Report of research results

Title: Prevalence and factors affecting visual performance and eye fatigue of public carrier car driver in Bangkok and perimeter area.

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Summary: Include the outline and conclusions of the research

Visual performance and eye fatigue is major factors to driving performance in public carrier car drivers. The research finds that personal data factors affecting eye fatigue consist of driving distance, age, sleep duration, looking at the screen of a mobile phone, tablet, computer, or television. The personal data are various. Most participants with normal visual performance. Moreover, there are environmental changes before- and after driving consist of the dust and light intensity.

Aim of Research

Aim of research are to study prevalence of visual performance and eye fatigue of public carrier car driver, and to study factors affecting eye fatigue of those in Bangkok and perimeter area. This research is an analytical cross-sectional study using questionnaire, visual performance, and eye fatigue tests. Benefits help people know their visual capabilities and provide guidance of driver safety.

Method of Research & Progression

This research is an analytical cross-sectional study.
1. Population and sample selection
Population is public carrier car drivers in Bangkok and perimeter area. Males or females can be selected in the research. Sample size is 360 cases calculated from 318 sample cases (determining the prevalence rate of fatigue and related factors in the bus drivers) and 10% adjusted cases using G-power program. The inclusion criteria are as follows: 1) Being a public carrier car driver for at least 1 year, aged 20-59 years, male or female, 2) driving only during the day, 3) having no history of glaucoma, cataract, corneal inflammation, dry eye, eye muscle imbalance and eye related diseases 4) able to communicate and read Thai, 5) no risk of Covid-19, 6) no symptoms of coughing, sneezing, fever, fatigue, loss of ability to smell and taste. on the day of the test, and 7) willing to participate in the research by having the informed consent by the Human Research Ethics Committee of Burapha University. The exclusion criteria are as follows: 1) severe eye pain during the test, and 2) the participants requested to terminate the test prematurely. Participants are selected by multi-stage sampling method. There are 12 locations coving Bangkok and perimeter areas.

2. Materials and methods
Materials

        1) The general information and driving factor survey was created based on relevant studies, consisting of personal data, and driving factors.

        2) Visual acuity test kit which consists of Snellen chart, Ishihara chart screening test for color blindness, Stereo test. The results are then evaluated against standard values to interpret driver performance.

        3) Eye fatigue measurement with Flicker fusion. CFF (Hz) are measured.

        4) Light intensity measuring instrument (lux meter) to measure environmental data.

        5) Portable dust meter

        6) Portable moisture meter

3. Data collection

        The data collection includes 1) personal data and driving factors, 2) visual performance and related factors, 3) CFF in pre-and post-works, and 4) working environment factors.

4. Data analysis

        Data are determined as percentage, mean, standard deviation.

Results of Research

1. Personal data.

        Samples are all males. They have an average age of 42.53 years (SD = 8.50). 20.81% of participants experienced eye fatigue. 12.78% of them had nearsightedness, farsightedness, astigmatism, or an eye accident. 39.53% of them wore eyeglasses, contact lenses or sunglasses while driving. They drive public carrier car as 12.87 years (SD = 8.83). They drive for an average of 8 hours a day, look at the screen of a mobile phone, tablet, computer, or television for 3.52 hours a day (SD = 1.62), sleep for 5.88 hours a day (SD = 0.85). There are no drinking drivers while driving. They drink tea/coffee during driving as 1.28 glasses per day (SD = 0.13) and drink energy drinks during driving as 0.42 bottle per day (SD = 0.07).

2. Environmental data.

        There is a significant difference of the dust before- and after driving (p = 0.036) and there is a significant difference of the light intensity between before- and after driving (p =0.026). However, there is no significant difference of humidity between before- and after driving.

3. Visual performance

        91.11% of the participants had normal eye level by measuring visual acuity. 96.66% of them had normal stereo dept perception. 100.00% of them had normal visual filed. 100.00% of them had normal color vision.

4. Eye fatigue

        The critical flicker frequency (CFF) before driving was averaged 31.84 Hz (SD = 3.26). 28.24% of participants had eye fatigue after driving.

5. Factors affecting eye fatigue

        The personal data factors affecting eye fatigue consist of driving distance (p = .028), age (p = .007), sleep duration (p = 0.015), looking at the screen of a mobile phone, tablet, computer, or television (p = 0.046).

Future Areas to Take Note of, and Going Forward

Researchers expect to collect data on driving performance tests with eye movement tracking tests. EEG measurement Measuring vital signs required during a test drive with a focus on the average driver. The research can help us get the basics we need to stay safe on the road.

Means of Official Announcement of Research Results

The researcher plans to publish the research results in a research journal. It is expected to be released in 2023.