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Assessment of the risk factors of Polycystic Ovary Syndrome in females of Bikaner district.

Shruti Srivastava (Research Scholar), Dr. Renu Mogra (Professor)

Abstract:
This study was planned with the objectives to assess the nutritional status of females of the age group of 18-25 years, the prevalence and the risk factors and development of educational packages about PCOS. The research work was delimited with the age group of 18-25 years of women's of Bikaner district. A total of 150 females aged 18-25 years were chosen for the current study using a purposive sample technique. One hundred and fifty females between the ages of 18 and 25 were approached, and 30 of them were chosen as having polycystic ovarian syndrome. A survey performa was used to select and categories the respondents, who provided information such as their names, age, gender, current menstrual status, and medical history. Based on accessibility, samples were collected from the Bikaner district in the following areas: Rani Bazar, Sharma colony, Pawan Puri, Chopara Katla, Industrial Area, and Bandra Vas. The questionnaire was designed to elicit responses, which were then analysed using statistical tools such as frequency, percentage, mean, and standard deviation.The respondents' and their families' general backgrounds were gathered. The nutritional status of all respondents was evaluated, which included anthropometric measurements such as height and weight, and these values were used to calculate the Body Mass Index (BMI). To assess food consumption habits, a dietary survey using the "24 hours recall" method was used. The lifestyle behavior of adolescent girls was evaluated, which included information such as daily wake-up time, sleep time, and number of meals consumed, breakfast, lunch, dinner, evening snack, and post-dinner timings, exercise timings, type of exercise, water intake, and habit of skipping meals.
According to the findings of the current study, the majority of respondents were unaware of PCOS. More than 68 percent had never heard of PCOS.PCOS was diagnosed in less than a quarter of the people. More than a quarter of those polled had irregular periods, and more than a third of those had heavy clotting, weakness, and vomiting. Only about 20% of those polled were receiving treatment for irregular periods. More than half of them reported
pelvic tugging. White water discharge was causing severe problems for less than 20% of the people. More than 10% of those polled were taking painkillers without a doctor's prescription. Both the groups are deficient in protein, calcium, iron and vitamins.

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I. Introduction :

Adolescence is the most crucial phase of human development since it is a transitional stage of physical and psychological development from puberty to adulthood that occurs generally from puberty to legal maturity. Adolescence is derived from the Latin word adolescere, which means "to grow up." Adolescence is defined by the World Health Organization as the period between the ages of 10 and 19. Teenage years are another name for adolescence. During this time, puberty (sexual maturation) occurs, and teenagers may grow a few inches in a few of months.

Adolescents are exposed to health hazards as a result of their overall growth and development, as well as biological and behavioral changes. During adolescence, various changes occur, including physical, psychological, emotional, and sexual changes (Kumar Kar et al. 2015).

Menstruation, which has a significant impact on a girl's health, is one of the many issues that arise at this stage of life. "Menarche" refers to a female's first menstrual period. When ovulation is not followed by conception, menstruation is the monthly loss of the functional layer of the uterine endometrial lining (Patil et al.2009).

Menstrual periods are shrouded in a slew of myths. In recent circumstances, "many myths regarding the menstrual cycle process and hygiene have emerged among rural girls due to their lack of education or awareness of the realities and scientific process of menstruation." Females must be educated about the menstrual cycle, the importance of diet, cleanliness, and sanitation during this time so that they may deal with difficulties on their own and remain healthy in the long run. If PCOS is not diagnosed early, it can have a negative impact on a woman's hormonal profile and overall health. If sufficient care is not taken during this time, "Polycystic Ovary

Disease (PCOD)/Polycystic Ovary Syndrome (PCOS)" may develop. The irregularity of the hormone causes PCOS. Secondary amenorrhea, hirsutism, hyperandrogenism, acne, androgenic alopecia,

Anovulation, oligomenorrhea, hypersecretion of luteinizing hormone (LH), and obesity are all symptoms of this syndrome. Women with PCOS are more likely to have diabetes, dyslipidemia, and metabolic syndrome (MS), as well as endometrial

Cancer, breast cancer, and recurrent pregnancy loss (Ratnakumari et al. 2018). Females can overcome many obstacles by educating themselves on their physiological status, which allows them to engage in regular activities without restriction during menstruation. After menarche, irregular and infrequent periods are common and do not require treatment, but irregular cycles associated with obesity and hirsutism owing to polycystic ovarian disease should be explored (Jia Huang et al.2010).Early preparation and education of females, particularly rural women, about the importance and care to be taken during this period is critical so that they can adjust to conception, pregnancy, and parenthood and conduct later activities without restriction during menstruation.

Table 1: - Different diagnostic criteria of PCOS.

NIH Consensus 1990 (all required)	**Rotterdam Consensus 2003 (two out of three required)**	**AE-PCOS definition 2006 (androgen excess and one criterion)**
Clinical and biochemical hyperandrogenism.	Clinical and biochemical hyperandrogenism**.**	Clinical and biochemical hyperandrogenism.
Oligo/amenorrhea, anovulation	Oligo/amenorrhea, anovulation	Oligo/amenorrhea, anovulation
	Polycystic ovaries appearance on ultrasound	Polycystic ovaries appearance on ultrasound

Source : Polycystic ovary syndrome: Reviewing diagnosis and management of metabolic disturbances

Symptoms & signs : Irregular or no periods are common symptoms of PCOS, getting pregnant is difficult (because of irregular ovulation or failure to ovulate), hair growth that is excessive (hirsutism) on the face, chest, back, and buttocks is common, obesity, hairs are thinned, acne or oily skin.

Prevention of PCOS: PCOS/PCOD can be avoided if caught early. A healthy lifestyle that includes a well-balanced diet, maintaining a healthy weight, and regular exercise can help avoid PCOS.

II. Methodology :

- **Sample selection:** The present study was conducted on females in Bikaner district of Rajasthan state in March 2021 while following the covid protocols. One hundred and fifty samples were selected, females between the ages of 18 and 25 were approached, and 30 of them were found to have polycystic ovarian syndrome. For the selection and categorization of the respondents, a survey performa was applied, which included information such as names, age, sex, current menstrual status, and medical history.
- **Development of tool:** The study's objectives were considered when developing the research tool. A questionnaire was created using selected samples, and an interview technique was utilized to collect data from all of the subjects. The questionnaire was divided into two sections: the first section examined the respondents' socio-demographic data, which included age, religion, caste, family type and size, parents' education and occupation, and the family's annual income, and the second section assessed the subjects' food consumption patterns through 24-hour recall method. Each respondent's meal pattern and dietary intake will be recorded for one day using the 24-hour recall method.
- **Data analysis :** The sociodemographic and food consumption pattern responses to the questionnaire were detected using descriptive statistics (frequency and percentage). The data of PCOS diagnosed womens and non PCOS diagnosed womens was compared using mean and standard deviation.

III. Result and discussion :

- **Respondents' socio demographic information :** Table 1 reveals that most of the respondents belonged to the age of 23 years and among them 64 % of the respondents belong to the general category. Only 14 % of the womens were married and the rest 86 % of them were unmarried. Further study shows that most of the respondents (75.3 %) were the students and only 2.7 % of the respondents were self employed or part time employed.. In terms of family type, the majority of the respondents (58%) belonged to a nuclear family, while the remaining 42 % belonged to a joint family. 52 percent of respondents come from small families (4-6 members), 24.7 percent from medium families (6-9 members), 12.7 percent from large families (more than 10 members), and just 10.7% from extremely small families (2-3 members).The majority of the respondents (45.3

percent) were 12th pass and only a handful were 8th pass, 46.7 % of respondent households have an income of less than 5 lakhs and 2.7 percent have a family income of 15-20 lakhs. Majority of them (64.7%) were vegetarian and the rest (3%) were Jain.

Table2: General information of the respondents. n= 150

S. No.	Variables	Frequency	Percentage
1	**Age (years)**		
	19-20	30	20
	20-21	29	19.3
	21-22	16	10.7
	22-23	12	8
	23-24	32	21.3
	24-25	18	12
	25-26	13	8.7
2	**Caste**		
	General	96	64
	OBC	46	30
	SC/ST	8	5.3
3	**Marital Status**		
	Married	21	14
	Unmarried	129	86
4	**Occupation**		
	Employed full time	10	6.7
	Employed part time	4	2.7
	Unemployed	19	12.7
	Self employed	4	2.7
	Student	113	75.3
5	**Family type**		
	Nuclear	87	58
	Joint	63	42
6	**Family size**		
	Very small	16	10.7
	Small	78	52
	Medium	37	24.7
	Large	19	12.7
7	**Education Qualification**		
	Illiterate	1	0.7

	Literate (can read and write)	1	0.7
	8th pass	1	0.7
	10th pass	3	2
	12th pass	68	45.3
	Graduate	38	25.3
	Post graduate	38	25.3
8	**Annual family income**		
	Less than 5 lakhs	70	46.7
	5-10 lakhs	48	32
	10-15 lakhs	19	12.7
	15-20 lakhs	4	2.7
	more than 20 lakhs	9	6
9	**Food habits**		
	Vegetarian	97	64.7
	Non vegetarian	32	21.3
	Eggetarian	18	12
	Jain	3	2

● **Respondents' daily lifestyle pattern:** This section contains information about the respondent's daily lifestyle pattern, such as wake-up, sleep, breakfast, lunch, evening snacks, supper, and exercise schedules. This part also covers the number of meals consumed per day, the sort of activity performed, and the amount of water consumed each day. According to Table 4, the bulk of respondents, 60 percent, have three meals per day and only 3.3 percent of respondents have four meals each day. 35.3 and 88 percent of the subjects consume green leafy vegetables, fruits, salads, and milk products on a daily basis and the remaining 4 and 1.3 percent consume them never. Only 93 people out of 150 had answers to this question regarding daily water intake. Table illustrates that 49.5 percent of respondents drink 2-3 litres of water per day and just 2.2 percent drink more than 5 liters per day.

S. No.	Variables	Frequency	Percentage
1	**Wake up timings**		
	6-May	19	12.7
	7-Jun	39	26
	8-Jul	53	35.3
	9-Aug	29	19.3
	above 9	10	6.7
	Sleep timings		
	11-Oct	11	7.3
	12-Nov	64	42.7
	1-Dec	55	36.7
	2-Jan	17	11.3

	above 2	3	2
2	**Meal consumption**		
	Two	24	16
	Three	90	60
	Four	31	20.7
	Above four	5	3.3
3	**Breakfast consumption**		
	Yes	124	82.7
	No	26	17.3
	Breakfast timings		
	8-9 A.M	55	36.7
	9-10 A.M	66	44
	Above 10	29	19.3
	Breakfast preference		
	Leftover chapatti with tea(species/curd)	3	2
	Paratha	54	36
	Poha	37	24.7
	Any other	56	37.3
4	**Lunch timings**		
	8-9 A.M	2	1.4
	9-10 A.M	0	0
	10-11 A.M	0	0
	11-12 A.M	4	2.8
	12-1 P.M	15	10.6
	1-2 P.M	55	39
	2-3 P.M	62	44
	3-4 P.M	3	2.1
	Lunch consumption		
	Yes	149	99.3
	No	1	0.7
5	**Consume green leafy veg, salads, fruits**		
	Daily	53	35.3
	Twice a week	65	43.3
	Thrice a week	26	17.3
	Never	6	4

	Milk consumption		
	Daily	132	88
	Twice a week	13	8.7
	Thrice a week	3	2
	Never	2	1.3
6	**Evening timings**		
	3-5 PM	54	36
	5-7 PM	88	58.7
	Any other	8	5.3
	Evening preferences		
	Only tea	25	16.7
	Tea with biscuits/ toast	51	34
	Milk with biscuits/ toast	29	19.3
	Any other	45	30
7	**Dinner timings**		
	7-8 PM	46	30.7
	8-9 PM	76	50.7
	After 9 PM	28	18.7
	Post dinner preferences		
	Milk	75	50
	Lukewarm water	38	25.3
	Any other	37	24.7
8	**Water intake in a day**		
	less than 2 ltr	28	30.1
	2-3 ltr	46	49.5
	3-5ltr	17	18.3
	more than 5 ltr	2	2.2
9	**Exercise in a day**		
	Yes	84	56
	No	66	44
10	**Exercise time**		
	20-30 mins	44	47.8
	30 mins	19	20.7
	30-45 mins	9	9.8
	1 hour	20	21.7

	Exercise type		
	Running	20	21.3
	Jogging	15	16
	Yoga	31	33
	Aerobics	6	6.4
	Weight lifting	3	3.2
	Any other	19	20.2

- **Dietary information of the respondent:** This section contains information based on each respondent's dietary intake. Diet plays a critical role in PCOS and increases the risk of a variety of metabolic problems. As a result, it is critical that they pay closer attention to their food. The respondent's dietary survey was assessed for 1 hour using a 24-hour recall dietary approach, as per my initial objective of the study. The respondents' food consumption and nutritional intake were examined using this method. NIN 2010's Recommended Dietary Intake (RDI) was used to compare the data.
- **Nutrient intake of the subjects:** Food contains nutrients that perform diverse activities for growth, development, and leading to a healthy and active life, and these functions are dependent on the meal patterns consumed by the individuals. Protein, energy, carbohydrate, lipids, calcium, iron, folic acid, and fat and water soluble vitamins and minerals are among the nutrients present in the foods.

Table 4: Daily mean nutrient intake and per adequacy nutrient intake of the subjects.

S.No	Variables	RDA (19-25 years)	Mean SD Non PCOS diagnosed women (n=120)	Percent adequacy of nutrient intake (n=120)	Mean SD PCOS diagnosed women (n=30)	Percent adequacy of nutrient intake (n=30)
1.	Energy	1660	1248.2194	75.19	1020.41244	61.44
2.	Carbohydrate	130	128.818.55	99	106.8517.91	81.53
3.	Protein	45.7	41.288.19	90.32	32.839.06	71.83
4.	Fat	45	61.7213.22	137.15	50.4215.63	112.04
5.	Calcium	1000	1002.4263	100.2	767.05314	76.7
6.	Iron	29	6.562.14	22.62	5.541.81	19.10
7.	Ascorbic acid	65	42.914.91	66	37.3712.49	57.49
8.	Vitamin D	600	29.722.06	4.95	17.059.3	2.84

- **Food intake of the subjects:** This component of the study covers a variety of factors that influence food consumption, including food habits, taste, socioeconomic status, cultural norms, and food availability. Thus, cereals, pulses, roots and tubers, milk and milk products, green leafy vegetables, fruits, other vegetables, fats and oil, sugars and jaggery can be analyzed.

Table 5: Daily mean food intake and per adequacy food intake of the subjects.

S.No	Variables	RDI (19-25 years)	Mean SD Non PCOS diagnosed women (n=120)	Percent adequacy of food intake	Mean SD PCOS diagnosed women (n=30)	Percent adequacy of food intake
. c	Cereals	270	166.08±26.05	83	164±28.93	60.7
B.	Pulses	60	36.11	60.1	32.31±13.36	53.33

			±11.48			
C.	Milk and milk product	300	553± 133	184	516± 227	172
D.	Green leafy vegetable	100	31.34±43.03	31.34	57.5± 95	57.5
E.	Roots and tubers	200	75.46±21.74	37.73	80.76±22.79	40.38
F.	Other vegetable	200	69.88±37.58	34.94	87.76±4.90	43.85
G.	Fruits	100	72.17±44.47	72.17	72±45.49	72
H.	Fats and oil	20	26.55±5.43	132	26.44±3.78	132.2
I.	Sugar and jaggery	20	15.18±6.55	75.9	14.338.86	71.65

- **Information and knowledge regarding PCOS among the subjects:** This section delves into the specifics of the respondent's menstrual cycle, which is directly linked to PCOS. Table shows that 69.3 percent of the individuals have never heard of PCOS, while 30.7 percent are aware of the condition. Only 23.3 percent of these women had been diagnosed with PCOS, with the remaining 76.7 percent having not been diagnosed. According to the data, 36.7 percent of the total respondents are unaware of the indications and symptoms of PCOS. Thirty of the 150 respondents had been diagnosed with PCOS and were experiencing symptoms such as irregular periods, significant facial hair growth, an erratic menstrual cycle, and so on.

According to the data in the table, 58.7% of the respondents had a normal menstrual cycle of 3-4 days and 13.3% had more than 5 days. Further research revealed that 28.7% of respondents had irregular periods, compared to 71.3 percent who had normal periods. The rest of the participants (87.3%) had normal menstrual bleeding, whereas 12.7 percent had excessive menstrual bleeding (soaking a pad or tampon in every 2 hours).

It was discovered that whereas 32.7 percent of respondents experience problems with significant clotting during their periods, 67.3 percent have no problems during their menstrual cycle. Table shows that the majority of respondents (66%) reported no issues; however 34% reported extreme weakness or vomiting throughout their menstrual cycle.

Table 6: Information and knowledge regarding PCOS among the subject n=150

S. No.	Variables	Frequency	Percentage
1.	**Heard about PCOS**		
	Yes	104	69.3
	No	46	30.7
2.	**PCOS diagnosed**		
	Yes	35	23.3
	No	115	76.7
3.	**Menstrual cycle**		
	2-3 days	20	13.3
	3-4 days	88	58.7

	More than 5 days	42	28
4.	**Menstrual period**		
	Regular	107	71.3
	Irregular	43	28.7
5.	**Menstrual bleeding**		
	Normal	131	87.3
	Heavy (soaking a tampon or pad in every 2 hours)	19	12.7
6.	**Heavy clots during periods**		
	Yes	49	32.7
	No	101	67.3
7.	**Excessive weakness and vomiting during periods**		
	Yes	51	34
	No	99	66

Table 4.11 shows that 18.7% of the respondents are receiving PCOS therapy, whereas the remaining 81.3 percent are not receiving PCOS treatment. 47.3 percent of these women had periods that were more painful than usual, whereas 52.7 percent had regular cycles. During the menstrual cycle, 47.3 percent of the patients reported no issues, whereas 52.7 percent reported abdominal heaviness or pelvic tugging. 46.7 percent of respondents reported a little difficulty, 37.3 percent had a moderate problem and 16 percent had a severe problem with white water discharge. 11.3 percent of respondents said they took medications to help with period discomfort, while 88.7% said they didn't take any painkillers without a prescription.

43.3 percent changed their napkins or sanitary pads three times per day and rest 7.3 percent were changing in every 2 hours. Only 1.3 percent of respondents were aware that they should not do heavy exercises during their periods. Among these, 98 percent used pads during their periods, 1.3 percent used menstrual cups, and 0.7 percent used tampons; no one used reusable (cloth) during their periods.

Table 7: Information and knowledge regarding PCOS among the subjects.
n=150

S. No.	Variables	Frequency	Percentage
8.	**Excessive weakness or vomiting**		
	Yes	51	34
	No	99	66
9.	**Any treatment regarding irregular periods**		
	Yes	28	18.7
	No	122	81.3
10.	**Painful more than normal**		

	Yes	71	47.3
	No	79	52.7
11.	**Feel heaviness in abdomen or tugging in the pelvic areas**		
	Yes	79	52.7
	No	71	47.3
12.	**White water discharge**		
	Severe	24	16
	Moderate	56	37.3
	Little	70	46.7
13.	**Taking some painkillers without any doctors prescription**		
	Yes	17	11.3
	No	133	88.7
14.	**Change your sanitary napkins or pads**		
	Twice a day	47	31.3
	Thrice a day	68	45.3
	After 2 hours	11	7.3
	After 6-7 hours	24	16
15.	**Doing heavy exercise during menstrual cycle**		
	Yes	148	98.7
	No	2	1.3
16.	**Types of product do you use during periods**		
	Pads	147	98
	Reusable pads(cloth)	0	0
	Tampons	1	0.7
	Menstrual cups	2	1.3
	Any other	0	0

Among 150 subjects, 62 percent reported no problems, while 38 percent reported irritability, depression, and anxiety during their menstrual cycle. 53.3 percent of respondents said they were frequently stressed, but 46.7 percent said they were relaxed and stress-free, while 61.3 and 57.3 percent reported excessive hair fall, hair thinning, and oily skin. 14 percent of respondents had severe problems with visible body hair growth and the remaining 38.7 percent had no problem.

Table 8 : Information and knowledge regarding PCOS among the subjects.
n=150

S. No.	Variables	Frequency	Percentage
17.	**Upper lip,chin,under arms,neck are darker**		
	Yes	38	25.3
	No	112	74.7
18.	**Suffer from acne or other skin problems**		
	Yes	72	48
	No	78	52
19.	**Trouble in maintaining weight**		
	Yes	49	32.7
	No	101	67.3
20.	**Family history of PCOD/PCOS**		
	Yes	13	8.7
	No	137	91.3
21.	**Experience irritability, anxiety or depression during or after periods**		
	Yes	57	38
	No	93	62
22.	**Often feel stressed**		
	Yes	80	53.3
	No	70	46.7
24.	**Observing excessive hair fall or thinning of hairs**		
	Yes	92	61.3
	No	58	38.7
25.	Oily skin		
	Yes	86	57.6
	No	64	42.7
26.	**Growth of visible body hairs**		
	Severe problem	21	14
	Moderate problem	33	22
	Little problem	38	25.3
	No problem	58	38.7

IV. Summary and Conclusion :

- The findings of the present study concluded that the majority of the respondents were not aware about PCOS.
- More than 68% had never heard of PCOS before.
- PCOS was diagnosed in less than a quarter of the population.
- More than a quarter of those polled had irregular periods, with more than a third of those reporting heavy clotting, as well as excessive weakness and vomiting.
- Only about a quarter of those polled said they were getting treatment for irregular periods.
- More than half of them felt a tugging sensation in their pelvic area.
- Only about 20% of those polled said white water discharge was causing serious problems.
- Over 10% of those polled admitted to taking pain relievers without a doctor's prescription.
- During their menstrual cycle, less than 2% of those polled engaged in strenuous exercise.
- More than a third of women struggled to keep their weight under control.
- More than half of the participants were frequently stressed.
- Excessive hair loss was reported by more than 60% of those polled.
- Oily skin was reported by 57.6% of the participants.
- More than 10% of the participants had serious issues with visible hair growth.
- Both groups are deficient in protein, calcium, iron, and vitamins.
- Oily skin was reported by 57.6% of the participants.

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