Original Research

AWARENESS AND ATTITUDE REGARDING EYE SCREENING PROGRAMS IN THE POPULATION OF SELANGOR, MALAYSIA BASED ON A CROSS-SECTIONAL STUDY

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ABSTRACT

Introduction: Visual impairment significantly impacts individuals, causing functional and psychological challenges. Effective health promotion strategies require a robust foundation, necessitating an assessment of the awareness toward eye screening programs. This study aims to evaluate the awareness and attitudes of the public towards eye screening programs in Selangor, Malaysia. **Methods:** A cross-sectional study involved 388 adults aged 18 years and above. Data were collected using a self-administered questionnaire. Chi-square analysis assessed associations between knowledge and attitudes regarding screening programs for various eye diseases among adults. **Results:** A significant correlation was found between knowledge and attitudes toward different eye disease screening programs among adults in Selangor ($p = 0.00$). Additionally, associations were observed between age, marital status, residence area, education level, and knowledge of screening programs for different eye diseases ($p < 0.05$). Age, gender, residential area, and education significantly correlated with attitudes toward screening programs ($p = 0.00$). **Conclusion:** This study underscores the need for targeted initiatives to raise awareness of visual impairment and the importance of routine eye exams. Particularly, efforts should be directed toward the elderly and individuals with lower education levels.

Keywords: Eye screening programs; Awareness; Attitude; Selangor; Malaysia

Introduction:

A person's life is significantly impacted by visual impairment, which results in functional and psychological problems. Widespread vision impairment lowers productivity, raises healthcare costs, and slows down the growth of the nation's economy. Treatment of preventable causes of blindness, particularly cataracts, has been found to enhance overall health, reduce poverty, and boost a community's economic standing. Population-based information on prevalence, causes of blindness, and the scope of ophthalmological coverage are necessary for the effective implementation and assessment of ocular health programs (Chew et al., 2018). Rising numbers of equipped eye hospitals and clinics, a qualified professional eye health workforce, and an improved cataract surgery rate are advantages of the current health system, nevertheless, health-seeking behavior among community members and integration of eye care in the primary health care system needs to be strengthened especially for people with lower socioeconomic status (Katibeh et al., 2019).

Increasing public awareness of ocular diseases is crucial for early diagnosis and treatment, leading to a reduced burden of visual impairment (Haddad et al., 2017). Variables such as age, gender, level of education, and socioeconomic status can influence awareness levels of ocular diseases (Al-Lahim et al., 2018). Therefore, evaluating the population's awareness of eye diseases provides a fundamental foundation and serves as a future reference for implementing health promotion measures (Al-Lahim et al., 2018). However, there is a lack of published studies describing the general population's knowledge and attitudes regarding eye screening programs in Malaysia compared to other countries.

The purpose of this study is to assess the knowledge, attitudes, and satisfaction of different eye screening programs among adults in Selangor, Malaysia. We also aim to identify the challenges and obstacles adults face when trying to join these screening programs. Additionally, we will study the relationship between sociodemographic factors and eye screening programs. The findings of this research will contribute to future studies and help reduce blindness among adults in our country. Effective screening can lower morbidity and enhance the quality of life for individuals with eye diseases, benefiting eye care services and healthcare in Malaysia. Raising awareness of the signs and symptoms of eye diseases and utilizing community resources for eye care is crucial. The study was conducted to assess the knowledge, attitudes, and satisfaction levels of adults in Selangor regarding eye screening programs, as well as to identify the obstacles that prevent them from participating in these programs.

Methods:

This study utilized a cross-sectional design, starting on September 5, 2022, and ending on June 2, 2023, in Selangor, Malaysia, chosen for its accessibility and large population base. Cluster sampling was employed, and questionnaires were distributed among adults who met the study criteria. Individuals younger than 18 years old, those with confirmed eye diseases, individuals on medication for eye diseases, and those who had undergone eye surgeries were excluded from the study. A total of 388 respondents aged 18 years and above completed the eye screening questionnaire. Ethical approval from MSU had been obtained. Verbal consent was secured from the respondents. The personal information of the participants was kept confidential.

The sample size was calculated using the formula for estimating a proportion of a finite population. Based on previous knowledge from a study on cataracts, a minimum sample size of 388 was calculated with a confidence interval of 95% and an acceptable error margin of 15% (Ahmed et al., 2018). To account for non-participation, the sample was increased by 20%. The questionnaire consisted of three sections: demographic profile, knowledge about eye screening programs and eye diseases, attitude towards eye screening programs, and satisfaction towards eye screening programs. Knowledge questions were answered on a two-point Likert scale (“Yes” or “No”), while attitudes were assessed using a five-point Likert scale (“Strongly disagree,” “Disagree,” “Neutral,” “Agree,” and “Strongly agree”). Correct responses were determined by the study investigators prior to the study.

Before commencing the study, a pilot study was conducted with 50 respondents of diverse demographic profiles to validate the questionnaire. The questionnaire was modified and adapted from a previous study by (Samuel et al., 2021). The primary questionnaire was in English and was distributed by the mother tongue in case a respondent did not understand a question in English and needed clarification. The study subjects were adults residing in Selangor, Malaysia, aged 18 years and above. Construct validity was performed, and Cronbach's alpha coefficient was used to measure the reliability of the questionnaire. A coefficient of 0.7 or higher indicates internal consistency. Data analysis such as descriptive and bivariate analysis was performed using IBM SPSS for Windows, Version 27.

Results:

According to 1, the frequency of respondents aged 18 to 24 years old is 172, which represents 44.3% of the total sample. The second largest age group is those aged 25 to 54, with 140 respondents or 36.1%. The age groups of 55 to 64 and 65 years old and above have 53 (13.7%) and 23 (5.9%) respondents, respectively. Regarding gender, there are 149 male respondents (38.4%) and 239 female respondents (61.6%). As for marital status, 246 respondents are single (63.4%), 127 are married (32.7%), and 15 are divorced (3.9%).

In terms of residential area, most respondents live in urban areas, with 312 (80.4%) respondents, while 76 (19.6%) live in rural areas. The largest group of respondents for occupation are those not working, with 159 (41%) respondents. The next largest group is those in the private sector, with 80 (20.6%) respondents. Those in government jobs have 69 (17.8%) respondents, while those in business have 32 (8.2%) respondents.

Lastly, 48 respondents (12.4%) fall under the other category, including students and part-time workers. Regarding education, most respondents have tertiary education, with 294 (75.8%) respondents. Secondary education has 69 (17.8%) respondents, while primary education has 25 (6.4%) respondents.

Table 1: Demographic information

Demographic Information	**N**	**%**
Age		
18 to 24 years old	172	44.3
25 to 54 years old	140	36.1
55 to 64 years old	53	13.7
65 years old and above	23	5.9
Gender		
Male	149	38.4
Female	239	61.6
Marital Status		
Single	246	63.4
Married	127	32.7
Divorce	15	3.9
Residential Area		
Urban	312	80.4
Rural	76	19.6
Occupation		
Government	69	17.8
Private	80	20.6
Business	32	8.2

Not Working	159	41.0
Others	48	12.4
Education		
Primary	25	6.4
Secondary	69	17.8
Tertiary	294	75.8

The majority of adults in Selangor appear to have a moderate to a good degree of knowledge regarding screening programs for various eye disorders, according to Table 3.2. In particular, 46.1% of people had good knowledge, compared to 39.7% of individuals with intermediate knowledge. However, 14.2% of individuals continue to have inadequate knowledge of these screening programs.

In terms of attitude, the majority of adults in Selangor have a positive attitude towards screening programs for different eye diseases. Specifically, 95.6% of adults fall into this category, while only 4.4% have a negative attitude.

Table 2: Knowledge and attitude level among participants

Variables	**Level**	**N**	**%**
Knowledge	Poor (0% - 59%)	55	14.2
	Moderate (60% - 79%)	154	39.7
	Good (80% - 100%)	179	46.1
Attitude	Positive (0% - 50%)	371	95.6
	Negative (51% - 100%)	17	4.4

The chi-square analysis in Table 3 shows that there is a significant association between knowledge with attitude about screening programs for different eye diseases among adults in Selangor (p = 0.00). Specifically, respondents who have good knowledge have the highest proportion of positive attitudes (46.1%), followed by those who have moderate knowledge (38.7%). Those who have moderate knowledge have the lowest proportion of negative attitudes (4.0%).

Table 3: Bivariate analysis between knowledge with attitude of the adults in Selangor about screening programs for different eye diseases

Knowledge	**Attitude**		**Value**	**df**	**P Value**
	Negative (*n*)	**Positive (*n*)**			
Poor	13	42	58.05	2	0.00
Moderate	4	150			
Good	0	179			

Age, marital status, residence area, and education are significantly associated with knowledge of screening programs for various eye disorders among adults in Selangor, according to the chi-square analysis in Table 4 (p = 0.00). In particular, adults between the ages of 18 and 24 had the largest percentage of good knowledge (47.0%), followed by adults between the ages of 25 and 54 (38.6%), and adults between the ages of 55 and 64 (16.0%). The proportion of adults with good knowledge is lowest among those 65 and older (9.0%).

Regarding marital status, single adults have the largest percentage of good knowledge (43.4%), followed by those who are married (29.8%), and those who are divorced (9.4%). Regarding their place of residence, adults in urban regions (39.2%) have a much larger percentage of good knowledge than those in rural areas (23.0%). Additionally, compared to people with primary and secondary education, those with university education had a much larger percentage of good knowledge (38.1%). Finally, no correlation between gender and occupation and knowledge of screening programmes for various eye diseases was discovered (p > 0.05).

Based on the chi-square analysis in Table 4, there is a significant association between age, gender, residential area, and education with attitude toward screening programs for different eye diseases among adults in Selangor (p < 0.05). Specifically, adults aged 18-24 years old have the highest proportion of positive attitudes (43%), followed by those aged 25-54 years old (35.1%), and those aged 55-64 years old (12.9%). Adults aged 65 years old and above have the lowest proportion of positive attitudes (4.6%). In terms of gender, female adults have the highest proportion of positive attitude (60.1%), followed by males (35.6%),

Regarding residential areas, adults living in urban areas have a significantly higher proportion of positive attitudes (77.8%) compared to those living in rural areas (17.8%). Moreover, there is a significant association between education level and attitudes towards screening programs for different eye diseases among adults in Selangor (p = 0.00). Specifically, adults with tertiary education have the highest proportion of positive attitudes (73.5%), followed by secondary education (17.3%) and primary education (4.9%). No significant association was found between marital status, and occupation with attitude towards screening programs for different eye diseases ($p > 0.05$).

Table 4: Bivariate analysis between demographic factors with knowledge and attitude of the adults in Selangor about screening programs for different eye diseases

		Knowledge					Attitude			
		Poor (n)	**Moderate (n)**	**Good (n)**	x^2	**p-value**	**Positive (n)**	**Negative (n)**	x^2	**p-value**
Age	18 to 24 years old	12	69	91	48.47	0.00	167	5	18.42	0.0.0
	25 to 54 years old	15	56	69			136	4		
	55 to 64 years old	17	23	13			50	3		
	65 years old and above	11	6	6			18	5		
Gender	Male	25	56	68	1.44	0.49	138	11	5.20	0.02
	Female	30	98	111			233	6		
Marital status	Single	23	101	122	22.20	0.00	239	7	3.79	0.15
	Married	30	42	55			118	9		
	Divorce	2	11	2			14	1		
Residential area	Urban	37	125	150	7.39	0.03	302	10	5.26	0.02
	Rural	18	29	29			69	7		
Occupation	Government	7	25	37	12.16	0.14	68	1	3.99	0.41
	Private	6	34	40			78	2		
	Business	7	16	9			31	1		
	Not working	20	32	68			149	10		
	Others	6	17	25			45	3		
Education	Primary	8	8	9	15.59	0.00	19	6	24.55	0.00

	Secondary	14	33	22			67	2		
	Tertiary	33	113	148			285	9		

Discussion:

According to the sociodemographic characteristics of this study, 44.3% of participants were between the ages of 18 and 24. While the survey encompassed adults of all age groups, it is evident that the younger generation was more actively engaged in the study, presumably because reaching the older generation proved more challenging. In a study by De-Gaulle and Dako-Gyeke (2016), respondents aged over 40 demonstrated greater awareness of glaucoma screening compared to younger generations, comprising only 2.7% of the population. This disparity may be attributed to the survey's distribution primarily in locations with easier access for older individuals. Additionally, a study conducted in Selangor by Buari and Dian (2017) revealed that individuals in their 50s exhibited greater awareness of diabetic retinopathy compared to other age groups. Moreover, 61.6% more women than men participated in our survey, although this gender difference did not reach statistical significance. This finding aligns with a prior study conducted in Ghana, which found no gender disparities in glaucoma awareness but suggested that women (22.3%) were slightly more likely to be aware of the condition (Ogbonnaya et al., 2016).

Single individuals (63.4%) participated more frequently than married couples and divorcees. Interestingly, married couples (53%) participated to a greater extent in this study compared to a prior Ghanaian study (Ogbonnaya et al., 2016). As this study was conducted in Selangor, particularly in the urban region, a substantial 80.4% of the participants hailed from urban areas. Only a small number of rural locations met the respondents' criteria. About educational characteristics, participants with tertiary degrees exhibited a higher participation rate (75.8%), suggesting that individuals with this level of education had better access to information about the eye screening program. Consequently, participants with tertiary education were more prominently represented due to their heightened interest in contributing to the research project. A previous study conducted in Ghana indicated that secondary school students were significantly ($p < 0.01$) more likely than elementary school students to be aware of eye illnesses (Ogbonnaya et al., 2016).

Numerous research studies have provided insights into community awareness of various eye illnesses. Data from different regions of the world have indicated variations in people's knowledge of prevalent eye disorders and their associated screening programs. Regrettably, there is limited and inconsistent information on this topic in Malaysia (Soe et al., 2021). Age, marital status, residential area, and education emerged as significant predictors of adults' knowledge of screening programs for various eye diseases in Selangor ($p = 0.00$). Notably, only 46.1% of the participants in this research possessed knowledge of eye screening programs for various eye illnesses. It appears that only half of the respondents were aware of such programs. The age group of 18 to 24 years old exhibited the highest awareness (47.0%), followed by the 25 to 54 years old group (38.6%), and the 55 to 64 years old group

(16.0%). Conversely, the least knowledgeable adults were those aged 65 years and older (9.0%). Encouraging individuals to learn more about the value of eye screening for early identification and treatment is crucial, as age is associated with an increased risk of certain eye disorders (De-Gaulle & Dako-Gyeke, 2016).

The overall knowledge levels uncovered in the current study were lower than those reported in studies conducted by Alimaw et al. (2019) and Al-Lahim et al. (2018), which found knowledge rates of 61.7% in Gondar, Northeast Ethiopia, and 52% in Northwestern Saudi Arabia, respectively. Furthermore, 60% of participants in a study conducted in Indonesia demonstrated high understanding of annual eye screening (Abeer Al-Alawi et al., 2016). The authors noted that while eye care professionals and their families exhibited excellent knowledge of the value of annual diabetic retinopathy screening in their study, it fell short of expectations. Surprisingly, our research findings exceeded those reported in studies conducted in Ghana (39.3%) and Nigeria (21.1%) by De-Gaulle and Dako-Gyeke (2016) and Ogbonnaya et al. (2016), respectively. The majority of those with the highest awareness—80.4%, or nearly all the participants in our study—resided in metropolitan regions. Residential areas frequently differ in socioeconomic status, with metropolitan areas typically characterized by a broader diversity of socioeconomic backgrounds compared to rural locations. Higher socioeconomic status is often linked to improved access to education and healthcare, particularly knowledge of preventive healthcare measures like eye screening.

Another significant finding from our study was the influence of educational attainment on participants' knowledge of eye screening for various eye illnesses, which was notably higher (75.8%) among those with tertiary education. Education plays a pivotal role in enhancing individuals' capacity to utilize health knowledge for preserving and improving health. Additionally, there was a strong correlation between attitude and residential area ($p = 0.02$). This is because campaigns and health education programs frequently have a more robust infrastructure in urban areas and well-established residential regions. These initiatives can promote eye screening programs and elevate public awareness regarding the value of health. Residents in these areas may be more exposed to health education programs, fostering more favorable attitudes toward eye screening programs.

As reported in a prior study conducted in northwest Ethiopia, individuals with higher economic status have greater access to eye care services compared to those with lower status, who may be concerned about the cost of seeking eye care services (Alimaw et al., 2019). Since economic development and quality of life are critical factors in determining a country's development status, education emerges as a vital component of overall well-being. Education equips individuals with the means to increase their income, express themselves creatively, and seek timely medical attention when needed. The profound impact of education on all aspects of the economy and society is undeniable (Made et al., 2022).

In conclusion, our study highlights the importance of targeted initiatives to increase awareness of visual impairment and the significance of routine eye exams, particularly among the elderly and those with lower levels of education. This aligns with the findings of Pallerla et al. (2020), who reported higher awareness of glaucoma among individuals with more education, reflecting the efficacy of collaborative efforts by government entities, non-governmental organizations, and private citizens in promoting eye health education.

The findings of our study also indicate a favorable attitude (95.6%) toward eye screening programs for various eye disorders. These results underscore that adult, despite possessing good knowledge, exhibit a willingness to engage in eye screening programs. This contrasts with a study conducted in Nigeria, where a discrepancy existed between respondents' favorable attitudes toward glaucoma screening (61.2%) and their actual participation (5%) (Ogbonnaya et al., 2016). In our study, 77.8% of respondents expressed eagerness to participate in eye screening programs, further indicating their positive perception of efforts to detect various eye disorders.

Age, gender, residential area, and education were all significantly correlated with attitudes toward screening programs for various eye illnesses among adults in Selangor, consistent.

Conclusion:

This study underscores the importance of targeted initiatives to increase awareness of visual impairment and the significance of routine eye exams, particularly among the elderly and those with lower levels of education. It also highlights a gap in the literature regarding the general population's knowledge and attitudes towards screening programs in Malaysia compared to other countries. One limitation of this study is the demographic skew, with a predominance of younger respondents relative to the older population. The findings support alternative hypothesis and rejected the null hypothesis, revealing that the population indeed possesses both adequate knowledge and a positive attitude. The findings of this study can aid in improving eye care services in Malaysia, potentially enhancing the quality of life for individuals with eye diseases. Additionally, the study provides a foundation for future research aimed at reducing the prevalence of eye diseases, particularly among the elderly. Our results indicate a critical need for intensified public health interventions, focusing specifically on older adults and individuals with lower levels of education. We recommend implementing targeted health education campaigns to increase the uptake of eye screening programs across Malaysia.

Conflicts of Interest

The authors declare no conflicts of interest.

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