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(Original article)

Vision screening for fitness to work among school vehicle drivers: A cross-sectional study in Chiang-Rai, Thailand
การตรวจคัดกรองสมรรถภาพในการมองเห็นภาพสำหรับการประเมินความพร้อมในการทำงานกลุ่มผู้ขับรถตู้โดยสารรับส่งนักเรียน การศึกษาภาคตัดขวาง ในจังหวัดเชียงราย ประเทศไทย

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ABSTRACT: This research was to examine the prevalence of visual functions for fitness to work; visual acuity, muscular balance, depth perception, and color perception, among school vehicle drivers. The cross-sectional study conducted in Chiang Rai Province, Thailand. 79 school vehicle drivers were participated. The self-administered questionnaire was executed in two sections; general characteristics and work experience. The vision screened was examined by Titmus V4, occupational model. The study begins with an examination of professional drivers' personal and occupational characteristics, followed by an examination of their visual function. The preponderance of the drivers were older men who were married and had completed secondary education, according to the findings. Overall, 14 of the 79 professional school vehicle drivers passed the criteria based on a visual job criterion that was the highest standard for those who worked with vehicles. The results showed that the visual acuity, which is the visual functions for fitness to work that most affects the fail criteria, largely distributed in the range of normal (fit to work) followed by mild visual impairment.

Keywords: Vision Screening; Fitness to Work; School Vehicle Driver; Professional Driver

บทคัดย่อ: การศึกษานี้ศึกษาความชุกของสมรรถภาพการมองเห็นสำหรับการประเมินความพร้อมในการทำงาน ได้แก่ ความชัดเจนในการมองภาพ ความสามารถในการมองประสานตา ความสามารถในการมองเห็นความลึก และความสามารถในการจำแนกสี ในกลุ่มผู้ขับรถตู้โดยสารรับส่งนักเรียน ซึ่งการวิจัยนี้ได้ออกแบบลักษณะการวิจัยเป็นการวิจัยภาคตัดขวาง ดำเนินการการศึกษาในกลุ่มผู้ขับรถตู้โดยสารรับส่งนักเรียน จำนวน 79 คน ในพื้นที่จังหวัดเชียงราย เก็บข้อมูลโดยใช้แบบสอบถามโดยให้กลุ่มตัวอย่างเป็นผู้ตอบแบบสอบถามด้วยตนเอง แบ่งข้อมูลออกเป็น 2 ส่วน คือ ลักษณะทั่วไปของกลุ่มตัวอย่าง และประสบการณ์การทำงาน จากนั้นตรวจสอบสมรรภาพในการมองเห็นด้วยเครื่องทดสอบสายตา รุ่น Titmus V4 ร่วมกับชุดสไลด์ทดสอบสำหรับงานอาชีวอนามัยเริ่มต้นการศึกษาด้วยการเก็บข้อมูลส่วนบุคคลและลักษณะการประกอบอาชีพ จากนั้นจึงดำเนินตรวจสอบสมรรถภาพในการมองเห็นภาพของกลุ่มตัวอย่าง ผลการศึกษาพบว่า กลุ่มตัวอย่างผู้ขับรถตู้โดยสารรับส่งนักเรียนทั้งหมด 79 คน มีผู้ผ่านเกณฑ์สมรรถภาพในการมองเห็นตามเกณฑ์ในงานควบคุมยานพาหนะซึ่งมีสมรรถภาพสูงกว่าเกณฑ์มาตรฐาน จำนวนเพียง 14 คน โดยผลการศึกษาพบว่า ความชัดเจนในการมองเห็นภาพเป็นปัจจัยที่ส่งผลให้กลุ่มตัวอย่างไม่ผ่านเกณฑ์สมรรถภาพในการมองเห็นตามเกณฑ์ในงานควบคุมยานพาหนะ โดยที่กลุ่มตัวอย่างส่วนใหญ่จะมีระดับความชัดเจนในการมองเห็นภาพอยู่ในระดับปกติ (พร้อมต่อการทำงาน) และมีความบกพร่องในการมองเห็นความชัดเจนของภาพเล็กน้อย

คำสำคัญ: การตรวจคัดกรองการมองเห็น; การประเมินความพร้อมในการทำงาน; ผู้ขับรถตู้โดยสารรับส่งนักเรียน; พนักงานขับรถมืออาชีพ

1. INTRODUCTION

Accidents on the road has become a major global public health issue in the twenty-first century. It accounts for one-third of all child deaths. In developed countries, the bus is recognized one of the safest modes of transportation and is primarily preferred by children to commute to

school, however this may not be the situation in Thailand. Children commuting to school are more likely to take a van or a modified pick-up vehicle. As of August 31, 2021, Thailand had approximately 42 million registered vehicles, with 17.81 percent of these have been vans and pickup trucks[1]. As a result, a school vehicle is defined in this study as a passenger vehicle that carries at least five children to and from school.

Children are most likely to be injured at school or when commuting to and from school[2], particularly between the hours of 6:00 a.m. and 8:00 a.m. and 3:00 p.m. and 5:00 p.m. Statistics show that over 1,500,000 Thai children receive treatment in medical care centers such as clinics and hospitals each year, with 18 percent of them, or 270,000, being harmed during that time. Accidents involving school vehicles are frequently reported in the local news, and because children are such a vulnerable age group, accidents involving school vehicles elicit considerable concern in many aspects of society. The key factors that cause road accidents involving school vehicles include the failure of human, vehicle, and environmental aspects. However, human error is the leading cause of road accidents, with other factors such as weather, infrastructure conditions, and vehicle mechanical faults playing a minor impact. [3]

Personal factors such as age, gender, road familiarity, risk behavior tendency, and driving practices have been shown to have statistically significant changes in the distribution of causes or factors leading to accident occurrence. Professional drivers whose profession (work-related) is to drive a vehicle for working purposes, usually to perform their business duties, have a higher risk of being involved in a traffic accident, according to a report by the European Agency for Safety and Health at Work, because they spend the majority of their working time on the road [4, 5]. Even professional drivers are familiar with the regions and roads they drive on a daily basis in a variety of weather situations, such as rain, sunshine, day, and night. As a result, the study of the fitness to work was focusing on the Thai professional school vehicle drivers who are responsible for public safety which are is critical concern for safety improvement.

Globally, at least 2.2 billion people have a near or distance vision impairment. In at least 1 billion – or almost half – of these cases, vision impairment could have been prevented or has yet to be addressed[6]. In the fourth national survey of blindness, low vision and visual impairment in Thailand, conducted in 2006, refractive errors causing visual impairment were included in the questionnaire and eye examination. The prevalence of visual impairments increased with age. Uncorrected refractive errors were the most common cause of bilateral visual impairment across all decades of life, increasing from 11% in <10 year-old age group to 27% in educated age group (20 year-old and less) and 49% in young working age group (21-40 year-old). In the 40-60 year-old age group, if presbyopia was excluded, the prevalence of refractive errors was 16% and increased to 26% in 61-70 year-old, 59% among those aged 70 years and older[7]. Figures from 2019 show that around 0.29 percent of the population is visually impaired, with women accounting for 52.71 percent, people aged 60 and more accounting for 69.02 percent, and people aged 15 to 59 years accounting for 29.71 percent[8].

Driving requires clear and comfortable vision for a variety of reasons, including judging distances, reading road signs and traffic signals, and responding quickly and efficiently to changes in the environment. Despite the fact that visual acuity is the most commonly used screening test when applying for a driver's license. However, the visual ability deteriorates gradually, most drivers unnoticed any changes in their eyesight[9].

The purpose of this study was to investigate the prevalence of visual function, such as visual acuity, eye muscular balance, depth perception, and color perception, which is regarded as one of the key sensory inputs for driving[10] towards road safety issues among Thai professional school vehicle drivers. The findings of this study will give critical information on vision functions and their fitness for work, guiding the development of professional school vehicle driver employment.

2. METHOD

2.1 Research design

This is a cross-sectional study design for investigate the prevalence of vision acuity by vision scanning compare with the fitness to work standard among school vehicle drives. The recruitment was conducted in August 2018 in Chaing Rai province, Thailand.

The Mae Fah Luang University Ethics Committee on Human Research approved throughout this study (REH-61102). The participants provided informed consent at the time of study enrollment.

2.2 Participants

A notice was announced to recruit participants through Chiang Rai Province's Professional School Vehicle Drivers Network Associated. The researchers clarify the purpose and procedure of the study. Finally, 79 school vehicle drives were recruited throughout this study.

The inclusion criteria were recruited the school vehicle drives by these following criteria:

- Member of the Chiang Rai Province's Professional School Vehicle Drivers Associated Network.
- Take responsibility for school van with 13 car seats
- Had valid driver's license
- Inform consent to participate throughout the process of this the study both questionnaire and vision screening test.

The exclusion criteria were a school vehicle drives who deny participating throughout the process of this the study. However, there is no exclusion by age, gender, and driving experience reasons.

2.3 Questionnaire

There are two parts to the self-administered questionnaire utilized in this study. The background variables of professional school vehicle drivers are covered in the first half. The first concerns driver demographics, such as gender, age, marital status, educational background, and so on. In the second section of the questionnaire, working characteristics and service time were

assessed, including the driver's daily driving time, daily sleep time, and so on. The researchers carried out the survey on an anonymous basis, and informed participants the aim of the survey.

2.4 Vision Screening

The vision screener Model Titmus V4, occupational model, was used to determine visual function. Titmus vision screener is a stereoscopic tool that is commonly used to evaluate vision in occupational and school health contexts. Visual acuity has a high sensitivity (90.9–95.8%) [11]. During the assessment, glasses or contacts were authorized, thus our vision measurement represented their visual function. Visual acuity, eye muscle balance, depth perception, color perception, and peripheral vision test or visual field were all tested. The study's fail score was based on a visual job criterion that was the highest standard for individuals who worked with vehicles (Job group 3: Driver) Table 1

Table 1 Fail criteria of visual job standards for machine (Job group 3: Driver)[12]

Vision Test Parameters	Fail Criteria
Binocular Vision	No infusion or Vision in only one eye
Visual acuity (Both eyes)	Lever at far: Lower than 1.00 (20/20)
	Lever at near: Lower than 0.67 (20/30)
Lateral phoria	0±4 prism values
Vertical phoria	0±0.5 prism values
Depth perception	Angle of Stereopsis higher than 40 second of arc
Color perception	Angle of Stereopsis higher than 40 second of arc
Peripheral vision test	Pass at 85°, 70°, 55°, N (45°)

2.5 Statistical Analysis

The descriptive statistics, followed by average, standard deviation, and per- centage, were used to explain general information, health information, working information, driver behavior, and the results of vision tests.

3. RESULTS

3.1 General Characteristics

A total of 79 participants in this study. Most of the participants were men 84.8%, who were married 86.1 %. They were 27 to 68 years old (Average 52.37±9.0), 38.0% of the participants have completed secondary school. The overall monthly income was in the range of 10,001 - 20,000 Thai Baht, and monthly expenses were in the same range (44.3%) or lower (43.1%), respectively (Table 2).

Table 2 Demographic of participants (N=79)

Characteristics	N	%
Gender		
● Male	67	84.8
● Female	12	15.2
Age Average = 52.4±9.0 Years; Min - Max = 27 – 68 Years		
Age (Year)		
● 27 to 30	1	1.3
● 31 – 40	7	8.9
● 41 – 50	22	27.9
● 51 – 60	34	43.0
● 60 and Older	15	18.9
Marriage Status		
● Single	3	3.8
● Married	68	86.1
● Divorce	5	6.3
● Separate	2	2.5
● Widow	1	1.3
Highest Education Level		
● Primary school	30	38.0
● Junior high school	24	30.4
● Senior high school / Vocational Certificate	18	22.8
● Bachelor's degree and Higher	7	8.8
Income (THB per month)		
● Lower than 10,000 to 10,000	34	43.1
● 10,001 - 20,000	35	44.3
● 20,001 – 30,000	8	10.1
● 30,001 – 40,000	2	2.5

The current health status and their health behavior was reported in Table 3 showed 55 paticipants (69.9%) have no underlying illness, 13.9% of whom have underlying illness were hypertension. 54.8% sleep 6-8 hours per day, 96 % do not smoking, and 78.2% do not drinking alcohol.

Table 3 Health statue and behaviors of participants (N=79)

Health status and behaviours	N	%
Underlying disease		
● Have no	55	69.6
● Hypertension	11	13.9
● Diabetes mellitus	7	8.9
● Osteoarthritis	1	1.3
● Gout	3	3.8
● Both Hypertension and Diabetes mellitus	2	2.5
Sleep duration (hours per day)		
● Less than 6	4	5.1
● 6 – 8	44	55.7
● 8 and over	31	39.2
Smoking behaviour		
● Non-smoking	78	98.7
● Smoking	1	1.3
Alcohol drinking behaviour		
● Non- drinking	62	78.5
● Drinking	17	21.5

3.2 Work Characteristic

Working characteristic was reported in Table 4 showed that most of the school vehicle drivers (62.1%) had experience for driving during 1 - 10 years. Despite the van 13 seat types, the number of passengers per vehicle was 11 - 15 (44.3%) and 16-20 (36.7%) with and average passengers 17.04 Pax from an average 5 schools. The average daily travel time is an hour to 2 hours (64.6%). The average daily round-trip distance is between 41 - 60 kilometres (24.1%).

3.3 Vision Screening Test

The results of the vision screening test from 79 participants were compared to the visual job standards criteria (Table 1), which can be shown the pass/fail result of each visual function in Fig. 1.

Binocular Function is the testing with both eyes working together. 15 of 79 fail this criterion that may causes of no fusion or vision in only one eye. Visual acuities (VA) are measured by identifying letters or numbers on a standardized eye chart to determine the sharpness and clarity of vision. Far visual acuity is a test that determines how well you can see distant items, whereas near visual acuity is a test that determines how well you can see nearby objects. The loss might

range from modest to profound to entire for each feature of vision loss. Titmus reported both far and near visual acuity results. VA was discovered with both eyes in this investigation. The individuals had a far visual acuity of 0.68±0.4 decimal acuity and near visual acuity of 0.41±0.4 decimal acuity on average (Table 5).

Table 4 Work characteristic and working experience (N=79)

Work Characteristics	N	%
Working experience (years)		
● 1 – 10	49	62.1
● 11 – 20	20	25.4
● 21 – 30	10	12.7
Experience average = 11.1±7.7 Year; Min -Max = 1 – 30 years		
Number of passenger per vehicle (Pax)		
● 1 – 10	2	2.5
● **11 – 15**	35	44.3
● 16 – 20	29	36.7
● 21 – 25	10	12.7
● **25 and over**	3	3.8
Passenger average 17.0±4.3; Min - Max = 9 – 29 Pax		
Number of school(s) take a responsible		
● 1 – 2	5	6.3
● 3 – 4	32	40.5
● 5 – 6	23	29.1
● 7 – 8	16	20.3
● 8 and over	3	3.8
Average 5.1±2.0; Min - Max = 1 – 10 schools		
Round trip, Travel time (hours)		
● Less than 1 hours	4	5.1
● 1 – 2 hours	51	64.6
● More than 2 hours	24	30.4
Round trip, Travel distance (Kilometres)		
● Less than 20 km	4	5.1
● 21 – 40 km	15	19
● 41 – 60 km	19	24.1
● 61 – 80 km	13	16.5
● 81 – 100 km	12	15.2
● More than 100 km	16	20.2

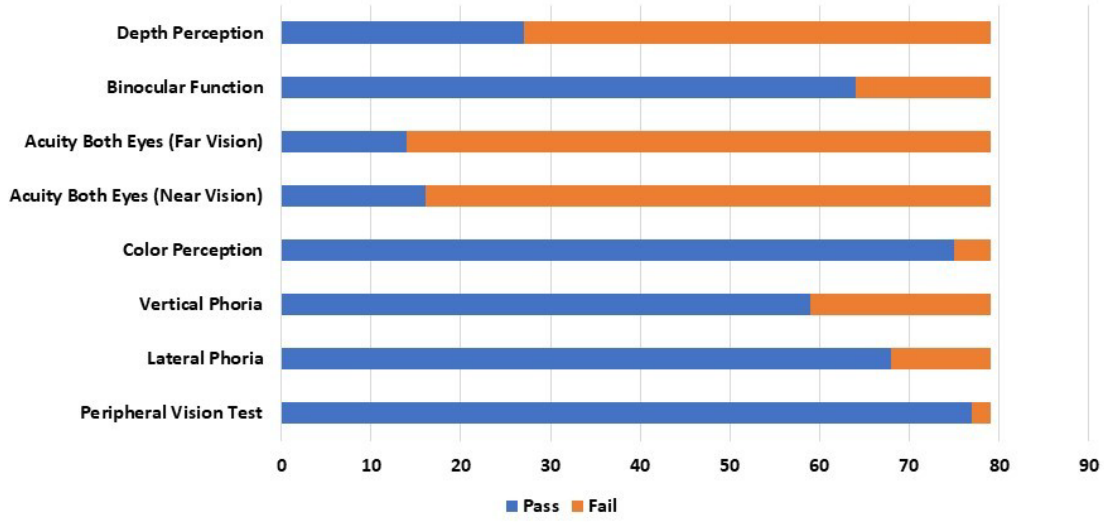

Fig. 1 Vision screening test result compared to the criteria of visual job standards (n=79)

Table 5 Visual acuity (VA) and depth perception (N=79)

Visual functions	Mean ± S.D.
VA, Both Eyes (Far)	0.68±0.4 Decimal acuity
VA, Both Eyes (Near)	0.41±0.3 Decimal acuity
Depth perception	134.9±133.1 second of arc

Table 6 also shows the range of VA loss distribution. The majority of people have normal vision (41.77%) and minor visual impairment (37.0%), respectively. Depth perception is the visual ability to perceive the world in three dimensions (3D) - length, width, and depth. This study the stereopsis was examined by Titmus V4 and the result show an average was 134.9±133.1 second of arc which are fail the criteria for driving group job. This study among the school drivers 79 cases showed, 4 cases (5.06%) of defective colour perception.

Phoria is a muscle balance test that determines a value for the eye's vertical and lateral balance. In the vertical direction, the muscular balance determines if there is a tendency of Left Hyperphoria or Right Hypophoria. 0 0.5 Prism dioptre was used as the failure of vertical phoria criteria in this study. In the horizontal direction, the muscular balance determines if there is a tendency of Esophoria (inward) or Exophoria (outward). 0±4 Prism dioptre was used as the failure of lateral phoria criteria in this study. Peripheral vision is ability to see out of the corner of the eyes. This means we can view things that aren't directly in front of us without turning our heads. It takes more effort to see what's around us when our peripheral vision is impaired. Only two of the 79 people tested failed to meet the requirements of driving group job, which is usually a sign of an eye problem.

Table 6 Ranges of Visual Acuity loss

Ranges of VA loss [13]	Visual Acuity (Far Vision)	N	%
Range of normal vision	20/10	3	3.80
	20/15	5	6.33
	20/20	6	7.59
	20/25	19	24.05
Mild visual impairment	20/30	12	15.19
	20/40	15	18.99
	20/50	6	7.59
	20/70	4	5.06
Moderate visual impairment	20/85	3	3.80
	20/100	1	1.27
	20/150	3	3.80
Severe visual impairment	20/200	2	2.53
Total		**79**	**100**

4. DISCUSSION

The average age of professional school vehicle drivers in Chiang Rai province was primarily aging, according to the demographics of professional school vehicle drivers. Despite the lack of information to determine if aging school bus drivers constitute a greater safety concern as they get older. In this section, we'll go through previous research that show how driver safety levels often alter as they get older in the general population. According to Thailand's Labour Protection Act (No. 6) B.E. 2560, the retirement age for all Thai employees is now 60 years old. In this survey, 18.9 percent of the professional school vehicle drivers was an elderly who met the criteria for retirement. Even though the crash rates based on numbers and licensed drivers reveal that older drivers are less likely to be involved in collisions than younger drivers[14]. In contrast with the great amount of literature available review show that the crash rates for senior school bus drivers begin to rise significantly around the age of 55 years old or 60 years old and continue to rise as the driver's age increases compared to school bus drivers in the other age groups, school bus drivers under 30 years old and over 65 years old had a disproportionately high frequency of accidents[15].

According to another research survey findings on fatality and/or crash involvement of commercial vehicle drivers showed that drivers younger than 27 years of age had higher rates of accident/fatality involvement, which then declined and plateaued until the age of 63, when elevated rates were detected again. The proportion of “turning left” and “failure to yield right-of-way” collisions increase significantly beyond the age of 55 years[16], which has been related to poor vision and judgment. The increased occurrence of medical issues (related with aging) raises the risk. Driver ability to drive safely has been found to be influenced by visual and physical abilities. Based

on the research studies previously described, it is evident that aging plays a significant role in driving performance. At-risk (both teenage and older) drivers were found to be more prone to traffic-related crashes/accidents compared to their middle-aged drivers. In the previously cited studies, many driving researchers hypothesized that drivers' visual functioning including depth perception, contrast sensitivity, and phoria would be related to driving performance[17].

The health status and health behavior of professional school vehicle drivers in Chiang Rai province, Thailand was showed the underlying disease which mostly found among them is hypertension follow by diabetes mellitus, respectively. The following medical conditions increased crash risk as follow visual impairment, hearing, cardiovascular disorder, cerebrovascular disease, peripheral vascular diseases, disorders of the nervous system, respiratory system, metabolic diseases, renal diseases, musculoskeletal disabilities, psychiatric disease, and medication or drugs [18]. The study in Swedish evaluates the self-reported driving abilities and use of visual and hearing aid for driving, among older adults showed better hearing and vision measures were associated with higher level of comfort in several traffic[19]. The sleep duration was approximately 6-8 hour per day. Sleepiness is a main factor responsible for traffic accidents due to human error. People who sleep for fewer than 6 hours have an increased risk of traffic accidents. Thus, the most essential thing to prevent traffic accidents due to sleepiness is ensuring that drivers get sufficient sleep at night[20]. The effects of alcohol on drivers and driving performance revealed that greater blood-alcohol concentration levels were associated with higher accident rates[21]. Alcohol influenced drivers in a variety of ways, including attitude, judgment, attentiveness, perception, reaction, and controlling. Even in the long-term, the impact of severe alcohol use in eye illness is unclear, and there is no consistent evidence that moderate alcohol intake plays a significant role in the development or progression of ocular disorders or visual acuity[22, 23]. However, alcohol has a number of short-term impacts on your eyesight that, while not life-threatening, make it dangerous to drive in the hours after drinking. The most prevalent side effect of heavy drinking is double vision, or impaired vision. However, other studies demonstrate that drunkenness with alcohol decreases the perception of depth from motion. Due to its impact on the slow eye movement system's capacity to recover depth from retinal motion, parallax is an essential component of the visual information required for driving[24]. Same as the previous, the correlation from this study shows a weakly significant positive link exists between visual acuities (Far) and alcohol consumption, indicating that while both variables tend to increase in reaction to one another, the relationship is not very strong.

Driving is an extremely difficult task. There is a link between driver safety and greater health, particularly sensory function, which is important for driving [25]. Visual elements are one of the most important sensory inputs for driving, and measurements of visual function like contrast sensitivity and visual fields have been shown to be beneficial in predicting driving safety. Workers' fitness for work is determined through a vision test that assesses human function. An eye exam that determines how well you can see the features of an optotype (a letter or symbol) from a certain distance or the role of a visual screening test known as visual acuity (VA)[26] is commonly employed in occupational health settings as well as for initial and periodic re-licensure of a driver's license [27]. In this study, eye testing was used as part of a health record to determine if school professional drivers were fit to work. The driver received an eye examination to determine how well they could see details of an optotype, such as a word or symbol, from a certain distance. Sensory and visual functions (binocular vision, visual acuity, muscle balance (lateral phoria, vertical phoria), depth perception, colour perception, and a peripheral vision test) are all necessary for safe driving.

Visual acuities (VA) are measured by identifying letters or numbers on a standardized eye chart to determine the sharpness and clarity of vision. Far visual acuity is a test that determines how well you can see distant items, whereas near visual acuity is a test that determines how well you can see nearby objects. The loss might range from modest to profound to entire for each feature of vision loss. Titmus reported both far and near visual acuity results. Drivers of personal autos, commercial motor vehicles, and school buses have different vision requirements. Each country has its own set of eyesight standards established in order for the person to receive an unrestricted driver's license. For example, the Driver and Vehicle Licensing Agency (DVLA) in the United Kingdom requires at least Snellen 6/7.5 (20/25) in the better eye and at least Snellen 6/60 (20/200) in the poorer eye; Austroads in Australia requires at least Snellen 6/9 (20/30) in the better eye and at least Snellen 6/18 (20/60) in the poorer eye; Department of Land Transport.

In Thailand requires at least Snellen 6/12 (20/40) which applicable for only disabled person [24, 28, 29]. However, the VA both eyes criteria for professional drivers was 20/20 for far vision and 20/30 for near vision, as recommended by the Guideline for Standardization and Interpretation of Vision Tests in the Occupational Health Setting[12]. Furthermore, words like residual vision and partial blindness have been used to minimize the relevance of remaining eyesight. The majority of professional school vehicle drivers have normal vision follow by minor visual impairment. As a result, an International Council of Ophthalmology (ICO) Committee working with the WHO on the preparation of ICD-9 extended these ranges to the normal range and named them [26].

Others of visual factors were depth perception which is the visual ability to perceive the world in three dimensions (3D) - length, width, and depth. It is the one of criteria to get the driving

license in several country such as Thailand, Japan[30] by Three-rods test that was fairly easy and simply involves moving one bar to line up with a second one. Regarding to the elements of driving, such as signs and lights, are based in part around colour. Then, the colour perception is the important factor for a criteria of visual job standards for driving profession. A study done by Institute of Neurological Science shows that of the 151 colour deficient subjects questioned, 126 admitted to having issues driving at night as well as stopping the car if the road lights change too quickly[31]. Lack of colour perception is known as colour blindness. Normally, the issuance of a driver's license is prohibited for colour blindness. However, the screening in the previous study in Ethiopia showed from among the drivers 1,879 cases showed, 85 cases (4.52%) of defective colour vision[32]. The previous research exists to investigate whether the normal aging process influences the ability to adapt disparity vergence and phoria. The ability to adapt vergence peak velocity and the rate of phoria adaptation showed no significant age-related influence ($p > 0.05$). The data suggest that the ability to modify the disparity vergence system and the rate of phoria adaptation are not dependent on age, whereas the magnitude of phoria adaptation decreases as part of the normal adult aging process[17].

The vision screening method used in this study to find drivers fitness to work and those who are showing early signs of disease is a limitation. Through this process, the eyesight disorders were not discovered. It was advised that the specified individuals promptly consult eye care specialists for thorough, confirming eye examinations, diagnosis, first therapy, and continued follow-up care.

5. CONCLUSION

This cross-sectional study was done in Chiang Rai province, Thailand. This study examines the relationship between personal and work-related factors and visual function in professional school car drivers. The study begins with an examination of professional drivers' personal and occupational characteristics, followed by an examination of their visual function. The preponderance of the drivers were older men who were married and had completed secondary education, according to the findings. Overall, 14 of the 79 professional school vehicle drivers who completed vision screening passed the criteria based on a visual job criterion that was the highest standard for those who worked with vehicles. Visual acuity, which is the visual function that most affects the fail criteria, largely distributed in the range of normal (fit to work) followed by mild visual impairment.

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