

Original article

Medication Use Patterns among Women with Polycystic Ovary Syndrome in Sabrata, Libya: A Retrospective Study

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Keywords

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ABSTRACT

Polycystic ovary syndrome (PCOS) was recognized by the World Health Organization (WHO) as one of the most common endocrine disorders affecting women of reproductive age. It is a leading cause of anovulatory infertility and is considered a chronic, lifelong condition that often begins during adolescence. Particularly, diagnostic and therapeutic approaches are variable. Due to the lack of standardized PCOS management recommendations, in Libya, an assessment of current clinical practices is necessary. The objective of this study was to evaluate the hormonal profiles, medication use, body measures, and management practices of women with PCOS who attended several private health care facilities in Sabrata, western Libya. A retrospective study was conducted on 148 PCOS women using a data collection form designed by the researchers during the period from December 2024 to June 2025. Data analysis was performed using SPSS version 25. Means and standard deviations were calculated, and the paired-samples t-test was applied to compare pre- and post-treatment measurements. A *p*-value of less than 0.05 was considered statistically significant. The majority of participants were married (71.6%) compared to 28.4% single, with a mean age of 22.9 ± 5.7 years. It is evident that the highest proportion of tests focused on Prolactin, FSH, and LH, each accounting for 24.26% of all tests performed (148 cases each). The TSH test ranked next with 9.67% (59 cases), and other tests such as Estradiol (5.57%), Testosterone (5.41%), and Vitamin D (4.43%) were performed less frequently. In terms of treatment, Metformin was the most commonly used treatment (18.75% of the prescribed regimens), followed by Inositol or Celine tablet (13.46%), then lifestyle modification (12.5%), and Clomiphene (9.61%). These findings show a varied approach to managing PCOS in Sabrata, mainly using Metformin, Inositol, and lifestyle management. Significant improvements in key hormonal levels and weight support the effectiveness of current methods.

Introduction

Polycystic ovarian syndrome (PCOS) is a common endocrine condition that affects women of reproductive age. It is commonly referred to as the Stein-Leventhal syndrome. One in ten women of reproductive age are thought to be diagnosed with this illness [1]. However, in the absence of hypothalamic-pituitary-ovarian (HPO) pathology, it may be linked to a number of problems with lifestyle and environmental factors [2]. Although the exact cause of PCOS is still unknown, it is believed to be the consequence of a complex interaction between environmental factors, hormonal imbalances, and genetic susceptibility. Its clinically diverse presentation makes diagnosis extremely difficult [3]. According to recent data, there has been a significant rise in PCOS incidence, with 1.55 million new cases reported worldwide [4]. In addition to being diagnosed with increased blood androgen and luteinizing hormone (LH) levels, patients with PCOS also have unique ultrasound findings, such as enlarged ovaries with more than 12 follicles that range in diameter from 2 to 9 mm. Ovulatory dysfunction brought on by these defining features of PCOS frequently results in irregular menstrual periods, oligomenorrhea, amenorrhea, and infertility [5]. These clinical characteristics also include physical symptoms such as hirsutism, acne, and obesity, which are driven by elevated male hormones like testosterone. Furthermore, metabolic abnormalities such as insulin resistance, elevated insulin, and abnormal cholesterol levels are closely linked to PCOS, increasing the risk of diabetes and cardiovascular disease [6].

Delayed diagnosis and unsatisfactory treatment of PCOS remain common challenges reported around the world [7]. According to the 2023 International Evidence-based Guideline for the assessment and management of PCOS, PCOS is diagnosed when two criteria—clinical/biochemical hyperandrogenism, ovulatory dysfunction, and polycystic ovaries on ultrasound or elevated anti-müllerian hormone (AMH) levels—are satisfied and other causes are ruled out [8]. PCOS management involves both pharmacological and non-pharmacological treatments. One important non-pharmacological tactic to improve ovarian morphology and increase fertility is to lose weight. Pharmacological treatment includes hormonal

contraceptives to treat hirsutism, acne, and irregular menstruation in women with symptomatic PCOS. Combination hormonal contraceptives work well to increase sex hormone-binding globulin (SHBG), reduce ovarian androgen synthesis, and lower LH [9].

The first line of treatment is changing lifestyle to normalize hyperinsulinemia. This includes eating a healthy diet, exercising, getting enough sleep, and reducing stress. Only when lifestyle changes fail to provide the intended results are hormonal medications taken into consideration [1]. It is typically preferred to use low-dose contraceptives such as ethinyl estradiol with low-androgenic progestins. For women with PCOS who want to get pregnant, ovulation induction is advised. Letrozole, an aromatase inhibitor, is recommended as a first-line treatment since it increases ovulation and live birth rates [1].

Women with PCOS who have insulin resistance, impaired glucose tolerance, or type 2 diabetes mellitus are the main patients treated with metformin, a biguanide insulin sensitizer. Metformin may enhance metabolic parameters and menstrual regularity, but when pregnancy is the goal, it is less successful than ovulation-induction medications and should be combined with lifestyle changes [10].

Many combined oral contraceptive drugs induce nausea, vomiting, migraines, headaches, and depression, which are frequently observed among users. Additionally, metformin induces nausea and vomiting during the initial days of administration. Hyperkalemia can be brought on by spironolactone, a medication that is frequently used and prescribed for issues related to androgens. Therefore, before writing a prescription, it is advised to look up any adverse reactions or contraindications in reputable medication literature or ask the patient about any potential reactions in the past [11]. In Libya, there is no established procedure for PCOS diagnosis and treatment. Studies to determine the frequency of the illness in the Libyan community and compare regularly used therapies are now required due to the large range of therapeutic choices, including drugs, dietary supplements, and lifestyle changes. This retrospective study aimed to evaluate the management of PCOS among women who attended several private health care facilities in Sabrata by assessing medication use patterns, hormonal profiles, lifestyle interventions, and body weight before and after three months of treatment.

Materials and methods

Study setting and population

This retrospective study included women diagnosed with PCOS who attended several private health care facilities in Sabrata, a city in western Libya. Medical records of 148 women diagnosed with PCOS were retrospectively reviewed between December 2024 and June 2025. Microsoft Excel 2016 was used for data collection.

Study tools and variables

Data were collected from patient records using an electronic data collection form designed by researchers. The recorded data included three main sections: the first section included demographic characteristics of patients; the second section consisted of laboratory tests (hormonal tests and vitamin D) before and after 3 months of treatment; and the third section concerned medication management.

Ethical considerations

The study was conducted with the approval of the University of Zawia; patient confidentiality was maintained throughout the study. All patient-related data were anonymized prior to analysis.

Statistical Analysis

Data analysis was performed using SPSS version 25. Descriptive statistics of means and standard deviations were calculated, along with frequencies and percentages for the categorized variable. A paired samples t-test was applied to compare pre- and post-treatment measurements, where a *p*-value of less than 0.05 was considered statistically significant.

Results

The socio-demographic data of 148 participants (Table 1) revealed that the mean age of the sample was 22.9 ± 5.7 years, with the largest proportion falling within the 24–31 years' age group (45.9%). While, the marital status of women represented the majority of women were married (71.6%), compared to 28.4% single.

Table 1. The socio-demographic characteristics

Variable	Category	N (Numbers)	%
Age Group	17-24	27	18.2%
	24-31	68	45.9%
	31-38	35	23.6%
	38-45	18	12.2%
Marital Status	Single	42	28.4%
	Married	106	71.6%

Table 2 illustrates the distribution of laboratory tests performed on the study sample. It is evident that the highest proportion of tests focused on Prolactin, FSH, and LH, each accounting for 24.26% (148 cases). Percentages in Table 2 are calculated relative to the total number of tests performed (610 tests), not the number of patients; all 148 patients (100%) underwent the Prolactin, FSH, and LH tests. The TSH test ranked next with 9.67% (59 cases), reflecting the importance of thyroid function in hormonal and reproductive disorders. Other tests such as Estradiol (5.57%), Testosterone (5.41%), and Vitamin D (4.43%) were performed less frequently, likely in more specific clinical situations. The Progesterone test represented the lowest percentage (2.13%, 13 cases).

Table 2. Types of tests performed for study patients

Percentage (% of total tests, n = 610)	Number of Cases	Type of Test
24.26%	148	Prolactin
24.26%	148	FSH
24.26%	148	LH
5.57%	34	Estradiol
9.67%	59	TSH
2.13%	13	Progesterone
4.43%	27	Vitamin D
5.41%	33	Testosterone

Note: Percentages are calculated out of the total number of tests performed (n = 610), not out of the total number of patients (N = 148). All 148 patients (100%) underwent Prolactin, FSH, and LH testing.

The results in (Table 3) indicated that most PCOS patients are treated with more than one medication. Metformin was the most commonly used treatment (18.75% of the 208 prescribed regimens), followed by Inositol or Celine tablet (13.46%), then lifestyle modification (12.5%), and Clomipramine (9.61%). Other drugs and supplements such as Vitamin D, Q-plus, Ferti-boost were used at varying frequencies.

Table 3. Types and distribution of therapeutic regimens

Type of Treatment	Number of Cases	Percentage (% of total regimens, n = 208)
Vit"D"	10	4.81%
Q-plus	11	5.29%
Ferti-boost	10	4.81%
Myofol (folic acid)	10	4.81%
Physiogest	10	4.81%
Inositol or Celine tablet	28	13.46%
Metformin	39	18.75%
Clomiphene	20	9.61%
Omega3	6	2.88%
Multivitamin	6	2.88%
Dostinex	10	4.81%
Primolut-Nor	6	2.88%
Lifestyle (exercise and diet control)	26	12.5%
Roxane sachet	8	3.85%
Oval-p capsule	8	3.85%

Note: Percentages are calculated out of the total number of prescribed regimens (n = 208), not out of the total number of patients (N = 148). Most patients received more than one regimen.

The results in (Table 4) revealed that average weight significantly decreased from 76.22 ± 14.20 to 68.47 ± 9.98 ($P=0.000$). Prolactin levels decreased from 31.53 ± 33.84 to 24.69 ± 35.20 ($P=0.001$). Also, FSH decreased from 8.03 ± 3.53 to 7.08 ± 1.92 ($P=0.002$), while LH decreased from 12.58 ± 4.32 to 10.18 ± 3.38 ($P=0.000$). Estradiol ($P=0.552$), TSH ($P=0.308$), and Testosterone ($P=0.832$) showed no significant changes. In addition, Progesterone significantly increased ($P=0.021$), as did Vitamin D ($P=0.021$).

As shown in Table 4, average weight, prolactin, FSH, and LH decreased significantly following treatment, while progesterone and vitamin D increased significantly ($P = 0.021$ for both). Estradiol, TSH, and testosterone showed no statistically significant change.

Table 4. Differences between pre and post-treatment measurements

Parameter	Before Treatment	After Treatment	T-test	P-Value
Average Weight	76.22± 14.208	68.47± 9.98	7.905	0.000
Average Prolactin	31.53±33.84	24.69±35.20	3.378	0.001
Average FSH	8.03±3.53	7.08±1.92	3.214	0.002
Average LH	12.58±4.32	10.18±3.38	6.721	0.000
Average Estradiol	13.88±30.27	12.51±30.75	.597	0.552
Average TSH	0.69±1.11	0.63±0.844	1.023	0.308

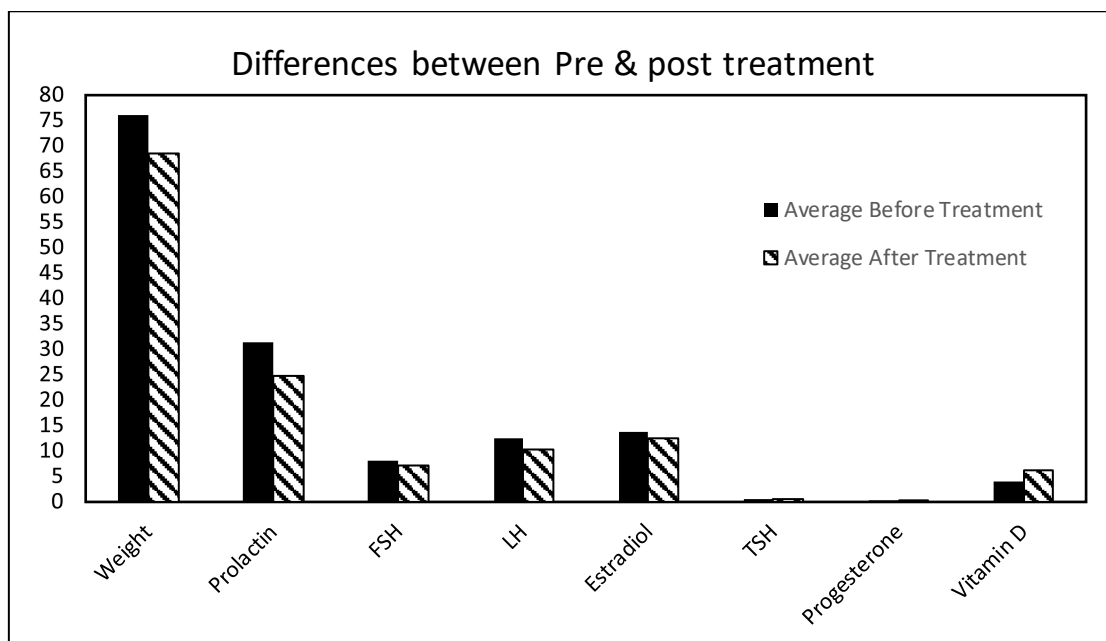


Figure 1. The mean values of the studied hormonal and anthropometric parameters before and after treatment.

Discussion

From a sociodemographic perspective the prevalence of PCOS across different age groups from 17 to 45 years, with the highest prevalence observed among women aged 24–31 years (45.9%). Also, the majority of cases were reported among married women (71.6%) compared to unmarried women (28.4%) (Table 1). This underscores the considerable impact of PCOS on women of reproductive age and reinforces the evidence that it remains one of the most prevalent endocrine disorders affecting women worldwide. Some potential reasons may include lifestyle changes, stress, Healthcare Access, etc. Married women may experience lifestyle changes after marriage, including stress levels, dietary habits, and physical activity, which can impact hormonal balance. Moreover, the responsibilities and expectations that come with marriage and family life can increase stress, which may contribute to hormonal imbalances associated with PCOS. In addition, the results from the different age groups are consistent with previous studies indicating that PCOS is most frequently diagnosed during early adulthood and the reproductive years. Studies conducted in Benghazi reported the highest prevalence of PCOS among women aged 20–29 years (67%), supporting the role of hormonal changes and reproductive maturation in the manifestation of the syndrome [12]. Moreover, prominent endocrine and metabolic disturbances, such as elevated Prolactin levels, further confirm the complex hormonal background of PCOS. Similar findings were also reported in studies from Alkhoms, where the prevalence was highest among women in their twenties, with a gradual decline with increasing age, which aligns with the results of the present study [3].

With regard to diagnostic approaches, hormonal assays and ultrasound imaging were the most commonly used tools, in line with widely accepted clinical practices. In the present study, the data indicate that the primary focus of blood investigations was on Prolactin, FSH, and LH, while the remaining tests were ordered in fewer cases depending on particular

diagnostic needs (Table 2). This highlights the central role of pituitary–ovarian axis hormones in the diagnostic process. The TSH test ranked next, reflecting the importance of thyroid function in hormonal and reproductive disorders. While, the Progesterone test represented the lowest percentage, which may be attributed to its selective use in evaluating ovulation. Testosterone ($P=0.832$) showed no significant changes; this may be due to no antiandrogens being prescribed for PCOS patients in the present study.

In terms of treatment (Table 3), the findings revealed that Metformin [13] was the most frequently prescribed medication, in accordance with international recommendations for the management of insulin resistance in PCOS patients. Following Metformin, Inositol and Clomiphene citrate (Clomid) were also commonly prescribed. Notably, it has been found that Metformin and Inositol improve insulin resistance, regulating menstrual cycle, and lower androgen levels [14]. Furthermore, Metformin reduces the likelihood of miscarriage and increases the chances of pregnancy even before the ovulation stage (Table 4), as it helps in managing Polycystic Ovary Syndrome (PCOS), which causes difficulties in conception for a significant number of women.

Clomiphene demonstrated significant effectiveness in inducing ovulation among women with PCOS-related infertility, which is consistent with previous findings [15]. In addition, oral contraceptives (OCs) were widely prescribed, consisting primarily of Norethisterone and other combined formulations [16]. OCs remain the first-line therapeutic option for the management of symptoms like menstrual irregularities, hirsutism, and acne in women with PCOS. Moreover, mean values of examined anthropometric and hormonal parameters (Figure 1) were compared before and after therapy. Prolactin, FSH, LH, and average weight all showed significant declines. On the other hand, progesterone and vitamin D levels dramatically increased, while estradiol, TSH, and testosterone stayed constant [6]. Finally, we noticed that antiandrogens were not prescribed as part of the treatment plan for the syndrome.

Conclusion

In conclusion, by modifying lifestyle with the use of appropriate therapy, optimal outcomes may be achieved. The findings suggest that Metformin and Inositol are among the most prescribed drug for PCOS; Metformin and Inositol were associated with significant improvements in weight and hormonal markers relevant to fertility (LH, FSH, Prolactin). This supports their effectiveness as therapeutic options for PCOS. Moreover, the results revealed that the highest proportion of tests focused on Prolactin, FSH, and LH. Furthermore, some parameters such as Estradiol, TSH, and Testosterone showed no significant changes, which may indicate that treatment effects are partial or dependent on factors such as treatment duration, severity of the condition, or patients' adherence to therapy.

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Conflict of interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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