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BEHAVIOR CHARACTERIZATION OF USE OF MOBILE PHONES WHICH POTENTIALLY CAUSE HEALTH PROBLEMS OF ELEMENTARY SCHOOL-AGE CHILDREN IN RURAL AND URBAN AREAS

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ABSTRACT

Introduction: The development of communication technology meets a siginificant advancement, and mobile phones are part of it. Mobile phones are used not only by adults but also by children, including elementary school-age children. Children in using mobile phones have different behavior based on their social, economic and cultural differences. Some behaviors of children in using mobile phones have a risk of health problems. **Objective:** The purpose of the study was to characterize the behavior of the use of mobile phones in elementary school-age children which could potentially cause health problems in rural and urban areas **Methods:** This is a descriptive study using a cross-sectional design. The study involved 60 children and their parents in urban and rural elementary schools. Data were collected by questionnaire (there were 13 questions) using the Google form application (close-ended questionnaire) from the population taken by the nonprobability sampling method. The data obtained were analyzed using descriptive analysis.. **Result:** The results found that the possession of mobile phones, lighting, place and duration of use mobile phones were behaviors that descriptively showed that there were differences between children from rural and urban elementary schools. The behavior of time using mobile phones, body position, alignment and distance of the mobile phone to the head or eye, the purpose, tool and the place where to use the cellphone, both groups have the same percentage. **Conclusion:** Quantitatively, there are differences and similarities in behavior in using mobile phones between children from rural and urban elementary schools ools.

ABSTRAK

Latar belakang: *Perkembangan teknologi komunikasi saat ini begitu peasat salah satunya adalah mobile phones Mobile phones tidak hanya digunakan oleh orang dewasa tetapi juga oleh anak-anak, termasuk anak usia sekolah dasar. Anak-anak dalam menggunakan mobile phones memiliki perilaku yang berbeda berdasarkan perbedaan sosial, ekonomi dan budaya mereka. Beberapa perilaku anak dalam menggunakan mobile phonesl memiliki risiko gangguan kesehatan.* ***Tujuan:*** *penelitian ini bertujuan untuk melakukan karakterisasi perilaku pemakaian mobile phones pada anak usia sekolah dasar: yang berpotensi menyebabkan gangguan kesehatan..* ***Metode:*** *penelitian deskriptif ini menggunakan pendekatan crossectional pada populasi di SD perkotaan dan SD pinggiran (pedesaan). Data dikumpulkan secara daring memakai aplikasi goegle form (close ended questionnaire) pada 60 responden (oran tua) dari kedua populasi (masing-masing 30 responden) yang diambil dengan metode non-probability sampling. Data yang diperoleh dilakukan analisis menggunakan analisis deskriptif.* ***Hasil:***. *Kepemilikan mobile phones, pencahayaan, tempat dan lama menggunakan adalah prilaku yang menunjukkan adanya perbedaan antara anak dari SD pinggiran dan SD perkotaan. Prilaku kapan waktu menggunakan mobile phones, posisi tubuh, kesejaran dan jarak mobile phones terhadap kepala/mata, tujuan dan alat serta tempat dalam menggunakan mobile phones kedua kelompok memiliki prosentase yang sama.* ***Kesimpulan:*** *secara kuantitatif ada perbedaan dan persamaan prilaku dalam menggunakan mobile phones antara anak dari SD pinggiran dan SD perkotaan.*

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Introduction:

A mobile phone or smartphone is an electronic telecommunication device with the same capability as a conventional telephone but is carriable anywhere and does not need to use cables. A smartphone is also referred to as a handphone or cellular phone with capabilities like mini computers with flexible design and use. With the development of digital technology, mobile phones are now also equipped with a various features such as capturing radio and television broadcasts, audio and mp3 player software, camera, games and internet service. (Nurhidayah, 2018)

A mobile phone is one of the many communication tools currently developing very rapidly and widely used by humans/society. A mobile telephone is one of the many communication devices currently overgrowing and is widely used by humans/communities. The use of mobile phones in the community is not only limited to adults but also widely used among children (Pebriana, 2017). The high use of mobile telephon in children is allegedly because of entertainment applications that are highly preferred by children, such as video game (Nurrachmawati, 2014).

The use of mobile phones among children today is increasingly worrying because of their improper use and tends to be excessive, so that it gives bad impacts for its users. The use of mobile phones that are not appropriate will lead to many problems. One of these problems is the occurrence of health problems from small to big levels. Among the health problems that occur from the improper use of mobile phones is eye problems, which can be in the form of reduced visual acuity, blurred vision, dry eyes and eye pain (Pravita, 2010; Rudhiati F, Apriany D, 2015). Other health problems that can occur due to improper use of mobile phones are sleep difficulties and hearing loss.

One of the causes of health problems by the use of mobile phones is the radiation (electromagnetic radiation in the form of microwave radiation) emitted by mobile phones that can affect their users. The radiation emitted by mobilephone is very low radiation. The wavelengths of mobile phone radiation range from 900 Mhz to 1900 Mhz. The radiation is higher when compared to the radiation produced by SUTET (Extra High Voltage Air Channel) which only causes radiation of 50 Hz (Yoanita et al., 2016). Thus, radiation from mobile phone was included in low-dose radiation, which was radiation with a dose of less than 200 mGy (Supriyadi, Prija TKS, 2018).

This study aims to characterize the behavior of the use of mobile phones in elementary school-age children in rural and urban areas.

Methods:

This is a descriptive cross-sectional research. The research has received ethical approval from "Health Research Ethics Committee" Health Science Faculty, University of Muhammadiyah jember with a letter number 297/KEPK/FIKES/2002.

The research population was parents of elementary school children aged of 7-12 years. The target population is the parents of students from the Muhammadiyah Jember elementary school and SDN (State Elementary School) Bintoro 2 Jember aged 7-12 years. The respondents (samples) are the parents of students from both elementary school institutions with inclusion criteria as follows: parents of elementary school students (grades 1 to 6), male or female students, android mobile phone possession in their family, good health during the research, and willingness to be respondents. Exclusion criteria were respondents using mobile phones but not their own. The research involved 60 respondents who were determined by nonprobability sampling (purposive sampling technique). The variable of this study was the behavior of elementary school age children in using mobile phones.

Before the research was conducted, an examination was made on research ethics. Research data were collected using survey method conducted online using Goegle form

Jurnal Kesehatan dr. Soebandi

application. The form was preceded by an explanation of the research process and request for informed consent. Then the respondents were requested to immediately fill out the questionnaire and send it back to the researcher. The questionnaire consisted of questions related to children's behavior when using mobile phones. The data obtained were then recapitulated and analyzed using descriptive analysis.

Results:

Result of this research shown description of respondents and distribution of the respondent behavior in using mobile phones

Table 1. The description of respondents

VARIABLES		Urban Elementary School		Rural Elementary School	
		f	%	f	%
Age	<6	1	3,3	0	0
	6.1 - 7	6	20	1	3,3
	7.1 - 8	3	10	8	26.7
	8.1 --9	4	13.3	10	33.3
	9.1 - 10	3	10	5	16.7
	10.1 - 11 or >	13	43.3	6	20
Sex	Male	17	56.7	20	66.7
	Female	13	43.3	10	33.3
Education grade of parent	Elementary school / No school	1	3,3	5	16.7
	Junior high school	1	3,3	17	56.7
	Senior high school	4	13.3	6	20
	Graduate or higher	24	80	2	6.6
Job of parents	Not have a job	0	0	5	16.7
	Farmers	2	6.6	15	50
	Government employees	18	60	2	6.6
	Private employees	10	33.3	8	26.7

Table 1 shows the distribution of respondents according to their age and gender, education and ocupation parents. Age and gender more than 8 years old. Parents' education for urban elementary school has more undergraduate education, whereas rural elementary school have more junior high school. Parents' jobs for urban elementary school were mostly as state employees while rural elementary school were more farmers and private employees.

Table 2. Distribution of the respondent behavior in using mobile phones (n = 60)

Behaviour			f	%
How long was the mobile phone owned by the family	Urban Elementary School	>5 years	23	76
	Rural Elementary School	2-3 years	15	50
How long have children known or used a mobile phones	Urban Elementary School	3-4 years	11	36,7
	Rural Elementary School	2-3 years	15	50
Who is the owner of the mobile phone being used	Urban Elementary School	The child's own	5	16,7
		Parents	22	73,3
	Rural Elementary School	Sendiri	0	0
		Parents	25	83,3

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Behavior			f	%
Duration of mobile phone use in one use	Urban Elementary School	< 1 hours	17	56,7
	Rural Elementary School	1-2 hours	16	53,3
Duration of time the use of mobile phone in a day	Urban Elementary School	2-3 hours	9	30
	Rural Elementary School	3-4 hours	16	53,3
The most time using a mobile phone	Urban Elementary School	After doing homework	8	26,7
		When school holidays	8	26,7
		go home	4	13,3
		Every chance	10	33,3
	Rural Elementary School	After doing homework	6	20
		When school holidays	4	13,3
		go home	8	26,7
		Every chance	12	40
Respondent position when using a mobile phone	Urban Elementary School	sitting	16	53,3
	Rural Elementary School	sitting	15	50
Mobile phone alignment to the body	Urban Elementary School	Eye or head level	50	50
	Rural Elementary School	Eye or head level	18	60
Distance of the mobile phone from the eye	Urban Elementary School	20 – 30 cm	13	43,3
	Rural Elementary School	20 – 30 cm	15	50
The purpose of children using mobile phones	Urban Elementary School	to learn	10	33,3
	Urban Elementary School	to comunication	4	13,3
		To play the game	14	46,7
	Rural Elementary School	to learn	7	23,3
		to comunication	2	6,6
		To play the game	20	66,7
Place to use mobile phones	Urban Elementary School	At home	26	86.,7
	Rural Elementary School	At home	17	56.7
		Friend's house	10	33,3
Room lighting when using a mobile phone	Urban Elementary School	bright	23	76,7
	Rural Elementary School	Dim	14	46,7
		Bright	12	40
Tool/accecoris when using a handphones	Urban Elementary School	nothing	21	70
	Rural Elementary School	nothing	25	83,3

Table 2 shows that some of the children's behaviors in using mobile phone have similarities and some have differences. The highest percentage of children's behavioral similarities were mobile phone ownership, The most time using a mobile phone, Distance of the mobile phone from the eye or head, body position, The purpose of children using mobile phones, Place to use mobile phones, and use of assistive devices when using a mobile phone; while the different behavior was duration of time the use of mobile phone in a day, and room lighting.

Discussion:

Science, technology and art today have been developing very rapidly, which directly or indirectly give impacts on all aspects of human life. The rapid development of science and technology affects the field of communication and information, one of which causes changes in people's communication styles, related to the communication tools used.

Mobile phones are the most widely used communication tools in the community today. Mobile phones are now in the form of smartphone which is equipped with a variety of sophisticated features, such as

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YouTube, Instagram, Facebook, WhatsApp, and, of course, the game features and various animations that children really like. There are differences in the use of mobile phones between adults and children. Adults people use cellular phones for communication tools, searching for information or browsing, YouTube, playing games, or others. Meanwhile, the use of mobile phones by early childhood usually limits only as a medium of learning, playing games, and watching animation (Rozalia MF., 2017). This study tried to characterize the behavior of elementary school age children in the use of mobile phones that are associated with their socioeconomic conditions and risks to health. The study involved 60 elementary school age respondents in elementary schools located in rural areas and elementary schools located in urban areas. The difference in taking respondents is intended to obtain the socioeconomic differences of the respondents.

The results of this study found several behavioral characteristics of elementary school age children either in rural or urban school. Among the characters of the behavior of the mobile phone usage were directly related to health risks, namely: the ownership of the mobile phone used, duration at a time of using mobile phone, the use of mobile phone in a day, the time most frequently used for using mobile phone, body position in using mobile phone, the position/alignment of mobile phone to body, distance of mobile phone toward eyes/head, lighting when using mobile phone, purpose of using mobile phone, place when using mobile phone, and tools when using mobile phone.

Some of the characteristics of a child's behavior in using the mobile phone i.e. ownership of the mobile phone, lighting, place, and length of time using a mobile phone are behaviors that descriptively indicate the differences between children from rural and urban elementary schools. This certainly can be related to socio-economic factors and community culture. Meanwhile, time most often used for mobile phone, body

position (sitting or lying), position/alignment of mobile phone, distance of mobile phone to body, purposes of using mobile phone, assistive devices when using mobile phone, and place of using mobile phone between the two groups had similarly the highest percentage. These children's behaviors certainly cannot be related to socio- economic factors and community culture. Social factors (education, home environment, culture, economy, etc.) are related to several behaviors of mobile phone use in elementary school age children. Education factor is one of the causes because behavior is greatly influenced by his knowledge from both students themselves and their parents. This is consistent with the concept or theory that knowledge is a very important domain for the formation of one's behavior (Notoatmodjo S., 2010).

Social factors of urban society are related to several problems, including parents' lack of time to pay attention to family/children, lack of control, and communication with their children. However, in general, they have advantages where their education/insight, employment and economic level are better. This is certainly different from the socioeconomic and social-culture communities of the rural areas, where their education/insight and economical level are lower. Most of them generally work in the agriculture/plantation sector and a small number are self-employed. This is supported by general data from respondents in this study.

Some of the children's behaviors in using mobile phones have risks to health, including: the child's body position (sitting or lying), the distance of the mobile phone to the body, the alignment of the mobile phone to the body/head area, room lighting, use of assistive devices, and length of use of the mobile phone. The related health risks include eye health disorders (reduced eye acuity, blurred or double vision, dry eyes, eye fatigue and eye pain (Pravita, 2010; Rudhiati F, Apriany D, 2015). These eye health problems can be caused by several waves on the screen that is sigthed too long.

Jurnal Kesehatan dr. Soebandi

Accordingly, light X, ultraviolet light, microwaves, very low frequency (VLF) electromagnetic radiation, and extremely low frequency (ELF) electromagnetic radiation will be captured by the cornea of the eye. As the light is transmitted to the lens, the lens can be damaged (Pravita, 2010). The use of mobile phones such as for playing video games with a long period of time makes the ciliary muscle always affect the lens to become convex. This is because it always views close objects which make it less sensitive to distant objects. Therefore, this condition leads to problems in sharpness of vision (James, 2016). This is in accordance with previous research which found that the screen time factor (duration) in playing video games for more than 2 hours per day has a significant relationship with the sharpness of vision (Lely IP, Woodford B S, Joseph, 2009). This is also confirmed by the statement that the environmental factor which plays the most role in myopia is the existence of continuous close work activities. The decrease in visual acuity depends on the length of duration of exposure with the monitor, so it is suggested that playing video games not exceed 2 hours every day (Pravita, 2010).

Similarly, the results of other studies also confirm that the use of mobile phones in elementary school age children is in fact mostly for playing, especially games. From another study it was found that almost all parents (94%) stated that their children used to technological devices for playing games. Most children (63%) spent a maximum of 30 minutes playing a game at once. Meanwhile, 15% of respondents stated that children played games for 30 to 60 minutes and the rest could interact with a game for more than an hour (Delima R., Arianti NK, 2015).

The siginifcances of this research are as follows:

1. Obtaining data on the behavior of the use of mobile telephon in elementary school-age children that can potentially cause health problems in rural and urban areas.
2. As a basis for formulating a model for handling problems, in this case the problem of the potential for health problems due to the use of mobile phones in elementary school-age children.

Acknowledgment

Conclusion:

The behaviors of children in using mobile phones that is at risk for health problems are lack of lighting, duration of time using mobile phones, body position (sitting or lying down), alignment of mobile phones to head/eyes, and improper distance of mobile phones to eyes/heads. quantitatively, there are differences and similarities in behavior in using mobile phones between children from rural and urban elementary schools

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