Decision-making changes in chronic migraine patients with medication overuse examined with the Iowa gambling task

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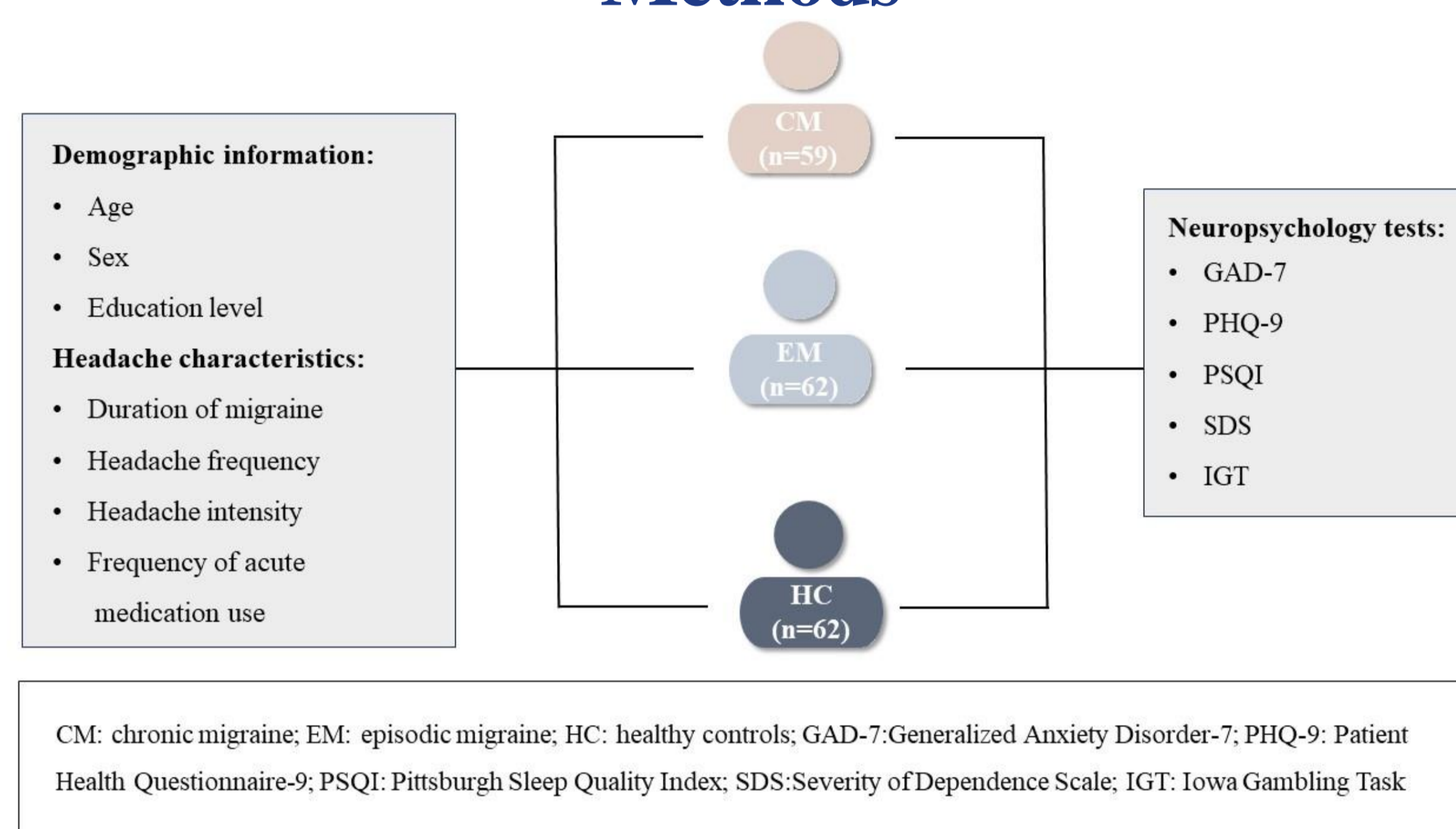
Background

The decision-making changes in medication overuse headache (MOH) patients have been debated [1-4].

Several studies have explored the abnormal orbitofrontal cortex (OFC) function associated with substance abuse[5-7], which may be resulted in decision-making dysfunction. And OFC dysfunction has been reported in patients with chronic migraine and MOH[1, 2].

Objective

To investigate changes in decision-making among MOH patients in China.

Methods

CM: chronic migraine; EM: episodic migraine; HC: healthy controls; GAD-7:Generalized Anxiety Disorder-7; PHQ-9: Patient Health Questionnaire-9; PSQI: Pittsburgh Sleep Quality Index; SDS:Severity of Dependence Scale; IGT: Iowa Gambling Task

The data collected included demographic information, headache characteristics, GAD-7 scores, PHQ-9 scores, PSQI scores, and SDS scores[8, 9].

The IGT was used to conduct a neuropsychological assessment of changes in decision-making [1-4].

Neuropsychology Test Results
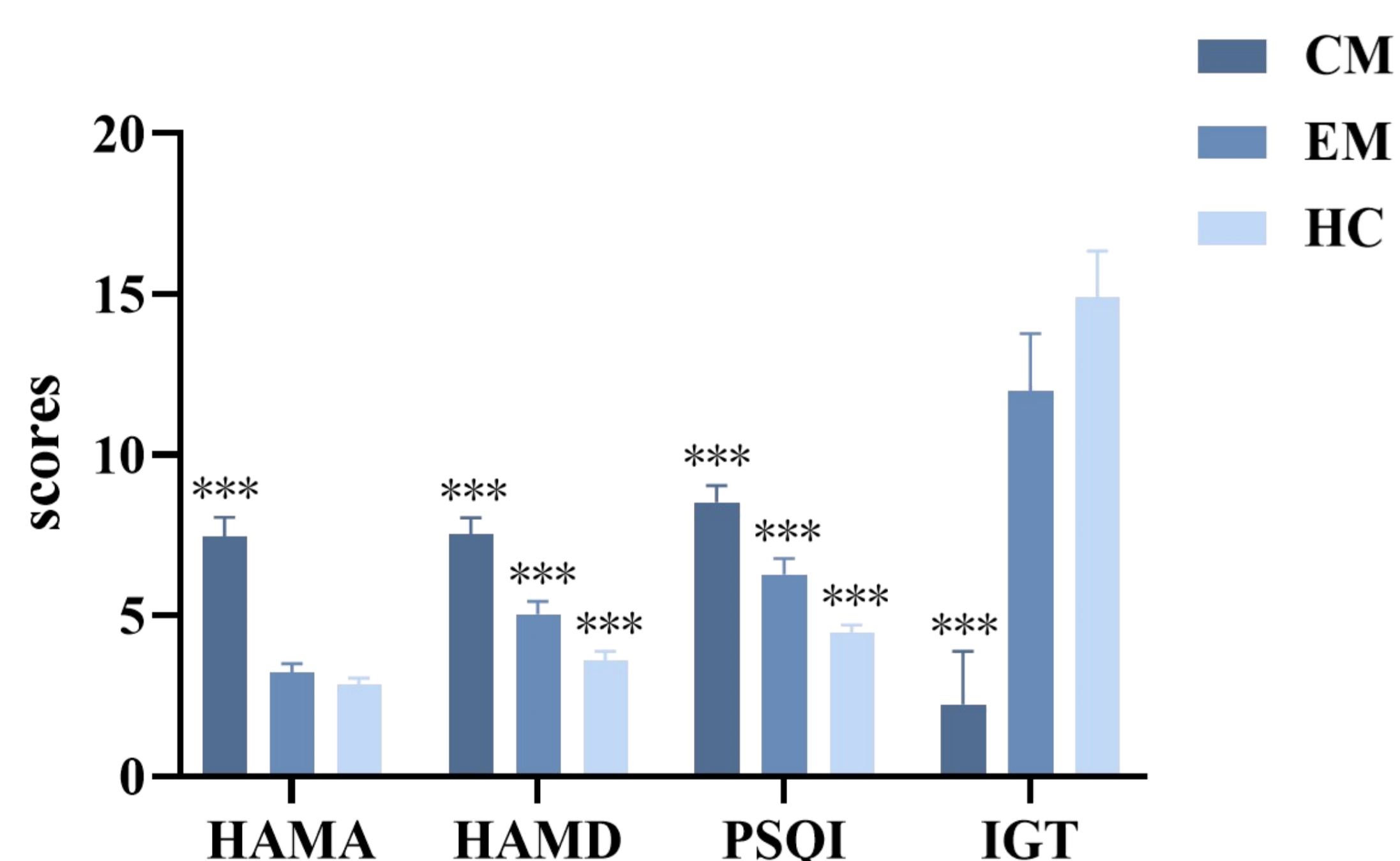
The net scores of the Iowa Gambling Task (IGT) showed significant differences among the three groups (2.24 ± 12.68 vs 11.52 ± 14.22 vs 14.90 ± 11.19, $p < 0.001$).

Post hoc analysis revealed that the CM group exhibited poorer performance than the EM group and the HC group, while there was no significant difference between the EM group and the HC group.

Subgroup Analysis Results

Variables	CM+MOH (n=30)	CM-MOH (n=29)	p-value
Age (years), mean ± SD	43.53±6.88	42.28±14.4	0.669
Sex, n, (%)			0.771
Man	8 (26.7)	7 (24.1)	
Woman	22 (73.3)	22 (75.9)	
Education level, n (%)			0.825
≤9 years	12 (40.0)	11 (37.9)	
9-12 years	8 (26.7)	7 (24.2)	
>12years	10 (33.3)	11 (37.9)	
Duration of primary headache(years), mean ± SD	15.60±9.20	11.40±7.66	0.062

Variables	CM+MOH (n=30)	CM-MOH (n=29)	p-value
Headache frequency, median (quartile)	25 (15-30)	15 (15-20)	< 0.001
Headache intensity (NRS), median (quartile)	8 (6.5-8)	6 (6-7)	0.001
Frequency of acute medication use (days/month), median (quartile)	25 (15-30)	5 (3-7)	< 0.001
GAD-7, mean ± SD	8.77±5.17	6.10±3.43	0.024
PHQ-9, mean ± SD	7.77±4.27	7.28±2.91	0.637
PSQI, mean ± SD	9.50±3.37	7.52±3.37	0.053
SDS, mean ± SD	10.17±3.78	1.14±1.62	0.010
IGT, mean ± SD	-1.87±12.84	6.48±11.20	0.010

CM patients with MOH had negative net scores (-1.87 ± 12.84), while CM patients without MOH had positive net scores (6.48 ± 11.20), and these differences were significant (-1.87 ± 12.84 vs 6.48 ± 11.20, $p=0.01$).

Correlation Analysis Results

(a) Headache frequency

(b) Frequency of acute medication

(c) GAD-7
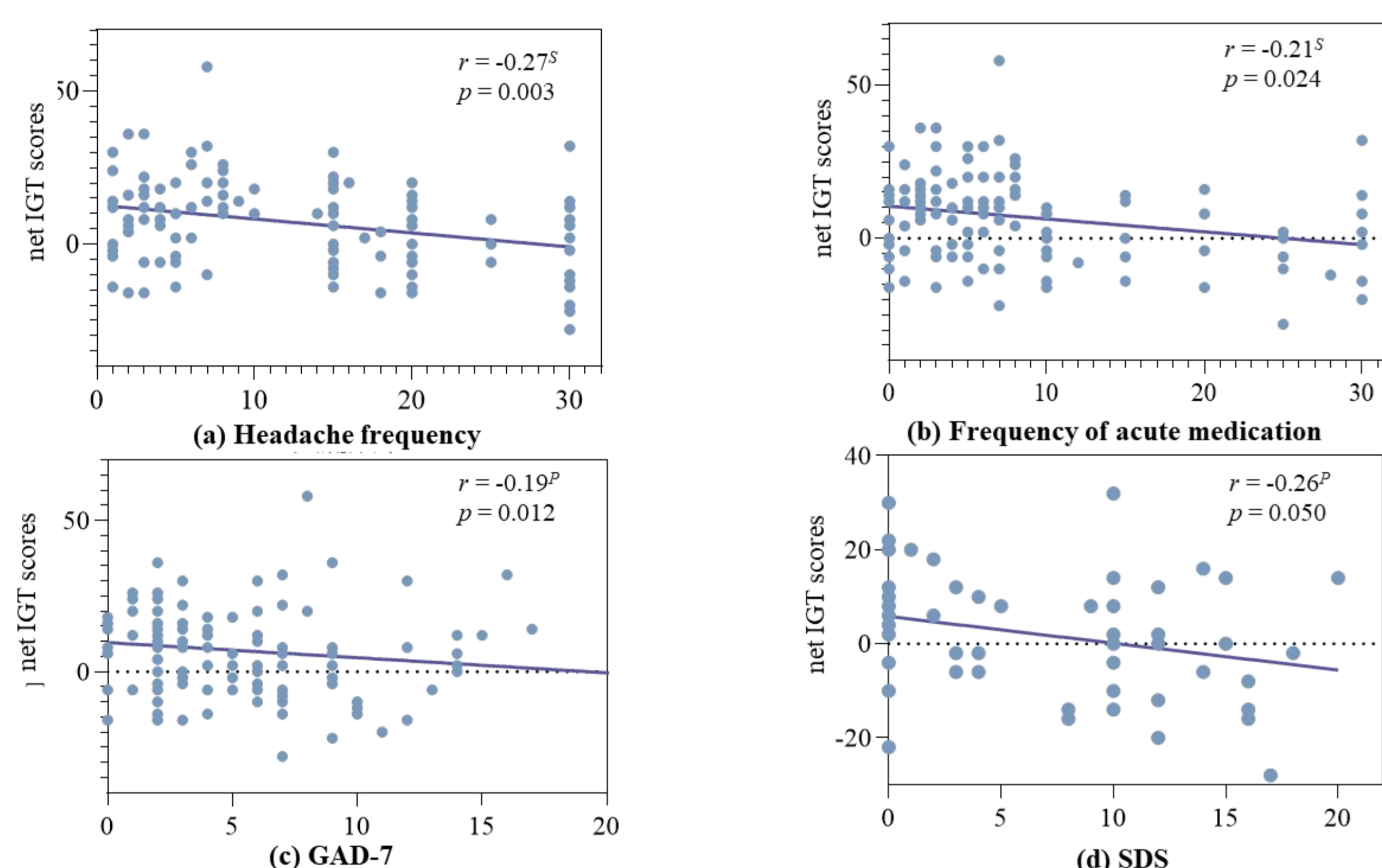
(d) SDS

Significant correlations between net IGT scores and clinical variables, including mean monthly migraine days ($r=-0.27$, $p=0.003$), frequency of acute medication use ($r=-0.21$, $p=0.024$), GAD-7 scores ($r=-0.19$, $p=0.012$), PHQ-9 scores ($r=-0.16$, $p=0.035$), and SDS scores ($r=-0.26$, $p=0.050$).

References

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Conclusion

MOH patients exhibited decision-making dysfunction, and we found a significant correlation between changes in decision-making and mean monthly migraine days, frequency of acute medication use, severity of dependence on acute medication, and GAD-7 scores.