Eye Strain and Coated Glasses Preference: A Self-Reported Cross-Sectional Study of Urban and Rural Bankers in a Digitally Driven Modern Banking Landscape in Trinidad and Tobago

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Abstract

Background: The modern workplace requirements in the banking sector require bankers to be working on screens for longer than 6 hours a day, putting much stress and strain on their eyes. Use of anti-glare screens and glasses can elevate the strain on the eyes of the users.Computer Vision Syndrome (CVS) is a serious occupational hazard that needs to be addressed to ensure that the usage of computers in the digital era do not diminish the quality of life of users. However, there is extremely limited research on CVS and its associated factors the Caribbean nations and to the best of our knowledge, no large scale study has been conducted nationally on the prevalence of CVS among bankers in Trinidad.

Objective: The study aimed to highlighht the prevelence extent of CVS in Trinidad and the factors associated with the risk of developing CVS. By investigating the preferences for coated glasses among bankers, the study aimed to explore the various factors influencing these preferences and their implications for improving eye health in the banking sector. Ultimately, it aimed to provide policymakers and researchers with key insights on why and how to manage the underlying factors for CSV to ensure that bankers keep up with the usage of computers.

Methods: A self-reported cross-sectional survey strategy was applied to collect data from the sample population between April and June 2021. The collected data was entered on excel worksheets and was later uploaded to SPSS for further analysis. The association between dependent and independent variables were examined using a binary logistic regression.

Results: The preference of using coated glasses was impacted by rural location as compared to the urban locations. Moreover, factors like source of light in the workplace, previous use of glasses and coating, and taking rest breaks impacted preference to use coated glasses and screens. Furthermore, ocular issues like frequent headaches, blurred vision and eye fatigue also increased the preference to use anti-glare coating. Only the education level among the assessed demographic factors had a significant impact the use of glass coating as the rest were proven to be insignificant. The use of eye sight glass has an impact on the use of coating with a resulted p-value of 0.00 and an AOR of 23.232. The results also depicted that the diseases like diabetes does not impact the decision to use coating with a p-value of 0.905 and AOR of 0.953. The impact of dry eyes has a significant effect on

the intention to use anti-glare coatings with a p-value of 0.024 and AOR of 1.694 respectively. Results however demonstrated that bankers in urban areas are hugely aware of the benefits regarding the usage of anti-glare coating compared to the rural area bankers in Trinidad.

Conclusions: The study concluded that there are many factors that can impact the preference of use of coated glasses. However, there is a low healthcare behavior in bankers of rural areas and organizational support is required to elevate the eye strain and stress caused by long hours of working on the computer screens as compared to the urban areas.

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Abstract

Introduction:

The modern workplace requirements in the banking sector require bankers to be working on screens for longer than 6 hours a day, putting much stress and strain on their eyes. Use of anti-glare screens and glasses can elevate the strain on the eyes of the users.

Research problem

Computer Vision Syndrome (CVS) is a serious occupational hazard that needs to be addressed to ensure that the usage of computers in the digital era do not diminish the quality of life of users. However, there is extremely limited research on CVS and its associated factors the Caribbean nations and to the best of our knowledge, no large scale study has been conducted nationally on the prevalence of CVS among bankers in Trinidad.

Aim and Objective

The study aimed to highlighht the prevelence extent of CVS in Trinidad and the factors associated with the risk of developing CVS. By investigating the preferences for coated glasses among bankers, the study aimed to explore the various factors influencing these preferences and their implications for improving eye health in the banking sector. Ultimately, it aimed to provide policymakers and researchers with key insights on why and how to manage the underlying factors for CSV to ensure that bankers keep up with the usage of computers.

Methods:

A self-reported cross-sectional survey strategy was applied to collect data from the sample population between April and June 2021. The collected data was entered on excel worksheets and was later uploaded to SPSS for further analysis. The association between dependent and independent variables were examined using a binary logistic regression.

Results:

The preference of using coated glasses was impacted by rural location as compared to the urban locations. Moreover, factors like source of light in the workplace, previous use of glasses and coating, and taking rest breaks impacted preference to use coated glasses and screens. Furthermore, ocular issues like frequent headaches, blurred vision and eye fatigue also increased the preference to use anti-glare coating. Only the education level among the assessed demographic factors had a significant impact the use of glass coating as the rest were proven to

be insignificant. The use of eye sight glass has an impact on the use of coating with a resulted p-value of 0.00 and an AOR of 23.232. The results also depicted that the diseases like diabetes does not impact the decision to use coating with a p-value of 0.905 and AOR of 0.953. The impact of dry eyes has a significant effect on the intention to use anti-glare coatings with a p-value of 0.024 and AOR of 1.694 respectively. Results however demonstrated that bankers in urban areas are hugely aware of the benefits regarding the usage of anti-glare coating compared to the rural area bankers in Trinidad.

Conclusion:

The study concluded that there are many factors that can impact the preference of use of coated glasses. However, there is a low healthcare behavior in bankers of rural areas and organizational support is required to elevate the eye strain and stress caused by long hours of working on the computer screens as compared to the urban areas.

Keywords*: Trinidad, Bankers, Anti-glare coating, Urban, Rural.*

Introduction

With the transformation to digitization, computers have been widely adopted as a useful tool that is efficient, reliable, and fast and it is now considered a necessity for all academic organizations and workplaces. From educational institutions to government and corporate offices to home offices, computer usage has exponentially increased [1]. However, the shift to computers has resulted in a serious health concern known as the Computer Vision Syndrome (CVS) due to the extended usage of a computer, incorrect posture and workstation arrangement, and inadequate lighting during working [2]. As per the American Optometric Association (AOA), the prolonged usage of a computer puts strain on the vision and increased stress to the eye can lead to a group of eye and vision-related disorders. Physical symptoms that are observed in CVS include dry and irritated eyes, delay in changing focus, visual fatigue and strain, blurring of vision, sensitivity to light and glare, red eyes, sensation of burning in eyes, excessive tears formation, headaches and color irregularities [2,3]. Furthermore, the frequent and extensive use of computer is also linked with retinal migraines and musculoskeletal problems [2]. With the enhanced usage of technology the reports of Trinidad & Tobago's students supported that ocular complaints are the results of the excessive usage of digital devices. The e-learning has gradually increased to a great extent after the prevalence of Covid-19 where teaching is also carried through digital platforms. According to the research online or digital medium of learning requires less time and results in greater retention of

knowledge but overall contributes in CVS without effective anti-reflective or eye-glass coatings usage [4].

It is estimated that every year at least one million new cases of CVS are reported and approximately 60 million people are suffering globally from the digital eye strain which requires serious evaluation and assessment of the underlying factors [5]. Studies have highlighted the socio-demographic factors along with the workplace characteristics that are likely to aggravate the problem [6-8]. Females are more prone to developing eye-related disorders [5]. Longer working hours, incorrect sitting posture, use of contact lens, eyeglasses and pre-existing eye or other health conditions are linked with CVS [6, 7]. Lighting of the room, brightness of the computer and the position of gazing at the computer are all risk factors associated with CVS [8]. The lack of protective equipment and ergonomic sitting arrangement provided to the workers, especially in less developed areas, along with no breaks increases the risk of CVS [9]. These problems are negatively affecting the lifestyle and well-being of workers resulting in reduced quality of life, health issues, lower productivity and dissatisfaction with jobs [10]. Workplaces such as banks require workers to perform their daily tasks using computers and the long working hours put the bank workers at risk of developing CVS [6]. Workers in rural areas have greater workload as compared to workers in urban areas which aggravate the issue [11].

Previous studies have discussed management strategies such as taking regular breaks, antiglare filters and coatings, blue-light blocking contact lens and spectacles to mitigate the risk of developing CVS [12]. Workers who have access to knowledge are likely to adopt preventive measures such as antiglare equipment [11]. Furthermore, workers with high salaries have access to healthcare facilities which helps in creating awareness and positively impacts the adoption of preventive measures [11]. CVS is a serious occupational hazard that needs to be addressed to ensure that the usage of computers in the digital era do not diminish the quality of life of users. The research objectives for this study are mentioned below:

1. To investigate the socio-demographic, behavioral, personal, and usage characteristics, and ocular complaints in rural vs urban bankers in Trinidad
2. Examine the impact of various socio-demographic and personal workplace characteristics on preference to use eyeglass coating
3. Examine the impact of various ocular complaints in preference to use eyeglass coating

The increasing prevalence of CVS has become a worldwide concern for policymakers and

researchers are discussing the importance of managing the underlying factors to keep up with the usage of computers [7]. Research conducted in Sri Lanka showed that around two-thirds of workers in a computer office are suffering from CVS [5]. Similarly, study in Ethiopia also elaborated on the factors that are associated with CVS to provide management strategy where 73% of computer users including bankers are suffering from CVS [13]. There is extremely limited research on CVS and its associated factors the Caribbean nations and to the best of our knowledge, no large scale study has been conducted nationally on the prevalence of CVS among bankers in Trinidad. Therefore, to seal the gap in the extant literature, the study aims to highlight the degree of prevalence of CVS in Trinidad and the factors associated with the risk of developing CVS. By investigating the preferences for coated glasses among bankers, the study uncoverse the various factors influencing these preferences and their implications for improving eye health in the banking sector. Thus, it intends to provide policymakers and researchers with key insights on why and how to manage the underlying factors for CSV to ensure that bankers keep up with the usage of computers.

The study aims to provide a comparative analysis into the working characteristics of urban and rural bankers in Trinidad. Data is collected through questionnaires from residents of the country of mixed ethnicities who are employed in the banking sector and using desktop computers or laptop for work purposes.

Literature Review

With the adoption of computers in workplaces in the 20th and 21st century, computers have become useful and relevant in different occupations particularly IT sector, banking, financial market, customer services and educational institutions [1]. However, studies have shown that extensive use of computers poses great threat to health including vision-related disorders, back aches, tension headaches and stress [14]. Ocular complaints about computer usage grouped as CVS have increased and previous research has found that the prevalence of CVS is 51.5% among workers in the administration department in a university in Ghana [15]. Another research conducted in Ghana assessed the health concerns of bankers and concluded that 71.2% of the bankers are developing CVS [6]. Blurred vision, eye redness, strain and headache are the most common issues developed in workers in Ethiopia whereas using eyeglass coating, spectacles, taking breaks, high income and blinking reduce the prevalence of CVS [11]. In another study in UAE, 53% of the participants also reported that they have headaches due to computer usage, whereas 55% stated they experienced burning in the eyes. About 48% of the subjects also experienced fatigue eye. These symptoms were found to be more common in

female respondents [10]. In Italy, a survey among bank workers showed that 32% of the respondents had ocular symptoms of CVS such as blurring of vision, eye strain, ocular fatigue, headaches [16]. Similarly, 63% of computer workers in Australia complained of ocular symptoms, however, these symptoms were managed and reduced to 25.2% when workers took breaks and ergonomic desk and chair were provided [17].

Associated Factors of CVS

There are multiple risk factors that aggravate the symptoms of CVS. Some of the factors that develop CVS and worsen its symptoms include lighting of the desktop such as the computer's screen brightness, lighting in the workplace or workstation at home, and gazing at the digital screen for a long time period [5]. One of the factors that are frequently highlighted in the literature that increases the risk of CVS is not taking breaks from the work and looking at the screen without intervals [5, 8, 13]. The constant exposure to the computer along with less distance from the screen because of improper seating and workstation can develop ocular and musculoskeletal problems [18]. Research has laid emphasis on the lighting conditions in the room as one of the most vital factor as it can be easily modified. A balance between the computer screen's brightness and the lighting of the room can ensure that there is no glare discomfort [19]. Knowledge about the safety measures when using computers can help reduce the threat posed by computer usage as stated by several studies [11, 9] that the risk of development of CVS reduces when subjects are more aware about the precautions. This can be due to the fact that people who are aware of the adverse effects use preventive measures [11].
The severity of the digital eye problem increases with the number of hours that are spent in front of the computer screens [12]. Studies have showed that using computers for three hours per day increases the risk of development of CVS as compared to people who use computers for less than three hours per day [15]. According to the study by [4], maintenance of clear and sharp eyes image while working and direct experiencing of eyes towards screen, the persistent contraction of the extraocular and ciliary muscles of eyes are required. The prolonged extension of experiencing direct screen with eyes disturbs the capacity of visual systems and results in CVS. The digital screen when used at a small working distance, the extended usage of screens such as tablets, iPad and computers results in ocular issues/discomforts and eyes' issues such as blurred vision and dry eyes. Similar to this finding, it is stated that spending two or more hours on the computer every day makes users twice as vulnerable to experience CVS and users who take frequent breaks from the computer screen are less exposed to CVS

symptoms [20]. The prolonged usage of computer reduces blinking rate which leads to dryness of the eye [2] and prevalence of developing CVS is low in computer users who have developed a habit of frequently blinking as compared to those who do not frequently blink [11]. The level of the computer screen also affects the vision as improper distance between the eye level and screen can negatively impact the vision [20].

To reduce the risk of developing CVS, the American Optometric Association has recommended prevention strategies that can be applied. Eyestrains and headaches are caused by the glare and reflections from computer display [2]. Symptoms of CVS are worse in people who have pre-existing conditions such as cataract and myopia [5]. The use of VDT filters and blue-light blocking contact lens has been proven to significantly reduce the frequency of symptoms [3, 5, 12]. A study conducted in Peshawar, Pakistan elaborated that only one fifth of medical students used anti-glare during the use of computers [21]. Studies have found that computer users who apply anti-glare filters and eyeglass coatings over their screens complain less about ocular problems [10, 11]. Ocular complaints were significantly reduced in subjects who are using eyeglass coating or filters on the screens [22]. The usage of anti-glare and eyeglass coating has been frequently discussed in literature with a positive impact on reduction of CVS [5, 10].

Study Design: A cross-sectional design was employed in this study to assess the use of glass coating among bankers in Trinidad and examine the factors associated with user preferences. The study collected primary data between April and July 2021.

Participants: The target population for the study consisted of bankers working across Trinidad in both rural and urban regions. Participants were selected using random sampling methods. However, to uphold ethical standards, informed consent was obtained from all participants before they could sign up for voluntary participation in the study. Measures were taken to ensure data privacy and confidentiality throughout the study. The inclusion criteria for the selected staff members were: having at least one year of working experience, exposure to excessive screen use for over six months, and availability during the data collection period. Bankers with a history of acute or chronic eye diseases were excluded from the study.

Method

Sample Size Calculation: The minimum sample size was calculated using the mechanism proposed by Tesfaye, Alemayehu, Abere, and Mekonnen [24]. The calculation resulted in a minimum sample size of 321. However, to account for potential attrition and non-response, a total sample size of N=371 was determined. Therefore, 400 questionnaires were distributed to bankers in rural and urban regions across Trinidad.

Data Collection Tool: A self-administered structured questionnaire was used as the data collection tool. The questionnaire was carefully designed based on an analysis of existing literature and consisted of five sections.

1. **Social and Demographic Questions (Items 1-6):** This section gathered information on the respondents' social and demographic characteristics**.**
2. **Personal Characteristics, Behavioral Factors, and Screen Use Factors (Items 7-20):** This section included questions related to personal characteristics, habits, and factors associated with screen use.
3. **Knowledge Assessment (Items 21-28):** This section presented true or false statements to assess the respondents' knowledge regarding the impact of various factors on ocular health.
4. **Ocular Complaints (Items 29-36):** This section collected information on the occurrence of ocular complaints among the respondents. Additionally, respondents were asked to rate the severity of the complaints they experienced**.**
5. **Resolution of Complaints and Quality of Life (Items 37-40):** The final section included three questions to determine the respondents' actions taken to resolve their ocular complaints and recorded their quality of life ratio.

Questionnaire Development and Review: The questionnaire was initially developed in English, and its form and structure were reviewed by experts to ensure clarity and comprehensibility. Expert advice was incorporated to improve the questionnaire's quality and enhance respondent understanding, which aimed to increase the response rate.

Data Collection: The questionnaires were distributed via email by obtaining the email addresses from banks in Trinidad. Branch managers were requested to assist in the collection of data for academic purposes. The data collection process spanned three months, during which respondents filled out the questionnaires. The filled questionnaires were then entered into Excel worksheets for data extraction and later used as input for further analysis using SPSS.

Data Analysis: Frequency distribution and regression analysis were conducted by the researcher to understand the impact of various factors on the preference for glass coating use among bankers. These statistical analyses aimed to identify the factors associated with user preferences for glass coating in Trinidad.

Results and Analysis

Social and Demographic Characteristics of the Participants

A total of 317 questionnaires were completed correctly, leading to a response rate of 92.7%, which is in line with above 90% response rates in studies that collect data from bankers. A majority of the respondents were female (63.4%), and composed of those aged between 23 and 38 (55%). The highest majority of the respondents was of African Ethnicity (40.9%), followed by East Indians (39.5%) and Mixed ethnicities (14%). The respondents belonged to various cities in Trinidad, as shown in Table 1. Moreover, 25% of the respondents lived in rural areas, whereas 75% in urban areas with a frequency of 93 and 279 respectively. As for education levels, 39.2% had a bachelor's degree. It was ensured that the work experience of all respondents was over one year, and excessive computer use was for more than six months.

Table 1. Socio-demographic characteristics of Bankers, Trinidad, 2022 (N=372).

Variables	Frequency	Percentage
Sex		
Male	136	36.6
Female	236	63.4
Age (years)		
18-23	42	11.3
23-28	69	18.5
28-33	63	16.9
33-38	73	19.6
38-43	41	11.0
43-48	45	12.1
48-53	24	6.5
53-58	10	2.7
58-63	5	1.3
Ethnic Background		
African	152	40.9
Caucasian	4	1.1
East India	147	39.5
Asian	9	2.4
Syrian	2	.5
Hispanic	6	1.6
Mixed	52	14.0
Location		
Mayaro	18	4.8
Rio Claro	38	10.2
Chaguana	60	16.1
Couva	26	7.0
San Fernando	61	16.4
Cunupia	17	4.6
Tunapuna	22	5.9
Valpark	2	.5
Grand Bazar	6	1.6
Port of Spain	35	9.4

Arima	2	.5
Aranguez	85	22.8
Area Type		
Rural	93	24.7
Urban	279	75.0
Education Level		
CSEC level	66	17.7
CAPE level	140	37.6
Bachelor's degree	146	39.2
Master's degree	19	5.1
PhD	1	.3

Behavioural, Personal, and Usage characteristics of Participants

76.1% of the respondents reported having an appropriate seating habit. As for kinds of devices, 81.7% used desktops for most of the day, as is the norm in banks. The screen level during use is reported to be at eye level by 41.7%, below eye level by 39.5%, and the rest, 18.8%, reported that their screens were above eye level. An equivalent of 73.7% of the respondents had over 6 hours of use of screen daily, 47.9% of the respondents took breaks of less than 20 minutes during the day, 23.2% took breaks longer than 20 minutes, whereas 28.9% took no breaks at all. Again, 56.2% of the respondents reported that they use eyesight glasses. 54.8% use an Anti-reflective coating on their glasses, followed by 8.9% having a Blue light blocker and 36.3% having no coating. 50.5% reported no frequent blinking. Furthermore, the light source in the office area for 84.4% was fluorescent, and for the rest, it is reported that the main source is natural light. Brightness adjustment Behavior was reported in 43.3% of the respondents, as 68.3% experienced no glare, 61% used no anti-glare setting, and 87.1% had no systematic disease.

Table 2. Behavioral, Personal, and Usage characteristics of Bankers, Trinidad, 2022 (N=372).

Variables	Frequency	Percentage
Type of Seating		
Appropriate	283	76.1
Not Appropriate	89	23.9
Type of Used Device		
Laptop	57	15.3
Desktops	304	81.7
Cellular Phone	11	3.0
Computer Screen Level		

Above eye level	70	18.8
Below eye level	147	39.5
At eye level	155	41.7
Hours of Daily Use		
>6 hours	274	73.7
<6 hours	98	26.3
Breaking Habit		
>20 minutes	86	23.1
<20 minutes	178	47.8
Use of Eyesight Glasses		
Yes	209	56.2
No	163	43.8
Type of Coating		
Anti-reflective coating	204	54.8
Blue light blockers	33	8.9
No coating	135	36.3
Blinks Frequently		
Yes	184	49.5
No	188	50.5
Light Source in office		
Natural light	58	15.6
Fluorescent light	314	84.4
Brightness adjustment Behavior		
I adjust the computer brightness	161	43.3
I do not adjust the computer's brightness	211	56.7
Experience of Glare		
Yes	118	31.7
No	254	68.3
Use of Anti-glare		
Yes	145	39.0
No	227	61.0
Any systematic diseases		
Yes	48	12.9
No	324	87.1

Current Knowledge of Users

The knowledge and opinions of the respondents regarding the impact of behaviour and habitual factors are shown in figure 1. The figure indicates that most people disagree that computers are made in a way that impacts the eyes and that computer-related eye problems cannot be resolved medically. The rest of the statements have the majority of true responses,

and the depicted knowledge includes the fact that breaking is vital, glasses can be used to reduce the impact of glare, adjustment of screen brightness is useful and prolonged and excessive use of personal computers can result in eye problems.

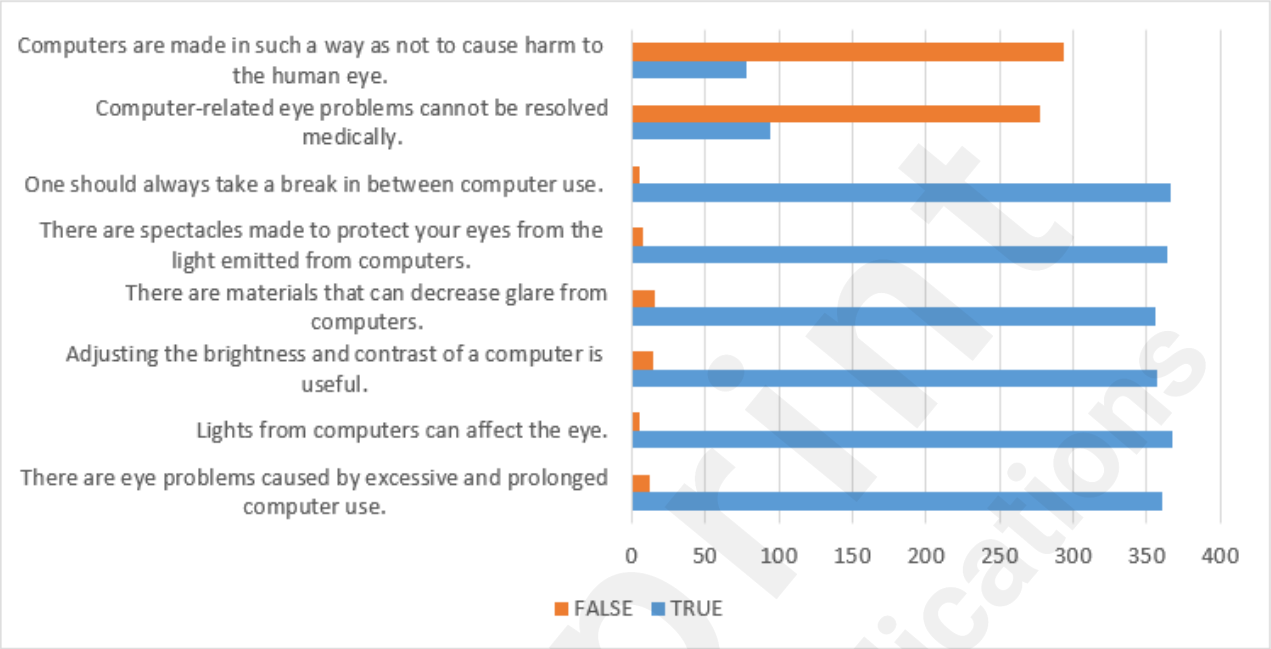

Figure 1: Opinions on Impact of Behavioral and Habitual factors from Bankers, Trinidad, 2022 (N=372).

Ocular Complaints in Participants

Various ocular complaints from the banker respondents due to the long-term use of screens have been collected. The results show that 56.5% had eyestrain, 53% had blurred vision, 63.7% had never had eye redness, and 66.4% suffered from headaches. Dry eyes were experienced by 48.9% of the respondents, eye fatigue by 73.9%, burning sensation by 47.6%, and irritation was reported by 41.7% of the respondents. Moreover, the respondents scored or rated the ocular complaints on a scale of 1-10. Eye fatigue had the highest score, followed by headcases, dry eyes, blurred vision, and burning and irritation of the eyes.

Table 3. Occurrence of Ocular Complaints in Bankers, Trinidad, 2022 (N=372).

Variables	Frequency	Percentage
Eyestrain		
Yes	210	56.5
No	162	43.5
Blurred Vision		
Yes	197	53.0
No	175	47.0
Eye Redness		

Yes	135	36.3
No	237	63.7
Headache Occurrence		
Yes	247	66.4
No	125	33.6
Dry Eyes		
Yes	182	48.9
No	190	51.1
Eye Fatigue		
Yes	275	73.9
No	97	26.1
Burning		
Yes	177	47.6
No	195	52.4
Irritation		
Yes	155	41.7
No	217	58.3

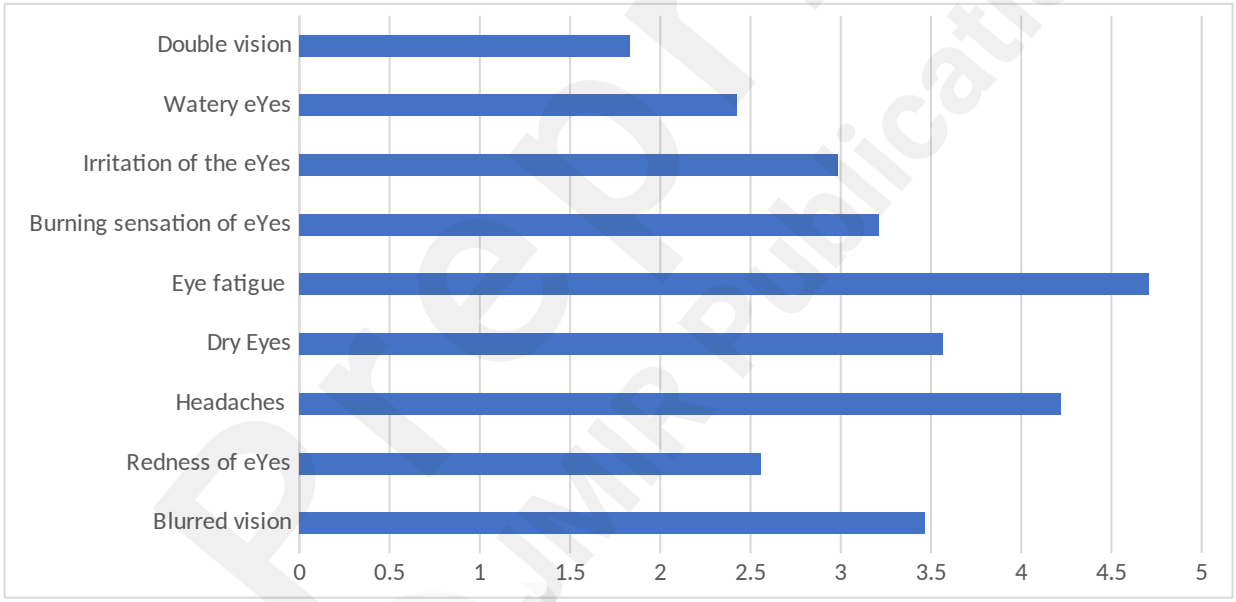

Figure 2: Occurrence Rating of Ocular complaints (1-10) from Bankers, Trinidad, 2022 (N=372).

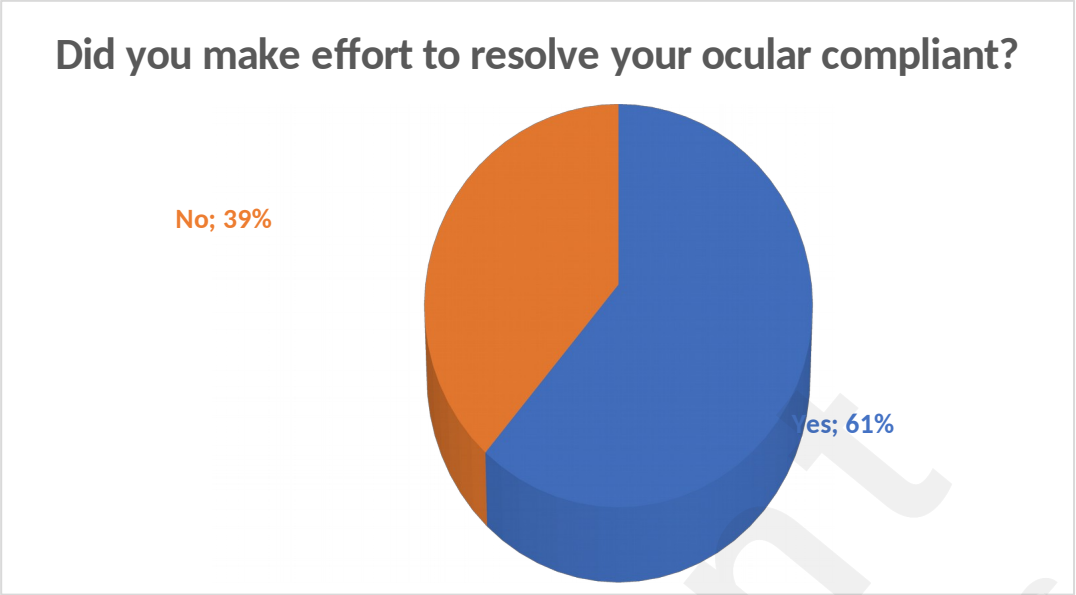

Figure 3: Efforts to Resolve Ocular Complaints

Figure 3 shows that 61% of the respondents made some conscious effort to resolve their ocular complaints. In figure 4, the listed actions taken to resolve the complaints include drinking additional water, visiting the optometrist/ophthalmologist, obtaining spectacles, use of eye drops, and taking breaks. Out of these remedial actions, taking breaks is mostly used, followed by obtaining spectacles, visiting the optometrist /ophthalmologist, and drinking water and use of eye drops were at equal ratings.

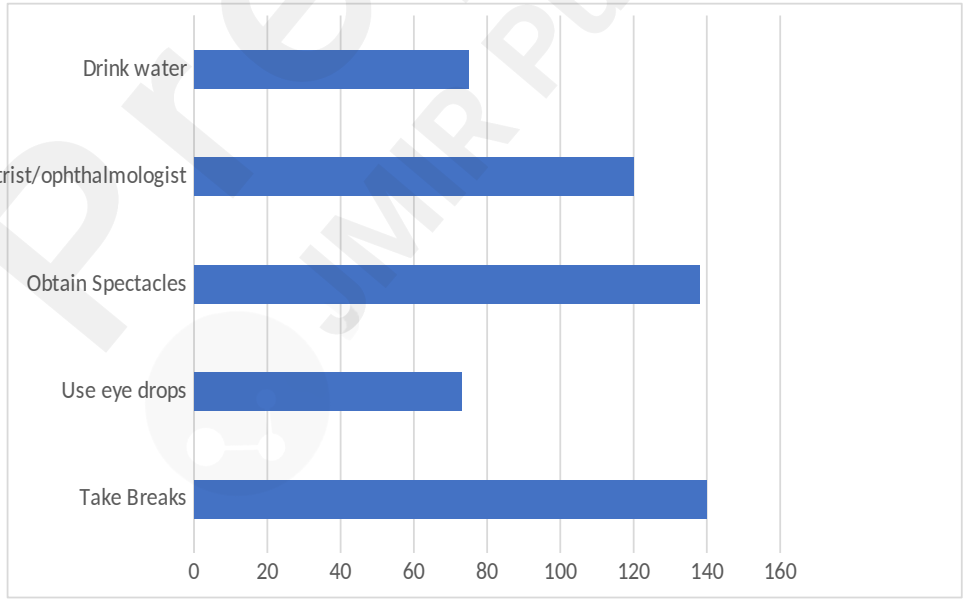

Figure 4: Actions Taken to Resolve Ocular Complaints

The respondents were also asked to rate their quality of life out of 10. The majority of the respondents ranked their life as above average and scored 7. The average life quality score calculated was 6.92. Figure 5 shows the frequency of each rating,

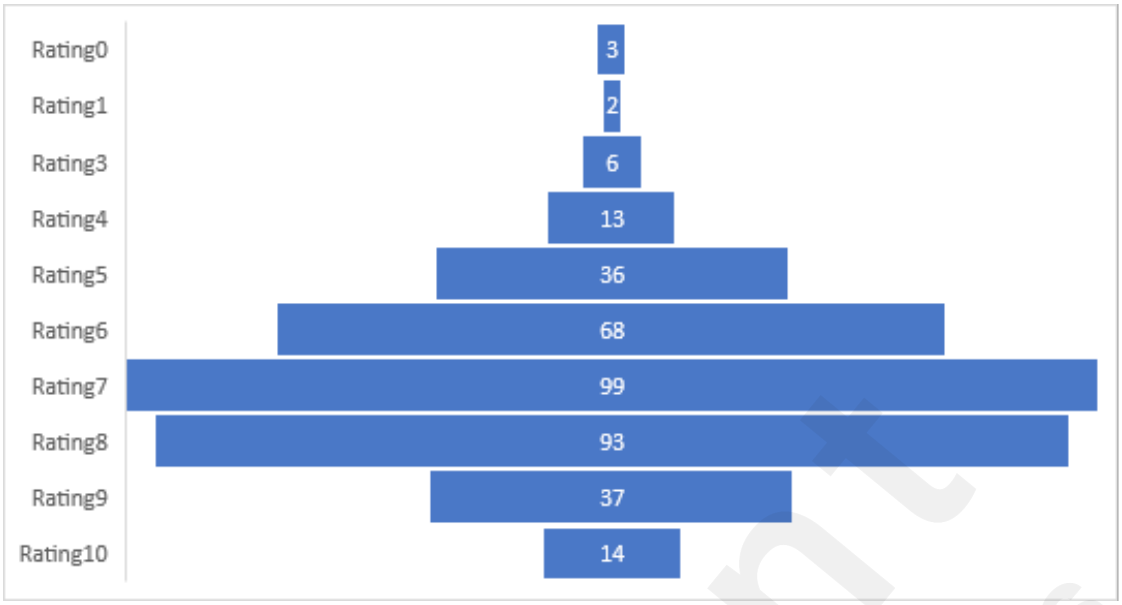

Figure 5: Quality of Life Impact Rating by Using Computer to Work

Regression Analysis

In order to establish the truth value of the hypotheses, the researcher carried out a regression analysis. First of all, the researcher tested the socio-demographic variables of the study and reported the results in table 4. The findings show that the only variable that significantly impacts the preference for using glass coating are education levels. The rest of the socio-demographic factors are insignificant.

Table 4: Regression analysis on the Socio-demographic characteristics of Bankers

Variables	Do you use anti-glare coatings on computers? or spectacles?		COR	CI limit 95%		AOR	CI limit 95%		p-value
	No	Yes		Lower	Upper		Lower	Upper	
Gender									
Female	142	93	0.945(0.613-1.458)			.950	0.592	1.525	0.832
Male	84	52	1			1			
Age									
18-23	26	11	.693	.285	1.684	.714	.289	1.767	.466
23-28	58	17	1.641	.688	3.919	1.605	.659	3.906	.297
28-33	36	25	1.231	.524	2.89	1.235	.511	2.98	.639

					4			5	
33-38	48	25	3.020	1.184	7.706	3.402	1.294	8.945	.013
38-43	18	23	2.955	1.180	7.399	2.891	1.123	7.443	.028
43-48	20	25	.973	.315	3.006	.875	.267	2.870	.825
48-53	17	7	9.455	1.723	51.874	9.406	1.678	52.741	.011
53-58	2	8	9.455	.946	94.482	8.900	.832	95.166	.071
Education									
Bachelor's degree	82	45	1.283	.789	2.086	1.507	.895	2.540	.123
Bachelor's degree	13	5	1.159	.633	2.119	1.301	.672	2.519	.436
CAPE level	80	54	2.850	1.094	7.428	2.730	.974	7.651	.056
CSEC level	41	25	2.850	.461	17.619	3.091	.443	21.586	.255
Master's degree	8	12	3069402201.417	.000	.	3317392857.418	.000	.	1.000
Computer usage									
> 6 hours	164	109	.860	.523	1.414	.917	.535	1.570	.751
≤ 6 hours	56	32	1.003	.277	3.637	1.066	.244	4.652	.932

Table 5 shows the regression analysis results on the Behavioral, Personal, and usage characteristics. Several factors, as seen in the table, are found to significantly impact choosing to have a coating on glasses. First, the use of eyesight glasses has an effect on the use of the coating. Finally, having a systematic disease like diabetes, hypertension, etc., does not influence the decision to use coating as suggested by a significant proportion of the sample. Moreover, the seating positions were found to effect the decision to use coating significantly.

Table 5: Regression Analysis on Behavioral, Personal, and Usage characteristics of Bankers

Variables	Do you use anti-glare	COR	CI limit 95%	AOR	CI limit 95%	p-value

	coatings on computers? or spectacles?								
	No	Yes		Lower	Upper		Lower	Upper	
How would you describe seating position at work?									
Appropriate	167	115	.738	.448	1.217	.546	.298	1.001	.051
Not appropriate	59	30	1			1			
How long has it been since you started using computers regularly?									
< 5 years	59	23	652002896.046	.000		50327066.457	.000		.999
≥ 5 Years	167	122	1180429091.148	.000		85327564.235	.000		.999
Do you wear eyeglasses?									
No	151	12	22.314	11.621	42.848	23.232	11.923	45.267	0.00
Yes	75	133	1			1			
Do you have any systematic diseases such as diabetes, hypertension or thyroids?									

No	198	125	1.131	.611	2.095	.953	.430	2.109	.905
Yes	28	20	1			1			
Do you take breaks while working									
>20 minutes	46	40	.437	1.236	1.698	1.030	.620	1.711	.909
≤ 20 minutes	108	69	.321	1.030		1			

Table 6 maps out the impact of various ocular issues on the preference to use a coating or not. The findings show that the effect of dry eyes has a significant effect on the usage intention of anti-glare coatings on computers and glasses. The AOR value is 1.694 (1.071-2.679) and COR value is 1.717(1.127-2.616). These values show that the usage intention is not linked with dry eyes, and other conditions like blurred vision, headaches, eyestrain etc. might contribute to the decision to use coated screens and glasses. The overall analysis has also illustrated a prominent difference regarding bankers of rural and urban areas. More than half bankers belong to the urban areas banks and their preference to use antiglare coating is prominently significant as compared to the rural areas bankers. The CVS has been thus estimated to exist in rural areas bankers as their screens are not protected through anti-reflective coating. Reasons for this might be the less-awareness and information regarding harmful impact of screen light and it'sprolong usage towards the eye sight.

Table 6: Regression analysis on the Ocular complaints of Bankers

Variables	Do you use anti-glare coatings on computers? or spectacles?		COR	CI limit 95%		AOR	CI limit 95%		p-value
	No	Yes		Lower	Upper		Lower	Upper	
Blurred vision									
No	110	64	1.200	.789	1.825	1.070	.667	1.717	.816
Yes	116	81	1			1			
Redness of eyes									
No	150	86	1.354	.880	2.084	1.210	.755	1.939	.428

Yes	76	59	1			1			
Headaches									
No	78	47	1.099	.706	1.711	.992	.623	1.580	.974
Yes	148	98	1			1			
Eye strain									
No	100	62	1.062	.697	1.618	.944	.580	1.535	.944
Yes	126	83							
Dry eyes									
No	127	62	1.717	1.127	2.616	1.694	1.071	2.679	.024
Yes	99	83	1			1			
Eye fatigue									
1.055	.655	1.698	1.055	.655	1.698	1.030	.620	1.711	.909
1.055	.655	1.698	1			1			
Burning sensation									
No	119	76	1.010	.665	1.533	.838	.524	1.341	.461
Yes	107	69	1			1			

Discussion

There is no doubt that the advent of computer technology has led to increased use of tablets, mobile phones, and computers at the workplace and in personal life. While these technologies have made life easier by making the world accessible, the excessive use of screens is linked to a number of substantial health issues, especially damage to the eyes. Computer Vision Syndrome is a common and frequent diagnosis in people who use screens for a major part of their day [20, 25-27]. In Trinidad, the banking sector employees do not give much preference to their health and safety, as the workplace environment has poor ergonomic and safety arrangements. The occurrence of strained eyes and CVS is, therefore, a frequent occurrence. In the current study, the researcher analyzed the use of the anti-glare coating in order to examine the tendency of taking care of themselves in the bankers of Trinidad. However, a low ratio of use was found. The impact of various types of factors was also analyzed. The study found that living in rural regions was the only socio-demographic factor that impacted the preference for using glass coating. The analysis has been undertaken to illustrate a comparison concerning ocular complaints and the prevalence of CVS among the rural versus urban bankers of Trinidad. People in urban areas are hugely aware of the benefits regarding the usage of anti-glare coating. This is the reason of fewer rations of eye diseases among urban residents. The bankers of urban sector of Trinidad are well-aware of the fact that anti-reflective coating has been in existence

for many years. The electronic devices usage in urban areas is more often found to be covered with anti-reflectors. Following the integration of technology into electronic devices, the anti-glare coating has become more advanced, and attracted more usage, especially in urban areas. The demographic section of the results also declared a significant impact of areas (urban/rural) towards the preference to use anti-glare coating. The finding contrasts with past literature that shows the adoption of such innovative solutions more strongly in urban populations [28-31].

Similarly, the study found that various environmental and use behaviour factors lead to impacting the preference for using the anti-glare coating. The findings are in line with past research as there are a vast number of studies on CVS that find that natural lighting, use of glasses, systematic diseases, etc., significantly affects the eye health of computer users [25, 26, 32-34]. It can be mapped that if eye health is impacted, the use of anti-glare coating will be higher, hence the significant findings. Finally, ocular complaints like headaches, eye fatigue, blurred vision etc., have also been reported in past literature as significant contributors to the use of solutions to overcome eye strain [31, 35-39].

Limitations and implications

This study was conducted to explore the preference behaviour of glasses or computer screen coating bankers in Trinidad to counteract the symptoms and issues of CVS. The study had a few limitations that cannot be ignored. First, the study was based on a large sample. It hence did not include any clinical examination, only self-reported data. Self-reported data can be biased. Moreover, the use of a cross-sectional design makes it difficult for the researcher to make a clear decision regarding the relation between preference behaviour and various factors. Therefore, future researchers should use diverse inputs and conduct a longitudinal study involving some level of ophthalmic examination.

Conclusion

This study revealed that the preference for using an anti-glare coating of glasses or computer screens is low among bankers working in Trinidad. The majority of the bankers reported eye trouble and ocular complaints that are an indication of computer vision syndrome. Therefore, there is a need to enhance the workplace practices and behavioural preferences of the banking staff in order to reduce the strain on the eyes and long-term eye problems. The use of anti-glare screens can be increased by the organization by ensuring all computer screens are coated and directing employees working long hours on the computer to use anti-glare glasses as well. It is also recommended that bankers take regular breaks between works, use eye drops to minimize

their chances of developing CSV. Again, workplaces should be illuminated optimally to reduce the burden on the eyes.

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Supplementary Files

Multimedia Appendixes

Questionnaire for the study.
URL: http://asset.jmir.pub/assets/dbe0a8e9f77b5769bcda256899ce866b.docx