

## Effects of disease severity on sleep and quality of life in Taiwanese patients with atopic dermatitis



*To the Editor:* Atopic dermatitis (AD) has been known to be associated with reduced sleep quality and impaired quality of life (QoL).<sup>1,2</sup> A previous study demonstrated that increased AD severity was significantly correlated with both QoL and sleep quality.<sup>3</sup> Sleep disturbance was also more strongly associated with QoL than with AD severity.<sup>4</sup> Previous studies used the SCORing Atopic Dermatitis index to evaluate disease severity, which may repeatedly measure the effects of sleep disturbance because it includes subjective loss of sleep.

We conducted a noninterventional, cross-sectional study to investigate the associations among disease severity, QoL, and sleep quality. We recruited 200 patients diagnosed with AD from 3 hospitals in Taiwan from April 2018 to April 2019. We used the Objective Scoring Atopic Dermatitis (oSCORAD) scale,<sup>5</sup> Dermatology Life Quality Index (DLQI), and Pittsburgh Sleep Quality Index (PSQI) to evaluate disease severity, QoL, and sleep quality, respectively. We conducted a PSQI component analysis to identify which aspects of sleep are most affected by disease severity and QoL.

A statistical analysis was performed using GraphPad Prism, version 8.4.0. We used Pearson correlation coefficient analyses to evaluate correlations with significance defined as  $P < .05$ . We used Bonferroni corrections to account for multiple comparisons in individual components of PSQI and conducted univariate and multivariate linear regression models to correct for the effects of age, sex, and body mass index.

The study group had a mean age of  $34.4 \pm 12.4$  years (range, 20-78 years), and the mean duration of the disease was  $18.0 \pm 11.3$  years (range, 0.3-55 years). The mean oSCORAD index score was  $27.56 \pm 15.89$ , the mean DLQI score was  $12.15 \pm 6.11$ , and the mean global PSQI score was  $8.65 \pm 3.9$ . Significant correlations were observed between the oSCORAD and DLQI scores ( $P < .0001$ ), between the oSCORAD and PSQI scores ( $P < .0001$ ), and between the DLQI and PSQI scores ( $P < .0001$ ). In the PSQI component analysis, all components showed significant correlations with the DLQI score. Four components showed significant correlations

**Table I.** Association between Pittsburgh Sleep Quality Index component scores and Objective Scoring Atopic Dermatitis scores

PSQI and oSCORAD	r	Corrected significant P value*
Global score	0.3021	<.0001*
Subjective sleep quality	0.3199	<.0001*
Sleep latency	0.1939	.0059*
Sleep duration	0.07524	.2896
Habitual sleep efficiency	0.06828	.3367
Sleep disturbance	0.2044	.0037*
Use of sleeping medication	0.1817	.01
Daytime dysfunction	0.3331	<.0001*

oSCORAD, Objective Scoring Atopic Dermatitis; PSQI, Pittsburgh Sleep Quality Index.

\*Corrected significant P value:  $P < .05/7 = .00714$ .

with the oSCORAD score, including subjective sleep quality ( $P < .0001$ ), sleep latency ( $P = .0059$ ), sleep disturbance ( $P = .0037$ ), and daytime dysfunction ( $P < .0001$ ) (Table I), whereas demographic characteristics, such as age, sex, and body mass index, did not significantly affect the PSQI component scores, as determined using the multivariate analysis (Table II).

Previous studies have revealed that subjective sleep quality and sleep latency are significantly correlated with the SCORing Atopic Dermatitis index score.<sup>3,4</sup> We found out that more parameters defining sleep quality were involved in our patients with AD, including subjective sleep quality, sleep latency, sleep disturbance, and daytime dysfunction. It might reflect that the severity of AD in the current study is higher than that in the previous ones, as noticed based on the higher SCORing Atopic Dermatitis index and DLQI scores,<sup>3,4</sup> although different cultural or environmental factors might also have played some roles. Our study further confirms the impact of the objective severity of AD on sleep quality.

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**Table II.** Univariate and multivariate relationships between Pittsburgh Sleep Quality Index score and possible affecting factor

	Univariate		Multivariate			
	Slope (95% CI)		Estimate (95% CI)		P value	
PSQI global score						
Age	0.007298 (−0.03683 to 0.05142)		.7446		0.01938 (−0.02275 to 0.06151) .3654	
Sex	−0.7894 (−1.874 to 0.2953)		.1528		−0.9125 (−1.964 to 0.1389) .0885	
BMI	−0.05432 (−0.1938 to 0.08512)		.4433		−0.06646 (−0.2013 to 0.06838) .3322	
oSCORAD	0.07427 (0.04150-0.1070)		<.0001		0.08008 (0.04702-0.1131) <.0001	

  

	Subjective sleep quality		Sleep latency		Sleep duration		Habitual sleep efficiency		Sleep disturbance		Use of sleeping medication		Daytime dysfunction	
	P value*	P value†	P value*	P value†	P value*	P value†	P value*	P value†	P value*	P value†	P value*	P value†	P value*	P value†
Age	.4232		.9481		.5486		.57		.2675		.2596		.0907	
Sex	.9858		.1991		.5564		.0086	.006	.1315		.3513		.7711	
BMI	.7047		.0325	.0248	.5242		.9167		.8575		.2815		.9099	
oSCORAD	<.0001	<.0001	.006	.0019	.2861		.3419		.0037	.0013	.0094	.0033	<.0001	<.0001

BMI, Body mass index; oSCORAD, Objective Scoring Atopic Dermatitis; PSQI, Pittsburgh Sleep Quality Index.

\*P value was computed using simple linear regression.

†P value was derived from multiple linear regression models, with all the variables listed above as independent variables.

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**Conflicts of interest**

None disclosed.

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