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Assessment of eating habits, health status and clinical assessment of young women with and without PCOS in Fatehabad district, Haryana

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Abstract

The present study was conducted in Fatehabad district, Haryana to assess the health status of young women, with and without polycystic ovary syndrome (PCOS). Among PCOS respondents 52.0, 44.0 and 4.0 percent were in the age group of 19 to 25, 26 to 32 and 33 to 40 years, respectively. It was observed that 52.0 percent of the PCOS respondents were students, whereas 46.0 and 2.0 percent were housewife and in service, respectively. Maximum (82.0 to 94%) of respondents were vegetarian. It was found that maximum number (34.0%) of PCOS respondents preferred spicy food followed by fried (30.0%), junk (12.0%), fruit juice (8.0%), salty (6.0%), sweet (6.0%) and soft drink (4.0%). The prevalence of obesity, sleep disorder, depression and food allergy was higher in young women with PCOS than without PCOS (normal). The hirsutism score indicated that the young women with PCOS had moderate (30.0%) and severe (2.0%) m F-G scores. Data on the frequency of menses in women with PCOS showed that only about 34.0 percent of the respondents had normal menstrual cycles at regular intervals (not later than 38 days). It was noted that out of 100, 64.0 percent of respondents had regularity of menses (variation of 2 to 20 days). The volume of monthly blood loss was found to be normal in only 28.0 percent of PCOS women compared to 88.0 percent of women without PCOS. From the present study it is concluded that early diagnosis and treatment of PCOS is pivotal for normal health, well-being and improved nutritional status of young women suffering from PCOS.

Keywords: Polycystic ovary syndrome (PCOS), young women, health status, food, obesity, hirsutism

1. Introduction

Polycystic ovarian syndrome (PCOS) has been related to metabolic syndromes and patients may develop obesity, insulin resistance, keratoosis nigricans (acanthosis nigricans), Type 2 diabetes, dyslipidemias, hypertension, non alcoholic liver disease and obstruction sleep apnea (Madnani *et al.*, 2013) [15]. PCOS is a diverse illness in which the ovary produces too many eggs. Mostly androgens derived primarily from the ovaries (Alshdaifat *et al.*, 2021) [2].

Several epidemiological studies have discovered a correlation between PCOS and lifestyle choices, as well as a link between food and the risk of polycystic ovarian syndrome (Eslamian and Hekmatdoost, 2019) [5].

Oligomenorrhea, hirsutism, severe acne and hair loss are some of the symptoms of PCOS. It produces major psychological disorders in adolescence, such as anxiety and depression. PCOS is the most common cause of infertility. Female infertility is a condition in which a woman is unable to conceive. Impaired glucose tolerance and type 2 diabetes are among the metabolic effects. Diabetes and obesity are all linked to an increased risk of cardiovascular disease. Complications of metabolism and when compared to other PCOS types, the classic PCOS was found to have a higher rate of cardiovascular morbidity. PCOS is a condition that affects both obese and non-obese women. Obese women, on the other hand, have a higher prevalence of IR (Insulin resistance) indicators (Ganie *et al.*, 2019) [9].

PCOS promotes hirsutism and acne due to an increase in male hormones, specifically androgen. Insulin resistance is a condition that leads to obesity and type 2 Diabetes. This issue causes irregularities in the menstrual cycle, which leads to infertility. Sleep apnea affects 20 percent of females on a regular basis. Anxiety and depression are very frequent. The normal concentration of hormones in the body has a big impact on how healthy ovarian function and as a result,

menstrual cycle regulation that sustains fertility (Ajmal *et al*., 2019) [1].

In PCOS patients, Acanthosis Nigricans is a sign for hyperinsulinemia and insulin resistance darkening and thickening of the upper layer of skin in body folds and wrinkles characterize Acanthosis Nigricans, giving it a velvety look. Acanthosis Nigricans primarily affects the armpits, groin and neck (Shivaprakash *et al*., 2013) [17]. PCOS management is as difficult as the disorder itself. A nutritious diet, frequent physical activity and drugs that address the related symptoms and co-morbidities are all part of PCOS management and treatment. The four basic components of PCOS, including regular menstrual cycles, control of hyperandrogenism (acne and hirsutism), treatment of infertility and insulin resistance, as well as its related risk factors (T2DM, hyperlipidaemia and obesity) are the focus of PCOS management techniques (Ganie *et al.*, 2019) [9].

Women with PCOS are more likely to have mood disorders and psychiatric issues than women without the condition. The distress related with the symptoms commonly found in PCOS (obesity, hirsutism etc.) causes mood disorders (Barry *et al*., 2011) [3].

Since the prevalence of PCOS is increasing and there is urgent need to educate young women, so keeping this in mind, the present study was carried out to attain following objectives:

1. To assess the eating habits and health status of young women with and without PCOS
2. To assess the clinical assessment of young women with and without PCOS

Materials and Methods

The study was carried out in city and villages of Fatehabad district, Haryana. The rural and urban areas of Fatehabad district were selected purposively depending on the availability of respondents and convenience of the researcher. For this study 50 young women with polycystic ovary syndrome (PCOS) and 50 without PCOS above 18 years of age were selected purposively. Through a pre-tested questionnaire, information about the individuals' age, caste, religion, contact information, the kind and size of their families, their educational status and their occupation was collected. The respondent's chronological ages in completed years and their educational status were noted. The individuals provided information about their eating habits, including the overall number of meals eaten, the kind of meals eaten and propensity of skipping meals and their likes and dislikes of particular foods. Data on the consumption of sweet, spicy, salty, fruity, junk and fried meals, soft drinks, etc. was also gathered.

Heart disease, diabetes, obesity, hypercholesterolemia, thyroid issue, sleep disorder, depression and eating disorders are long-term effects of PCOS. Additionally, the self-reported prevalence of hypertension and the medical history of the family were evaluated. Additionally, specific information was gathered regarding the subject's use of supplements. Menstrual alterations, Acanthosis Nigricans (AN) and other PCOS-related clinical symptoms, including hirsutism, acne and menstrual changes, were evaluated physically or self-reported and the results were then analyzed using a grading system.

First, when selecting study participants, hirsutism was assessed using modified Ferriman Gallwey ratings (Ferriman and Gallwey 1961) [7]. The proposed normal ranges for menstrual parameters, such as menstruation frequency, regularity, flow duration and monthly blood loss flow were used to analyze menstrual alterat (Fraser *et al.*, 2011) [8].

Statistical analysis: The qualitative and quantitative data were tabulated to draw meaningful inferences. The data was analyzed with the help of percentage, mean and standard deviation using SPSS software.

Results and Discussion

Personal and socio-economic profile of young women with and without PCOS

Personal and socio-economic profiles of young women with PCOS (50.0) and without PCOS (50.0, normal) were selected purposively. Among PCOS respondents 52.0, 44.0 and 4.0 percent were in the age group of 19 to 25, 26 to 32 and 33 to 40 years, respectively. An equal number (36.0%) of young women (normal) were in the age group of 19 to 25 and 26 to 32 years and remaining (28.0%) were in the age group of 33 to 40 years. It was observed that as many as 52.0 percent of the PCOS respondents were students, whereas 46.0 and 2.0 percent were housewife and in service, respectively. Sixty percent of the normal respondents were housewife, while 30.0 and 10.0 percent were students and in service, respectively. As a whole the maximum number of respondents were housewives (53.0%).

Dietary patterns of young women with and without PCOS (normal)

Table 1 represents the dietary information of the young women with PCOS and without PCOS (normal).

Maximum number (82.0%) of PCOS respondents were vegetarian, whereas 14.0 and 4.0 percent were eggetarian and non-vegetarian, respectively. It was found that among normal respondents (without PCOS) ninety four percent of normal respondents were vegetarian while remaining were non-vegetarian (6.0%). Out of 100, maximum number of respondents i.e. 91.0% were vegetarian followed by eggetarian (7%) and non vegetarian (2%). On the contrary Katte *et al.*, (2021) [12], only 2, 4, and 8 percent of the women in the CP (Classic PCOS), NP (Normandrogenic PCOS), and CN (Control) groups, respectively, did not eat any food made from an animal source and maximum respondent were non-vegetarian.

Table 1: Dietary patterns of the young women with and without PCOS (n=100)

Food pattern	With PCOS (n = 50)	Without PCOS (n = 50)	N=100
Eating habits			
Vegetarian	41(82.0)	47(94.0)	91(91.0)
Non-vegetarian	2(4.0)	3(6.0)	5(5.0)
Eggetarian	7(14.0)	0	7(7.0)
Common Dietary Pattern			
Two meals per day	3(6.0)	3(6.0)	6(6.0)
Three meals per day	18(36.0)	20(40.0)	38(38.0)
Four meals per day	27(54.0)	15(30.0)	42(42.0)
Five meals per day	2(4.0)	12(24.0)	14(14.0)
Do you Skip any of the major meals?			
Yes	11(22.0)	5(10.0)	16(16.0)
No	39(78.0)	45(90.0)	84(84.0)
If Yes, Which Meal			
Breakfast	4(8.0)	1(2.0)	5(5.0)
Lunch	3(6.0)	3(6.0)	6(6.0)
Dinner	4(8.0)	1(2.0)	5(5.0)
How Often			
Daily	1(2.0)	2(4.0)	3(3.0)
Twice a week	6(12.0)	0	6(6.0)
Thrice a week	1(2.0)	0	1(1.0)
Fortnight	3(6.0)	0	3(3.0)
Monthly	0	0	0
Rarely	0	3(6.0)	3(3.0)

PCOS –Polycystic Ovary Syndrome; Figures in parenthesis indicate percentages

It was found that majority of PCOS respondents (54.0%) were taking four meals per day while 36.0, 6.0 and 4.0 percent of respondents were taking 3,2 and 5 meals per day, respectively. Maximum number of respondents (total) were taking four meals per day (42.0%), followed by 3 (38.0%), 5 (14.0%) and 2 (6.0%) meals per day. Katte *et al.,* (2021) [12] reported that 36 percent of the women in the CP (Classic PCOS) group, 26 percent of the NP (Normandrogenic PCOS), and 12 percent of the CN (Control) group, had a propensity of skipping a meal every day. The number of women in the non-PCOS group who consumed all three meals were comparatively high. The study's participants, who were largely young college-bound ladies, tended to eat outside every day since they could readily access and afford it.

Majority (78.0%) of PCOS respondents were not skipping any of the major meals whereas 22.0 percent respondents were skipping major meals. It was noted that 90.0 percent of normal respondents were not skipping any of the major meals and remaining 10.0 percent respondents were skipping major meals. Amirjani *et al.,* (2019) in his study showed that most overweight and obese adolescent girls with PCOS have little physical activity, skip the meals (especially breakfast), eat fast and consume large meals.

Food preferences of young women with and without PCOS (normal)

The data pertaining to the food preferences of the young women with PCOS and without PCOS (normal) are presented in Tables 2.

It was found that maximum number (34.0%) of PCOS respondents preferred spicy food followed by fried (30.0%), junk (12.0%), fruit juice (8.0%), salty (6.0%), sweet (6.0%) and soft drink (4.0%). As many as 48.0 percent of normal respondents preferred sweet food while 44.0 percent preferred spicy and equal number (2.0%) preferred salty, fried, junk, fruit juice and soft drink. Maximum number of respondents (total) preferred spicy food (39.0%) and appreciable (27%) number preferred sweet and fried (16%) foods. Srivastava, R. *et al.,* (2018) [18] in his study it has been found that salt intake of cases was more than the controls since childhood days or we can say that majority of cases didn't like sugary foods prefer savoury carbohydrate (e.g burger, pizza, potato chips, samosa, etc.) even more than any sugary foods.

Table 2: Craving and Food preferences among young women with and without PCOS (n=100)

Food Preferences	With PCOS (n = 50)	Without PCOS (n=50)	N=100
Sweet	3(6.0)	24(48.0)	27(27.0)
Spicy	17(34.0)	22(44.0)	39(39.0)
Salty	3(6.0)	1(2.0)	4(4.0)
Fried	15(30.0)	1(2.0)	16(16.0)
Junk	6(12.0)	1(2.0)	7(7.0)
Fruit Juice	4(8.0)	1(2.0)	5(5.0)
Soft Drink	2(4.0)	1(2.0)	3(3.0)
Cravings for any food Preference			
Yes	42(84.0)	24(48.0)	66(66.0)
No	8(16.0)	26(52.0)	34(34.0)
How much			
Strong	14(33.33)	12(50.0)	26(26.0)
Rare	28(66.66)	12(50.0)	40(40.0)
Never	8(16.0)	26(52.0)	34(34.0)

PCOS –Polycystic Ovary Syndrome; Figures in parenthesis indicate percentages

Maximum percentage (84.0%) of PCOS respondents craved for their food preferences while 16.0 percent of respondents did not crave for any food preference. It was found that 48.0 percent of normal respondents craved for food preferences and remaining (52.0%) had no craving for any food preferences. Out of 100 respondents, under study maximum number of respondents (66.0%) craved for food preferences. It was observed that the intensity of food craving among 66.6 percent of PCOS respondents was rare, while 33.33 percent had strong and 16 percent never craved for food. Maximum number (52.0%) of normal respondents had no craving, while an equal number (50.0%) of respondents had strong and rare craving for food preferences. Our study finding is in contrast with Morrell, A. (2015) [16] who reported that the majority of participants craved sweet carbohydrates, with 50.7% of the sample, the most common craving of which was chocolate with 74.1% of the participants in the sweet carbohydrate craving group selecting chocolate as the food which they crave the most often. Lim *et al.*, (2009) [14] showed in his study that when considering single food items, the most frequently craved food was chocolate (3.9± 0.08 i.e., sometimes-often), followed by candy (2.9± 0.09 ie rarely-sometimes), chips (2.84±0.09), bread (2.74± 0.09) and pasta (2.73± 0.08). In terms of food categories, most frequent cravings were reported for fast foods (2.6± 0.07) and sweets (2.5± 0.05), followed by carbohydrates (2.3± 0.06) and high fat foods (2.0± 0.04).

Medical profile of young women with and without PCOS

Table 7 indicates the medical profile of the young women. The data revealed that young women suffering from PCOS had a medical history of obesity (40.0%), sleep disorder (8.0%), hypertension (4.0%), depression (4.0%) and food allergy (2.0%). While in the young women without PCOS (normal) obesity (14.0%), sleep disorder (4.0%) and hypertension (4.0%) was prevalent. The prevalence of obesity, sleep disorder, depression and food allergy was higher in young women with PCOS than without PCOS (normal). Out of total number of respondents (100) maximum exhibited obesity (27.0%), followed by sleep disorder (6.0%), hypertension (4.0%), depression (2.0%) and food allergy (1.0%). Obesity is one of the most common symptom of PCOS, which is associated with hirsutism, anovulation and infertility.

Table 3: Medical history of the young women with and without PCOS (n=100)

Health Disorders*	With PCOS (n=50)	Without PCOS (n=50)	N=100
Obesity	20(40.0)	7(14.0)	27(27.0)
Eating disorder	0	0	0
Sleep disorder	4(8.0)	2(4.0)	6(6.0)
Thyroid disorder	0	0	0
Hypertension	2(4.0)	2(4.0)	4(4.0)
Hypercholesterolemia	0	0	0
Diabetes	0	0	0
Depression	2(4.0)	0	2(2.0)
Food Allergy	1(2.0)	0	1(1.0)

PCOS –Polycystic Ovary Syndrome; Figures in parenthesis indicate percentages; *Multiple responses

Table 4: Dietary supplement intake among the young women with and without PCOS (n=100)

Supplements intake	With PCOS (n=50)	Without PCOS (n=50)	N=100
Intake of any Supplements			
Yes	7(14.0)	6(12.0)	13(13.0)
No	43(86.0)	44(88.0)	87(87.0)
If yes, mention-			
Iron	3(42.85)	1(16.66)	4(4.0)
Calcium + Iron	2(28.57)	3(50.00)	5(5.0)
Biotin	0	1(16.66)	1(1.0)
Multivitamin	1(14.28)	1(16.66)	2(2.0)
Protein Supplement	1(14.28)	0	1(1.0)

PCOS –Polycystic Ovary Syndrome; Figures in parenthesis indicate percentages

Table 4 depicts the intake of dietary supplements among young women with and without PCOS (normal). It was recorded that 14 percent of the young women with PCOS and 12 percent young women without PCOS (normal) were consuming supplements. The types of supplements consumed by the young women with PCOS were iron supplements (42.85%), followed by calcium + iron (28.57%) and an equal number (14.28%) were taking multivitamin and protein supplement. While, the young women without PCOS (normal) were consuming calcium + iron (50.00%), multivitamin (16.66%), iron (16.66%) and biotin (16.66%). Maximum number of respondents (87.0%) didn't consume supplements.

Clinical assessment of young women with and without PCOS: Table 5 lists the clinical characteristics that were seen in the young women. In comparison to females without PCOS (normal) (4.0±2.28), the modified Ferriman Gallwey score (m F-G) was shown to be higher in women with PCOS (14.14±6.12). The hirsutism score indicated that the young women with PCOS had moderate (30.0%) and severe (2.0%) m F-G scores. None of the normal women had hirsutism scores in moderate or severe range. The number of young women with and without PCOS (normal) who had

mild hirsutism were 60.0 and 10.0 percent, respectively. It was found that 90.0 percent of respondents without PCOS (normal) and 8.0 percent of respondents with PCOS had normal hair development, which equates to no hirsutism. Maximum number (49.0%) of total respondents had no hirsutism followed by 35.0, 15.0 and 1.0 percent that had mild, moderate and severe hirsutism, respectively. Previous research on hirsutism also supports the finding of significantly higher m F-G score in PCOS women compared to control women (Ezeh *et al.*, 2014) [6].

Table 5: Clinical characteristics of the young women, (n=100)

Characteristics	With PCOS (n=50)	Without PCOS (n=50)	N=100
Hirsutism (Mean ± SD)*	14.14±6.12	4.00±2.28	
Not present (0-7)	4(8.0)	45(90.0)	49(49.0)
Mild (8-15)	30(60.0)	5(10.0)	35(35.0)
Moderate (16-25)	15(30.0)	0	15(15.0)
Severe (25-36)	1(2.0)	0	1(1.0)
Acne			
Yes	38(76.0)	8(16.0)	46(46.0)
No	12(24.0)	42(84.0)	54(54.0)
If yes, Specify the area			
Face	33(66.0)	8(16.0)	41(41.0)
Upper Back	3(6.0)	0	3(3.0)
Face + Neck	2(4.0)	0	2(2.0)
Acanthosis Nigricans (Hyper-pigmentation)			
Yes	37(74.0)	4(8.0)	41(41.0)
No	13(26.0)	46(92.0)	59(59.0)
If yes, specify the area			
Back of neck	16(32.0)	3(6.0)	19(19.0)
Armpit	2(4.0)	0	2(2.0)
Groins	2(4.0)	0	2(2.0)
Face	5(10.0)	1(2.0)	6(6.0)
Around Nose	2(4.0)	0	2(2.0)
Back of neck + Face	10(20.0)	0	10(10.0)

PCOS –Polycystic Ovary Syndrome; Figures in parenthesis indicate percentages; *Modified Ferriman-Gallwey Score (m F-G) (Ferriman and Gallwey 1961) [7]

Additionally, Table 5 shows that 76.0 percent of young women with PCOS were having acne distributed on face (66.0%), upper back (6.0%) and face + neck (4.0%). As many as 16.0 percent of young women without PCOS (normal) were having acne on face. Timpatanapong and Rojanasakul (2015) explained that acne is a common manifestation of hyperandrogenism and further reported a 37.3 percent prevalence of acne in PCOS patients.

It was observed that 74.0 percent of young women with PCOS had Acanthosis Nigricans (AN), or hyper pigmented skin (Table 5) on back of neck (32.0%), on back of neck + face (20.0%), face (10.0%), armpit (4.0%), groins (4.0%) and around nose (4.0%), respectively. It was found that 8.0 percent of women without PCOS had Acanthosis Nigricans distributed on the back of neck (6.0%) and on face (2.0%). It was observed that maximum number (19.0%) of respondents had Acanthosis on back of neck. Chang and Katz (1999) [4] linked an increased insulin secretion to AN, with obesity in PCOS and reported the presence of AN on nape of the neck, axilla and underneath breasts.

Menstrual health of young women with and without PCOS

The menstrual health profile of the women was also noted and is described in Table 6. Data on the frequency of menses in women with PCOS showed that only about 34.0 percent of the respondents had normal menstrual cycles at regular intervals (not later than 38 days), while the majority (50.0%) had irregular and 16.0 percent had frequent menstruation. Out of 100 respondents 67.0 percent had normal frequency of menses (24-38 days). Hoeger (2006) illustrated the role of obesity behind frequent menstrual disturbances and suggested a weight loss of 5-10 percent in order to manage PCOS.

As regards the regularity of menses, it was found, that 2.0 percent of PCOS women experienced amenorrhea i.e. absence of menstruation for six months or longer and 62.0 percent had oligommenorrhea (A cycle length of more than 35 days but less than six months). It was noted that out of 100, 64.0 percent of respondents had regularity of menses (variation of 2 to 20 days).

It was found that 86.0 percent of women without PCOS had normal duration of flow lasting between 4.5 to 8 days, compared to 36.0 percent of those with the condition (PCOS) (Table 6). It was found that less than 4.5 days of menstruation was experienced by 6.0 percent of women without PCOS (normal) and 28.0 percent of those with PCOS. Thirty-six percent of the PCOS women and 8.0 percent without PCOS (normal) women experienced prolonged menstruation or periods lasting more than 8 days. On mean basis the 61.0 percent of respondents had normal duration of flow (4.5-8 days) followed by prolonged (22.0%) and shortened (17.0%) duration of flow. Gupta *et al.*, (2015) explained that high levels of androgens interrupt ovulation and subsequently hinder production of reproductive hormones, thus creating an imbalance of hormones and irregular menstrual cycle. Moreover, the findings of the present study are similar with the described in terms of irregular menstrual cycle, skipping of menstruation which were more commonly reported by PCOS college girls.

Table 6: Menstrual health of the young women, (n=100)

Menstrual history	With PCOS (n=50)	Without PCOS (n=50)	N=100
Frequency of menses (in days)			
Frequent (< 24)	8(16.0)	0	8(8.0)
Normal (24-38)	17(34.0)	50(100.0)	67(67.0)
Infrequent (> 38)	25(50.0)	0	25(25.0)
Regularity of menses (cycle to cycle variation in days over 12 months)			
Absent (no bleeding)	1(2.0)	0	1(1.0)
Regular (variation±2-20)	17(34.0)	50(100.0)	64(64.0)
Irregular (variation > 20)	32(62.0)	0	35(35.0)
Duration of flow (in days)			
Prolonged (>8)	18(36.0)	4(8.0)	22(22.0)
Normal (4.5 – 8)	18(36.0)	43(86.0)	61(61.0)
Shortened (< 4.5)	14(28.0)	3(6.0)	17(17.0)
Volume of monthly blood loss(ml)			
Heavy(>80)	25(50.0)	1(2.0)	26(26.0)
Normal(5-80)	14(28.0)	44(88.0)	58(58.0)
Light(<5)	11(22.0)	5(10.0)	16(16.0)

PCOS –Polycystic Ovary Syndrome; Figures in parenthesis indicate percentages; Suggested normal limits for menstrual parameters. (Adapted from Fraser *et al.*, 2011) [8]

Table 6 shows the volume of monthly blood loss, which was found to be normal in only 28.0 percent of PCOS women compared to 88.0 percent of women without PCOS. Only 2.0 percent of women without PCOS reported experiencing heavy menstrual volume while 50.0 percent women with PCOS women experienced heavy bleeding. It was observed that 22.0 percent of young women with PCOS reported light flow while in normal women light flow was reported by 10.0 percent. Maximum number (58.0%) of respondents had normal volume of monthly blood loss (5-80 ml) followed by 26.0 and 16.0 percent who had heavy (>80 ml) and light (<5 ml) flow, respectively.

Conclusion

Maximum numbers of respondents were vegetarian. Maximum numbers of respondents (total) were taking four meals per day, followed by 3, 5 and 2 meals per day, respectively. Majority of PCOS and without PCOS respondents were not skipping any of the major meals. It was found that maximum number of PCOS respondents' preferred spicy food followed by fried, junk, fruit juice, salty, sweet and soft drink. As many as Forty-eight percent of normal respondents preferred sweet food while forty-four percent preferred spicy. The prevalence of obesity, sleep disorder, depression and food allergy was higher in young women with PCOS than without PCOS (normal). It was recorded that fourteen percent of the young women with PCOS and twelve percent young women without PCOS (normal) were consuming supplements. The hirsutism score indicated that the young women with PCOS had moderate and severe m F-G scores. None of the normal women had hirsutism scores in moderate or severe range. Data on the frequency of menses in women with PCOS showed that only about thirty-four percent of the respondents had normal menstrual cycles at regular intervals (not later than 38 days). It was found that eighty-six percent of women without PCOS had normal duration of flow lasting between 4.5 to 8 days. The volume of monthly blood loss was found to be normal in only twenty-eight percent of PCOS women compared to eighty-eight percent of women without PCOS. From the present study it is concluded that early diagnosis and treatment of PCOS is pivotal for normal health, well-being and improved nutritional status of young women suffering from PCOS. There is great scope for improvement in the health and nutritional status of young women if they are advised timely about their health issues and emphasis is given on making them understand the importance of taking balanced diet, inclusion of protective foods in diet specially fruits and vegetable and role of physical activity in overall health.

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