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ORIGINAL RESEARCH

Drinking Habit Could Exacerbate the Progression of Presbyopia in Men

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Purpose: Presbyopia is strongly dependent on age and progresses throughout life, yet the influence of lifestyle factors has not been fully determined. The aim of this study was to assess the association between presbyopia and common lifestyle factors in relation to a detailed ophthalmological evaluation.

Methods: The near add power of 6258 individuals aged 40 to 79 years was measured, and its association with lifestyle factors was examined. Odds ratios for specific near add power levels were calculated, and regression analysis was conducted to evaluate the relationships between near add power, lifestyle, and ocular parameters.

Results: Logistic regression analyses showed that that male sex, drinking habit, myopic spherical equivalent, astigmatic errors, and a thin ganglion cell complex were common significant risk factors associated with near add power levels of 1.50 D and 2.50 D. Smoking status, HbA1c levels, and the presence of diabetic retinopathy were not significant factors. Kaplan-Meier survival analysis indicated that men reached the end point (+1.50 D) significantly earlier than women ($P < 0.01$), and male drinkers reached the end point (+2.50 D) significantly earlier than male non-drinkers ($P < 0.05$).

Conclusion: The association between lifestyle factors and near add power was analyzed, identifying drinking habit and male sex as significant contributors. These findings complement previous investigations and may be useful in healthcare education to highlight the detrimental effects of alcohol consumption on ocular health.

Keywords: presbyopia, near add power, near vision, drinking, smoking, lifestyle

Introduction

Presbyopia is a common age-related condition that typically starts to develop around the age of 40 years and progresses over time.[1–3] Presbyopia arises due to the hardening of the crystalline lens and functional decline in the surrounding ciliary muscles and other tissues,[4–6] and is managed with corrective lenses and/or surgical options. In the modern digitalized and aging society, the mean percentages of time dedicated to distance, intermediate, and near vision have been reported as 27.2%, 30.2%, and 42.5%, respectively, indicating that near vision is most frequently used in daily life.[7] Consequently, the burden of presbyopia is rapidly increasing.

Age is the primary factor influencing presbyopia,[1–3] and other well-known lifestyle factors may also worsen presbyopia, including diabetes, smoking, and alcohol consumption. Diabetes is a typical lifestyle-related metabolic disease and is suggested as a risk factor for presbyopia.[8,9] Diabetic retinopathy and cataracts could also exacerbate presbyopia since the diabetic lens tend to lose elasticity and harden with fluctuating vision.[10] Indeed, clinical guideline-listed risk factors for nuclear cataract include diabetes, obesity, hypertension, smoking, myopia, prior vitrectomy, family history, and ultraviolet-B light exposure.[11] Smoking is a strong risk factor for lung and heart diseases and cancer, and has also been identified as a factor exacerbating accommodation amplitude.[12,13] Andualem et al[13] conducted a multivariate analysis on 668 school teachers, and found that age, smoking, pregnancy, salary, work experience, and refractive error were positively and significantly associated with presbyopia. Drinking alcohol is a known risk factor for liver, cardiovascular, and mental disorders.[14] Furthermore, alcohol consumption is increasing and is a considerable social

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issue.[15] Nirmalan et al[16] conducted a population-based assessment of presbyopia in 5587 residents 30 years of age or older, and found the age-, gender-, and area-adjusted prevalence of presbyopia was 55.3%. Identified risk factors for presbyopia were female sex, rural residence, alcohol consumption, nuclear cataract, myopia, and hyperopia. Sex differences,[17–19] dry eye,[20] annual income, and waking time[21] were also identified as contributing factors for presbyopia. However, no recommendations have been established to delay or relieve presbyopia progression and related symptoms, which are major health problems in our digitalized society. As such, lifestyle factors for presbyopia progression should be further explored.

The aim of this study was to determine whether there were any associations between presbyopia and common lifestyle factors in relation to detailed ophthalmological assessment. We measured near add power as a relevant indicator of presbyopia and surveyed alcohol consumption status, smoking status, HbA1c levels, and the presence of diabetic ocular complications evaluated with fundus examination. We also investigated men and women separately since there is a sex difference in lifestyle factors. This study covered individuals aged from 40 to 79 years, sufficient to explore the whole range of presbyopia.

Methods

Study Design and Participants

This clinic-based, retrospective study included healthy individuals who attended Otake Eye Clinic in Kanagawa, Japan. Consecutive patients who visited from December 1, 2018 to April 30, 2024 were included. The study was approved by the Institutional Review Board and Ethics Committee of the Kanagawa Medical Association (approval date: November 12, 2018; permission number: krec2059006) and adhered to the Declaration of Helsinki guidelines. Consent requirements were waived by the Institutional Review Board of the Kanagawa Medical Association since the study followed an opt-out protocol and it involved a retrospective review of medical charts. Additionally, the Institutional Review Board and Ethics Committee of Keio University School of Medicine approved this study (approval date, May 31, 2024; approval number, 20241019), allowing authorship for researchers affiliated with the university (KN, AH, and MA). The protocol was registered with the UMIN Clinical Trials Registry (UMIN000051891) on August 15, 2023. All data, including patient interviews, were gathered as part of standard-of-care examinations.

Inclusion and Exclusion Criteria

Participants included were aged 40 to 79 years with bilateral phakic eyes and a best-corrected visual acuity above 20/25. Exclusion criteria included a history of corneal or intraocular surgeries (eg, laser treatment, refractive or cataract surgeries), moderate-to-severe cataracts, glaucoma, macular diseases, and severe dry eye disease.

Ophthalmological Examinations

Participants underwent comprehensive ophthalmological evaluations, which included best-corrected visual acuity testing (Vision Chart, SSC-370R; Nidek Co., Ltd., Gamagori, Aichi, Japan), autorefractometry, intraocular pressure (IOP) measurement (Tonoref™ II; Nidek Co., Ltd.), ocular surface examinations with slit-lamp biomicroscopy, including tear break-up time, Schirmer test, and fluorescein corneal staining test, and funduscopy. Binocular near add power was assessed at a 30 cm distance using a Bankoku near-acuity chart (Handaya Inc., Tokyo, Japan). After determining each patient's distance refractive correction, the minimum additional power needed to achieve near acuity above 20/25 at 30 cm was measured in 0.25 D increments and recorded as the near add power.

Optical Coherence Tomography (OCT)

OCT (RS-3000, software version 1.4.2.1; Nidek, Aichi, Japan) was used to measure macular retinal nerve fiber layer (mRNFL), ganglion cell layer (GCL) + inner plexiform layer (IPL) (GCL/IPL), mRNFL + GCL + IPL (GCC), and full macular thickness from macular cube scans of a fovea-centered 6×6 mm square area. For peripapillary RNFL imaging, raster scanning over a 6×6 mm square area centered on the optic disc was conducted at a scan density of 512 A-scans (horizontal) × 128 B-scans (vertical). Peripapillary RNFL measurements were obtained using a 3.45-mm diameter circle

automatically centered on the optic disc. The 12 RNFL sectors (each covering 30 degrees) were numbered starting from the 1 o'clock position. In all cases, the scan circle from the peripapillary protocol did not intersect any areas of parapapillary atrophy. The RS-3000 provides an image quality index, and scans with a quality score below 30 were excluded in accordance with the manufacturer's recommendation. Retinal layer boundaries generated by the built-in segmentation software were used. All included scans were visually inspected, and images with obvious segmentation failures (eg, truncated layers or algorithm misidentification) were excluded No scans with segmentation errors were included in the final analysis. All measurements were taken within three months of the most recent visual field examination.

Patient Interviews and Lifestyle Factors

Patients were surveyed regarding common lifestyle factors, including alcohol consumption (drinking at least twice a week or not), smoking status (current/previous smoker or non-smoker), and HgA1C (%) levels.

Statistical Analysis

Normality of continuous variables, including near add power, was assessed using distribution plots and the Shapiro–Wilk test. Near add power was not normally distributed, and several other ophthalmological and lifestyle variables showed non-normal distributions. Logistic regression models were used to estimate odds ratios and 95% confidence intervals for the presence of presbyopia, defined by near add power cut-offs of 1.50 D and 2.50 D, in relation to sex, drinking status, smoking status, diabetic retinopathy without maculopathy, serum HbA1c levels, astigmatism, spherical equivalent, intraocular pressure (IOP), and retinal thickness. Consequently, explanatory variables included male sex, alcohol consumption, myopic spherical equivalent, astigmatic errors, elevated IOP, and reduced retinal thickness. Spearman correlation coefficients were used to explore additional parameters potentially associated with near add power because several variables were non-normally distributed or ordinal in nature. Participants were categorized by sex and alcohol consumption status to compare lifestyle and ophthalmological parameters. The independent sample *t*-test was applied for continuous variables, and chi-squared tests were used for categorical variables. Given the sufficiently large sample sizes in study groups, the independent sample *t*-test was considered robust to moderate deviations from normality based on the central limit theorem.

Kaplan–Meier survival analysis was applied to examine differences in the age at which near add powers of +1.50 D and +2.50 D were reached. The Log rank test was used for comparisons between men and women (for +1.50 D) and between male drinkers and male non-drinkers (for +2.50 D). Since accommodative amplitude declines from early childhood, near add power thresholds of +1.50 D and +2.50 D were set as endpoints representing symptomatic and advanced presbyopia.[1–3] All statistical analyses were conducted using StatFlex (Atech, Osaka, Japan), with a two-sided P-value < 0.05 considered to indicate a significant difference.

Results

A total of 6258 patients (1844 men, mean age 55.6 ± 9.8 years) were enrolled (Table 1 and Table 2). Of these, 50.3% of men and 23.4% of women ($P < 0.01$) were drinkers, and 7.7% of men and 5.5% of women were smokers ($P = 0.43$). The mean HbA1c level was 7.2 ± 1.3% (n = 346) and 6.3% had diabetic retinopathy. The mean spherical equivalent was −2.78 ± 3.46 D, mean astigmatic error was 0.73 ± 0.82 D, mean anisometropia was 0.60 ± 0.88 D, mean near add power was 2.09 ± 0.88 D, prevalence of near add power ≥ 1.50 D was 80.1%, prevalence of near add power ≥ 3.00 D was 30.5%, and mean IOP was 15.7 ± 3.5 mmHg.

Table 1 shows comparisons of parameters in relation to sex and drinking. Near add power was significantly higher in male drinkers than non-drinkers ($P < 0.01$). The prevalence of smoking was higher, and RNFL was thinner, in drinkers than non-drinkers in both sexes. Table 2 shows regression analysis of systemic and ocular parameters in relation to sex and near add power. Drinking status, tear break-up time, and anisometropia in men, and myopic errors, astigmatic errors, high IOP, thin GCC and RNFL in both sexes, were associated with near add power after controlling for age. Table 3 shows age- and sex-adjusted logistic regression analyses of parameters in relation to near add power. Male sex, drinking status, myopic spherical equivalent, astigmatic errors, and thin GCC were significant risk factors for near add power of

Table 1 Comparison of Systemic and Ocular Parameters in Relation to Sex and Drinking

	Men			Women		
	Non-Drinker (n = 377)	**Drinker (n = 381)**	***P*-value***	**Non-Drinker (n = 1187)**	**Drinker (n = 362)**	***P*-value***
Age (y)	59.3 ± 10.7	60.7 ± 10.3	0.07	58.5 ± 9.5	56.0 ± 9.4	0.25
Smoking (%)	13.0	22.8	< 0.01	4.2	12.3	< 0.01
HbA1C[a] (mg/dL)	7.3 ± 1.3	7.0 ± 1.7	0.40	7.4 ± 1.3	6.9 ± 1.0	0.34
Diabetic retinopathy[a] (%)	12.5	3.8	0.23	3.5	0.00	0.58
Spherical equivalent (D)	−2.81 ± 3.49	−2.47 ± 3.39	0.18	−2.16 ± 3.41	−2.89 ± 3.46	< 0.01
Astigmatic errors (D)	0.89 ± 0.90	0.95 ± 0.88	0.35	0.71 ± 0.84	0.56 ± 0.70	< 0.01
Anisometropia (D)	0.65 ± 0.81	0.69 ± 0.93	0.59	0.59 ± 0.95	0.58 ± 0.72	0.89
Near add power (D)	2.36 ± 0.80	2.52 ± 0.72	< 0.01	2.31 ± 0.78	2.29 ± 0.81	0.73
Near add power ≥ 1.50 D	88.9	91.1	0.31	88.0	85.9	0.26
Near add power ≥ 2.50 D	61.3	71.4	< 0.01	59.4	58.7	0.61
Intra-ocular pressure (mmHg)	15.9 ± 4.1	17.0 ± 6.2	< 0.01	15.7 ± 3.5	16.2 ± 3.1	< 0.05
GCC (μm)	81.6 ± 12.6	81.0 ± 15.2	0.59	85.5 ± 11.7	85.4 ± 13.2	0.60
Peripapillary RNFL (μm)	108.2 ± 20.8	104.5 ± 22.2	< 0.05	113.6 ± 19.2	110.7 ± 17.6	< 0.05
Foveal thickness (μm)	264.1 ± 34.4	266.6 ± 29.5	0.40	252.9 ± 30.6	262.6 ± 31.9	< 0.01
Tear break-up time (s)	4.1 ± 2.5	4.2 ± 2.5	0.86	2.8 ± 2.1	2.9 ± 2.3	0.67
Corneal staining (%)	14.2	9.4	0.07	31.2	36.7	0.04*
Schirmer test (mm)	14.8 ± 8.2	19.8 ± 10.5	< 0.01*	15.4 ± 8.7	16.2 ± 7.7	0.29
Use of dry eye medication (%)	17.0	5.1	< 0.01	28.2	12.7	< 0.01

Notes: [a]Diabetic patients only. *Unpaired *t*-test or chi-squared test, as appropriate.
Abbreviations: GCC, thickness of the ganglion cell complex measured using optical coherence tomography; RNFL, retinal nerve fiber layer thickness.

Table 2 Regression Analysis of Systemic and Ocular Parameters in Relation to Near Add Power Stratified by Sex

	Men (n = 1844)	**Women (n = 4574)**
Age (y)	0.70**	0.73**
Smoking	0.01	−0.01
Drinking	0.06*	0.01
HbA1C (mg/dl)	−0.04	0.06
Diabetic retinopathy	0.03	0.07
Spherical equivalent (D)	−0.07**	−0.05**
Astigmatic errors (D)	0.06**	0.02**
Anisometropia (D)	0.04**	−0.01
Intra-ocular pressure (mmHg)	0.04*	0.02**
GCC (μm)	−0.17**	−0.14**
Peripapillary RNFL (μm)	−0.14**	−0.07**
Foveal thickness (μm)	0.00	0.01
Tear break-up time (s)	0.07**	−0.02
Corneal staining	0.00	0.00
Schirmer test (mm)	0.05	0.03
Use of dry eye medication	0.03	0.00

Notes: Values are standardized partial regression coefficients. Adjusted for age and sex. *$P < 0.05$, **$P < 0.01$.
Abbreviations: GCC, ganglion cell complex; RNFL, retinal nerve fiber layer thickness.

2.50 D. Smoking habit, HbA1c levels, and the presence of diabetic retinopathy were not significant factors. Results of dry eye-related parameters were scattered among sex differences and drinking habit (Table 2 and Table 3), while drinking status was beneficial for dry eye in men, whilst the opposite was true for women (Table 1).

Kaplan-Meier survival analysis indicated that men reached the end point (+1.50 D) significantly earlier than women ($P < 0.01$, Log rank test; Figure 1), and male drinkers reached the end point (+2.50 D) significantly earlier than male non-drinkers ($P < 0.05$, Log rank test) in the 50 to 59 year age range (Figure 2).

Table 3 Comparison of Odds Ratios for Risk Factors for Reaching Near Add Power

Characteristics	Near Add Power	
	1.50 D	2.50 D
Age (y)	1.34** (1.31–1.36)	1.26** (1.25–1.28)
Sex (male = 1)	1.29** (1.08–1.55)	1.25** (1.07–1.46)
Drinking	0.93 (0.67–1.29)	1.54* (1.03–2.32)
Smoking	1.10 (0.68–1.78)	1.06 (0.73–1.54)
HbA1C (mg/dL)	0.98 (0.71–1.36)	1.05 (0.85–1.29)
Diabetic retinopathy	0.99 (0.00–10.00)	0.99 (0.33–2.93)
Spherical equivalent (D)	1.00 (1.00–1.00)	0.99** (0.99–0.99)
Astigmatic errors (D)	1.01** (1.00–1.01)	1.01** (1.00–1.03)
Anisometropia (D)	1.00 (0.99–0.01)	1.01* (1.00–1.01)
Intra-ocular pressure (mmHg)	1.04** (1.02–1.07)	1.03 (1.01–1.05)
GCC (μm)	0.97** (0.96–0.98)	0.97** (0.96–0.98)
Peripapillary RNFL (μm)	0.98** (0.98–0.99)	0.98** (0.97–0.99)
Foveal thickness (μm)	0.99 (0.99–1.01)	1.00 (0.99–1.01)
Tear break-up time (s)	0.99 (0.95–1.04)	0.98 (0.94–1.01)
Corneal staining	1.04 (0.85–1.28)	0.80* (0.67–0.96)
Schirmer test (mm)	1.00 (0.99–1.02)	1.00* (1.00–1.03)
Use of dry eye medication	0.98 (0.75–1.28)	0.92 (0.72–1.18)

Notes: Values are odds ratio (95% confidence interval). Adjusted for age and sex. *$P < 0.05$, **$P < 0.01$.
Abbreviations: GCC, ganglion cell complex thickness; RNFL, retinal nerve fiber layer thickness.

Discussion

Drinking was a risk factor for near add power solely in men, and it was further confirmed that the mean near add power of male drinkers was higher than male non-drinkers. The results with Kaplan-Meyer survival analysis were consistent with these findings. Collectively, drinking may be one of the potential risk factors for the sex difference in presbyopia.

The worsening of presbyopia in men may be exacerbated by sex-specific factors, including the impact of alcohol consumption which could negatively affect accommodative amplitude.[16] Men experiencing presbyopia often reported unhappiness and insomnia.[22] Acetaldehyde, a byproduct of alcohol metabolism, induces apoptosis and cytotoxic effects in various organs by generating reactive oxygen species and impairing mitochondrial function.[23] Additionally, alcohol consumption is linked to increased IOP as indicated in the present study, which is associated with presbyopia.[24,25] Drinking frequency, average daily alcohol intake, and total lifetime alcohol consumption correlated with glaucoma risk in men, whereas no such association has been observed in women.[26] Alcohol has both transient and chronic effects on IOP and ocular blood flow.[26] Acute alcohol intake is known to produce a dose-dependent reduction in IOP and a temporary increase in optic nerve head blood flow, which may exert short-term protective effects. In contrast, chronic alcohol consumption has been associated with higher IOP and an increased risk of open-angle glaucoma, as demonstrated in a recent meta-analysis and large population-based studies, including the Canadian Longitudinal Study on Aging.[27]

Chronic alcohol intake has been shown to exacerbate neurodegenerative processes via mitochondrial dysfunction, autonomic dysregulation, oxidative stress, and chronic inflammation, particularly in aging individuals.[28,29] These mechanisms may impair parasympathetic control of the ciliary muscle, reduce its contractile efficiency, and disrupt metabolic support for sustained accommodation. In addition, systemic inflammation and microvascular dysfunction associated with heavy alcohol use may contribute to earlier lens sclerosis and reduced tissue elasticity. Taken together, these pathways provide a plausible biological framework in which alcohol-related neurophysiological impairment could diminish accommodative function and thereby exacerbate presbyopia symptoms.

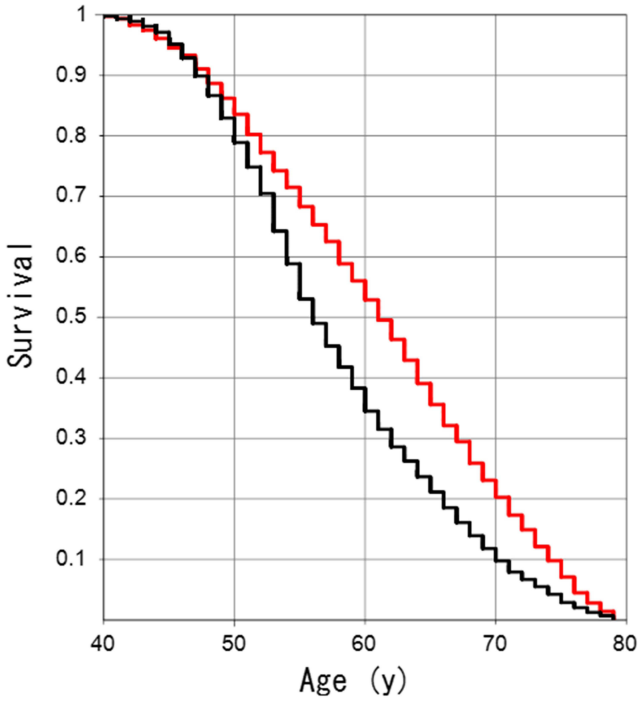

Figure 1 Kaplan-Meier survival curve analysis showing the age at which sex reached the near addition endpoint of 1.50 D. Men (black line) reached the end point significantly earlier than women (red line, $P < 0.01$; Log rank test).

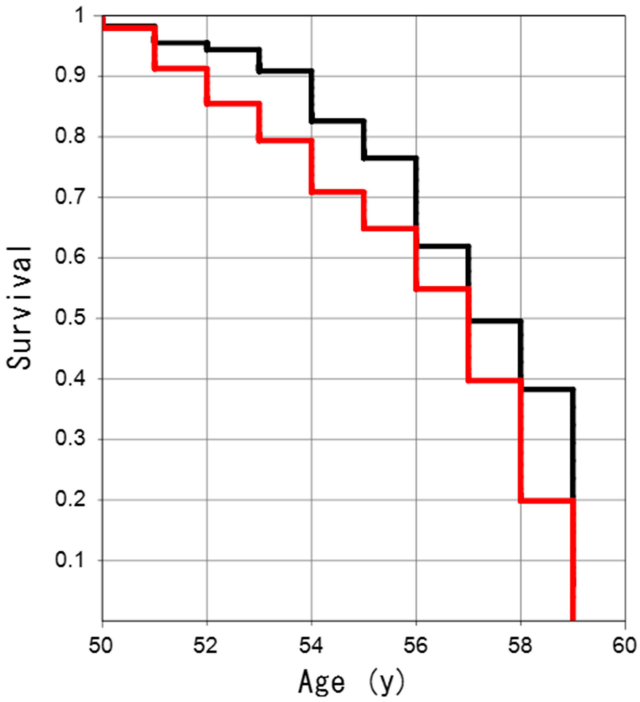

Figure 2 Kaplan-Meier survival analysis showing the age the near addition endpoint of 2.50 D was reached. Male drinkers (red line) reached the end point (+2.50 (**D**) significantly earlier than male non-drinkers (black line, $P < 0.05$; Log rank test).

The findings of the present study on alcohol and dry eye were inconsistent, and no definitive conclusions were drawn regarding sex differences and lifestyle factors in presbyopia related to dry eye and alcohol use. Magno et al[30] reported that alcohol consumption significantly increased the risk of symptomatic dry eye in females, but not in males. Conversely, among male drinkers, higher alcohol intake seemed to have a protective effect on symptomatic dry eye—

an effect that was not observed in females. These findings align with the current results; however, they also contrast with previous research suggesting that dry eye may exacerbate presbyopia.[20] Given that dry eye is a multifactorial condition, further investigations are needed to clarify the relationships between drinking status, dry eye, and presbyopia.

One strength of the current study is that it was not merely an analysis of survey data or databases, but rather involved direct examination and interviews conducted by medical professionals, with a sufficient number of participants to yield substantial findings: That men who consume alcohol may be at an increased risk of worsening presbyopia. Another advantage of this study is the application of Kaplan-Meier survival analysis, which allowed us to identify the age at which individuals reached specific near add power thresholds. In the present study, endpoints were set at +1.50 D and +2.50 D, both representing critical points at which presbyopic symptoms typically become noticeable. If presbyopia progresses rapidly, the decline in accommodative power occurs earlier, and this method has been consistently used in previous studies.[20,31] This method is an effective tool for detecting and assessing the progression of age-dependent changes in presbyopia. The assessment of presbyopia is also highly dependent on age range. Kaplan-Meier analyses helped to address these challenges and enhance the reliability of the findings.

The present study has several limitations. Detailed assessments for other unmeasured factors, including education, occupation, and working distance, were unable to be conducted. Since the study is observational, it cannot establish causation, but only correlation, and a cross-sectional design limits the ability to track changes over time, making it harder to determine life-long effects on presbyopia. Drinking and smoking habits were self-reported which can introduce recall bias or inaccuracies in reporting. Regarding drinking patterns, this study did not specify whether frequency, quantity, or type of alcohol consumed played a role in presbyopia progression. Further research with controlled variables would be beneficial to strengthen the findings of the present study.

Conclusions

The association between lifestyle and near add power was explored and drinking status and male sex were identified as significant factors. The current findings should complement previous investigations and be helpful for healthcare education to emphasize the harmful effects of alcohol consumption on ocular health.

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Disclosure

The authors report no conflicts of interest in this work.

References

1. Hanyuda A, Kubota M, Kubota S, et al. Establishing the cutoff value of near visual acuity for assessment of early presbyopia. *Jpn J Ophthalmol*. 2024;68(6):709–716. doi:10.1007/s10384-024-01114-x
2. Wolffsohn JS, Davies LN, Sheppard AL. New insights in presbyopia: impact of correction strategies. *BMJ Open Ophthalmol*. 2023;8(1):e001122. doi:10.1136/bmjophth-2022-001122
3. McDonald MB, Barnett M, Gaddie IB, et al. Classification of presbyopia by severity. *Ophthalmol Ther*. 2022;11(1):1–11. doi:10.1007/s40123-021-00410-w
4. Croft MA, Nork TM, Heatley G, Mcdonald JP, Katz A, Kaufman PL. Intraocular accommodative movements in monkeys; relationship to presbyopia. *Exp Eye Res*. 2022;222:109029. doi:10.1016/j.exer.2022.109029
5. Kaufman PL, Lütjen Drecoll E, Croft MA. Presbyopia and glaucoma: two diseases, one pathophysiology? The 2017 Friedenwald lecture. *Invest Ophthalmol Vis Sci*. 2019;60(5):1801–1812. doi:10.1167/iovs.19-26899
6. Hipsley AM, Hall B. Influence of ocular rigidity and ocular biomechanics on the pathogenesis of age-related presbyopia. In: Pallikaris I, Tsilimbaris MK, Dastiridou AI, editors. *Ocular Rigidity, Biomechanics and Hydrodynamics of the Eye*. Cham, Switzerland: Springer; 2021:127–146.
7. 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. doi:10.1155/2023/6440954
8. Adnan, Efron N, Mathur A, et al. Amplitude of accommodation in type 1 diabetes. *Invest Ophthalmol Vis Sci*. 2014;55(10):7014–7018. doi:10.1167/iovs.14-15376
9. Srinivasan R, Paramasivan G, Sharma A, Surya J, Sharma T, Raman R. Prevalence, risk factors and association with glycemic levels of presbyopia in South Indian population. *Indian J Ophthalmol*. 2021;69(11):3173–3177. doi:10.4103/ijo.IJO_1407_21

10. Kador PF, Wyman M, Oates PJ. Aldose reductase, ocular diabetic complications and the development of topical Kinostat(®). *Prog Retin Eye Res*. 2016;54:1–29. doi:10.1016/j.preteyeres.2016.04.006
11. Cataract and anterior segment preferred practice pattern panel 2020–2021. Risk factors. In: *Cataract in the Adult Eye Preferred Practice Pattern® Guidelines*. San Francisco, CA: American Academy of Ophthalmology; 2021:10–11.
12. Ide T, Negishi K, Yamaguchi T, Hara S, Toda I, Tsubota K. New compact accommodometer to measure accommodation amplitude as a biomarker. *Asia Pac J Ophthalmol*. 2012;1(1):24–27. doi:10.1097/APO.0b013e31823f1a69
13. Andualem HB, Assefa NL, Weldemichael DZ, Tefera TK. Prevalence and associated factors of presbyopia among school teachers in Gondar city, Northwest Ethiopia, 2016. *Clin Optom*. 2017;9:85–90. doi:10.2147/OPTO.S129326
14. Manthey J, Kilian C, Kraus L, Schäfer I, Schranz A, Schulte B. Identifying levels of alcohol use disorder severity in electronic health records. *Subst Abuse Treat Prev Policy*. 2025;20(1):36. doi:10.1186/s13011-025-00670-w
15. Manthey J, Shield KD, Rylett M, Hasan OSM, Probst C, Rehm J. Global alcohol exposure between 1990 and 2017 and forecasts until 2030: a modelling study. *Lancet*. 2019;393(10190):2493–2502. doi:10.1016/S0140-6736(18)32744-2
16. Nirmalan PK, Krishnaiah S, Shamanna BR, Rao GN, Thomas R. A population-based assessment of presbyopia in the state of Andhra Pradesh, south India: the Andhra Pradesh Eye Disease Study. *Invest Ophthalmol Vis Sci*. 2006;47(6):2324–2328. doi:10.1167/iovs.05-1192
17. Hickenbotham A. Meta-analysis of sex differences in presbyopia. *Clin Epidemiol Res*. 2012;53:3215–3220. PMID: 22531698. doi:10.1167/iovs.12-9791
18. Pointer J. The presbyopic add. II. Age-related trend and a gender difference. *Ophthalmic Physiol Opt*. 1995;15:241–248. doi:10.1046/j.1475-1313.1995.9400022r.x
19. Ayaki M, Hanyuda A, Negishi K. Presbyopia, dry eye, and retinal thickness in the middle-aged population: focusing on sex differences. *Clin Optom*. 2024;16:223–231. doi:10.2147/OPTO.S481279
20. Ayaki M, Negishi K. Short tear breakup time could exacerbate the progression of presbyopia in women. *Biomed Res Int*. 2022;2022:8159669. doi:10.1155/2022/8159669
21. Negishi K, Ayaki M, Kawashima M, Tsubota K. Sleep and subjective happiness between the ages 40 and 59 in relation to presbyopia and dry eye. *PLoS One*. 2021;16(4):e0250087. doi:10.1371/journal.pone.0250087
22. Ayaki M, Negishi K, Kawashima M, Tsubota K. Starting time of presbyopic eyeglasses wear and lifestyle. *Front Public Health*. 2022;10:856999. doi:10.3389/fpubh.2022.856999
23. Yan T, Zhao Y. Acetaldehyde induces phosphorylation of dynamin-related protein 1 and mitochondrial dysfunction via elevating intracellular ROS and Ca(2+) levels. *Redox Biol*. 2020;28:101381. doi:10.1016/j.redox.2019.101381
24. Lee S, Kim JS, Kim SS, et al. Relationship between alcohol consumption and ocular pressure according to facial flushing in Korean men with obesity. *Korean J Fam Med*. 2019;40:399–405. doi:10.4082/kjfm.18.0131
25. Ayaki M, Hanyuda A, Negishi K. Presbyopia and associated factors specific to age groups. *Clin Exp Optom*. 2026;109(1):47–52. doi:10.1080/08164622.2025.2461737
26. Sano K, Terauchi R, Fukai K, et al. Association between alcohol consumption patterns and glaucoma in Japan. *J Glaucoma*. 2023;32(11):968–975. doi:10.1097/IJG.0000000000002308
27. Grant A, Roy-Gagnon MH, Bastasic J, et al. Alcohol consumption, genetic risk, and intraocular pressure and glaucoma: The Canadian Longitudinal Study on Aging. *Invest Ophthalmol Vis Sci*. 2023;64(10):3. doi:10.1167/iovs.64.10.3
28. Kuhns L, Kroon E, Lesscher H, Mies G, Cousijn J. Age-related differences in the effect of chronic alcohol on cognition and the brain: a systematic review. *Transl Psychiatry*. 2022;12(1):345. doi:10.1038/s41398-022-02100-y
29. Ruiter-Lopez L, Khan MAS, Wang X, Song BJ. Roles of oxidative stress and autophagy in alcohol-mediated brain damage. *Antioxidants*. 2025;14(3):302.
30. Magno MS, Daniel T, Morthen MK, et al. The relationship between alcohol consumption and dry eye. *Ocul Surf*. 2021;21:87–95. doi:10.1016/j.jtos.2021.05.005
31. Ayaki M, Ichikawa K. Near add power of glaucoma patients with early presbyopia. *J Clin Med*. 2024;13(19):5675.