



A Pilot Study on Driving Difficulties Among Bilateral Cataract Patients

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## Introduction



Cataract is the main cause of visual impairment among population of 50 years of age in Malaysia

(National Eye Survey 2014; Zainal et al. 2002).

Reduce visual functions due to the presence of cataract also affect driving skills (Ghazilla & Yap 2016) People with cataract experienced blurring of vision, reduced contrast sensitivity & glaring (Chua, Mitchell & Cumming 2004).

Elderly with cataract rated their level of performing an activity of daily living as poor to moderate.

(Mehmet and Abuzer 2009)



Driving is a challenging task that requires good vision, psychomotor, and cognitive abilities

(Melanie & Micheal 2016)

Significant association between cataract severity and driving performance

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(Nischler et al. 2010)

Older drivers with cataract had significant driving difficulty during rain, rush hours, heavy traffic, at night and found it difficult to make the left turns (Owsley et al. 1999)

Elderly with cataract experienced driving difficulty and has 2 times the risk of accident compared to elderly without cataract (Owsley et al.1999).

This study was done in a western country with different culture and traffic environment as compared to Malaysia. Therefore, to address the gap, this study aimed to determine the driving difficulties among drivers with bilateral cataract in specific driving situations using Driving Difficulty Questionnaire.

#### Introduction





## Materials and Methods



Methods	Details
Study Design	Cross-sectional
Study Location	Ophthalmology Clinic, Hospital Melaka, Malaysia
Study Population	Low vision patients with bilateral cataract
Sampling Method	Purposive sampling (30 participants)
Ethics	UKM PPI/111/18/JEP-2017-684 KKM/NIHSEC/P17-1583(5).







## Results



Demog Da	graphic ata
	<b>Table 1</b> Demographic and driving characteristic of the participants

Characteristics	Respondents ( %) n=30
Gender	
Male	70.0
Female	30.0
lace	
Malay	60.0
Chinese	30.0
Indian	10.0
Vorking status	
Working	30.0
Not working	70.0
Driving per week	
1 time	3.3
2 times	3.3
3 times	6.7
More than 4 times	86.7
Ouration driving licence	
1-9 years	3.3
10 - 19 years	3.3
20 - 29 years	10.0
More than 30 years	83.3
ehicle transmission	
Manual	36.7
Automatic	43.3
Manual and Automatic	20.0

Demographic Data

Characteristics	Participants (n=30)
Visual acuity (mean <u>+</u> SD)	
Better eye	0.52 <u>+</u> 0.19
Worse eye	0.72 <u>+</u> 0.22
Bilateral	0.53 <u>+</u> 0.33
Contrast sensitivity (mean <u>+</u> SD)	
Better eye	1.23 <u>+</u> 0.25
Worse eye	0.98 <u>+</u> 0.33
Bilateral	1.25 <u>+</u> 0.30

**Table 2** Visual acuity & contrast sensitivity of theparticipants



Mean score:	
72.08 <u>+</u> 15.95	

Driving Difficulty Status

Driving Situation	Percentage of Participant (%) n=30
Driving in rain	
Difficult (Score 1-4)	90
No difficulty (Score 5)	10
Stop driving because of vision	10
Driving alone	
Difficult (Score 1-4)	33
No difficulty (Score 5)	67
Stop driving because of vision	-
Parallel parking	
Difficult (Score 1-4)	33
No difficulty (Score 5)	67
Stop driving because of vision	_
Making right turn	
Difficult (Score 1-4)	10
No difficulty (Score 5)	90
Stop driving because of vision	-

**Table 3** Driving difficulty status for different driving situations among theparticipants



Mean score: Driving on local road or highway	
72.08 <u>+</u> 15.95 Difficult (Score 1-4) 20	
No difficulty (Score 5) 70	
Stop driving because of vision3	
σ Driving in high traffic	
SDifficult (Score 1-4)57	
No difficulty (Score 5) 43	
S Stop driving because of vision -	
Driving in rush hour	
Difficult (Score 1-4) 47	
No difficulty (Score 5) 53	
Stop driving because of vision -	
Driving at night	
Difficult (Score 1-4) 87	
No difficulty (Score 5) 13	
Stop driving because of vision23	

**Table 3** Driving difficulty status for different driving situations among theparticipants

72.08+15.9 Driving Difficulty Status

Relationship between visual functions and driving difficulty score

- Spearman's Rho indicated that
  - no correlation between driving difficulty score and bilateral VA (r<sub>s</sub>=-0.2672, p=0.146)
  - significant positive moderate correlation between driving difficulty and bilateral CS (r<sub>s</sub>=0.404, p=0.027)



# Discussion & Conclusions



- Most of the participants were still driving actively (> 4 times per week) even with reduced VA and CS due to cataract.
- This group of participants also failed the VA requirement for driving set by the authority.
- Renewal of driving license does not require drivers to undergo general and ocular health assessments

(Official Portal of Road Transport Department Malaysia 2018)





- The results also showed that >50% of the participants were having difficulty in driving, with a score of less than 90.
- Another study in Malaysia reported that almost 50% of the older drivers did have difficulty in driving - did not consider the factor of vision status among the participants

(Ang et al. 2016)

 Cataract was found to be significantly related to the driving difficulties and performance.

(Owsley et al. 1999 and Nischler et al. 2010)





- The participants complained of difficulty when driving in the rain and at night.
- 67% of older drivers with cataract had difficulties driving in the rain and 77% having difficulties driving at night.

(Owsley et al. 1999)

• Driving during bad weather or at night caused difficulties among drivers with cataract at all levels of severity of visual impairment.

(Nischler et al. 2010)

 Cataract could affect driving related tasks such as reading signage, seeing objects under low contrast condition, and seeing other vehicles in adjacent lanes



(Ghazilla & Yap 2016)

- The correlation of the driving difficulty and VA could not be seen among cataract patients in this current study as it only focused on moderate visual impairment instead of severe visual impairment.
- A significant association between cataract severity and the driving performance - classified the severity of cataract based on morphological criterion.



 The CS analysis showed a significantly moderate positive correlation with driving difficulty. This finding agreed with the current objective finding that our participants with bilateral cataract had difficulties driving in low contrast situations.



## Conclusions

- The older drivers with bilateral cataract would experience driving difficulties especially in low contrast situations.
- Only distance VA and colour vision are being considered in the issuing of driving license in Malaysia.
- It is suggested that
  - CS be a part of the criteria being considered by the authority
  - the older drivers be made to undergo regular and comprehensive eye examination before issuing or renewing their driving licenses.





# Thank you

