

Lynchburg HeadStart Vision Screening Initiative

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Abstract and/or Background

Background: Vision-related problems in kids are challenging, and amblyopia, also known as ‘lazy eye,’ is the most common reason for vision loss in children. Amblyopia is a vision disorder that comprises either a bilateral or unilateral decrease in vision, which stems from abnormal vision development in childhood. Several vision disorders, like refractive errors, strabismus, and cataracts, contribute to the development of amblyopia. The US Preventive Services Task Force recommends that all children between 3 to 5 years be screened to detect amblyopia; this is vital because amblyopia is reversible if detected before the critical period, up to age 8, of visual development.

Methods: A collaboration was established between the LU research team and the Lynchburg HeadStart program, a federally funded program for children from birth to age 5 that aids low-income families in supporting their children’s academic, social, and emotional growth. The research focused on providing vision screening services and collecting data from children who attended the HeadStart program. The vision screening was done using a photo screener called PlusOptix®: children were placed in an adequately lit area and asked to look directly into the screening device. Once the device detected the child’s retina, infrared rays bounced off the retina and back to the device. Test results from the PlusOptix device provided either a pass or refer message. **Results and Conclusion:** Children with positive results were referred to a local ophthalmologist, and the data collected were analyzed based on demographics, types of refractive errors, and referrals. Notably, only 5 out of 25 referrals made appointments despite the screening and referral provided. These results show the impact of social determinants of health (low social economic status, including low education and income) and an individual’s hesitancy in interacting with available healthcare resources.



Figure 1: The PlusOptix screening device and example screening result report page that is provided to parents following a screening, Lynchburg HeadStart Screening Initiative, 2022. From: PlusOptix Gallery. “Pictured is the PlusOptix Device.”, n.d., https://www.plusoptix.com/fileadmin/Images/Products/S12C/Plusoptix_S12C_front-view_Freisteller_menu.png. Accessed 20 March 2023. Creative Commons BY-SA 2.0.

Introduction and/or Research Question

Amblyopia, referred to as ‘lazy eye,’ is a vision disorder with a bilateral or unilateral decrease in vision caused by abnormal vision development in childhood. Amblyopia is a common problem in infants and children and if left untreated, results in permanent visual loss.¹ It is the most common cause of monocular vision loss in children and adults.² Amblyopia can arise from many causes, including refractive errors, cataracts, or strabismus.² The US Preventive Services Task Force currently recommends vision screening in all children 3 to 5 years to detect amblyopia; however, studies have shown that screening rates among children vary by race, ethnicity, and family income.³ Vision screening is offered by pediatricians during well child visits and in the first years of schooling. Typical testing includes visual acuity assessments and evaluation for strabismus; however, it is often more difficult for younger children to cooperate, resulting in false-positive results. Photoscreeners can be used with young children and infants to improve cooperation and test accuracy. They detect amblyopia risk factors such as refractive error, ocular malalignment, and lens opacity.³ There is a critical period, up to age 8, to complete developmental screening in children to ensure prompt evaluation and treatment. Thus, early vision screening is imperative to giving a child the best chance for visual recovery if amblyopia is detected.⁴

Methods

1. Local data regarding the incidence of amblyopia in children in the Lynchburg area has not been published, even though screening is done annually at the HeadStart program.
2. We, therefore, developed a vision screening study to describe the burden of amblyopia in children attending Lynchburg’s HeadStart programs using a photo screener, the PlusOptix Vision Screening® device.
3. After obtaining IRB approval from Liberty University, we partnered with the Lynchburg HeadStart program to conduct vision screening for all children in the program who met the eligibility criteria and had parental informed consent.
4. Vision screening was conducted at the three HeadStart locations in the Lynchburg area.
5. We chose the HeadStart programs because they serve low-income families with limited access to preventive services.

Group Demographics		
Gender	Female	Male
	44	33
Ethnicity/Race		
African American/Black	61	
White/Caucasian	7	
Did not provide	9	

Table 1: Number of children screened by sex and race, Lynchburg HeadStart Screening Initiative, 2022

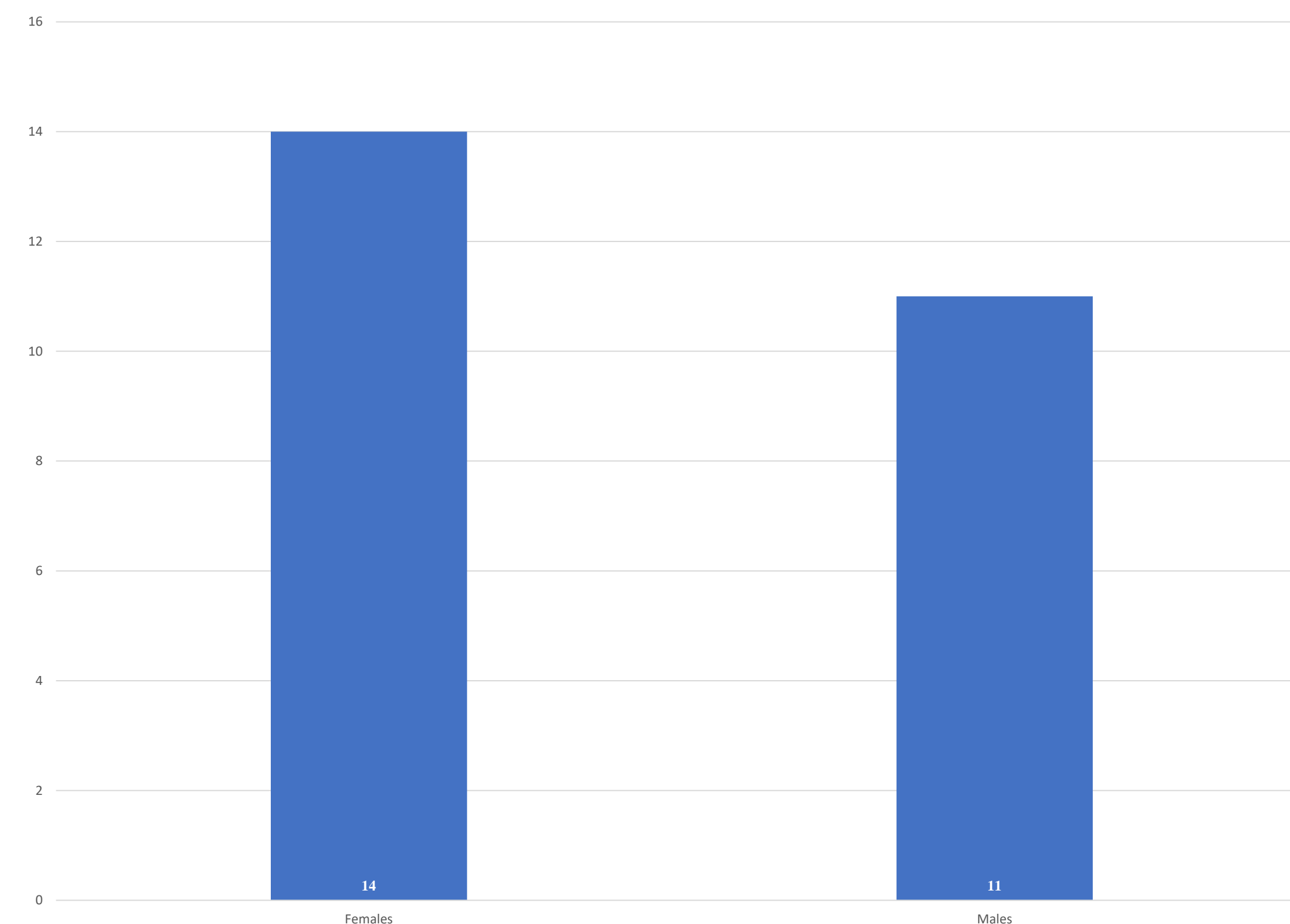


Figure 2: Number of children referred to an ophthalmologist by sex, Lynchburg HeadStart Screening Initiative, 2022

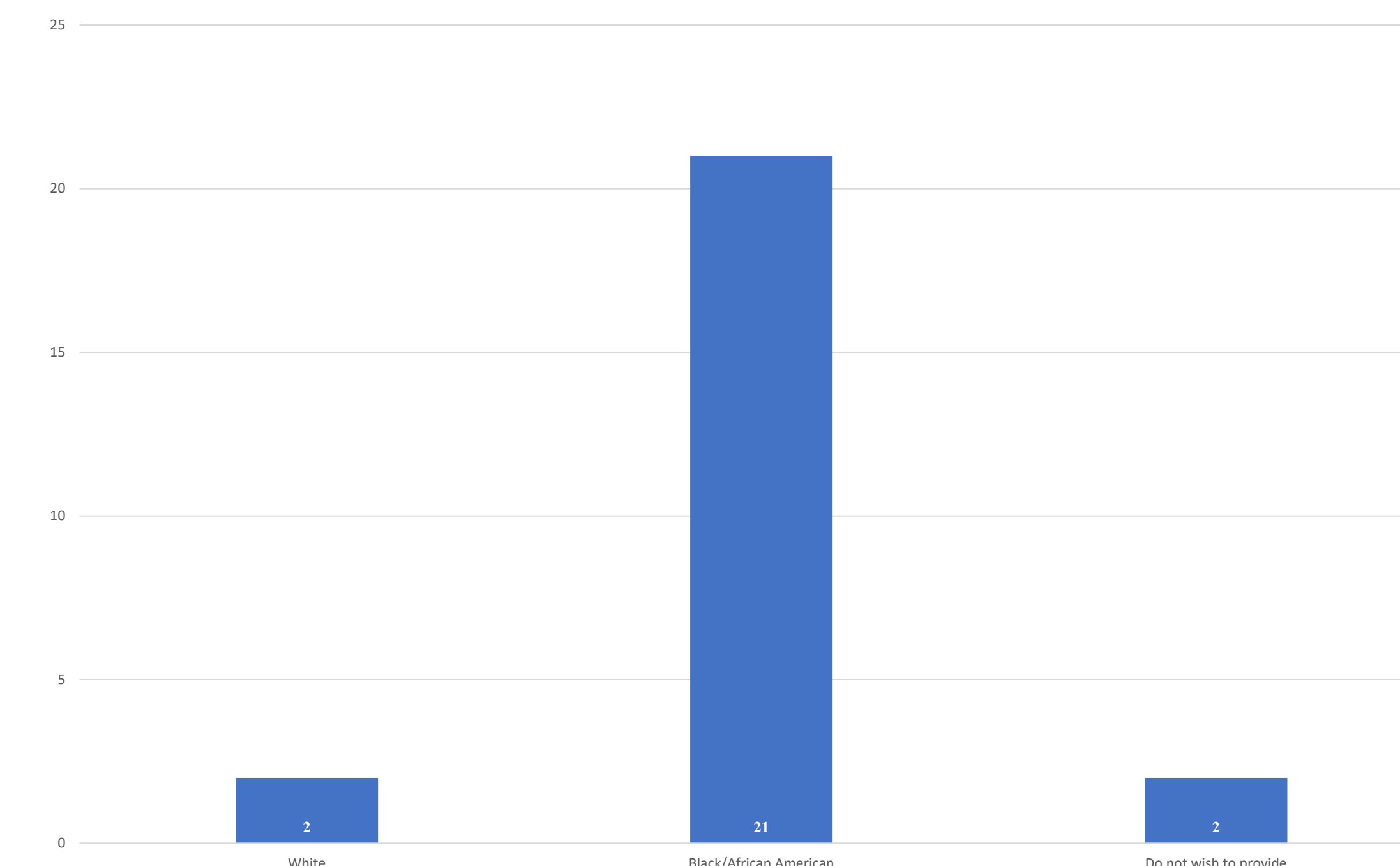


Figure 3: Number of children referred to an ophthalmologist by race, Lynchburg HeadStart Screening Initiative, 2022

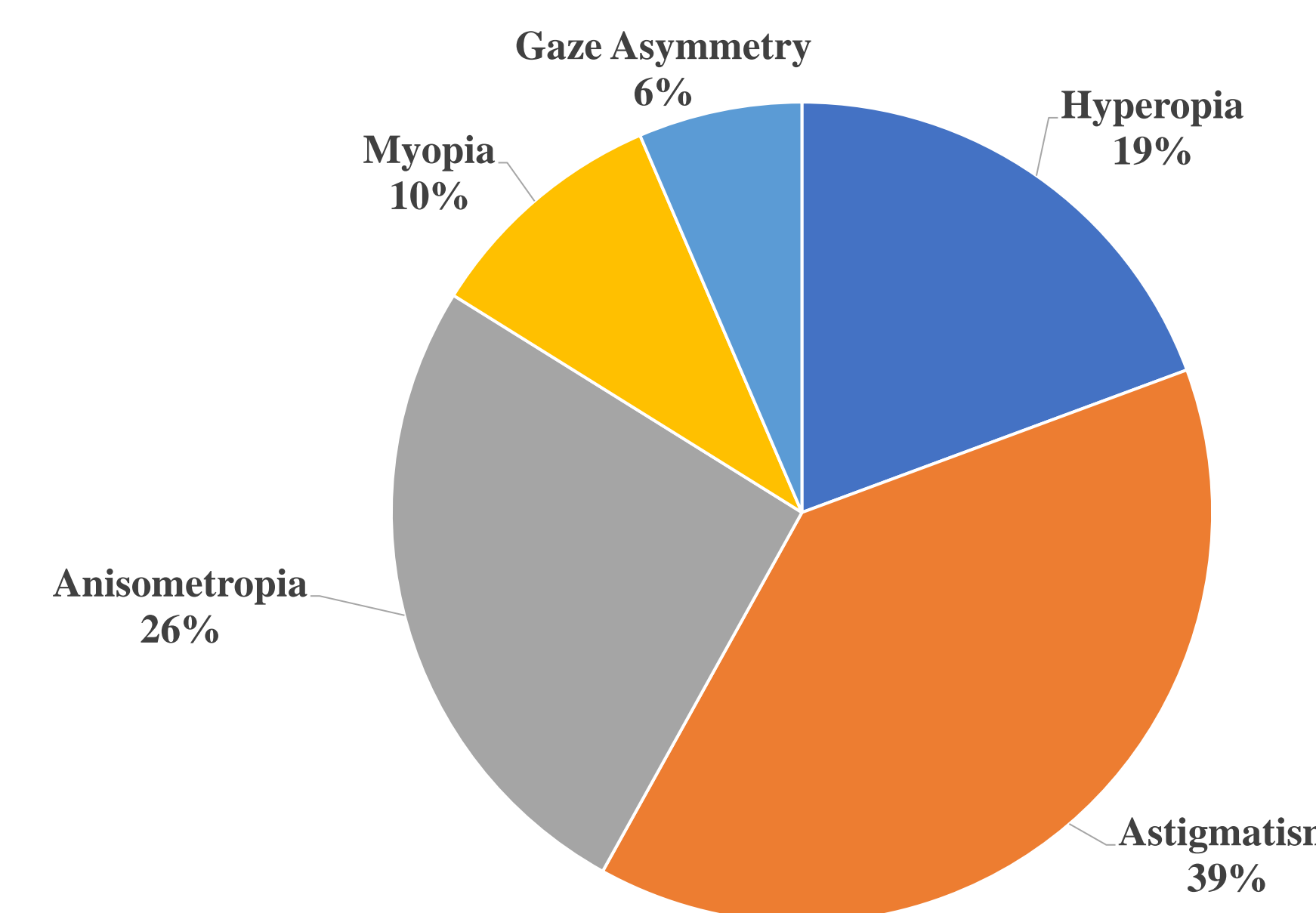


Figure 4: Incidence of ophthalmological problems that led to referral after the screening, Lynchburg HeadStart Screening Initiative, 2022

Results and/or Conclusion

Results

Vision screening was completed for 77 children out of 91 eligible children at the HeadStart programs.

- 44 females and 33 males were screened (see Table 1)
- The average age was 3.84 years
- 61 identified as African American/Black, 7 as White/Caucasian (see Table 1)
- 25 of the children screened had an abnormal result (see Fig. 1)
- Every child with an abnormal screening result was referred for further evaluation with a local pediatric ophthalmologist
- 14 females and 11 males were referred (see Fig. 2)
- Average age of those referred was 3.88 years
- Of those referred for services, 21 were Black/African American, 2 were White/Caucasian, and 2 did not provide their race or ethnicity (see Fig. 3)
- The PlusOptix® device also provides a specific indication for referral (see Fig. 4)
- Only 5 out of 25 referrals made appointments

Conclusions

The referral rate observed in this study is higher than the national rate of 20% in children in HeadStart programs⁶. Despite the screening and referral provided, only 5 out of 25 referrals made appointments. These results show the impact of social determinants of health (low social economic status, including low education and income) and an individual’s hesitancy in interacting with available healthcare resources.

A limitation of our study is the small sample size, with minimal diversity in the population screened.

Future Work

1. Despite low appointment turnout from the referrals, we are still following up with the family advocates assigned to each child referred to an ophthalmologist
2. Looking into factors that led to low appointment rates despite the available healthcare resources.
3. We hope that this project will promote awareness about the importance of vision screening in children and highlight the barriers that low-income families face when obtaining vision services.

References and/or Acknowledgments

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