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Knowledge, attitude and the associated factors regarding spectacle use among adults living in Debre Birhan Town, North Shewa, Ethiopia, 2023: a community-based, cross-sectional study

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ABSTRACT

Objective This study aimed to assess the knowledge, attitude and the associated factors regarding spectacle use among adults living in Debre Birhan Town, North Shewa, Ethiopia.

Design A community-based, cross-sectional study was conducted using a multistage sampling method.

Setting The study was conducted in Debre Birhan Town, North Shewa, Ethiopia.

Participants The study included 1022 adults aged ≥18 years living in Debre Birhan Town for more than 6 months.

Main outcome measures Data were collected using face-to-face interviews completed by an interviewer.

Results The study included 1022 adults with a median age of 45 years. Of the participants, 86.01% (95% CI 83.88, 88.14) had adequate knowledge and 85.32% (95% CI 83.15, 87.50) had favourable attitude towards spectacle use. Older age (adjusted OR (AOR)=1.21, 95% CI 1.17, 1.26), higher educational status (AOR=2.65, 95% CI 1.06, 6.60), history of spectacle use (AOR=3.20, 95% CI 1.31, 7.83) and family history of spectacle use (AOR=4.75, 95% CI 2.31, 9.75) were positively associated with having adequate knowledge of spectacle use. Higher educational status (AOR=2.56, 95% CI 1.26, 5.21), history of spectacle use (AOR=3.22, 95% CI 1.58, 6.55), family history of spectacle use (AOR=1.89, 95% CI 1.13, 3.16) and adequate knowledge about spectacle use (AOR=4.63, 95% CI 2.69, 7.98) were positively associated with having favourable attitude towards spectacle use.

Conclusion This study revealed a good proportion of adults with adequate knowledge and favourable attitude towards spectacle use. Higher educational status, history of spectacle use and family history of spectacle use were significantly associated with having adequate knowledge and favourable attitude towards spectacle use.

STRENGTHS AND LIMITATIONS OF THIS STUDY

⇒ This study provides up-to-date information on the proportion of adults with knowledge and attitude towards spectacle use and the associated factors among those living in Northeast Ethiopia, with the aim of reducing ultraviolet radiation-related ocular hazards and visual impairments resulting from refractive errors and presbyopia.

⇒ As a cross-sectional study, it demonstrates the temporal relationship between knowledge and attitude towards spectacle use and the associated factors rather than establishing a cause–effect relationship.

⇒ Although the study involves the general population, the results do not specifically address the attitudes and knowledge of adults who use spectacles to correct refractive errors or presbyopia, or of the parents/guardians of children who use them for the same purpose.

INTRODUCTION

Spectacles are optical devices consisting of a frame with lenses that are used to correct distance and/or near vision impairments, as well as for protection and gaining self-confidence.[1 2] Use of spectacles is the world's most cost-effective method to correct refractive errors.[3] In many countries, the proportion of adults who could benefit from spectacles to correct refractive errors but do not currently own or use them is high: 60% in rural China[4] and 71.58% in Finote Selam Town, Ethiopia.[5] Worldwide, the prevalence of inadequate knowledge and unfavourable attitude towards spectacle use among adults ranges from 8% to 80% and from 0.8% to 69%, respectively.[6–9]

Evidence has shown that knowledge about spectacle use is positively associated with male sex, college and above educational status, history of spectacle use, history of eye examination, self-reported reduction in vision and family history of spectacle use,[10–13] whereas a favourable attitude towards spectacle use is significantly associated with older age, college

and above educational status, urban residency, positive history of spectacle use and knowledge about spectacle use.[8 14 15]

Adults' knowledge and attitude towards spectacle use play an important role in encouraging people to seek treatment to correct refractive errors and improve eye health-seeking behaviours.[15–17] In addition, wearing glasses to correct refractive errors helps minimise the burden associated with visual impairments.[6 15]

In contrast, inadequate knowledge and unfavourable attitude towards spectacle use lead to visual impairments and blindness resulting from uncorrected refractive errors, which hinder education and productivity and result in limited social participation, negative psychological impact and reduced quality of life.[18–24] These also lead to an enormous burden on the healthcare system.[6 25–28]

Although numerous studies have been conducted to determine the prevalence of refractive error, there are comparatively insufficient data on the knowledge and attitude towards spectacle use. Providing up-to-date information on the knowledge and attitude towards spectacle use is very crucial to policymakers' and stakeholders' works on reduction of refractive to design the platform in awareness creation in spectacle use. The main objective of this study was to investigate the knowledge, attitude and associated factors regarding spectacle use among adults in Debre Birhan Town, North Shewa, Ethiopia.

METHODS AND MATERIALS

Study design and setting

A community-based, cross-sectional study was conducted in Debre Birhan Town, North Shewa, Ethiopia, between 8 May and 8 June 2023. The town is located in North Shewa, Amhara National Regional State Government, 130 km away from Addis Ababa, the capital city of Ethiopia, and 688 km away from Bahir Dar, the capital city of Amhara National Regional State. The town has a total population of 88 375 (39 961 male and 48 414 female residents), of whom 56 914 are adults aged ≥18 years.[29] It has nine administrative kebeles. The town has a tertiary eye care centre with ophthalmologists, optometrists, ophthalmic nurses and nurses serving more than three million people in the catchment area, as well as a private eye clinic. The town also has more than three optical workshops.

Study population and eligibility criteria

All adults aged ≥18 years living in Debre Birhan Town for more than 6 months and who were available during the data collection period were included in the study. Adults who were unable to respond to the questionnaire due to a serious illness or mental impairment were excluded.

Patient and public involvement

Patients and/or the public were not involved in the study design, conduct of the study or plan to disseminate the results to the study participants.

Sample size determination for the first objective

Sample size was determined using the single proportion formula, $n=\frac{(Z\,\alpha/2)^2\times P(1-P)}{d^2}$, with the following considerations: n is the sample size; Z is the value of Z statistics at 95% confidence level, which is equal to 1.96; P is the expected proportion of adults with adequate knowledge and favourable attitude towards spectacle use, which was 90.6% and 90.4%, respectively, and taken from a study done in Gondar, Ethiopia[9]; and d is the margin of error at 5%. According to this calculation, the sample sizes would be 131 and 134 for adequate knowledge and favourable attitude towards spectacle use, respectively.

Sample size determination for the second objective

Educational status is consistently associated with knowledge about spectacle use.[9] To determine the sample size for the second objective regarding knowledge about spectacle, the Epi Info V.7 software was used, considering a confidence level of 95%, power of 80%, a ratio of unexposed to exposed patients of 0.989 and an OR of 0.31, with the proportion of cases in the exposed and unexposed groups set at 83.2% and 94.1%, respectively. The computer-generated sample size was 300.

Occupational status is consistently associated with attitudes towards spectacle use.[9] To determine the sample size for the second objective regarding knowledge about spectacle using, the Epi Info V.7 software was used, considering a confidence level of 95%, power of 80%, a ratio of unexposed to exposed patients of 1.00 and an OR of 0.376, with the proportion of cases in the exposed and unexposed groups set at 86.6% and 94.5%, respectively. The computer-generated sample size was 478.

Finally, the sample size calculated on the basis of occupational status was selected because it was sufficient to meet both objectives. Considering a design effect of 2 and a non-response rate of 10%, we arrived at a final sample size of 1052.

Sampling procedures and techniques

A multistage sampling procedure was applied to obtain the sampling unit. First, four kebeles were selected from nine kebeles using lottery method. The sample size was proportionally allocated to the size of the population in each selected kebele. Finally, using a constant interval of 10, a systematic random sampling method was applied to select households. The interval was calculated as the total number of households in the selected kebeles divided by the sample size (K=N/n=10 519/1052=10). We then randomly chose a number between 1 and 10 to select the first household to be included in the sample, and every 10th household was randomly selected. Moreover, if more than one eligible adults aged ≥18 years were found in the selected household, participants were recruited by lottery. If an eligible person could not be found during data collection, the household was visited again. If no eligible person meeting the inclusion criteria was found in the selected household, an adjacent household was surveyed (figure 1).

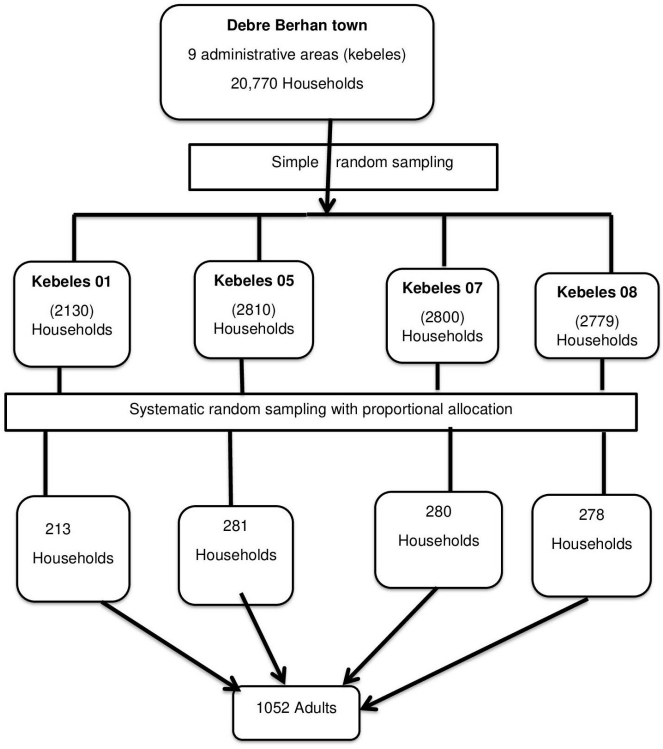

Figure 1 Diagrammatic representation of the sampling procedure in Debre Birhan Town, North Shewa, Ethiopia, 2023.

Operational definitions

- Knowledge about spectacle use: assessed using 15 'yes' or 'no' questions. A correct (yes) answer to the questions was scored 1, while an incorrect (no) answer was scored 0. For the knowledge questions, the sum of the scores ranged from 0 to 15 points, with a median score of 11. Participants who had a median score or above on the knowledge-related questions were considered to have adequate knowledge about spectacle use and inadequate knowledge otherwise.
- Attitudes towards spectacle use: assessed by 15 attitude-related questions with a 5-point Likert scale. The responses were strongly agree=1, agree=2, neutral=3, disagree=4 and strongly disagree=5. The sum of the scores ranged from 15 to 75 points, with a median score of 57. Thus, participants who answered more than or equal to the median score on the attitude-related questions had a favourable attitude towards spectacle use, while those who answered less than the median score had an unfavourable attitude.
- History of eye examination: the study participant has performed an eye examination at least once in the last 2 years.[17]
- History of eye training: the study participant has received an eye health-related education from an eye care professional at least once before the data collection period.

Data collection procedures

Data were collected through face-to-face interviews using pretested structured questionnaires adapted from similar previous studies.[7 13] The questionnaires included questions on sociodemographic characteristics, ocular history, personal medical history and knowledge-related and attitude-related questions (online supplemental file 1). Four optometrists participated in the data collection. Interexaminer reliability was assessed, and the Cohen's kappa statistics were 0.79 and 0.81 for knowledge and attitude towards spectacle use, respectively. After completing the interviews, participants' distance visual acuity was measured in each eye using a Snellen visual acuity chart at a distance of 6 m. If the participant could not see a letter at 1 m, other measures such as counting fingers, hand motion, light perception and no light perception were used to assess visual acuity. Visual acuity status was classified as follows: normal vision (presenting visual acuity (PVA) in the better eye ≥6/12), mild visual impairment (PVA in the better eye <6/12–6/18), moderate visual impairment (PVA in the better eye <6/18–6/60), severe visual impairment (PVA in the better eye <6/60–3/60) and blindness (PVA in the better eye <3/60), based on the International Classification of Diseases, 11th Revision's definition of visual impairment.[30]

Statistical analysis

After checking for completeness and consistency, the data were entered in KoboCollect V.2021.4.4 and exported to Stata V.14 for analysis. Both descriptive and analytical statistics were performed. Multicollinearity was checked using variance inflation factor and tolerance. A bivariable logistic regression followed by a multivariable binary logistic regression was fitted to identify possible predictors of knowledge and attitude towards spectacle use. The strength of the association between the predictors and the outcome variables was shown using adjusted OR (AOR) with 95% CI. The model of fitness was ensured through the Hosmer and Lemeshow goodness of fit. A variable with a p value of 0.05 in the multivariable binary logistic regression was considered statistically significant.

RESULTS

Sociodemographic characteristics of the study participants

A total of 1022 study participants were included, with a response rate of 97.15%. The median age of the participants was 45 years (IQR 37–54). Of the study participants, 687 (67.22%) were male, 812 (79.45%) were married and 468 (45.79%) had college and above educational status (table 1).

Clinical characteristics of the study participants

Out of the 1022 participants, about 285 (27.89%) had worn spectacles at least once in their life, 542 (53.03%) had self-reported visual deterioration, 137 (13.41%) had a history of eye training and 424 (41.49%) had a family history of spectacle use (table 2).

Table 1 Sociodemographic characteristics of the study participants in Debre Birhan Town, North Shewa, Ethiopia, 2023 (N=1022)

Variables	Categories	Current spectacle wearers (%)	Currently not spectacle wearers (%)
Overall		285 (100)	737 (100)
Age (years)	≤37	50 (17.5)	209 (28.4)
	38–45	80 (28.1)	184 (24.9)
	46–54	93 (32.6)	192 (26.0)
	≥55	62 (21.8)	152 (20.6)
Sex	Male	230 (80.7)	457 (62.0)
	Female	55 (19.3)	280 (38.0)
Marital status	Not married	33 (11.6)	13.21 (13.8)
	Married	238 (83.5)	79.45 (77.9)
	Divorced	11 (3.9)	4.70 (5.0)
	Widowed	3 (1.0)	2.64 (3.3)
Educational status	Unable to read and write	13 (4.6)	104 (14.1)
	Able to read and write	24 (8.4)	171 (23.2)
	Primary school	6 (2.1)	64 (8.7)
	Secondary school	52 (18.3)	120 (16.2)
	College and above	190 (66.7)	278 (37.7)
Occupational status	Merchant	57 (20)	214 (29.0)
	Government-employed	139 (48.8)	289 (39.2)
	Housewife	18 (6.3)	114 (15.5)
	Privately employed	55 (19.5)	86 (11.7)
	Unemployed	16 (5.6)	34 (4.6)

Table 2 Clinical characteristics of the study participants in Debre Birhan Town, North Shewa, Ethiopia, 2023 (N=1022)

Variables	Categories	Current spectacle wearers (%)	Currently not spectacle wearers (%)
Overall		285 (100)	737 (100)
History of eye examination	Yes	239 (83.9)	252 (34.2)
	No	46 (16.1)	485 (65.8)
Self-reported reduction of vision	Yes	247 (86.7)	295 (40.0)
	No	38 (13.3)	442 (60.0)
History of cataract surgery	Yes	105 (36.8)	102 (13.8)
	No	180 (63.2)	635 (86.2)
History of ocular trauma	Yes	38 (13.3)	58 (7.9)
	No	247 (86.7)	679 (92.1)
History of training on eye	Yes	63 (22.1)	74 (10.0)
	No	222 (77.9)	663 (90.0)
Family history of spectacle	Yes	158 (55.4)	266 (36.1)
	No	127 (45.6)	471 (63.9)
History of DM	Yes	28 (9.8)	53 (7.2)
	No	257 (90.2)	684 (92.8)
History of HTN	Yes	11 (3.9)	32 (4.3)
	No	274 (96.1)	705 (95.7)
Distance visual acuity status	≥6/12	42 (17.4)	200 (82.6)
	<6/12–6/18	203 (30.8)	457 (69.2)
	<6/18–6/60	7 (24.1)	22 (75.9)
	<6/60	33 (36.3)	58 (63.8)

Knowledge about spectacle use among study participants

In this study, the proportion of adults having adequate knowledge about spectacle use was 86.01% (95% CI 83.88, 88.14). Regarding detailed knowledge about spectacle use, 249 (24.36%) out of the 1022 participants said that eye-drops can be an alternative to using spectacles for correcting vision, 238 (23.29%) thought that spectacles prescribed for one person can be used by another, 241 (23.58%) assumed that spectacles can be obtained once and then they will always have the same meaning for the rest of one's life, and only 637 (62.33%) assumed that those who wear spectacles must wear them regularly (online supplemental file 2).

Attitude towards spectacle use among study participants

Of the total 1022 study participants, 872 (85.32%; 95% CI 83.15, 87.50) had favourable attitude towards spectacle use. Of those who had favourable attitude, 71.10% were male. Of the study participants, 102 (9.98%) strongly agreed that wearing spectacles can result in activity limitations, 230 (22.50%) agreed that wearing spectacles is fashionable, 128 (12.52%) strongly disagreed that wearing spectacles makes one look better, 108 (10.57%) agreed that wearing spectacles worsens vision and 111 (10.86%) agreed that wearing spectacles is uninteresting (online supplemental file 3).

Factors associated with knowledge about spectacle use

In the bivariable binary logistic regression analysis, female sex, increasing age, marital status (being widowed), higher educational status (secondary school and college and above), occupational status (being a merchant and a housewife), history of training on the eye, history of eye examination, history of spectacle use, history of self-reported reduction in vision, history of cataract surgery and family history of spectacle use were associated with knowledge about spectacle use. However, the multivariable binary logistic regression analysis revealed that age, educational status, history of spectacle use and family history of spectacle use were significantly associated with knowledge of spectacle use.

This study revealed that as age increases by one unit the odds of having adequate knowledge about spectacle use increase by 1.21 times (AOR=1.21, 95% CI 1.17, 1.26). The odds of having adequate knowledge among participants with a higher level of education (college and above) were 2.65 times higher compared with those who cannot read and write (AOR=2.65, 95% CI 1.06, 6.60). The odds of having adequate knowledge among participants with a positive history of spectacle use were 3.20 times higher compared with those who had no positive history of spectacle use (AOR=3.20, 95% CI 1.31, 7.83). The odds of having adequate knowledge among participants with a positive family history of spectacle use were 4.75 times higher compared with those who had no family history of spectacle use (AOR=4.75, 95% CI 2.31, 9.75) (table 3).

Factors associated with attitude towards spectacle use

In the bivariable binary logistic regression analysis, female gender, older age, higher educational level (secondary school and college and above), occupational status (being a merchant, a housewife or unemployed), history of eye examination, history of spectacle use, history of self-reported vision reduction, history of cataract surgery, family history of spectacle use and knowledge about spectacle use were significantly associated with attitude towards spectacle use. However, the multivariable logistic regression analysis revealed that educational status, history of spectacle use, family history of spectacle use and knowledge of spectacle use were significantly associated with attitude towards spectacle use.

The odds of having favourable attitude among those who had higher educational level (college and above) were 2.56 times higher compared with those who could not read and write (AOR=2.56, 95% CI 1.26, 5.21). The odds of having favourable attitude among those who had a positive history of spectacle use were 3.22 times higher than those who had no history of spectacle use (AOR=3.22, 95% CI 1.58, 6.55). The odds of having favourable attitude among those who had a positive family history of spectacle use were 1.89 times higher compared with those who had no family history of spectacle use (AOR=1.89, 95% CI 1.13, 3.16). The odds of having favourable attitude among those who had adequate knowledge about spectacle use were 4.63 times higher than those who had inadequate knowledge about spectacle use (AOR=4.63, 95% CI 2.69, 7.98) (table 4).

DISCUSSION

In this study, about 86.01% (95% CI 83.88, 88.14) of the study participants had adequate knowledge about spectacle use. This is lower than the studies conducted in Gondar, Ethiopia (90.6%),[9] South Africa (94%)[22] and India (92%).[16] The difference could be because sociodemographic characteristics, ocular history and study population vary from country to country. For instance, in the study done in Gondar, Ethiopia, the number of spectacle users was higher than in the current study,[9] which led to an overestimation of the proportion of those with adequate knowledge in Gondar. The use of spectacles has been shown to have a major impact on knowledge of spectacle use.[13 31] Furthermore, the studies in India and South Africa were conducted among participants with high educational status, with the Indian study including secondary school students and the South African study including university students. Therefore, different levels of education of study participants could lead to different levels of knowledge about spectacle use. Knowledge about spectacle use is influenced by participants' level of education.[8 9 16 22 32]

In contrast, the result of the present study is higher than those conducted in Egypt (67%),[33] Ghana (38.5%),[13] Nigeria (38%),[34] Saudi Arabia (23%),[14] China (33.3%)[31] and Indonesia (20%).[8] This difference could also be due to variations in study setting and study population. The study in Saudi Arabia was conducted among women, while in the present study most of the participants were men who can easily obtain information about spectacles from their colleagues and from trainings compared with women, resulting in the high proportion of individuals with adequate knowledge about spectacle use.[34 35]

The odds of having adequate knowledge about spectacle use among study participants who had a higher level of education (college and above) were 2.65 times higher than those who were unable to read and write. This finding is consistent with the findings of the studies conducted in Gondar, Ethiopia[9] and Indonesia.[8] This association might be because individuals with a high level of education are more likely to attend health education programmes, understand written and visual documents, and approach different sources of information that builds knowledge about spectacle use.[36] It has been suggested that all stakeholders, particularly the ministers of health and education, collaborate on implementing a plan to educate students about eye health issues at all levels of education, with the aim of reducing the impact of visual impairment resulting from presbyopia and refractive errors by ensuring appropriate use of spectacles.

Age was significantly associated with having adequate knowledge about spectacle use. As age increases by one unit, the odds of having adequate knowledge about spectacle use increase by 1.21 times. This is in line with other research conducted in Nigeria[37] and Indonesia.[8] This association might be because older people are more likely to be presbyopic[38 39]; they need spectacles for near vision. This exposes to those population to get enough information about their spectacles.[8]

The odds of having adequate knowledge about spectacle use among study participants who had a positive history of spectacle use were 3.20 times greater than those who did not use spectacles. This finding is supported by studies conducted in Ghana[13] and China.[31] This might be due to spectacle users seeing the advantages of spectacle use, such as in improving their vision or providing protection. The methods of wearing spectacles may be explained to patients before dispensing them, so respondents may

Table 3 Factors associated with knowledge about spectacle use among adults in Debre Birhan Town, North Shewa, Ethiopia, 2023 (N=1022)

	Knowledge about spectacle use				
Variables	Adequate	Inadequate	COR (95% CI)	AOR (95% CI)	P value
Sex					
Female	253	82	0.30 (0.20, 0.43)	1.03 (0.58, 1.85)	0.897
Male	626	61	1.00	1.00	
Age (years)			1.22 (1.18, 1.26)	1.21 (1.17, 1.26)	<0.0001
Marital status					
Not married	120	15	1.00	1.00	
Married	698	114	0.76 (0.43, 1.35)	1.03 (0.46, 2.29)	0.937
Divorced	41	7	0.73 (0.27, 1.92)	0.23 (0.04, 1.23)	0.087
Widowed	20	7	0.35 (0.12, 0.98)	0.74 (0.17, 3.10)	0.686
Educational status					
Unable to read and write	86	31	1.00	1.00	
Able to read and write	142	53	0.96 (0.57, 1.62)	0.81 (0.38, 1.70)	0.581
Primary school	51	19	0.96 (0.49, 1.88)	0.66 (0.25, 1.68)	0.385
Secondary school	152	20	2.73 (1.47, 5.09)	1.62 (0.65, 4.02)	0.293
College and above	448	20	8.07 (4.39, 14.82)	2.65 (1.06, 6.60)	0.035
Occupational status					
Merchant	222	49	0.53 (0.34, 0.82)	0.98 (0.51, 1.86)	0.956
Government-employed	383	45	1.00	1.00	
Housewife	100	32	0.36 (0.22, 0.60)	0.85 (0.39, 1.81)	0.677
Privately employed	132	9	1.72 (0.82, 3.62)	2.77 (0.95, 8.07)	0.061
Unemployed	42	8	0.61 (0.27, 1.39)	0.56 (0.13, 2.32)	0.428
History of training on eye					
Yes	128	9	2.53 (1.25, 5.11)	1.36 (0.52, 3.53)	0.517
No	751	134	1.00	1.00	
History of eye examination					
Yes	465	26	5.05 (3.23, 7.88)	1.33 (0.64, 2.75)	0.431
No	414	117	1.00	1.00	
History of spectacle use					
Yes	277	8	7.76 (3.75, 16.06)	3.20 (1.31, 7.83)	0.010
No	602	135	1.00	1.00	
Self-reported reduction of vision					
Yes	508	34	4.38 (2.92, 6.59)	0.91 (0.45, 1.82)	0.795
No	371	109	1.00	1.00	
History of cataract surgery					
Yes	197	10	3.84 (1.98, 7.44)	1.14 (0.44, 2.94)	0.775
No	682	133	1.00	1.00	
Family history of spectacle use					
Yes	411	13	8.78 (4.89, 15.76)	4.75 (2.31, 9.75)	<0.0001
No	468	130	1.00	1.00	

AOR, adjusted OR; COR, crude OR.

understand what spectacle use is. This implies the need for eye care education, especially on the use of spectacles, when providing them to certain individuals.

The odds of having adequate knowledge about spectacle use among study participants with a family history of spectacle use were 4.75 times higher compared with those

Table 4 Factors associated with attitude towards spectacle use among adults in Debre Birhan Town, North Shewa, Ethiopia, 2023 (N=1022)

	Attitude towards spectacle use				
Variables	**Favourable**	**Unfavourable**	**COR (95% CI)**	**AOR (95% CI)**	**P value**
Sex					
Female	252	83	0.32 (0.23, 0.46)	0.65 (0.41, 1.02)	0.065
Male	620	67	1.00	1.00	
Age (years)			1.06 (1.04, 1.07)	1.00 (0.98, 1.02)	0.575
Marital status					
Not married	111	24	1.00	1.00	
Married	700	112	1.35 (0.83, 2.19)	1.41 (0.79, 2.48)	0.235
Divorced	42	6	1.51 (0.57, 3.96)	1.86 (0.61, 5.61)	0.270
Widowed	19	8	0.51 (0.20, 1.30)	0.88 (0.30, 2.54)	0.815
Educational status					
Unable to read and write	85	32	1.00	1.00	
Able to read and write	146	49	1.12 (0.66, 1.88)	1.03 (0.57, 1.83)	0.915
Primary school	50	20	0.94 (0.48, 1.81)	0.85 (0.41, 1.77)	0.675
Secondary school	149	23	2.43 (1.34, 4.43)	1.76 (0.87, 3.58)	0.113
College and above	442	26	6.40 (3.62, 11.28)	2.56 (1.26, 5.21)	0.009
Occupational status					
Merchant	218	53	0.44 (0.28, 0.69)	0.65 (0.38, 1.08)	0.102
Government-employed	386	42	1.00	1.00	
Housewife	104	28	0.40 (0.23, 0.68)	0.89 (0.48, 1.67)	0.733
Privately employed	124	17	0.79 (0.43, 1.44)	0.52 (0.26, 1.05)	0.069
Unemployed	40	10	0.43 (0.20, 0.93)	0.41 (0.16, 1.01)	0.053
History of training on eye					
Yes	122	15	1.46 (0.83, 2.58)	0.56 (0.28, 1.10)	0.096
No	750	135	1.00	1.00	
History of eye examination					
Yes	454	37	3.31 (2.23, 4.92)	1.04 (0.58, 1.88)	0.873
No	418	113	1.00	1.00	
History of spectacle use					
Yes	274	11	5.78 (3.08, 10.87)	3.22 (1.58, 6.55)	0.001
No	598	139	1.00	1.00	
History of ocular trauma					
Yes	87	9	1.73 (0.85, 3.52)	1.22 (0.52, 2.84)	0.638
No	785	141	1.00	1.00	
Self-reported reduction of vision					
Yes	496	46	2.98 (2.05, 4.32)	0.85 (0.49, 1.47)	0.566
No	376	104	1.00	1.00	
History of cataract surgery					
Yes	192	15	2.54 (1.45, 4.43)	0.94 (0.47, 1.89)	0.873
No	680	135	1.00	1.00	
Family history of spectacle use					
Yes	397	27	3.80 (2.45, 5.89)	1.89 (1.13, 3.16)	0.015
No	475	123	1.00	1.00	
Knowledge about spectacle use					

Continued

Table 4 Continued

	Attitude towards spectacle use				
Variables	Favourable	Unfavourable	COR (95% CI)	AOR (95% CI)	P value
Adequate	798	81	9.18 (6.15, 13.70)	4.63 (2.69, 7.98)	<0.0001
Inadequate	74	69	1.00	1.00	

AOR, adjusted OR; COR, crude OR.

who had no family history of spectacle use. This is in line with the findings of the studies conducted in Nigeria[12] and Swaziland.[40] This might be due to the chance of obtaining information from family experiences about the advantages of spectacle use.[12] This implies the need for eye care education, particularly on use of spectacles, when providing them to certain individuals.

In the present study, the proportion of adults with favourable attitude towards spectacle use was 85.32% (95% CI 83.15, 87.50). This finding is lower than the studies conducted in Gondar (90.4%)[9] and India (99.2%).[6] This may be due to the higher knowledge about spectacle use among the population in those studies, as attitude is influenced by knowledge.[8 9] Moreover, in India, eye health information and eye care centres are easily accessible,[41] which can influence people's attitude towards spectacle use, thus facilitating a positive attitude.

In contrast, the finding of the present study was higher than the studies performed in Nigeria (36%, 61.62%),[34 42] India (23.5%),[43] Oman (53.5%)[15] and Indonesia (50%).[8] The difference could also be due to variations in study population. In previous studies, the participants were between 15 and 35 years old, whereas in the present study most of the participants were older than 35 years old and were more likely to be presbyopic and thus more likely to use spectacles for near vision. As a result, their attitude towards spectacle use became favourable as practice changed.[38 39]

The odds of having favourable attitude among participants with a higher level of education (college and above) were 2.56 times higher than those who cannot read and write. This finding is supported by studies in Gondar,[9] Oman[15] and Indonesia.[8] This might be because with higher educational level, people might be highly concerned about their vision and thus may use spectacles to improve their vision. They may also have good attitude towards use of spectacles. Moreover, their visual needs may also be a factor for these educated groups, which prompts them to be spectacle users.[44] This implies that stakeholders, especially the Ministry of Health and Education, should develop a plan to provide eye health education at all levels of education, with the aim of reducing the impact of visual impairment resulting from refractive errors and presbyopia by ensuring adequate information is provided about spectacles and their proper usage.

The odds of having a favourable attitude among participants with a positive history of spectacle use were 3.22 times higher compared with those who did not have a positive history of spectacle use. This is supported by studies performed in Ghana[13] and Saudi Arabia.[14] This might be because when individuals use spectacles, they improve their vision and they receive advice when spectacles are dispensed. This finding implies that properly distributed spectacles for correction or protection can result in a positive attitude towards their use.

The odds of having a favourable attitude among participants with a family history of spectacle use were 1.89 times higher compared with those who did not have a family history of spectacle use. This is supported by studies performed in Nigeria[12] and Indonesia.[8] Parents who wear spectacles were more likely to allow their family members to wear spectacles.[12] This result indicates that optometrists or opticians should exert extra effort to provide the necessary corrective or protective glasses, and that trust should be established between individuals who need spectacles and the professionals who provide them.

The odds of having a favourable attitude among participants with adequate knowledge about spectacle use were 4.63 times higher compared with those who had inadequate knowledge about spectacle use. This is in agreement with the findings of studies conducted in Gondar[9] and Indonesia.[8] This might be due to individual knowledge improvement, which can positively change the attitude of participants towards spectacle use.[8 15] This further implies that having sufficient information is necessary to develop a positive attitude towards use of spectacles and that it requires a multidisciplinary approach to raise awareness about spectacles and their usage.

Strengths and limitations of this study

This study provides up-to-date evidence on the proportion of adults with knowledge and attitude towards spectacle use and the associated factors among those living in Northeast Ethiopia, with the aim of reducing ocular hazards related to ultraviolet rays as well as visual impairments resulting from refractive error and presbyopia. Being a cross-sectional study, this study can show the temporal relationship between the associated factors and the knowledge and attitude towards spectacle use rather than the actual cause–effect relationship. Although the study involves the general population, the results did not specifically address the attitudes and knowledge of adults who use spectacles to correct refractive errors or presbyopia, or the parents/guardians of children who use them for the same purpose. Furthermore, this study mainly focuses on quantitative information, but limited

information on the qualitative aspects and their impact relationship.

CONCLUSION

This study revealed a good proportion of adults having adequate knowledge and favourable attitude towards spectacle use. Increasing age, higher level of education, positive history of spectacle use and family history of spectacle use were significantly associated with having adequate knowledge of spectacle use. In addition, higher educational status, positive history of spectacle use, family history of spectacle use and adequate knowledge of spectacle use were positively associated with having favourable attitude towards spectacle use. We recommend strengthening the existing knowledge and attitudes towards spectacle use by disseminating information among individuals with low levels of educational status during community meetings. It is also recommended that both large-scale qualitative and quantitative comparative cross-sectional studies be conducted to better estimate the prevalence of knowledge and attitude towards spectacle use and the associated factors.

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Patient consent for publication Not required.

Ethics approval This study involves human participants and was conducted in accordance with the Declaration of Helsinki. Ethical approval was obtained from the Ethical Review Committee of the University of Gondar College of Medicine and Health Sciences, Comprehensive and Specialized Hospital and the School of Medicine. A letter of support was provided by the administration of Debre Birhan. Verbal informed consent was obtained from all participants after detailed explanation of the purpose of the study. Verbal informed consent was approved by the Ethical Review Committee of the University of Gondar (ethical approval number 622/05/2023). All included participants were informed of their right to withdraw from the study at any time during the interview. No risk was taken for the selected study participants. Confidentiality was maintained by not using personal identifiers in the data collection tools and using password-protected data on a computer. Participants gave informed consent to participate in the study before taking part.

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