

Research Article

The Association of the Use of Electronic Media with Primary Headache in Students of the Faculty of Medicine, Baiturrahmah University Class 2017

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Abstract

Background: The use of multimedia-based electronics during this Covid pandemic is the right solution for distance learning. Electronic media that are generally known by the public are cellphones and laptops/computers, and television which are communication media that use electromechanical power.

Aims: To find the association between the use of electronic media with primary headaches in students of the Faculty of Medicine, Baiturrahmah University class 2017.

Method: This research was an observational analytic study with a cross-sectional design. The sample of this study was the 2017 class of students who met the inclusion criteria and exclusion criteria—sampling using a non-random sampling method, namely consecutive selection. Data collection was done by distributing questionnaires.

Results: In this study, the gender of the respondents, who were primarily women, was 50 people (72.5%). Respondents who experienced migraine headaches were 13 people (18.8%), and Tension-Type Headache was 56 people (81.2%). This study showed no significant association between the use of cellphones and primary headaches in terms of frequency, duration, length of possession, position, and brightness ($p > 0.05$). Likewise, for the use of laptops/computers, there was no significant association with primary headaches in terms of frequency, duration, length of stay, position, and brightness ($p > 0.05$). Furthermore, there was no significant association with primary headaches for television use in terms of frequency, duration, length of stay, and position.

Conclusion: There is no significant association between the use of electronic media with primary headache.

Keywords: Electronic media, primary headaches, students of the Faculty of Medicine, Baiturrahmah University Class 2017.

Introduction:

The use of multimedia-based electronic during this covid pandemic is the right solution for distance learning. Electronic media is a communication medium that uses electromechanical power; electronic media generally known by the public are cellphones, laptops/computers, and television.

The Ministry of Education and Culture of Indonesia initiates the Distance Learning program, which is broadcast on television on TVRI or using the Zoom application on mobile phones, laptops./computers. This program is implemented for students at Kindergarten, Elementary School, Junior High

School, Senior High School, and university. The distance learning through television or the zoom application is an effort from the Ministry of Education and Culture (Kemendikbud) to help organize education for all people during the Covid 19 pandemic. Universities in Indonesia, especially at Baiturrahmah University, in handling the Covid 19 case, also use distance learning through the Whatsapp Group (WAG) application, google classroom, zoom application, and youtube. This can be accessed through electronic media such as mobile phones laptops/computers. Apart from the solutive benefits during the Covid 19 pandemic, prolonged use of electronic media can result in health problems, one of which is headaches.^{1,2,3}

Data in March 2019 showed that the most online media usage was 829 million people, namely China. The second largest was 560 million, namely India, in third place 292.89, namely the United States, fourth place was 148.06 million, namely Brazil, and fifth was 143.26 million, namely Indonesia. The latest data based on research conducted by Hendra Gunawan in 2020 found that the use of social media in Indonesia and throughout the world experienced a significant increase during the Covid 19 pandemic, where Indonesia was ranked as the third-largest in the world along with Japan and India. Internet users in Indonesia experienced a surge of around 17.3% million from 64% of the total population of Indonesia, the majority of users using mobile phones as much as 98% or equivalent to 171 million people.^{4,5}

The use of electronic media that is too long can result in a decrease in health. An observational study conducted by Milde-Buschet al. in 2010 stated that electronic media is one of the causes of headaches. This study is also by research conducted by Mustakim, also found in electronic media users who use cellphones for a long duration. Prolonged use can cause users to experience physical complaints such as headaches (33.3%), complaining of eye fatigue (53.3. %), difficulty resting (20%), frequent sleepiness (33.3%), and other complaints (13.3%) such as fever, shortness of breath, and body aches. Headache is a type of referred pain that originates from the deep structures to the surface of the head. Headaches are caused by several painful stimuli originating from the cranium and outside the skull, such as the nasal sinuses. Headaches are also divided into two main categories, namely primary and secondary. Primary headaches include migraine, Tension-Type Headache (TTH), and Trigeminal Autonomic Cephalgias. Secondary headaches can be divided into headaches caused by trauma to the head and neck, cranial and cervical vascular disorders, and other secondary headaches.

Based on research conducted by IkaNurwulandari (2014) worked on adolescents in Surakarta, totaling 48 respondents, 40 people (83.3%) suffered from headaches while eight people (16.7%) did not suffer from headaches. It was found that adolescents experienced headaches due to prolonged use of electronic media; the highest results were 29.2% tension headache, 29.2% miscellaneous headache, and 25.0% migraine.¹

Researchers here only examine TTH and migraine because the most common cases experienced when using electronic media are TTH and migraine and based on the pathophysiology of the factors that influence the occurrence of TTH and migraine.

Based on the above background, the author intends to research "The association of Electronic Media Use With Primary Headaches in Baiturrahmah Medical Faculty Students Class of 2017".

I. Research Methods

This research is an observational analytic study with a cross-sectional design. The sample of this study was the 2017 class of students who met the inclusion criteria and exclusion criteria—sampling using a non-random sampling method, namely consecutive selection. Data collection is done by distributing questionnaires.

II. Results

This study is an observational analytic study that aims to determine the association between the use of electronic media and primary headaches in students of the Faculty of Medicine, Baiturrahmah University class of 2017 with a total sample of 69 samples by inclusion and exclusion criteria.

5.1 Distribution of subject characteristics study

Table 5.1 Distribution of research subject characteris

Variable	f	%
Cellphone use		
Do not have	0	0
Have	69	100
total	69	100
use of laptop/computer		
Do not have	0	0
Have	69	100
total	69	100
Television Use		
Do not have	15	21.7
Have	54	78.3
total	69	100
Headache		
Yes	69	100
Not	0	0
total	69	100

Type of headache		
Migraine	13	18.8
TTH	56	81.2
total	69	100
Gender		
Man	19	27.5
Woman	50	72.5
total	69	100

straight neck	11	15.9
looking down	58	84.1
other	0	0
total	69	100
phone screen brightness		
Bright	6	8.7
Currently	51	73.9
Dark	12	17.4
total	69	100

Based on table 5.1, it can be seen that of the 69 respondents at the Faculty of Medicine, Baiturrahmah University class 2017, respondents with cellphones were 69 people (100%), 69 people had laptops/computers (100%), 54 people had televisions (78.3%), and those who do not have tv are 15 people (21.7%), respondents who experience headaches are 69 (100%), for the characteristics of the type of headache experienced by the most respondents are TTH, amounting to 56 people (81.2%), based on the gender of the respondents whom themost are female, totaling 50 people(72.5%).

5.2 Distribution of mobile phone usage characteristics

Table 5.2 Distribution of the characteristics of the use of mobile phone

Variable	f	%
frequency of cell phone use		
<2x a day	0	0
2-10x a day	24	34.8
>10x a day	45	65.2
total	59	100
Duration of cellphone use per day		
<2 minutes	1	1.4
2-60 minutes	23	33.3
>60 minutes	45	65.2
total	69	100
Have you had a cellphone for a long time?		
<1 year	1	1.4
1-2 years	0	0
>2 years	68	98.6
total	69	100.0
head/neck position when using a cell phone		

Based on table 5.2, the highest frequency of cellphone use is >10 times a day, totaling 45 people (65.2%), the most extended duration of time using cellphones is >60 minutes, counting 45 people (65.2%), the most length of time having a cellphone is >2 years totaling 68 people (98.6%), the position of the neck or head when using a cellphone is the most, namely looking down or looking up at 58 people (84.1%), the highest brightness of the cellphone screen is 51 people (73.9%).

5.3 Distribution of usage characteristics laptop/computer

Table 5.3 Distribution of laptop/computer usage characteristic

Variable	f	%
frequency of use of laptop/computer		
<2x a day	39	56.5
2-10x a day	27	39.1
>10x a day	3	4.3
total	69	100
Duration of laptop/computer usage per day		
<2 minutes	8	11.6
2-60 minutes	34	49.3
>60 minutes	27	39.1
total	69	100
Have had a laptop/computer for a long time		
<1 year	0	0
1-2 years	1	1.4
>2 years	68	98.6
total	69	100
head/neck position when using a laptop/computer		

straight neck	44	63.8
looking down	25	36.2
other	0	0
total	69	100
laptop/computer screen brightness		
Bright	5	7.2
Currently	57	82.6
Dark	7	10.1
total	69	100

Based on table 5.3 above, the highest frequency of laptop/computer use is <2x a day, totaling 39 people (56.5%), the most extended duration of laptop/computer use is 2-60 minutes totaling 34 people (49.3%), long time having a laptop or computer the most, namely > 2 years, amounting to 68 people (98.6%), the most neck or head position when using a laptop/computer is the neck perpendicular to 44 people (63.8%), the screen brightness when using a laptop/computer is the most, which is 57 people(82.6%).

5.4 Distribution of usage characteristicstelevision

Table 5.4 Distribution of characteristics of television usage

Variable	f	%
frequency of watching television		
don't have a television	15	21.7
<2x a day	45	65.2
2-10x a day	7	10.1
>10x a day	2	2.9
total	69	100.0
Time spent watching television per day		
don't have a television	15	21.7
<2 minutes	14	20.3
2-60 minutes	32	46.4
>60 minutes	8	11.6
total	69	100.0
Have had television for a long time		
don't have a television	15	21.7

<1 year	0	0
1-2 years	2	2.9
>2 years	52	75.4
total	69	100.0
head/neck position while watching television		
don't have a television	15	21.7
straight neck	36	52.2
looking down	18	26.1
other	0	0
total	69	100
television screen brightness		
don't have a television	15	21.7
Bright	11	15.9
Currently	43	62.3
Dark	0	0
total	69	100

Based on table 5.4 above, the highest frequency of watching television is <2x a day, totaling 45 people (65.2%), the longest watching television duration is 2-60 minutes totaling 32 people (46.4%), the longest having a television is >2 years counting 52 people (75.4%), the position of the neck or head when watching television is the most upright necks amounted to 36 people (52.2%), the highest brightness of the television screen is moderate amounting to 43 people(62.3%).

5.5 Association using mobile phonewith primary headache

Table 5.5 Usage associationwith primary headache

frequency of cell phone use	headache		p
	TTH	Migraine	
do not have			0.519
<2x a day	0	0	
2-10x a day	21	3	
>10x a day	35	10	
total	56	13	
Duration of cellphone	TTH	Migraine	p

use per day			
do not have			0.822
<2 minutes	1	0	
2-60 minutes	18	5	
>60 minutes	37	8	
total	56	13	
Have you had a cellphone for a long time?	TTH	Migraine	<i>p</i>
do not have			1,000
<1 year	1	0	
1-2 years	0	0	
>2 years	55	13	
total	56	13	
head/neck position when using a cell phone	TTH	Migraine	<i>p</i>
do not have			0.422
straight neck	8	3	
looking down	48	10	
other	0	0	
total	56	13	
phone screen brightness	TTH	Migraine	<i>p</i>
do not have			0.059
Bright	6	0	
Currently	38	13	
Dark	12	0	
total	56	13	

(p=0.059).

5.6 Usage relationship laptop/computer with primary headache

Table 5.6 Usage relationship laptop/computer with primary

frequency of use of laptop/computer	headache		<i>p</i>
	TTH	Migraine	
do not have			0.382
<2x a day	30	9	
2-10x a day	24	3	
>10x a day	2	1	
total	56	13	
Duration of laptop/computer usage per day	TTH	Migraine	<i>p</i>
do not have			0.278
<2 minutes	7	1	
2-60 minutes	25	9	
>60 minutes	24	3	
total	56	13	
Have had a laptop/computer for a long time	TTH	Migraine	<i>p</i>
do not have			1,000
<1 year	1	0	
1-2 years	0	0	
>2 years	55	13	
total	56	13	
head/neck position when using a laptop/computer	TTH	Migraine	<i>p</i>
do not have			0.756
straight neck	35	9	
looking down	21	4	
other	0	0	
total	56	13	
laptop/computer screen	TTH	Migraine	<i>p</i>

Based on table 5.5, the statistical analysis results using the chi-square test showed no significant association between the frequency of cell phone use and primary headache (p=0.519). There was no critical association between the duration of cell phone use and primary headache (p=0.822). There was no meaningful association between the time of having a cellphone and primary headache (p=1,000). There was no significant association between the position of the neck or head when using a mobile phone with primary headache (p=0.422). There is no meaningful association between cellphone screen brightness and primary headaches

brightness			
do not have			0.185
Bright	5	0	
Currently	44	13	
Dark	7	0	
total	56	13	

Based on table 5.6, the chi-square test's statistical analysis results showed no significant association between the frequency of laptop/computer use and primary headache ($p=0.382$). There was no critical association between laptop/computer use duration and primary headache ($p=0.278$). There was no association between the length of time having a laptop/computer with primary headaches ($p=1,000$). There was no association between the position of the neck or head when using a laptop/computer with primary headache ($p=0.756$). There was no association between screen brightness when using a laptop/computer and primary headache ($p=0.185$).

5.7 Association of television use with primary headache

Table 5.7 Association of television use with primary headache

Frequency of watching television	Headache		<i>p</i>
	TTH	Migraine	
do not have	14	1	0.204
<2x a day	36	9	
2-10x a day	4	3	
>10x a day	2	0	
total	56	13	
Time spent watching television per day	TTH	Migraine	<i>p</i>
do not have	14	1	0.150
<2 minutes	13	1	
2-60 minutes	24	8	
>60 minutes	5	3	
total	56	13	
Have had television for a long time	TTH	Migraine	<i>p</i>

do not have	14	1	0.282
<1 year	0	0	
1-2 years	2	0	
>2 years	40	12	
total	56	13	
head/neck position while watching television	TTH	Migraine	<i>p</i>
do not have	14	1	0.395
straight neck	28	8	
looking down	14	4	
other	0	0	
total	56	13	
screen brightness while watching television	TTH	Migraine	<i>p</i>
do not have	14	1	0.352
Bright	8	3	
Currently	34	9	
Dark	0	0	
total	56	13	

Based on table 5.7, the analysis results using the chi-square test showed no association between the frequency of watching television and primary headaches ($p=0.204$). There was no association between television viewing duration and primary headache ($p=0.150$). There was no association between the time spent on television and primary headache ($p=0,282$). There was no association between the position of the neck or head while watching tv with primary headache ($p=0.395$). There was no association between television screen brightness and primary headache ($p=0.352$).

III. Discussion

6.1 Distribution of subject characteristics study

In this study, the respondents amounted to 69 students of the Faculty of Medicine, Baiturrahmah University class 2017. Electronic media in the form of cellphones were used by 69 respondents (100%), and for those who used laptops/computers were 69 people (100%). In contrast, 54 people (78.3%) own a television, and 15 people do not own a television (21.7%). This study also obtained from 69 respondents who suffered from headaches totaling

69 people (100%), for the type of headache experienced by respondents for TTH amounted to 56 people (81.2%) and 13 people who experienced migraines (18.8%). There is an increase in mobile phones, laptops/computers, and televisions because all access during this pandemic uses electronic media, especially access to lectures carried out online, to minimize the number of cases of Covid 19. Research conducted by Kezia Oroh for the type of headache most experienced, namely TTH, amounted to 177 people (72.84%) migraine without aura was 42 people (17.28%), migraine with aura 21 respondents (8.64%). This study is also in line with research by Ika Nurwulandari in 2014 in adolescents in Surakarta; there were the most frequent headaches experienced, namely TTH totaling 14 people (29.2%) and migraines amounting to 12 people (25.0%).^{1,8} Research conducted by Kezia Oroh for the type of headache most experienced, namely TTH amounted to 177 people (72.84%) migraine without aura amounted to 42 people (17.28%), migraine with aura 21 respondents (8.64%). This study was also in line with research by Ika Nurwulandari in 2014. In adolescents in Surakarta, the most frequent headaches were experienced, namely TTH totaling 14 people (29.2%) and migraines amounting to 12 people (25.0%).^{1,8} Research conducted by Kezia Oroh for the type of headache most experienced, namely TTH amounted to 177 people (72.84%) migraine without aura amounted to 42 people (17.28%), migraine with aura 21 respondents (8.64%). This study is also in line with research by Ika Nurwulandari in 2014, in adolescents in Surakarta, there were the most frequent headaches experienced, namely TTH totaling 14 people (29.2%) and migraines amounting to 12 people (25.0%).^{1,8}

In this study, women experienced more headaches than men, with 50 people (72.5%) who experienced headaches while men amounted to 19 people (27.5%). This is because hormone levels, especially estrogen, when estrogen levels decrease, can trigger headaches.¹ This study is in line with research conducted by Dewi Sartika, namely the female gender experienced more headaches, amounting to 50 people (71.4%) and 20 men (28.6%).⁹

6.2 Distribution of usage characteristics of cellphone

Based on the characteristics of mobile phones, in

this study, it was found that the highest frequency of using mobile phones was >10x a day yours five people (65.2%). Duration >60 minutes 45 people (65.2%). Old have >2 years 68 people (98.6%). The position of the neck or head bowed or looked up 58 people (84.1%). Screen brightness with moderate intensity 51 people (73.9%). This study is in line with the research conducted by Dewi Sartika on the use of the highest frequency mobile phone that is > 10 times a day, totaling 52 people (74.3%). The highest mobile phone duration is >2 years for 65 people (92.9%). This research is also in line with research conducted by Ahmad Yusuf in 2019 on students of the Faculty of Medicine, University of Muhammadiyah Makassar; it was found that the highest frequency cellphone use was > 10x a day amounted to 35 people (58.3%). The highest duration of mobile phones was >60 minutes, totaling 37 people (61.7%). The highest cellphone duration is >2 years, totaling 48 people (80.0%). The highest position of the neck or head when using a cellphone is looking down at 31 people (51.7%). When using a cellphone, the screen's brightness is the highest, with moderate intensity, totaling 42 people (70.0%).^{9,10}

6.3 Distribution of usage characteristics of laptop/computer

In this study, the highest laptop/computer use frequency was <2x a day, totaling 39 people (56.5%). Duration 2-60 minutes 34 (49.3%). Old have >2 years 68 people (98.6%). Upright position 44 people (63.8%). Screen brightness with moderate intensity is 57 people (82.6%). This research is different from the research conducted by Ni Ketut in 2019, which obtained the longest duration of computer use, which is <3 hours totaling 30 people (55.6%).¹¹

6.4 Distribution of usage characteristics of television

In this study, the highest frequency of watching television was <2x a day, totaling 45 people (65.2%). Duration 2-60 minutes 32 people (46.4%). Old have >2 years 52 people (75.4%). Upright neck position 36 people (52.2%). Medium screen brightness 43 people (62.3%). This study is different from the research conducted by Hemalini in 2014.¹²

6.5 Association using a cellphone with primary headache

Based on the use of cellphones with primary headaches, in this study, the frequency of using cellphones with primary headaches ($p=0.519$), duration of cellphone use with primary headaches ($p=0.822$), duration of having cellphones with primary headaches ($p=1,000$), neck or head position when using a mobile phone with primary headache ($p=0.422$), screen brightness when using a mobile phone with primary headache ($p=0.059$).

This research is in line with the study conducted by Buschet al. There was also no significant association between the characteristics of cellphone use, namely the duration of cellphone use with primary headaches ($p = 0.184$). This study is also in line with research conducted by Surya with respondents, namely teenagers at SafiyyatulAmaliyah High School in 2012, where there is no significant relationship between the characteristics of electronic media use and primary headaches, where the frequency of cellphone use and the type of primary headache ($p = 0.100$), there was no significant relationship between the duration of cell phone use and the type of primary headache ($p = 0.100$). There was no meaningful relationship between the length of time having a cellphone and the type of primary headache ($p = 0.603$).

Based on research conducted by M. Hakim Darman, there is a limit to the intensity of electromagnetic wave radiation. The safest cellphone to use is a cellphone with low radiation intensity. All cellphones whose electromagnetic wave radiation intensity has been measured are still in a safe condition for health because they have not exceeded the safe limit of electromagnetic wave radiation intensity for body tissues, which is 10mW/cm^2 . Experts reveal that the radiation generated by mobile phones is not one hundred percent can cause health problems for humans. According to WHO, the impact of high-voltage electromagnetic waves or cellphones is not dangerous as long as the emission is negligible. Researchers the KraeftensBekaempelse interviewed 427 Danes with brain cancer and 822 people without brain tumors about cell phone use. The study results clearly show that mobile phones do not increase the risk of brain cancer at all.^{15,16}

6.6 Association between laptop/computer use and primary headaches

In this study, the frequency of laptop/computer use

with primary headaches ($p=0.382$), duration of laptop/computer use with primary headaches ($p=0.228$), duration of having a laptop/computer with primary headaches ($p=1,000$), position neck or head when using a laptop/computer with primary headache ($p=0.756$), screen brightness when using a laptop/computer with primary headache ($p=0.185$).

This research is in line with the study conducted by Busch et. al. There was no significant association between laptop/computer use duration and primary headache ($p=0.430$). This research is also in line with a study conducted by Surya with respondents, namely teenagers at SafiyyatulAmaliyah High School in 2012; there is no relationship between using a computer a day and the type of primary headache.^{13,14}

6.7 Association of television use with primary headache

In this study, the frequency of watching television with primary headache ($p=0.204$), duration of watching tv with primary headache ($p=0.150$), duration of having a tv with primary headache ($p=0.282$), neck or head position while watching television were found with primary headache ($p=0.395$), television screen brightness with primary headache ($p=0.352$).

This research is in line with the research conducted by Busch et al. there was no significant relationship between television viewing duration and primary headache ($p=0.140$). This study is also in line with research conducted by Surya with respondents, namely teenagers at SafiyyatulAmaliyah High School in 2012; there was no significant relationship between watching television a day and the type of primary headache ($p = 0.899$).^{13,14}

According to Yao et al., 2012 the recommended distance from electronic media to be safe from electromagnetic waves is 50-70 cm or with a horizontal angle of 40 degrees and a vertical angle of 15 degrees or less.

Headaches are not only caused by electromagnetic waves but can also be caused by stress, where stress is one of the most common factors that aggravate headaches. Research reports that headaches are triggered by an increased incidence or increased pressure in everyday problems during the hours or

days before the attack, with increased tension, irritability, and fatigue occurring one or more days earlier. According to Nash and Thebarga, sensitivity to stress was also associated with increased headache duration. Hormonal changes can also sometimes interact with psychological factors and are related to the timing of attacks.

IV. Conclusions and recommendations

This study found:

1. The distribution of the characteristics of research subjects respondents mostly used mobile phones 69 people (100%), laptops/computers 69 people (100%), television 54 people (78.3%), experienced headaches 69 people (100%), TTH headaches 56 people (81.2%), gender 50 people (72.5%)
2. Most mobile phone use in terms of frequency >10 times a day 45 people (65.2%), duration >60 minutes 45 people (65.2%), duration of having >2 years 68 people (98.6%), looking down or looking up 58 people (84.1%)., moderate screen brightness 51 people (73.9%).
3. The most use of laptops/computers in terms of frequency <2x a day 39 people (56.5%), duration 2-60 minutes 34 people (49.3%), duration of having >2 years 68 people (98.6%), upright neck position 44 people (63.8%), the highest screen brightness was 57 people (82.6%).
4. The highest use of television in terms of frequency of watching television <2x a day 45 people (65.2%), duration 2-60 minutes 32 people (46.4%), duration of having >2 years 52 people (75.4%), upright neck position 36 people (52.2%), medium brightness 43 people (62.3%).
5. This study showed no significant relationship between hand trees and primary headaches regarding frequency, duration, length of possession, position, and brightness with a value ($p = > 0.05$).
6. There was no significant relationship between the use of laptops/computers with primary headaches in terms of frequency, duration, length of stay, position, and brightness with a value of ($p=>0.05$).
7. There was also no significant relationship between the use of television with primary headaches in terms of frequency, duration, length of possession, position, and brightness

with a value of ($p=>0.05$).

Regarding the current debate regarding the relationship of electronic media use with primary headaches, the authors could not show any significant relationship between electronic media use and primary headaches. It is necessary to do further research on the relationship between the use of electronic media with more primary headaches so that the research results are better.

For those who use electronic media as well as the distance from electronic media, namely with a distance of 50-70 cm or with a horizontal angle of 40 degrees and vertically 15 degrees or less and it is recommended to be more careful in using electronic media because the effects of using electronic media also have an impact on fatigue eyes, don't spend too much time busy using electronic media such as playing games or playing social media which feels like the harm is greater than the benefits, fill your spare time with dhikr to Allah or reading the Qur'an so that our time is not useless and use this electronic media as a field for us to get a reward with Allah by doing things that are beneficial for everyone.

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