



## Effectiveness of self help strategies (shs) for pcos on biochemical parameters among young adult girls

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### ABSTRACT



Polycystic ovary syndrome (PCOS) with the predominance of 5 to 7% among youthful grown-up is a main source of infertility and endocrine issue. Metabolic clutters, for example, increased levels of LH and FSH in these young ladies was normal and impacts soundness of the youthful grown-up with PCOS in long-term. Treatment of female infertility and other entanglements needs to have direct hormones and get exogenous hormone. In this investigation, levels of Luteinizing hormone (LH) and Follicle stimulating hormone (FSH) and testosterone among young adults with PCOS were measured. The consequence of this investigation demonstrated that LH, FSH and Free testosterone hormone levels were altogether extraordinary in this disorder. The adjustments in the hormones show an intense effect on the character of the young people. It is a time of existence with explicit wellbeing and formative needs and rights to create information and aptitudes figure out how to oversee feelings and connections, and secure properties and capacities that will be significant for getting a charge out of the immature years and expecting adult roles. To identify the effectiveness of self help strategies in reducing PCOS symptoms.

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### INTRODUCTION

Poly cystic ovarian disorder is a constant issue where numerous benign cysts form on the ovaries. It for the most part happens in ladies less than 30 years of age; influences about 5% of ladies of conceptive age. The paces of polycystic ovarian disorder

have allegedly been high among Indian ladies contrasted with their Caucasian partners, with an expected predominance of 9.13% in Indian young people (Abbott *et al.*, 2005). PCOS is caused by increased production of LH and decreased FSH. This imbalance prevents regular and predictable ovulation. There is a risk of development of dysfunctional uterine bleeding and endometrial hyperplasia due to unopposed estrogen exposure. Many teenagers start with ordinary menstrual period and afterward following 1 to 2 years the periods becomes sporadic and afterward inconsistent, whenever left untreated cardiovascular ailment, unusual insulin opposition with type II DM and ovarian and endometrial disease may create. Ladies with PCOS with corpulence, cigarette smoking, dyslipidemia, hypertension, debilitated glucose resistance, and subclinical vascular infection are in danger, while those with metabolic disorder and/or type 2 diabetes mellitus are at high hazard for CVD (Abdullah *et al.*, 2013).

PCOS is a major public health. Most studies in India report prevalence of PCOS as 9.13% to 36%. According to Rotterdam criteria oligomenorrhea should be present following two years of menarche or primary amenorrhea at the age 16 years; polycystic ovaries on ultrasound alongside ovarian size of more than 10cm<sup>3</sup> and hyperandrogenemia ought to be available. Hyperandrogenism in polycystic ovaries may be ovarian in origin, adrenal or both. The levels of testosterone, androstenedione, dehydroepiandrosterone sulphate (DHEA) and 17-alpha-hydroxyl progesterone (17OHP) may be raised. Raised serum androgen levels have been demonstrated in PCOS.

High basal LH levels in the follicular phase compromise the quality of the developing oocyte and lead to a higher incidence of early pregnancy losses and missed abortion. Down regulating the LH levels in the follicular stage with gonadotropin discharging hormone GnRH agonists won't just improve the pregnancy rate and will likewise decrease the pregnancy misfortune rate. Hyper secretion of luteinizing hormone, which triggers ovulation and the advancement of the corpus luteum in females, and unusually low serum levels of follicle animating hormone, advance the arrangement of ova in females. The clinical side effects of hyperandrogenism are alopecia (male-designed hairlessness), Hirsutism (strange facial and body hair in ladies), and skin inflammation. Constant anovulation differs from oligomenorrhea (rare monthly cycle), amenorrhea (a nonattendance of feminine cycle), and useless uterine dying. These unsettling influences in monthly cycle generally show themselves at menarche and lead to infertility (Akdoğan *et al.*, 2007).

Ladies with PCOS have an expanded predominance of obesity, a accord on the extent of overweight and large ladies with PCOS isn't clear, with evaluations of between 40-60% (Feigenbaum, 2006). Obesity tends to aggravate the clinical presentation of PCOS. Indeed, the incidence of Hirsutism and menstrual irregularity is greater in the obese population as compared to non obese PCOS (Altieri *et al.*, 2013).

Lifestyle modification, including expanded physical movement, is the primary line approach in over-seeing PCOS. Way of life adjustments, explicitly diet and exercise, have been demonstrated to viably deal with the side effects and decline the hazard factors that are related with PCOS. Numerous individuals guarantee this is more powerful than medicine. A large portion of the examinations that have been led investigate the impact of diet and exercise on fat PCOS ladies, and it has been discovered that weight reduction is a significant factor for great outcomes. Diets with limited caloric admissions that

bring about weight reduction have been appeared to improve hormone focuses, cardio metabolic hazard factors and regenerative working in fat PCOS ladies. Way of life mediation improves body structure, hyperandrogenism (high male hormones and clinical impacts) and insulin obstruction in ladies with PCOS. There were no proof on the impact for way of life intercession on improving glucose resistance or lipid profiles and no writing surveying clinical regenerative results, personal satisfaction and treatment fulfillment were accessible (Azziz *et al.*, 2006).

Being overweight or fat impedes male and female fruitfulness and decreases the opportunity of unconstrained and helped origination. Weight the executives is pivotal in forestalling and treating fruitlessness. Exercise is a key part of weight the executives. Proof proposes that moderate normal exercise emphatically impacts fruitfulness and helped regenerative innovation (ART) results. In an investigation of 26,955 ladies, enthusiastic action was related with diminished danger of ovulatory barrenness (Rich-Edwards, 2002). At least one hour practice three times each week improved paces of implantation and pregnancy and diminished the danger of premature delivery in 436 ladies experiencing ICSI (Grant, 2010).

A great number of plant species is generally utilized for treatment of fruitfulness related illnesses. Right now in Iran, Menthaspicata (spearmint) basic oil is created financially and utilized orally as a carminative and antispasmodic specialist. This home grown plant mint is likewise suggested for easing Hirsutism and menstrual torment. It is affirmed that spearmint tea has antiandrogen properties and essentially diminishes testosterone level and Hirsutism in ladies with PCOS (Kataoka *et al.*, 2017). It additionally has cancer prevention agent, anticancer, calming and antidiabetic properties (Khadakarami *et al.*, 2015).

Considering the rapid increase in the cost of drugs and their adverse effects, medicinal plants (herbs) are widely used to lower the symptoms of PCOS and improve ovulatory functions among young adult girls. The present study was aimed to determine the effectiveness of self help strategies which includes, mint tea, diet and exercise on PCOS among the young adult girls. The main aim of this study was to identify the effectiveness of self help strategies in reducing PCOS symptoms and the objectives were

1. To assess the prevalence of PCOS among young adult girls at selected colleges.
2. To compare the pre and post test level between

the control and experimental group young adult girls.

3. To associate the selected demographic variables with bio physiological and biochemical parameters among young adults.

## MATERIALS AND METHODS

The study participants were young adult girls with PCOS between the age of 18-25. The participants were selected from 2 constituent colleges in SIMATS after obtaining permission from the Principals of respective colleges and authorities. Totally 70 participants were selected based on convenience sampling technique and assigned to the control group, and experimental group. Written consent was obtained from the participants after explaining the study. The Institutional Human Ethics Committee of Saveetha University had given approval for the study (001/01/2016/IEC/SU; Dated 18<sup>th</sup> January 2016). The study included young adult girls with PCOS and not having other systemic diseases. Young adult girls with other problems like autoimmune diseases were excluded. Tools containing demographic variable and self assessment tool were used for pre and post assessment for both the groups.

Blood investigations included FSH, LH and Fasting blood glucose level and Ultra sonogram of pelvis was studied to confirm the diagnosis, PCOS prior and after interventions. The details are given in chapter 4.

1. **Methodology (pre test phase)** - Orientation programme was conducted for the participants in the conference hall. Demographic details of young adult girls were collected. Height and weight of the young adult girls were measured with the measuring tape and weighing machine to check BMI and self assessment tool was distributed. Scores were recorded. Prior appointment was fixed for obstetrician consultation for both the groups separately. Followed by the consultant advice those young adult girls were taken to laboratory for blood investigation like FBS,FSH,LH, and Testosterone and radiology department for Ultra sonogram Pelvis at SMCH. All the needed biochemical markers except free testosterone were done by ECLIA method. Testosterone sample alone was tested in a private lab. 83 young adults were confirmed with PCOS by ultra sound pelvis. Among them 70 were selected by convenience sampling technique and they were divided in to control and experimental group (35 in each group).

2. **During the test phase** - Self help strategies were started followed by investigations. For each individual the requirement was 5 gm of dried mint powder. The mint powder bought from a branded company and it was tested for quality in Food analysis laboratory. The mint tea was prepared hygienically by the investigator. The experimental group girls were given 50ml of mint tea. The exercise and diet module was explained. (balanced diet, do's and don'ts in PCOS). The tea was distributed daily on weekdays at the midmorning break. Daily reminder message for performing exercise and diet maintenance was given. This procedure was followed for 12 weeks by the participants

3. **Post test Phase** - The same physiological and biochemical parameter was followed in post assessment after twelve weeks of intervention. Haemoglobin level and RBC level were also randomly checked for experimental group students to rule out any adverse effects of mint tea. Among these 35 young girls 14 of them had regular menstrual cycle. Remaining 21 had no significance of Self Help Strategies because they did not follow the SHS regularly due to gastritis and bitterness, and some of them revealed that the taste was not good, whereas some performed exercise and followed the diet module alone.

4. **Statistics** - The data was analyzed by means of descriptive and inferential statistics. It was presented as mean and standard error. Pre test and post test were compared by paired "t" test. Wilcoxon signed rank test was used to find the effectiveness of self help strategies, compared with control group. A probability of 0.05 level or less was taken as statistically significant. The analysis and graph plotting were carried out by using Sigma Plot 13 (Systat software USA).The data's of 14 young adult girls who followed the self help strategies regularly were also analysed separately to evaluate the effectiveness of the study by One way ANOVAs.

## RESULTS

The effectiveness of self help strategies on biochemical parameters. A detailed analysis was done on the changes of biochemical parameters like, Fasting blood glucose level, free testosterone level, Follicle stimulating hormone level and luteinizing hormone level between both experimental and control group participants before and after the intervention. The pre and post- test intervention scores of control and

experimental group were compared by paired t-test and the difference between experimental and control group was compared by unpaired t-test.

#### **Comparison of pre-test and post test Fasting blood sugar in both experimental and control groups**

The mean and SE pre test value of FBS for control group was  $100.57 \pm 2.935$  and post test value was  $93.143 \pm 1.893$ . Paired 't' test between pre and post test value of FBS for control group was statistically significant ( $p < 0.00$ ). The mean and SE pre test value of FBS for experimental group was  $100.57 \pm 1.619$  and the post test value was  $89.71 \pm 1.263$ . The paired t test between the pre and post test value for FBS in the experimental group was statistically significant ( $p < 0.001$ ). The comparison of pre test FBS value between experimental and control group was not statistically significant ( $p = 1.00$ ). The comparison of post test FBS value between experimental and control group was not statistically significant ( $p = 0.137$ ).

#### **Comparison of pre-test and post-test scores of FSH in experimental mint tea compliance, experimental mint tea non compliance and control groups**

pre test value of FSH for control group was  $2.565 \pm 0.143$  and post test value was  $2.381 \pm 0.153$  respectively. Paired 't' test between pre and post test value of FSH for control group was statistically significant ( $P = 0.007$ ). The mean and SE pre test value of FSH for experimental tea group was  $2.740 \pm 0.186$  and the post test value was  $2.253 \pm 0.207$  respectively. The mean and SE pre test value of FSH for experimental no tea group was  $2.210 \pm 0.237$  and the posttest value was  $2.116 \pm 0.226$  respectively. The paired' test between the pre and post test value for FSH in the experimental tea group was statistically significant ( $p < 0.123$ ). The paired' test between the pre and post test value for FSH in the experimental no tea group was not statistically significant ( $p < 0.022$ ). The comparison of pretest FSH value between control group and experimental tea and no tea group through one way ANOVA showed not statistically significant difference between groups ( $p = 0.193$ ). The comparison of posttest FSH value between control group experimental tea and no tea group was not statistically significant between groups ( $p = 0.581$ ).

#### **Comparison of pre-test and post-test scores of LH in experimental mint tea compliance, experimental mint tea non compliance and control group**

The mean and SE pre test value of LH for control group was  $11.340 \pm 0.836$  and post test value was

$11.216 \pm 0.820$  respectively. Paired test between pre and post test value of LH for control group was statistically significant ( $p = 0.024$ ). The mean and SE pre test value of LH for experimental tea group was  $10.426 \pm 0.836$  and the post test value was  $9.461 \pm 0.738$  respectively. The mean and SE pre test value of LH for experimental no tea group was  $13.256 \pm 1.486$  and the post test value was  $13.458 \pm 1.525$  respectively. The paired 't' test between the pre and post test value for LH in the experimental tea group was statistically significant ( $p < 0.157$ ). The paired 't' test between the pre and post test value for LH in the experimental no tea group was not statistically significant ( $p < 0.937$ ). The comparison of pretest LH value between control group and experimental tea and no tea groups through one way ANOVA showed not statistically significant difference between the groups ( $p = 0.255$ ). The comparison of post test LH value between control group experimental tea and no tea group was not statistically significant between groups ( $p = 0.088$ ).

#### **Comparison of pre-test and post-test scores of testosterone in experimental mint tea compliance, experimental mint tea non compliance and control group**

The mean and SE pre test value of testosterone for control group was  $2.537 \pm 0.332$  and post test value was  $2.137 \pm 0.277$  respectively. Paired test 't' between pre and post test value of LH for control group was statistically significant ( $p = 0.001$ ). The mean and SE pre test value of testosterone for experimental tea group was  $2.564 \pm 0.261$  and the post test value was  $1.681 \pm 0.368$  respectively. The mean and SE pre test value of testosterone for experimental no tea group was  $2.807 \pm 0.217$  and the post test value was  $1.721 \pm 0.378$  respectively. The paired 't' test between the pre and post test value for testosterone in the experimental tea group was statistically significant ( $p < 0.020$ ). The paired 't' test between the pre and post test value for testosterone in the experimental no tea group was not statistically significant ( $p < 0.015$ ). The comparison of pretest testosterone value between control group and experimental tea and no tea group through one way ANOVA showed not statistically significant difference between groups ( $p = 0.812$ ). The comparison of post test testosterone value between control group experimental tea and no tea group was not statistically significant between the groups ( $p = 0.539$ ).

#### **Comparison of pre-test and post-test ultra sonogram of pelvis (right ovary volume) in both experimental and control group**

The comparison of the pre-test was assessed by

Mann-Whitney rank sum test between control and experimental group which showed the T value to be 1005.000 and  $P=0.005$ , whereas control and experimental post test results showed that  $T= 1417.500$  and  $P=0.037$  which was statistically significant. The comparison between experimental pre and post test and that of control group pre and post test was analyzed using Wilcoxon test scores. Within control pre-test and post-test right ovary volume result showed significant difference ( $W=0.55$ :  $p=0.002$ ) In experimental group pre-test and post test result showed the presence of highly significant changes ( $W=465$ : $p<0.001$ ) for the right ovarian volume.

#### **Comparison of pre-test and post-test Ultrasound pelvis (left ovary volume) parameters in both experimental and control group**

The comparison between pre-test control and experimental group pre-test was assessed by Mann-Whitney rank sum test which showed the T value to be 1067.500 and  $P=0.035$ , whereas between control and experimental post test result showed that  $T= 1592.500$  and  $P<0.001$  that was statistically significant. The comparison between experimental pre and post-test and control group pre and post-test was analyzed using Wilcoxon test scores. In left ovary volume of pre and post-test and control group result showed significant difference ( $w=325$ :  $p<0.001$ ) In experimental group pre-test and post test result showed there is highly significant changes ( $w=630$ : $p<0.001$ ) for the right ovarian volume.

#### **Comparison of pre-test and posttest biochemical parameters among experimental SHS compliance and non compliance group and control group**

Based on adherence of all three interventions (mint tea, exercise, diet) for the duration of three months students in the experimental group were divided in to two groups :compliance to SHS (students 21) and non compliance to SHS (students 14) A sub analysis was done using one way ANOVA between the experimental compliance and non compliance group ( $n=35$ ) Experimental compliance and control group( $n=21+35$ )Experimental non compliance and control group ( $n=15+35$ ).

## **DISCUSSION**

Polycystic ovary disorder (PCOS) is an intricate, normal conceptive and endocrine issue influencing up to 17.8% of regenerative matured ladies. Clinical administration places solid accentuation on a multidisciplinary approach as pharmaceutical medications give off an impression of being just decently

powerful in treating singular indications. Customary pharmaceutical administration is restricted by the predominance of contraindications in ladies with PCOS. Non-viability in certain conditions. Reactions and by inclinations of ladies with PCOS for options in contrast to pharmaceutical administration ([Khodakarami et al., 2015](#)).

The utilization of Complementary medication (CM) use by ladies has expanded during the previous ten years with paces of utilization extending somewhere in the range of 26% and 91%. One of the well known sorts of CM is natural medication. Natural meds are known to contain pharmacologically dynamic constituents with physiological consequences for female endocrinology and have been emphatically connected with decreased occurrences of bosom malignancy, osteoporosis and cardiovascular malady. PCOS is a deep rooted condition and despite the fact that the specific reason is yet to be distinguished, it is accepted to have epigenetic beginnings, impacted by the uterine condition and social variables. Being overweight worsens all parts of PCOS because of basic metabolic unsettling influences. Signs and side effects are intervened by hormone issue including raised androgens and fasting insulin, and strange relative proportion of the gonadotropins luteinising hormone (LH) and follicle invigorating hormone (FSH). Endocrine lopsided characteristics happen inside the structure of confused ovarian folliculogenesis, ceaseless anovulation, clinical indications of hyperandrogenism and metabolic disorder ([Lindsey, 2015](#))

Pharmaceutical treatment for menstrual inconsistency incorporates the oral prophylactic pill (OCP) and ovulation acceptance with Clomiphene citrate contingent upon fruitfulness needs. Ladies with PCOS are anyway prone to display contraindications for the OCP and while acceptance of ovulation with Clomiphene has exhibited achievement, pregnancy rates remain mysteriously low. Up to thirty 30% of ladies, especially overweight ladies with PCOS, neglect to react to Clomiphene treatment. The executives for hyperandrogenism incorporates enemies of androgens and hypoglycemic pharmaceuticals, for example, metformin. Metformin has shown viability for improving insulin affectability and hyperandrogenism, anyway utilization of metformin is related with the high rate of unfriendly impacts including queasiness, heaving and gastro-intestinal unsettling influences ([Sanchez, 2014](#)).

Home grown medications are intricate mediations with the potential for synergistic and opposing communications between mixes Effects inside the body may likewise display multifaceted nature by syn-

chronous collaborations with different body frameworks, both biochemically and by modifying organ work. The focal point of this survey was contemplating researching entire home grown medication removes with direct impacts on regenerative endocrinology for the treatment of ladies with unpredictable monthly cycle, hyperandrogenism and PCOS. Most patients exhibit abdominal obesity. PCOS patients with abdominal obesity often have glucolipid metabolism disorders, which lead to reproductive problems and aggravate the ovaries to promote the development of PCOS. Therefore, obese PCOS patients are more likely to have relevant clinical symptoms than those who are not obese. Western treatment of PCOS can promote ovulation, normalize endocrine metabolism, and improve clinical symptoms. However, drug dependence or relapse after disuse of drugs and toxic side effects of oral medication greatly limit the clinical use of Western Medicine. TCM including acupuncture can have certain curative effects on PCOS. However, it takes longer for Chinese medicine or acupuncture to take effect than Western Medicine in the treatment (Sills *et al.*, 2001).

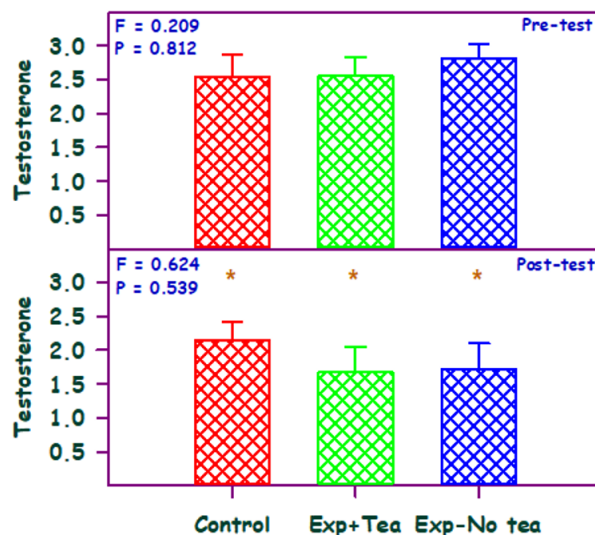
Comparative investigation was finished to assess the impact of green tea on the weight, and hormonal and biochemical profiles in large ladies with PCOS. In this investigation, 34 corpulent ladies with PCOS were haphazardly separated into two gatherings of mediation and control, who got cases of green tea and fake treatment for a quarter of a year, individually. As per the aftereffects of the referenced investigation, the patients' weight in the intercession bunch was decreased by 2.4%; be that as it may, this decrease was not noteworthy (Bharathi *et al.*, 2017).

A huge affiliation was found between stomach fat mass and insulin obstruction assessed by the glycemic hyper insulin micclamp procedure. They likewise found an exceptionally huge relationship between's FFA fixations and insulin opposition, which underpins the idea that an expansion of FFA motion from the profoundly lipolytic stomach fat to the liver and muscles may speak to the most significant connection between stomach stoutness and the insulin obstruction state. In addition, this subgroup of PCOS ladies may have an increasingly negative lipid profile, in particular higher triglyceride and exceptionally low-thickness lipoprotein (VLDL) and lower HDL cholesterol focuses.

To outline, weight reduction in ladies with heftiness and PCOS diminishes all out and instinctive fat, yet in addition reestablishes ordinary menstrual cycles and improves the ripeness rate in a huge extent

of influenced ladies, by lessening androgen and insulin fixations and improving insulin affectability. Eminently, the impacts of dietary-instigated weight reduction on androgens appear to be explicit to corpulent hyperandrogenic ladies, since they have not been accounted for in non-PCOS stout ladies.

Clinical investigations have over and over again demonstrated that stout PCOS ladies to be described by essentially lower LH focuses than their typical weight partners and that, in hefty PCOS ladies, LH fixations habitually take after the ordinary range (Ali *et al.*, 2006)



**Figure 1: Testosterone Hormone levels with self-help strategies on PCOS among young adult girls in control and experimental Tea group experimental No tea groups.**

An investigation was directed on 28 patients with PCOS, who were arbitrarily allotted to two gatherings of intercession (n=14) and control (n=11). The patients in both the gatherings got marjoram and fake treatment teas two times per day for one month, separately. The hormonal and metabolic parameters were estimated at the pre-and post-mediation stages. In the mediation bunch the DHEA-S and fasting insulin levels fundamentally decreased; by the by, there was a noteworthy distinction between two gatherings just as far as DHEA-S level. Along these lines, it was affirmed that marjoram tea positively affects the hormone profile of females with PCOS (Zhou *et al.*, 2014).

Mint is a herb which is effectively accessible consistently and has an awesome impact on endocrine framework. Exercise and diet adjustment additionally decrease the side effects of PCOS. There are barely any examinations on the impact of various teas on the PCOS. The investigations have affirmed

their beneficial outcomes of utilizing this tea on the PCOS. PCOS is a more up to date methodology. Utilizing other therapeutic plants, can open another window for the scientists in this field. As indicated by the standards of clinical preliminaries and Jadad scale, the nature of these four investigations was acceptable and the counter androgenic impacts of mint were more articulated than different teas (van Zuuren *et al.*, 2015).

The present study supported the young adult girls to adopt natural herb and non pharmacological treatment, like mint tea, fast fat loss exercise and diet pattern which is available easily and throughout the year as an alternative therapy to reduce symptoms of PCOS and thereby lower the risk of type II Diabetes mellitus and CAD. Present data also suggest that mint tea proved to be of clinical importance in the management of Hirsutism and other symptoms of PCOS

The effectiveness of self help strategies on bio chemical parameters. A detailed analysis was done on the changes of biochemical parameters like, Fasting blood glucose level, free testosterone level, Follicle stimulating hormone level and luteinizing hormone level between both experimental and control group participants before and after the intervention. The pre and post-test intervention scores of control and experimental group were compared by paired t-test and the difference between experimental and control group was compared by unpaired t-test. The present research reveals that self help strategies were effective in reducing the symptoms of PCOS among young adult girls. While comparing the ANOVA from pre and post test the results were highly significant. Figure 1 shows the values are mean + SE (n= 35). The “t” and “P” values are by unpaired “t” test.

## CONCLUSIONS

The finding of the study gives that commonness of indications and manifestations of PCOS are expanding. However, understudies didn't know about PCOS in spite of the fact that its signs and side effects were knowledgeable about a significant number of them. So extraordinary mindfulness projects ought to be done to give learning about such sicknesses to females. Besides, the study demonstrates that the greater part of females don't counsel gynecologist except if there is a serious or hazardous issue or sickness. So females ought to counsel gynecologist at any rate once in a year to analyze their wellbeing status to improve the wellbeing.

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## Conflict of Interest

None.

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