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A COMMUNITY BASED CROSS SECTIONAL STUDY ON PREVALENCE OF POLYCYSTIC OVARIAN SYNDROME (PCOS) AND HEALTH RELATED QUALITY OF LIFE IN PAKISTANI FEMALES

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Abstract- Polycystic Ovarian Syndrome is a hormonal disorder and its symptoms exist in most of young females. In Pakistan, PCOS diagnosis is being reported at an alarming rate, however the frequency of early diagnosis is very low. Objective of this community based study was to find out prevalence of PCOS related symptomology based on Rotterdam criteria in Punjab district of Pakistan. Moreover, the relationship between health status and PCO related quality of life was also assessed. 1258 young females within the age range of 18-25 years participated in a cross sectional survey from the various colleges of Punjab District. The participants completed the questionnaire of Short Form-36, Polycystic Ovarian Syndrome Questionnaire and Clinical Profile Form. There was an increased prevalence of one or two PCOS symptoms (i.e., Menstrual Irregularity and Hirtuism) in most of young females. Most of the females were not aware of the PCOS phenomenon. Furthermore, pearson correlation analysis on study scales revealed that with increase in PCOS symptomology, there are chances that quality of life will be poor. These findings suggest that still most of educated females are largely unaware about PCOS symptoms, it needs further expansion in terms of educational seminars to promote awareness about risk factors. The results of this study can be used by educational institutions or health care centers for promoting PCOS awareness and contributing towards early diagnosis and prevention

Key words: Poly Cystic Ovarian Syndrome (PCOS), Prevalence, Young women, Pakistan, Punjab

I. INTRODUCTION:

Poly Cystic Ovarian Syndrome (PCOS) is the most frequently diagnosed endocrinal and metabolic disorder around globe which usually affects approximately 7% of reproductive aged women (Jalilian, Anahita, et al, 2015; Landay, Melanie, Andy Huang, and Ricardo Azziz, 2009). According to World Health Organization, PCOS is an emerging public health issue (Gjönnaess, Halvard, 1990) and most likely to be a lifelong condition which is characterized by unexplained weight gain, menstrual irregularities , facial / body acne and hair though these symptoms may vary from one woman to another (Hachey, Lisa M., et al, 2020). Although this condition has not gained much attention, it significantly impacts young women of reproductive age both physically and psychologically. It has been estimated that approximately 4-8% of the teens and young women suffer from PCO's worldwide (Moran., Tena, Moran, Ruiz, Reyna, & Duque, 2010). PCOS is becoming a frequently diagnosed condition in Pakistan where the prevalence is as high as 15.7% to 37% (Haq et al 2017, Rizvi et al, 2014). The recent studies conducted in various geographic locations of Pakistan demonstrate that majority of the women are unaware of the symptoms and remain undiagnosed till the symptoms become complicated (Anjum, Nargis, et al. 2013). It has been demonstrated through the clinical reports show that PCOS if untreated, may lead to anovulatory infertility and oligomenorrhoea and other reproductive complications (Valdimarsdottir, Ragnheidur, et al. 2019).

The etiology of PCOS in women remains unclear, and it has been found to be linked with an-ovulatory infertility menstrual dysfunctions and hirsutism (Chapman, John, et al. 2009). Though this disease is most common and affects every 1 out of 10 women of reproductive age, its etiology is still unclear and diagnostic difficulty remains there. Previous research has suggested that genetic, endocrine, metabolic, environmental and lifestyle are highlighted clinical manifestations of PCOS (Rutkowska, Aleksandra Zofia, and Evanthia Diamanti-Kandarakis, 2016; Tekin, Göknur, et al 2008). Major etiological factors of PCOS includes an increased alteration in sympathetic nerve activity whichis directly associated with PCOS while women suffering from PCOS exhibit decreased association with parasympathetic nervous activity (Sverrisdottir, Yrsa Bergmann, et al 2008, Raperport, Claudia, and Homburg, 2019).

Difficulty in the diagnosis of PCOS has been reported to be related to the subjective presentation of phenotypes. Literature suggests that PCOS prevalence rate is higher in first degree relatives (Chae, et al 2017). The prevalence of PCOS in women residing in South Asian regions, particularly in Pakistani is rapidly increasing. According to an estimate, 52% of the women residing in the Indian subcontinent present with clinically significant symptoms of PCOS (Bharathi, Vidya, et al. 2017).

Despite these high figures, there is insufficient published literature that could give insight into the indigenous etiological factors for PCOS in Pakistan. Furthermore, diagnosis of PCOS is source of immense distress for the young females, therefore need for psychoeducation and counseling prevails in midst of fact that majority of the women are not educated enough to identify early signs and symptoms of this disorder. Therefore, this study was first of its kind to look into the perception and attitude towards PCOS in Pakistani young women.

Research Objective

This cross sectional study was designed to:

1. Evaluate prevalence of symptoms of PCOS according to the Rotterdam diagnostic criteria (Mumusoglu, Sezcan, and Bulent Okan Yildiz 2020).
2. Examune the association between PCOS and Health related quality of life in such females

II. METHOD & PROCEDURES:

From February 2019 to August 2019, 1258 female students from various colleges of Rawalpindi, Islamabad, Attock and Lahore (Punjab Districts) participated in a self-report survey related to prevalence of PCOS. Along with the PCOS questionnaire, SF-36 was applied to assess health related quality of life in young women. The presence or absence of acne and androgenic alopecia was recorded, and weight, height, and waist and hip circumferences were alsoassessed. The participants also completed a clinical history form which included details related to menstrual cycle, symptoms of hirsutism, acne, reproductive health, gynecological history, ongoing medications, family history of physical illnesses, and lifestyle habits.Data of Young women who qualified the criteria of PCOS were subjected for further analysis. The study was approved by the institutional review board of Fatima Jinnah Women University, and written informed consent was obtained from all the participants. The ethical aspects of the present study are covered in the Declaration of Helsinki. Those females who were 18 years and above, with or without history of PCOS related symptoms (and related comorbidity) and who had consented were included in the present study. Those with severe form of physical and psychological disturbance were not included. The required sample who met eligibility criteria was selected through non-probability purposive sampling technique. Sample size of 1258 was estimated through G power calculator with 95% confidence interval and 5% chance of error (Faul, Franz, et al 2007). Other than demographic and clinical features of PCO profile, PCOS clinical symptoms questionnaire and SF-36 were administered to assess prevalence of PCOS symptomology and the Health Status of the participants. Combination of descriptive and inferential analysis was used to identify degree of occurrence of PCOS symptomology, health status and health related quality of life. For objective 2, face to face interviews were conducted regarding perception about PCOS. The data was subjected to screening process through with any form of outliers, or missing data was treated before main analysis.

III. RESULTS

Table 1

Demographic Information of the participants (n=1258) in terms of frequency(f), percentages (%), Mean(M) and Standard Deviation (SD) values

Variable	Response Category	f (%)	M	SD
Participant Age	18-20	538 (42.8)		
	21-24	720 (57.2)	20.78	1.56
Education Completed	F. A	35 (2.8)		
	ICS	91 (7.2)		
	FSC	981 (78)		

	BS	116 (9.2)		
	MS Missing	20 (1.6) 5 (.39)		
Self-Reported SES	Low	55 (4.4)		
	Moderate	1088 (86.5)		
	High	111 (8.8)		
	Missing	4 (0.3)		
Body-Mass Index	Underweight	252 (20)		
	Normal Weight	601(47.8)		
	Overweight	170 (13.5)		
	Obese	225 (17.9)		
Marital Status	Un-Married	1198 (95.2)		
	Married	60 (4.8)		
Family System	Joint	356 (28.3)		
	Nuclear	897 (71.3)		
	Missing	5 (.4)		

Note: F. A=Faculty of Arts, F.SC=Faculty of Science, ICS=Intermediate in Computer Science, BS. =Bachelor of Science, MS= Master of Science, SES=Socio-economic Status

84% (1258 out of 1500) women completed the protocols involved in the survey. Study data analysis revealed that both PCOS and SF-36 had appropriate cornbach alpha reliabilities (alpha = 0.82 and 0.94 respectively).

Clinical signs and symptoms of PCOS as Assessed through Clinical Profile Form

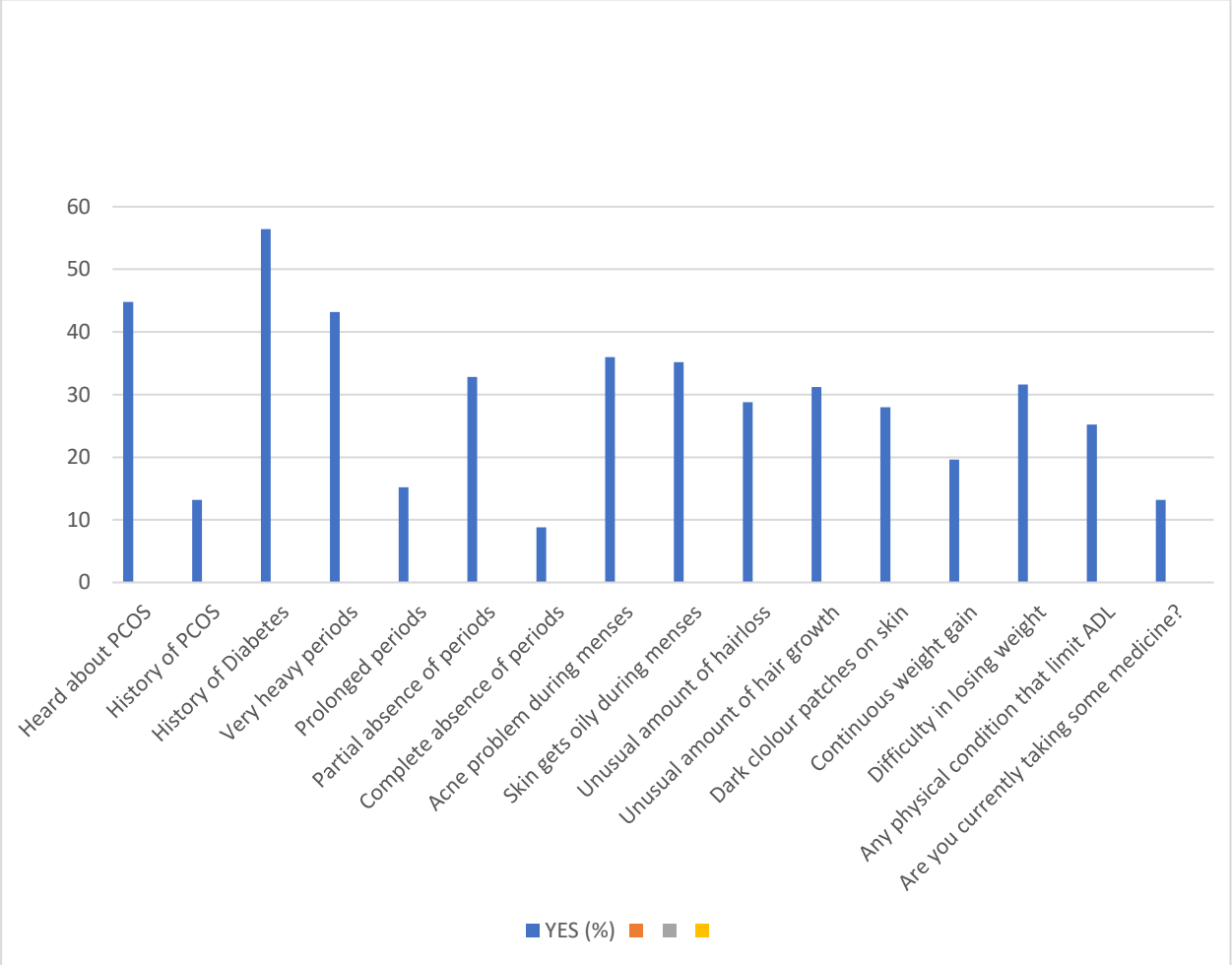

Figure 1 *Showing percentage of Yes responses on Clinical Profile Form (n=1258)*

Clinical signs and symptoms of PCOS are shown in figure 01 using percentage values. According to the responses on Clinical Profile Form, 44% participants were reported to be aware of PCOS. while 13.2% of them indicate family history of PCOS. 56% of the participants reported family history of both Type II Diabetes and PCOS. 32% of the participants reported partial absence of menses, which is major symptom of PCOS. 32% of the participants felt difficulty in losing their weight while 25% reported feeling difficult in performing ADL's (Activities of Daily Living) due to some physical condition. During Adolescence, one need extra supplements or vitamin capsules for appropriate growth of body, however in this study only 13% participants reported take some form of supplements while 86% relayed on food they ate.

Association between PCOS related Quality of Life and SF-36 (Health Status)

Table 2

Pearson's correlation between the sub-domains of Short Form (SF-36) and Polycystic Ovarian Syndrome Questionnaire (PCOSQ) (n = 1258)

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14
PF	1													
RP	.134*	1												
RE	.112	.502**	1											
EF	-.006	.192**	.193**	1										
EWB	-.036	.277**	.151*	.517**	1									
SF	.005	-.051	-.078	.053	-.008	1								
P	-.031	-.298**	-.281**	-.207**	-.280**	.292**	1							
GH	-.014	.027	-.040	.182**	.300**	.075	-.094	1						
BH	-.060	.334**	.292**	.262**	.404**	.035	-.293**	.077	1					
E	-.050	.324**	.309**	.320**	.351**	.102	-.342**	.079	.718**	1				
W	-.036	.413**	.340**	.263**	.376**	.028	-.327**	.009	.652**	.685**	1			
I	.000	.277**	.296**	.326**	.355**	.145*	-.174**	.069	.663**	.818**	.616**	1		
M	-.064	.319**	.270**	.248**	.305**	-.011	-.355**	-.009	.670**	.766**	.688**	.591**	1	
BMI	.175**	-.013	-.079	-.011	-.129*	-.042	-.024	.032	-.053	-.020	-.222	-.088	.033	1

*Correlation is significant at 0.05 level

**Correlation is significant at 0.01 level

Note: PF= physical functioning, RP(role limitation due to physical functioning),RE (role limitation due to emotional functioning),EF(energy/fatigue),EWB (emotional well-being) ,SF(social functioning), P(pain),GH (general health), BH (body hair), E (emotions) ,W (weight),I (infertility) , M (menstrual problems) ,BMI (body mass index)

In table 2, the results of Pearson's product moment correlation are reported. There was a significant positive correlation between most of the sub-scales (such as Physical Functioning with Role limitation due to Physical Functioning and Emotional Functioning, Physical also shows positive correlation with Emotional Well-Being) except for few. Participants reported positive correlation among Physical Functioning with Role Limitation due to Physical Functioning (r= .134, p>0.05), Role Limitation due to Emotional Functioning (r=.112), Social Functioninng (r=.005) and Body Mass Index (r=.175, p>0.01).

Table 3: Univariate Logistic Analysis of demographic and clinical correlates of PCOS (n = 1258)

Variables	OR (95% CI)	p Value
Age (yrs.)	0.64 (0.54 – 1.17)	n.s.
Income (PKR)	1.02 (1.00-1.19)	.03
Family Status	1.05 (1.03 – 1.13)	.02
Weight (Kgs)	1.06 (1.09 – 1.17)	.02
BMI >23	1.16 (1.01-1.17)	.00
Family History of Type II Diabetes, PCOS	4.61 (1.09 – 8.76)	.00

As indicated in Table 3 of the 1258 girls, 165 (13.1%) reported to experience menstrual irregulation, 1101 (87.5%) had high prevalence of symptoms of Hersuitism and 157 (12.5%) had both MI and H. Of the 165 cases, 62 (37.5%) had undergone hormonal check while 11 (6%) agreed for the need of ultrasonography. 27 girls (16%) had already diagnosed PCOS. On the basis of these figures, it can be estimated that if all of the identified cases in this study underwent hormonal assessment, approximately 13% - 25% of the young women would have likely to have received diagnosis for PCOS.

Table 4: Estimated Prevalence of Cases based on Rotterdam Criteria

Clinical Symptoms of PCOS	N	Completed Evaluation	Confirmed Diagnosis as per Rotterdam criteria	Probable cases*	Total exposed to the condition
Menstrual Irregularity (MI)	135	62	16	34	42
Menstrual Irregularity (MI) and Hirsutism (H)	130	11	4	5	7
Total	165	73	20	39	49

Calculated based on Rotterdam criterion

Given that there were 165 women who fulfilled PCOS criterion, the prevalence of 3% (95% CI 2.6 – 4.0) in this sample is estimated as per Rotterdam criterion (see Tables 1 to 4). Average age range of cases with PCOS was 19.7 ± 1.71 years with BMI level of 22 ± 4.57 Kg/m2

IV. Discussion:

PCOS is an under recognized and yet complex and most common condition. Through this study, we have reported perceived clinical features of PCOS in general population of 1258 college going young women. Other than estimation of prevalence rates, we aimed at examining their health status along with presence of PCOS related quality of life and attitudes towards the condition. Most of the women who participated in this study were identified with PCOS symptoms including irregularity in periods (165 % out of 1258). Amongst the different symptoms of PCOS, hirtuism was the most commonly reported. We also observed that despite the high prevalence of these clinical features only 16% of the women had received proper diagnosis or clinical attention. The remaining % were either unaware or did not consider it as a significant problem.

As substantiated by the diagnostic literature on PCOS, the most commonly reported presentation of symptoms was ovulatory malfunction, hyperandrogenism, and polycystic ovarian morphology (PCOM) (Escobar-Morreale, 2018). The metablic features of this condition include predominantly, an abnormality in fat distribution (Boumosleh, Jocelyne Matar, et al. 2017). In terms of health status, we found out that the participants who reported high prevalence of clinical features of PCOS had poor health related quality of life on all domains of SF-36. Similar results have been reported by other studies with high correlation between clinical symptoms of PCOS and Quality of Life (Panico, Annalisa, et al 2017, Moghadam, Zahra Behboodi, et al 2018).

There were few limitations of this study, such as diverse sample across various provinces of Pakistan could not be approached Additionally qualitative responses on perception towards PCOS related symptoms can add meaningful insight into contextual factors leading to delay in PCSO recognition and diagnosis among girls.

This study has identified high prevalence of PCOS symptoms among women across various districts of Punjab, Pakistan. As most of the women were either unaware or did not consider the PCOS as a problem, educational programs and clinical awareness is required along with provision of counseling due to expected distress that might be involved. It is pertinent to mention here that in developing countries such as Pakistan, PCOS is either not recognized timely, and the symptoms are likely to be attributed to skin diseases or dermatology, the spread of awareness can lead to timely identification and treatment of the PCOS.

V. CONCLUSION:

Significant prevalence of PCOS in general community of Punjab region of Pakistan draws attention towards the issue related to early diagnosis and need for psychoeducation in adolescent girls and families. It is recommended to provide education and counseling to women suffering from the symptoms of PCOS. Long term impact of awareness and education about the PCOS may have immense physical and psychological benefits.

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