

SUPPLEMENTARY MATERIAL

Association of the six-minute walk test with severity of obstructive sleep apnea: an observational study

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Key words: asleep apnea, exercise tolerance, 6-minute walk test, polysomnography, functional
capacity.

Supplementary Table 1. Shapiro-Wilk test for bivariate normality.

Variables	Shapiro-wilk	p
AHI-ODI	0.99	0.127
AHI-6MWD	0.84	<.001
ODI-6MWD	0.96	<.001

AHI, Apnea Hypopnea Index; ODI, Oxygen Desaturation Index ;6MWD, 6-minute walk distance.

Supplementary Table 2. Correlation between Apnea-Hypopnea Index,Oxygen Desaturation Index and 6-minute walk distance.

Variables	Sample size (N)	Pearson correlation(r)	Spearman(rho)
AHI-ODI	124	0.820***	
AHI-6MWD			-0.974***
ODI-6MWD			-0.775***

*p<0.05, **p<0.01, ***p<0.001; AHI, Apnea-Hypopnea Index, ODI, Oxygen Desaturation Index,6MWD, 6 Minute Walk Distance.

Supplementary Table 3. One-way analysis of variance: comparison of 6-minute walk distance by obstructive sleep apnea severity(Apnea-Hypopnea Index classification).

AHI groups	n of patients (n=124)	Mean 6MWD	SD	(df1,df2)	F	η^2	p	Homogeneity correction
Mild OSA	8	420.85	17.396	(2,121)	138.45	0.563	<0.001	Welch
Moderate OSA	17	396.99	9.602					
Severe OSA	99	348.61	22.008					

N, number; AHI, Apnea-Hypopnea Index; OSA, Obstructive Sleep Apnea; 6MWD, 6-minute walk distance; SD, standard deviation.

Supplementary Table 4. Games-Howell post-hoc comparisons: Apnea-Hypopnea Index groups.

Comparison	Mean difference (m)	95% CI lower	95% CI upper	p (Tukey)	Cohen's d
Mild OSA vs. moderate OSA	23.86	5.52	42.20	0.014	1.16
Mild OSA vs. severe OSA	72.24	53.96	90.52	<0.001	3.52
Moderate OSA vs. severe OSA	48.38	40.63	56.14	<0.001	2.36

OSA, obstructive sleep apnea; CI, confidence interval; AHI, Apnea-Hypopnea Index.

Supplementary Table 5. Multiple linear regression analysis for OSA severity prediction.

Model 1: AHI Prediction				
Variable	β coefficient	Standard error	p	95% CI
ESS Score	0.58	0.15	<0.001	0.29 to 0.87
6MWD(meters)	-0.61	0.03	<0.001	-0.68 to -0.55
Borg dyspnea post-6MWT	1.89	0.51	<0.001	0.89 to 2.89
Constant	258.65	13.35	<0.001	232.2 to 285.1
Model Statistics	R² = 0.891, Adjusted R² = 0.889, F = 325.84, p<0.001			
Model 2: ODI Prediction				
ESS Score	0.96	0.31	0.003	0.33 to 1.60
6MWD(meters)	-0.51	0.07	<0.001	-0.64 to -0.37
Borg dyspnea post-6MWT	4.21	1.11	<0.001	2.02 to 6.39
Constant	207.88	29.16	<0.001	150.14 to 265.63
Model Statistics	R² = 0.654, Adjusted R² = 0.645, F = 74.999, P < 0.001			

ESS, Epworth Sleepiness Scale; 6MWD, 6-minute walk distance; 6MWT, 6-minute walk test; AHI, Apnea-Hypopnea Index; ODI, Oxygen Desaturation Index; CI, confidence interval.

Supplementary Table 6. Multiple regression analysis (dependent variable: Apnea-Hypopnea Index).

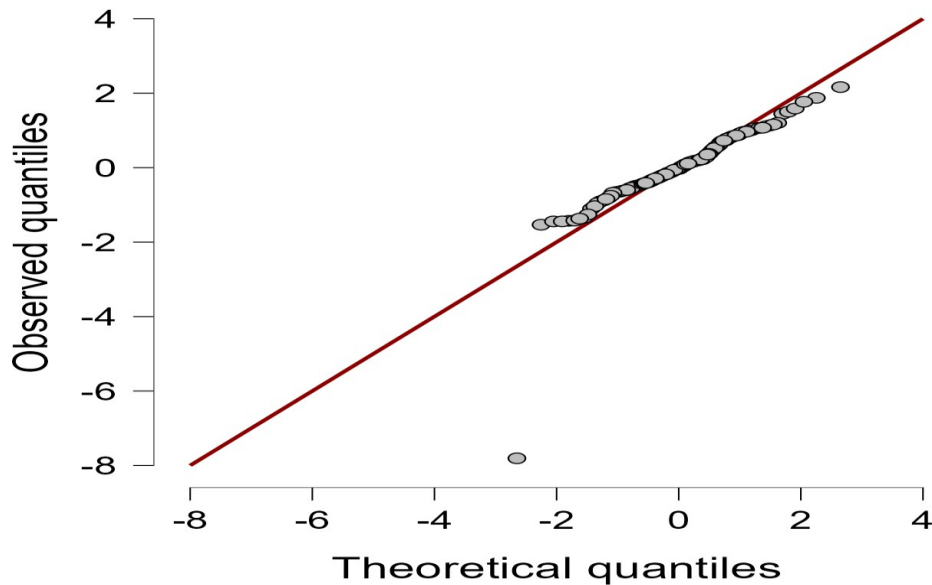
Independent variables	Unstandardized coefficients(b)	Standardized coefficients(β)	T statistics	p	Collinearity Statistics	
					Tolerance	VIF
Constant	289.53		13.05	<0.001		
BMI	0.092	0.027	0.681	0.497	0.675	1.481
6MWD	-0.677	-0.881	-24.828	<0.001	0.828	1.207
ESS	0.608	0.131	3.843	<0.001	0.904	1.107
FEV₁	-0.092	-0.002	-0.018	0.986	0.064	15.654
FVC	-0.106	-0.003	-0.024	0.981	0.066	15.178
FEV₁/FVC	-0.968	-0.003	-0.065	0.949	0.504	1.983
HCO₃ in ABG	-0.241	-0.023	-0.612	0.542	0.745	1.342
PCO₂ in ABG	0.180	0.034	0.812	0.419	0.606	1.651
Age	-0.078	-0.037	-1.036	0.302	0.806	1.241

AHI, Apnea-Hypopnea Index; VIF, variance inflation factor ;BMI, body mass index; 6MWD, 6-Minute Walk Distance; ESS, Epworth Sleepiness Scale; FEV₁, forced expiratory volume; FVC, forced vital capacity; HCO₃, bicarbonate; ABG, arterial blood gas; PCO₂, partial pressure of carbon dioxide.

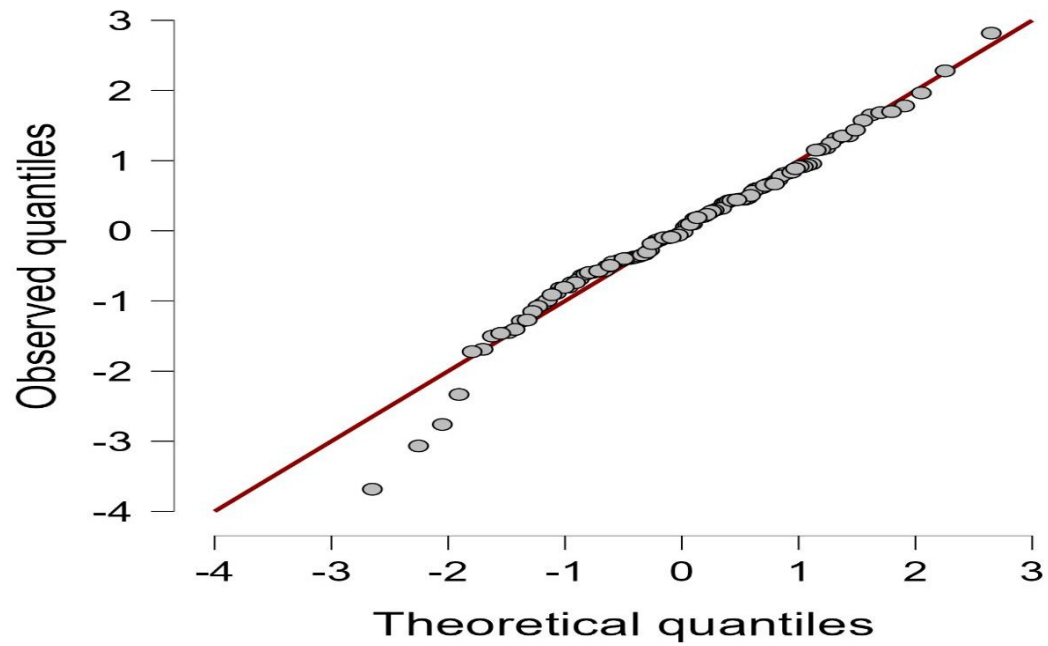
Supplementary Table 7. Multiple Regression analysis (dependent variable: Oxygen Desaturation Index).

Independent Variables	Unstandardized coefficients(b)	Standardized coefficients(β)	T statistics	p	Collinearity Statistics	
					Tolerance	VIF
Constant	253.961		20.592	<.001		
BMI	0.106	0.025	0.354	0.724	0.675	1.481
6MWD	-0.608	-0.642	-10.106	<.001	0.828	1.207
ESS	1.113	0.194	3.190	0.002	0.904	1.107
FEV₁	5.832	0.117	0.513	0.609	0.064	15.654
FVC	-7.785	-0.177	-0.788	0.432	0.066	15.178
FEV₁/FVC	-26.444	-0.065	-0.799	0.426	0.504	1.983
HCO₃ in ABG	-0.781	-0.060	-0.899	0.371	0.745	1.342
PCO₂ in ABG	0.494	0.075	1.011	0.314	0.606	1.651
Age	-0.154	-0.060	-0.925	0.357	0.806	1.241

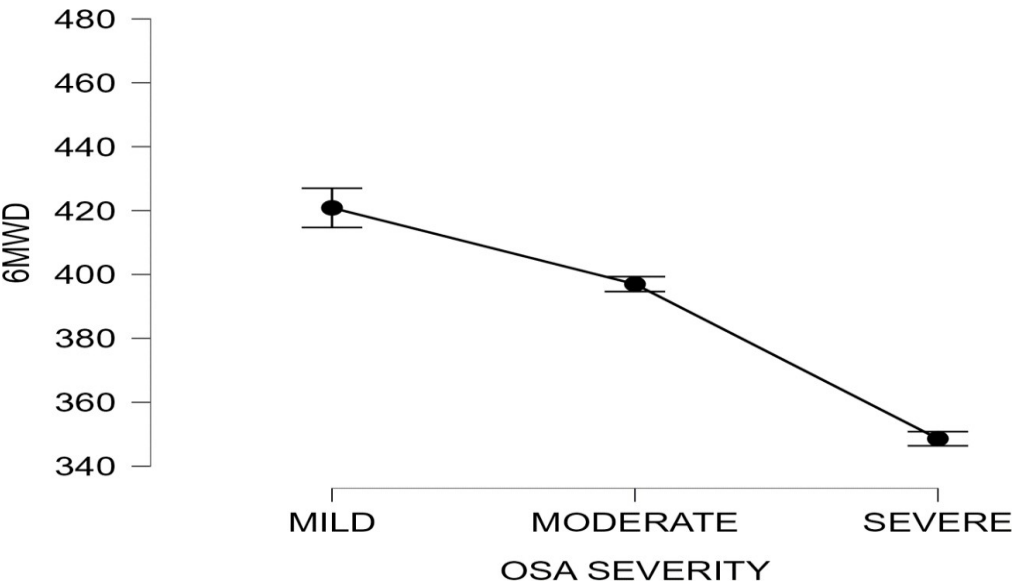
ODI, Oxygen Desaturation Index; VIF, variance inflation factor ;BMI, body mass index; 6MWD, 6-Minute Walk Distance; ESS, Epworth Sleepiness Scale; FEV₁, forced expiratory volume; FVC, forced vital capacity; HCO₃, bicarbonate; ABG, arterial blood gas; PCO₂, partial pressure of carbon dioxide.



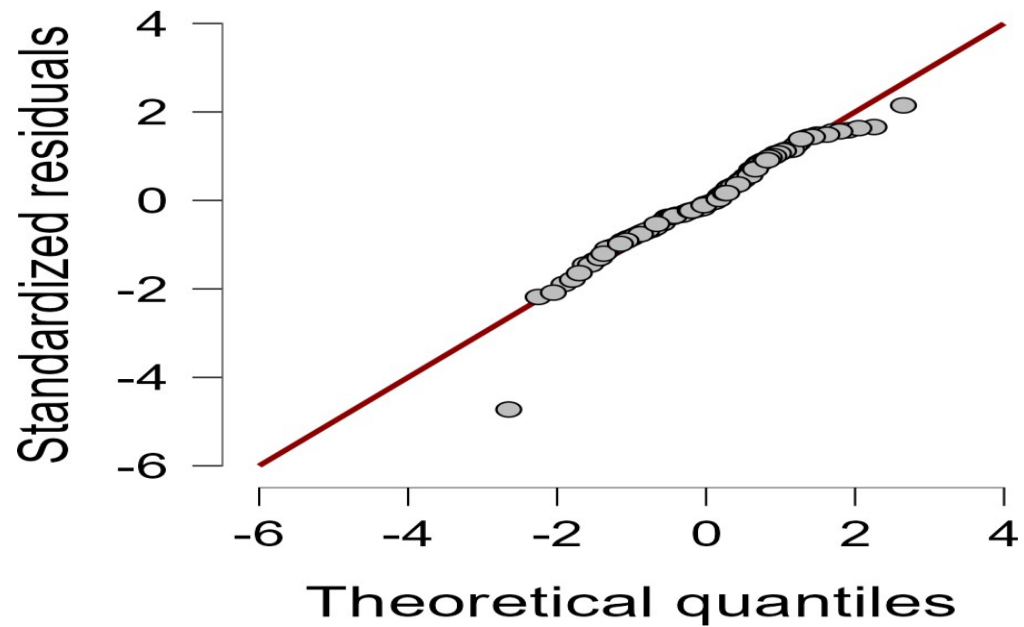
Supplementary Figure 1. Q-Q plot for Apnea-Hypopnea Index regression analysis model.



Supplementary Figure 2. Q-Q plot for homogeneity testing in the regression analysis model.



Supplementary Figure 3. Descriptive plot for 6-Minute Walk Distance and Apnea-Hypopnea Index in analysis of variance testing.



Supplementary Figure 4. Q-Q plot for homogeneity testing in analysis of variance testing.