				
	a) 1-3 days	0	0	0	0
	b) 4-5 days	3	60	2	40
	c) 6-7 days	1	20	2	40
	d) Last more than 7 days	1	20	1	20
11	Do you have abnormal bleeding during your menstruation?				
	a) Scanty	0	0	0	0
	b) Moderate	3	60	2	40
	c) Heavy	2	40	3	60
	d) Extremely heavy	0	0	0	0
12	Are you using any contraceptive methods?				
	a) YES	1	20	2	40
	b) NO	4	80	3	60
13	Do you have a family history of PCOS?				
	a) YES	1	20	1	20
	b) NO	4	80	4	80
14	Are you taking any treatment for PCOS?				
	a) YES	4	80	3	60
	b) NO	1	20	2	40

Table 1. Indicates (60%) 20–30-year-old women constitute the majority of the women in the experimental group, and (80%) 31–40-year-old women constitute the control group. Both the experimental group and the control group have the most women (40%) enrolled in 10th and UG and above. Among the women in the experimental group, there were house makers (40%), private employees (40%), while 40% are government employees and 40% are private employees in the control group. In the experimental and control groups, 40% of the women are married, and 40% are single. Most of the women (80%) are overweight in the experimental and

control groups. In the control group, 60 percent of the women's monthly income for their families is Rs. 1–1.5 lakh, and in the experimental group, 60 percent of the women's monthly income is Rs. 5,000–1 lakh. In the experimental group, 40% of the women live in semi-urban and semi-rural areas, but in the control group, 60% of the women live in rural areas. For most women, menarche happens between the ages of 12 and 14 (80% in experimental versus 60% in control). 60% in the experimental group and the control group (80%) exhibited menstrual cycles lasting 35–60 days. In 60% of cases, the first day of menstruation persisted for 4–5

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days in the experimental group, whereas in 40%, it persisted for 4–5 days and 40% for 6–7 days in the control group. 60% of women experience moderate bleeding during menstruation in the intervention group and heavy bleeding during menstruation in the control arm. There were a lot of women in the experimental and

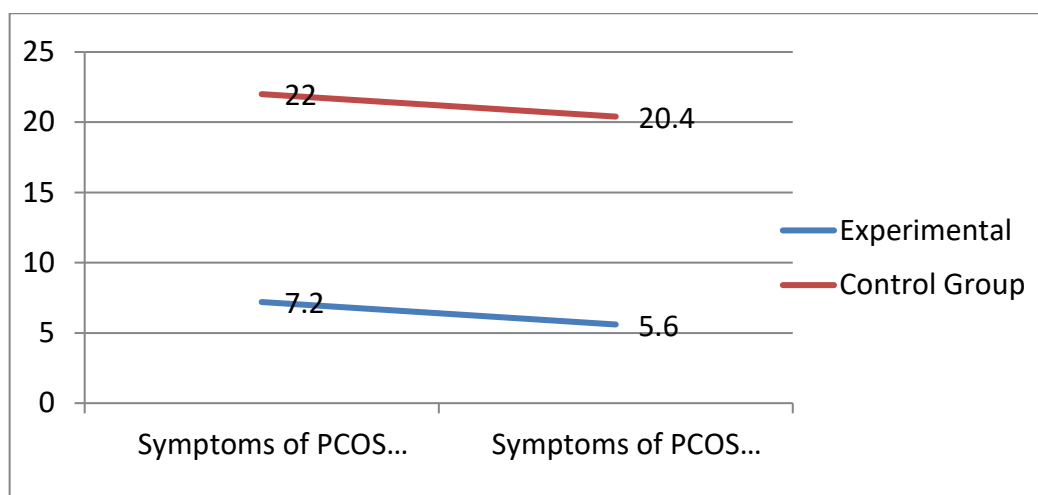
control groups—about 80% and 60%—who were not using any contraceptive methods, respectively. In both the experimental and control groups, 80% of the women did not have a family history of PCOS. Other treatments of the PCOS in the experimental and control groups (80%) and (60%) women were taken, respectively..

Table: 2. Description of comparing the pretest and posttest symptoms of PCOS in experimental and control group
n=10

Symptoms of PCOS		Mean	Standard Deviation	Paired 't' Value	p-value
Experimental Group	Pre-test	7.2	0.83	4	.016*
	Post-test	5.6	0.89		
Control Group	Pre	22	5.38	-1.63	.178
	post	20.4	5.02		

As it is seen from the Table 2 data, In a study on the symptoms of PCOS, the experimental group showed a significant decrease in symptoms from pre-test (M = 7.2, SD = 0.83) to post-test (M = 5.6, SD = 0.89; t(4) = 4, p

= .016*). The control group, on the other hand, did not show a significant difference in symptoms from pre (M = 22, SD = 5.38) to post (M = 20.4, SD = 5.02; t(4) = -1.63, p = .178).



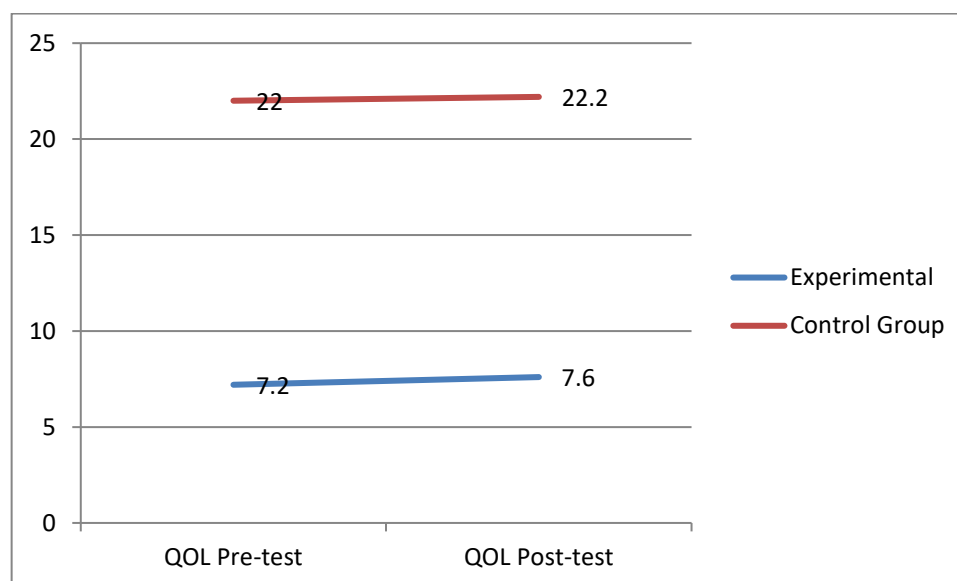
Graph: 1. Line graph depicts the Comparing the pretest and posttest symptoms of PCOS in experimental and control group

Table: 3. Description of comparing the pretest and posttest Quality of life in experimental and control group
n=10

Quality of life		Mean	Standard Deviation	Paired 't' Value	p-value
Experimental Group	Pre-test	7.2	0.83	6.532	.003*
	Post-test	7.6	0.54		
Control Group	Pre	22	5.38	-1	.374
	post	22.2	5.06		

Based on the data reported in Table 3, the mean pretest score for the experimental group was 7.2 (with a slight improvement to 7.6 on the posttest). This shows that the use of Butea monosperma in women with PCOS helps

improve quality of life. This is compared with a mean pre-test score of 22 and a post-test score of 22.2 in the control group.



Graph: 2. Comparing the pretest and posttest Quality of life in experimental and control group

Discussion:

Oral contraceptives are still the first-line medical therapy for irregular menses in PCOS. These, however, can lead to several side effects and allergic reactions. Recently, CAM (Complementary and Alternative Medicine) alternatives have become one of the most frequently used practices in clinical medicine. Ayurvedic treatments offer several potential benefits over allopathic (conventional) treatments for managing polycystic ovary syndrome (PCOS). Ayurveda, an ancient system of medicine from India, emphasizes balance and holistic care, which can be particularly beneficial for managing chronic conditions like PCOS. PCOS, which manifests as a variety of symptoms, should be treated holistically as opposed to addressing individual symptoms. Alternative and complementary medicine (CAM) might offer a longer-lasting cure for PCOS.

There have been several studies showing that Ayurvedic medications can reduce PCOS symptoms. A significant reduction ($p < 0.01$) in the mean composite score for subjective symptoms was recorded in the group receiving plant extract-based natural oils through topical application in the management of polycystic ovarian syndrome (Bahl, A.S., 2020). In a clinical study examining the impact of oral cinnamon extract on menstruation clivity in women with polycystic ovarian syndrome, it was discovered that taking cinnamon daily for eight weeks reduced insulin resistance in PCOS patients.

In this present study the diagnosis of the PCOS was done by the gynaecologist base on the medical history presented by the participants and their investigation reports. This study was conducted in a primary health centre to check the efficacy of *butea monosperma* in the management of PCOS symptoms and QOL.

Women's quality of life is greatly impacted by polycystic ovarian syndrome (PCOS), which has an adverse effect on their social, emotional, and mental health. Inconvenience, health issues, and insulin resistance are the results of symptoms such as hirsutism,

acne, obesity, and irregular menstruation. Long-term symptoms can lead to psychological discomfort by lowering self-esteem, generating worry, and depression. Social stigma and concerns about one's body image might make the illness worse.

The study involved four phases: assessing demographic information using a self-administered structured questionnaire, assessing baseline data on PCOS symptoms using a validated structured questionnaire schedule, assessing Quality of Life using a validated structured questionnaire schedule, and explaining the standard operating procedure to women for a 10-minute explanation.

The standard operating procedure involves taking a pack of *Butea monosperma* flower, soaking it in hot water until soft, and then removing any excess water. Apply the sock flower to the lower abdomen and let it stay on the skin for at least 30 minutes. To prevent the flower from drying out, mist it with water every five minutes. Apply the medication at bedtime once a day and cover it with a damp cloth or tissue for at least half an hour. A daily calendar checklist was used to ensure consistent application, and telephone follow-up was used to confirm the medication was applied as directed.

The present study is aimed at evaluating the effectiveness of *Butea monosperma* (Lam). Results of the study revealed that the administration of *Butea monosperma* effectively treats PCOS symptoms and also improves the quality of life in PCOS-diagnosed women. The mean pretest scores for the experimental group and the control group were 7.2 and 22, respectively, with mean posttest scores of 7.6 and 22.2.

Conclusion:

The experimental post-test group demonstrated that the efficacy of *Butea monosperma* on Polycystic Ovary Syndrome (PCOS) was significantly proven, highlighting its potential as a therapeutic option. However, the study did not show significant differences in the effects on PCOS symptoms and cyst size. These findings suggest that while *Butea monosperma* may

offer some benefits in managing PCOS, its impact on specific symptoms and cyst reduction requires further investigation.

Recommendation

Further studies, with a larger group and a longer follow-up time, need to be carried out in order to verify these early observations. A larger and more heterogeneous group of participants and a longer duration of follow-up may help us have an idea about the role of *Butea monosperma* in PCOS. This method could be more effective in detecting differences in response and detecting potential long-term benefits or harms, thus providing more reliable clues for the use of clinical.

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