Text Neck Epidemic: a Growing Problem for Smart Phone Users in Thailand

Poonsri Vate-U-Lan

Graduate School of eLearning,
Assumption University of Thailand, Thailand
poonsri.vate@gmail.com

Abstract - **This research study examined the rapid changes in computer user behavior among Thai internet users, and analyzed differences in the computer health risk between desktop users and mobile device users. The emphasis is on "Text Neck" which has become a global epidemic affecting millions of people of all ages using various computer devices. The purpose of this study was to consider the incidence and relationship between health problems, and Thai Internet users' behavior on computer and smart devices. The main research instrument was an internet-based survey which yielded 642 responses. The research findings reflected that the text neck health problem in Thailand is growing. This survey found that the smart phone device was the most popular computer application rather than desktop computers as almost two thirds of Thais always have their smart phones with them. The research isolated other behaviors of Thai computer users that contribute to health problems as the survey found that almost two thirds of respondents never wear glasses to protect their eyes from the blue light that emanates from computer screens (64.33%). Almost one third of participants continuously worked on the computer without a break (30.84%). On occasions, 62.3 percent of users experienced pain in the neck and/or shoulder regions when working on the computer.**

Keywords - **Computer Users Behavior, Computer Vision Syndrome, Health, Survey, Text Neck**

I. INTRODUCTION

People's contemporary lifestyle has become much dominated by computer technology; often overuse in digital tasks on handheld mobile technology induces 'Text Neck' [1, 2], seemingly a world-wide health effect. The term of 'text neck', or another phrase 'turtle neck posture', can be described as a repeated stress injury and pain sustained from excessive watching or texting on handheld devices for long periods of time [1, 3-5]. Text neck may cause many harmful symptoms such as neck pain, shoulder pain, upper back pain, chronic headaches and increased curvature of the spine [1-6]. Mobile device users frequently adopt prolonged forward head posture while looking down at the screens of mobile devices [1-6]. Text neck directly affects the spine while flexing the head forward at varying degrees - when the head tilts forward at 15 degrees, the forces on the neck surge to 27 pounds, at 30 degrees 40 pounds, at 45 degrees 49 pounds and at 60 degrees 60 pounds, then at 90 degrees the model prediction was not reliable [5]. This issue is a major concern with children, since their heads are larger in relation to their body size than adults, and thus they are have an increased risk for text neck given their propensity to use mobile phones. Serious permanent damage of untreated text neck can be the result and be quite similar to occupational overuse syndrome or repeated stress/strain injuries [2].

II. LITERATURE REVIEW

Both text neck and Computer Vision Syndrome (CVS) are parts of serious physical computer-related illnesses [2]. According to

health science research results, spending time on computer longer than 2 hours a day increases the risk by 90 per cent to develop CVS [7-9]. Eye strain together with dryness and irritation of the eyes, headache, blurred vision, dry eyes, and neck and shoulder pain are characteristic of CVS symptoms [7, 8, 10].

Many 10-15 years old children in Thailand and other countries have used mobile devices or touched screen monitors which has induced CVS – their numbers have increased markedly [7]. A case study in Thailand found that a Thai 14-year old teenager suffered from digital eyestrain since the user performed almost every activity (90%) such as social networking and messaging on a mobile phone due to lacking a computer desktop at home [7]. The qualitative element in another survey in Thailand detailed many Thai teenagers told how they were addicted to the Internet and faced many health problems, especially eye strain [11].

The crisis of CVS and text neck, associated with texting and general overuse of smart devices, is reflected in research, which found that American citizens peered down onto their smart devices for web searching, communicating and socializing for longer than 2.7 hours daily on average [1]. Another study of a developed country in Asia found that almost all people in the Republic of Korea have smart mobile phones (97.4%), spending an estimated 4.1 hours a day on the devices while the heavy smart phone users spent even longer, reaching around 5.4 hours daily [3]. Computer-related illnesses are a concern warranting an added focus as the research found that CVS may decrease working productivity by up to 20 per cent [8].

The text neck epidemic is a global phenomena and problem. A U.S.A. survey of university students revealed that forty per cent of participants faced text neck or spinal pain using mobile devices [12]. The group that experienced frequent pain were found to have higher levels of anxiety and/or depression [12]. A report from the Republic of Korea confirmed that the heavy smart phone users

affected by multiple stress on the cervical spine, also experienced cervical curve and pain threshold in the muscles around the neck [3]. The suggestion was to limit the time hunched over a mobile phone on a daily basis and move the whole screen content upwards until the user returns to a good head posture or look at the screen with a neutral spine [4, 13]. According to research conducted with Saudi female nursing students, almost all of whom own mobile phones and portable devices (95.9% and 92.4 % respectively) [14], almost a third spent time on computers and mobile devices longer than three hours daily, with two fifths experiencing mild headaches (39.2%) thus representing a correlation between visual content use and headaches [14].

The 20-20-20 rule which means every 20 minutes take a 20 second break and focus the eyes on something at least 20 feet away is recommended to practice in order to avoid the health problems of CVS. Mobile applications provide a capacity to replace many activities in game consoles, e-readers, media players, digital camera, and video recorders by enabling all of these functions to be performed on one hand-held device, thus restricting human movement [1]. Given these circumstances, the American Chiropractic Association has advised to control text neck by avoiding and limiting activities on mobile "gadgets" by replying to emails on a desktop computer and making a telephone call instead of texting long messages [15]. The correct posture to prevent text neck syndrome is the ears be aligned with the shoulders and the shoulder blades, retracted so this proper bodily alignment diminishes spinal stress [5].

An awareness campaign aimed at mobile phone users is needed to thwart problems from text neck and CVS. An innovative mobile application would be useful to alert users if they are holding their smart phones in an 'at-risk' position along the lines of the 'The Text Neck Indicator' [1]. The application would likely trigger the user to adopt a risk-free operation. The group of Japanese researchers involved in this type of ergonomic research pertaining to smart phones have also created an

application to blur the device's screen if it detects that users did not blink for a given period of time (8 seconds in the demo system) [13]. The application tracked the head angle and mobile device movement using the build-in accelerometer [13]. The application also allows users to continue watching the screen content after they adjusted their heads to a better angle [13]. This research group also designed and embedded a function of tracking reading activities in order to perform simple eye gestures while interacting with the computer screen on 'computer glasses' that normally filtered blue light [13].

Referring to possibilities to alleviate problems as outlined above, it is necessary to explore the potential correlation between health problems and Thai Internet users' behavior on computer and smart devices. Therefore, this research employed the online self-administered survey as the main research instrument to explore the problem and comment on possible solutions.

III. RESEARCH METHODOLOGY

An online self-administered survey was employed in this current research as the most appropriate instrument to elicit information from the target population, who are Internet users in Thailand. The questionnaire included 20 questions which explored details pertaining to computer users' behavior. The researcher selected only four questions related to text neck and CVS to discuss in this article. Each question format was a simple multiple-choice item. The invitation to fill in the questionnaire was declared on the researcher's timeline on a Facebook and on a web forum in Thai. Participation was fully voluntary without incentives offered.

IV. RESEARCH FINDING AND DISCUSSION

The first question aimed to know the type of devices that users favored: "What kind of computer do you most often use?" The question offered three options: I. Desktop computer, II. Mobile device and III. Laptop,

tablet or similar (see Fig. 1). Almost two fifths (39.1%, n=251) of respondents chose 'Mobile phone', about one third (34.27%, n=220) chose desktop computer and about one quarter (26.6%, n=171) chose tablets, laptop or similar. This can be interpreted that mobile devices or smart phones were more popular devices than desktop computers since approximately two thirds of Thai Internet users (65.73%, n=422) selected mobile phone or tablets. This trend was the same as in Republic of Korea, Saudi Arabia and the U.S.A. [4, 12, 14].
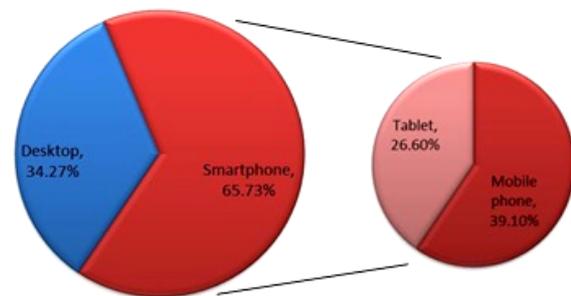

Fig 1. Type of Computer most often used

The second question asked about behavior: "Do you wear glasses to protect you from the computer light?" The question offered three options to choose: I. Yes, I do. II. No, I do not and III. Sometimes. Fig. 2 reveals the findings which presents both desktop and smart phone users. The majority of respondents (64.33%) did not wear glasses to protect the computer light (45.02% of smart phone users and 19.31% of desktop users).
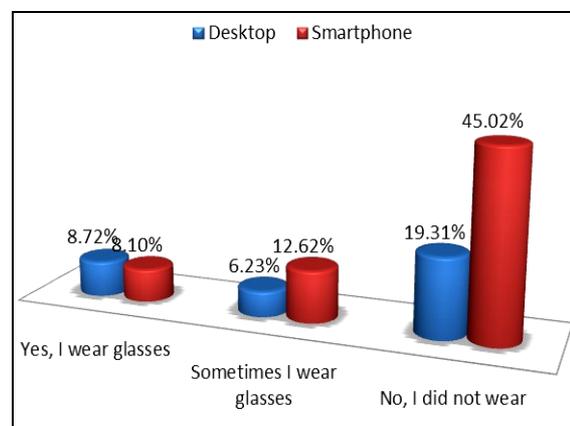

Fig 2. Wearing Glasses to Protect Computer Light

The computer users who were most safe since they wore glasses to protect from the computer light was the smallest group or 16.82 percent (8.10% of smart phone users and 8.72% of desktop users). This finding highlighted how the majority of Thai Internet users, especially mobile device users, were at risk of being CVS since they did not protect their eyes from computer light.

The third question also focused on computer user behavior: "While you are using the computer, do you break away from the computer, let your eyes relax by looking at a green object?" The question offered three options to choose: I. No break, II. Break every 20 minutes and III. Break every 1 hr. Fig. 3 presents the findings which are separated into desktop and smart phone users. The computers users having a break appropriately or every 20 minutes is the smallest group which was about one quarter of users (26.08% in total 19.16% of smart phone users and 6.85% of desktop users). All the rest or about three quarters of users were at risk of having CVS problems, especially 30.84 percent (20.72% of smart phone users and 10.12% of desktop users) that had no break while working continuously on a computer.
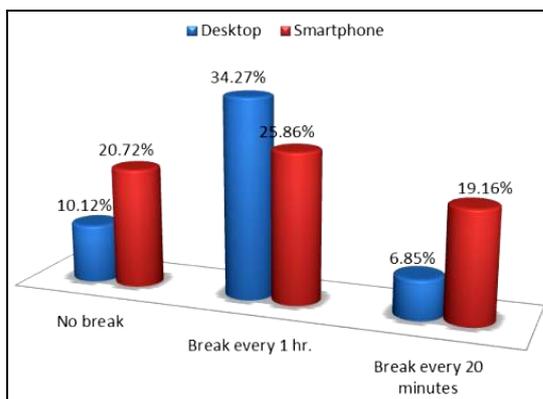

Fig 3. Taking a Break while Using Computer

The fourth question inquired about the symptoms of text neck: "When you are working on the computer for a long time, do you have neck or shoulder pain?" The question offered three options: I. It is con-tinuing, II. No, I don't and III. Just happens sometimes. Fig. 4 presents the results showing desktop and smart phone users. The research finding found

that 15.11 percent of users already suffered from text neck - mobile phone users were higher than desktop users (10.44% and 4.67% respectively). The biggest proportion or 63.3 per cent (42.21% of smart phone users and 20.09% of desktop users) were at the initial stage of experiencing text neck.
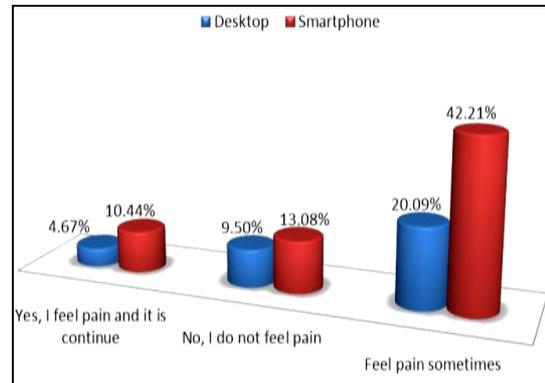

Fig 4. Feeling Pain on Neck or Shoulder when Working on the Computer

Demographic information of 642 respondents who participated in the survey can be described by gender, place of living, age, occupation, and education. Approximately three fifths (59.5%) were females and the rest (40.5%) were males. The majority of users resided in rural areas (61.21%) and the rest in urban areas (38.79%). Fig. 5 shows the age profile of respondents, the red column representing smart phone users and the blue column desktop users. The majority of participants were 11-20 years old (total=45.33%, smart phone=33.64% and desktop=11.68%) followed by 21-30 years old (total=27.73% smart phone= 18.69% and desktop=9.03%). The rest of participants were over 30 years of age (26.94 %). According to this figure, the smart phone users are a bigger group from 11-40 years old.
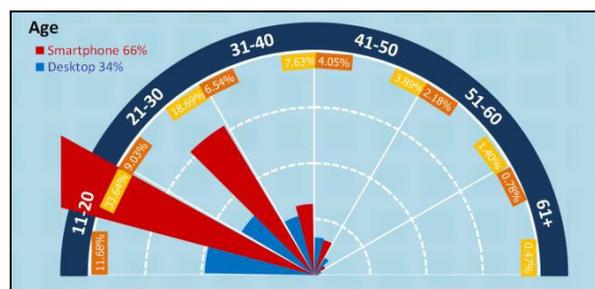

Fig 5. Age of Respondents

Fig. 6 presents the occupational profile, with a similar trend in the majority of occupations but university students and secondary school students have higher proportions of smart phones (red line shows 34.11% and 14.49% respectively).
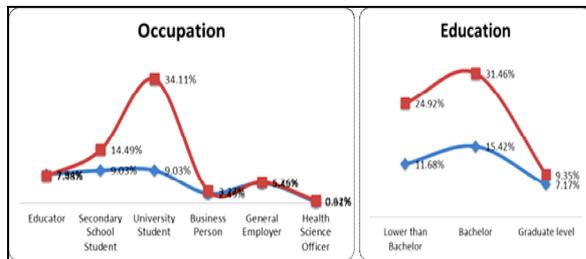

Fig 6. Occupation and Education of Respondents

The right graph in Fig. 6 above is revealing as education attainment levels of respondents can be described that mobile devices are more popular than desktop computers for users whose education is lower than bachelor degree or at bachelor degree level.

V. CONCLUSIONS

This current online self-administered questionnaire finding reflected how CVS and text neck has become a real problem for Internet users in Thailand. The trends of Thai computer users' behavior were similar to other countries because the mobile device was more popular than the computer desktop [4, 7, 8, 12, 14]. The Thai computer users were at high risk of developing CVS and text neck since the majority showed a lack of concern to wear glasses to protect their eyes from computer light, or use 20-20-20 rules. Only a small group did not feel pain in their necks and shoulders. A future campaign to educate users to recognize the correct gesture and computer user behavior needs to be directed to Thai Internet users in order to prevent and increase awareness of CVS and text neck. The mobile application to reduce CVS and text neck problems should be introduced to Thai Internet users since prevention is better than cure.

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(Arranged in the order of citation in the same fashion as the case of Footnotes.)

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