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A comparative study of knowledge, attitude and practices (KAP) and dietary pattern between healthy reproductive women and women with PCOS in Imphal, Manipur

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Abstract

Polycystic ovary syndrome (PCOS) is one of the most common endocrine disorders and metabolic heterogeneous disorders among reproductive-aged women, with likely genetic origin influenced by environmental factors including diet, lifestyle and social status. There may be reproductive complications such as infertility, dysfunctional uterine bleeding, endometrial cancer and late age at menopause due to PCOS. Therefore, a cross-sectional study was conducted among 160 reproductive age group women (80 women suffering from PCOS and healthy women) residing in Manipur systematically sampled from four hospitals i.e. Jawaharlal Nehru Institute of Medical Sciences (JNIMS), Maipakpi Maternity and Child Hospital, National Charitable hospital, Hillside Charitable Hospital and Research Institute to obtain information about sign and symptoms, risk factor, KAP and dietary pattern. Structured questionnaires, key informant interviews and focus group discussions were used to collect data. A nutrition knowledge score was determined (correct response: 1, incorrect: 0). Overall knowledge level was the total of correct responses in percentages. Scores of ≤40 %, 41–69 % and ≥70 % were categorized as low, moderate and high knowledge respectively. Data were analyzed using SPSS. P-value of $p < 0.05$ was considered significant. The results of the study suggest that PCOS is linked to an increase in calorie and saturated fat intake and that obese or overweight woman are more likely to develop PCOS. The first line of treatment for PCOS patients should be lifestyle changes such as a healthy diet and regular exercise.

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Introduction

Among the reproductive-aged women, one of the leading hormonal problems is PCOS. Polycystic ovary syndrome (PCOS) is a hormonal disorder causing an enlarged with small cyst on the outer edge. It is the most common endocrine disorder and metabolic heterogeneous disorder affecting 5-10% of reproductive age, with likely genetic origin influenced by environmental factors including diet, lifestyle and social status (Rashid *et al.,* 2019). PCOS has highly variable global prevalence (2.2% - 26%), 116 million women worldwide are affected by this condition, as reported by the World Health Organisation (WHO) in 2012 (Aleng *et al.,* 2019). Polycystic Ovary Syndrome (PCOS) is a set of symptoms due to elevated androgens for women (Nidhi *et al.,* 2008). Signs and symptoms of Polycystic Ovarian Syndrome (PCOS) include irregular or no menstrual periods, heavy periods, excessive hair on the body and face, acne pelvic pain, pregnancy difficulties and patches of thick darker, velvety skin. Associated conditions include type 2 diabetes, impaired glucose tolerance, obesity, sleep apnea, heart disease, mood disorders, endometrial cancer, high blood pressure, dyslipidaemia, hyperinsulinemia and infertility (Gupta *et al.*, 2018). It increases the risk of fatal deformities, miscarriages, and complications during pregnancy including premature deliveries and neonatal complications (Boomsma *et al.,* 2006). Women with PCOS are more likely to suffer from depression, anxiety, poor self-esteem, alter the coping abilities, strain relationships, decrease quality of life, disordered eating and psychosexual dysfunction (Teede *et al.,* 2018). Thus, PCOS is associated with short term and long term presentations that may adversely affect women at varying stages of their life. Hence it is imperative in identifying effective therapies for the prevention and treatment of the syndrome to reduce its health and economic burdens.

The major and most important risk factor for PCOS is obesity and family history. The presence of obesity can exacerbate the reproductive and metabolic effect (Shreeyanta *et al.,* 2020). Obesity worsens the metabolic, clinical and endocrine features of PCOS mainly by increasing insulin resistance and hyperinsulinemia. More than 50% of PCOS women are obese (Douglas *et al.,* 2006). This increase in obesity rates are due to changing lifestyles, including unhealthy food habits like increased consumption of junk and fast food with increasing sedentary lifestyles (Elmenim *et al.,* 2016).

Long-term use of the seizure medicine valproate has been linked to an increased risk of PCOS. Girls with low birth weight as well as afamily history of diabetes mellitus, premature birth, cardiovascular disease, hypertension, hormonal imbalance, genetic problem, endocrine disease, weekend immune system, environmental factors, and toxin effect are at risk for developing Polycystic Ovarian Syndrome (Shreeyanta *et al.,* 2020).

There is no cure for PCOS, but controlling it lowers the risks of infertility, miscarriages, diabetes, heart disease, and uterine cancer (Zangeneh *et al.,* 2012). Behaviour and life style modifications are important first-line treatment for PCOS. Lifestyle modification have been proposed to improve not only the metabolic and reproductive manifestation of PCOS but also yielding benefits including improvements in mood, self-esteem, anxiety, depression and psychological well-being (Galletly *et al.,* 2014).

The role and the effect of lifestyle modification are well documented in the literature. These non-pharmacological measures such as Diet and exercise are recommended as first-line of treatment in oligomenorrhoea, hirsutism, infertility, and obesity in PCOS by the majority of endocrinologists and gynaecologists (Cussons *et al.,* 2010). Lifestyle modification, focus on dietary modification and increased physical activity and behavioural therapy, are considered as important aspects in the management of PCOS (Norman *et al.,* 2010). As PCOS is on the rise, and its management calls for a comprehensive strategy. Assessing the knowledge and creating awareness among the women is one of them. Therefore, the study was conducted to assess the food consumption pattern and compare the Knowledge, Attitude and Practices (KAP) on PCOS among healthy reproductive women and women with PCOS.

Materials and methods

Study Population and Study Area

The study adopted a cross-sectional study design which was conducted among 160 reproductive age group women (80 women suffering from PCOS and 80 healthy women) residing in Manipur systematically sampled from four hospitals i.e. Jawaharlal Nehru Institute of Medical Sciences (JNIMS), Maipakpi Maternity and Child Hospital, National Charitable hospital, Hillside Charitable Hospital and Research Institute.

Data Collection

Socio-Demographic Economic Characteristics

The demographic profile of the selected respondents was obtained by using a standardised pretested questionnaire consisting of relevant questions and an observational study under the following heading including age, gender, educational qualification etc.

Nutritional status by Anthropometric measurements

Nutritional anthropometry is a measurement of human body at various age and level of nutritional status. Anthropometric measurement include height, weight, skinfold thickness and circumference etc. (Shrivastava *et al.,* 2016). Body Mass Index is mathematical calculation that estimates a person's health status based on his height and weight (Khanna *et al.,* 2019). It is a measure of body fat based on height and weight that is applied to adult men and women. BMI is calculated by a person's weight in kilogram divided by the square of height in meters.

Dietary Assessment

The data on dietary patterns was obtained by using a structured questionnaire and observational study with the help of a Food frequency questionnaire (FFQ). The participants were personally interviewed during a period of the study to report their dietary information of the commonly used food items mentioned in the food frequency questionnaire during the past 1 year. Furthermore, dietary intake between healthy reproductive women and women with PCOS in Imphal, Manipur was compared.

Nutrition Knowledge, Attitude and Practices Scores

A three point of Knowledge, Attitude and Practice scale was adopted. The scale was organised into three sections nutritional knowledge, nutritional attitude and nutritional practices among the PCOS and healthy women. The nutritional knowledge section was designed to evaluate the nutritional knowledge of the respondents, nutritional attitude section was designed to determine the understanding of the attitude towards PCOS of the respondents and the last section that is practice section was designed to evaluate the nutritional practices done by the respondents. The knowledge, attitude and practice section contained 10 sets of statement. Each section contained 2 possible answers "yes" and "no". For evaluation, a score between 0 and 10 was used with a correct answer considered as one point while incorrect answer was regarded as zero points. The score was then converted to its equivalent on a basis of 10 = 80. A score less than 50 was considered as poor nutritional KAP, 50 to 75 was considered as average and more than 75 was considered as having a good level of knowledge, attitude and practice.

Statistical Analysis

The information acquired was coded, tabulated and components were subjected to statistical analysis for the description of the dietary pattern, nutritional status and KAP of women with PCOS and healthy women.

Results and discussion

Demographic profile

Demographic profile outlines the complex profile or framework of the selected patients in Manipur. A total of 160 reproductive age group women (80 women suffering from PCOS and 80 healthy women) residing in Manipur were randomly and purposely selected from 4 hospital that is Jawaharlal Nehru Institute of Medical Sciences (JNIMS), Maipakpi Maternity and Child Hospital, National Charitable hospital, Hillside Charitable Hospital and Research Institute and various information were collected on different parameters including age, gender, education etc.

Table 1 depicst that among women suffering from PCOS, out of 80 responses, 59% respondents belong to the age group of 15-30 years and 21% respondents belong to age group of 31-40 years. For the healthy respondents, 66.25% respondents belong to age

group of 15-30 years and 33.75%. respondents belong to 31-40 years. According to a survey by Fatima *et al.* (2022), in PCOS, majority of the patients present with complaints of pain, obesity, disrupted menstrual cycles and infertility in the age of childbearing. Another study by Chauhan *et al.* (2021) concluded those age groups 18-30 are most likely to suffer from PCOS. From table 1, the data collected for the educational status of respondents with PCOS include 25% of respondents having HSLC, 22.5% with a diploma, 40% undergraduate and 12.5% post graduate and for healthy respondents, 31.25% have HSLC, 16.25% have diploma, 78.75% respondents are under graduate and 13.75% of respondents are post graduate. It is evident from table 1 that among the respondents, 31.25% were married, 65% of them were unmarried and 3.75% of them were divorced. While for healthy respondents, 65% respondents were married, 33.75% were unmarried and only 1.25% was divorced. Most of the respondents with PCOS (95%) belong to Hindu religion and 5% were Christians. On the other hand, among healthy respondents, 93.75% belong to Hindu, 5% were Christians and only 1.25% Muslims. Table 1 reveals that 38.75% of PCOS respondents were housewife, 7.5% worked professionally, 13.75% worked in state government sector, 21.25% had business and 18.75% were students. In contrast, among healthy respondents, only 30 (37.5%) were housewives, 14.5% worked in private sector, 4.5% worked in state government, 25 had business and 16.25% were students. Among PCOS women, 73.75% came from nuclear families and 26.25% were from joint families. Whereas, in case of healthy women, 63.75% belong to joint families and 36.25% were from nuclear families, respectively.

Nutritional Status

The height and weight of the respondents were collected and BMI of the respondents were calculated. From table 2, it is evident that respondents with PCOS who had normal BMI were 56.25% and overweight 43.75%. While for healthy women, 95% of respondents had normal BMI and 5% were overweight. Gopalan *et al.* (2020) performed a case control study in which study population was women in the age group 15-45 years with complaints of PCOS. The study results suggested that PCOS is associated with the increase intake of high calorie foods and saturated fat and that woman who are obese or overweight are more likely to develop PCOS.

Table 1. Percentage distribution of the respondents according to age, educational qualification, marital status, religion, occupation and types of family.

Parameters	PCOS Women	Percentage	Healthy Women	Percentage
Age				
15 – 30 years	42	59	53	66.25%
31 – 40 years	38	21	27	33.75%
Educational Status				
HSLC	20	25%	25	31.25%
Diploma	18	22.5%	13	16.25%
Under graduate	32	40%	31	38.75%
Post graduate	10	12.5%	11	13.75%
Marital Status				
Married	25	31.25%	52	65%
Unmarried	52	65%	27	33.75
Divorce	3	3.75%	1	1.25
Religion				
Hinduism	76	95%	75	93.75%
Christian	5	5%	4	5%
Muslims			1	1.25%
Occupation				
Housewife	31	38.75%	30	37.5%
Professional	6	7.5%	14	17.5%
State	11	13.75%	4	5%
government	17	21.25%	20	25%
Business	15	18.75%	13	16.25%
Student				
Types of family				
Nuclear family	59	73.75%	29	36.25%
Joint family	21	26.25%	51	63.75%

Table 2. Percentage distribution of the respondents according to the height, weight and BMI.

Parameters	PCOS Women	Percentage	Healthy women	Percentage
Height				
120 – 130	3	3.75%		
131 – 140			3	3.75%
141 – 150	2	2.5%	30	37.5%
150 – 160	27	3.75%	47	58.75%
160 – 170	48	60%		
Weight	PCOS women	%	Healthy women	%
40 – 50	5	6.25%	9	11.27%
51 – 60	32	40%	62	77.5%
61 – 70	43	53.75%	9	11.27%
BMI	PCOS women	%	Healthy women	%
Normal	45	56.25%	76	95%
Overweight	35	43.75%	4	5%

Dietary and food consumption pattern

Food habit of an individual is the way by which they select the food they want to eat which depends on the availability in the nature or market and knowledge about the food.

People usually eat foods which are easily available nearby. Food habit of a person has a strong association with the person's health status. From fig. 1, it is noted that 7.5% of respondents with PCOS were vegetarian and 92% were non vegetarian. For healthy women respondents, 15% were vegetarian and 45% were nonvegetarian.

Food allergy of the respondents

Table 3 depicts that distribution of respondents with PCOS which are allergic to food was 50% and non-allergic to any food was 50%. While for healthy women, it was observed that 15% of respondents were allergic to some food while 85% of respondents were not allergic to any food.

Table 3. Percentage distribution of food allergy among the respondents.

Parameter	PCOS women	Percentage	Healthy women	Percentage
Yes	40	50%	12	15%
No	40	50%	68	85%

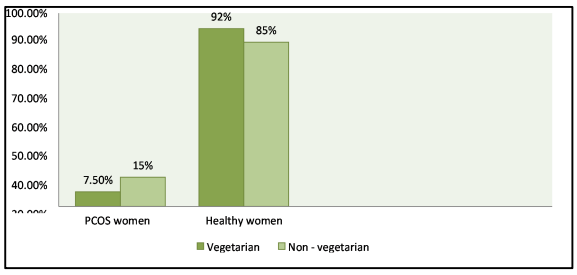

Fig. 1. Dietary habit of respondents

Oil or fat used for cooking at home

Fig. 2 signifies the type of oil used by the respondents for PCOS women, 2.5% of them used margarine, 43.75% used mustard oil, 3.75% of them used olive oil and 50% used refined oil. On the other hand, in case of healthy women, 32.5% of the respondents used mustard oil, 11.25% used olive oil and 56.25% used refined oil.

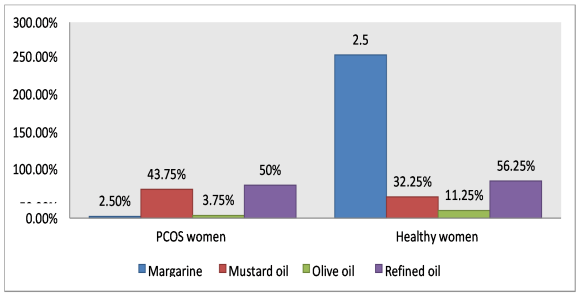

Fig. 2. Percentage of types of oil used for cooking at home.

Daily consumption of fried foods

Fig. 3 provides the information and distribution of amount of fried food consumed which are made at home. Amongst PCOS women, 13.75% of respondents consumed daily, 45% of them took 1-3 times per week, 27.55% of them had 4-6 times a week and 12.5% of them had less than once a week. For healthy women, respondents 70% (56) of them took 1-3 times per week, 7.5% (6) of them had 4-6 times a week and 22.5% (18) of them had less than once a week. Fig. 4 depicts that out of all the respondents with PCOS, 6.25% (5) of them had fried foods prepared outside home, 52.5% (42) of them had such foods 1 – 3 times a week, 21.25% (17) of them had 4-6 times a week and 20% (16) consumed less than once a week. While in case of healthy women, none of the respondents consumed daily, 33.75% (27) consumed 1-3 times a week, 1.25% (1) consumed 4-6 times a week and 65% (52) of the respondents consumed less than once a week.

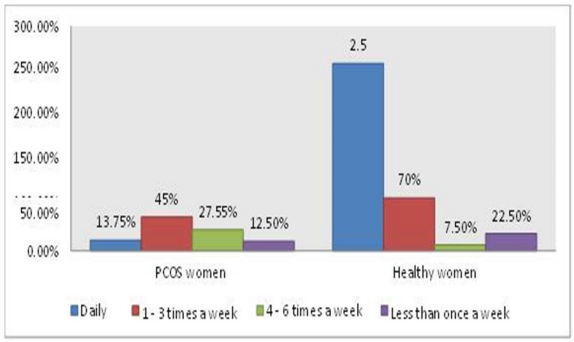

Fig. 3. Consumption of fried foods at home.

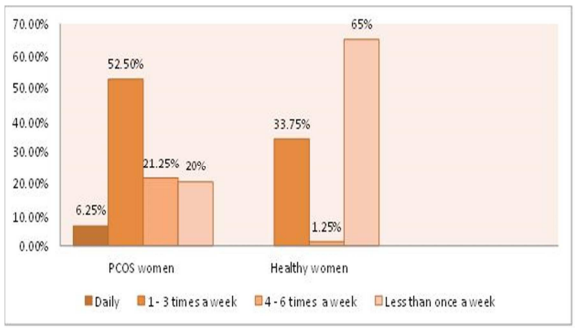

Fig. 4. Consumption of fried foods outside home

Food consumption pattern of the respondents

Table 4 depicts that while consuming meat, the amount of visible fat taken by the respondents with PCOS were 11.25% (9) who ate most of the fat, 23.75%

(19) ate as little as possible, 58.75% (47) ate some of the fat and 6.25% (5) of respondents did not eat meat. While in the case of healthy women, 2.5% (2) of respondents ate most of fat, 57% (46) ate as little as possible, 25% (20) ate some of the fat and 15% did not eat meat. It is further observed from table 4 that that in respondents of PCOS women, 6.5% always added salt to food while cooking, 10% of respondents rarely added salt, 36.25% usually added salt, 45% of them added sometimes and 2.5% never added salt to food while cooking. In case of healthy women, none of them always or rarely added salt to food while cooking. 18.75% of respondents usually added salt, 72.5% of them sometimes added and 8.75% never added salt while cooking. Table 4 also revealed the consumption of any form of supplements during the past year among the respondents. Among PCOS women, 66.25% had taken supplements while 3.75% did not take supplements and 30% did not know about it. Whereas, in healthy women, 67.5% had taken supplements, 7.5% did not take and 25% did not know about it. Table 4 also depicted that 100% of respondents (both PCOS women and healthy women) included fibrous food in their diet.

Further, it is noted that for PCOS women, 50% of respondents included fibre in the diet from vegetable salad, 1.25% from fruit salad and 48.75% included from both sources. On the other hand, in case of healthy women, 35% of them included fibre from vegetable salad, 7.6% from fruit salad and 57.5% from both vegetable and fruit salad**.** Low-carbohydrate diets are helpful for weight loss and reducing insulin levels, according to studies comparing PCOS diets. A low-GI diet, which sources the majority of its carbohydrates from fruits, vegetables, and whole grains, is beneficial. better than a typical weight loss plan for regulating the menstrual cycle (Moran *et al*, 2013)

Table 4. Food consumption pattern of the respondents.

Parameters	PCOS women	Percentage	Healthy women	Percentage
Consumption of visible fat in the form of meat				
Ate most of fat	9	11.25%	2	2.5%
Ate as little as possible	19	23.75%	46	57%
Ate some of the fat	47	58.75%	20	25%
Did not eat meat	5	6.25%	12	15%
Intake of salt while cooking food	PCOS women	%	Healthy women	%
Always	5	6.5%		
Rarely	8	10%		
Usually	29	36.25%	15	18.75%
Sometimes	36	45%	58	72.5%
Never	2	2.5%	7	8.75%
Intake of supplement like vitamins, minerals, fish oils, fibre, or other food supplement during the past year	PCOS women	%	Healthy women	%
Yes	53	66.25%	54	67.5%
No	3	3.75%	6	7.5%
Don't know	24	30%	20	25%
Intake of fibrous food in the diet	PCOS women	%	Healthy women	%
Yes	80	100%	80	100%
No	-	-	-	-
Different forms of consumption of fibrous food	PCOS women	Percentage	Healthy women	Percentage
Vegetable salad	40	50%	28	35%
Fruit salad	1	1.25%	6	7.6%
Both	39	48.75%	46	57.5%

Other eating habits of the respondents

Table 5 revealed that 78.75% of respondents with PCOS consumed tea or coffee while 21.25% of them do not consume tea or coffee. In healthy respondents, 75% of them consumed tea or coffee and 25% of them do not consume it. None of the respondents had the habit of cigarette smoking. It was found that women with PCOS who took alcohol/wine consisted of 7.5% and 92.5% did not consume alcohol/wine. On the other hand, among healthy women, 5% of respondents took alcohol/wine, whereas 95% of respondents did not take any alcohol/wine.

It was also observed that among PCOS women, 30% of the respondents had the habit of chewing paan and 70% do not have it. While for healthy women, 21.25% of respondents had the habit of chewing paan and 78.75% do not have such a habit. Wang *et al.* (2021) stated that some elements in caffeinated beverages have been shown to be advantageous for the control of hormones linked to polycystic ovarian syndrome (PCOS), which may prevent the onset of PCOS. However, there is little epidemiological evidence linking coffee drinking to PCOS.

Table 5. Other eating habits of the respondents.

Parameter	PCOS women	Percentage	Healthy women	Percentage
Consumption of tea/coffee				
Yes	63	78.75%	60	75%
No	17	21.25%	20	25%
Cigarette smoking	PCOS women	Percentage	Healthy women	Percentage
Yes	-	-	-	-
No	80	100%	80	100%
Intake of alcohol/wine	PCOS women	Percentage	Healthy women	Percentage
Yes	6	7.5%	4	5%
No	74	92.5%	76	95%
Habit of chewing paan	PCOS women	Percentage	Healthy women	Percentage
Yes	24	30%	17	21.25%
No	56	70%	63	78.75%

Food frequency consumption pattern of the respondents

The goal of the study was to assess the dietary pattern between PCOS women and healthy women using food frequency questionnaires. Table 6 reveals the frequency of food consumption pattern among PCOS women and healthy women. PCOS women consumed 87.5% of cereals daily, 12.5% weekly, pulses were consumed daily by 52.5% and weekly by 47.5%, milk and its products were consumed by 48.75% daily, 42.5% weekly and 8.75% monthly. Fruits were consumed daily by 18.75%, weekly by 72.5% and monthly by 8.75%. Meat and its product were consumed daily by 2.5%, weekly by 61.25% and 5% of PCOS women never consumed meat.

Green leafy vegetables were consumed by daily 57.5%, weekly by 42.5%. Roots and tubers were consumed daily by 77.5%, weekly by 20% and monthly by 2.5%. 20% of respondents eat junk food on daily basis, 52.5% eat weekly and 26.25% eat monthly. 3.75% of respondents have beverages daily, 61.25% of the respondents have on weekly basis and 36.35% have beverages monthly. It is revealed that 11.25% eat sugar every day, 26.25% eat sugar weekly and 45% of respondents have sugar monthly.

Table 6. Percentage distribution of Food frequency consumption pattern among the respondents.

Fooditem	Daily		Weekly		Monthly		Once		Never	
	PCOS women	Healthy women	PCOS women	Healthy women	PCOS women	Healthy women	PCOS women	Healthy women	PCOS women	Healthy women
Cereals	87.5%	100%	12.5%							
Pulses	52.5%	25%	47.5%	48.75%		26.25%				
Milk and its product	48.75%	6%	42.5%	73.75%	8.75%	20%				
Fruits	18.75%	15%	72.5%	63.75%	8.75%	21%				
Meat and its product	2.5%		61.25 %	53.75%		31.25%			5%	15%
Green leafy vegetable	57.5%	80%	42.5%	20%						
Roots and tubers	77.5%	62.5%	20%	25%	2.5%	12.5%				
Junkfood	20%	3.75%	52.5%	67.5%	26.25%	28.75%				
Beverages	3.75%	11.25%	61.2%	53.75%	36.35%	35%				
Sugars	11.25%	10%	26.2%	22.5%	45%	62.5%	17.5%			

For healthy women, 100% of cereals were consumed daily, pulses were consumed daily by 25%, 48.75% weekly and 26.25% monthly. Milk and its products were consumed daily by 6%, 73.75% weekly and 20% monthly. Fruits were consumed daily by 15%, weekly by 63.75% and monthly by 21%. Meat and its product were consumed weekly 53.75% and 31.25% of monthly, 15% of PCOS women never eat meat. Green leafy vegetables were consumed daily by 80% and weekly by 20%. Roots and tubers were consumed

daily by 62.5%, weekly by 25% and 12.5% consumed monthly. 3.75% of respondents consumed junk food daily, 67.5% eat weekly and 28.75% eat monthly. 11.25% of respondents had beverages daily, 53.75% of the respondents had weekly and 35% had beverages monthly. 10% of respondents ate sugar every day, 22.5% ate weekly and 62.5% of respondents had monthly. It is observed that there were slight variations between the diets of both the categories. With greater weight loss for a monounsaturated fat-enriched diet; improved menstrual regularity for a low glycemic index diet; increased free androgen index for a high-carbohydrate diet; greater reductions in insulin resistance, fibrinogen, total, and high-density lipoprotein cholesterol; improved quality of life; and improved depression and self-esteem for a low glycemic index diet (Moran *et al.,* 2013).

Knowledge, Attitude and Practice (KAP) score of the PCOS respondents

Knowledge accumulates through learning process and these may be formal or informal instruction, personal experience and experimental sharing. It has been traditionally assumed that knowledge is automatically transferred into behaviour (Glanz and Lewis 2002). Attitude involves to evaluate concepts associated with the way people think, feel and behave. It comprises a cognitive, emotional and a behavioural component implying what you know, how you feel, and what you do (Keller, 1998). It has also been postulated that attitudes may influence one's intention to perform a given behaviour or practice (Rutter and Quine, 2003). Practice or practices is the act of rehearsing behaviour over and over, or engaging in an activity again and again, for the purpose of improving or mastering it. Practice refers to the ways in which it demonstrates its knowledge and attitude through their actions (Kaliyaperumal, 2004).

Several questionnaires were designed and validated to access the Knowledge, Attitude and Practice of respondents suffering from PCOS and healthy women. The responses collected were analysed and compared among the two groups of respondents. From the responses collected, the Knowledge, Attitude and Practice were graded as poor, average and good.

From table 7, it can be noted that respondents with PCOS with Poor Knowledge score were 15%, average score consisted of 62.5% and good score for knowledge were 22.5%. In terms of attitude, respondents scoring poor score was 16.25%, average score was 70% and good score was 13.75%. For practice, the respondents with poor score were 50%, average score were 42.5% and good score were 7.5%.

Table 7. KAP score of PCOS women.

Para-meters	Knowledge		Attitude		Practice	
	Number (n = 80)	Percentage %	Number(n= 80)	Percentage %	Number (n = 80)	Percentage %
Poor (<50)	12	15%	13	16.25%	40	50%
Average (50-75)	50	62.5%	56	70%	34	42.5%
Good (>75)	18	22.5%	11	13.75%	6	7.5%

Albezrah *et al.* (2019) conducted the study on "Knowledge, attitude, and practice toward weight reduction among polycystic ovary syndrome women at Taif city." Through closed- ended questions, participants were inquired about sociodemographic conditions, marriage, presenting complaints, knowledge, awareness of symptoms, attitude and practices of weight reduction related to PCOS. A total of 100 study participants completed the proforma with the mean age as 31.29 years. Majority (89%) had heard about the ovarian cyst before, around 34% had received knowledge through health education. Moreover, 81% were aware about the problems of the disease, 69% reported delay of pregnancy and 31% informed menstrual problems as problems of PCOS. Importantly, 63% were aware about the methods of treatment, with treatment options as weight reduction (44.44%). Two-third of the study participants believed that weight reduction is an effective treatment. Among those, 21 (31.8%) believed improving ovulation, 2 (3.04%) improving psychological condition and both were improved by weight reduction. The current level of awareness among Saudi women with PCOS about the beneficial effects of weight reduction as the first line of therapy was poor. Table 8 revealed the respondents (healthy women) with poor score in terms of knowledge was

40%, average score was 56.25% and good score was 3.75%. Respondents with poor attitude scores were 50%, average score 74% and 3.75% had good score. In terms of practice, respondents with poor practice scores were 25%, average score were 60% and 15% had good scores.

Table 8. KAP score of healthy women.

Para-meters	Knowledge		Attitude		Practice	
	Number (n = 80)	Percentage %	Number (n = 80)	Percentage %	Number (n = 80)	Percentage %
Poor (<50)	32	40%	40	50%	20	25%
Average (50-75)	45	56.25%	37	74%	48	60%
Good (>75)	3	3.75%	3	3.75%	12	15%

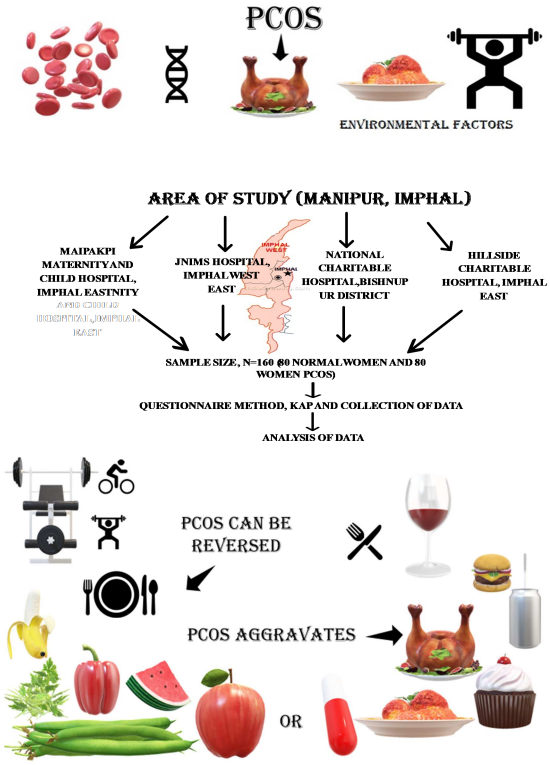

Fig. Graphical depiction of the Abstract (Graphical Abstract).

Conclusion

The goal of the study was to assess the dietary pattern between PCOS women and healthy women using food frequency questionnaires. From the responses collected, it was evident that there were very few differences in the dietary pattern of the respondents. There were noticeable differences in the dietary intake of fried food at home. Moreover, after assessing the KAP score between PCOS women and healthy women using designed questionnaire, it was noticed that there is scope of creating more awareness among people regarding PCOS. It is evident that in PCOS treatment diet plays a huge role as can been seen in the results of weight management. A well balanced diet and healthy eating habits has been shown to support the treatment of PCOS. Nutrition knowledge is vital to sustain the diet and lighten PCOS symptoms.

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