

## **OBJECTIVES**

To evaluate the health-related quality of life (HRQoL) of adolescents with asymptomatic convergence insufficiency (CI) in China and to identify the impact factors associated with the HRQoL of those patients.

## METHODS

- ➤ Adolescents aged 7-17 years with asymptomatic CI were recruited from outpatients in optometric center of Tianjin Eye Hospital, China.
- $\succ$  The severity of CI symptoms was assessed using the Convergence Insufficiency Symptom Survey (CISS), and the HRQoL was evaluated using the Child Health Utility instrument (CHU-9D). Socio-demographic characteristics were also collected. Clinical data including spherical equivalent, near point of convergence, and difference between exophoria at far and at near were retrieved from medical records.
- Subgroup analyses were conducted to determine whether there were significant differences in HRQoL between subgroups with different demographic characteristics. Ordinary least squares (OLS) regression model was performed to examine the association of demographic and clinical indicators with HRQoL.

## RESULTS

- > Socio-demographic characteristics of patients
- A total of 88 patients were included in the study. As shown in Table 1, 53.4% (N = 47) of total patients were male, the mean (SD) age was 11.4(2.6) years.
- > HRQoL of patients
- As shown in Table 2, the mean value (SD) of CHU-9D was **0.915** (0.125), the average score (SD) of CISS was 7.057 (6.649).
- No significant differences in HRQoL were found between subgroups with different demographic characteristics.

# Health-Related Quality of Life of Adolescents with Asymptomatic Convergence Insufficiency in China Chang Luo<sup>1</sup>, Tianqi Hong<sup>2</sup>, Yue Zhang<sup>3</sup>, Yanglin Jiang<sup>3</sup>, Shitong Xie<sup>1\*</sup> PCR100

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Table 1 Characteristics of patients			
Characteristics	N = 88, N (%)		
Age (mean [SD])	11.4 (2.6)		
Gender (%)			
Male	47 (53.4%)		
Female	41 (46.6%)		
Residence			
Urban	65 (73.9%)		
Rural	23 (26.1%)		
Sitting posture			
Normal sitting position	34 (38.6%)		
To the left	15 (17.0%)		
To the right	9 (10.2%)		
On the table	14 (15.9%)		
Uncertain	16 (18.2%)		
<b>Outdoors activity hours per day (mean [SD])</b>	1.8 (1.1)		
Near activity hours per day (mean [SD])	4.0 (2.6)		
Degree of Myopia			
Non-myopia (+0.75D <se)< td=""><td>4 (4.5%)</td></se)<>	4 (4.5%)		
Pre-myopia (- 0.50D <se≤+0.75d)< td=""><td>21 (23.9%)</td></se≤+0.75d)<>	21 (23.9%)		
Low-myopia (- 3.00D <se≤ -6.00d)<="" td=""><td>60 (68.2%)</td></se≤>	60 (68.2%)		
High-myopia (SE≤- 6.00D)	3 (3.4%)		
Glasses type			
No glasses	34 (38.6%)		
Frame glasses	50 (56.8%)		
Orthokeratology lenses	4 (4.5%)		

### Table 2 HRQoL of patients

	CHU-9D		CISS	
Characteristics	Mean(SD)	p value	Mean(SD)	p value
Overall	0.915 (0.125)		7.057 (6.649)	
Gender		0.363		0.457
Male	0.904 (0.139)		7.553 (7.592)	
Female	0.928 (0.106)		6.488 (5.409)	
Age group		0.183		0.935
age<12	0.897 (0.144)		7.116 (6.908)	
age≥12	0.933 (0.101)		7.000 (6.470)	
Sitting posture		0.762		0.187
Normal sitting	0.931 (0.141)		6.206 (6.064)	
position				
To the left	0.916 (0.102)		6.800 (4.586)	
To the right	0.928 (0.074)		12.111 (11.174)	)
On the table	0.908 (0.137)		7.286 (7.342)	
Uncertain	0.881 (0.124)		6.063 (4.946)	
Degree of myopia		0.127		0.493
Non-myopia	0.782 (0.177)		10.500 (2.380)	
Pre-myopia	0.909 (0.162)		8.333 (7.002)	
Low-myopia	0.923 (0.104)		6.417 (6.761)	
High-myopia	0.981 (0.032)		6.333 (4.726)	
Glasses type		0.554		0.571
No glasses	0.897 (0.150)		7.882 (7.343)	
Frame glasses	0.927 (0.107)		6.400 (6.188)	
Orthokeratology lenses	0.922 (0.100)		8.250 (6.850)	



**Figure 1 Distribution of HRQoL of patients** 

Table 3 Multiple linear regression of CHU-9D utility			
<b>Characteristics</b>	Coefficient	p value	
ge	0.021	0.100	
lender			
Male	Reference		
Female	0.017	0.484	
rade	-0.008	0.543	
itting posture		0.762	
Normal sitting position	Reference		
To the left	-0.040	0.280	
To the right	0.038	0.368	
On the table	-0.267	0.466	
Uncertain	-0.076	0.031	
egree of myopia		0.127	
Non-myopia (+0.75D <se)< td=""><td>Reference</td><td></td></se)<>	Reference		
Pre-myopia (- 0.50D <se≤+0.75d)< td=""><td>0.062</td><td>0.321</td></se≤+0.75d)<>	0.062	0.321	
Low-myopia (- 3.00D <se≤ -6.00d)<="" td=""><td>0.041</td><td>0.476</td></se≤>	0.041	0.476	
High-myopia (SE≤- 6.00D)	0.089	0.322	
lasses type		0.554	
No glasses	Reference		
Frame glasses	-0.005	0.873	
Orthokeratology lenses	0.060	0.321	
outdoors activity hours per day	0.015	0.178	
ear activity hours per day	0.002	0.709	
ISS score	-0.011	< 0.001	
bsolute value of the difference between	-0.005	0.280	
xophoria at far and at near			
ear point of convergence	0.004	0.141	
onstant term	0.726	< 0.001	

#### > Distribution of HRQoL of patients

• As shown in Figure 1, more than **70%** of patients had a utility value **above 0.9** on CHU-9D (the higher, the better), more than 90% of patients had a score below **15** on CISS (the higher, the more serious).

• From the distribution of CHU-9D dimensions across levels, the dimensions with the highest reported problems school among respondents are work/homework, able to join in activities, tired, and sleep, respectively.

### > Factors associated with HRQoL of patients

• The R square of regression was 0.4316 and the adjust R square was 0.2936.

• As shown in Table 3, CHU-9D utility value **decreased with CISS score** (p < 0.001).

• Regarding sitting posture, patients with uncertain posture had significantly lower CHU-9D utility value than patients with normal posture (p = 0.031).

• Other characteristics, like age, gender, grade, degree of myopia, glasses type, outdoors activity hours per day, near activity hours per day, absolute value of the difference between exophoria at far and at near, and near point of convergence didn't show a significant impact on CHU-9D utility.

## CONCLUSION

> Asymptomatic CI affects the HRQoL of adolescents in China.

> Subgroup analyses showed no significant differences in HRQoL between subgroups with different demographic characteristics.

 $\succ$  OLS result indicated that CISS scores and sitting position were both associated with HRQoL in adolescents with asymptomatic CI in China.