

Psychological impacts on parents of children with strabismus in Baghdad: A cross-sectional study at Ibn Al-Haitham Eyes Teaching Hospital, 2023

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ABSTRACT

Introduction: Strabismus, a common visual disorder marked by eye misalignment, can severely affect visual functioning. Beyond functional implications, strabismus has a notable psychological impact on both children and their parents, with effects that vary according to socio-cultural and economic factors.

Objective: This study aims to evaluate the psychological burden experienced by parents of children with strabismus in Baghdad and analyse its associations with sociodemographic factors.

Methods: An analytic cross-sectional study was conducted involving 400 parents of children aged 6–18 years who attended the paediatrics and strabismus outpatient clinic at Ibn Al-Haitham Eye Teaching Hospital in Baghdad from the 1st of April to the 31st of December, 2023.

Results: Among the 400 children, 249 (62.3%) were over six years old, and 210 (52.5%) were female. The mean psychological impact score was 39.36 ± 9.8 , with 59% of parents showing a moderate level of psychological distress.

Conclusion: Mothers and those with a diploma-level education experienced higher psychological impacts. Additionally, higher psychological impact scores were noted among parents who perceived strabismus as treatable, had prior clinic visits, or had visited private clinics.

Key words: Strabismus, psychological impact, pediatric ophthalmology, children, squint.

INTRODUCTION

Ophthalmic disorders may be caused by factors operating during prenatal, neonatal and childhood periods. It may seriously affect a child's development, education, future work, opportunities and quality of life.^[1]

Strabismus, commonly known as a squint, is characterised by misalignment of the eyes, which may significantly affect visual function. It may deviate the eyes inwards, outwards, upwards or downwards, alternate in different directions or be intermittent, visible (tropia) or non-visible (phoria).^[2,3]

Screening for eye problems is essential in

children to detect problems early and secure effective treatment. Major causes of squint in children vary worldwide, with 60-70% being avoidable and/or treatable.^[4]

Psychosocially, individuals with strabismus might have trouble in interactions and interpersonal relationships or feel general embarrassment due to the condition. Feelings of social phobia, anxiety, avoidance and depression have also been reported.^[5-7] The psychosocial impact definitely affects children and their parents but variably depends on the socio-cultural-economic milieu. Seeking treatment by the parents depends on their



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knowledge about the problem acquired through the social environment, information technology, and local physicians.^[8]

The rationale for choosing this topic is that despite the global prevalence of strabismus and its well-documented effects, there is limited evidence focusing on the Iraqi pediatric population. This gap highlights a significant area for further investigation to understand the implications of strabismus within this context. Besides, the effective management of strabismus improves the child's visual outcomes and enhances their social interactions and academic performance, which in turn provides emotional relief to parents. Furthermore, timely intervention can prevent long-term complications, fostering a sense of reassurance and confidence in parents regarding their child's overall development.

This study is designed to assess the psychological challenges faced by parents of children with strabismus in Baghdad and to find the association of sociodemographic variables with some variables related to the child and his parents by using a direct interviewer questionnaire.

METHODS

Study design and setting: Setting and study design: A descriptive cross-sectional study with some analytic elements was conducted at the strabismus outpatient unit for children, Ibn Al-Haitham Eye Teaching Hospital in Baghdad, from the 1st of April to the 31st of December, 2023.

Ethical consideration: The research ethics committees of the Scientific Council of the Family and Community Medicine/ Iraqi Board for Medical Specializations and the Al-Rasafa Health Directorate approved the proposal for this study. Agreement was taken from the administration of Ibn Al-Haitham Eye Teaching Hospital to implement the study at the hospital and use study-relevant resources. Verbal consent was taken from each participant after explaining the aims of this study. The confidentiality of the data was secured during

all stages of the study.

Inclusion and exclusion criteria: We included parents of children aged 6 months to 18 years who were diagnosed with strabismus by expert ophthalmologists using a cover test ^[9] and visited the outpatient unit during the study period. We excluded parents who refused to participate and parents of children who have complex eye problems in addition to strabismus like a lenticular abnormality, intra-ocular tumour, complicated glaucoma, retinal detachment, etc.

Sampling: We conveniently selected 400 parents according to the abovementioned inclusion criteria by attending the Strabismus outpatient unit for children two to three days a week.

Tools of the study: Data was collected using a direct interviewer questionnaire. Each questionnaire form took about 10-15 minutes and was filled by authors based on data taken from the parents. The scientific data were retrieved from the patient's medical records or the treating ophthalmologist on the interview day. The psychological and social challenges have been assessed using a validated 12-item questionnaire.^[10]

The data for this research was collected through direct interviews conducted by the authors with the parents of the children selected. During the interview, we explained the questions in Arabic to the parents and gathered information based on their responses. The authors tried to be impartial in writing the parents' responses and did not direct the answers against the parents' wishes.

The questionnaire was translated into Arabic by linguistic experts, ensuring both the accuracy and cultural relevance of the translated content. A pilot study was conducted on forty participants in the Strabismus outpatient unit for children of the Ibn Al-Haitham Eye Teaching Hospital in Baghdad to test the tool of the study. The purposes of the pilot were to assess the tool's applicability, find difficult or unclear questions, and explore any administrative or technical obstacles. After the pilot study, no

major changes were made to the study tool. The participants involved in the pilot study were excluded from the study's final analysis.

The questionnaire contained three parts. Part one included questions about the sociodemographic characteristics of the children and their parents like The child's age at the interview and at the time of the diagnosis, the child's sex, the duration of having the squint, which one of the parents answered the questionnaire and what was the parent level of education.

Part two included questions about the characteristics of the strabismus like the type of strabismus, its nature, improvement in wearing glasses as defined by expert ophthalmologists, who first noticed the presence of strabismus in the child before the diagnosis, and the parents thought about whether strabismus is treatable or not. To complete this part, the following definitions were used:

- Esotropia: A type of strabismus (eye misalignment) where one or both eyes turn inward toward the nose.
- Exotropia: A type of strabismus where one or both eyes turn outward away from the nose.
- Constant squint: a condition where the misalignment of the eyes is present all the time. Whether it's esotropia or exotropia, if the misalignment is constant, the eyes are always in an abnormal position.
- Intermittent Squint: This is a condition where the misalignment of the eyes is not constant but occurs occasionally. For example, someone with intermittent esotropia may have one eye turn inward only at certain times, like when trying to focus on something close.
- Complete Squint Improvement: the eye misalignment has been fully corrected or resolved. The eyes are aligned properly, and there is no visible squinting or misalignment. In other words, the treatment has fully restored normal eye position and function.
- Partial Squint Improvement: This refers to

a situation where there has been some, but not total, improvement in the alignment of the eyes. The treatment has reduced the degree of misalignment, but the eyes may still show some residual squint or misalignment.

Part three included the psychological challenges parents may face. These challenges were assessed using a validated 12-item questionnaire. Parents were asked to quantify how much they agree with the following statements: You feel that your child's strabismus bothers you, you feel that other people often notice your child's strabismus when he deals with them, you feel that your child's strabismus may affect his/ her performance at school or work, you feel that your child's strabismus might limit the chances of your child to build social relationships, you feel that your child has difficulty in finding friends due to his strabismus, you feel annoyed when someone asks you about your child's condition, you feel that some people avoid looking at your child because of his/her strabismus, you feel some people stare for a long time at your child due to their strabismus, you feel that strabismus decreases your child's vision, your child has difficulty in reading because of strabismus, your child shows signs of being psychologically affected by strabismus, and you think that squint is a cosmetic stigma. Each question has a five-point Likert scale ranging from "strongly disagree", coded as 1, to "strongly agree", coded as 5. The total score for the 12 questions ranged from 12-60 points, where a higher score indicated a higher psychological impact on the respondents. We calculated the percentage of the total score as follows: Percentages = Total score/60 * 100. A percentage of less than 50% is considered a low impact, 50-75% is a fair impact, and more than 75% has a high impact. [10]

Statistical analysis: All data analyses were performed using the Statistical Package for Social Sciences, version 26. Descriptive statistics were used to describe the overall group of respondents, including numbers and percentages (categorical variables). The

Table 1 | Sociodemographic characteristics of the children and caregivers

Variables	No.	%
Child's age 'now'	6 ms – 6 yrs	160 40.0
	> 6-18 years	240 60.0
Child's sex	Male	190 47.5
	Female	210 52.5
Participants (care givers)	Father	184 46.0
	Mother	216 54.0
Child's age at diagnosed in years	≤6 Years	331 82.8
	>6 Years	69 17.3
Duration of squint	one year	63 15.8
	> one year	337 84.3
Educational level of caregivers	≤Elementary	244 61.0
	Secondary	106 26.5
	Diploma	21 5.3
	Bachelor's	29 7.2
Total	400	100

differences in the level of psychological impact among the sociodemographic and disease characteristics were determined using the Chi-square test. Two-tailed analysis with $p < 0.05$ was used as the cut-off for statistical significance. The sample size for this study was calculated using the standard equation, which is used to calculate the sample size of cross-sectional studies.^[11] The minimally needed

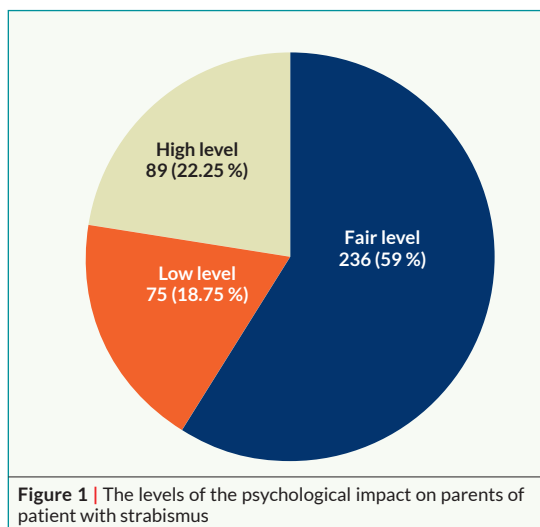


Figure 1 | The levels of the psychological impact on parents of patient with strabismus

sample was 384 subjects. By adding 5% of the calculated sample size to compensate for the non-response,^[12] the sample size became 401.

RESULTS

Of the 400 children included in the study, 240 (60.0%) were older than six years, and approximately 210 (52.5%) were females. A higher portion, specifically 216 (54.0%), of the questionnaire respondents were mothers.

Table 2 | Characteristics of the children with strabismus

Variables	No.	%
The first visit to a paediatric ophthalmology and strabismus clinic?	Yes	64 16.0
	No	336 84.0
Your last visit was to:	Public hospital	353 88.3
	Private clinic	47 11.8
Strabismus type	Esotropia	337 84.3
	Exotropia	63 15.8
Strabismus nature	Constant	88 22.0
	Intermittent	312 78.0
The child improve when wearing glasses?	Complete	6 1.5
	Partial	239 59.8
	No	155 38.8
Before the diagnosis, who noticed the presence of strabismus in your child?	Father	179 44.8
	Mother	221 55.3
Do you think that strabismus is a treatable condition	Yes	247 61.8
	No	57 14.2
	May be	96 24.0
Total	400	100

Table 3 | Association of psychological impact score with characteristics of the children with strabismus

Factors		Psychological score								P- Value
		Low		Fair		High		total		
		No.	%	No.	%	No.	%	No.	%	
Child's Sex	Male	35	18.4	111	58.4	44	23.2	190	47.5	0.916
	Female	40	19.0	125	59.5	45	21.4	210	52.5	
Child's age "at the time of the study"	≤6 Years	33	20.6	97	60.6	30	18.8	151	37.7	0.352
	>6Years	42	17.5	139	57.9	59	24.6	249	62.2	
Child's age "At the time of diagnosis"	≤6 Years	63	19.0	197	59.5	71	21.5	322	80.5	0.697
	>6 Years	12	17.4	39	56.5	18	26.1	78	19.5	
Duration of squint	One year	13	20.6	41	65.1	9	14.3	63	15.75	0.254
	> one year	62	18.4	195	57.9	80	23.7	337	84.25	

The chi-square test was used and considered significant at P <0.05

Furthermore, 331 (83.8%) reported having children aged six or younger at the time of their strabismus diagnosis. Regarding caregivers' education, 244 (61.0 %) had completed only elementary or lower. Squint persisted for over a year in 337 children, accounting for 84.3%. These details are summarised in **table 1**.

We found that 336 (84.0%) parents admitted

that this was not the first visit to the strabismus clinic, and in 353 (88.3%), the last previous visit was also to the public hospital. The most prevalent type of strabismus identified was esotropia (inward eye turning), observed in 337 cases (84.3%). Intermittent strabismus was the most common form of the condition, affecting 312 patients (78.0%). In 239 patients (59.8%),

Table 3 | Association of psychological impact score with characteristics of the children with strabismus

Factors		Psychological score								P- Value
		Low		Fair		High		total		
		No.	%	No.	%	No.	%	No.	%	
Who is the caregiver										
	Father	33	17.9	121	65.8	30	16.3	184	46	0.017
	Mother	42	19.4	115	53.2	59	27.3	216	54	
what is the caregiver's educational level										
	Elementary OR less	56	23.0	139	57.0	49	20.1	244	61	0.018
	Secondary	7	6.6	70	66.0	29	27.4	106	26.5	
	Diploma	5	23.8	10	47.6	6	28.6	21	5.2	
	Bachelor's	7	24.1	17	58.6	5	17.2	29	7.2	
Do you think that strabismus is Treatable										
	Yes	58	23.5	156	63.2	33	13.4	247	61.7	0.001
	No	11	19.3	43	75.4	3	5.3	57	14.2	
	May be	6	6.3	37	38.5	53	55.2	96	24	
Is it the first visit to a pediatric ophthalmology and strabismus clinic?										
	Yes	8	12.5	50	78.1	6	9.4	64	16	0.002
	No	67	19.9	186	55.4	83	24.7	336	84	
Your last visit was to a										
	Public hospital	68	19.3	221	62.6	64	18.1	353	88.2	0.001
	Private clinic or center	7	14.9	15	31.9	25	53.2	47	11.7	

The chi-square test was used and considered significant at P <0.05

the ophthalmologist noted partial improvement in the child's eyes using glasses. Mothers were the first to notice the squint before diagnosis in 221 cases (55.3%), and 247 respondents (61.8%) believed strabismus could be corrected and improved, See [Table 2](#).

The psychological impact score was fair in 236 (59%) participants, high in 89 (22.25%), and low in 75 (18.75%), as demonstrated in [Figure 1](#).

When evaluating the relationship between the sociodemographic characteristics of children and parents and the level of psychological impact, we found no statistically significant associations with the child's sex, age, or duration since the diagnosis of strabismus, with p-values of 0.916, 0.352, 0.697, and 0.254, respectively, See [Table 3](#).

[Table 4](#) illustrates the relationship between the psychological impact on caregivers and various parental factors. Specifically, being a mother and holding a diploma were significantly linked to the psychological impact, with p-values of 0.017 and 0.018, respectively. Additionally, the psychological impact was statistically associated with parents' understanding that strabismus is a treatable condition, making multiple visits to pediatric ophthalmology and strabismus clinics, and attending either private or public clinics, with p-values of 0.001, 0.002, and 0.001, respectively. For further details, please refer to [Table 4](#).

DISCUSSION

Strabismus in children extends beyond mere aesthetics; it is linked to abnormal binocular vision and can result in amblyopia. Studies suggest that the impact becomes even more significant when strabismus manifests early in life, influencing the quality of life for children and teenagers. It also affects the development of self-image and self-esteem.^[13]

The present study found that 210 (52%) of children were females, and 240 (60%) were above the age of six years. Silva^[14] from Portugal in 2022 and Darraj^[15] from Saudi Arabia in 2016 have supported these results. Both studies

found a trend towards female children aged more than six years, the age at which a child can recognise the interference of strabismus with the functional and psychosocial aspects of their life.^[16] Female patients had higher expectations about the role of improving appearance-related issues than did male patients.^[5]

More than half of the respondents were mothers, and 331 (82.8%) reported that the diagnosis of strabismus was made when the child was six years or younger. However, Althiabj^[10] in Saudi Arabia in 2023 revealed that mothers constitute about 32 (31%) of the questionnaire respondents and that 66 (62.9%) of children were at the age of six years or less since being diagnosed with strabismus.

The significant participation of mothers in this study can be attributed to their heightened awareness of potential eye problems in children. This knowledge likely empowers them to seek timely care and reduces their anxiety.^[17]

Children under four years use part-based processing, categorising faces based on fragmented characteristics. Therefore, younger children may not be able to realise that two eyes are not aligned,^[18] but by this age, a child starts interacting with other children of the same age and has to work under peer pressure.^[19]

About three-quarters of the children, 337 (84.3%), had squint for over a year. In terms of the parental educational level, the present study found that more than half of them completed only elementary school or lower. A study by Khudhair et al^[20] in Iraq in 2018 concluded that 36.3 % of mothers caring for children with squint graduated from secondary schools or lower. However, Dass^[21] from India in 2023 mentioned that 88 % of parents were graduates or post-graduates. This discrepancy proved that parents' educational attainment was a key factor influencing their knowledge and attitudes towards strabismus.^[8]

The current study found that the most common type of strabismus was esotropia (eye turning inward), observed in 337 cases (84.3%), and intermittent strabismus was the most frequently encountered nature of the condition,

seen in 312 cases (78.0%). This doesn't agree with the study by Alnuman^[22] in Saudi Arabia in 2021, who stated that the majority of children, 31 (44.9%), had inward squint while 24 (34.8%) had intermittent squint. These discrepancies may be linked to the data collection methods, as Alnuman utilised online data collection instead of clinical examinations, which complicates the accurate diagnosis of the types and nature of the conditions.

In the present study, more than half of the children experienced partial improvement in their condition when wearing glasses. Notably, half of the mothers were the first person to notice the presence of strabismus in their children before the diagnosis. Althiabi et al.^[10] found that improvement in wearing glasses occurred in 44.8 % of his sample, and the mothers were mainly the first to notice strabismus in their children before the diagnosis. Some participants harboured the mistaken belief that regular eyeglass use could lead to impaired vision. Additionally, most respondents expressed concern about the stigma associated with wearing glasses.^[23]

This study observed that 247 (61.8%) respondents held the belief that strabismus would be corrected and improved; this finding aligned with that of Althiabi^[10] from Saudi Arabia, who reported this in 81 (77.1%) respondents.

The present study explored the psychological difficulties faced by parents of children with strabismus. The findings, obtained through a 12-item questionnaire, revealed an overall psychological impact score of 39.36 ± 9.8 out of 60 points. Based on the designated criteria, the majority, 236 (59%), fell into the category of a fair psychological impact, 89 (22.25%) as high, and 75 (18.75%) as a low impact level. According to the study by Althiabi et al.,^[10] the overall mean psychological impact score was 36.2 ± 8.15 , with 62.9% categorised as having a fair impact, 17.1% high, and 20% as low psychological impact levels.

No significant association was observed between the level of impact and the age of

children during the study and the duration since the diagnosis of strabismus. Kothari^[19] from India, in 2009, also reported no significant psychosocial impact of childhood strabismus with age, and he only confirmed that children could perceive an abnormality in their appearance. Additionally, if they experience any handicap or cosmetic deformity at an early age, it could negatively impact them with various psychosocial and emotional changes.^[24] Therefore, Kothari et al.^[19] suggested that intervention to correct strabismus should ideally occur before the age of four years.

The results showed that being a mother and having a diploma as an educational level were significantly related to a high level of impact on the parents; this outcome is similar to that of Singh^[8] in India in 2017, who found that education level has a significant impact on knowledge and attitude of parents toward strabismus. This correlation may be attributed to the close and substantial connection between the psychological stress faced by children with strabismus and their parents and the educational and awareness levels of the parents. It was observed that more educated parents were less severely affected by the social stigma associated with their children being strabismic.^[8]

The current study showed a significant association between the high level of psychological impact and parental thinking that strabismus may be treatable, visiting the strabismus outpatient clinic for children more than one time and visiting a private hospital on their last visits. In contrast, a study by Althiabi et al.^[10] demonstrated no significant association between the psychological impact score and participants' thoughts concerning whether strabismus is treatable and visiting a strabismus outpatient unit for children. Althiabi study observed only a significant association with the last visit to a governmental hospital; this controversy could be related to the differences in awareness related to the complications of the untreated child with strabismus.

This study has limitations during data collection; the parents did not give the real

answers to some questions, either due to their denial to show their neglect or low awareness towards psychological feelings concerning their children.

CONCLUSION

Being a mother and having a diploma degree were related to a high level of impact. The responders who think that strabismus may be treatable had a high level of psychological impact. The high level of psychological impact was also associated with the responders who visited the paediatric ophthalmology and strabismus clinic not for the first time and for those who visited a private clinic.

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