

## การศึกษาความชุกของโรคทางจักษุวิทยาและผลกระทบต่อคุณภาพชีวิต: โครงการตรวจคัดกรองสุขภาพตา ณ สถานสงเคราะห์คนชราบ้านมหาสารคาม

### Prevalence of Geriatric Ocular Diseases and Impact on Quality of Life: An Eye Screening Project at Maha Sarakham Provincial Elderly Care Center

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#### บทคัดย่อ

โรคทางจักษุวิทยามีความแตกต่างกันไปในแต่ละกลุ่มอายุ ซึ่งการสูญเสียการมองเห็นอาจส่งผลกระทบต่อคุณภาพชีวิตในมิติต่างๆ ของผู้สูงอายุได้ การศึกษานี้ได้รายงานความชุกของโรคทางตาและวิเคราะห์ผลกระทบต่อคุณภาพชีวิตโดยใช้แบบสอบถาม SF-36 ภาษาไทยฉบับแปลใหม่ ทำการศึกษา ณ สถานสงเคราะห์คนชราบ้านมหาสารคาม โดยทำการตรวจวัดระดับการมองเห็น ความดันลูกตา ตรวจโครงสร้างลูกตาส่วนหน้า และถ่ายภาพจอตาโดยไม่ได้ขยายรูม่านตา ประเมินสภาวะสุขภาพโดยการสัมภาษณ์ด้วยแบบสอบถาม พบว่ามีผู้ป่วยจำนวน 23 ราย ค่าเฉลี่ยอายุเท่ากับ 74.2 ปี โรคทางตาที่พบบ่อย ได้แก่ ต้อกระจก (ร้อยละ 80.4) สายตาสั้นที่ไม่ได้รับการแก้ไข (ร้อยละ 58.7) สายตาวายที่เกิดในวัยสูงอายุ (ร้อยละ 26.1) โดยสาเหตุหลักของการสูญเสียการมองเห็น ได้แก่ ภาวะต้อกระจก ต้อหิน ตามลำดับ เมื่อทำการวิเคราะห์ผลกระทบต่อคุณภาพชีวิต พบว่าคะแนนของการรับรู้ภาวะสุขภาพทางด้านสภาพทางร่างกายในมิติ Physical functioning มีค่าต่ำที่สุด และมีมิติ Mental health มีค่าสูงที่สุด โดยไม่พบความสัมพันธ์กับระดับการมองเห็น

**คำสำคัญ:** ผู้สูงอายุ คนชรา ระดับการมองเห็น ตาบอด โรคทางตา คุณภาพชีวิต แบบประเมิน SF-36 ฉบับภาษาไทย

#### Abstract

Ocular diseases are different among each age group. Visual impairment can affect quality of life (QoL) in the ageing population. This cross-sectional study reports the prevalence of ocular diseases and evaluates the impact of visual impairment on QoL using the Short Form (36) Health Survey (SF-36): retranslated Thai version questionnaire at Maha Sarakham Provincial Elderly Care Center. The examinations included visual acuity test, intraocular pressure and anterior eye segment examination. A nonmydriatic, digital fundus camera was used for the posterior segment evaluation. All patients were interviewed to evaluate health status. According to the findings, 23 patients were enrolled, the mean (SD) age was 74.2 (7.7) years old. The prevalence of ocular diseases was; cataract (80.4%), uncorrected refractive errors (58.7%) and presbyopia (26.1%). Two major causes of visual impairment were cataract and glaucoma. The questionnaire showed the lowest score in the physical functioning domain and highest score in the mental health domain with no significant correlation to visual impairment status.

**Keywords:** blindness, elderly, geriatric, ocular disease, quality of life, questionnaire, SF-36, visual impairment.

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## Introduction

Causes of visual impairment and ocular diseases may vary among each age group. Based on the statistics in 2010, approximately 285 million people worldwide were affected by visual impairment, 80% of which is avoidable. Cataract and uncorrected refractive errors are the leading causes of avoidable visual impairment. Accordingly, unoperated cataract and glaucoma are the leading causes of avoidable blindness. By 2019, the world population will have reached 7.5 billion and the number of blind people aged above 50 will grow, particularly in Southeast Asian countries<sup>1</sup>. In 1999, World Health Organization (WHO) launched 'Vision 2020', a global initiative campaign to eliminate avoidable blindness.

Problems of perception, especially the decline of vision, can affect quality of life (QoL) and lead to limitations of daily activities in ageing population<sup>2</sup>. Furthermore, the physical limitations of ageing patients may cause them to experience near task activities, especially reading. Presbyopia and cataract, in particular, could be troublesome leisure and result in mental health problems. In 1996, the United States Preventive Services Task Force (USPSTF) suggested routine visual screening in a primary care center via Snellen eye chart, which is a subjective measurement and cannot be used to evaluate the impact on QoL<sup>3,4</sup>.

In Thailand, the report in 2014 found that there were 672 cases of people aged 60 years and over in the eye screening project of Primary Care Unit, Faculty of Medicine, Thammasat University. Of these, 31.4% were the cases with pterygium, 4.5% were cataract which caused visual acuity lower than 20/70, diabetic retinopathy 2.7% and glaucoma 2.4%<sup>5</sup>. In 2016, Ratanasukon M, et al. reported the vision-related quality of life (VRQoL) in 120 patients with visual impairment by different causes at Songklanagarind Hospital, Songkhla province<sup>6</sup>, using Thai version of the impact of vision impairment (IVI) questionnaire, which divided the health aspects into three categories; (i) mobility and independence, (ii) reading and accessing information and (iii) emotional well-being. It was found that the symptoms of the common vision impairment diseases are associated with an adverse

impact on VRQoL.

In the present study, the authors used available, different, easily-trained and non-invasive instruments were used by trainees for the screening of common visual problems at Maha Sarakham Provincial Elderly Care Center, which almost of the patients were difficult to access the eye treatment due to physical disability, social welfare, care giver or self-care ability.

The authors report the QoL as described in the International Classification of Functioning, Disability and Health: ICF, using the Short Form (36) Health Survey (SF-36) retranslated Thai version questionnaire, which have the statistically significant positive correlation in all aspects with the WHOQOL: BREF ( $P < 0.05$ ) questionnaire in QoL assessment<sup>7</sup>. The prevalence of ocular diseases and visual impairment or blindness are also discussed.

## Materials and Methods

### Study design

This is the cross-sectional study conducted in April, 2017 at Maha Sarakham Provincial Elderly Care Center. The study was approved by the Mahasarakham University Ethics Committee for research involving human subjects (EC ID 029/2017). All investigations were carried out in accordance with the tenets of the Declaration of Helsinki and all participants gave an informed consent. This study had been registered in the Thai Clinical Trials Registry (TCTR), [clinicaltrials.in.th](http://clinicaltrials.in.th), (TCTR identification number: TCTR 20170418001).

### Participants

The population in this study was all geriatric patients at Maha Sarakham Provincial Elderly Care Center, who eligibly met the inclusion criteria, which are all patients who participated in the eye screening project of Suddhavej Hospital, Faculty of Medicine, Mahasarakham University. Informed consent were obtained from the participants while some of them were excluded by the exclusion criteria, i.e. the patients who refused to be enrolled, any problems in the response to the questionnaire or had a physical limitation to an eye examination in upright position.

### Data Collection

Both eyes of all participants were evaluated for distance visual acuity test with Snellen eye chart and for near vision by Rosenbaum pocket vision screener. Autorefractor and keratometer was used for evaluation of ocular refraction. Intraocular pressure measurement using automatic non-contact tonometer. Data acquisition by these simple, objective and easily-trained instruments were provided by well-trained medicals, paramedics and applied Thai traditional medicine students. The authors used slit-lamp biomicroscope for the assessment of anterior eye segment by one ophthalmologist. Data was recorded in the case record form. The last step was posterior segment photography using a nonmydriatic, digital fundus camera for single-field central posterior 45-degree image of both eyes without pupillary dilatation.

All participants were interviewed using the list in the SF-36: retranslated Thai version questionnaire, which covered 8 aspects of QoL; namely, physical functioning, (role limitations due to physical problems), social functioning, (role limitations due to emotional problems), bodily pain, general mental health, vitality and general health perceptions. This questionnaire was developed in 1992 by Ware and Sherbourne and validated in Thai version by Leurmarnkul W and Meetam P in 2005<sup>7</sup>, which had evidence supporting the validity and reliability of the retranslated Thai version and recommended in the interpretation with caution in Vitality and Role-emotional scales due to the relatively low agreement between the Thai version and the original. The evaluation of the results was done by attributing scores to each question, which were then transformed into a scale ranging from 0 to 100, where 0 corresponds to the worst QoL and 100 to the best. Each dimension was analyzed separately.

### Data Analysis and Statistics

Descriptive statistics was used for continuous and categorical variables. Variables were divided into 3 sets of data; patient background data, visual level, ocular status and ocular examination data. Visual acuity levels were divided in 4 categories based on the 4 visual

stratifications proposed by Brown MM, *et al.* in 2002<sup>8</sup>. The prevalence of ocular diseases was evaluated with all 46 eyes from 23 patients. The causes of visual impairment in the better eyes that have presenting or best possible correction worse than 20/70 were also reported. Uncorrected near visual acuity (UNVA) of better eyes was divided in 3 stratifications modified from Sanders and Sanders 2007<sup>9</sup>. Mean scores of the QoL questionnaire were separately reported in each domain. Differences between two groups were evaluated using independent t-test or Mann-Whitney U-test and using one-way analysis of variance (ANOVA) or Kruskal-Wallis test for more than two groups' comparison.

The researchers have also selected the better eyes for evaluating the correlation to QoL by comparing between the eyes with visual acuity level better or equal 20/70 and the eyes with visual acuity level worse than 20/70 (based on a classification of severity of visual impairment by the International Statistical Classification of Diseases and Related Health Problems 10th Revision (ICD-10 Version: 2016))<sup>10</sup>. Patient performance status was categorized by ECOG which was developed by the Eastern Cooperative Oncology Group<sup>11</sup>. The patient performance status includes grade 0; fully active, able to carry on all pre-disease performance without restriction, grade 1; restricted in physically strenuous activity but ambulatory and able to carry out work of a light or sedentary nature, e.g., light house work, office work, grade 2; ambulatory and capable of all self-care but unable to carry out any work activities; up and about more than 50% of waking hours, grade 3; capable of only limited self-care; confined to bed or chair more than 50% of waking hours, grade 4; completely disabled; unable to carry on any self-care; totally confined to bed or chair and grade 5; dead. Data was analyzed using R 3.4.0 for Windows (The R Project for Statistical Computing). A p-value of less than 0.05 was considered statistically significant.

## Results

### Patient Demographics

Twenty-three geriatric patients were included for

analysis. There were 11 (47.8%) males and 12 (52.2%) females. All patients were Buddhists. The mean (SD) age was 74.2 (7.7) years old and the majority (52.2%) aged between 71-80 years old. The ECOG performance status was grade 2-3 (69.6%), grade 0-1 (21.7%) and grade 4 (8.7%), respectively (Table 1). All patients were under the care of the elderly care officers.

### Visual acuity

The majority visual acuity level was moderate visual loss (50%). Binocular status (ICD-10 classification of visual impairment) were mild or none of visual impairment in both eyes, whereas monocular severe visual impairment, binocular moderate visual impairment, monocular blindness, binocular severe visual impairment and binocular blindness, accounted for 30.4%, 21.7%, 17.4%, 13.0%, 8.7% and 8.7%, respectively.

**Table 1** General demographic characteristics

Participants baseline characteristics	N	%
<b>Gender</b>		
Male	11	47.8
Female	12	52.2
<b>Age range (years) mean (SD)</b>	74.2	(7.7)
61 - 70	6	26.1
71 - 80	12	52.2
≥ 81	5	21.7
<b>Marriage status</b>		
Married	9	39.1
Divorced/ widowed	12	52.2
Single	2	8.7
<b>Educational level</b>		
None	4	17.4
Primary level	17	73.9
Secondary level	2	8.7
<b>Underlying diseases</b>		
Type 1 and 2 diabetes mellitus	10	43.5
Hypertension	17	73.9
CVA/ IHD	2	4.4
Asthma/ COPD	7	30.4
Psychiatric and cognitive disorders	5	21.7
Others	11	47.9

**Table 1** General demographic characteristics (continue)

Participants baseline characteristics	N	%
<b>Body mass index (BMI)</b>		
< 18.5	3	13.0
18.5 to 22.9	11	47.8
23.0 to 24.9	4	17.4
25.0 to 29.9	4	17.4
≥ 30	1	4.4
<b>ECOG Performance status</b>		
Grade 4	2	8.7
Grade 2-3	16	69.6
Grade 0-1	5	21.7

CVA, Cerebrovascular accident; IHD, Ischemic heart disease; COPD, chronic obstructive pulmonary disease; Psychiatric and cognitive disorders (depression, Alzheimer's disease, Behavioral and Psychological Signs and Symptoms of Dementia (BPSD), Parkinson's disease), Others: osteoarthritis of the knee, polyneu-ropathy, peptic ulcer, anemia, rheumatic heart disease, aortic stenosis and ostium secundum atrial septal defects, ECOG, Eastern Cooperative Oncology Group.

The uncorrected near visual acuity (UNVA) was reported in Jaeger (J) system, which were J7 to J9 (43.5%), J1 to J5 (30.4%) and worse than J9 (26.1%) (Table 2).

**Table 2** Visual acuity level

Visual acuity level	N	%
<b>Best possible corrected distance visual acuity</b>		
Good reading vision (20/20–20/25)	4	8.7
Legal driving vision (20/30–20/40)	7	15.2
Moderate visual loss (20/50–20/100)	23	50.0
Legal blindness (20/200 or worse)	12	26.1
<b>Classification of visual status (ICD-10 Version: 2016)</b>		
H54.0 Blindness, binocular	2	8.7
H54.1 Severe visual impairment, binocular	2	8.7
H54.2 Moderate visual impairment, binocular	4	17.4
H54.4 Blindness, monocular	3	13.0
H54.5 Severe visual impairment, monocular	5	21.7
<b>Uncorrected near visual acuity (UNVA) of better eyes</b>		
Jaeger 1 to Jaeger 5	7	30.4
Jaeger 7 to Jaeger 9	10	43.5
Worse than Jaeger 9	6	26.1

**Prevalence of ocular diseases**

The prevalence reported from 46 eyes of 23 patients may have more than one diagnosis in some cases. There were 38 (82.6%) phakic eyes and 7 (15.2%) pseudophakic eyes, while one eye could not be identified due to corneal opacification. The five common diagnoses were cataract (80.4%), uncorrected refractive errors (58.7%), presbyopia (26.1%), glaucoma (included primary angle-closure suspect, primary angle-closure and pseudoexfoliative glaucoma) (17.4%) and hypertensive retinopathy (17.4%). Other diagnoses were pterygium, diabetic retinopathy, dry eyes, non-neovascular AMD, high myopia, optic disc coloboma, retinitis pigmentosa, flecked retina, macular scar and phthisis bulbi (from chronic uveitis). When evaluated only the three main causes of visual impairment (VA worse than 20/70), visually significant causes most commonly found included cataract, glaucoma and retinitis pigmentosa. Others were macular scar, uncorrected refractive errors and phthisis bulbi (Table 3).

**Table 3** Prevalence and principal causes of visual impairment

Ocular conditions	N	%
<b>Prevalence of ocular diseases (46 eyes)</b>		
Cataract	37	80.4
Uncorrected refractive errors	27	58.7
Presbyopia	12	26.1
Glaucoma/ PAC/ PACS/ PXG	8	17.4
Hypertensive retinopathy	8	17.4
Pterygium	6	13.0
Diabetic retinopathy	5	10.9
Others	14	30.7
<b>Principal causes of visual impairment (46 eyes)</b>		
Visual acuity better or equal 20/70	22	47.8
Cataract	16	34.8
Glaucoma	3	6.5
Retinitis pigmentosa	2	4.4
Macular scar	1	2.2
Uncorrected refractive errors	1	2.2
Phthisis bulbi	1	2.2

**Table 3** Prevalence and principal causes of visual impairment (continue)

Ocular conditions	N	%
<b>Lens status (46 eyes)</b>		
Phakia	38	82.6
Pseudophakia	7	15.2
N/A	1	2.2

PAC, primary angle-closure; PACS, primary angle-closure suspect; PXG, pseudoexfoliative glaucoma; Others: dry eyes, non-neovascular age-related macular degeneration, high myopia, optic disc coloboma, retinitis pigmentosa, flecked retina and corneal scar with band keratopathy.

**Consequences of visual impairment on QoL**

The SF-36: retranslated Thai version questionnaire was used to evaluate QoL. This instrument is divided in two major components (8 domains); physical and mental components. The better eyes in each patient were selected for analysis. The visual status of the selected eyes was shown in Table 4.

**Table 4** Concurrent ocular conditions of the better eyes

Ocular conditions of the better eyes	N	%
<b>Laterality</b>		
Right eyes	9	39.1
Left eyes	14	60.9
<b>Vision impairment (Brown et al., 2002)</b>		
Good reading vision (20/20–20/25)	3	13.0
Legal driving vision (20/30–20/40)	5	21.7
Moderate visual loss (20/50–20/100)	13	56.5
Legal blindness (20/200 or worse)	2	8.7
<b>Visual impairment (ICD-10 Version: 2016)</b>		
Better or equal 20/70	15	65.2
Worse than 20/70	8	34.8
<b>Lens status</b>		
Phakia	19	82.6
Pseudophakia	4	17.4

The patients had the lowest score in physical functioning domain (49.134.4), and the highest score in mental health domain (77.4) (Table 5). When compared to the Thai population from the study reported by Leurmarnkul W and Meetam P, 2005, the results of the present research had significantly lower scores in physical functioning domain ( $P < 0.001$ ), role physical

domain ( $P = 0.008$ ), but higher in mental health domain ( $P = 0.003$ ).

For each category, the health status were not significantly different for patients with and without visual impairment (cut point VA was 20/70), each level of VA (good reading vision, legal driving vision, moderate visual loss and legal blindness) or UNVA as well (Table 6, 7, 8).

**Table 5.** The SF-36: retranslated Thai version scores in our population

Domains	Mean	SD	Median	min-max
Physical components summary	57.9	23.8	48.8	24.4-100
Physical functioning	49.1	34.4	40	0-100
Role physical	52.2	45.2	50	0-100
Bodily pain	63.2	36.1	67.5	0-100
General health	67.0	20.6	65	30-100
Mental component summary	69.7	20.2	75	24.6-97
Vitality	65.7	22.6	70	10-100
Social functioning	66.3	28.3	62.5	12.5-100
Role emotion	69.6	42.5	100	0-100
Mental health	77.4	20.3	80	24-100

**Table 6.** The SF-36: retranslated Thai version scores of the better eyes by ICD-10 classification (N=23)

Domains	Better or equal 20/70 (15)			Worse than 20/70 (8)			P value
	Mean	SD	min-max	Mean	SD	min-max	
PCS	58.8	24.1	28.1-100	56.2	24.9	24.4-91.3	0.811
PF	45.7	34.0	0-100	55.6	36.7	5-100	0.400
RP	51.7	45.8	0-100	53.1	47.1	0-100	0.973
BP	72.0	32.3	22.5-100	46.6	39.2	0-100	0.117
GH	65.7	20.6	30-100	69.4	21.8	35-95	0.691
MCS	71.9	22.8	24.6-97	65.7	14.8	48.9-86.9	0.501
VT	66.0	24.5	10-100	65.0	20.0	30-85	0.922
SF	74.2	27.7	12.5-100	51.6	24.5	12.5-87.5	0.067
RE	68.9	46.2	0-100	70.8	37.5	0-100	0.796
MH	78.4	16.0	44-100	75.5	27.9	24-100	0.752

PCS, physical components summary; PF, physical functioning; RP, role physical; BP, bodily pain; GH, general health; MCS, mental component summary; VT, vitality; SF, social functioning; RE, role emotion; MH, mental health.

**Table 7** The SF-36: retranslated Thai version scores of the better eyes by Brown vision level classification (N=23)

Domains	Good reading vision			Legal driving vision			Moderate visual loss			Legal blindness			P value
	Mean	SD	min-max	Mean	SD	min-max	Mean	SD	min-max	Mean	SD	min-max	
PCS	80.6	30.4	45.6-100	69.8	21.4	45-91.3	49.5	20.0	24.4-82.5	48.4	25.2	30.6-66.3	0.085
PF	85.0	21.8	60-100	44	41.1	5-95	41.9	33.1	0-100	55.0	21.2	40-70	0.295
RP	66.7	57.7	0-100	75	43.3	0-100	48.1	42.7	0-100	0.0	0.0	0-0	0.237
BP	89.2	18.8	67.5-100	89	24.6	45-100	47.5	34.2	0-100	61.3	54.8	22.5-100	0.069
GH	81.7	23.6	55-100	71	16.4	45-85	60.4	20.5	30-95	77.5	24.8	60-95	0.328
MCS	73.3	33.3	35.3-97	80.5	6.5	72.8-86.9	66.0	21.8	24.6-94.5	62.0	0.7	61.5-62.5	0.554
VT	61.7	34.0	35-100	61	12.5	40-70	69.2	24.9	10-100	60.0	21.2	45-75	0.605
SF	83.3	28.9	50-100	80	22.7	50-100	56.7	30.0	12.5-100	68.8	8.8	62.5-75	0.273
RE	66.7	57.7	0-100	100	0	100-100	64.1	44.0	0-100	33.3	47.1	0-66.7	0.150
MH	81.3	22.7	56-100	80.8	15.6	60-100	73.9	22.8	24-96	86.0	19.8	72-100	0.858

**Table 8** The SF-36: retranslated Thai version scores by UNVA of the better eyes (N=23)

Domains	J1 to J5			J7 to J9			worse than J9			P value
	Mean	SD	min-max	Mean	SD	min-max	Mean	SD	min-max	
PCS	56.3	24.4	28.1-100	56.4	26.2	24.4-96.3	62.0	22.8	30.6-85	0.894
PF	42.9	32.4	5-100	40.0	33.8	0-95	71.7	32.7	25-100	0.140
RP	57.1	45.0	0-100	52.5	50.6	0-100	45.8	43.1	0-100	0.849
BP	58.9	31.3	22.5-100	70.3	39.9	0-100	56.3	39.1	12.5-100	0.784
GH	66.4	21.0	45-100	63.0	23.2	30-90	74.2	16.6	60-95	0.596
MCS	67.5	19.3	35.3-87.5	75.0	24.5	24.6-97	63.5	12.8	46.6-82.8	0.532
VT	57.9	16.8	35-80	67.0	29.1	10-100	72.5	15.4	45-85	0.513
SF	71.4	23.6	50-100	71.3	33.9	12.5-100	52.1	21.5	12.5-75	0.376
RE	61.9	48.8	0-100	86.7	32.2	0-100	50.0	46.0	0-100	0.199
MH	78.9	16.3	56-100	75.2	24.3	24-100	79.3	20.5	44-100	0.910

J, Jaeger.

#### Consequences of physical disability on QoL

It could be assumed that there might be a stronger correlation of physical component with the mobility status. When compared the SF-36 scores between grades

0-1 and grades 2-4 ECOG performance status, there was significant difference in physical functioning domain ( $P=0.001$ ) (Table 9).

**Table 9** The SF-36: retranslated Thai version scores by mobility status (N=23)

Domains	ECOG grade 0-1 (N=5)			ECOG grade 2-4 (N=18)			P value
	Mean	SD	min-max	Mean	SD	min-max	
PCS	62.7	25.6	24.4-100	46.9	15.4	33.1-78.8	0.148
PF	64.7	29.0	20.0-100	13.6	11.4	0-30	0.001
RP	51.6	46.1	0-100	53.6	46.6	0-100	0.833
BP	65.0	34.9	12.5-100	58.9	41.3	0-100	0.863
GH	69.4	19.1	40.0-100	61.4	24.5	30-90	0.407
MCS	69.8	19.4	35.3-97	69.5	23.6	24.6-90.9	0.975
VT	70.6	18.9	35.0-100	54.3	27.6	10-80	0.112
SF	66.4	27.7	12.5-100	66.1	32.0	12.5-100	0.980
RE	62.5	43.7	0-100	85.7	37.8	0-100	0.169
MH	79.8	18.7	44.0-100	72.0	24.2	24-96	0.412

ECOG, Eastern Cooperative Oncology Group.

## Discussion

To our knowledge, this study is the first study in Thailand which evaluated visual acuity and ocular diseases of geriatric patients in elderly care center. The researchers assessed the correlation of visual acuity and QoL using retranslated Thai version of SF-36, a global QoL measuring instrument. The results did not demonstrate any correlation between all sub-components of SF-36 scores and visual performance (distance VA and UNVA).

In prevalence of ocular diseases, the result is comparable with the report from the eye screening project of Primary Care Unit, Faculty of Medicine, Thammasat University in 2014, and WHO statistics, which were cataract (82.61%), uncorrected refractive errors (39.13%), presbyopia (21.74%), glaucoma (17.39%), hypertensive retinopathy (17.39%), diabetic retinopathy (8.70%) and pterygium (8.70%), respectively. The other diagnoses were non-neovascular AMD, high myopia, optic disc coloboma, dry eyes, retinitis pigmentosa, flecked retina and corneal scar with band keratopathy. The majorities of leading causes of distance visual impairment were cataract, glaucoma and retinitis pigmentosa. Presbyopia is one problem that might affect the leisure and near task activities.

There are studies reporting the correlation of QoL in ocular problem patients. In 2001, Kupersmith MJ,

et al. evaluated the patient perception of visual and systemic disability associated with giant cell arteritis (GCA) and reporting that the Activities of Daily Vision Scale (ADVS) and SF-36 did not reveal significant disability in GCA patients and there were no strong correlations with any visual performance or systemic measures<sup>12</sup>. In subfoveal choroidal neovascularization patients, the results reported by Childs AL, et al. in 2003 showed that mental component summary scale (MCS) and mental health subscale scores did not correlate with better eye visual acuity at any time point after 2 years follow up<sup>13</sup>. The physical component summary scale (PCS) and the physical functioning subscale scores were slightly correlated with better eye visual acuity at 2 years. They concluded that the SF-36 scales were not responsive to changes in visual acuity in patients in the Submacular Surgery Trials pilot study, and a general QoL tool may not be sufficient, and a vision-targeted QoL tool may be needed.

In glaucoma patients, Lester M and Zingirian M reported in 2002 that the SF-36 score showed significant mild correlation with age and visual field indices but when compared to the Viswanathan et al's questionnaire, the complexity of SF-36 made Viswanathan et al's questionnaire more useful than MOS SF-36, both for the score and for the velocity to use<sup>14</sup>. On the other hand, these

results differed from Nah YS, et al. in 2002, which reported no significant correlation between visual field defect and visual function with SF-36 score<sup>15</sup>.

When correlated the best possible corrected distance visual acuity and UNVA to the SF-36 scores, there was no significant difference in QoL score between better and worse visual acuity levels. The physical functioning domain was statistically different between ECOG grade 0-1 and grade 2-4 groups. Comparing to Thai general population<sup>7</sup>, the population of this research had significant lower score in physical functioning and role physical domain, that might be caused by the population were ageing patients and the majority of their performance status was ECOG grade 2-3. On the other hand, the mental health domain score was statistically higher.

Our study has two important limitations. Firstly, the small size of population because of some of the geriatric patients were unable to attend the eye examination in all tasks, which were excluded from the study. Secondly, the response to subjective measurement, especially visual acuity and questionnaire was varied. Others might be the physical disabilities and other medical problems may be the obstacles to the result reliability in QoL assessment. Due to the possibility of unilateral or bilateral blindness, visual impairment might affect the QoL assessment. In addition, the authors also tried to compare each group according to ICD-10 Version: 2016 but the low number of patients could not demonstrate any significant difference.

As a screening eye disease, the results do not assess other visual functions such as visual field, contrast sensitivity, stereopsis and dilated fundus examination, which may influence the ocular disease prevalence and QoL analyses. Given these limitations, our results might difficult to generalize to a larger cohort of patients. The researchers believe that ophthalmic data management, such as registration and follow-up data collection, the use of other instruments to assess the organ specific (vision) QoL, and the development of multi-center visual screening in elderly care center may improve the reliability of the results and provide additional information in the future.

## Conclusion

In conclusion, the prevalence of ocular diseases in geriatric patients at Maha Sarakham Provincial Elderly Care Center is comparable to the WHO report and other studies in Thailand. The better eye's visual acuity has no statistical correlation to SF-36 subscale scores.

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## Conflict of interest

All the authors declare that there is no conflict of interest referring to this article.

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