International Journal of Innovative Research and Scientific Studies, 8(4) 2025, pages: 240-250

IJIRSS
International Journal of Innovative Research & Scientific Studies

ISSN: 2617-6548

URL: www.ijirss.com

The impact of childhood amblyopia on the quality of life of pediatric population at King Abdulaziz medical city in Jeddah, Saudi Arabia

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Abstract

To measure the quality of life in the pediatric population with amblyopia at National Guard Health Affairs Jeddah, Saudi Arabia, our study used a non-probability consecutive sampling technique. Participants' eligibility criteria included amblyopic patients within the pediatric age group. Patients' contact information was collected from medical records in King Abdulaziz Medical City, National Guard Health Affairs, Jeddah, Saudi Arabia. Phone calls were utilized to contact the patients' guardians and to complete the questionnaires. Data was pooled in a spreadsheet and analyzed using SPSS v.26.0. Categorical data were described using frequency and percentages. Likert-scale questions were described using frequency and percentages along with mean and standard deviation. Reliability analysis was done for each domain to calculate Cronbach's alpha. The Statistical Package for Social Sciences (SPSS) version 26.00 was used for the analysis. Sixty participants were included in this study; almost half of the children had struggles in seeing moving objects, which resulted in 35% having difficulties catching a moving object while playing, observing pictures and words, and learning new things at school. There was a non-negligible percentage who had missing days of school attendance due to vision issues and clinic appointments. Cronbach's alpha was calculated for all of the domains; most of the values were above 0.8, with some of the values reaching above 0.9, indicating good to excellent internal consistency. The study concluded that amblyopia has a huge effect on children's quality of life and their families. A limited number of papers pertaining to the prevalence, impact, and quality of life of patients affected by amblyopia are available in Saudi Arabia. Therefore, more studies are recommended to tackle the same topic and to make it feasible to generalize the results in Saudi Arabia, yielding a more accurate conclusion.

Keywords: Amblyopia, Pediatric, Quality of life, Saudi Arabia, Visual impairment.

DOI: 10.53894/ijirss.v8i4.7775
Funding: This study received no specific financial support.
History: Received: 2 May 2025 / **Revised:** 5 June 2025 / **Accepted:** 6 June 2025 / **Published:** 12 June 2025

Competing Interests: The authors declare that they have no competing interests.

Authors' Contributions: All authors contributed equally to the conception and design of the study. All authors have read and agreed to the published version of the manuscript.
Transparency: The authors confirm that the manuscript is an honest, accurate, and transparent account of the study; that no vital features of the study have been omitted; and that any discrepancies from the study as planned have been explained. This study followed all ethical practices during writing.
Publisher: Innovative Research Publishing

1. Introduction

Amblyopia is a clinical condition of reduced visual acuity that occurs due to an error in refraction or any ocular abnormality, either unilaterally or bilaterally. The term amblyopia originated from the Greek word "Amblyos," meaning blunt vision. According to the American Academy of Ophthalmology, a corrected visual acuity of 20/30 or worse, or a two-line difference between both eyes on the visual acuity table, is considered significant [1, 2]. A global meta-analysis, which included 60 studies, defined the prevalence of amblyopia between 1% to 4%, varying across different continents [3].

In Saudi Arabia, no available study has reported the national prevalence. However, different regions have conducted small population-based studies in an attempt to estimate the number of cases. Prevalence rates fluctuate across different regions in the kingdom: 1.3% in Jeddah, 1.9% in Abha, 2.6% in Riyadh, and 3.9% in Qassim [4-7]. Individuals' well-being, which affects the health of their daily life, is defined as health-related quality of life (HRQOL). For example, individuals' satisfaction regarding health condition and the nature of care that is directed towards their illness [8]. Activity limitation and vision-related quality of life were significantly impaired in amblyopic children according to a number of studies. The presence of strabismus, reading difficulties, and poor near-vision were the main reasons behind parental concern.

Thus, this study was formulated to measure the quality of life in the pediatric population with amblyopia in Saudi Arabia. In addition, it aims to contribute to the literature and the published research that has been conducted in the field of amblyopia in Saudi Arabia. Furthermore, this would increase the level of awareness regarding this disease. Finally, based on the current knowledge, a limited number of studies are available in Saudi Arabia that focus on measuring the quality of life in this group of patients.

2. Methods

The study was conducted at the National Guard Hospital in Saudi Arabia, Jeddah. The study enrolled pediatric patients who were treated at the previously mentioned institution. The included age group ranged from 0 to 18 years, with a history of clinical diagnosis of amblyopia. The patients had to be registered in the best care system from its start in May 2016. The study excluded patients of higher age groups or those with uncertain diagnoses. The type of study used in this research is cross-sectional. The sample size includes all possible documented participants, of which there are 60 patients who fulfilled the criteria in total. This sample was collected through non-probability consecutive sampling methods.

Children's vision-related quality of life questionnaire parental report highlights different dimensions in a 43-item format. The scales are concerned with demographic information, overall appearance, social life, visual function, physical activity, behavior, and school performance. An available validated Arabic version was used. The questionnaire was completed through phone calls, and the phone numbers were obtained from the best care system, which is the medical record system utilized in this hospital. There are three response options in the general treatment information section, including: Yes, No, and sometimes. For the other sections, there are five categories to answer each question. These categories are: not at all, a little, moderately, a lot, and extremely, which is intended to measure the parent/caregiver's response. The parent/caregiver is required to respond to the question by circling one answer from the five categories that matches his/her feelings.

Categorical data were described using frequencies and percentages. Likert-scale questions were described using frequencies and percentages along with means and standard deviations. Reliability analysis was conducted for each domain to calculate Cronbach's alpha. The Statistical Package for Social Sciences (SPSS) version 26.00 was used for the analysis.

3. Results

The total participants who were included in the study are 60 candidates. Table 1 demonstrates the general description and demographics of the guardians. These involve the gender of the guardians who attended the clinics with the children, their age, educational backgrounds, the area in which the family lives, family income, the number of people living in the same household, and which adult the child lives with in the house Table 2 described the perceived appearance of the child to their parents and to themselves. Table 3 addresses the social life of the enrolled children and their interactions with their peers. It answers two of the most important questions, which are the acknowledgment of abnormality in regard to someone's own eyes and the acceptance of those children among their peers.

Table 1.
General description and demographics.

Variables	Total participants (n=60)
Attend the clinic with the child	
Mother	27 (45)
Father	32 (53.3)
Both parents	1 (1.7)
Mother / Female Guardian's age	
21 – 30 years	9 (15)
31 – 40 years	32 (53.3)
41 – 50 years	16 (26.7)
Over 50 years	3 (5)
Father / Male Guardian's age	
21 – 30 years	1 (1.7)
31 – 40 years	23 (38.3)
41 – 50 years	25 (41.7)
Over 50 years	11 (18.3)
Mother/ Female/Guardian Educational background	
Primary or no schooling	7 (11.7)
Intermediate	7 (11.7)
Secondary	27 (45)
University/college or higher	19 (31.7)
Father/ Male/Guardian Educational background	
Primary or no schooling	7 (11.7)
Intermediate	6 (10)
Secondary	26(43.3)
University/college or higher	21(35)
Area in which the child lives	
Rural	9 (15)
Urban	1 (51)
Family income	
Less than 5000 SR	7 (11.7)
Between 5000 - 10000 SR	31 (51.7)
Between 10000 - 15000 SR	8 (13.3)
Between 15000 - 20000 SR	9 (15)
More than 20000 SR	5 (8.3)
Number of people living with the child at home	
2 - 3	15 (25)
4 – 5	18 (30)
6 – 7	17 (28.3)
>7	10 (16.7)
Which adult does the child live with?	
Mother	2 (3.3)
Father	1 (1.7)
Both parents/ Guardians	57 (95)

Table 2.
Overall and appearance.

Variables	Total participants (n=60)	
	(%)	Likert-scale Mean (±SD)
Feeling the child is happy		3.38 (±0.99)
-Not at all	1 (1.7)	
-A little	11 (18.3)	
-Medium	20 (33.3)	
-A lot	20 (33.3)	
- Extremely	8 (13.3)	
Feeling the child is good-looking		3.17 (±0.91)
-Not at all	2 (3.3)	
-A little	11 (18.3)	
-Medium	25 (41.7)	
-A lot	19 (31.7)	
- Extremely	3 (5)	
Child feeling okay with his appearance		3.13 (±1.14)
-Not at all	5 (8.3)	
-A little	14 (23.3)	
-Medium	15 (25)	
-A lot	20 (33.3)	
- Extremely	6 (10)	

Table 3.
Social life.

Variables	Total participants (n=60)	
	(%)	Likert-scale Mean (±SD)
Feeling that other children want to be your child friend		2.87 (±1.10)
-Not at all	5 (8.3)	
-A little	19 (31.7)	
-Medium	21 (35)	
-A lot	9 (15)	
- Extremely	6 (10)	
Feeling your child NOT teased or bothered by others		3.27 (±1.43)
-Not at all	9 (15)	
-A little	12 (20)	
-Medium	8 (13.3)	
-A lot	16 (26.7)	
- Extremely	15 (25)	
Child feels his eyes are no different from others		3.25 (±1.26)
-Not at all	6 (10)	
-A little	11 (18.3)	
-Medium	17 (28.3)	
-A lot	14 (23.3)	
- Extremely	12 (20)	
Children like spending time with relatives who do not live in the same home		3.38 (±0.96)
-Not at all	1 (1.7)	
-A little	12 (20)	
-Medium	15 (25)	
-A lot	27 (45)	
- Extremely	5 (8.3)	

Feeling your child enjoys playing with his sibling if any		3.50 (±1.05)
-Not at all	2 (3.3)	
-A little	10 (16.7)	
-Medium	13 (21.7)	
-A lot	26 (43.3)	
- Extremely	9 (15)	
Child has a lot of friends		2.87 (±1.11)
-Not at all	5 (8.3)	
-A little	22 (36.7)	
-Medium	13 (21.7)	
-A lot	16 (26.7)	
- Extremely	4 (6.7)	
Child enjoy playing with his/her friends		3.53 (±0.99)
-Not at all	1 (1.7)	
-A little	11 (18.3)	
-Medium	11 (18.3)	
-A lot	29 (48.3)	
- Extremely	8 (13.3)	
Easiness for the child to make new friends		3.02 (±1.16)
-Not at all	6 (10)	
-A little	15 (25)	
-Medium	17 (28.3)	
-A lot	16 (26.7)	
- Extremely	6 (10)	
Feeling that the child is popular among peers		2.93 (±1.07)
-Not at all	4 (6.7)	
-A little	18 (30)	
-Medium	22 (36.7)	
-A lot	10 (16.7)	
- Extremely	6 (10)	

Table 4 depicts the visual functions of the participants. Almost 39% of the children stated a difficulty seeing pictures on a television. 45% struggled to observe moving pictures on hand-held computers. Seeing pictures and words in books was challenging for 43% of the candidates. The table also highlights other issues related to children's visual functions. Physical activity and children's ability to interact with their surrounding environment are shown in Table 5. Table 6 states the behavior and attitude of the participants with their treatment. It also emphasizes their discipline and general attitude. Table 7 addresses school performance of the candidates. 18.2% had missing days and impaired learning experiences due to vision complaints and eye appointments. 62.7% of the participants had suffered from difficulties when learning new things at school. Seeing the smallest writing on the board was a concern and an obstacle for 66.7% of the candidates. Finally, the last table concerns the reliability of the questionnaire used in the study. The least reliable domain was the overall and appearance questions.

Table 4.
Visual Function.

Variables	Total participants (n=60)	
	(%)	Likert-scale Mean (±SD)
Child clearly see the picture on television		3 (±1.07)
-Not at all	3 (5)	
-A little	20 (33.3)	
-Medium	16 (26.7)	
-A lot	16 (26.7)	
- Extremely	5 (8.3)	
Child clearly sees the moving pictures in hand-held computer		2.93 (±1.01)
-Not at all	3 (5)	
-A little	18 (30)	
-Medium	24 (40)	
-A lot	10 (16.7)	
- Extremely	5 (8.3)	
Child clearly sees pictures and words in books		2.90 (±1.07)
-Not at all	4 (6.7)	
-A little	20 (33.3)	
-Medium	19 (31.7)	
-A lot	12 (20)	
- Extremely	5 (8.3)	
Easiness for the child to put the cap of a pen back on		3.48 (±0.98)
-Not at all	4 (6.7)	
-A little	3 (5)	
-Medium	19 (31.7)	
-A lot	28 (46.7)	
- Extremely	6 (10)	
Easiness for the child to pick up a cup from a table		3.50 (±0.93)
-Not at all	3 (5)	
-A little	4 (6.7)	
-Medium	18 (30)	
-A lot	30 (50)	
- Extremely	5 (8.3)	
Easiness for the child to cut shapes with scissors		3.47 (±0.99)
-Not at all	3 (5)	
-A little	7 (11.7)	
-Medium	15 (25)	
-A lot	29 (48.3)	
- Extremely	6 (10)	
Easiness for the child to use a ruler to draw a straight line		3.53 (±0.97)
-Not at all	2 (3.3)	
-A little	5 (8.3)	
-Medium	21 (35)	
-A lot	23 (38.3)	
- Extremely	9 (15)	
How good the child at writing exactly on the line		3.45 (±0.99)
-Not at all	2 (3.3)	
-A little	8 (13.3)	
-Medium	19 (31.7)	
-A lot	23 (38.3)	
- Extremely	8 (13.3)	

Table 5.
Physical Activity.

Variables	Total participants (n=60)	
	(%)	Likert-scale Mean (±SD)
Child enjoying playing outdoor		2.98 (±1.37)
-Not at all	12 (20)	
-A little	11 (18.3)	
-Medium	12 (20)	
-A lot	16 (26.7)	
- Extremely	9 (15)	
Easiness for the child to catch something it when it is in the		3.08 (±1.12)
-Not at all	5 (8.3)	
-A little	13 (21.7)	
-Medium	21 (35)	
-A lot	14 (23.3)	
- Extremely	7 (11.7)	
Easiness for the child to see steps when he/she walk up or down stairs		3.90 (±0.95)
-Not at all	-	
-A little	7 (11.7)	
-Medium	9 (15)	
-A lot	27 (45)	
- Extremely	17 (28.3)	
Child good at all kinds of sports		2.93 (±1.15)
-Not at all	7 (11.7)	
-A little	13 (21.7)	
-Medium	24 (40)	
-A lot	9 (15)	
- Extremely	7 (11.7)	
How good the child when trying a new sport		2.97 (±1.10)
-Not at all	5 (8.3)	
-A little	16 (26.7)	
-Medium	21 (35)	
-A lot	12 (20)	
- Extremely	6 (10)	

Table 6.
Behavior.

Variables	Total participants (n=60)	
	(%)	Likert-scale Mean (±SD)
Child enjoying having vision treatment (patch/ spectacles)?		2.37 (±1.16)
-Not at all	18 (30)	
-A little	13 (21.7)	
-Medium	22 (36.7)	
-A lot	3 (5)	
- Extremely	4 (6.7)	
Child do the right thing		3.72 (±0.99)
-Not at all	-	
-A little	7 (11.7)	
-Medium	19 (31.7)	
-A lot	18 (30)	
- Extremely	16 (26.7)	
Child feel NOT troubled because of things he do		2.75 (±1.09)

-Not at all	10 (16.7)	
-A little	13 (21.7)	
-Medium	21 (35)	
-A lot	14 (23.3)	
- Extremely	2 (3.3)	
Child does things he should do		2.93 (±1.18)
-Not at all	12 (20)	
-A little	5 (8.3)	
-Medium	20 (33.3)	
-A lot	21 (35)	
- Extremely	2 (3.3)	
How well- behaved the child is		4.03 (±0.92)
-Not at all	-	
-A little	3 (5)	
-Medium	15 (25)	
-A lot	19 (31.7)	
- Extremely	23 (38.3)	

Table 7.
School Performance.

Variables	**Total participants (n=51)**	
	(%)	**Likert-scale Mean (±SD)**
Child enjoying his/her school day		3.59 (±1.04)
-Not at all	3 (5.9)	
-A little	3 (5.9)	
-Medium	15 (29.4)	
-A lot	21 (41.2)	
- Extremely	9 (17.6)	
Child enjoying reading the smallest print in textbooks		3.25 (±0.99)
-Not at all	1 (2)	
-A little	11 (21.6)	
-Medium	19 (37.3)	
-A lot	14 (27.5)	
- Extremely	6 (11.8)	
Child alertness when studying in at school		3.16 (±1.21)
-Not at all	5 (9.8)	
-A little	11 (21.6)	
-Medium	13 (25.5)	
-A lot	15 (29.4)	
- Extremely	7 (13.7)	
Child alertness when studying at home		3.37 (±1.15)
-Not at all	4 (7.8)	
-A little	8 (15.7)	
-Medium	11 (21.6)	
-A lot	21 (41.2)	
- Extremely	7 (13.7)	
Easiness for the child to draw, color in a picture or write words while at school		3.18 (±1.13)
-Not at all	4 (7.8)	
-A little	10 (19.6)	
-Medium	16 (31.4)	
-A lot	15 (29.4)	
- Extremely	10 (11.8)	
How clearly child see the smallest writing on the board while at school		3.02 (±0.91)
-Not at all	2 (3.9)	

-A little	13 (25.5)	
-Medium	19 (37.3)	
-A lot	16 (31.4)	
- Extremely	1 (2)	
Happiness of the child when teacher asks him/her to read a story or a book to his/her class aloud		
-Not at all		
-A little	1 (2)	3.29 (±0.86)
-Medium	8 (15.7)	
-A lot	19 (37.3)	
- Extremely	21 (41.2)	
	2 (3.9)	
Attend school with no vision complaints and not missing school due to eye appointments		
-Not at all		
-A little	3 (5.9)	
-Medium	12 (23.5)	3.61 (±1.34)
-A lot	5 (9.8)	
- Extremely	13 (25.5)	
	18 (35.3)	
Easiness for the child to learn new things at school		
-Not at all	4 (7.8)	
-A little	8 (15.7)	3.16 (±1.07)
-Medium	20 (39.2)	
-A lot	14 (27.5)	
- Extremely	5 (9.8)	
Easiness for the child to explain a story it to someone else when he reads it		
-Not at all	3 (5.9)	
-A little	7 (13.7)	3.29 (±1.06)
-Medium	20 (39.2)	
-A lot	14 (27.5)	
- Extremely	7 (13.7)	
How clever do you think your child is?		
-Not at all	-	
-A little	4 (7.8)	3.69 (±0.81)
-Medium	15 (29.4)	
-A lot	25 (49)	
- Extremely	7 (13.7)	
How quick the child is in finishing his/her homework		
-Not at all	2 (3.9)	
-A little	6 (11.8)	3.63 (±1.11)
-Medium	14 (27.5)	
-A lot	16 (31.4)	
- Extremely	13 (25.5)	
How easy is it for your child to finding out the answer at school?		
-Not at all	2 (3.9)	
-A little	6 (11.8)	3.43 (±1.03)
-Medium	19 (37.3)	
-A lot	16 (31.4)	
- Extremely	8 (15.7)	

Table 8.
Reliability Analysis.

Domain	Cronbach Alpha
Overall, all questionnaire (questions 1-30 only)	0.906
School performance (questions 31-43)	0.795
Overall and appearance questions (questions 1-3)	0.329
Social life (questions 4-12)	0.834
Visual function (questions 13-20)	0.952
Physical Activity (questions 21-25)	0.886
Behavior (questions 26-30)	-0.844

4. Discussion

The study measured the quality of life (QOL) among children with amblyopia who were not undergoing any correction or surgical intervention. Most of the participants were accompanied almost equally by either one of the parents. The guardians' mean age ranged between 31 and 50 years, with the vast majority having a high school degree or higher. In a study with a similar goal that was conducted at Grigore T. Popa University of Medicine and Pharmacy in Romania, most of the guardians of the enrolled participants were females. Most of the parents' ages were in the range of 31 to 50, and their level of education was high school level and above [2]. In this study, virtually 90% are living in urban areas. In addition, 74% are living with four or more family members, and approximately all of them are living with both of their parents. Parents thought that their children were good-looking and generally happy in nearly 40% of cases. In one question that addressed the child's perspective on his own appearance, it was shown that 23% felt a little satisfaction with their appearance, while 68% were satisfied to extremely happy with how they looked. In our study, most of the children had little to medium difficulty in seeing pictures, moving objects, and words in books. In comparison to the previously mentioned study, which underestimated the significance of low visual acuity in the included sample based on the parental response to the questionnaire.

In this study, 26.7% of the children enjoyed playing outdoors, 35% were neutrally struggling to catch something while they were playing. It was easy for 45% of them to walk up and down the stairs. This coincides with the Romanian study in which most of the parents believe that their children have no issues performing their daily activities, including riding a bicycle (9). Furthermore, commitment to treatment was not optimal due to multiple factors such as poor compliance, children's annoyance from the treatment, and lack of free time for the caring parents. On the other hand, the participants involved in our study had fewer issues in terms of disliking the treatment plan.

Cronbach's Alpha was calculated for all of the domains; most of the values were above 0.8, with some of the values reaching above 0.9, which indicates good to excellent internal consistency. One value came in at 0.3, which is predicted as the number of questions included is only 3. Some of the questions' values were inverted, so all of them would yield similar values on the Likert scale. High degree educations, such as college/university, were given the same code. This study did not enroll and evaluate the QOL after amblyopia treatment. In a paper that took place in Iran, which focused on the QOL of amblyopic children before and after treatment, it was found that QOL improves remarkably with the initiation of treatment [9]. Furthermore, they have concluded that compliance with treatment has a greater impact on QOL than the early start of management of amblyopic children (IR). Nevertheless, the Romanian study addressed the issue of having the guardians fill out the questionnaire on behalf of their offspring, and their answers might be biased and based solely on their perception of their children [2].

5. Conclusion

Amblyopia has a huge effect on children's quality of life (QOL) and their families. The estimated prevalence of amblyopia ranges between 1% and 4%, varying across different continents based on previous studies. A limited number of papers pertaining to the prevalence, impact, and QOL of patients affected by amblyopia are available in Saudi Arabia. A number of studies have found that activity limitation and vision-related QOL were among the most impacted domains. Roughly half of the children had struggles in seeing moving objects, observing pictures and words, and learning new things at school. There was a non-negligible percentage who had missing days of school attendance due to vision issues and clinic appointments. More studies are recommended to tackle the same topic to be able to generalize the results in Saudi Arabia and to yield a more accurate conclusion. To sum up, patient education and awareness promotion should be taken to improve their outcomes, which heavily rely on compliance with the treatment, not the timing plan.

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