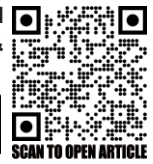


# Assessing Additional Spectacle Need for Intermediate Distance in Presbyopic Computer Users.

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## ABSTRACT

**Purpose:** Evaluate intermediate add necessity and unaddressed visual issues in presbyopic computer users using bifocals.

**Methodology:** It was an institutional-based study using a structured Proforma containing questions to evaluate the need for intermediate correction (add). 50 presbyopic computer users using bifocal glasses were included in this study. They were asked to complete the proforma / questionnaire to document the problems experienced during computer work with bifocals.

**Results:** Out of 50 presbyopic computer users with bifocals, 90% were males and 10% were females. 76% had computer vision syndrome 2. About 64% had a complaint of blurred vision, 56% had a complaint of headache, 76% had eyestrain, 70% had neck, shoulder, and back pain, 44% complained of dry, tired, and sore eyes, and 36% complained of blurry distance vision after computer work. Most of them were using near correction to monitor the vision between 21-25 inches (near) and 31-35 inches (intermediate). 60% of computer users had illumination of the room the same as a computer screen, 8% had brighter than the screen, and 32% had dimmer than the screen. 20% of patients knew intermediate correction (add), and 80% were unaware of it. However, the Chi-square test, between awareness of intermediate add and the presence of any reported symptoms revealed no statistically significant association with a p-value less than 0.05.

**Conclusion:** Most presbyopic computer users experience significant visual symptoms. However, awareness about intermediate vision correction remains low and is not significantly associated with symptom presence.

**Key Words:** Prebyopia, Bifocals, Vision.

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## INTRODUCTION

Both near and far vision impairment can result from refractive problems. However, presbyopia is the term used to describe a loss of accommodative ability or a decrease in the amplitude of accommodation with age. Near vision impairment is an age-related condition that can impair quality of life and is caused by a progressive loss of accommodation.<sup>1</sup>

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Accommodative power declines with age, and without glasses, it becomes difficult or impossible to see well at close range of objects or tasks between the ages of 40 and 45. We refer to this condition as presbyopia. In addition to age, the patient's refractive status also plays a role.<sup>2,3</sup>

Each person experiences this differently, but as accommodative power declines with age, the range of clear vision may become insufficient for the patient's routinely performed duties. It's likely to be harder for those engaged in more challenging near-vision tasks. All industrialised civilisations require people to work and read at close to and intermediate distances, hence presbyopia has social and medical implications.<sup>4,5</sup>

Because presbyopia is an age-related disorder, its frequency is directly correlated with the proportion of older people in the population, and it is more common in societies where a larger percentage of the population lives into old age.<sup>6</sup>

However, because presbyopia is a chronic disorder with a sluggish beginning, it is difficult to assess its incidence; however, it seems that the population between the ages of 42 and 44 has the highest incidence of presbyopia.<sup>7,8</sup>

Most presbyopes are corrected with bifocals, but usually bifocals don't work properly for computer use because the working distance for computers (normally 50-60cm) is usually longer than the normal bifocal reading distance (40cm), and also, computer monitors are usually located higher than the angle of gaze required for bifocals. That's why most presbyopes wearing bifocals experience difficulty using the computer.

In the early stage of presbyopia, single vision glasses and bifocals give clear vision for intermediate tasks, because they can adjust their

head position according to intermediate distances and can still accommodate for their intermediate tasks. But in case of higher additions, bifocal glasses don't give clear vision for intermediate distances, and patients experience many problems during work.<sup>9</sup>

Presbyopia is commonly caused by age (typically affecting function at or after age 40), refractive errors such as hyperopia if remains uncorrected, more demands of near occupational work, Gender (as earlier onset in females than males due to menopause and short stature), Trauma or ocular disease (such as removal or damage of lens, zonules, ciliary body etc), Systemic diseases (such as multiple sclerosis, diabetes mellitus, myasthenia gravis, cardiovascular accidents, anemia etc), Drugs (such as alcohol, diuretics, anti-depressants etc), iatrogenic and geographic factors and other factors also count such as poor nutrition etc.<sup>10</sup>

## METHODOLOGY:

A cross-sectional study was conducted at Al-Ahsan Trust Eye Hospital over a three-month period from September to November 2023. A total of 50 presbyopic individuals aged between 40 and 70 years, who regularly use computers, were included. Participants were selected using convenience sampling from various workplaces, including banks, offices, and the medical profession.

Data collection was performed using a self-designed questionnaire and a meter rod for measuring screen distance. The questionnaire comprised sections on patient demographics and visual complaints or symptoms.

## STATISTICAL ANALYSIS:

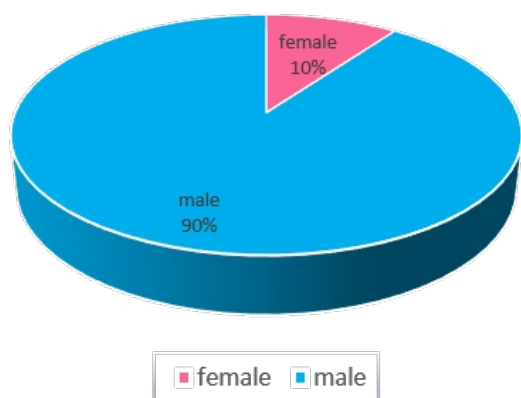
Statistical analysis was carried out using SPSS

version 22. Descriptive statistics, including frequencies and percentages, were used to summarize categorical variables such as gender. To evaluate the relationship between the presence of visual symptoms and participants' awareness of intermediate vision correction (such as computer-specific spectacles), the Chi-square test was used. A p-value of less than 0.05 was considered indicative of statistical significance.

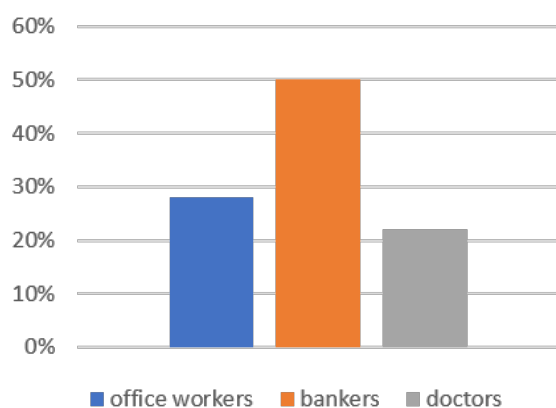
## RESULTS:

The study included 50 presbyopic computer users, of whom 10% were female and 90% were male. Professionally, 28% were office workers, 50% were bankers, and 22% were doctors.

Gender Distribution

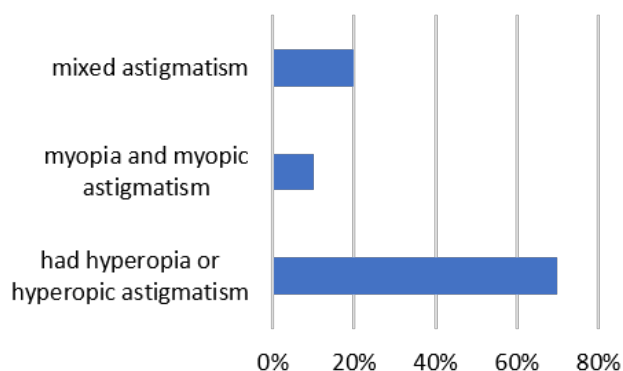


Profession

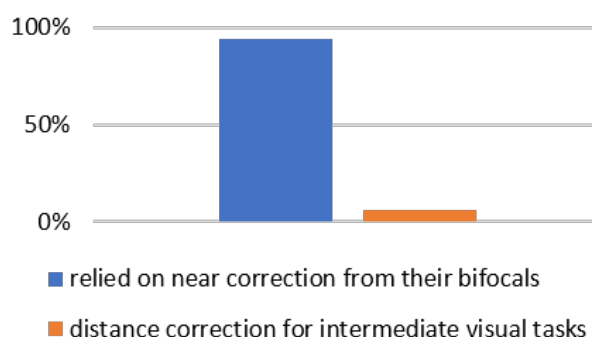


In terms of refractive errors, 70% had hyperopia or hyperopic astigmatism, 10% had myopia and myopic astigmatism, while 20% presented with mixed astigmatism. When using the computer, 94% of participants relied on near correction from their bifocals, and only 6% used distance correction for intermediate visual tasks.

Refractive Errors



Glasses wearing habit during use of computer



Most participants positioned their screens between 21 to 25 inches and 31 to 35 inches away. Regarding room lighting, 60% reported that the illumination level matched the brightness of their screens, 32% worked in dimmer lighting, and 8% in brighter lighting conditions.

Symptoms associated with prolonged computer use

were highly prevalent. Eyestrain was reported by 76% of users, while 70% experienced neck, shoulder, or back pain. Blurred vision was present in 64% of participants, and 56% complained of headaches. Other complaints included dry, tired, and sore eyes (44%), difficulty focusing on distant objects after computer work (36%), and visual discomfort leading to squinting (58%). Additionally, 26% noticed that letters on the screen appeared to merge or overlap, 20% had trouble with night driving or vision after computer use, and 8% experienced double vision. Seventy percent of the participants stated they had to pause their work regularly to rest their eyes.

Symptoms	Yes	No
Headache	28(56%)	22(44%)
Blurred Vision	32(64%)	18(36%)
Pain in the back, shoulder, and neck	35(70%)	15(30%)
Eyestrain	38(76%)	12(24%)
Dry, tired, and sore eye	22(44%)	28(56%)
Squint	29(58%)	21(42%)
Double Vision	04(08%)	46(92%)
Letters on the screen run together	13(26%)	37(74%)
Night Vision	10(20%)	40(80%)
Need to interrupt work frequently to rest eyes	35(70%)	15(30%)
Knowledge about the intermediate add	10(20%)	40(80%)
Did any ophthalmologist or Optometrist tell you about the intermediate add	18%	82%

Awareness about intermediate vision correction (such as computer-specific glasses) was limited. Only 20% were aware of this option, and just 18% reported that an eye care professional had ever discussed intermediate correction with them.

The Chi-square test revealed no statistically significant association between awareness of intermediate add and the presence of any reported symptoms:

Symptom	Chi <sup>2</sup>	p-value	Significant (p < 0.05)
Headache	0.000	1.0000	No
Blurred Vision	0.005	0.9413	No
Neck/Back/Shoulder Pain	0.000	1.0000	No
Eyestrain	0.829	0.3625	No
Dry, Tired, and Sore Eyes	0.005	0.9432	No
Squint	0.046	0.8298	No
Double Vision	0.000	1.0000	No
Letters Merging/Overlapping	0.000	1.0000	No
Night Vision Difficulty	0.005	0.9413	No
Need to Rest Eyes	0.000	1.0000	No

## DISCUSSION:

Presbyopia is an age-related refractive condition of the eye in which the amplitude of accommodation decreases with age, and near vision is affected. If to specify the distance, 25- 40cm is stated as the near distance and 6 meters for the distance vision.<sup>11,12</sup>

Between the near and the distant is the intermediate distance of about 50-60cm. If a patient's distance and near vision is not disturbed most probable is that his intermediate distance might also need correction and other factors also count which cause problems like bad sitting posture with computer, duration of work, working distance from monitor is not proper, angle of gaze and improper room illumination, glare problem etc.<sup>13</sup>

A study on functional vision issues brought on by or linked to near-point visual stress was carried out. Additional visual issues include aberrant heterophorias and accommodative abnormalities. These eyesight conditions impair performance, comfort, and acuity.<sup>14</sup> Near-point stress, which includes vision issues, can be eliminated or significantly reduced with the use of vision treatment, lens prescriptions, and visual hygiene advice.<sup>15</sup>

Most presbyopes, whose profession demands extensive computer work, feel difficulty in the computer viewing task, or they are suffering from CVS 2, as evident from my study. Computer work can be regarded as an intermediate-distance viewing task. The majority of presbyopic computer users wearing bifocals suffer from several symptoms like headache, eyestrain, backache, blurry distance vision is blurry vision after near work, haloes on the screen, need to interrupt work to give rest to eyes, etc.,<sup>16,17</sup>

A study was previously carried out to assess the visual functions following computer screen use. Sixty individuals' visual efficiency was assessed before and after an hour of reading material from a monitor. The results indicated that the loss of the near point of convergence, the deviation of phoria for near vision, and the reduced power of accommodation were the most significant alterations following the monitor. The findings showed that eye strain in computer operators may be caused by a deficiency in these crucial visual skills.<sup>1</sup> To relieve the symptoms, prescribing intermediate correction by optometrists and ophthalmologists should be practiced.

Ophthalmologists researched computer vision syndrome to evaluate the prevalence of the

condition in terms of knowledge, attitudes, and practices by using a questionnaire including both ophthalmologists and patients. The findings indicated that while both groups were confused about treatment guidelines, all respondents were aware of CVs. Ophthalmologists who used computers were notified of symptoms and diagnostic indicators related to treatment options.<sup>19</sup>

The effectiveness of computer spectacles in lowering computer worker symptoms was investigated. According to the previous researches, computer glasses can effectively lessen the symptoms that computer users have relating to their vision.<sup>20</sup>

The correction is made in the form of trifocal glasses or progressive lenses or a pair of bifocals; one with distance and intermediate correction and the other with intermediate and near correction, or in the form of single vision glasses. A study was conducted in which twenty-nine presbyopic subjects who spent at least 20 hours a week at a video display terminal compared a progressive addition lens designed with a task-specific lens. Both groups reported symptomatic relief. The presence of a distance-clear zone and the absence of lens discontinuities most likely accounted for user preference for the task-specific lenses. That preference suggests improved performance for presbyopic computer users wearing task-specific progressive addition lenses.<sup>21</sup>

Research was conducted on the prevention of visual fatigue in computer users by eyeglasses with spectral filters. Wearing eyeglasses with filters promoted the shifting of the most distant point of clear vision. After 4 weeks of using eyeglasses with spectral filters, 86.9% of volunteers noted an improvement in visual working capacity, and 13.1% considered there was no difference. They concluded



that eyeglasses with spectral filters are recommended as an ophthalmological measure to prevent visual fatigue.<sup>22</sup>

According to our study, we found that 76% of the presbyopic computer users wearing bifocal glasses were experiencing computer vision syndrome type 2 and needed adjustments for intermediate distance.

### CONCLUSION:

Despite a high prevalence of symptoms such as eyestrain (76%), neck/shoulder/back pain (70%), and blurred vision (64%) among presbyopic computer users, the study found no statistically significant relationship between symptom presence and awareness of intermediate vision correction. This indicates a widespread lack of understanding or discussion regarding computer-specific spectacle needs, underscoring the necessity for better patient education by eye care professionals.

### RECOMMENDATIONS:

Eye care professionals should actively educate presbyopic patients on the importance of intermediate vision correction for computer use. Routine eye examinations should include assessment for digital eye strain and counseling on appropriate eyewear. Employers should promote ergonomically optimized workstations and encourage regular visual breaks. Further research on larger populations is recommended to strengthen awareness strategies and improve visual comfort in digital environments.

### REFERENCES:

1. Boccardo L. Viewing distance of smartphones in presbyopic and non-presbyopic age. *J Optom.* 2021;14(2):120–6.
2. Hughes AR, Bullimore M, Elliott D. 'Ease of adaptation' predicts preferred spectacle prescriptions better than visual acuity: a retrospective analysis. *Clin Exp Optom.* 2025;108(1):79–86.
3. Smith SL, Maldonado-Codina C, Morgan PB, Read ML. Gaze and behavioural metrics in the refractive correction of presbyopia. *Ophthalmic Physiol Opt.* 2024;44(4):774–86.
4. Alipour F, Mehrdad R, Abdolalizadeh P, Pouragha H, Esmaili M. Spectacle coverage for presbyopia correction and its associated factors among employees of an academic centre in Tehran. *Sci Rep.* 2025;15(1):1–8.
5. Naipal S, Khumalo N, Rahmtoola M, Chagi S, Didi L, Mthethwa S, et al. Viewing distance, font size and symptoms of eyestrain in non-presbyopic and presbyopic smartphone users. *Ophthalmic Physiol Opt.* 2025;45(1):269–79.
6. Sánchez-Brau M, Domenech-Amigot B, Brocal-Fernández F, Quesada-Rico JA, Seguí-Crespo M. Prevalence of computer vision syndrome and its relationship with ergonomic and individual factors in presbyopic VDT workers using progressive addition lenses. *Int J Environ Res Public Health.* 2020;17(3):1003.
7. Fogt JS, Weisenberger K, Fogt N. Visual performance with multifocal contact lenses and progressive addition spectacles. *Cont Lens Anterior Eye.* 2022;45(4):101472.
8. Wolffsohn JS, Berkow D, Chan KY, Chaurasiya SK, Fadel D, Haddad M, et al. BCLA CLEAR Presbyopia: Evaluation and diagnosis. *Cont Lens Anterior Eye.* 2024;47(4):102156.
9. Katz JA, Karpecki PM, Dorca A, Chiva-Razavi S, Floyd H, Barnes E, et al. Presbyopia—a review

- of current treatment options and emerging therapies. *Clin Ophthalmol*. 2021;15:2167–78.
10. Beesley J. Clinician measurement of spectacle prescription changes and patient tolerance to them [dissertation]. Bradford: University of Bradford; 2024.
  11. Ribeiro F, Ferreira TB, Silva D, Matos AC, Gaspar S, Piñero DP. Analysis of daily visual habits in a presbyopic population. *J Ophthalmol*. 2023;2023:6440954.
  12. Wolffsohn JS, Davies LN, Sheppard AL. New insights in presbyopia: impact of correction strategies. *BMJ Open Ophthalmol*. 2023;8(1):e001122.
  13. Mylona I, Floros GD. Correction of presbyopia alone does not adequately protect against digital eye strain from handheld devices. *Optom Vis Sci*. 2022;99(10):758–62.
  14. Galindo-Romero C, Rodríguez-Zamora CL, García-Ayuso D, Di Pierdomenico J, Valiente-Soriano FJ. Computer vision syndrome-related symptoms in presbyopic computer workers. *Int Ophthalmol*. 2023;43(9):3237–45.
  15. Halling WC. Hand-Eye Coordination with Multifocal Contact Lenses and Progressive Addition Spectacles [master's thesis]. Columbus: The Ohio State University; 2025.
  16. Boccardo L, Gurioli M, Grasso PA. Viewing distance and character size in the use of smartphones across the lifespan. *PLoS One*. 2023;18(4):e0282947.
  17. Yang A, Lim SY, Wong YL, Yeo A, Rajeev N, Drobe B. Quality of life in presbyopes with low and high myopia using single-vision and progressive-lens correction. *J Clin Med*. 2021;10(8):1589.
  18. Karkhanis MU, Banerjee A, Ghosh C, Likhite R, Meyer D, Mastrangelo CH. Models of Accommodation Deficiency in Presbyopia Patients. *medRxiv* [Preprint]. 2020 Aug. Available from: <https://doi.org/10.1101/2020.08.20.20178964>
  19. Vincent M, Marin G, Legras R. Subjective evaluation of defocus and astigmatism combinations using image simulation in Presbyopes. *Optom Vis Sci*. 2021;98(1):73–80.
  20. Chang DH, Waring GO 4th, Hom M, Barnett M. Presbyopia treatments by mechanism of action: a new classification system based on a review of the literature. *Clin Ophthalmol*. 2021;15:3733–45.
  21. National institute for occupational safety and Health, city of San Francisco. Municipal code, chapter 5 (Health code). Article 23, as amended. 1990 Dec. <http://pantheon.yale.edu/~danu/ce91.html>.
  22. Felgin AA, Zak PP, Korniuschina TA, Rozenblium Iuz. Prevention of visual fatigue in computer users by eyeglasses with spectral filters. *Vestn oftalmol*. 1998 Mar-Apr; 114(2):34-6.