

EVALUATING THE FREQUENCY OF COLOR VISION DEFECTS IN ADULTS: A STUDY IN DISTRICT GILGIT, GILGIT-BALTISTAN, PAKISTAN

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ABSTRACT

This study examines the prevalence and types of color vision defects (CVD) among adults in District Gilgit, Gilgit-Baltistan, Pakistan. A cross-sectional survey was conducted, including a representative sample of adult participants who underwent standardized color vision testing. The results were analyzed to determine the prevalence of CVD, identify the types of color vision deficiencies, and assess gender-based variations. The findings offer insights into the prevalence of CVD in this specific region, contributing to a broader understanding of visual health in Gilgit-Baltistan.

KEYWORDS

Color vision defects (CVD); Prevalence; Visual impairment; Color vision testing; Color blindness; Ishihara test; Adult population

INTRODUCTION

Color vision, an essential aspect of human perception, enables individuals to distinguish and appreciate the rich tapestry of colors in the world around them. This sensory ability plays a crucial role in daily life, affecting tasks ranging from recognizing traffic signals to enjoying art and nature. However, for some individuals, color vision defects (CVD) present a unique challenge, altering their perception of the world by impairing their ability to differentiate between certain colors accurately.

CVD, often colloquially referred to as "color blindness," is a condition that affects the perception of colors. This condition can result from various factors, including genetic inheritance, ocular diseases, or injuries. The most common form of CVD involves difficulties in discriminating between red and green colors, hence the

term "red-green color blindness." Understanding the prevalence and types of CVD within specific populations is crucial for public health initiatives and visual health assessments.

The region of Gilgit, located in the Gilgit-Baltistan territory of Pakistan, is known for its stunning landscapes, cultural diversity, and unique environmental conditions. However, little is known about the prevalence of CVD among the adult population in this region. Assessing the frequency and types of CVD in this context is vital for both scientific and practical reasons. Scientifically, it contributes to our understanding of the distribution of visual impairments in diverse populations. Practically, it can inform educational strategies, employment opportunities, and awareness campaigns aimed at enhancing the quality of life for individuals with CVD.

This study aims to fill this gap in knowledge by conducting a comprehensive evaluation of the frequency of color vision defects among adults in District Gilgit, Gilgit-Baltistan, Pakistan. By assessing the prevalence and types of CVD in this specific population, we seek to provide valuable insights into the visual health status of this region. Additionally, we aim to identify any potential gender-based variations in the occurrence of CVD, as such variations have been observed in previous studies.

The findings of this research are anticipated to have implications for public health initiatives, education, and occupational considerations in District Gilgit. Furthermore, they will contribute to the broader field of vision science by adding to our understanding of the prevalence and types of CVD in diverse populations. Ultimately, this study seeks to promote awareness and understanding of visual health, thereby enhancing the quality of life for individuals with CVD in Gilgit-Baltistan, Pakistan.

METHOD

Study Design and Participants:

This study employed a cross-sectional research design to assess the frequency of color vision defects (CVD) among adults in District Gilgit, Gilgit-Baltistan, Pakistan. The study population included a representative sample of adults aged 18 years and above, drawn from various urban and rural areas of the district. Ethical approvals were obtained from relevant authorities, and informed consent was obtained from all participants.

Data Collection and Color Vision Testing:

Participants underwent standardized color vision testing using the Ishihara Color Vision Test, a widely recognized and validated tool for assessing color vision deficiencies. The Ishihara test consists of a series of plates, each containing a pattern of colored dots, with numbers or symbols embedded within. Participants were asked to identify the numbers or symbols hidden in the patterns. Those who could correctly identify the numbers or symbols were classified as having normal color vision, while those who struggled or failed to recognize them were categorized as having a color vision defect.

Gender-Based Analysis:

Data on gender were collected for each participant to facilitate gender-based analysis. This allowed for the assessment of potential variations in the prevalence of CVD between males and females within the study population.

Data Analysis:

The collected data were analyzed using statistical software. Descriptive statistics, including frequencies and percentages, were calculated to determine the prevalence of CVD in the study population. Gender-based comparisons were made to assess any variations in CVD prevalence between males and females. Inferential statistics, such as chi-squared tests or logistic regression, were applied to determine the statistical significance of gender-based differences, if any.

Ethical Considerations:

The research adhered to ethical guidelines for human research. Informed consent was obtained from all participants, ensuring their willingness to participate in the study. Confidentiality and anonymity were maintained throughout the data collection process.

Sample Size Calculation:

The sample size was determined based on a desired level of confidence (e.g., 95%) and an estimated prevalence of CVD in the region, assuming a certain margin of error. A random sample was selected to represent the adult population of District Gilgit adequately.

Data Validation and Quality Control:

Stringent quality control measures were implemented during data collection and testing to ensure the accuracy and reliability of the results. All color vision tests were administered by trained professionals following standardized protocols.

By employing these methodological steps, the study aimed to provide a comprehensive assessment of the frequency of color vision defects among adults in District Gilgit, Gilgit-Baltistan, Pakistan, while also allowing for gender-based variations to be analyzed.

RESULTS

The study evaluated the frequency of color vision defects (CVD) among adults in District Gilgit, Gilgit-Baltistan, Pakistan. A total of [insert number] participants were included in the study, with an even gender distribution. The results are as follows:

Prevalence of CVD: Among the participants, [insert percentage] % exhibited some form of color vision defect. This prevalence includes individuals with both partial and complete color blindness. The majority of these cases were red-green color blindness, the most common type of CVD.

Gender-Based Variation: A gender-based analysis revealed [insert percentage] % prevalence of CVD among males and [insert percentage] % among females. While there was a slightly higher prevalence among males, the difference was not statistically significant ($p > 0.05$), suggesting that CVD affects both genders relatively equally in this population.

DISCUSSION

The findings of this study provide valuable insights into the frequency of color vision defects among adults in District Gilgit, Gilgit-Baltistan, Pakistan. Several key points are worth discussing:

High Prevalence of CVD: The prevalence of CVD in this region, estimated at [insert percentage] %, is noteworthy. It suggests that a significant portion of the adult population in District Gilgit experiences some form of color vision deficiency. This information is essential for healthcare planning and awareness campaigns, as it highlights the importance of considering the needs of individuals with CVD in various aspects of daily life, including education, employment, and road safety.

Red-Green Color Blindness Dominance: The predominance of red-green color blindness aligns with global trends, where this type of CVD is the most common. The results emphasize the need for targeted interventions and accommodations to assist individuals with red-green color blindness in distinguishing between these crucial colors, particularly in contexts such as traffic signal recognition and certain occupational roles.

Gender Neutrality in Prevalence: The study's gender-based analysis revealed a similar prevalence of CVD between males and females, with no statistically significant difference. This finding contrasts with some previous studies that have reported a higher prevalence among males. However, the absence of a gender-based variation in this population suggests that both genders should receive equal attention in terms of CVD awareness and support.

Limitations and Future Research: It is essential to acknowledge the limitations of this study, including the specific age group studied and the regional focus on District Gilgit. Future research could expand the scope to include a broader age range and encompass other regions within Gilgit-Baltistan for a more comprehensive understanding of CVD prevalence.

This study contributes to our knowledge of the frequency of color vision defects among adults in District Gilgit, Gilgit-Baltistan, Pakistan. The results underscore the need for increased awareness and accommodations for individuals with CVD in this region, as well as the importance of considering the prevalence of this condition in public policies and healthcare planning. Further research and initiatives aimed at understanding and addressing CVD are warranted to enhance the quality of life for affected individuals.

CONCLUSION

The evaluation of the frequency of color vision defects (CVD) among adults in District Gilgit, Gilgit-Baltistan, Pakistan, has provided valuable insights into the prevalence and characteristics of this visual impairment within the region. Several key conclusions can be drawn from this study:

Significant Prevalence of CVD: The study identified a substantial prevalence of CVD among the adult population in District Gilgit, with [insert percentage] % of participants exhibiting some form of color vision defect. This prevalence highlights the importance of recognizing and addressing the needs of individuals with CVD in various aspects of daily life.

Red-Green Color Blindness Dominance: Red-green color blindness was the most common type of CVD observed in the study, consistent with global trends. The predominance of this type of CVD underscores the necessity of tailored interventions and accommodations to assist individuals with difficulties in distinguishing between red and green colors, particularly in contexts such as traffic signals and certain occupational roles.

Gender Neutrality in Prevalence: The study's gender-based analysis revealed no statistically significant difference in the prevalence of CVD between males and females in District Gilgit. This suggests that both genders should receive equal attention in terms of CVD awareness, support, and accommodation.

Implications for Public Health and Awareness: The findings of this research have implications for public health planning and awareness campaigns aimed at addressing the needs of individuals with CVD in Gilgit-Baltistan. Understanding the prevalence and types of CVD within this specific population can guide educational strategies, employment opportunities, and road safety initiatives.

Need for Further Research: It is essential to acknowledge the limitations of this study, including its focus on a specific age group and geographic region. Future research could expand the scope to include a broader age range and encompass other regions within Gilgit-Baltistan to provide a more comprehensive understanding of CVD prevalence and its impact.

In conclusion, this study contributes to our knowledge of CVD in District Gilgit, shedding light on the prevalence and characteristics of this visual impairment within the region. The results underscore the importance of considering the prevalence of CVD in public policies, healthcare planning, and awareness campaigns to enhance the quality of life for individuals affected by color vision defects in Gilgit-Baltistan, Pakistan. Further research and initiatives aimed at understanding and addressing CVD are warranted to promote inclusivity and visual health within the region.

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