

Knowledge, attitudes and practices related to seeking medical eyecare services by adults with moderate-to-severe visual impairment in rural Yueqing, Wenzhou, China: a cross-sectional survey

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Abstract

• **AIM:** To evaluate the knowledge, attitudes, and practices regarding eye-care seeking practices of visually impaired adults in a rural area Yueqing, and explore factors influencing their behavior.

• **METHODS:** A stratified sampling method was used to select 48 villages in Yueqing, from which 2400 people were selected to receive vision screenings conducted by oculists during a household visit. Those presenting visual acuity ≥ 0.5 logMAR in either eye completed a self-designed questionnaire investigating their knowledge about medical eye-care seeking, attitudes about eye health and eye-care-seeking behavior.

• **RESULTS:** Totally 165 people with moderate-to-severe visual impairment were identified (6.9%, 165/2400), and 146 eligible participants were recruited (response rate: 88.4%, mean age: $68.6 \pm 15.0y$), among which 88 (60.3%) were female. They had 82 (56.2%) and 64 (43.8%) monocular and binocular visual impairments respectively. A total of 67 (45.9%) subjects demonstrated a high knowledge level about medical eye-care seeking and 88 (60.3%) had self-rated poor vision, with 23 (15%) receiving regular vision checks. The 105 (71.9%) subjects had never been to hospital for an eye examination. "No need" and "schedule conflicts" were the main reasons for not seeking

eye care. Having extensive knowledge of medical eye-care seeking was positively associated with high education levels (OR=3.73, $P=0.045$) and negatively correlated with older age (OR=0.97, $P=0.043$). Both the self-perceived vision condition (OR=2.59, $P=0.03$) and regular vision check behavior (OR=6.50, $P<0.01$) were related with seeking eye care services.

• **CONCLUSION:** In rural Yueqing, intervention is required to increase public knowledge about seeking medical eye care among people with moderate-to-severe visual impairment, especially for the elderly and poorly education. Regular vision checks may be useful to promote their medical eye-care utilization.

• **KEYWORDS:** visual impairment; knowledge; attitude; practices; eye care service

DOI:10.18240/ijo.2020.07.16

Citation: Li LS, Ge ZY, Lohfeld L, Zhou K, Zhou WH, Cui LL, Qu J, Liang YB. Knowledge, attitudes and practices related to seeking medical eyecare services by adults with moderate-to-severe visual impairment in rural Yueqing, Wenzhou, China: a cross-sectional survey. *Int J Ophthalmol* 2020;13(7):1115-1123

INTRODUCTION

According to the World Health Organization, there are 253 million people living with visual impairment (VI) worldwide, including 217 million people with moderate-to-severe visual impairment, 80% of whom are aged 50y and older^[1]. The number of people with VI is expected to more than double over the 2020-2050 period to 587.6 million people^[2]. This health issue is especially severe in low-and middle-income countries where funds and services needed to diagnose and treat VI are limited^[3].

In 2014, the estimated prevalence of presenting VI in China was 10.3%^[4] of the country's 1.39 billion people^[5], among which 24.3 million people were living with irreversible low vision and 4.65 million were blind^[6]. The burden of vision

loss from eye diseases in China has increased from 12th to 11th leading health problem in the 25y since 1990. During this same period, all-age years lived with disability (YLD) for vision loss from eye diseases increased by 86.5%^[7]. Since uncorrected refractive errors and unoperated cataract are the two leading causes of VI globally, over 80% of all VI is preventable or curable^[1].

However, in China, the usage of eye care services in rural areas is low. A survey in Handan, Hebei Province, found that almost 90% of rural residents have never visited an eye care provider before, and over 50% of those with VI have never seen an eye doctor^[8]. This pattern of poor uptake of health services by rural residents consistent with the finding of a study in Guangdong Province, China, in which 69% of rural patients with diabetic retinopathy reported never having had an eye exam^[9].

Studies of people's knowledge, attitudes and practice (KAP) are useful in identifying factors affecting people's health behaviors and building a targeted educational intervention. Few studies in China have investigated factors influencing the eye-care seeking behaviors of the visually impaired^[8-10]. Therefore, the present KAP study was conducted to fill this knowledge gap by providing evidence of the eye-care seeking behaviors and literacy of those with VI in rural Yueqing, Wenzhou, Zhejiang Province, China.

Yueqing is a county-level city in eastern China home to approximately 1.4 million people. The annual average income in rural Yueqing (4784 USD per capita) is much higher than the national average (2175 USD per capita)^[5,11]. In 2017, We launched a self-detected vision project by laypeople at home using eye-chart, and those people identified as low visual acuity will get a referral to a free comprehensive eye exam at a nearby eye clinic. This project aims to explore a simple and cost-effective eye disease screening model in rural Yueqing. Before expanding this program to all of rural Yueqing, a subset of participants was administered the KAP survey, which inquires participants' knowledge and usage of local eye care services. This information will help program developers identify and address barriers to ensure the provision of appropriate and timely medical eye care services.

SUBJECTS AND MEHTODS

Ethical Approval The study protocol was approved by the Ethics Committee of the Eye Hospital of Wenzhou Medical University. The study was carried out in accordance with the Helsinki Declaration. All subjects were provided written informed consent when enrolled in the main YES project and then provided additional verbal consent prior to data collection for the present study.

Aim, Study Design and Setting The aim of this cross-sectional survey study was to determine the KAP of rural-dwelling adults with VI about seeking medical eye-care

service. The subjects were drawn from a larger sample of participants in the main project—Yueqing Eye Study (YES). KAP data was collected from May to June 2017 by teams of trained researchers conducting home visits in 12 communities in Liushi Town and 4 subdistricts in Yuecheng Town.

Sample A stratified sampling plan was used to select three villages representing small, medium or large area in each of the selected streets and communities. Twenty households were randomly drawn from each of the 48 areas, for a total of 960 households. For the purposes of this study, a household was defined as the individuals who usually sleep under the same roof over a 6-month periods. We checked the vision of all eligible adults (people ≥ 18 years of age) living in a selected household and administered a questionnaire to each person with moderate-to-severe VI.

Eligibility criteria included being a registered resident of Yueqing, aged 18y or older, able to give oral informed consent and verbally answer questions on the researcher-administered questionnaire, if designated as having moderate-to-severe VI after completing a researcher-administered eye chart exam. VI status was defined according to the ICD-10 classification system to describe anyone with distance presenting visual acuity (PVA) of $< 6/18$ (approximately > 0.5 logMAR) in one or both eyes^[12]. Those with severe mental or physical problems preventing them from comprehending or answering the research questions were deemed ineligible.

Instrument Development The questionnaire was developed based on previously published literature and the research team's knowledge about local perceptions about vision and eye care developed during the main project^[8,11,13-17]. The instrument included 16 Yes/No questions about knowledge of low vision and eye care seeking behaviors; one single-choice question on attitudes towards eye care; four single-choice questions on seeking eye care services; one multiple-choice question on reasons for not seeking eye care; and 13 questions about demographic characteristics. The original instrument was created in Mandarin, translated to Yueqing, the local dialect, and then back translated back to Mandarin by two bilingual speakers. Discrepancies were resolved and the updated versions of the questionnaires were pilot tested with 10 local residents whose feedback led to minor revisions to both instruments.

Data Collection Local residents helped the team locate the target households. If no one was home at the time of the research team's visit, three subsequent visits were made on the same day. If still no contact had been made, five telephone calls were made over the next three days to invite the household to participate in the vision screening program. A total of 59 households (6.1%, 59/960) could not be contacted and were dropped from the study. Visual acuity for the 2400

residents living in the remaining 901 households was checked by a team of trained oculists using the log of the minimum angle of resolution (logMAR) Tumbling-E visual acuity chart (GB 11533-2011). One or more family member was taught how to use this chart prior to the scheduled oculist-led vision examination, which identified less than 10% of the sample to have moderate-to-severe VI (6.9%, 165/2400).

Survey data was collected during face-to-face interviews with participants in their homes, and led by a two-person researcher team and a bilingual translator. Nineteen subjects declined to participate in this study, citing no time to participate (6/19); the others gave no reason for their decision. The final sample consisted of 146 subjects from 137 households (88.4% response rate, 146/165).

Statistical Analysis All data was double entered by two researchers (Li LS and Ge ZY) into Epi-data (Ver.3.1; The Epidata Assoc., Odense, Denmark) and analyzed using SPSS (Ver.20.0; IBM, Armonk, NY, USA). Frequencies and percentages were used to describe categorical data. Associations between eye care knowledge, eye care-seeking practices, and demographics (age, sex, education, eye disease history) were analyzed with the Pearson χ^2 test, and the Fisher's exact test as needed. Results from the univariate analysis determined which variables to include in the multiple logistic regression, with the effect of multi-categorical variables assessed by keeping the first category as the reference value. The level of significance for all statistical tests was $P < 0.05$.

The 16 dichotomous variables (knowledge about low vision and eye care seeking behavior) were given a score of 0 (incorrect answer) or 1 (correct answer). Subjects were labeled as having a high level of knowledge if they scored $>$ the mean score for all 16 items^[16]. Other dichotomous variables included prior history of seeking eye care from a trained professional (0=no visits, 1=at least 1 prior visit) and intention to seek eye care if needed in the future (0=No, 1=Yes). Subjects were designated as having 'positive eye health behaviors' if the answer to either of these questions was 'Yes'.

RESULTS

Social-demographic Characteristics Participants ranged in age from 18 to 92y (mean 68.6 ± 15.0 y); 60.3% of them were female. Their mean PVA was 0.8 ± 0.2 logMAR for the worse-seeing eye and 0.5 ± 0.3 logMAR for the better-seeing eye. There were more subjects with monocular than binocular VI [82 (56.2%) and 64 (43.8%) respectively]. Most participants had no formal education (35.6%) or had only completed elementary school (40.4%). Half of the participants reported no income and another 32.4% indicated they had a low level of income. Over half (54.1%) of them reported family members as their main source of income. Nearly one-third (30.8%) of the subjects reported a history of eye disease including,

11 people who had cataract surgery, 4 people who had laser treatment and 2 people who had undergone glaucoma surgery. More than one third (38.4%) of the subjects reported having hypertension, 13.7% with diabetes and 3.4% reported having a family history of eye disease.

There were three factors associated with 50% or more of the participants having seen an eye care professional: income source from an old-age pension (66.7%) or social assistance (50%), and having a history of eye disease (55.6%). Having a mid-level income also was associated with relatively high rates of positive behaviors for eye care (42.9%).

There was no statistically significant difference in the proportion of subjects who had versus had not sought eye care from a professional prior to the survey by gender, age, education, income level, family history of eye disease, visual acuity of the better-seeing eye, and personal history of diabetes or hypertension. There were significant differences for subjects who rated their vision as poor, received an old-age pension or had a personal history of eye disease (36.4%, 66.7% and 55.6% reportedly had sought care, respectively; Table 1).

Knowledge Related to Eye-care Seeking Accurate knowledge about visual acuity and eye disease varied considerably in this sample, from a high of 77.4% of subjects correctly noting that those with myopia can see things but not far into the distance, to a low 17.1% who knew that distant vision loss is not a normal part of aging. Over half the sample knew that low vision can affect daily life; and that reduced vision requires prompt examination or treatment at a hospital; that cataract can cause low vision or blindness and is most effectively treated by surgery. Approximately one-third or less of the sample could accurately identify what is visual acuity for normal and low vision; that low vision may not be correctable with glasses or contact lenses; and that cataract cannot be cured with eye drops. When subjects were asked to identify the causes of vision loss, the leading answer was cataract (64.1%), distantly followed by high myopia (37.2%), diabetes (30.8%), glaucoma (23.3%) and hypertension (21.2%; Table 2).

Only 67 participants (45.9%) answered at least half of the 16 knowledge questions accurately ('adequate knowledge'). The main source of information about eye health for participants was family/relatives/friends (50.7%) followed by doctors (44.5%), television (21.2%), newspaper (8.2%), school (5.5%) and the Internet (2.7%).

Attitude Towards Eye Health Four different levels of concern about one's eye health were identified in this survey. Nearly half (49.3%, $n=72$) were mildly concerned, 27.4% ($n=40$) were moderately concerned, 15% ($n=22$) were very concerned, and 8.2% ($n=12$) felt eye health was not a priority.

Eye Care-seeking Practices Over half (60.3%) of the participants with VI thought they had poor vision, compared

Table 1 Demographic characteristics of study subjects who sought eye-care service or not n (%)

Variable	Previous eye care seeking behavior			χ^2	P
	Total	Yes (n=41)	No (n=105)		
Gender				0.74	0.39
Male	58 (39.7)	14 (24.1)	44 (75.9)		
Female	88 (60.3)	27 (30.7)	61 (69.3)		
Age				0.09	0.96
18-50y	15 (10.3)	4 (26.7)	11 (73.3)		
51-80y	97 (66.4)	28 (28.9)	69 (71.1)		
>80y	34 (23.3)	9 (26.5)	25 (73.5)		
Better-seeing eye				0.13	0.72
>0.5 logMAR	64 (43.8)	17 (26.6)	47 (73.4)		
≤0.5 logMAR	82 (56.2)	24 (29.3)	58 (70.7)		
Worse-seeing eye				28.06	<0.01
>0.5 logMAR	146 (100)	41 (28.1)	105 (71.9)		
≤0.5 logMAR	0	0	0		
Self-perceived vision condition				7.35	0.02
Good	7 (4.8)	1 (14.3)	6 (85.7)		
Neither good or poor	51 (34.9)	8 (15.7)	43 (84.3)		
Poor	88 (60.3)	32 (36.4)	56 (43.6)		
Education				0.26	0.88
Illiterate	52 (35.6)	14 (26.9)	38 (73.1)		
Elementary	59 (40.4)	16 (27.1)	43 (72.9)		
≥secondary school	35 (24)	11 (31.4)	24 (68.6)		
Income (USD/y)				1.95	0.58
None	73 (50.3)	18 (24.7)	55 (75.3)		
Low (1-4500)	47 (32.4)	13 (27.7)	34 (72.3)		
Medium (4500-7500)	14 (9.7)	6 (42.9)	8 (57.1)		
High income (>7500)	11 (7.6)	3 (27.3)	8 (72.7)		
Financial source				14.97	<0.01
Own	46 (31.5)	12 (26.1)	34 (73.9)		
Family members	79 (54.1)	16 (20.3)	63 (79.7)		
Old-age pension	15 (10.3)	10 (66.7)	5 (33.3)		
Social assistance	6 (4.1)	3 (50.0)	3 (50.0)		
Own history of eye disease				24.31	<0.01
Yes	45 (30.8)	25 (55.6)	20 (44.4)		
No	101 (69.2)	16 (15.8)	85 (84.2)		
Family history of eye disease				0	1
Yes	5 (3.4)	1 (20.0)	4 (80.0)		
No	141 (96.6)	40 (28.4)	101 (71.6)		
Diabetes				0.04	0.84
Yes	20 (13.7)	6 (30.0)	14 (70.0)		
No	126 (86.3)	35 (27.8)	91 (72.2)		
Hypertension				0.74	0.39
Yes	56 (38.4)	18 (32.1)	38 (67.9)		
No	90 (61.6)	23 (25.6)	67 (74.4)		

Statistical difference existed among variables such as visual acuity for wore-seeing eye, self-perceived vision condition, financial source and eye disease history. ‘Yes’ and ‘No’ refer to eye care seeking behavior prior to the survey.

to 34.9% who thought their vision was adequate (neither good nor bad), and 4.8% who thought their vision was good. About

15.8% were currently receiving regular eye checks, 9.5% of them within the past year. Although 71.9% of the subjects had

Table 2 Percent of questions correctly answered to test knowledge about eye-care seeking

n (%)

Question	Correctly answered ^a
Understanding of vision	
A person with myopia can see near things but cannot see things in the distance.	113 (77.4)
Normal vision is generally >1.0 (equivalent to logarithmic visual acuity 0.0).	53 (36.3)
Distant vision loss is not a normal manifestation of aging.	25 (17.1)
Wearing glasses cannot improve vision for some visual impairments.	31 (21.2)
Knowledge about low vision and seeking eye care service	
Visual acuity <0.3 in either eye at screening may be labeled as 'low vision'.	50 (34.2)
People with low vision cannot use glasses or contact lenses to correct their vision to normal.	49 (33.6)
Low vision can have an influence on daily life.	99 (67.8)
When reduced vision happens, one should promptly go to the hospital for examination or treatment.	91 (62.3)
Knowledge about cataract	
Cataract is white opacity (lens opacity) in eyes.	84 (57.5)
Cataract cannot be cured by eye drop use.	49 (33.6)
The most effective way to treat cataract is surgery.	82 (56.2)
Knowledge of diseases causing vision loss	
Cataract can cause vision loss.	93 (64.1)
High myopia can cause vision loss.	34 (37.2)
Diabetes can cause vision loss.	45 (30.8)
Glaucoma can cause vision loss.	34 (23.3)
Hypertension can cause vision loss.	31 (21.2)

^aNumber of participants who answered 'yes'.

never been to a hospital for an eye examination, 63.7% of the participants stated they would be willing to go to a nearby hospital-based eye clinic if they noticed any loss of sight (Table 3). The main reason was expecting to seek eye care service in the future was 'no need' (73.6%). Other reasons included lack of time (28.3%), and difficulties reaching the hospital due to heavy traffic (26.4%). Other less frequent reasons included no one to accompany the participant (13.2%), cost (11.3%), and ineffective treatment of an eye disease (3.8%; Figure 1).

Association of Knowledge, Practice and Other Study Variables Multiple logistic regression showed that the only demographic variables significantly associated with knowledge about seeking eye care services were education and age. Old age had a negative relationship with adequate knowledge (OR=0.97, 95%CI: 0.95-1.00) and education had a strong relationship. Subjects with at least a secondary school education were 3.7 times more likely to know when and how to seek eye care services than those with no formal education or less than an elementary school education. Although younger participants had a higher knowledge score ($P<0.05$), there was no significant association between level of knowledge and sex, socioeconomic status, own or family history of eye disease, and practices such as having a regular vision examination or previous use of eye care services (Table 4).

Two variables significantly associated with having sought eye care services were self-perceived vision problem and regular

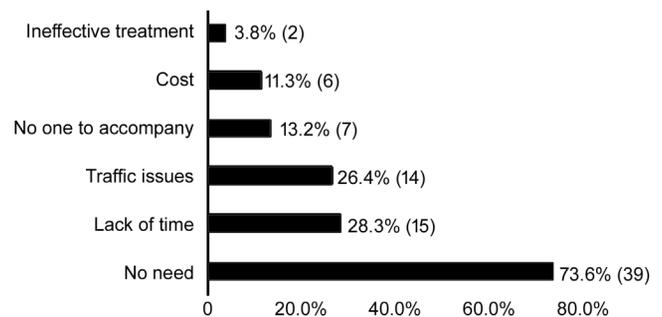


Figure 1 Reasons not seeking eye care services in the future (n=53).

Table 3 Eye health care practices of study participants

Self-care practice	<i>n</i> (%)
Regular vision-check	
Yes	23 (15.8)
No	123 (84.2)
Time interval of doing vision-check (n=23)	
Within past 1y	14 (9.5)
Within past 2y	3 (2.1)
Within past 3y	1 (0.6)
>3y	5 (3.4)
Are you willing to seek eye care service in the future?	
Yes	93 (63.7)
No	53 (36.3)
Have you ever sought eye care service before?	
Yes	41 (28.1)
No	105 (71.9)

Table 4 Multiple logistic regression on knowledge related to seeking eye car service

Variable	Knowledge related to seeking eye care service	
	OR (95%CI)	P
Age	0.97 (0.95, 1.00)	0.04
Gender		
Male	Reference	
Female	1.23 (0.58, 2.60)	0.60
Level of education		0.05
Illiterate	Reference	
Elementary school	1.74 (0.77, 3.94)	0.19
≥Secondary school	3.73 (1.32, 10.55)	0.01
Have you ever sought eye care service before?		
No	Reference	
Yes	0.94 (0.43, 2.02)	0.87

OR: Odds ratio; CI: Confidence interval. Age was regarded as a continuous variable to be computed and B value=-0.028. Knowledge was analyzed as two categories (0=inadequate one; 1=adequate one).

Table 5 Multiple logistic regression on previous and future practices related to seeking eye care service

Variable	Previous practice of seeking eye care service		Willing to seek eye care service in future	
	OR (95%CI)	P	OR (95%CI)	P
Age	0.99 (0.97, 1.02)	0.50	1.00 (0.98, 1.03)	0.74
Gender				
Male	Reference		Reference	
Female	1.89 (0.81, 4.39)	0.14	1.00 (0.48, 2.07)	0.99
Self-perceived vision condition		0.03		0.04
Good	Reference		Reference	
Neither good n or poor	0.71 (0.07, 7.05)	0.77	0.74 (0.15, 3.76)	0.72
Poor	2.59 (0.29, 23.39)	0.40	2.03 (0.40, 10.18)	0.39
Better-seeing eye				
≤0.5 logMAR	Reference		Reference	
>0.5 logMAR	0.51 (0.10, 2.53)	0.41	0.27 (0.06, 1.23)	0.09
Regular vision-check				
No	Reference		Reference	
Yes	6.50 (2.30, 18.1)	<0.01	2.24 (0.75, 6.71)	0.15
Knowledge level				
Low (<8 items)	Reference		Reference	
High (≥8 items)	0.92 (0.40, 2.12)	0.85	1.50 (0.71, 3.14)	0.29

OR: Odds ratio; CI: Confidence interval. Age was used as a continuous variable when included in this analysis. High level of knowledge was defined as having a knowledge score equal to or greater than the mean score for all 16 items.

vision-check behavior ($P<0.01$). Regularly checking one’s vision was strongly associated with previously seeking eye care (OR=6.50, 95%CI: 2.3-18.1). Subjects who perceived they had poor vision were 2.59 times more likely to seek medical eye-care before participating in this study ($P=0.03$), and were 2.03 times more likely to intend to seek eye care in the future ($P=0.04$; Table 5).

DISCUSSION

Our study assessed KAP towards medical eye care seeking behavior among adults with moderate-to-severe VI in rural China. A key finding from this study is that most participants

had little knowledge about eye health and the need to promptly seek medical care for declining or changing vision. This was particularly the case for older adults and people with little formal education. The current and future intention of going to eye clinics or regularly checking their vision was found in less than half of the subjects. This may contribute to a lack of awareness about eye diseases. ‘No need’ and ‘scheduling conflicts’ were the main reasons for not seeking eye care services. Regular vision-checks may help people recognize they have poor vision, which is a pre-condition for seeking eye care and intention to use medical eye care services.

Most participants attributed vision loss to the natural aging process or myopia, which may contribute to delaying or refusing to seek eye care services. This has, also been observed in other studies^[18-19]. However, reduced vision is an early manifestation of many eye diseases that, if left untreated, can result in low vision or blindness^[20]. People with VI are more likely to be diagnosed with sight-threatening eye diseases that respond well to early diagnosis and treatment^[21-22]. Therefore, efforts improve people's knowledge about VI and the value of regularly checking their vision may promote more positive attitudes towards sight-preserving behaviors.

Adults with VI in the study region had good knowledge about myopia and cataract but, knew less about vision loss caused by glaucoma, diabetes and hypertension. Myopia and cataract are common problems in China, so it is not surprising that other studies have also found a high level of understanding about this eye condition^[23-24]. In contrast, results from this study indicated that more subjects correctly identify treatment for cataract than in studies conducted in Cambodia^[25], India^[26] and Nepal^[27]. This disparity may be because of the recent rapid increase in cataract surgery rate in China. In 2017 the rate was 2205/million, which is an increase of 6.25% compared to rate in 2016^[28]. Other sight-robbing diseases such as glaucoma, diabetic retinopathy and hypertensive retinopathy can be asymptomatic and progress with aging, and so may not be as readily identified by the public^[14-16]. These deficits in knowledge about these harder-to-perceive causes of VI may affect person's motivation to undergo eye examinations. Therefore, it may be important to focus on increasing public knowledge of eye diseases as well as advice people with VI to have regular eye exams.

This study did not find any association between sex and knowledge about seeking eye care services unlike results from research in Australia^[14] and Iran^[29] where women were more likely than men to seek care. Similar to findings from other studies, this investigation found age and level of education were strongly associated with knowledge about vision and eye diseases^[29-30]: younger adults and people with more education knew more about their health. Such variation across studies conducted in different locations indicates that services based on current knowledge should be based on local data and tailored to fit the context and culture in which programs are delivered. In our study region, knowledge of seeking eye care service among the VI should be increased specifically for the elder and the low-educated.

According to guidelines issued by the American Academy of Ophthalmology, people aged 65 years and older should have a vision test once every 1-2y^[31]. However, less than one third of the subjects (28.1%) in this study reported they had sought eye care in the past, and even fewer (15.8%) indicated

they did regular vision checks. Our investigation found the main reasons for their not seeking eyecare service were no need (73.6%) and lack of time (28.3%). These results are comparable to another study in Wenzhou, China, in which one of the three leading reasons for refusing to have cataract surgery was advanced age which may correlates closely with perceived lack of need for eye care^[32]. Similar studies found other barriers to eye care service utilization including cost, little awareness of eye health, fear of surgery, and no one to escort the patient^[10,18-19]. The range of barriers to seeking eye care across settings indicate that understanding local conditions is critical when developing a sustainable eye-health program that address underlying barriers to addressing VI in adults.

In this study, participants who regularly did vision checks or were aware they had poor vision, were more likely to seek medical eye-care than other community members. Therefore, we commend that a campaign to reduce vision loss in Wenzhou include home-based vision screening, information to help people with VI to recognize their poor vision and encourage them to regularly seek professional eye care. Other studies had indicated that home-based eye diseases screening, for age-related macular degeneration^[33] and amblyopia^[34] is effective. Home-based disease screening is a cost-saving and effective way to change people's behavior^[34-35]. This approach could be adopted to help people with VI better use the ophthalmic resources in the future.

Strengths and Limitations Results of this study identifies the need to increase knowledge of people with VI regarding eye care utilization in China. The study region is a relatively well-developed rural area in China, which may help forecast changing awareness of rural residents in some impoverished places with the economic developed in the future. Information reported here has direct relevance to improve China's eye care system by suggesting content for new public health messages to correct misinformation, and ways to address other barriers to preventing permanent vision loss or blindness in people with VI.

There are also several limitations to this work. First, data were gathered in a rural region in China as part of a larger home-based vision screening program to identify and refer adults with VI for medical care. It would be useful to carry out similar studies in communities of different sizes and level of urbanization to identify program elements that fit a wide range of settings as well as those to be developed after assessing local factors. This could result in an expanded home-based screening plus referral program outside of Yueqing. This plan is now under consideration by the Ministry of Health and could provide opportunities to further identify barriers to eye care that differ in other parts of China. Second, data were gathered using a created-for-purpose questionnaire rather than a fully validated instrument. This limits the generalizability

or external validity of study results, but is a common problem when investigating new issue. Work is under way to test the psychometric properties of the questionnaire developed for this study to enable its use with other populations where low vision and blindness are major health concerns.

In conclusion, the VI in rural Yueqing, China, had poor knowledge about the need to regularly seek eye care services. It is important to develop strategies to increase public awareness of the link between declining vision and preventable blindness due to conditions that can be diagnosed and treated in local hospital-based eye clinics. Intervention that target the elderly and persons with little education are needed. Regular vision checks and increasing awareness that poor vision is not a normal part of aging may help people with VI seek eye care services and receive timely treatment when diagnosed with an eye disease.

ACKNOWLEDGEMENTS

Foundations: Supported by the Science and Technology Benefiting Program of Zhejiang Province (No.2014H01007); the Zhejiang Medical Science and Technology Program (No.2018KY543).

Conflicts of Interest: Li LS, None; Ge ZY, None; Lohfeld L, None; Zhou K, None; Zhou WH, None; Cui LL, None; Qu J, None; Liang YB, None.

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