

Parenting Psychological Distress and Its Association with Demographic and Clinical Characteristics in Strabismus Children: A Cross-Sectional Study

Juan Ding^{*1}, Wei Wang¹, Wei Zhang¹, and Yueping Li¹

¹Tianjin Eye Hospital

January 4, 2024

Abstract

Purpose: This study aimed to probe the psychological problems in the parents of children with strabismus. **Methods:** Cross-sectional study. A total of 220 parents of children with strabismus were enrolled. Demographic and clinical characteristics of strabismus children were collected and analyzed. The HADS and SAS/SDS were used to evaluate anxiety and depression in parents of children with strabismus. **Results:** There were significant differences in the rate of both anxiety and depression between HADS-A and SAS (21.82 vs. 12.73%, $P = 0.012$) and between HADS-D and SDS (16.82 vs. 31.82%, $P < 0.001$). Additionally, the HADS-D score was positively correlated with strabismus deviation ($P = 0.018$), parents' educational level ($P = 0.001$), and family habitation ($P = 0.034$). SDS score presented less correlation with clinical features of children with strabismus, which illuminated that only SDS score was positively associated with educational level ($P = 0.040$). No correlation between both HADS-A and SAS scores was found with patients' clinical features. Meantime consumption of HADS was 2.54 ± 1.45 minutes, which was shorter than that of SAS/SDS (7.25 ± 4.13 minutes) ($P < 0.001$). **Conclusion:** Parents of children with strabismus who are experiencing psychosocial distress should be identified. HADS seems to be a better option for emotional assessment than SAS/SDS in parents of children with strabismus.

Introduction

Misaligned visual axes are the hallmark of the relatively common eye condition known as strabismus, which most frequently shows up during the crucial stage of visual development^[1]. Strabismus is more common in the population than in the individual, with an incidence of 0.01% to 7%^[2-7]. Strabismus can result in amblyopia, decreased binocular vision and cosmetic concerns, etc.^[8] Meanwhile, it can cause psycho-social issues like low self-esteem, strained interpersonal connections, and decreased employment^[9-13].

Most previous studies focused on evaluating the psychopathological severity of patients' emotional responses^[14]. The Health-Related Quality of Life (HRQOL) and Hospital Anxiety and Depression Scale (HADS) were developed to assess the emotional condition of non-psychiatric patients receiving hospital care for physical disease^[16]. The effect of intermittent exotropia (IXT) on children's mental health can be evaluated in further detail using the patient proxy scales^[16]. Previous studies have indicated that childhood-onset strabismus has a persistent impact in the long term so the health-related quality of life (HRQOL) gets worse in both children and parents.^[17-19] Recent research also emphasized that emotional disturbance in the parents also had a psychosocial impact on their children with strabismus. Successful strabismic surgery has a significant impact on the child's and the family's psychosocial functioning and quality of life^[20]. When it is discovered that parents may be exhibiting anxiety and/or depressive symptoms, they should be chosen for a diagnosis and confirmation, which is also of positive significance for further treatment of children.

Numerous dermatology, psychiatry, rheumatology, osteology, nephropathy, and cancer departments use the Zung Self-Rating Anxiety/Depression Scale (SAS/SDS) and the HADS^[14,21-25].

Few studies probed and compared the use of HADS and SAS/SDS in assessing emotional problems in parents of strabismus children. In order to provide a reference for future clinical investigations of patients' parents' psychological issues, the aim of this study was to assess anxiety and depression in parents of Chinese children with strabismus by using two scales, HADS and SAS/SDS, as well as to compare the correlation between these two scales and patients' clinical signs.

Method

Participants

The aims of the study were explained to each participant. The study was conducted on parents of strabismus children (<14 years of age) in the in-patient department of ** Hospital, who were ready for strabismic surgeries on the next day. Physical and mental conditions that interfered with the participants' ability to respond to the scales were among the exclusion criteria.

Data were collected on demographic characteristics, clinical data, and psychosocial measures. The clinical data include the type of strabismus, prior ocular history, the size and direction of the deviation, binocular visual function, and previous history of strabismus surgery. Prism cover test, and an alternative cover test were used to determine deviation and angle of strabismus.

All processes were carried out in accordance with the applicable norms and legislation. Ethics approval for this research was granted by the Medical Ethics Committee of ** Hospital(#2022050). Consent from participants was collected and all subjects provided consent to share their information for research purposes.

Instruments

HADS (Hospital Anxiety and Depression Scale). A 14-item scale is divided into anxiety and depression subscales of 7 items each (even for depression and odd for anxiety). Each item is graded on a Likert scale of 0 to 3, with higher scores indicating more severe anxiety and despair. The combined HADS-A and HADS-D scores ranged from 0 to 21. HADS anxiety was defined as a HADS-A score [?] 8, and HADS depression was defined as a HADS-D score [?] 8. Anxiety and depression severity was further graded as follows: (1) mild, 8-10; (2) moderate, 11-14; and (3) severe, 15-21 [26].

The combined Zung SAS and SDS scores ranged from 0 to 100, and the Zung SAS score [?] 50 was considered to indicate SAS anxiety, while the Zung SDS score [?] 50 indicated SAD depression. Gradings for the intensity of anxiety and depression were mild (50-59), moderate (60-69), and severe (70-100) [27,28]. After thoroughly learning the contents of the scales, the participants would independently complete the HADS and SAS/SDS self-reports. The HADS and SAS/SDS scores would then be calculated and recorded by the nurses who were blind to the design of the study.

Results

Patient and parents' general characteristics

220 parents of strabismic children participated in this study. All participants were adults, aged 24 to 62 (36.07 ± 6.04) years. 77.72% (171/220) of the subjects were females. Most families were in urban (146/220, 66.36%), while the rest were in rural (74/220, 33.63%). In terms of education, the majority of participants (104/220, 47.27%) possessed bachelor degrees, followed by high school diplomas (90/220, 40.91%), master degrees (14/220, 6.63%), and primary schooling (12/220, 5.45%). Most of the participants (139/220, 63.18%) were not fully understanding their children's strabismus, 35.91% (79/220) of them fully understood it, and only 0.91% (2/220) did not aware completely. Table 1 summarizes the clinical characteristics of children with strabismus.

In terms of education, the majority of participants (104/220, 47.27%) possessed bachelor degrees, followed by high school diplomas (90/220, 40.91%), master degrees (14/220, 6.63%), and primary schooling (12/220, 5.45%).

Table 1. Clinical features of strabismic patients

Patient Characteristics	No.	%(/220)
Type of Strabismus		
XT*	165	75
ET*	35	15.91
HYPT*	20	9.09
Strabismus Frequency		
Never found	33	15
<20%	62	28.18
20%~50%	84	38.18
>50%	41	18.64
Wearing Glasses		
Yes	106	48.18
No	114	51.82
Genetic history		
Yes	5	2.32
No	215	97.73
Systemic abnormality		
Yes	22	10
No	198	90

*XT: extropia; ET:esotropia; HYPT:hypertropia

Comparison of Anxiety Detection in Parents of Children with Strabismus between HADS-A and SAS

The anxiety rate measured by the HADS-A and SAS criteria in parents of children with strabismus differed significantly (21.82% vs. 12.73%, $P = 0.012$, Fig 1a), as Figure 1 illustrates. According to the HADS-A and SAS criteria, the parents who had concurrent anxiety were 77.09% and 92.86% mildly anxiety, 20.83% and 7.14% moderately anxiety, and 2.08% and 0 severely anxiety (Fig 1b). The severity of anxiety as determined by SAS criteria and HADS-A did not differ from one another (Fisher test, $P = 0.192$). According to Figure 2, 5.91% (13/220) of parents reported feeling anxiety based on both HADS-A and SAS criteria; 15.91% (35/220) reported showing anxiety based only on HADS-A criteria; 6.82% (15/220) exhibited anxiety based only on SAS criteria; and 71.36% (157/220) did not show anxiety based neither HADS-A nor SAS criteria. There was a substantial correlation (Spearman test $r = 0.468$, $P < 0.001$) between the HADS-A scores and the SAS scores (Fig 2).

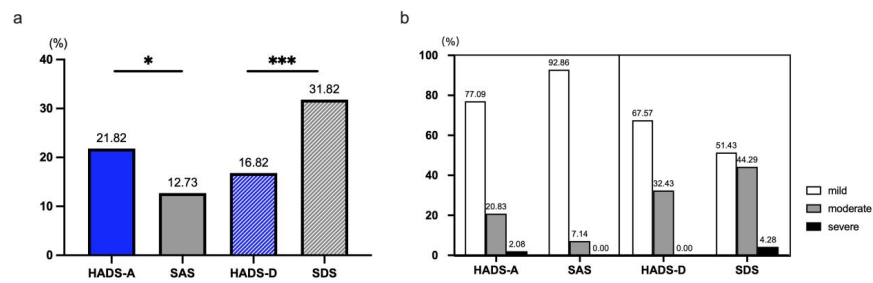


Fig. 1. Detection rate and severity of anxiety and depression in parents of children with strabismus by HADS-A and SAS, HADS-D and SDS. (a) Significant difference in detection rates between HADS-A and SAS, HADS-D and SDS was noted. (b) No discernible variation in the percentage of severity between HADS-A and SAS, HADS-D and SDS. * $P < 0.05$, *** $P < 0.01$

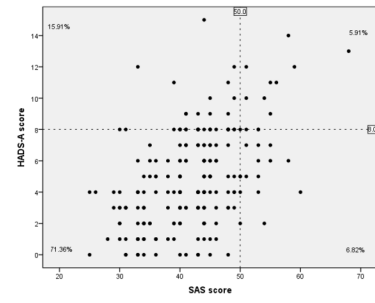


Fig. 2. Correlation of HADS-A and SAS in parents of children with strabismus. Positive correlation between the score of HADS-A and SAS was observed.

Comparison of Depression Detection in Parents of Children with Strabismus between HADS-D and SDS

Figure 1a shows that among parents of children with strabismus, the incidences of depression were significantly different by the HADS-D and SDS (16.82% vs. 31.82%, $P < 0.001$). According to HADS-D and SDS criteria, respectively, among the parents who had concomitant depression, 67.57% and 51.43% had mild depression, 32.43% and 44.29% had moderate depression, and 0 and 4.28% had severe depression (Fig 1b). The proportion of depression severities identified using the HADS-D and SDS criteria did not differ (Fisher test, $P = 0.190$).

As seen in Figure 3, 10.91% (24/220) of the patients met the criteria for depression according to both HADS-D and SDS, 5.91% (13/220) met the criteria for depression according to only HADS-D, 20.91% (46/220) met the criteria for depression according to only SDS, and 62.27% (137/220) did not show anxiety according to either HADS-A or SAS. There was a significant correlation between the HADS-D and SDS scores (Spearman test, $r = 0.523$, $P = 0.000$). (Fig 3)

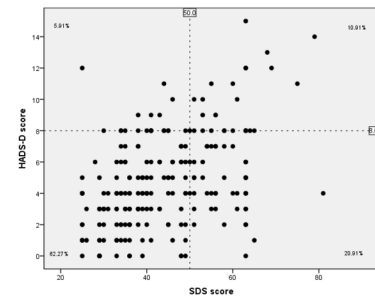


Fig.3. Correlation of SDS and HADS-D in parents of children with strabismus. A significant correlation was found between SDS and HADS-D.

Correlation between the clinical data of patients and the anxiety and depression scores assessed by the HADS-A and SAS, HADS-D and SDS in parents

As shown in Tables 2 and 3, there was no evidence of a correlation between the SAS score and HADS-A score with clinical data.

In this study, we also evaluated the correlation between the HADS-D and SDS scores and clinical information. The HADS-D score was strongly correlated with a deviation of strabismus ($P = 0.018$, Table 2), and inhabitation of the family ($P = 0.034$). Meanwhile, both HADS-D scores and SDS scores were positively associated with parental education level ($P = 0.001$, $P = 0.040$, Table 3).

Table 2. Correlation of anxiety and depression score with clinical data (continuous variables)

	HADS-A score	SAS score	HADS-D score	SDS score
Parents age				
Relative coefficient	0.013	-0.017	-0.005	-0.007
<i>P</i> value	0.851	0.802	0.942	0.914
Patients age				
Relative coefficient	-0.029	-0.001	0.065	-0.005
<i>P</i> value	0.667	0.983	0.340	0.940
Duration of strabismus				
Relative coefficient	0.080	0.066	0.102	0.099
<i>P</i> value	0.238	0.332	0.132	0.143
Deviation				
Relative coefficient	0.109	0.076	0.159	0.051
<i>P</i> value	0.106	0.259	0.018*	0.455

Correlation between the variables was found using a Spearman rank correlation. **P* less than 0.05 was regarded as significant.

Table 3. Correlation of anxiety and depression score with clinical data (discontinuous variables)

Subgroups	HADS-A score	<i>P</i> value	SAS score	<i>P</i> value	HADS-D score
Gender					
Male	5(3,7)	0.745	43 (38.5, 45)	0.722	5(3,7)
Female	4(3,7)		43 (36,46)		4(2,7)
Education level					
Primary	6.5(2.5,8)	0.649	45.5(37,50.5)	0.090	8(5.5,11)
High school	4(3,8)		44(40,46)		5(3,7)
Undergraduate	4(3,7)		40(34,45)		3(2,6)
Graduate	4.5(1.75,8.5)		42(38.25,45.75)		3(1,7)
Habitation					
Urban	4(3,7)	0.882	43(36,45)	0.641	4(2,6)
Rural	4(2,8)		42(38,48)		5(2,8.25)
Understanding of strabismus					
Fully understood	4(2,6.5)	0.471	43(36,45)	0.714	4(1,6)
Partrial understood	4(3,7)		43(36,46)		5(2,7)
Not understood	6(4,8)		44.5(43,46)		5(3,7)
Genetic history of patients					
Yes	5(2.5,7)	0.830	43(36,46)	0.839	4(1,7.5)
No	4(3,7)		40(34.5,49)		4(2,7)
Type of Strabismus					

Subgroups	HADS-A score	<i>P</i> value	SAS score	<i>P</i> value	HADS-D score
XT	4(3,7)	0.504	43(36,46)	0.464	4(2,7)
ET	4(2,7.25)		40.5(34,45.25)		3.5(1.75,7)
HYPT	4(1,7)		43(40,44)		5(2,6)
Systemic abnormality of patients					
Yes	5(3,7)	0.204	43(35.5,47)	0.676	5(3,7)
No	4(2,7)		43(36,46)		4(2,7)
History of wearing glasses of patients					
Yes	4(3,7.25)	0.534	43(39,45)	0.908	5(2,7)
No	4(2,7)		43(35,46)		4(2,6)
Amblyopia					
Yes	5(3,7)	0.329	44(41,48)	0.114	4(2,8)
No	4(3,7)		43(36,45.5)		4(2,7)
Frequency of strabismus					
None	4(3,5)	0.378	43(37,45.5)	0.541	5(2,6.5)
<20%,	5(3,7)		43(38.5,46)		5(2,7)
20%-50%,	4(2,8)		41(35,45)		4(2,7)
>50%	4(2.5,7.5)		44(35,46)		5(2,7)
Titmus(arc/second)					
None	5(2.5,7)	0.993	43(36,45.5)	0.554	4(2,7)
800-3000	4(2.75,7)		44(42.5,48.25)		4(2,7.75)
400-800	4(3,5.75)		43(34,49.25)		3(1,5.25)
100-400	4(2,7)		41(35,46)		4(2,7)
40-100	4(3,7)		42(38,45)		5(2,7)
Operation frequency					
1	2(4,7)	0.489	43(36,46)	0.839	4(3,7)
2	5(3,6)		43(34,46)		5(3,6)
3	1(0,2)		39.5(36,43)		2.5(1,4)

The median (25th to 75th percentile) is used to represent the data. Mann-Whitney U test was used to compare two individuals groups. Kruskal-Wallis H rank-sum test was used to compare three or more individual groups. * $P < 0.05$, *** $P < 0.01$ were considered significant.

Time consumption between HADS and Zung SAS/SDS

HADS took 2.54 ± 1.45 minutes on average, which was less than Zung SAS/SDS (7.25 ± 4.13 minutes) ($P < .0001$) (Fig. 4).

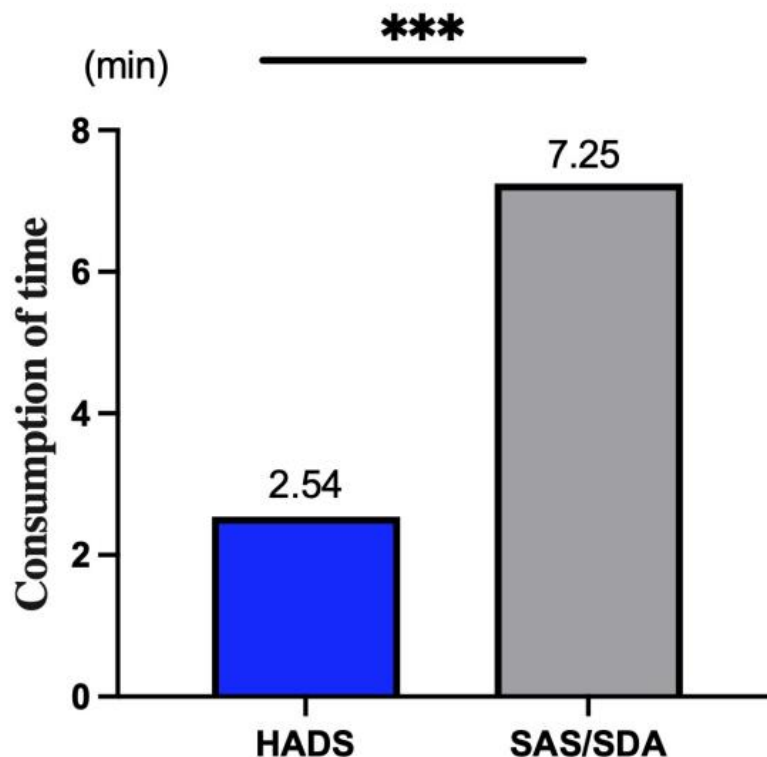


Fig.4. HADS and SAS/SDS assessment time spent by parents of children with strabismus. Compared to SAS/SDS, HADS required less time for assessment. *** $P < 0.01$ was considered significant.

Discussion

In recent years, the psychological state of children with strabismus and their families has been followed with interest increasingly. According to a series of studies, parents of children who have intermittent exotropia (IXT) show a clear predisposition toward psychological suffering based on their anxiety and depressive symptoms. Since more than 90% of IXT patients exhibit a decline in their mental health, the parents are genuinely worried about their children^[20]. Successful strabismus surgery has a positive impact on children's and their families' psycho-social functioning, particularly anxiety, and quality of life.

In clinical practice, clinical evaluation by psychologist is still the standard method for diagnosing anxiety and depression; however, self-report tests like the HADS and SAS/SDS are commonly used for screening and measuring anxiety and depression as well. The HADS scale is a self-report questionnaire that is used to investigate how mood disorders, particularly anxiety and depression, contribute to suffering within the context of medicine practice. The scale was originally developed for use in a hospital setting, though it is now widely used across all settings, including screening in families of patients with diseases^[29]. Another technique for determining a patient's anxiety or depression levels when they exhibit symptoms connected to either condition is SAS/SDS. The 20-item of SAS and SDS scales evaluate how severe a patient's depression symptoms have been over the past week.

According to a prior study, based on HADS criteria, anxiety and depression are diagnosed in 24% and 11% of adult strabismus patients, respectively^[30]. This coincidentally aligns with our findings regarding parents of strabismus-affected children (positive rates of anxiety and depression were 21.82% and 16.82%, respectively), who in this study reported clinical levels of anxiety and depression—roughly ten times higher than those in the general population^[31]. The anxiety rate by HADS-A was higher than that by SAS, and the depression detection rate by HADS-D was lower than that of SDS in our study, based on the HADS and SAS/SDS

criteria. Compared with SAS, which aims to assess the psychological status of patients in the recent week, the higher detection rate of anxiety by HADS-A might be related to the fact that HADS-A is immediately affected by children's hospitalization. We reasoned that the increased number of questions in the SDS from different perspectives and the tendency for the SDS scores to produce more depression patients could be the cause of the increasing risk of depression.

Although there were significant differences in detection rates between HADS-A and SAS and between HADS-D and SDS, there was no difference in anxiety/depression severity detected by the two scales. In addition, correlation analysis revealed that HADS-A and SAS were of good consistency in anxiety detection and HADS-D was consistent with SDS in detecting depression. Meanwhile, both clinical anxiety and depression detected by HADS-A and SAS, HADS-D and SDS in our study were experienced by 5.91% (13/220), and 10.91%(24/220) of patients, respectively. If these individuals had been examined by a mental health professional, they would likely they would have been diagnosed with an identifiable psychiatric disorder. We suggested that HADS and SAS/SDS were of value in assessing anxiety and depression in parents of children with patients, because both scales assessed depressive symptoms including emotional, cognitive, and behavioral symptoms, and were reliable measurements clinically in consensus.

Despite the fact that there were notable variations in the detection rates between HADS-A and SAS and between HADS-D and SDS, the two measures did not differ in the severity of anxiety or depression they detected. Furthermore, correlation analysis demonstrated strong consistency between HADS-A and SAS in recognising anxiety and consistency between HADS-D and SDS in detecting depression. In the meantime, 5.91% (13/220) and 10.91% (24/220) of patients in our study, respectively, reported having clinical anxiety and depression as determined by HADS-A and SAS, HADS-D and SDS. These people probably would have received a diagnosis of a recognised psychiatric condition if they had undergone a mental health examination. Since both scales assessed depressed symptoms, including emotional, cognitive, and behavioral symptoms, and were widely agreed to be accurate clinical measurements, we proposed that they were useful in evaluating anxiety and depression in parents of patients.

Further, HADS showed a stronger correlation with patients' clinical data compared to SAS/SDS. Our research revealed a positive correlation between HADS-D and strabismus deviation in patients, parental education, and place of residence (urban vs. rural). With the increasing deviation angles, the status of ocular misalignment aggravates and the patient's appearance becomes more obvious. Consequently, parents' concerns and psychological distress symptoms will worsen as depression progresses. Prior research has also shown comparable results [32, 33]. Additionally, the parents of children with strabismus with depression have low educational levels and live in rural areas in our study. We consider the low level of education and the lack of rich medical resources in rural areas in China contribute to people's perceptions of their condition's visibility as well as their lack of social support and comprehension of strabismus.

Additionally, the HADS assessment took less time than the SAS/SDS assessment, which was in line with the earlier data^[34]. This was a result of the questionnaire's length, topic, and scoring methodology. An example of a chronic condition is strabismus, which may require both pre- and post-operative follow-up visits. The HADS's quicker assessment time reduced the amount of time needed for each follow-up, which would encourage family members to cooperate more. In light of this, we propose that HADS is more appropriate and acceptable in clinics. However, more research is required to determine whether HADS is superior to SAS/SDS for assessing anxiety and depression.

The current study had some limitations: (1) it was a single-center clinical study, which could have a selection bias due to the region restriction; and (2) it was a cross-sectional study without follow-up, so we were unable to assess the long-term utility of using these two types of scales to assess anxiety and depression.

To sum up, in order to enhance the results of strabismus surgery, it is critical to identify the parents of strabismus-affected children who are enduring severe psychosocial suffering and to evaluate their expectations following surgery. For the assessment of anxiety and depression in parents of children with strabismus, HADS may be a practical and effective choice.

Reference

1. Chen X, Fu Z, Yu J, et al. Prevalence of amblyopia and strabismus in Eastern China: results from screening of preschool children aged 36-72 months. *Br J Ophthalmol*. 2016;100:515–519. doi:10.1136/bjophthalmol-2015-306999.
2. Matsuo T, Matsuo C, Matsuoka H, Kio K. Detection of strabismus and amblyopia in 1.5- and 3-year-old children by a preschool vision-screening program in Japan. *Acta Med Okayama*. 2007;61:9-16. doi:10.18926/AMO/32910
3. Noche CD, Kagmeni G, Bella AL, Epee E. Prévalence et étiologies de l'amblyopie chez l'enfant camerounais de 5 à 15 ans à Yaoundé [Prevalence and etiology of amblyopia of children in Yaoundé (Cameroon), aged 5-15 years]. *Sante*. 2011;21:159-164. doi:10.1684/san.2011.0254
4. Monaco A, Spadaro A, Sgolastra F, Petrucci A, D'Andrea PD, Gatto R. Prevalence of hyperopia and strabismus in a paediatric population with malocclusions. *Eur J Paediatr Dent*. 2011;12:272-274.
5. Sherpa D, Panta CR, Joshi N. Ocular morbidity among primary school children of Dhulikhel, Nepal. *Nepal J Ophthalmol*. 2011;3:172-176. doi:10.3126/nepjoph.v3i2.5272
6. Chia A, Dirani M, Chan YH, et al. Prevalence of amblyopia and strabismus in young singaporean chinese children. *Invest Ophthalmol Vis Sci*. 2010;51:3411-3417. doi:10.1167/iovs.09-4461.
7. Beauchamp GR, Black BC, Coats DK, et al. The management of strabismus in adults—I. Clinical characteristics and treatment. *J AAPOS*. 2003;7:233-240. doi:10.1016/s1091-8531(03)00112-5.
8. Ribeiro Gde B, Bach AG, Faria CM, Anastásia S, Almeida HC. Quality of life of patients with strabismus. *Arq Bras Oftalmol*. 2014;77:110-113. doi:10.5935/0004-2749.20140027.
9. Bez Y, Coşkun E, Erol K, et al. Adult strabismus and social phobia: a case-controlled study. *J AAPOS*. 2009;13:249-252. doi:10.1016/j.jaapos.2009.02.010.
10. Mojon-Azzi SM, Mojon DS. Strabismus and employment: the opinion of headhunters. *Acta Ophthalmol*. 2009;87:784-788. doi:10.1111/j.1755-3768.2008.01352.x
11. Mojon-Azzi SM, Kunz A, Mojon DS. Strabismus and discrimination in children: are children with strabismus invited to fewer birthday parties?. *Br J Ophthalmol*. 2011;95:473-476. doi:10.1136/bjo.2010.185793.
12. McBain HB, Au CK, Hancox J, et al. The impact of strabismus on quality of life in adults with and without diplopia: a systematic review. *Surv Ophthalmol*. 2014;59:185-191. doi:10.1016/j.survophthal.2013.04.001.
1. Yue T, Li Q, Wang R, Liu Z, Guo M, Bai F, Zhang Z, Wang W, Cheng Y, Wang H. Comparison of Hospital Anxiety and Depression Scale (HADS) and Zung Self-Rating Anxiety/Depression Scale (SAS/SDS) in Evaluating Anxiety and Depression in Patients with Psoriatic Arthritis. *Dermatology*. 2020;236(2):170-178. doi: 10.1159/000498848. Epub 2019 Aug 21. PMID: 31434087.
2. Brennan C, Worrall-Davies A, McMillan D, Gilbody S, House A. The Hospital Anxiety and Depression Scale: a diagnostic meta-analysis of case-finding ability. *J Psychosom Res*. 2010;69:371-378. doi:10.1016/j.jpsychores.2010.04.006
3. Mao D, Lin J, Chen L, Luo J, Yan J. Health-related quality of life and anxiety associated with childhood intermittent exotropia before and after surgical correction. *BMC Ophthalmol*. 2021;21:270. Published 2021 Jun 30. doi:10.1186/s12886-021-02027-w
4. Hatt SR, Leske DA, Adams WE, Kirgis PA, Bradley EA, Holmes JM. Quality of life in intermittent exotropia: child and parent concerns. *Arch Ophthalmol*. 2008;126:1525-1529. doi:10.1001/archophth.126.11.1525
5. Hatt SR, Leske DA, Yamada T, Bradley EA, Cole SR, Holmes JM. Development and initial validation of quality-of-life questionnaires for intermittent exotropia. *Ophthalmology*. 2010;117:163-168.e1. doi:10.1016/j.opthta.2009.06.038
6. Yamada T, Hatt SR, Leske DA, Holmes JM. Health-related quality of life in parents of children with intermittent exotropia. *J AAPOS*. 2011;15:135-139. doi:10.1016/j.jaapos.2010.11.020
7. Temeltürk RD, Koçer AM, Yaşar HH. Psychosocial Improvements in Children and Their Par-

- ents Following Strabismus Surgery. *J Pediatr Ophthalmol Strabismus*. 2022;59:261-268. doi:10.3928/01913913-20211130-02.
8. Knight RG, Waal-Manning HJ, Spears GF. Some norms and reliability data for the State-Trait Anxiety Inventory and the Zung Self-Rating Depression scale. *Br J Clin Psychol*. 1983;22 (Pt 4):245-249. doi:10.1111/j.2044-8260.1983.tb00610.x
9. Hartung TJ, Friedrich M, Johansen C, et al. The Hospital Anxiety and Depression Scale (HADS) and the 9-item Patient Health Questionnaire (PHQ-9) as screening instruments for depression in patients with cancer. *Cancer*. 2017;123:4236-4243. doi:10.1002/cncr.30846
10. Macêdo EA, Appenzeller S, Costallat LTL. Depression in systemic lupus erythematosus: gender differences in the performance of the Beck Depression Inventory (BDI), Center for Epidemiologic Studies Depression Scale (CES-D), and Hospital Anxiety and Depression Scale (HADS). *Lupus*. 2018;27:179-189. doi:10.1177/0961203317713142
11. Pallant JF, Tennant A. An introduction to the Rasch measurement model: an example using the Hospital Anxiety and Depression Scale (HADS). *Br J Clin Psychol*. 2007;46(Pt 1):1-18. doi:10.1348/014466506x96931
12. Broschewitz J, Wiltberger G, Krezdorn N, et al. Primary liver transplantation and liver retransplantation: comparison of health-related quality of life and mental status - a cross-sectional study. *Health Qual Life Outcomes*. 2017;15:147. Published 2017 Jul 21. doi:10.1186/s12955-017-0723-8
13. Zigmond AS, Snaith RP. The hospital anxiety and depression scale. *Acta Psychiatr Scand*. 1983;67:361-370. doi:10.1111/j.1600-0447.1983.tb09716.x
14. Gainotti G, Cianchetti C, Taramelli M, Tiacci C. The guided self-rating anxiety-depression scale for use in clinical psychopharmacology. *Act Nerv Super (Praha)*. 1972;14:49-51.
15. Zung WW, Ganturco JA. Personality dimension and the Self-Rating Depression Scale. *J Clin Psychol*. 1971;27:247-248. doi:10.1002/1097-4679(197104)27:2<247::aid-jclp2270270230>3.0.co;2-6
16. Bjelland I, Dahl AA, Haug TT, Neckelmann D. The validity of the Hospital Anxiety and Depression Scale. An updated literature review. *J Psychosom Res*. 2002;52:69-77. doi:10.1016/s0022-3999(01)00296-3
17. Lee YH, Repka MX, Borlik MF, et al. Association of Strabismus With Mood Disorders, Schizophrenia, and Anxiety Disorders Among Children. *JAMA Ophthalmol*. 2022;140(4):373-381. doi:10.1001/jamaophthalmol.2022.0137
18. Cumurcu T, Cumurcu BE, Ozcan O, et al. Reprint of: Social phobia and other psychiatric problems in children with strabismus. *Can J Ophthalmol*. 2015;50 Suppl 1:S7-S11. doi:10.1016/j.jcjo.2015.04.002
19. Alpak G, Coskun E, Erbagci I, et al. Effects of corrective surgery on social phobia, psychological distress, disease-related disability and quality of life in adult strabismus patients. *Br J Ophthalmol*. 2014;98:876-879. doi:10.1136/bjophthalmol-2014-304888
20. McBain HB, MacKenzie KA, Au C, et al. Factors associated with quality of life and mood in adults with strabismus. *Br J Ophthalmol*. 2014;98:550-555. doi:10.1136/bjophthalmol-2013-304220
21. Adams GG, McBain H, MacKenzie K, Hancox J, Ezra DG, Newman SP. Is strabismus the only problem? Psychological issues surrounding strabismus surgery. *J AAPOS*. 2016;20:383-386. doi:10.1016/j.jaapos.2016.07.221