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Effect of Dietary Habits and Supplements on Nutritional Status of Polycystic Ovaries Syndrome Patients

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Abstract

This study set out to assess the effect of dietary habits and supplements on nutritional status in women with PCOs of reproductive age in Lahore district. Data was collected using a cross sectional study method from **115** randomly selected women with PCOs. Structured self-administered questionnaire were used to gather data on anthropometric measurements, clinical symptoms, supplementation and dietary habits. The time frame for the research work was 6 months. The data was analyzed by using SPSS version 29.0. In this study the socio demographic data showed that most of the women participating in study were of age 15 to 30 years that is 59.1% while other women fall in the age group of 30 to 55 are 40.9%**.** According to marital status 17.4% women were unmarried and 82.6% were married. Nutritional status of these 115 women were measured on the basis of their BMI which showed that either they were under weight, normal in weight, overweight or obese. 4.3% women had BMI less than 18 which showed that they were underweight**.** 44.3% women had BMI in between range 18 to 24.99 which illustrated that they are in the category of healthy nutritional status. 42.6% women had BMI in range 25 to 29.99 that showed that they were overweight while 8.7% had BMI above 30 which showed that they fall in the category of obesity. The intake of fruits and salads was observed mostly in respondents 3 to 6 times a week, most of them were overweight. 66 respondents responded that they consume saturated fats like mutton and egg yolk etc 3 to 6 times week and another **2**49 responded that they consume twice or thrice a month. The study showed that the highest number of exercise sessions was attended by normal and overweight respondents 2 to 3 times per month. While other respondents in less amount performing exercise sessions 3 to 6 times a week. Lowest number of respondent exercises in each session was once daily.

Introduction:

Polycystic ovary syndrome is a complex endocrine disorder, induces the issues of reproduction and metabolism in 5-17 % women of reproductive age (March et al., 2010). Hyper-androgenism, recurrent

anovulation and polycystic ovaries are some of the signs of Polycystic ovaries syndrome. It has been linked to insulin resistance, infertility, obesity, and long-term chronic illnesses like type 2 diabetes, endometrial cancer, and heart disease. Nevertheless, it has been discovered that insulin resistance theca cell hypersensitivity to gonadotropins, hyperinsulinemia and high amount of LH pulse frequency give rise to an extreme ovarian androgen secretion are the key pathophysiological etiologies (Nerve et al., 2020).The four primary physiological reasons of polycystic ovaries were involved disorder of hormonal production of gonadotropin as it causes pituitary to release luteinizing hormone and follicular stimulating hormone that result in secretion of estrogen and progesterone that helps in development of ovaries and implantation of egg in endometrium. The second common reason of polycystic ovaries was emergence of insulin resistance; it results in cease of egg release and cause increase in level of androgens which cause irregular menstrual cycle, acne and growth of excessive hair on face and body. The third cause of polycystic ovaries was extreme body fat results in excess production of estrogen which causes infrequent menstrual cycle. Another reason of polycystic ovaries was related to metabolic route that is production and release of insulin, which codes for steriodogenesis and other hormonal and metabolic procedures (Del Pup, L., & Cagnacci, A. 2021).In PCOS women, avoiding dairy and starchy meals has been shown to reduce hyperandrogenism through reducing fat and insulin resistance. (Merkin et al., 2016). When PCOs and obesity are combined, there are numerous known symptoms that most women today are impacted by. Food habits, on the other hand, have an impact on metabolic disorders. Because most of the women are working, they don't have enough time to eat properly because they perform multiple roles such as housewives, office workers, and so on, and as a result, their health continues to suffer. Unsanitary food consumption is the most prevalent scenario in the population because it is widely available (Mariona, P., & Roy, A. (2021).The majority of women with PCOs, according to the evidence, consume an unhealthy diet that is lacking in fiber, omega-3 fatty acids, minerals (calcium, magnesium, and zinc) and vitamins (folic acid, vitamin C, vitamin B12, and vitamin D). Likewise, the excessive amount of sodium, sucrose, total fats, saturated fatty acids, and cholesterol were observed. For the majority of vitamins B, increasing food intake led to the anticipated outcome of higher levels in the plasma of PCOs women. (Szczuko et al., 2021) Vitamin B3 did not have the same effect as the other, related vitamins, and its levels as well as those of B2 and thiamine. A lack of vitamin B3 has been associated with an increased likelihood of cardiovascular syndromes as well as the emergence of inflammatory disorders that result in illnesses. Metformin, which maintains blood sugar, may be used to treat PCOs in women, although long-term use has been associated with deficiencies in thiamine and cobalamin. (Szczuko et al., 2021). A 25-amino acid peptide called hepcidin inhibits the absorption of iron by the proximal cells of the duodenum. Hepcidin levels rise in response to an increase in the iron concentration of circulatory transferrin, which controls intestinal iron absorption and macrophages iron discharge through ferroportin internalization and breakdown. Hepcidin mutations in humans result in juvenile hemochromatosis, whereas its constitutional excessive expression in mice causes significant iron deficiency anemia. We investigate whether hepcidin is associated with the elevated body iron reserves of PCOs women in light of the significant role that hepcidin serves in the modulation of iron metabolism (Luque-Ramírez et al., 2011).

Methodology:

Study design:

An observational cross sectional study design was used to study the impact of dietary habits and supplements on nutritional status of PCOs patients.

Locality

The study setting was chosen purposefully to meet the objectives of the present study as PCOs patients in two areas of District head Quarter Hospital Batkhela Malakand and Tehsil Headqurter Hospital Chakdara Dir Lower.

Study Population

All the women (age 15-55 years) from the district Malakand and tehsil Adenzai Chakdara will constitute the study population. Age of first group range from (15 to 30 years) and second group range from (31 to 55 years).

Sample size

Sampling with cluster technique was applied, which include hospitals and general population. The calculated sample size was 115. So, 115 participants were taken. Sample size n=115 calculated by formula of cross-sectional study:

a. Significance level or power of the study will be 5%.
b. Confidence/probability level will be 95%.
c. The incidence of the disease will be taken as 3%.
d. The formula for such cross sectional studies as described is

$$n= [\{Z \times (1-\alpha/2)\}^{2} \times p \times (1-P)]/d^{2}.$$

e. In this study p will be 0.05
f. And d = 3
g. Percentage points = 0.03.
h. Probability level or confidence level (1-α) = 95%.
i. At this level Z (1-α/2) = 1.96.
j. So the sample size will be = $\{(1.96)^2 \times (0.03) \times (0.898)\}/ (0.03)^2 = 114$; to make the figure round it will be taken as 115 women

Sampling technique

Sampling with purposive technique will be applied, which will include hospitals and general population. Sample size was 115 women with diagnosed polycystic ovaries condition. Inclusion criteria Women with polycystic ovaries with age group (15 to 55) and Those who had signed consent form while Exclusion criteria was Women with medical history of cardiac disorder all pregnant women.

Research instruments

Self-structured questionnaire, and close ended questions was used to conduct research for dietary assessment. Question tools will be based on following section:

a. Anthropometric measures

b. Clinical characteristics

c. Supplements

d. Dietary pattern

e. Physical activity

The general questionnaire was used to gather information on anthropometry and socioeconomic factors. It inquired about age, ethnicity, weight and height, BMI, marital status, menstrual age, and the number of pregnancies. With little clothing and no shoes, the participants' weight was measured on a Seca scale with an accuracy of 0.1 kilogram (kg), and their height was determined using a wall-attached tape meter with an accuracy of 0.5 cm (cm). Following that, each woman's BMI was determined by multiplying her weight

in kilogram by her height in meters squared (kg/m2).

Data collection

The study was conducted in DHQ batkhela and THQ chakdara. Patients were enrolled after taking their signature on consent form. Five sections were used to collect the data. The first portion contained demographic information about the respondents and anthropometric measurements that were collected. In the second segment, clinical history was collected in order to learn more about the signs and symptoms that PCOs can cause in female patients. The final component of the study examined drug-related characteristics, and respondents were asked about any medications they were taking. Supplementation was the fourth section, where information on various supplements was gathered to help stop PCOs. In the final section, respondents' eating patterns were evaluated to determine if they had good eating habits or not.

Data collection and data analysis

Data will be collected on the questionnaire. Analysis will be done using SPSS latest version 29 after consultation with a statistician. The study deals with samples; I may find the significant differences between the outcomes or dependent variables, which are PCOs and supplementation. Results will be compared with South Asian criteria BMI cut off for computing outcome variables. The participants' height was measured using a wall-attached tape meter with an accuracy of 0.5 cm, and their weight was assessed on a Seca scale with minimal clothing and no shoes (cm). The next step was to calculate each woman's BMI by dividing her weight in kilogram by her height in meter squared (kg/m2).

Ethical Consideration

- The subjects were briefed about the study.
- Their queries were addressed through personal communications.
- Consent was taken from the subjects after explaining the purpose of study.

Results and Discussion

The current cross-sectional observational study was conducted to investigate the relationship between dietary practices and dietary supplements and nutritional status in women with polycystic ovaries in two areas of DHQ batkhela Malakand and THQ chakdara dir lower. The study's objectives, which include women with polycystic ovaries, were carefully considered when choosing the study's environment. 115 people made up the estimated sample size. The formula of Cross-sectional study calculated a sample size of n = 115. Data results were distributed in five sections demographic, clinical characteristics, drug related factors, supplementation and dietary habits. Results of frequency distribution of socio demographic data showed that most of the women participated in study were of age 15 to30 years that is 59.1% while other women fall in age group of 30 to 55 are 40.9%. About 83.5 % women fall in weight category of 51-70 kg and 11.3 %fall in category of 30 to 50 kg while 4.3% fall in category of 71 and above kg weight. According to marital status 17.4 % women were unmarried and 82.6% were married. As per major diseases were concerned 89.6% women were suffering from polycystic ovaries and 10.4% had Polycystic ovaries along with other endocrinal or gynecological disorders.

Less than 18.5 = Underweight 18-22.9 = Normal 23- 24.9= Overweight 25-29.9+ = pre- Obesity

Nutritional status of these 115 women were measured on the basis of their BMI which showed that either they were under weight, normal in weight, overweight or obese. 4.3% women had BMI less than 18 which showed that they were underweight. 44.3% women had BMI in between range 18 to 24.99 which illustrated that they are in category of healthy nutritional status. 42.6% women had BMI in range 25 to 29.99 that showed that they were overweight while 8.7% had BMI above 30 which showed that they fall in category of obesity.

Results of frequency distribution of clinical characteristics showed that women having ultrasonography showed that 44.3% had normal ovaries, 47% had ovaries with multiple cysts, 7.8% were having

polycystic ovaries along with endometrioses. 0.9% women had other pathological condition. As per menstrual flow 28.7% had normal menstrual flow 64.3% had amenorrhea (absence of menstruation). 0.9% women were suffering from oligo-menorrhea (irregular menstrual blood flow). Women with menorrhagia (menstrual blood flow last longer than 7 days) account for 6.1%. Clinical characteristics caused by PCOs include hirsutism that accounts for 52.2% in women while women with no symptoms of hirsutism were 47.8%. Symptoms of acne were seen in 69.6% women while 30.4% were not facing any issues of acne. About 27.8% women were suffering from depression while 72.2% had no depression. Due to polycystic ovaries 62.6% married women were facing infertility issues as they were not able to conceive while 37.4% women were not facing issue in infertility. Any other comorbidity faced by the women with PCOs was diabetes, hypertension and cardiac condition. According to results it was showed that 86.1% women had no other comorbidity while 9.6% were suffering from diabetes and 1.7% had diabetes, hypertension and a cardiac condition along with this 2.6% women showed other endocrinal conditions. Results also showed that 93% had good quality of life 7% showed that they were not living a good quality of lifestyle. Results of frequency distribution of supplement data showed that 53.9% were consuming iron tablets on daily basis while 38.3% were consuming 3 to6 time in a week, 7% were consuming 1 to 2 times in a month and 0.9% were consuming once in a month or less. 45.2% women with polycystic ovaries were taking inositol in daily basis however 23.5% women were taking inositol in 3 to 6 times in a week. 1.7% women were taking inositol in 1 to 2 times in a month although 29.6% were taking inositol once a month or less. Results of frequency distribution of dietary habits data showed that 33.9% women were consuming meals 3 times a day while 66.1% were consuming twice a day. Exercise sessions were daily attended by 10.4% but 21.7% were those who had session 3 to 6 times in a week. Therefore 49.6% were those who had exercise sessions 2 to 3 times in a month, 18.3% were who had sessions once a month or not even doing any exercise sessions. Sc Fried food like parathas, kachori, pakoras and samosas etc were consumed by 5.2% women on daily basis although 33.9% were consuming 3 to 6 times in a week. 28.7% women were consuming 2 to 3 times in month and 32.2% were consuming fried food once in month or not at all. Consumption of fruits and salad observed in women with PCOs were 2.6% who were taking on daily basis on the other hand 61.7% women were consuming on 3 to 6 times a week while 35.7% were consuming only 2 to 3 time a month. The uptake of saturated fats like mutton, egg yolk etc were 57.4% in 3 to 6 times a week but 42.6% were consuming 2 to 3 times in a month. Exercise sessions were daily attended by 10.4% but 21.7% were those who had session 3 to 6 times in a week. Therefore 49.6% were those who had exercise sessions 2 to 3 times in a month, 18.3% were who had sessions once a month or not even doing any exercise sessions. NS = non-significant; * = Significant ($P<0.05$); **= Highly significant ($P<0.01$) Results of table 6 displayed that there was no statistically significant association among the respondents of different BMI regarding supplement intake i.e., $P>0.05$ (in Ch-square test). Results showed that out of 115 respondents 29 were those who were consuming iron tablets on daily basis and have normal BMI. Most of the respondents were consuming iron tablets on regular basis having normal and overweight BMI on the other hand some were consuming on the weekly basis. The daily inositol consumption was seen highest in PCOs respondents and secondly most consumption of inositol is found in respondents on monthly basis or even less than that. In respondents there was once in month or not at all consumption pattern seen in regard to probiotic supplements. NS = non-significant; * = Significant ($P<0.05$); **=Highly significant ($P<0.01$)

Results of table 4.7 displayed that there was no statistically significant difference among the respondents of different BMI regarding dietary habits., $P>0.05$ (in Ch-square test) Results showed that out of 115 respondents 63 were those who were consuming meals twice a day and remaining were having meal intake thrice a day. Most consumption of fried food was observed in respondents on weekly basis but many of the respondents did consume on monthly basis. The lowest number of fried food intake was seen in daily intake. The intake of fruits and salads was observed mostly in respondents 3 to 6 times a week, most of them were overweight. 66 respondents responded that they consume saturated fats like mutton and egg

yolk etc 3 to 6 times week and other 49 responded that they consume twice or thrice a month. The amount of saturated fat consumption was lowest in respondents who had BMI less than 18. Fried food items were consumed by 59 respondents on monthly basis. 42 respondents showed that they ingest fried food items many times a week. Association between BMI and exercise was displayed statistically insignificant. The study showed that highest number of exercise sessions was attended by normal and overweight respondents 2 to 3 times per month. While other respondents in less amount performing exercise sessions 3 to 6 times a week. Lowest number of respondent exercise in each session was once in daily. Fried food items were consumed by 59 respondents on monthly basis. 42 respondents showed that they ingest fried food items many times a week. The current cross-sectional observational study design was executed to probe out the association between dietary habits and supplements with nutritional status in polycystic ovaries women in Lahore district. The study setting was chosen purposefully to meet the objectives of current study as women with polycystic ovaries. The calculated sample size was 115. Sample size n = 115 calculated by Rao-soft software. According to the frequency distribution of socio-demographic data, the majority of the women who participated in the survey were between the ages of 15 and 30 (59.1%), while the remaining 40.9% of women are between the ages of 30 and 55. Around 83.5% of women fall into the 51-70 kg weight range, 11.3% into the 30-50 kg weight category, and 4.3% into the 71 kg and higher weight category. 67% of women were between 140 and 160 cm tall, while 30% of women were between 161 and 180 cm tall. In terms of marital status, 82.6% of women were married and 17.4% of women were single. According to major diseases, polycystic ovaries affected 89.6% of women, and 10.4% of these women also had additional endocrine or gynecological abnormalities. These 115 women's nutritional status was assessed based on their BMI, which indicated whether they were underweight, normal weight, overweight, or obese. Women who were underweight had a BMI of less than 18, which was 4.3% of the population. Women who had a BMI between 18 and 24.99 (44.3%) were considered to have a healthy nutritional status. Women who had a BMI between 25 and 29.99 were overweight (42.6%), while those who had a BMI over 30 were considered obese (8.7%). According to the frequency distribution of clinical characteristics, 44.3% of women who had ultrasonography had normal ovaries, 47% had numerous cysts on their ovaries, and 7.8% had polycystic ovaries with endometriosis. Other pathological conditions affected 0.9% of women. Regarding menstrual flow, 28.7% of women reported normal flow. 64.3% were amenorrheic (absence of menstruation). Oligo-menorrhea affected 0.9% of women (irregular menstrual blood flow). 6.1% of women have menorrhagia, in which the menstrual period lasts longer than seven days. Hirsutism is one of the clinical traits brought on by PCOs and affects 52.2% of female patients, compared to 47.8% of hirsutism-free women. 69.6% of women had acne symptoms, compared to 30.4% who had no symptoms at all. While 72.2% of women did not have depression, about 27.8% of them did. While 37.4% of married women did not experience infertility problems, 62.6% of them were unable to conceive as a result of polycystic ovaries. Diabetes, hypertension, and heart conditions were any additional comorbidity that the women with PCOs had to deal with. Results indicated that 86.1% of women had no other comorbidities, 9.6% had diabetes, 1.7% had diabetes, hypertension, and a heart problem, and 2.6% of women had additional endocrine conditions. The findings also indicated that 93% of people had satisfactory life quality. 7% of people demonstrated that they were not leading healthy lives. The frequency distribution of drug interaction data revealed that, whereas 13.9% of women experienced a substantial interaction, 86.1% of women did not have any drug interactions. 41.7% of the women were found to be taking metformin, whereas 58.3% were not since no doctor had given them a prescription for it. According to the findings, 13.9% of women used progestin as a form of contraception, 11.3% of women used combined oral contraceptives, and 74.8% did not use any kind of contraception at all. Although PCOs caused infertility in some women, anti-fertility medicines were prescribed to treat infertility; these women make up 26.1% of the population, whereas the remaining 73.9% of the population did not receive any infertility drug prescriptions. Hirsutism causes excessive hair growth in women; as a result, 10.4% of those women had anti-hirsutism medications prescribed to them. Whereas 89.6% of women did not receive a

prescription for an anti-hirsutism. It was shown that 87% of people did not take any anti-acne medications, compared to 13% who did. 1.7% of women received anti-hypertensive medicine advice, whereas 98.3% did not receive any such advice. Anti-obesity medications were administered in 5.2% of women due to obesity, compared to 94.8% of women who did not get any such medications. Women who used antidepressants made up 27.8% of the population, whereas 72.2% did not. The frequency distribution of supplement data revealed that 53.9% of people took iron tablets daily, 38.3% took them three to six times per week, 7% took them once or twice per month, and 0.9% took them just once a month or fewer Whereas 23.5% of women with polycystic ovaries took inositol three to six times per week, 45.2% of those with polycystic ovaries took it daily. Despite the fact that 29.6% of women took inositol once a month or less, 1.7% of them did so on a regular basis. The frequency distribution of dietary habits data revealed that 66.1% of women only ate twice daily, compared to 33.9% of women who ate three meals each day. 5.2% of women reported eating fried foods including parathas, kachori, pakoras, and samosas every day, compared to 33.9% who ate them three to six times a week. 32.2% of women consumed fried food once a month or not at all, compared to 28.7% of women who consumed it twice to three times per month. Women with PCOs were found to consume 2.6% of fruits and salads daily, compared to 61.7% of women who consumed them weekly. 42.6% of people consumed 2 to 3 times per month compared to 57.4% who consumed saturated fats as mutton, egg yolk, etc. 3 to 6 times per week. 10.4% of people went to their daily exercise sessions, but 21.7% went three to six times per week. Hence, 18.3% of people attended sessions once a month, whereas 49.6% had sessions two to three times a week or never engaged in any exercise. The majority of respondents were found to consume fried food on a weekly basis, but many also did so on a monthly basis. The daily intake of fried food was at its lowest level. Most of the respondents, who consumed fruits and salads three to six times per week, were overweight. The incidence of ovarian cancer is significantly reduced with extended usage of oral contraceptives, which has a strong protective impact. According to histologic subtypes, this connection has been found to change. A thorough review of 45 studies found that OC use was considerably beneficial for serous malignant, endometrioid, and clear cell subtypes, but less beneficial for the serous borderline subtype and insignificant for the mucinous subtype4. Women with PCOS also have a lower lifetime ovulation rate than do women who use ocs, which may help to at least to some extent justify the antagonistic relationships noticed in the given study. (Harris et al., 2017). The subjects with PCOS were classified into three groups for the examination of menstrual dysfunction: amenorrheic with cycles longer than three months, oligo-ovulatory eumenorrheic with cycle's days 26 to 34, and oligomenorrheic with cycles days 35 to 3 months. For normally distributed continuous variables, intergroup differences were assessed using the unpaired Student's t-test. With cycles ranging from 26 to 34 days, all the 57 control subjects displayed typical ovulatory menstrual patterns. Among the 57 oligo-ovulatory women with PCOS, 12 (26.1%) displayed clinically obvious eumenorrhea (cycle length 26-34 days), 24 (31.3%) oligomenorrhea (cycle length >35 days to 3 months), and 21 (32.6%) amenorrhea (cycles >3 months). Regarding menstrual flow, 28.7% of women reported normal flow. 64.3% were amenorrheic (absence of menstruation). Oligo-menorrhea affected 0.9% of women (irregular menstrual blood flow). 6.1% of women have menorrhagia, in which the menstrual period lasts longer than seven days (Ezeh, et al., 2021). The daily inositol consumption was seen highest in PCOs respondents and secondly most consumption of inositol is found in respondents on monthly basis or even less than that. In respondents there was once in month or not at all consumption pattern seen in regard to probiotic supplements (Kalra et al., 2016). In addition to being the first-choice medication for type 2 diabetes mellitus, the anti-diabetic medicine metformin is also frequently used to treat other disorders linked to insulin resistance, such as PCOS, due to its demonstrated ability to sensitize the insulin receptor. Moreover, it effects on several tissues and enhances ovulatory function, lowers blood sugar levels, and decreases ovarian androgenic hormone synthesis and circulating androgen concentration. According to a recent meta-analysis of six clinical trials involving a total of 355 patients, Inositols (n = 177) have similar effects on fasting insulin, the HOMA index, testosterone, androstenedione, SHBG, and body mass index

(BMI), (Facchinetti et al., 2019). The frequency distribution of dietary habits data revealed that 66.1% of women only ate twice daily, compared to 33.9% of women who ate three meals each day 5.2% of women reported eating fried foods including parathas, kachori, pakoras, and samosas every day, compared to 33.9% who ate them three to six times a week. 32.2% of women consumed fried food once a month or not at all, compared to 28.7% of women who consumed it twice to three times per month. Women with PCOs were found to consume 2.6% of fruits and salads daily, compared to 61.7% of women who consumed them weekly (Pohlmeier et al., 2014). Shishehgar et al. (12) conducted a study in Iran in 2019 to ascertain the impact of a low-calorie, hypocaloric diet on human factors, impaired glucose tolerance in women with or without PCOS, as well as the impact of this kind of diet on clinical and hormonal traits of women with PCOS. All participants were advised to consume lean meat, whole grains, low-fat dairy, non-starchy vegetables, and vegetable oils. Fast food and high-salt items were not permitted. The findings of the aforementioned study demonstrated that this diet had a similar positive impact on anthropometric and metabolic traits in obese individuals with or without PCOS. Also, after six months, menstrual periods, as well as biochemical and clinical characteristics, improved in PCOS-affected individuals. As a result, it was shown that women with PCOS had low testosterone levels and an elevation in sex hormone binding globulin (SHBG). 59 respondents reported eating fried food per month. (Shishehgar et al., 2019).

According to the review's analyses, a diet that is low in glycemic index and typically non-starchy (vegetables such as artichokes, asparagus, bean sprouts, brussels sprouts, broccoli, cabbage, cauliflower, celery, cucumber, eggplant, mushrooms, onions, peppers, salad greens, spinach, tomato, turnips, zucchini, and fruits for example; melons, berries like strawberries, raspberries, blackberries, and blueberries, citrus fruits like oranges, tangerines, grapefruit and lemons, peaches, plums, apricots, cherries, and pears), fat-reduced dairy in lesser amount, omega-3 fatty acids enriched fish, lean red meat and poultry like chicken and turkey in less amounts, oils enriched in fatty acids (olive oil-olives, vegetable oils, fish oils), nuts and seeds (almonds, pumpkin seeds, sunflower seeds, sesame seeds, poppy seeds), legumes, whole grain products and alcohol in reasonable quantity i.e. 150 ml of red wine per day appears to be beneficial in the clinical and laboratory picture of PCOS. Kazemi and his associates (2020) came to the conclusion that the amed and DASH diets that are extremely close to one another result in a better image of the ovaries. As a result, the diet option mentioned above can help to clarify PCOS. Water consumption and brief exercise are also important in addition to this diet. They will support your efforts to lose weight, which will be more challenging for women with PCOS (Xenou and Gourounti, 2021). The study was limited to polycystic ovaries patients present in Lahore district. Therefore, this study is limited to one city only. Biochemical assessment was not studied in this study. Time and financial status for data collection was liable to affect the study. I have no sponsor and was conduct research individually.

Conclusion

In current study it was concluded that the association between BMI and supplementation was insignificant. There was no association found between supplementation and nutritional status among polycystic ovaries women. In this study it is also found that there was no significant difference among nutritional status of PCOs women with regards to dietary habits. PCOs found mostly in married women because of obesity or overweight and hormonal changes. Lifestyles change, especially dietary habits among PCOs patients is a key tactic for lowering the PCOs.

Table 1: Frequency distribution of socio-demographic data of respondents with PCOs

Socio-demographic		**2. N (%)**
Age	**4.** 15-30 years	**5.** 68(59.1)
	6. 31-55 years	**7.** 47(40.9)
Weight	**9.** 30-50kg	**10.** 13(11.3)
	11. 51-70 kg	**12.** 96(83.5)
	13. 71+ kg	. 5(4.3)
. **Marital status**	**16.** Unmarried	**17.** 20(17.4)
	. Married	. 95(82.6)
. **Major disease**	. PCOs	. 103(89.6)
	. PCOs with other gynecological or endocrine disorder.	. 12(10.4)

Table 2: Frequency distribution of clinical characteristics data of respondents with PCOs

. **Clinical characteristics**		. **N (%)**
. **Ultrasonography**	. Normal	. 51(44.3)
	. Ovaries with multiple cyst	. 54(47)
	. PCOs and endometriosis	. 9((7.8)
	. Other pathological condition	. 1(0.9)
. **Menstrual flow**	. Normal	. 33(28.7)
	. Amenorrhea	. 74(64.3)
	. Oligo menorrhea	. 1(0.9)
	. Menorrhagia	. 7(6.1)
. **Comorbidity**	. None	. 99(86.1)
	. Diabetes	. 11(9.6)
	. Diabetes and hypertension	. 2(1.7)
	. Other endocrine disorder	. 3(2.6)

. Quality of life	. Good	**6.** 107(93)
	. Poor	**8.** 8(7)

Table 3: frequency distribution of supplement data of respondents with PCOs

59. SUPPLEMENTS		**. N(%)**
. How often do you consume iron tablets?	. At least once daily	. 62(53.9)
	. 3-6 times a week	. 44(38.3)
	. 1-2 times a month	. 8(7)
	. Once a month or less	. 1(0.9)
. How often do you take inositol?	. At least once daily	. 52(45.2)
	. 3-6 times a week	. 27(23.5)
	. 1-2 times a month	. 2(1.7)
	. Once a month or less	. 34(29.6)

Table 4: frequency distribution of dietary characteristics data

. Dietary characteristics	.	**. N(%)**
. How often do you eat meals in a day (including tea, coffee, fruits, salads, snacks)?	. 6 times	. 0
	. 5 times	. 0
	. 4 times	. 0
	. 3 times	. 39(33.9)
	. 2 times	. 76(66.1)
. How much time do you exercise for each session?	. At least once daily	. 12(10.4)
	. 3 to 6 times a week	. 25(21.7)
	. 1 to 2 times a week	. 0
	0. 2 to 3 times a month	**1.** 57(49.6)
	2. Once a month or less	**3.** 21(18.3)

Table 5: frequency distribution of iron and Inositol Consumption Frequency

Frequency	**Less than 18.5**	**18.5-22.9**	**23-24.9**	**25-29.9 and above**	**Total**	**P Value**
How often do you consume iron tablets?	**N (%)**	**N (%)**	**N (%)**	**N (%)**	**N (%)**	
Once daily	1 (20%)	29 (56.9%)	27 (55.1%)	5 (50%)	62 (53.9%)	5.472 NS
3-6 times / week	3 (60%)	20 (36.2%)	17 (34.7%)	4 (34.7%)	44 (38.3%)	P = 0.791
1-2 times a month	1 (20%)	2 (3.9%)	4 (8.2%)	1 (8.2%)	8 (7%)	
Once a month or less	0 (0%)	0 (0%)	1 (2%)	0 (0%)	1 (0.9%)	
How often do you take inositol?	**N (%)**	**N (%)**	**N (%)**	**N (%)**	**N (%)**	
Once daily	4 (80%)	20 (39.2%)	23 (46.9%)	5 (50%)	52 (45.2%)	7.892 NS
3-6 times / week	0 (0%)	10 (19.6%)	15 (30.6%)	2 (20%)	27 (23.5%)	P = 0.545
1-2 times a month	0 (0%)	1 (2%)	1 (2%)	0 (0%)	2 (1.7%)	
Once a month or less	1 (20%)	20 (39.2%)	10 (20.4%)	3 (30%)	34 (29.6%)	

Table 6: Association between BMI and dietary habits

Frequency	**Less than 18.5**	**18.5-22.9**	**23-24.9**	**25-29.9 and above**	**Total**	**P Value**
How often do you eat fried foods such as Puri, Parathas, Kachori, Tikki, Bhature, Pakoras, Samosas, etc.?	**N (%)**	**N (%)**	**N (%)**	**N (%)**	**N (%)**	

Frequency	**Less than 18.5**	**18.5-22.9**	**23-24.9**	**25-29.9 and above**	**Total**	**P Value**
Once daily	0 (0%)	2 (3.9%)	4 (8.2%)	0 (0%)	6 (5.2%)	7.092 NS
3-6 times / week	2 (40%)	19 (37.3%)	13 (26.5%)	5 (50%)	39 (33.9%)	P = 0.628
2-3 times a month	0 (0%)	16 (31.4%)	15 (30.6%)	2 (20%)	33 (28.7%)	
Once a month or less	3 (60%)	14 (27.5%)	17 (34.7%)	3 (30%)	37 (32.2%)	
How often do you eat fruit and salad?	**N (%)**	**N (%)**	**N (%)**	**N (%)**	**N (%)**	
Once daily	0 (0%)	1 (2%)	2 (4.1%)	0 (0%)	3 (2.6%)	1.67 NS
3-6 times / week	3 (60%)	30 (58.8%)	32 (65.3%)	6 (60%)	71 (61.7%)	P = 0.947
2-3 times a month	2 (40%)	20 (39.2%)	15 (30.6%)	4 (40%)	41 (35.7%)	
Once a month or less	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	
How often do you eat saturated fat like mutton fat, egg yolks, etc.?	**N (%)**	**N (%)**	**N (%)**	**N (%)**	**N (%)**	
Once daily	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	2.575 NS
3-6 times / week	2 (40%)	33 (64.7%)	25 (51%)	6 (60%)	66 (57.4%)	P = 0.462
2-3 times a month	3 (60%)	18 (35.3%)	24 (49%)	4 (40%)	49 (42.6%)	

Frequency	Less than 18.5	18.5-22.9	23-24.9	25-29.9 and above	Total	P Value
Once a month or less	(0%)	0 (0%)	0 (0%)	0 (0%)	0(0%)	

Table 7: Association between BMI and exercise

Frequency	Less than 18.5	18.5-22.9	23-24.9	25-29.9 and above	Total	P Value
How much do you exercise for each session?	**N (%)**	**N (%)**	**N (%)**	**N (%)**	**N (%)**	
At least once daily	0 (0%)	5 (9.8%)	5 (10.2%)	2 (20%)	12 (10.4%)	
3-6 times weekly	2 (40%)	13 (25.5%)	10 (20.4%)	0 (0%)	25 (21.7%)	
2-3 times a month	1 (20%)	21 (41.2%)	28 (57.1%)	7 (70%)	57 (49.5%)	4.479 NS

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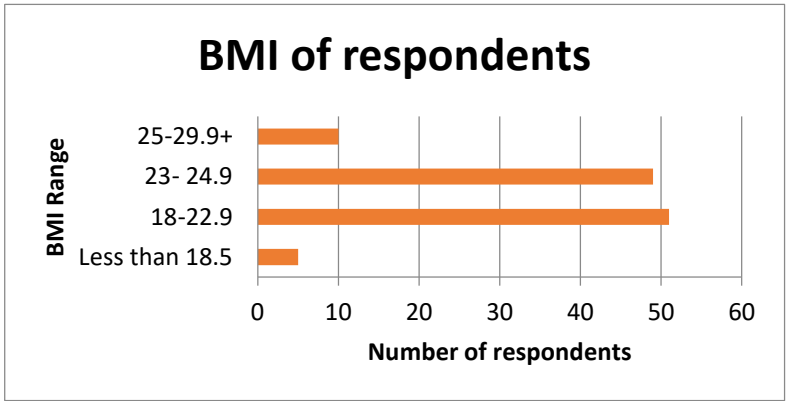

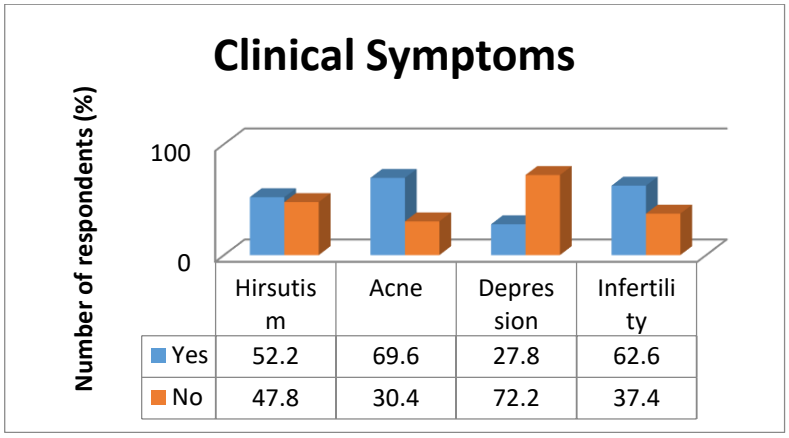

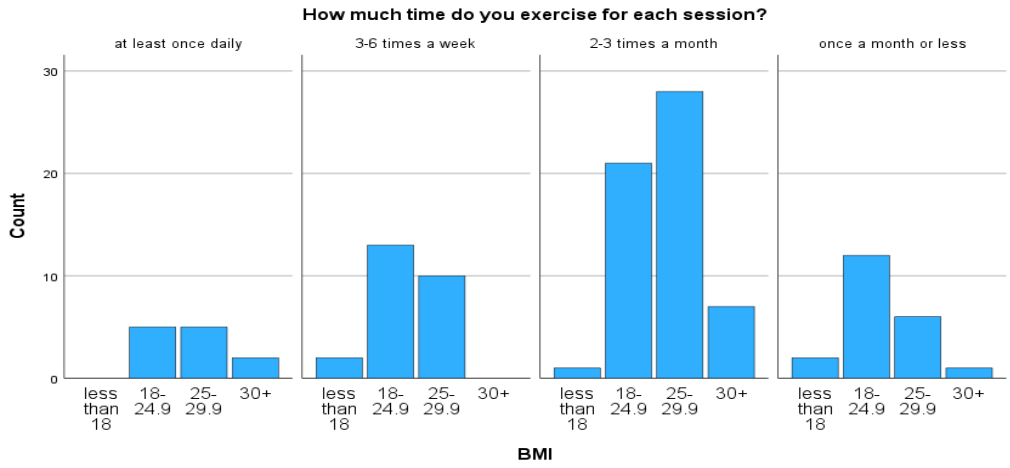

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