

ORIGINAL ARTICLE

VISUAL IMPAIRMENT AND ITS ASSOCIATED FACTORS AMONG THE ADULT POPULATION OF KUALA PAJAM VILLAGE, BRANANG, SELANGOR, MALAYSIA.

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ABSTRACT

Background : Visual impairment among the rural community has rarely been studied in this country. The purpose of this study is to determine the prevalence of visual impairment and its related factors among the adult population of Kampung Kuala Pajam, Branang.

Methodology : A cross sectional study was carried out in Kampung Kuala Pajam, Mukim Branang from 25th of December till 30th of December 2007. Universal sampling is adopted and the sample size consists of 321 respondents who is 18 years and above. Trained interviewer has been used to obtain the data through questionnaire and eye examinations using logMAR chart, Red Reflex eye test, Relative Afferent Pupillary Defect (RAPD) test and Pin-Hole test.

Result : A total of 261 respondents who fulfil the criteria were interviewed and had eyes examination during the study period. The prevalence of visual impairment in this population was 9.2% and factors that showed significant association were age ($p < 0.001$, $r^2 +0.542$), education level ($p < 0.001$), employment status ($p 0.027$), income ($p < 0.001$, $r^2 -0.303$), hypertension ($p < 0.001$), refractive eye problem ($p < 0.001$) and media eye problem ($p = 0.002$). The risk of developing visual impairment were OR=5.168 (CI: 1.035-25.797) among the low education group, OR=23.172 (CI: 5.956-90.150) among media eye problem group and OR=3.150 (CI: 1.060-9.368) among refractive eye problem group.

Conclusion : Improving knowledge and awareness among the adult population in this community through health promotion programme emphasizing on healthy lifestyle, symptoms of systemic diseases and eye care by the Health District Office and Community Health Clinic together with committed cooperation of the Head Villagers will have a long term effect in reducing the prevalence of visual impairment.

Keywords : Prevalence, Visual Impairment, Rural Community.

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INTRODUCTION

Visual impairment can be defined as visual acuity less than 6/18 in the healthy eyes or when using spectacles, with the power amount to minimum angle logarithm equivalent to or more than 0.5, while blindness is defined as visual acuity less than 3/60 or inability to count fingers at the 3 metres distance in the good eyes (wear glasses when need)¹. Normal visual acuity is defined by Snellen as the ability to identify letters (optotype) placed on 5 minute arc which is equivalent to Snellen chart of 20/20 feet, 6/6 metre, 1.00 decimal or 0.0 logMAR.

Eyesight damage and blindness are a common problem in the world where World Health Organization has estimated in the year 1990 as many as 38 million people experience blindness². It was estimated that the prevalence for world blindness is 0.7%³, where else in South East Asia, the prevalence on blindness has been reported as many as 1.2% in Indonesia, 1.1% in Thailand and 0.8% in Vietnam⁴.

In Malaysia, the prevalence of visual impairment and blindness in the same village in Kuala Selangor over a 10 years period was 4.3% for visual impairment and blindness was at 1.7% in the year 1984, while in the year 1994 the prevalence rate for visual impairment was 5.6% and 0.7% for blindness⁵. This research showed that the prevalence for visual impairment was higher in Kuala Selangor compared to nearby country like Indonesia (1.2%) and Thailand (1.1%)⁴.

There are varieties of factors that contribute to visual impairment. Complications from systemic disease such as diabetes are the main factors that cause blindness among adult. Nearly 12,000 to 24,000 new cases was reported each year⁶. Hypertension contributes to visual impairment by causing reduction of blood supply to the eyes resulting in blurry eyes⁷. Based on Malaysian National Eye Survey 1996 the main factors that contribute to visual impairment in Malaysia were untreated media eye problem such as cataract and diseases of the retina and refractive eye problem⁸.

Other factors such as aging⁹, female gender⁸ and poor education background⁹. Unemployment and poverty also have close link with visual impairment¹⁴. According to Andhra Pradesh Eye Disease Study, the odds of developing visual impairment increases when the monthly income decreased¹⁰.

Factors such as excessive computer usage¹¹, close proximity less than 2 meters

when watching television or less than 30cm while reading have also been linked with visual impairment¹².

The objective of this study is to determine the prevalence of visual impairment and factors related to it among the adult villagers of Kampung Kuala Pajam, Branang, Selangor, Malaysia.

METHODOLOGY

A cross-sectional method was used with samples taken as adult villagers living in Kampung Kuala Pajam, Branang, Selangor. The research was conducted in the month of December 2007. Two hundred and sixty one respondents were recruited using universal sampling method. All respondents were interviewed using questionnaire and underwent eyes examination such as LogMAR chart test (to examine visual acuity), Red Reflex eyes test (to examine presence of media eye problem), Relative Afferent Pupillary Defect (RAPD) Test (to examine presence of conduction eye problem) and Pin-hole Test (to examine refractive eye problem for respondents with LogMAR score more than 0.5) by trained examiner. All of the data collected were analysed using SPSS version 13.

RESULT

A total of 261 respondents were interviewed and underwent eyes examination during the survey. The minimum age of the respondents was 18 years old and maximum age was 87 years old. The mean age of the respondents was 43 ± 16.37 . The prevalence of visual impairment in the community was 9.2%.

Table 1 shows the sociodemographic characteristic of the respondents. Majority of the respondents were females (144 respondents or 55.2%). Most of them were employed (143 respondents or 54.8%) and have a low education background (136 respondents or 52.1%). Overall the prevalence of visual impairment in this survey was 9.2%.

Table 1 Sociodemographic of the respondents

Variable	Frequency (n=261)	Percentage (%)
Gender		
Male	117	44.8
Female	144	55.2
Employment status		
Working	143	54.8
Unemployed	118	45.2
Education Level		
Low (Up to Form 3)	136	52.1
High (Up to PhD level)	125	47.9
Visual Impairment		
Yes	24	9.2
No	237	90.8

12.6% of the study population has hypertension, 5.7% has diabetes mellitus, 21.1% has reading distance less than 30 cm, 23.4% watching television less than 2 m,

27.6% has refractive eye problems and 5.9% has media eye problem as shown in Table 2.

Table 2 Underlying factors in the study population

Factors	Frequency (n=261)	Percentage (%)
Systemic diseases		
Hypertension	33	12.6
Diabetes mellitus	15	5.7
Hypertension and Diabetes	15	5.7
Lifestyle		
Reading distance		
\geq /= 30 cm	206	78.9
< 30 cm	55	21.1
Distance watching television		
\geq /= 2 meter	200	76.6
< 2 meter	61	23.4
Eyes problem		
Yes	91	34.9
Refractive	72	27.6
Media	10	5.9
Conductive	0	0.0
Refractive + Media	7	0.08
Media + Conductive	1	0.01
Refractive + Conductive	0	0.0
Refractive+Media+Conductive	1	0.01
No	170	65.1

Further analysis using Spearman correlation between visual impairment and all of the factors, only age and income were shown to have significant correlation. The correlation

coefficient r^2 for age was 0.542 (good positive correlation) and for income was -0.303 (poor negative correlation). (Refer table 3)

Table 3 Correlation between factors and visual impairment.

Factors	Correlation coefficient (r^2)	P value
Age	0.542	<0.001
Income	-0.303	<0.001

Table 4 shows the association between visual impairment and all the factors, the factors with significant association were low education level (p <0.001), unemployment (p 0.027), respondents with hypertension (p <0001),

respondents with media problem (p < 0.001) and respondents with refractive problem (p 0.002).

Table 4 Association between factors and visual impairment

Factors	Visual Impairment		χ^2	p
	Yes (n=24)	No (n=237)		
Gender				
Male	8 (6.8%)	109 (93.2%)	1.412	0.235
Female	16 (11.1%)	128 (88.9%)		
Education level				
High	2 (1.6%)	123 (98.4%)	16.574	<0.001
Low	22 (16.2%)	114 (83.8%)		
Employment status				
Working	8 (5.6%)	135 (94.4%)	4.912	0.027
Unemployed	16 (13.6%)	102 (86.4%)		
Diabetes				
Yes	5 (16.7%)	25 (83.3%)	1.368	0.132
No	19 (8.2%)	212 (91.8%)		
Hypertension				
Yes	11 (22.9%)	37 (77.1%)	11.325	<0.001
No	13 (6.1%)	200 (93.9%)		
Reading distance				
≥ 30cm	18 (8.7%)	188 (91.3%)	0.245	0.621
< 30cm	6 (10.9%)	49 (89.1%)		
Distance watching television				
≥ 2m	18 (9.0%)	182 (91.0%)	0.039	0.843
< 2m	6 (9.8%)	55 (90.2%)		
Media eye problem				
Yes	11 (57.9%)	8 (42.1%)	52.083	<0.001
No	13 (5.4%)	229 (94.6%)		
Refractive eye problem				
Yes	14 (17.5%)	66 (82.5%)	9.528	0.002
No	10 (5.5%)	171 (94.5%)		

Table 5 Univariate and multivariate models between associated factors and visual impairment

Factors	Crude odds ratios	95% Confidence intervals		Adjusted odds ratios	95% Confidence intervals	
		Univariate models			Multivariate model	
		Lower	Upper		Lower	Upper
Male gender	0.587	0.242	1.425	1.002	0.325	3.087
Low education level	0.084	0.019	0.366	5.168	1.035	25.797
Unemployed	0.378	0.156	0.917	0.754	0.225	2.530
Diabetic	2.232	0.766	6.498	2.163	0.541	8.644
Hypertensive	4.574	1.904	10.985	1.965	0.631	6.002
Reading distance < 30cm	0.782	0.295	2.075	0.957	0.286	3.197
Watching TV < 2m	0.907	0.343	2.396	1.297	0.379	4.435
Media eye problem	24.221	8.321	70.508	23.172	5.956	90.150
Refractive eye problem	3.627	1.535	8.570	3.150	1.060	9.358

DISCUSSION

The prevalence for visual impairment in this village was 9.2% which was slightly higher than the prevalence for visual impairment in Kuala Selangor which was 5.6%⁵.

Ageing was one of the important factors that contribute to visual impairment. This is consistent with other research that shows visual impairment and blindness increases as age increases⁹. In this study we found that the correlation coefficient, r^2 was 0.542 (moderately strong positive correlation) between the age and visual impairment which signify as age increases so does visual impairment. Aging process is believed to be behind the reason. A research in China among its population also shows similar results⁹.

Gender difference does not contribute to visual impairment. There was no significant association noted in this research which is consistent with other research that also found there is no significant differences in visual impairment among male and female respondents¹⁵ but these result contradict the finding on Malaysian Eye Survey 1996 that found visual impairment was higher among female⁸.

While there is no difference in gender, education level showed different results. Low education group were noted to have higher prevalence of visual impairment. ($p < 0.001$) in fact the risk to develop visual impairment was 5.168 (CI: 1.035 – 25.797) compared to higher education group. Similar result was also found by other researcher and the reason behind it is due to lack of knowledge and awareness making them more prone to develop visual impairment⁹.

Similarly employment status which closely related to education level was also

found to be significant. Therefore the respondents who were unemployed were found to have higher prevalence of visual impairment. ($p < 0.027$). This could be due to visual acuity is not really important when someone is unemployed and the problem is further exacerbated by the inability to buy healthy food required to maintain eyes sight because lack of money. A research in Timor Leste among the unemployed also yields similar result¹⁴.

As mention earlier further analysis between income factor and visual impairment found significant association using correlation coefficient, r^2 -0.303 (fair negative correlation). This showed that as the income decrease, visual impairment increases and the finding is consistent with research done in Andhra Pradesh¹⁰.

Systemic diseases such as hypertension and diabetes are well known factors to cause visual impairment. In this study only hypertension was found to have significant association ($p < 0.001$) while no association was found for diabetes ($p < 0.132$). This could be due to the number of respondents who have diabetes were small in this study. This result is consistent with other research that also found similar findings. The reason for visual impairment in hypertensive respondents are because of complication from hypertension that cause reduced blood supply to the eyes causing visual impairment⁷. Other research also found retinopathy among the hypertension to be around 7.8%¹⁵.

Earlier research in Malaysia found that visual impairment were higher among respondents who reading distance less than 30cm and distance watching television less than 2m but in this research, no association were found¹². This could be due to the small

number of respondents whose reading distance less than 30cm and distance watching television less than 2m.

Refractive eye problem were found to have significant association with visual impairment ($p < 0.001$). Those with refractive eye problem were found to have OR = 3.150 (CI: 1.060 – 9.358) times higher risk of developing visual impairment compare to those who does not. Similarly those who have media problem were also found to have significant association ($p 0.002$) and have OR = 23.172 (CI: 5.956 – 90.150) times higher risk of developing visual impairment. These finding are consistent with other research that found visual impairment is closely related to untreated refractive eye problem and base on Malaysian National Eye Survey (1996) that found cataract (media problem) and refractive eye problems if not treated were the main reasons for visual impairment in Malaysia^{9,12}.

CONCLUSION

This research provides some insight into the prevalence and factors leading to visual impairment among the adult population of Kampung Kuala Pajam. The prevalence of visual impairment in this village was higher than the previous study could be due to high number of low education level, unemployment status and poor income group.

These factors will subsequently leads to poor knowledge and awareness on visual impairment making them more susceptible to develop visual impairment from refractive eye problem or media problem. These will also lead to delay looking for medical intervention which will further worsen then condition. Lack of knowledge and awareness on systemic disease such as hypertension and diabetes will lead to delay in diagnosing the diseases and treatment and making them more prone to develop complication.

Focus should be made in improving the knowledge and awareness among the villagers through health promotion programme emphasizing on the important of healthy lifestyle, symptoms of diseases and eye care so that they will be well informed when to seek medical advice.

Continuous effort from the Health District Office and Community Health Centre in health promotion programme with committed cooperation from Head Villagers will ensure the success of the programme.

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