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THE ASSOCIATION BETWEEN EXCESSIVE USE OF SMARTPHONE AND TENSION-TYPE HEADACHE IN HIGH SCHOOL STUDENT

Anak Agung Ngurah Agung Adhiyoga Santosa*, I Putu Eka Widyadharma*,¹ and Anak Agung Ayu Putri Laksmidewi* *Department of Neurology, Faculty of Medicine, Udayana University, Bali, Indonesia.

ABSTRACT Tension-Type Headache (TTH) are one of the most common forms of primary headache. The presence of headache reported in 80.6% of teenager within age range 14 to 19, with 17.9% in the form of TTH. Easy access to electronic cause worry over its effect on teenage health. Association has been reported between the use of mobile phone and health problems, were 21.65% of subjects reported headache. This research meant to evaluate whether the use of the electronic device, specifically smartphone within a period of time associated with the incidence of TTH on a teenager. Length of use defined as less or the same as 3 hours, and more than 3 hours. This cross-sectional analytic research conducted to whole second year students of National High School 1 Denpasar in the form of a survey in July 2018. From 129 subjects that responded, eight subjects filled the exclusion criteria, while 22 subjects excluded for filling incorrect or incomplete answer, leaving 99 subjects that fulfilled the inclusion criteria. Subjects (80.8%) admitted for using a smartphone over 3 hours a day. There is no significant association between length of use of the electronic device and TTH (Chi-square 2.326, p=0.127; OR 2.38; 95% CI 0.72-7.4).

KEYWORDS TTH, Length of Use, Electronic Device, Smartphone, High School Student

Introduction

Generally, headache is classified into two categories, primary and secondary. A primary headache is a headache not caused by a problem within the intracranial structure. TTH is the most common primary type of headache. [1-4]

TTH lifetime prevalence from different studies is ranging between 30% and 78%. Episodic TTH occurring fewer than 15 days per month is reported by more than 70% of some populations. Research done by Suryawijata et al. (2016) in medical students with an average age of 19.79+0.417 years found TTH positive

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moderate correlation with impaired quality of life.[3,5]

Research by Michelle Katherine Andrade Xavier (2015) found 80.6% teenager within age range of 14 to 19 years old reported headache where 17.9% are TTH. On the other hand, Schwartz (1998) research categorized by age, sex, education, and race found TTH within age range 19 to 29 as much as 34.5% in male and 40.8% in female. [6-7]

TTH risk factors are related to continuous muscle contractions. These contractions can be caused by psychological factors or any activities that involve head bending downward for an extended period. Patient that sleep with multiple pillows might complain about TTH because of head positioned too high causing too much pressure on the neck muscle. Patient with Hypotension and Anemia might suffer TTH caused by inadequate oxygen supply to the muscle. TTH also related to myofascial pain where activated trigger point caused muscle tension and causing radiating pain.[1,8-12]

A recent trend has shown increasing use of the internet by teenagers, aided with access provided by the mobile device. Research by Pew Research Centre (2015) shown 92% population of

Anak Agung Ngurah Agung Adhiyoga Santosa et al./ International Journal of Medical Reviews and Case Reports (ARTICLE IN PRESS)

Table 1	Subject	Characteristic	(n=99).
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Variable	n	%	
Age: (Average + SD)		16,04+0,426	
Sex:			
Male	18	18,2	
Female	81	81,8	
TTH:			
Yes	19	19,2	
No	80	80,8	
Brand:			
Apple	54	54,5	
Samsung	30	30,3	
Xiaomi	5	5,1	
Орро	5	5,1	
Asus	1	1	
Vivo	2	2	
Axioo	1	1	
More than one	1	1	
Length of Use:			
\leq 3 Hour	19	19,2	
>3 Hour	80	80,8	
Monitor Size:			
\leq 5 inches	44	44,4	
>5 inches	28	28,3	
Not answering	27	27,3	
Body Posture:			
Sitting	57	57,6	
Lying Down	42	42,4	
Pillow Used:			
1 Pillow	62	62,6	
>1 Pillows 37 37,4			
TTH: Tension-Type Headache, SD: Standard Deviation			

Table 2 Test Between Length of Use and TTH (n=99).

	TTH						
Р	2	íes	No				
	n	%	n	%	Total	X2	Р
≤ 3	6	31,6	13	15,4	19	2,236	0,127*
>3	13	16,2	67	83,8	80		
Total	19	19,2	80	80,8	99		
* Chi-square test (not							
significant p>0,05); P: Length of Use (Hour)							

a teenager (age 13 to 17 years old) go online every day with 24% from a total teenager of America stay online "almost constantly", facilitated by the widespread availability of smartphones. This continuous gadget use might be a double-edged sword that could cause an adverse effect. Thamir Al Khlaiwi found an association between mobile phone use and health problems, where 21.65% of subject reported headache. [13-14]

Smartphone with all its features is now capable of competing with a conventional computer in term of function. It also means the adverse effect of the computer might also affect the smartphone user. Hanne-Marri Schiotz Thorud Research (2012) found that during 2 hours of visually demanding computer work such as working with small font and bright light, there was a significant increase of eye-related pain and tiredness, blurred vision, itchiness, gritty eye, photophobia, dry eyes, and teary eyes. Headache was also found although insignificant. These findings will be the focus of this research.[15]

RESEARCH PURPOSE

To find out the association between the use of smartphone and TTH on high school student.

METHOD

This is cross-sectional research targeted to the student of National High School 1 Denpasar, Bali. The subject is all secondyear students within the month of July 2018. The inclusion criteria are as follow: the student of National High School 1 Denpasar, age range within 14 to 19 years old, agree to participate in the research. The exclusion criteria are as follow: experiencing fever, had a history of head trauma, tumour, do not own a smartphone.

Subject categorized into a group with TTH and group without TTH. The diagnosis of TTH is referred from "headache consensus" by Perhimpunan Dokter Spesialis Saraf Indonesia (PER-DOSSI). TTH defined as a bilateral headache that often described as feeling like a tight band tying or pressuring around the head; it is mild to moderate in intensity. The pain does not cause increased sensitivity to sound and light and generally does not worsen from physical activity.2 Length of use defined as the length of time of daily smartphone uses. These groups are categorised into a group that uses a smartphone in less or the same as 3 hours, and the group that use the smartphone for more than 3 hours.

We also add other questions in the survey such as the brand of smartphone, size of the monitor, the body posture while using the smartphone, and pillow used. Smartphone brand defined as the brand of the smartphone used by the subject. Size of monitor categorized into less or same as 5 inches, or more than 5 inches. Body posture defined as the most used posture while using a smartphone, categorized into sitting and lying down. Pillow used defined as the amount of pillow used while sleeping, categorized into 1 pillow and more than 1 pillow.

Statistical analysis uses SPSS 20.0 program for windows. Descriptive analyzed conducted to understand the characteristic of the subject. Chi-Square test will be used between the nominal variable length of use and nominal variable TTH. The result will be evaluated as significant if value p<0.05.[16,17]

RESULT

This research involved 99 subjects (table 1) with average age 16.04+0.426; the majority are female (81.8%). 19.2% of subjects admitted having TTH.

Most of the subjects do not report TTH where most of them belong in the group with more than 3 hours of smartphone use (83.8%) (Table 2). We discovered a chi-square value of 2.235 with an insignificant result (p=0.127).

Chi-square test conducted to other variables also shown an insignificant result. With monitor size as the variable, we found chi-square 1.725 with p=0.422. Body posture as variables shown chi-square 0.235 with p=0.628. Pillow used as variable shown chi-square 1.003 with p=0.316 (p>0.05).

DISCUSSION

TTH is one of the most commonly seen primary headache. Lifetime prevalence of TTH ranging between 30% and 78%, this research found 19.2% of subjects reported TTH. This diverse finding might be related to the difference in the amount of subjects and their age range, where most of our subjects are a teenager. Other research found that 80.6% of teenagers reported headache where 17.9% are in the form of TTH, which is similar to this research.[3,6]

This research did not find any significant association between the length of smartphone use and TTH. Research on a mobile phone showed an association between the use of mobile phone and health problem were 21.65% reported headache. These diverse findings might be related to the different capability presented between classic mobile phone and a smartphone, although both provide the same general function. The research also only presented data of the unspecified form of headache. In term of function, the smartphone is now capable of competing with a computer. Thus health problem acquired from using a computer might be felt to smartphone user as well. Research has been conducted to find out the result of visually demanding work on computer with small font and bright light. It significantly increases health problems, although the increase in headache wasn't. This result supports our finding that there is no significant association between the use of smartphone and TTH. [14,15]

Continuous contraction of muscles is one of the risk factors of TTH. Bending the neck downward during activities such as reading could cause muscle stiffness. Using multiple pillows while sleeping will cause pressure to the neck muscle and might cause TTH. During this research we found no significant association between sitting, lying down, or the amount of pillow used. The result might be related to the amount of subjects gathered, also the subject might not bend their neck while using the smartphone, and the different range of softness of pillow used by the subject. [1,8]

CONCLUSION

There is no significant association between the use of smartphone and TTH on high school student of National High School 1 Denpasar.

Competing Interests

There were no financial supports or relationships between authors and any organization or professional bodies that could pose any conflict of interest.

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