

The relationship between Obstructive Sleep Apnoea and Quality of Life in women with Polycystic Ovary Syndrome: A cross-sectional study

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Introduction Obstructive sleep apnoea (OSA) and polycystic ovary syndrome (PCOS) are associated with significant comorbidities and commonly coexist. The primary aim of this study was to examine the relationship between OSA and quality of life (QoL) in women with PCOS.

Methods We conducted an observational cross-sectional study. PCOS was diagnosed according to the Rotterdam criteria. Women with increased risk of OSA, based on the Berlin questionnaire and/or the Epworth Sleepiness Scale (ESS), had home-based polysomnography performed (ALICE PDx). Participants were divided into two groups: 1) PCOS only: women with normal ESS and low-risk Berlin questionnaire (no sleep studies performed), or women with normal sleep studies [oxygen desaturation index (ODI) < 5 events/hour]; and 2) PCOS+OSA: women with PCOS and OSA ODI ≥5. QoL was assessed using the World Health Organisation QoL questionnaire (WHOQOL-BREF) and the PCOS health-related quality of life questionnaire (PCOSQ).

Results 39 women were included and 15 were found to have OSA (38.5%), **Table 1**. ODI was independently associated with impaired QoL, **Table 2**. Excessive daytime sleepiness (EDS) was independently associated with anxiety, depression, and impaired QoL, **Table 2**.

	PCOS OSA (n=15)	PCOS only (n=24)	P value
Age (years)	33 (26 – 43)	29.5 (27 – 33)	0.43
BMI (kg/m ²)	37.3 ±7.3	32.2 ±7.8	0.046
Neck circumference (cm)	39.3 ±4.1	36.8 ±3.4	0.053
PCOS phenotype			1.0
Hirsutism/hyperandrogenism + oligomenorrhoea	13 (86.7%)	21 (87.5%)	
Hirsutism/hyperandrogenism + PCO	0	1 (4.2%)	
Oligomenorrhoea + PCO	2 (13.3%)	2 (8.3%)	
Modified Ferriman-Gallwey score	16.0 (11.0 – 20.0)	12.5 (10.0 – 17.5)	0.35
Oxygen desaturation index (events/hour)	11.5 (7.3 – 18.7)	2.6 (1.6 – 3.7)	<0.00 01
ESS	9.1 ±4.9	8.2 ±4.7	0.57
Hormonal contraception			0.13
Combined OCP	0	5 (20.8%)	
Contraceptive implant	2 (13.3%)	1 (4.2%)	
Mirena coil	0	2 (8.3%)	
None	13 (86.7%)	16 (66.7%)	

Table 1. Baseline characteristic for women with PCOS+OSA compared to women with PCOS only. BMI, body mass index; ESS, Epworth sleepiness scale; OCP, oral contraceptive pill; OSA, obstructive sleep apnoea; PCO, polycystic ovaries; PCOS, polycystic ovary syndrome. Normally distributed data were presented as mean ±standard deviation, while non-normally distributed data were presented as median (interquartile range). Frequencies were presented as numbers (percentages).

Conclusions In women with PCOS, intermittent hypoxaemia and EDS were associated with lower QoL. EDS was also associated with anxiety and depression. Interventional studies are needed to examine these associations further. aired QoL.

Outcome measure†	Variable	Adjusted Beta value	P-value	
			Unadjusted	Adjusted
WHOQOL Physical health R ² = 0.343	Age	-0.102	0.36	0.551
	BMI	0.102	0.98	0.561
	ODI	-0.327	0.17	0.063
	ESS	-0.527	0.003	0.003
WHOQOL Psychological health R ² = 0.249	Age	0.264	0.17	0.157
	BMI	0.125	0.83	0.506
	ODI	-0.174	0.80	0.341
	ESS	-0.442	0.009	0.017
WHOQOL Environment R ² = 0.235	Age	-0.032	0.45	0.862
	BMI	0.059	0.09	0.750
	ODI	-0.472	0.006	0.013
	ESS	0.061	0.41	0.727
PCOSQ weight R ² = 0.309	Age	0.100	0.28	0.564
	BMI	-0.243	0.034	0.173
	ODI	-0.090	0.74	0.598
	ESS	-0.440	0.003	0.012
PCOSQ infertility R ² = 0.447	Age	0.400	0.012	0.014
	BMI	-0.225	0.006	0.160
	ODI	-0.446	0.018	0.007
	ESS	-0.086	0.66	0.562
PCOSQ Menstruation R ² = 0.208	Age	0.109	0.83	0.556
	BMI	0.048	0.58	0.800
	ODI	-0.457	0.021	0.018
	ESS	-0.185	0.46	0.301
HADS anxiety R ² = 0.230	Age	-0.154	0.28	0.399
	BMI	-0.029	0.71	0.877
	ODI	-0.032	0.50	0.857
	ESS	0.443	0.004	0.016
HADS Depression R ² = 0.271	Age	-0.191	0.24	0.285
	BMI	0.013	0.34	0.943
	ODI	0.179	0.64	0.314
	ESS	0.472	0.003	0.009

Table 2. Predictors of QoL and psychological health outcomes in women with PCOS using linear regression. ESS, Epworth Sleepiness Scale; HADS, Hospital Anxiety and Depression scale; WHOQOL, World Health Organisation QoL-BREF questionnaire; PCOSQ, PCOS health-related quality of life questionnaire. †R² given is for the adjusted model.