

Burden of Eye Diseases in Orphanage in Onitsha, Anambra State, Nigeria

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ABSTRACT

Background: Eye disorders can affect individuals of all ages, potentially leading to visual impairment. Children in orphanages are particularly vulnerable due to limited healthcare access and inadequate eye health awareness. In Nigeria, most healthcare resources for orphanages focus on acute illnesses rather than preventive eye care. **Objectives:** This study assessed the burden of eye diseases among children residing in orphanages in Onitsha, Anambra State, Nigeria. **Materials and Methods:** A descriptive cross-sectional design was employed, with simple random sampling used to select two orphanages. Sixty-four children underwent eye health assessments, while structured interviews with twenty-nine caregivers assessed their level of knowledge of eye health. A structured questionnaire and interview methods were used to collect data from the respondents. The collected data were analyzed using SPSS version 27 for both descriptive and inferential statistics. **Results:** Findings revealed that 7.8% of children were under one year, and 10.9% were aged eleven to fifteen years. Gender distribution showed 48.4% male and 51.6% female children, with most attending pre-nursery school (21.9%). The most common eye conditions included simple hypermetropia (46.9%), hypermetropic astigmatism (31.2%), myopic astigmatism (7.8%), and simple myopia (6.3%). **Conclusion:** Age was significantly associated with the prevalence of eye diseases, while caregivers' age and job position did not significantly affect their attitudes toward eye care. The high burden of eye diseases was attributed to caregivers' limited eye health knowledge and insufficient eye care services within the orphanages.

Keywords: Eye diseases; Orphanages; Children's eye care; Caregiver knowledge; Eye Health Awareness

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INTRODUCTION

Engagement disorders are group of diseases that can affect individuals of all ages, affecting eye function and potentially leading to significant visual impairment. [1] Visual impairment affect people across all age groups and socioeconomic backgrounds.[2] According to the World Health Organization (WHO), approximately 285 million people worldwide experience visual impairment, of which 246 million suffer from low vision and 39 million are blind. [3] This study focuses on the prevalence of eye diseases among children living in orphanages, to characterize the unique challenges faced by this vulnerable population. An orphanage is a residential institution for the care and education of Orphans.[4] Orphanages play important role in providing a supportive environment for children who have lost parental care, helping protect them from social risks. However, the health needs of these children, particularly their eye health, often receive inadequate attention. Globally, eye health remains a significant public health concern, especially in low- and middle-income countries where factors such as limited healthcare resources, socioeconomic challenges, and restricted access to health education exacerbate the burden of eye diseases.[5] The high number of blindness resulting from childhood eye diseases was the reason for the control of childhood blindness as a priority by the World Health Organization/International Agency for Prevention of Blindness (WHO/IAPB) Vision 2020: The Right to Sight Programme.[6] Timely screening for the early detection of eye and vision problems in children is vital to avoid lifelong visual impairment. In Nigeria, access to specialized healthcare for children in orphanages is often inadequate, with resources primarily allocated to addressing acute illnesses rather than preventative or specialized care like ophthalmology. This gap in care is concerning as untreated eye conditions in childhood can severely affect visual acuity, learning outcomes, and overall quality of life. However, there are inadequate studies on the prevalence and etiology of ocular morbidities at orphanages in Anambra State, Nigeria. This study aims to identify the ocular abnormalities prevalent in

orphanages in Onitsha, Anambra State, to offer a chance for early intervention and the avoidance of irreversible vision loss.

MATERIALS AND METHODS

Study design

This study was a cross-sectional study of the eye diseases in children of orphanages in Onitsha, Anambra state, Nigeria.

Study population

Participants (n = 64) made up of 31 males and 33 females were recruited from two selected orphanages in Onitsha, Anambra State, Nigeria. The study included children residing in the orphanages and aimed to assess the burden of eye diseases in this population.

Sampling Technique

A multi-stage sampling technique was employed.

Stage 1: Selection of Orphanages

From the six major orphanages in Onitsha, two were chosen using simple random sampling by balloting: Red Cross Orphanage Home in Onitsha North and Umunna Motherless Babies' Home in Onitsha South.

Stage 2: Selection of Participants

All children residing in these orphanages and meeting the inclusion criteria were included in the study. A total of 64 children formed the study population, with additional data provided by 29 caregivers who consented to participate.

Data Collection

Data were collected using structured questionnaires and interviews with caregivers, designed specifically for the objectives of this study. The questionnaire encompassed various sections that gathered information on the prevalence of eye diseases among the children, caregiver knowledge of eye health, and the availability of eye care services in the orphanages. Caregivers were informed about the study's purpose, and their participation was voluntary.

Ethical Consideration and Consent to Participate

Ethical approval was obtained from the Ethics Review Committee of Nnamdi Azikiwe University. Participants were informed about the study's objectives, and consent was sought from both the children and their caregivers. Unique identifiers were assigned to each questionnaire to maintain participant confidentiality throughout the research process.

Statistical Analysis

The collected data were analyzed using the Statistical Package for the Social Sciences (SPSS) version 25. Descriptive statistics were employed to summarize the demographic characteristics of the participants and the prevalence of eye diseases. Additionally, chi-square tests were performed to assess associations between caregiver knowledge and the prevalence of eye diseases among the children. The significance level was set at $p < 0.05$.

RESULTS

Table 1 presents a summary of the demographic characteristics of children residing in selected orphanages in Onitsha, Anambra State, Nigeria. A total of 64 children participated in the study, with the age distribution showing that five children (7.8%) were aged less than 1 year, constituting the smallest age group, while thirty children (46.9%) were aged 6–10 years, making them the largest age group. The male-to-female ratio was approximately 1:1. The educational status indicated that thirty (46.9%) children were in primary school, only two (3.1%) were in secondary school, and thirty-two (50.0%) were nursery and pre-nursery pupils.

Figure 1 illustrates that 53 (82.8%) out of the 64 children had ocular disorders, highlighting the high burden (83%) of eye diseases among children in the two orphanages sampled for this study.

Figure 2 shows the pattern of eye diseases among the children. Of the 53 children with ocular disorders, forty-eight (90.6%) had refractive errors, while traumatic uveitis and congenital ptosis each accounted for one case (1.9%).

Figure 3: details the distribution of refractive errors among the children. Among the forty-eight children diagnosed with refractive errors, twenty-eight (58.3%) had simple hypermetropia, while three (6.3%) had myopic astigmatism. Simple hypermetropia was the most prevalent condition, whereas myopic astigmatism was the least common.

Table 2 displays the significant association between age and the prevalence of eye diseases among children in orphanages in Onitsha, with a degree of freedom = 1, p -value = 0.015, and chi-square = 5.966. This indicates that age is a significant factor in the prevalence of eye diseases.

Table 3 reveals no significant association between gender and the prevalence of eye diseases among children, with a degree of freedom = 1, p -value = 0.656, and chi-square = 0.198. This suggests that the prevalence of eye diseases is independent of the children's gender.

Table 4 indicates that there is no significant association between gender and the pattern of eye diseases among inmates in orphanage homes in Onitsha, with a degree of freedom = 1, p -value = 0.201, and chi-square = 1.635. Similarly, there is no significant relationship between age and the pattern of eye diseases among these children, with a degree of freedom = 1, p -value = 0.670, and chi-square = 0.181.

Table 5 summarizes caregiver behavior regarding seeking eye examinations. Six (42.9%) caregivers indicated they would seek an eye examination if the children exhibited excessive tearing, while only one (7.1%) would seek an examination for double vision or frequent eye rubbing. Additionally, the table highlights the reasons staff members do not seek eye care for the children, with fifteen (51.8%) stating no reason, six (20.7%) citing the cost of eye care services, and one (3.4%) expressing fear of presenting eyeglasses for a child.

Figure 4 presents the forms of eye care available within the orphanage. Sixteen (55.2%) staff members reported practicing first aid treatment on the inmates, while thirteen (44.8%) agreed to take

the inmates to an eye hospital. All staff members acknowledged that there is no eye clinic or visiting eye care health worker at the orphanage.

Table 6 indicates no significant relationship between caregivers' age, position, and attitude towards children's eye health (p -value = 0.822, chi-square = 0.051). However, it reveals a significant relationship between caregivers' positions and their attitudes towards the children's eye health, with all junior staff members exhibiting a negative attitude (degree of freedom = 1, p -value = 0.002, chi-square = 14.08).

DISCUSSION

Orphanage homes serve as much more than shelters for children without parental care; they provide a close-to-normal family setting that protects vulnerable children from adverse situations like drug abuse and trafficking, and they enable their growth toward becoming well-adjusted adults. [7], [8]. Recognizing the importance of their health, particularly eye health, is essential for ensuring these children are not marginalized in any aspect of development. Eye disease is a global pandemic, with a notably greater health and economic burden in low- and middle-income countries due to factors such as poverty, limited health education, and strained healthcare systems. [5]. This underscores the United Nations' Sustainable Development Goals (SDGs), especially goals 3 and 10, which advocate for health equity and access to quality healthcare for all people, leaving no one behind [9].

This present study revealed a significantly high prevalence of eye disease burden among children in orphanages in Onitsha, Anambra State, with 83% of children affected by one or more eye diseases (Fig 1). This shows the urgent need for inclusive eye health policies targeting underserved children. Although this prevalence differs from that found in Nepal in a study conducted by Shrestha et al. (2010), [7] where 18% of children in orphanages had eye disease. The discrepancy may be attributed to regional differences and the socioeconomic challenges faced by Nigeria. Similarly, a study conducted on the prevalence and determinants of

visual impairments among school-aged children in southern Nigeria revealed a high prevalence of eye diseases, affecting approximately 32% of the 2,418 children. Notably, refractive error accounted for about 71% of all cases of visual impairment within this age group. [7]. This finding shows the significant role of refractive errors in pediatric visual impairment, aligning with our current study's observations on the burden of similar eye conditions among children in orphanages in Onitsha. The high prevalence of refractive errors suggests a pressing need for early detection and corrective interventions, particularly in settings where children may have limited access to regular eye care services. Consistent with studies like that by Nasawysir and colleagues, which compared eye health among orphanage children and age-matched school children, our findings reveal a greater prevalence of eye diseases in orphaned children, emphasizing the inadequate eye health attention given to these vulnerable groups. The study found that 90.2% of affected children suffered from refractive errors, specifically hypermetropia, which was the most common refractive condition observed. [10].

While our study adopted a criterion of ± 0.25 spherical and cylindrical error as clinically significant, other studies, such as those by Uzma et al., used higher thresholds (± 0.50 sphere for myopia and ± 2.00 for hypermetropia), which could explain the higher prevalence rates in our findings. Additionally, we observed that simple hypermetropia was the most prevalent form of refractive error in these orphanages, aligning with findings in both urban and rural school children studies in India. [11]. Our study found no significant associations between age, gender, and the prevalence or pattern of eye diseases among the orphaned children. This is consistent with findings by Shrestha et al. (2010), [7] which showed that eye disorders affect both genders equally. Furthermore, Uzma et al. (2009), [11] reported no gender bias in the patterns of eye diseases in children. Irrespective of the type of refractive error a child has, correcting these errors will go a long way in improving the

quality of life of these children. In a study in a private eye clinic on Patterns of Refractive Errors and Presbyopia in Nigeria, a sample size of 700 patients with refractive errors was attended to for 4 months duration. It was found that Myopia constituted 9.4%, hypermetropia 5%, astigmatism 23.3%, and presbyopia 63.3% of the refractive errors in these patients. Although this study cuts across all age groups, they also found that among the children 27% had myopia, 8% had hypermetropia and 64% were astigmatic. It was noted that refractive error was more common in males than in the females. [12]. Caregiver knowledge and attitudes toward eye health significantly impact the health outcomes of children in orphanages. Most caregivers in this study lacked adequate knowledge of eye care and did not prioritize regular eye examinations. This aligns with the findings by Surrati et al. (2022), [13] who reported that only 3% of parents in a related study demonstrated good eye health knowledge. [13]. The limited awareness of caregivers regarding eye care, combined with the absence of any designated health facilities within the orphanages studied, represents a significant gap in eye health accessibility for these children. As noted by Bunkers (2014), having at least a basic health facility is a minimum requirement for care homes. [14]. The attitude of the caregivers to the eye health of the children cannot be over-emphasized as most of these children are under age to make decisions for themselves. Therefore, it is very important to constantly educate the caregivers on eye health to ensure quick and proper eye care delivery to the children. This is supported by the work done by Aparma et al, on perspectives and impediments to eye care in caregivers of children with childhood glaucoma, this researcher concluded that impediments in seeking early eye care for blinding diseases in children including distance from the nearest hospital, low socioeconomic constraints, and sociocultural beliefs and taboos were major reasons that care was not optimal. [15]. Therefore, there is a need for proper awareness of the importance of good eye care and health-seeking behavior by the caregivers of the orphanages to avert the complications of late presentation or harmful eye care practices that can

result in serious eye complications. It's necessary to put in place policies such as eye clinics within the orphanages or having an eye specialist visit through a mobile eye clinic on a regular to ensure optimal eye health care for the children. Eye health education of the caregivers on proper eye health practices will go a long way to prevent eye disease complications and also, they should be informed where and how to get to the nearest eye care facilities within Onitsha and its environs. This will help prevent complications of late presentations and ensure normal development of the children raised in these homes, and therefore better academic performance and optimal development for these children.

Strengths and Limitations

The main strengths of this study lie in its focus on children residing in orphanage homes, a vulnerable population often overlooked in routine eye health research. To the best of our knowledge, this is the first study to assess the burden of eye diseases in orphanages in Onitsha, Anambra State, Nigeria, addressing an important gap in pediatric eye care research. The study employed a structured questionnaire and standardized eye examinations, ensuring a comprehensive assessment of both the children's eye health and caregivers' knowledge. Additionally, the use of a descriptive cross-sectional design and simple random sampling enhanced the reliability and representativeness of the findings within the study population. The study's findings provide valuable insights into the prevalence of refractive errors and highlight the need for improved eye care services in orphanages.

Despite these strengths, the study has some limitations. The relatively small sample size may limit the generalizability of the findings to orphanages in other regions of Nigeria or beyond. Additionally, the cross-sectional design restricts the ability to establish causal relationships between caregivers' knowledge, healthcare accessibility, and the prevalence of eye diseases among the children. The study relied on self-reported data from caregivers, which may introduce recall or social desirability biases. Furthermore, while structured interviews provided useful insights into caregivers'

knowledge of eye health, they may not have fully captured deeper behavioral or institutional factors influencing access to eye care services in orphanages.

Recommendations for Further Research

Future research should consider expanding the study to multiple orphanages across different regions in Nigeria to improve the generalizability of the findings. A longitudinal approach could provide a better understanding of how eye health issues evolve over time and the long-term impact of interventions. Additionally, incorporating qualitative methods, such as in-depth interviews with caregivers and healthcare providers, could offer richer insights into barriers to pediatric eye care in orphanages. Finally, intervention-based studies assessing the effectiveness of targeted eye health education programs and routine vision screenings in orphanages could help inform policies aimed at improving eye care accessibility for vulnerable children.

CONCLUSION

The high prevalence of eye diseases among children in orphanages in Onitsha, Anambra State, demonstrates a critical gap in eye health care in low-income settings. The findings reveal significant associations between age and the prevalence of ocular disorders, with refractive errors being the most common condition. Current eye health practices in these orphanages are limited, with most caregivers relying on first-aid measures rather than professional eye care, largely due to lack of awareness and resource constraints. To address these gaps, a coordinated approach involving primary, secondary, and tertiary health care providers, non-governmental organizations, and government health agencies is essential. Establishing routine eye screenings, caregiver education programs, and facilitating access to affordable eye care services within orphanages could markedly reduce the prevalence and impact of preventable vision impairments. Reducing the ocular disease burden in these young populations not only improves their health and developmental outcomes but also fosters

their capacity to become independent and productive members of society, thereby contributing to public health advancement in low-resource settings.

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Author Contributions

EO and SN designed the study and developed the methodology. EO collected the data, analyzed it and wrote the first draft of the manuscript. All authors reviewed and contributed to the final draft. All authors reviewed and approved the final version of the manuscript.

Data Availability

The data presented in this study are available on request from the corresponding author (amadaokoye@gmail.com)

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This work was not funded by any organization or body

Conflict of interest

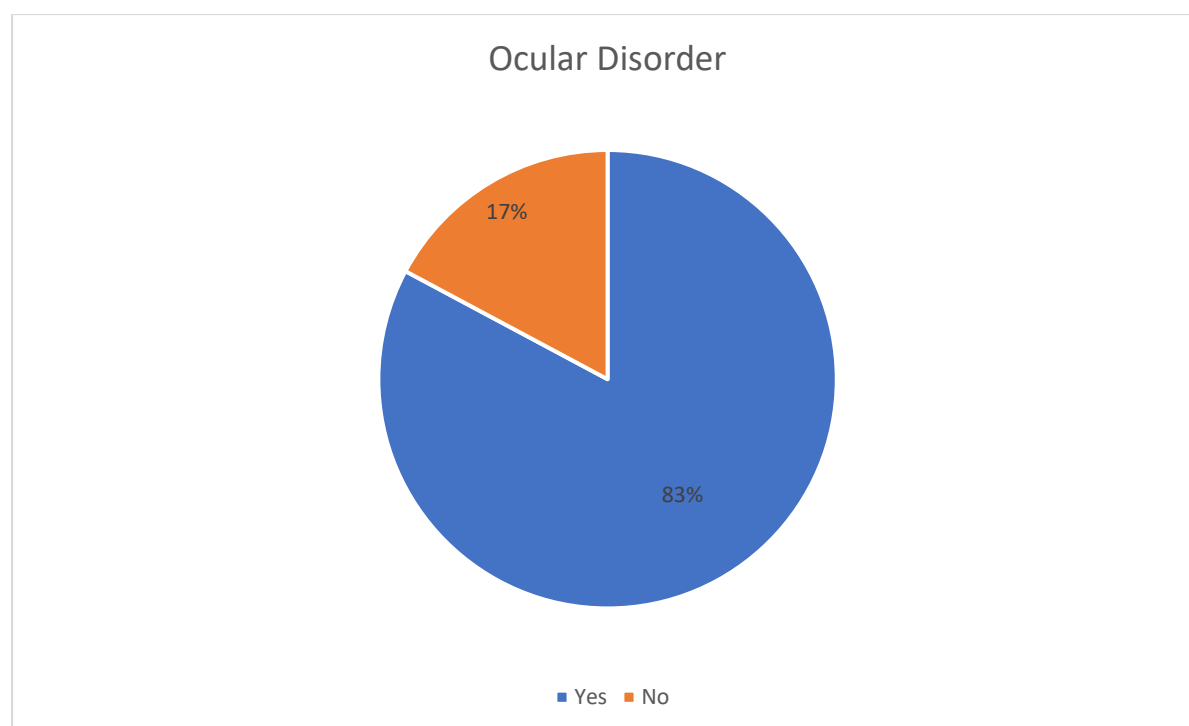
The authors declare no competing interests

Ethics approval and consent to participate

Ethical approval for this study was obtained from the Health Research Ethics Committee of Nnamdi Azikiwe University. Informed consent was obtained from all participants prior to data collection. Participants were explicitly informed of their right to withdraw from the study at any stage without any consequences. All measures were taken to ensure confidentiality and the ethical treatment of participants throughout the research process.

Table 1: Demographic characteristics of the children

Characteristic	Number	%
Age group (years)		
< 1	5	7.8
1-5	22	34.4
6-10	30	46.9
11-15	7	10.9
Gender		
Male	31	48.4
Female	33	51.6
Level of Education		
Pre-Nursery	14	21.9
Nursery	18	28.1
Primary	30	46.9
Secondary	2	3.1
Total	64	100.0

**Figure 1: Prevalence of Eye diseases**

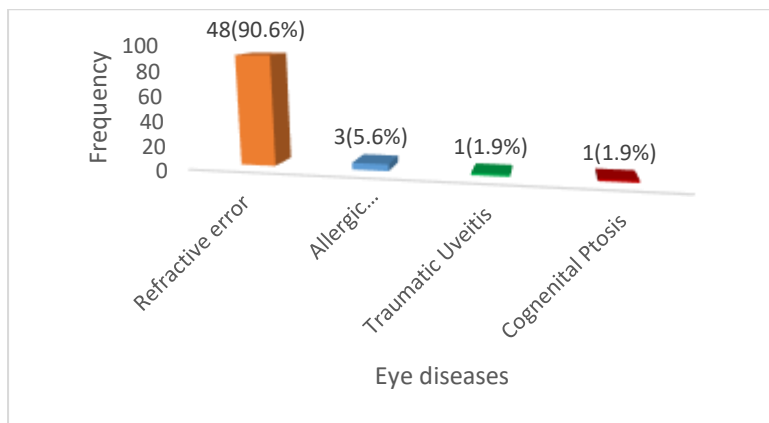


Figure 2: Pattern of eye diseases among the children.

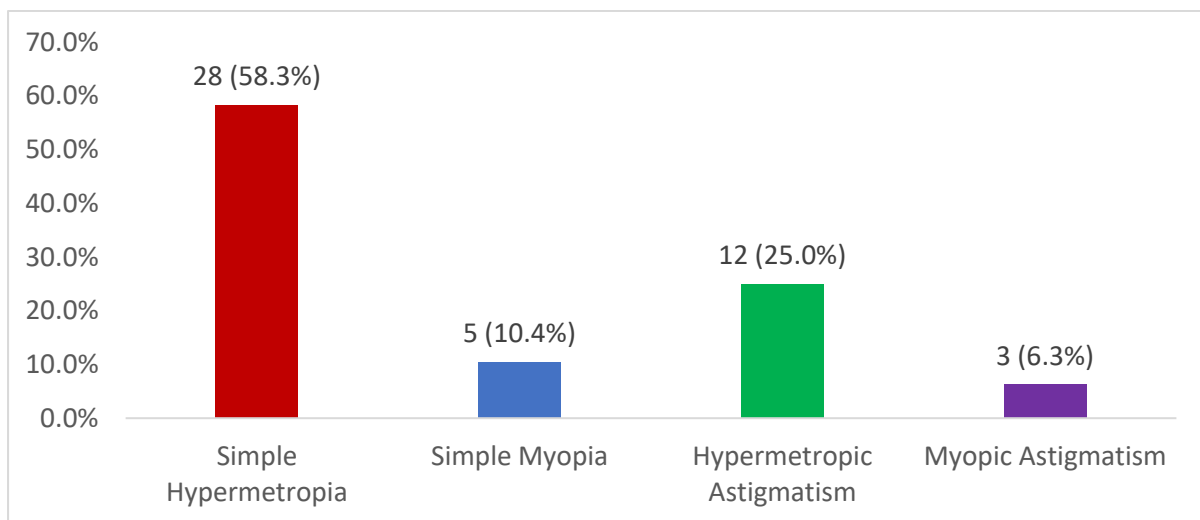


Figure 3: Distribution of Refractive Errors

Table 2: Association between gender and age and prevalence of eye diseases among children in orphanages in Onitsha

	Eye disease		Df	Chi-square	P value
	Yes n (%)	No n (%)			
Gender					
Male	25 (80.6)	6(9.4)	1	0.198	0.656
Female	28 (84.8)	5 (15.2)			
Age Group					
≤ 5yrs	26 (96.3)	1 (3.7)	1	5.966	0.015
>5yrs	27 (73.0)	10 (27.0)			

Table 3: Association between gender, age, and, pattern of eye diseases among children

	Eye disease				
	Refractive error n (%)	AC/TU/CP n (%)	Df	Chi-square	P value
Gender					
Male	24 (96.0)	1 (4.0)	1	1.635	0.201
Female	24 (85.7)	4 (14.3)			
Age Group					
≤ 5yrs	24 (92.3)	2 (7.7)	1	0.181	0.670
>5yrs	24 (88.9)	3 (11.1)			

AC = Allergic Conjunctivitis, TU = Traumatic Uveitis, CP = Traumatic Uveitis

Table 5: Attitude of caregivers toward eye health

Question	No.	%
Reasons why staff would seek eye care for children (n = 14)		
Excessive tearing	6	42.9
Frequent eye rubbing	1	7.1
Double vision	1	7.1
Red eye	6	42.9
Reasons why staff do not seek eye care for the children (n = 29)		
High cost of eye care services	6	20.7
Lack of knowledge of available eye care facility	6	20.7
Afraid of presenting eyeglasses for a child	1	3.4
Lack of need for eye care	1	3.4
No reason	15	51.8
How frequently should a child have a routine eye examination (n = 29)		
Every month	1	3.4
Every Year	4	13.8
Not Sure	8	27.6
Only when the child reports an eye symptom	16	55.2

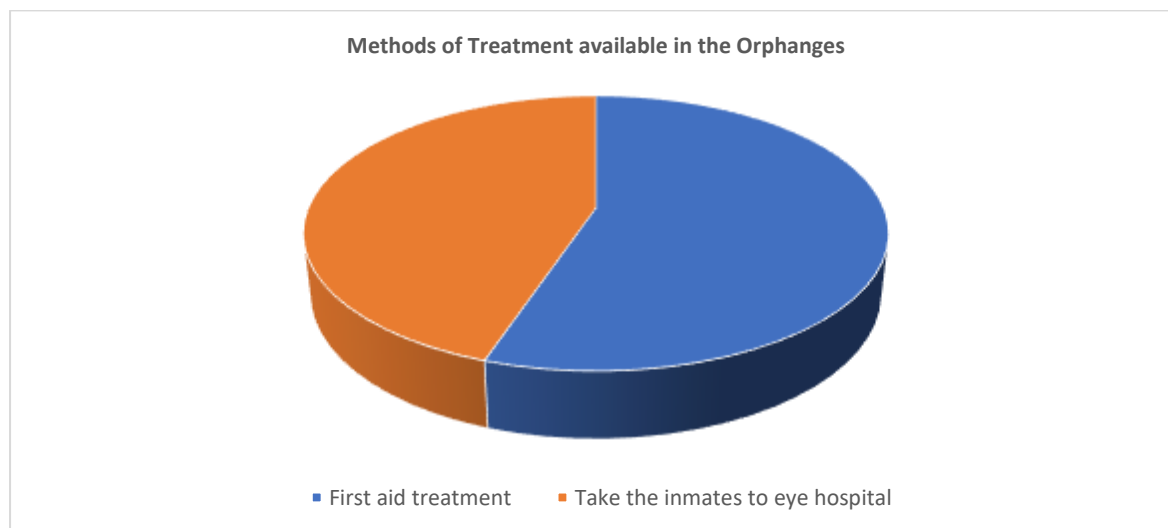
**Figure 4: Methods of Treatment Available in the Orphanages**

Table 4: Relationship between caregiver's age and their attitude towards eye diseases among the children

	Attitude		Chi-square	P value
	Negative n (%)	Positive n (%)		
Caregiver's Age (years)				
21 – 30	2 (25.0)	6 (75.0)	0.051	0.822
31 > 50	4 (21.1)	15 (78.9)		
Position				
Senior staff	0 (0.0)	19 (100.0)	14.08	0.002
Junior Staff	6 (60.0)	4 (40.0)		

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