Statistical Consultancy Project 1

Knowledge and Practices in Preventing Screen Time Induced Eye Disorders Among Computer-Based Office Workers in Galle District, Sri Lanka

Submitted by

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Abstract

This study looks into the awareness and prevention methods of screen time-induced eye problems among computer-based office workers in Galle, Sri Lanka. With the increasing frequency of Computer Vision Syndrome (CVS) and Digital Eye Strain (DES), understanding workers' knowledge and behavior is crucial for promoting workplace eye health. A systematic self-administered questionnaire was used to collect data from 224 participants. It assessed demographic characteristics, awareness of screen-related eye diseases, and following to recommended preventive actions. Participants' levels of understanding and conduct were assessed using a composite knowledge score and a practice score. The results were such that although a percentage of the respondents possessed high awareness of screen-related eye disorders, the higher percentage of respondents exhibited low prevention measures practice. The statistic had no significant relation of the level of knowledge and the level of practice ($p > 0.05$), which represents the awareness does not translate the prevention practice. The results declare the importance of specific interventions that do not only enhance the awareness but also enable the regular application of the practice of eye health at the workplace.

Content

1. Introduction

1.1 Background of the study

The usage of electronic gadgets has become established in daily life in today's technologically advanced society, particularly in professional settings. Long periods of screen time are particularly common among office workers, which has increased the prevalence of eye conditions brought on by screen time. These conditions, often referred to as Digital Eye Strain (DES) or Computer Vision Syndrome (CVS), include a variety of symptoms, including headaches, blurred vision, dry eyes, eye fatigue, and shoulder or neck pain. Long-term use of digital gadgets like computers, smartphones, and tablets is the main cause of them.

According to the American Optometric Association, CVS is a collection of vision-related issues brought on by extended computer use that can have a major negative influence on one's quality of life and productivity. According to studies, between 60% and 90% of computer users may have CVS symptoms. Inappropriate lighting, screen settings, poor ergonomics, and infrequent breaks are all contributing issues. Among these, prolonged screen time has been strongly associated with Meibomian Gland Dysfunction (MGD), Asthenopia, and Dry Eye Disease (DED), especially in poorly designed work environments.

While office workers do achieve some level of comprehension of the risk of excessive screen use, practical use of prevention measures always falls short. Prevention measures like the use of correct screen distance, lighting, and brightness control, use of the 20-20-20 rule, and postural adjustments are hardly ever implemented in practical settings.

In Sri Lanka, among the corporate or administrative sectors, no clear data exist regarding the knowledge of office workers concerning these disorders and the adoption of prevention measures. The current study among computer-screen-based office workers of the DJ Group of Companies at Batapola, Galle, purports to evaluate their knowledge as well as practices of preventing screen-related disorders of the eyes. Recognizing these gaps can be used as a guide to implementing workplace measures as well as education strategies for the reduction of the risk of visual strain and the improvement of the well-being and output of the employees.

1.2 Objectives of the study

1.2.1 General Objective

- To determine the knowledge & practices of computer-based office workers in preventing screen time-induced eye disorders among computer-based office workers in a selected office in the Galle district, Sri Lanka.

1.2.2 Specific Objectives

- To assess the level of knowledge among computer-based office workers in preventing screen time-induced eye disorders among computer-based office workers in a selected office in the Galle district, Sri Lanka.
- To describe the common practices among computer-based office workers in preventing screen time-induced eye disorders among computer-based office workers in a selected office in the Galle district, Sri Lanka.
- To describe the association between the level of knowledge & preventive practices among computer-based office workers in preventing screen time-induced eye disorders among computer-based office workers in a selected office in the Galle district, Sri Lanka.

2. Methodology and Data collection

A quantitative, descriptive cross-sectional study design was used to evaluate the prevention and knowledge of screen time disorders of the eyes of office workers employed in computers. The study setting was the DJ Group of Companies, Batapola, Galle District, Sri Lanka. The study population was the 224 office workers inclusive of the following obligatory criteria: age of 20-50 years, carrying out a minimum of four hours of screen-based work per day, and at least six months of employment. Exclusion criteria were workers not carrying out screen-based work, individuals possessing pre-existent, unrelated-to-screen, chronic disorders of the eyes, individuals possessing prior history of eye surgery for the previous 12 months, part/temp workers employed for less than six months, and individuals possessing additional related medical disorders.

The full eligible population of 224 computer-based office workers was included using a population-based sample technique. This strategy reduced sampling bias and guaranteed thorough coverage. A pre-tested, self-administered questionnaire that was created and modified for the local context under the direction of subject matter experts was used to gather data. The questionnaire, which was available in English, Sinhala, and Tamil, was divided into five sections: sociodemographic data, awareness of eye problems brought on by screen usage, preventive measures, symptom experience, and behavior related to vision care.

A composite knowledge score was calculated using answers to five important questions in order to measure knowledge. "Yes" denoted accurate knowledge and received a score of 1, whilst "No" or "Not Sure" received a score of 0. The range of the total knowledge score was 0 to 5. This led to the classification of knowledge levels as either good (> 2.5) or low (≤ 2.5).

Eight distinct preventive activities were assessed in the practices portion, including taking screen breaks, regulating brightness, keeping good posture, blinking consciously, adhering to the 20-20-20 rule, cleaning displays to minimize glare, and situating screens optimally.

Responses were scored on an ordinal scale: “Always” or “Yes” received 1 point, “Sometimes” 0.5, “Rarely” 0.25, and “Never” or “No” received 0 points. The total practice score ranged from 0 to 8 and was categorized as low practice (≤ 4) or high practice (> 4).

Statistical analysis was conducted to explore patterns in the data and test for associations. Descriptive statistics summarized demographic and response distributions. A Chi-square test of independence was used to examine the association between knowledge level and practice level.

This approach made it possible to conduct a thorough and organized study of computer-based office workers' present eye health awareness and behavior, identifying important gaps and areas in need of focused interventions.

3. Variable Description

3.1 Demographic variable

Variable Name	Type	Description
Age	Categorical	Age group of the respondent
Gender	Categorical	Gender of the respondent
Ethnicity	Categorical	Ethnic background of the respondent
Religion	Categorical	Religious affiliation
Marital status	Categorical	Marital status (e.g., single, married)
Educational level	Categorical	Highest level of education completed
Job role	Categorical	Job title or position in the workplace
Working Experience	Categorical	Length of work experience

Table 01: Variable description of demographic variables

3.2 Variables under knowledge score variable

Variable Name	Type	Description	Response Options
Awareness of screen time-induced eye disorders	Binary	Awareness of conditions caused by prolonged screen use	Yes / No
Awareness of symptoms of eye disorders	Binary	Knowledge of common symptoms such as eye strain and dryness	Yes / No

Variable Name	Type	Description	Response Options
Knowledge of recommended screen break duration	Categorical	Understanding of recommended time intervals for screen breaks	Yes / No / Not Sure
Awareness of the 20-20-20 rule	Binary	Awareness of the 20-20-20 rule to prevent digital eye strain	Yes / No
Knowledge of correct screen-to-eye distance	Categorical	Knowledge of the correct distance between eyes and the screen	Yes / No / Not Sure

Table 02: Variable description of variables under knowledge score variable

3.3 Variables under practice level variable

Variable Name	Type	Description	Response Options
Take regular screen breaks	Binary	Frequency of taking breaks from screen time	Yes / No
Adjust brightness/contrast	Binary	Whether brightness and contrast are adjusted for comfort	Yes / No
Maintain proper posture	Ordinal	Use of proper body posture while using screens	Always / Often / Rarely / Never
Conscious blinking	Ordinal	Conscious effort to blink regularly to reduce dryness	Always / Sometimes / Rarely / Never
Follow 20-20-20 rule	Binary	Whether the 20-20-20 rule is followed during screen use	Yes / No
Clean your screen to reduce glare	Ordinal	Screen cleaning practices to minimize glare	Always / Sometimes / Rarely / Never
Position screen to avoid glare from windows/lights	Ordinal	Screen positioning to avoid glare from lights or windows	Always / Sometimes / Rarely / Never
Adjusting sitting posture to reduce eye strain	Ordinal	Adjusting seating to reduce physical strain on eyes	Always / Sometimes / Rarely / Never

Table 03: Variable description of variables under practice score variable

4. Data Analysis

4.1 Exploratory Data Analysis

➢ Gender

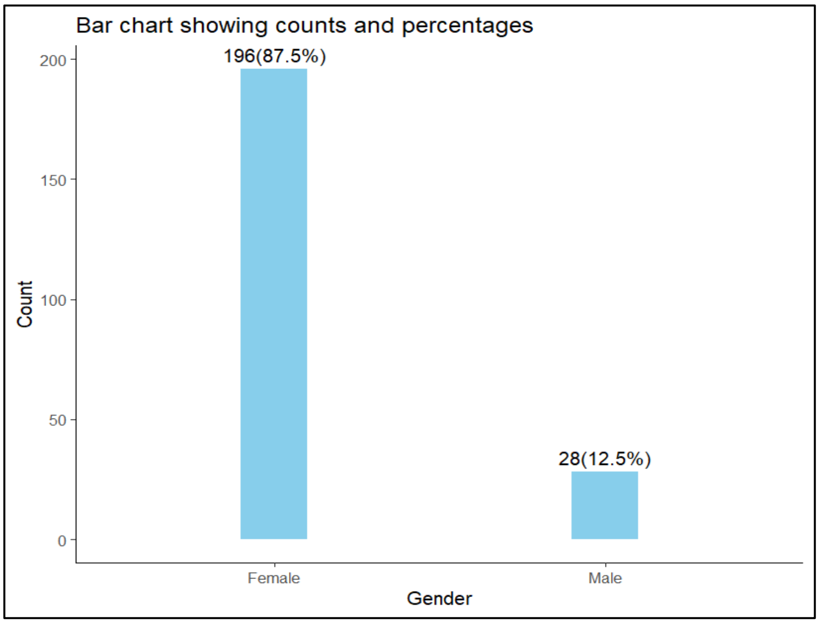

Figure 01: Bar chart of gender variable

Females significantly outnumber males in this dataset, comprising nearly 88% of the total, while males account for only about 12.5%.

➢ Age

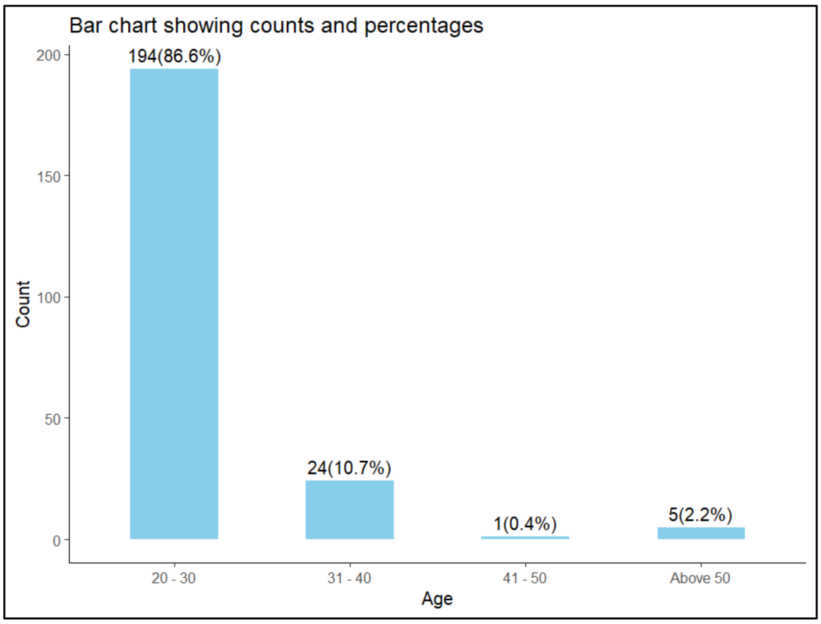

Figure 02: Bar chart of age variable

The bar chart shows the age distribution of participants, with the majority (86.6%) falling in the 20-30 age group, followed by 31-40 (10.7%), 41-50 (2.2%), and above 50 (0.4%).

➢ Ethnicity

In this data set, all participants reported the same ethnicity, meaning the group is ethnically the same. This shows that the sample likely comes from one main ethnic group, possibly reflecting the local population.

➢ Religion

Similarly, all participants reported the same religion, so there is no difference in religious background within the sample. This suggests the group may come from a place where most people follow the same religion. Because everyone gave the same answer, the religion variable can't be used to compare groups or study differences.

➢ Education Level

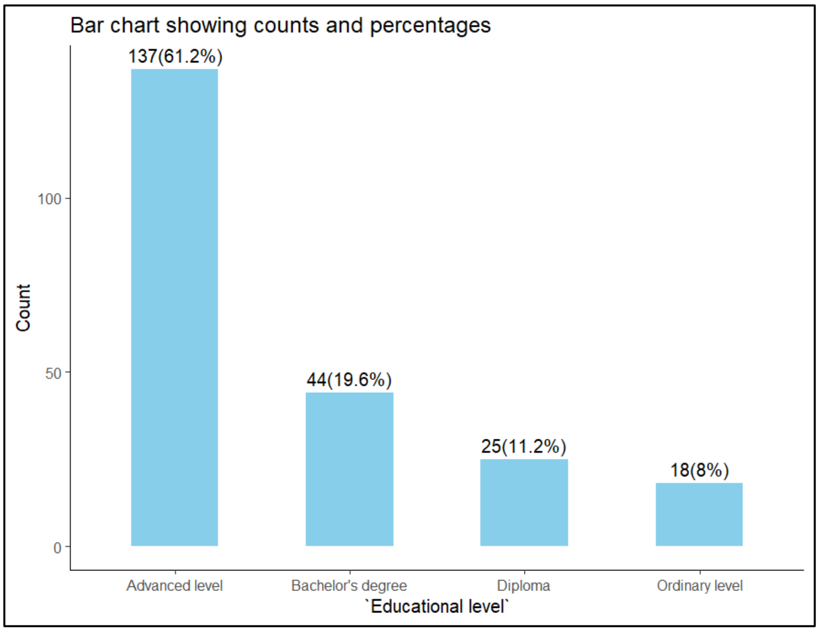

Figure 03: Bar chart of education level variable

The bar chart displays the educational attainment of participants, with the majority (61.2%) holding an advanced level qualification, followed by bachelor's degrees (19.6%), diplomas (11.2%), and ordinary level qualifications (8%).

➢ Working experience

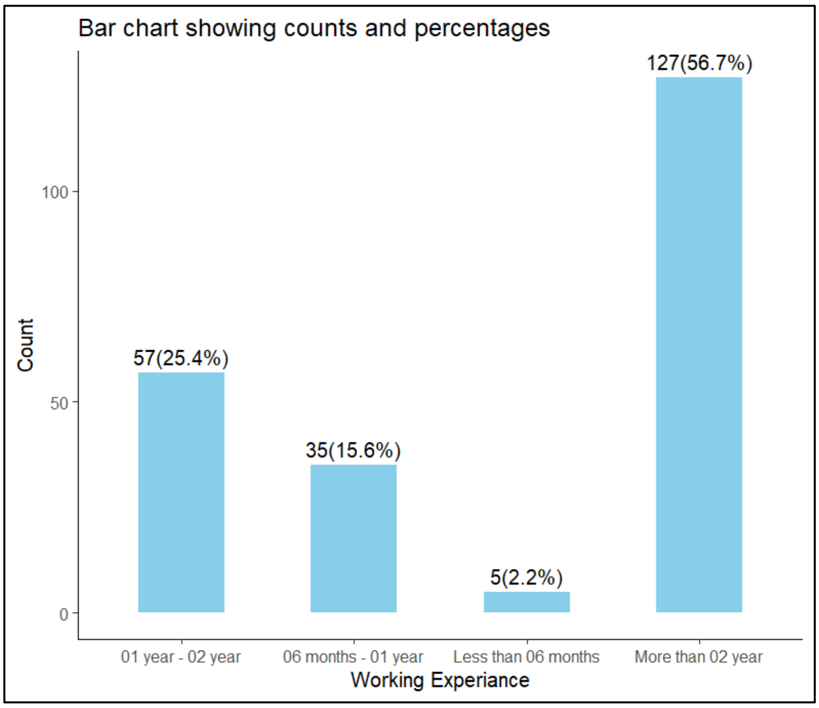

Figure 04: Bar chart of working experience variable

The bar chart illustrates participants' work experience distribution, showing that 25.4% have 1-2 years of experience, 15.6% have 6 months to 1 year, 2.2% have less than 6 months, and the remaining majority (56.8%) have more than 2 years of experience.

➢ Job role

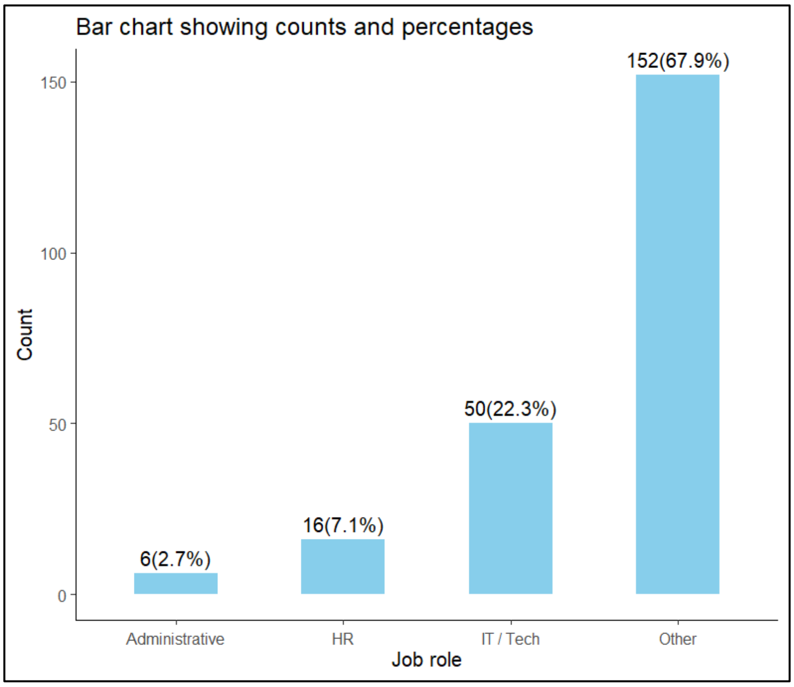

Figure 05: Bar chart of job role variable

With IT/Tech roles being the most common (67.9%), followed by HR (7.1%), Administrative (2.7%), and other unspecified roles (22.3%).

➢ Knowledge score variable

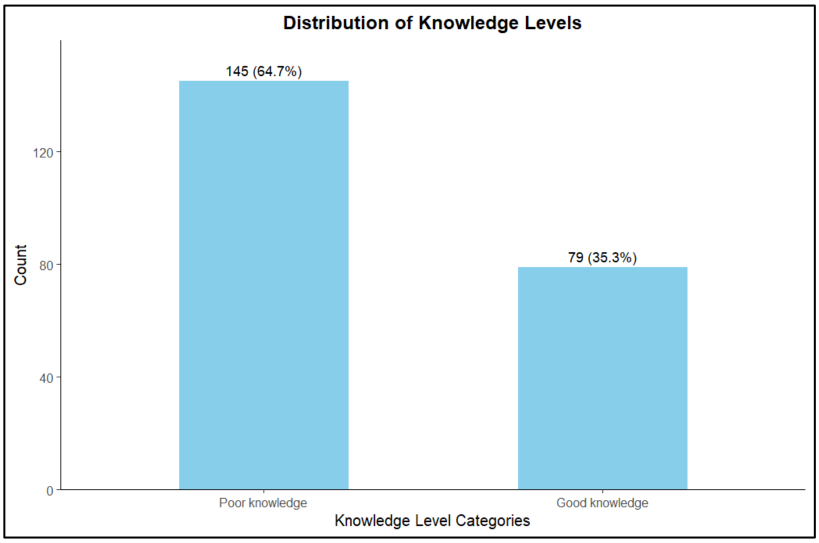

Figure 06: Distribution of knowledge score variable

The bar chart reveals that 64.7% of participants (145) have poor knowledge, while 35.3% (79) possess good knowledge in screen induced eye disorders.

➢ Knowledge score by gender

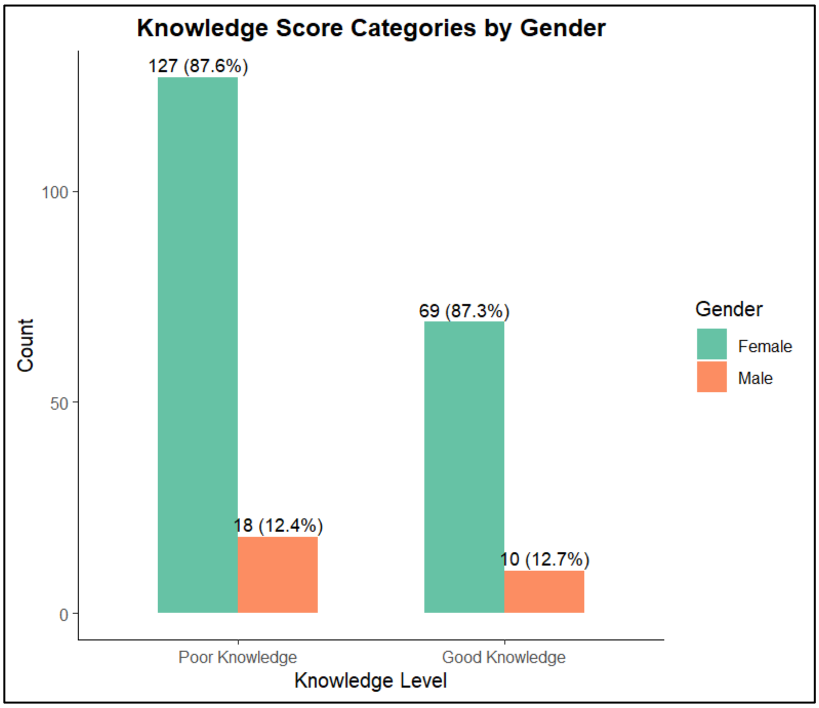

Figure 07: Bar chart of knowledge score by gender variable

The bar chart shows similar knowledge gaps between genders, with 87.6% of females (127/145) and 87.3% of males (69/79) demonstrating poor knowledge. Only about 12-13% in each group show good knowledge, indicating systemic knowledge deficits across all participants.

➢ Knowledge score by education level

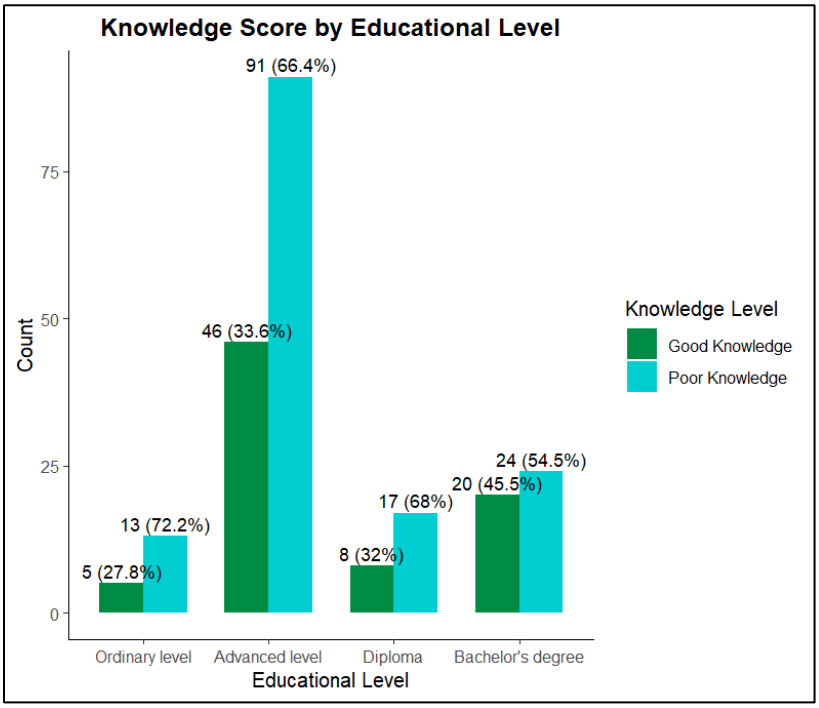

Figure 08: Bar chart of knowledge score by education level variable

The chart reveals an inverse relationship between education level and knowledge gaps. While 72.2% of ordinary level holders and 68% of diploma holders show poor knowledge, this drops to 54.5% among bachelor's degree holders. Conversely, good knowledge increases with education - from 27.8% (ordinary) to 32% (diploma) to 45.5% (bachelor's). This demonstrates education's protective effect against knowledge deficits.

➢ Practice score variable

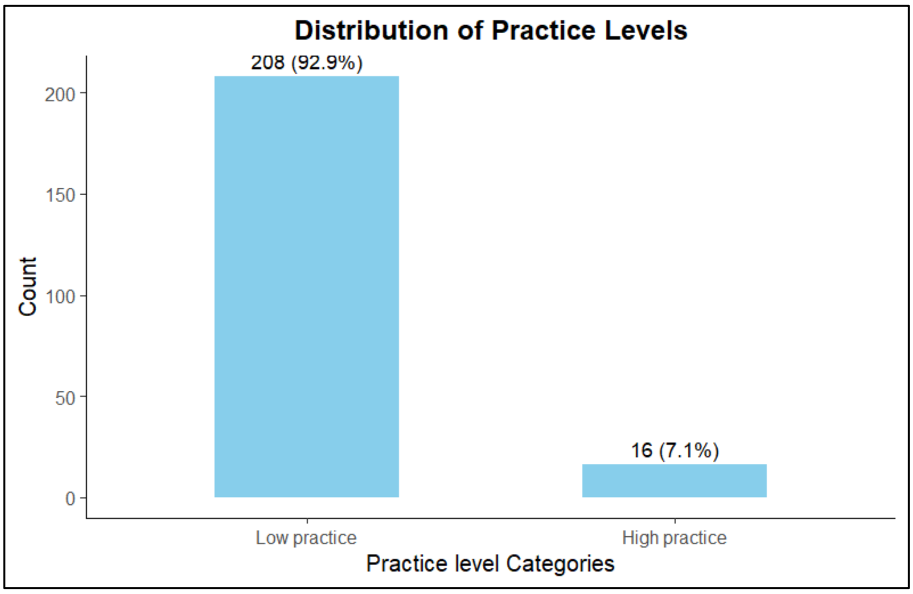

Figure 09: Distribution of practice score variable

The bar chart indicates that 92.9% of participants (208) demonstrate low practice levels, suggesting a widespread need for improved implementation or adherence to the assessed practices. The remaining 7.1% (not shown) would presumably fall into higher practice categories.

4.2 Statistical Analysis

Objective 1: To assess the level of knowledge among computer-based office workers in preventing screen time-induced eye disorders.

Response	point
Yes	1
No	0
Not sure	0

Variables	Knowledge score
Poor knowledge	<= 2.5
Good knowledge	> 2.5

Assessment of knowledge regarding preventing screen time-induced eye disorders is based on the above given specific variables. These five variables are selected based on the questions that are used in the google form. For each question, responses were coded as 1 for “Yes” (indicating correct knowledge and 0 for both “No” and “Not sure” (indicating lack of knowledge or uncertainty. After combining all five variables together, create a new scaled variable to observe how the level of awareness of eye disorders is composite among computer-based office workers. Since all five variables are binary, the highest value for the scaled variable is 5 while the lowest is 0. Based on the [2] Previous research papers, computer-based office workers categorized into 2 parts according to the mid value (2.5). These 2 categories help to identify where the selected person has a good knowledge about preventing screen time-induced eye disorders. Among these computers-based office workers 79 people have a good knowledge about eye disorders which is a percentage of 36% while the rest of the people have a poor knowledge as a percentage of 65%. Below given diagram shows how the level of knowledge is distributed among computer-based workers.

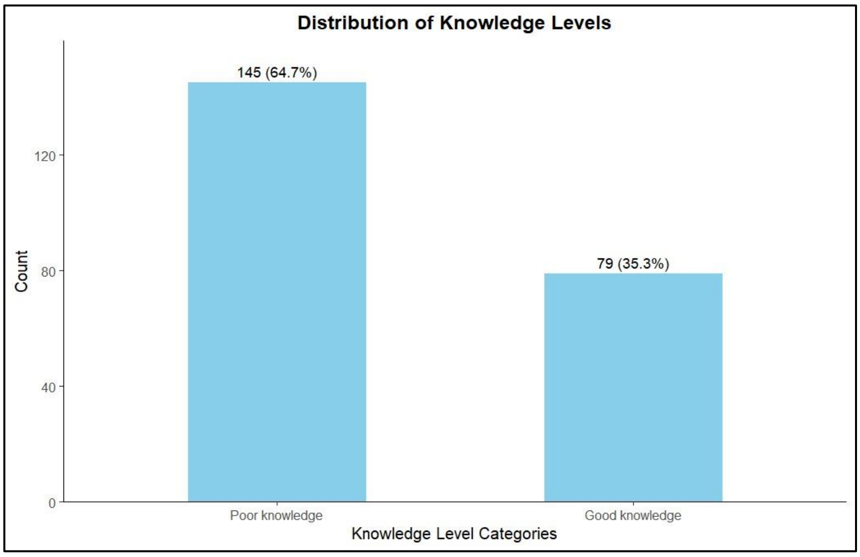

Figure 10: Distribution of knowledge score variable

Objective 2: To describe the common practices among computer-based office workers in preventing screen time-induced eye disorders.

Response	Point
Always / Yes	1
Sometimes	0.5
Rarely	0.25
Never / No	0

Variables	Practice score
Low practice	<= 4
High practice	>4

To analyze the objective, a composite practice score was created using selected eight practice-related questions. Each response to the practice-related questions was scored on an ordinal scale to reflect the degree of adherence to recommended preventive behaviors. Responses of "Always" or "Yes" were assigned 1 point, indicating consistent practice. Responses of "Sometimes" were given 0.5 points, while "Rarely" responses received 0.25 points, reflecting partial or infrequent engagement. Responses of "Never" or "No" were assigned 0 points, indicating no practice of the behavior. Based on the [1] Previous research papers, computer-based office workers categorized into 2 parts according to the mid value (4). The total practice score, ranging from 0 to 8, was computed by assigning weighted marks based on participants' responses to eight preventive behaviors related to screen use. Based on this score, a categorical variable named practice level was created. Below given diagram shows how the level of practice is distributed among computer-based workers.

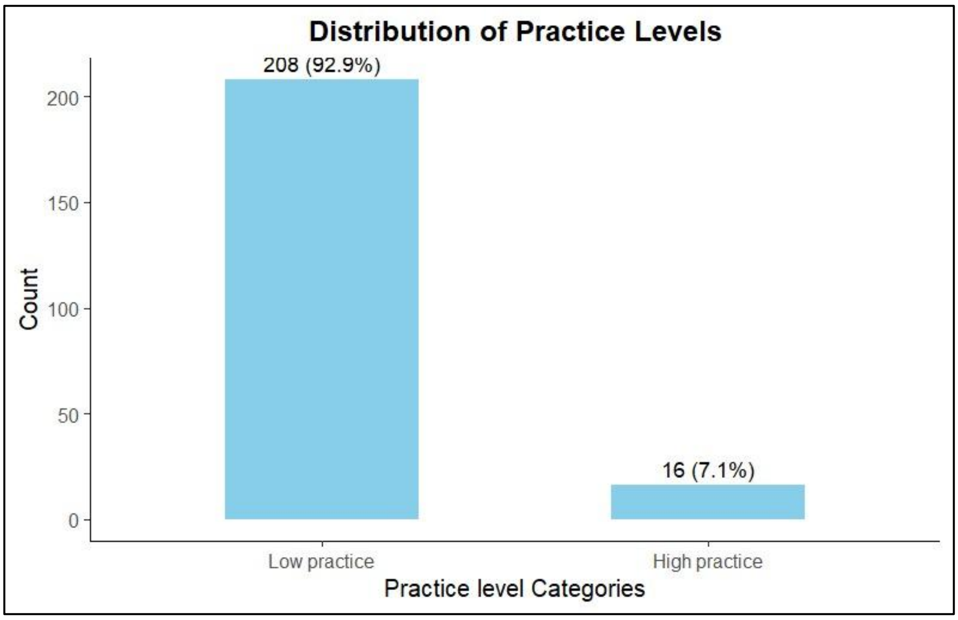

Figure 11: Distribution of practice score variable

Objective 3: To describe the association between the level of knowledge & preventive practices among computer-based office workers in preventing screen time induced eye disorders.

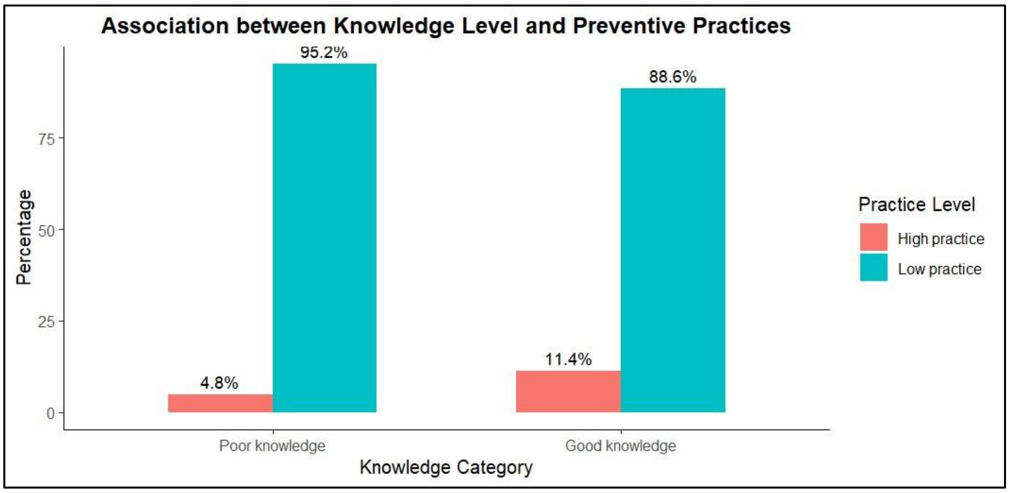

Figure 12: Association between knowledge level and preventive practices

The above diagram shows the composition of the level of practice within the level of knowledge. Among the workers who have a good knowledge about eye disorders, only 11% of the workers have good practices on preventing methods. Similarly, of the workers who have a poor knowledge about eye disorders, only 5% of the workers have good practices on preventing methods. To assess the association between knowledge level and preventive practices regarding screen time-induced eye disorders among computer-based office workers, a chi-square test of independence was conducted. The diagram shows the Contingency table of knowledge and practice score variables. The following hypotheses are considered to check the association between these 2 variables.

H0: There is no association between two variables
H1: There is an association between two variables.

Since p-value is 0.1208 > 0.05 we have not enough evidence to reject H0 at 5% of significance. As H0 rejected at 5% level of significance, there is no association between the level of knowledge & preventive practices among computer-based office workers.

5. Conclusions

This study provides insight into the awareness and prevention methods for screen time-induced eye problems among computer-based office workers in Sri Lanka's Galle District. The findings show a worrying gap between awareness and actual implementation of preventative measures. While 36% of participants had strong understanding of digital eye strain and related diseases, a staggering 92.9% had poor preventive actions. Even among knowledgeable workers, just 11% adhere to suggested eye care methods on a regular basis. The statistical study revealed no significant relationship between knowledge levels and practice behaviors ($p = 0.1208$), implying that awareness alone is insufficient to motivate behavioral change in workplace eye health practices.

The findings identify several crucial areas for intervention. First, there is a definite need for improved educational programs that not only convey information but also prioritize practical application and habit building. Second, workplace contextual factors appear to be a significant barrier to the adoption of healthy eye care practices. The study shows that organizational policies and physical workspace design may need to be changed to better promote eye health. Third, the data show that individual knowledge must be supplemented by systemic support, such as regular reminders, supervisor encouragement, and possibly incentive structures, in order to promote consistent use of preventive measures.

These findings have significant implications for occupational health programs in computer-dependent settings. Future interventions should take a multifaceted strategy, integrating education, environmental adjustments, and regulatory reforms. Furthermore, study should look into the specific barriers that limit knowledge translation into practice, such as workload demands, time constraints, or a lack of available resources. Employers can reduce the dangers of digital eye strain and promote improved eye health among their computer-using workforce by addressing both individual knowledge gaps and organizational variables, thereby improving both employee wellbeing and workplace efficiency.

6. Discussion

This study assessed knowledge and preventive actions related to screen time-associated eye conditions among office staff working on computers in the Galle District, Sri Lanka. While most participants had a general understanding of conditions like Digital Eye Strain and Computer Vision Syndrome (CVS), there was a clear gap between their knowledge and the actual preventive measures they took daily.

Only 36% of the sample fell into the good knowledge category, with 64% categorized as having poor knowledge. Despite this moderate awareness, actual practice levels were very low: just 11% of those with good knowledge and only 5% of those with poor knowledge regularly practiced preventive measures. This gap underscores that awareness alone does not lead to behavior change.

The lack of a statistically significant correlation between knowledge and practice ($p = 0.1208$) suggests that other factors—such as workplace culture, environmental barriers, or absence of rewards—may prevent the adoption of best practices. This highlights the need not only for awareness campaigns but also for behavior-oriented interventions, including organizational support and policy adjustments.

Notably, during data analysis, we observed an imbalance between practice and knowledge categories. More participants fell into the "low practice" and "low knowledge" groups, which could skew the results and reduce the ability to detect meaningful relationships. Future research should address this imbalance using methods like stratified sampling or weighted analysis to improve the results' generalizability.

Additionally, the current approach categorized preventive behaviors based on self-reported frequency on a limited ordinal scale (Always, Sometimes, Rarely, Never). However, these vague categories may not accurately reflect participants' consistency. Future studies and workplace surveys should ask employees to specify how often (e.g., daily, weekly, hourly) they perform preventive actions, providing more precise and actionable insights into behavior patterns.

Overall, this study highlights the gap between knowledge and action regarding eye health in digital work settings. Closing this gap requires targeted interventions, improved measurement methods, and ongoing engagement with workers about the importance and frequency of adopting preventive strategies.

References

[1] Titiati, P. E. (2019). Knowledge, Attitude and Practices of Eye Health Care among University of Ghana Graduate Students (Doctoral dissertation, University of Ghana).[Google Scholar]

[2] Onwubiko, S. N., Eze, B. I., Udeh, N. N., Okoloagu, N. N., & Chuka-Okosa, C. M. (2015). Knowledge and attitudes towards eye diseases in a rural South-eastern Nigerian population. Journal of health care for the poor and underserved, 26(1), 199-210.[Google Scholar]