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**ORIGINAL SCIENTIFIC ARTICLE**

**THE RELATIONS OF USING DIGITAL MEDIA AND PHYSICAL ACTIVITY WITH THE PHYSICAL FITNESS OF 4TH AND 5TH GRADE PRIMARY SCHOOL STUDENTS**

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Authors’ Contribution: A – Study design; B – Data collection; C – Statistical analysis; D – Manuscript Preparation; E – Funds Collection

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**Abstract**

The study purpose was to determine the relations of using digital media and physical activity with the physical fitness of 4th and 5th grade students of the state of Ngablak Elementary School in the academic year 2019/2020, Turi, Sleman Regency both individually and wholly.

**Materials and methods.** This research is a correlative study, which aims to find out whether there is a relationship between independent variables and dependent variables. The population of this study was 49 students from 4th and 5th grade of the state of Ngablak Elementary School in the academic year 2019/2020, Turi, Sleman. All of them were used as research subjects. The data collection technique is surveys. The surveys are done by applying collection techniques using surveys, tests and measurements. The instrument used in this study was a questionnaire both for digital media variables and physical activities, as well as the physical fitness test for Indonesian physical fitness variables. Data analysis techniques are regression and correlation analysis, both in simple way and double way through the prerequisite tests for normality and linearity.

**Results.** The results showed that at the level of 5% error means the correlation between the use of digital media and physical activity and the physical fitness of students in 4th and 5th grade of the state of Ngablak Elementary School in 2019/2020 academic year Turi, Sleman Regency, it was $F_{\text{count}} = 11.072 > F_{\text{table}} = 3.20$.

**Conclusions.** Since $F_{\text{count}} > F_{\text{table}}$, it can be concluded there is a significant relation between the use of digital media and physical activity and physical fitness.

**Keywords:** digital media, physical activity, physical fitness, elementary school.

**Introduction**

As the age progresses, technology develops rapidly, therefore everyone is required to be able to keep up with these developments (Limin et al., 2021). There are many positive impacts of this development. The positive impact of the development of science and technology enables everyone to obtain abundant, fast, and easy information from all over the world, penetrating space and time, for example with digital media (Wu, Wang, & Evans, 2019). The rapid development of digital media, it turns out that the psychological situation of children also experiences various reactions (Livingstone et al., 2017). Some use smartphones to add value to school lessons, and some make students lazy to move and often waste time in front of smartphones. In addition, the large number of children using digital media makes them less sociable (Cunningham, 2018). There are actually a lot of sports games that can make a child healthy, but games in digital media e.g. smartphones dominate more (Kristiyanto et al., 2020). This is what makes the child’s movements inhibited because the child is already sleepy on the smartphone (Handa & Ahuja, 2020). Physical activity outside the hours of the lesson as a reference becomes unusual for the children, this is actually on the basis of a rationing philosophy that explains the involvement of the child in the care of games, gymnastics, joint activities, and others...
To stimulate the development of efficient children's movements which will later be useful for mastering various skills. These skills can be in the form of basic skills, namely: walking, running, throwing, and jumping as well as special skills such as swimming and gymnastics. In the end, these skills will be used by children in everyday life (Bidzan-Bluma & Lipowska, 2018). Physical education teachers cannot know and directly monitor the physical activities of their students outside of school.

Development of basic movement skills and physical abilities in accordance with the needs of growth and development in a multilateral manner according to the age of students can be the basis for the development of sports movement skills (Sutapa et al., 2020). Physical activity is very important for a person, so everything that supports a good level of physical fitness is strived to be implemented since early childhood (Pramandhika, Rumin, & Kusuma, 2020). Therefore, the government requires the inclusion of physical education subjects in the education level from Elementary School, Junior High School, and Senior High School. Elementary school age is a very decisive period in the possibility of achieving growth and development in the future. The role of physical education as an educational tool is to achieve overall goals. The purpose of physical education is not an activity in itself, but to develop a student's potential through physical activity (Castelli & Mitchell, 2021). So that physical activities carried out during physical education can improve the quality of students' physical fitness, but if they are not active during the learning process.

A person with good physical fitness will be able to carry out daily activities relatively longer when compared to someone who has a low level of physical fitness (Nasrulloh et al., 2020; Nugroho et al., 2021). Physical fitness is very important for someone, so everything that supports a good level of physical fitness, is strived to be applied since early childhood. According to the physical education curriculum, Physical Education is 2 integral parts of education as a whole that is able to develop a child or individual as a whole in the sense that it includes physical, intellectual, emotional and moral spiritual aspects which in the learning process prioritize physical activity and habituation to a healthy lifestyle (Osipov et al., 2021).

Because a good level of fitness is the initial capital for elementary school age children to achieve further physical fitness. Good physical fitness will affect student learning activities, because students with good fitness status will be more enthusiastic in participating in the learning process (Gråstén et al., 2021). However, in reality, from the results of observations at the Ngablak public elementary school, students in the learning process are not allowed to bring digital media such as cellphones, laptops, tablets, and others. So that at rest time children can use rest time to do physical activities such as running, some are sitting while chatting with friends and some are eating. However, during the break, there are still few students who do physical activities.

### Table 1. Instrument Grid

| Variable | Factor | Indicator | Question Number | Number of Question |
|----------|--------|-----------|-----------------|--------------------|
| **Use of Digital Media** | | | | |
| Communication | | Use of digital media | 1,2 | 2 |
| | | Application use | 3,4 | 2 |
| | | The purpose of using media in communication | 5,6 | 2 |
| | | Frequency and duration of usage | 7,8 | 2 |
| | | Use of digital media | 9,10 | 2 |
| Education | | Application use | 11,12 | 2 |
| | | The purpose of using media in communication | 13,14 | 2 |
| | | Frequency and duration of usage | 15,16 | 2 |
| | | Use of digital media | 17,18 | 2 |
| | | Application use | 19,20 | 2 |
| | | The purpose of using media in communication | 21,22 | 2 |
| | | Frequency and duration of usage | 23,24 | 2 |
| Entertainment/Recreation | Physical Activity | The frequency of P.E. learning | 27 | 1 |
| | | The intensity of P.E. Learning | 29 | 1 |
| Physical activity at school | | Participation in P.E. Learning | 31 | 1 |
| | | Use of school breaks | 33,34* | 2 |
| | | Extracurricular activities at school | 25 | 1 |
| | | The frequency of P.E. learning | 28,35 | 2 |
| Physical activity outside of the school | | The intensity of P.E. Learning | 39,40,41 | 3 |
| | | Participation in P.E. Learning | 30,37 | 2 |
| | | Use of school breaks | 36*38* | 2 |
| | | Extracurricular activities at school | 26,32 | 2 |

Total: 41

Information: (*) negative statement item (-)
Materials and methods

Study participants

The population in this study were students of the state of Ngablak Elementary School, Turi District, Sleman Regency, with total of 51 students, namely 4th grade with 25 students and 5th grade with 26 students for academic year 2019/2020. The technique used in research sampling was incidental sampling, namely the technique of determining the sample based on the chance, i.e. anyone who incidentally meets the researcher can be used as a sample, if it is considered that the person who happened to be met is suitable as a data source.

Study organization

This study used an observational research design with survey methods and physical fitness test. Observational research is the research that does not manipulate or intervene in research subjects. The survey method of this research is a correlation study, using the survey method, while the data collection technique uses a questionnaire and the test uses the physical fitness test.

The instrument used in this study was a questionnaire. Compilers use a closed questionnaire so that high respondents choose several alternative answers available. Composers used a questionnaire with a Guttman scale. Research using the Guttman scale is carried out if you want to get a firm (consistent) answer to the problem being asked. Answers from respondents can be made the highest score “one” and the lowest score “zero” for alternative answers in the questionnaire, the compilers assign a category for each positive statement, namely Yes = 1 and No = 0, while the category for each negative statement, namely Yes = 0 and No = 1. The general information regarding the instrument can be shown in table 1 below.

Data collection was carried out by distributing the questionnaire directly by the compilers assisted by other colleagues, and the questionnaire then the researcher provided an explanation of the filling of the questionnaire in accordance with reality and honestly with the Guttman scale model, then the questionnaire was collected to the compilers. Physical fitness test is conducted during P.E. lesson hours.

Statistical analysis

To test the relationship between the independent variable and the dependent variable, the product moment correlation analysis was used. To provide an interpretation of this relationship, the following guidelines can be used:

Table 2. Interval Class Table

| Formula                  | Category     |
|--------------------------|--------------|
| X ≤ M – 1.5SD            | Very Less    |
| M – 1.5 SD < X ≤ M – 0.5 SD | Less         |
| M – 0.5 SD < X ≤ M + 0.5 SD | Enough      |
| M + 0.5 SD < X ≤ M + 1.5 SD | Good        |
| X > M + 1.5 SD           | Very Good    |

M = Average Value, S = Standard Deviation

Table 3. Variable Frequency Distribution of Digital Media Use

| No | Interval Class | Category | Frequency | Percentage |
|----|----------------|----------|-----------|------------|
| 1  | X = 6.51       | Very poor| 4         | 8.16%      |
| 2  | 6.51 < X = 10.45 | Poor     | 10        | 20.41%     |
| 3  | 10.45 < X = 14.40 | Enough  | 19        | 38.78%     |
| 4  | 14.40 < X = 18.35 | Good    | 13        | 26.53%     |
| 5  | X > 18.35      | Very good| 3         | 6.12%      |
|    | Total          |          | 49        | 100%       |

From above table, it can be easily seen with the histogram of digital media below:

Fig. 1. Variable Histogram of Digital Media Usage

Digital media is denoted by Xn, obtained a score with a maximum value of 21.00 and a minimum value of 3.00. The mean obtained is 12.43, the standard deviation is 3.99, the mode is 13.00 and the median is 13.00. Furthermore, the data are arranged in a frequency distribution based on the mean and standard deviation values obtained, which are divided into five categories, namely very good, good, enough, poor, and very poor. The calculation of the category norms for the use of digital media can be seen in the following table.

Table 4. Variable Frequency Distribution of Physical Activity

| No | Interval Class | Category | Frequency | Percentage |
|----|----------------|----------|-----------|------------|
| 1  | X ≤ 29.80      | Very poor| 2         | 4.08%      |
| 2  | 29.80 < X ≤ 46.29 | Poor     | 14        | 28.57%     |
| 3  | 46.29 < X ≤ 62.78 | Enough  | 20        | 40.82%     |
| 4  | 62.78 < X ≤ 79.26 | Good    | 9         | 18.37%     |
| 5  | X > 79.26      | Very Good| 4         | 8.16%      |
|    | Total          |          | 49        | 100.00%    |

From above table, it can be easily seen with the histogram of physical activity below:
Physical fitness is denoted by Y, the maximum score is 17 and the minimum score is 9. The mean obtained is 13.26, the standard deviation is 2.16, the mode is 12.00 and the median is 13.00. Furthermore, the data are categorized based on the standard norms of physical fitness test. The following is a table of variable frequency distribution of Indonesia's physical fitness tests obtained.

Table 5. Distribution of Physical Fitness Frequency

| No | Interval Class | Category  | Frequency | Percentage |
|----|----------------|-----------|-----------|------------|
| 1  | 5-9            | Very poor | 2         | 4.08%      |
| 2  | 10-13          | Poor      | 26        | 53.06%     |
| 3  | 14-17          | Enough    | 21        | 42.86%     |
| 4  | 18-21          | Good      | 0         | 0.00%      |
| 5  | 22-25          | Very good | 0         | 0.00%      |
|    | Total          |           | 49        | 100.00%    |

From above table, it can be easily seen with the histogram of physical fitness below:

From the table above, the Sig price of the digital media use variable is 0.200, the physical activity variable is 0.124, and the Indonesian physical fitness test variable is 0.070. It turns out that the Sig value of the three variables is all greater than 0.05, thus the hypothesis stating the sample came from a normal distributed population is accepted.

**Discussion**

Based on the results of the calculation, a significant relationship was obtained between the use of digital media and physical activity on the physical fitness test. Together, there is a significant relationship between the use of digital media and physical activity on physical fitness.
media and physical activity on physical fitness. The multiple correlation value between the use of digital media and physical activity on physical fitness together is 0.570. Based on hypothetical testing, it turns out that the correlation of the two independent variables together with the Indonesian physical fitness test is significant. The relationship given by the two independent variables together with the Indonesian physical fitness test is 0.570. The correlation value obtained is positive, so this means that the higher the use of digital media and one's physical activity, the better one's Indonesian physical fitness test will be. From the correlation coefficient also obtained a coefficient of determination of 0.325. This means that the two independent variables have a contribution of only 32.5%. While the remaining 67.5% is influenced by other variables not included in this study.

These results are in accordance with the research of Riso et al. (2019) that Children participating in SC had higher moderate-to-vigorous PA, vigorous PA and cardiorespiratory fitness than children not participating in SC. Overweight children had lower results in cardiorespiratory fitness and all weight-bearing fitness tests, and better results in handgrip strength test in comparison with normal weight children. Significant associations were found between body composition indices and physical fitness tests. PA level was associated with fat-free mass and physical fitness but not with fatness indices. In addition, research by Pope et al. (2019) explained that Intervention adherence was high (~86%), with a retention of 92.1%. Participants implemented health education tips 1-3 times per week. We observed experimental and comparison groups to have 4.2- and 1.6-min/day increases in moderate-to-vigorous PA (MVPA), respectively, at six weeks – partially maintained at 12 weeks. In both groups, similarly decreased body weight (experimental = -0.6 kg; comparison = -0.5 kg) and increased self-efficacy, social support, and intrinsic motivation were observed pre- and post-intervention.

In the current era, learning with digital media is no longer prohibited, even now, during the corona pandemic around the world, learning that was initially face-to-face was replaced with learning using digital media (Cesare et al., 2019). Students of 4th and 5th grade elementary school grade will be very happy if they hold gadget, now this should not be misused just for playing games or using social media, but actually it will be more useful when children are directed to use gadget to help in the learning they are going through. Due to the joy that exists when holding gadget, learning using digital media will also be fun, so this will be a driving factor for students in completing their tasks to achieve their goals. In physical education learning, digital media is very important, for example when the teacher gives the task “try to do the correct kicking motion”. Students can see examples by watching on YouTube, so that children will be more enthusiastic about practicing the information obtained from digital media to do assignments from their teachers.

The effective contribution given by the variable use of digital media and physical activity is 32.5% to the Indonesian physical fitness test. In the variable use of digital media, an effective contribution of 20.3% was obtained. While the physical activity variable gave an effective contribution of 12.2. It turns out that the contributions given from the two independent variables are not the same, namely that the variable use of digital media provides a greater contribution than physical activity.

Referring to the results above, it is suggested that in physical education learning in schools, the school provides concession for students to bring gadget to support the learning process. With digital media-based learning, learning will be more fun, and students will be more enthusiastic about participating in the learning process. In Physical Education learning, students will be more enthusiastic when doing physical activities, so that the level of physical fitness of the students will also be better. But beyond that there are still many other factors that contribute to Indonesia's physical fitness test such as the intensity of physical activity, frequency of exercise and others, which is 67.5%.

Conclusions

Based on the results of data analysis, hypothesis testing and discussion, it can be concluded that there is a significant relationship between the use of digital media on the physical fitness of 4th and 5th grade students of the state of Ngablak Elementary School in academic year 2019/2020, Turi, Sleman Regency. There is a significant relationship between physical activity on the physical fitness of 4th and 5th grade students of the state Ngablak Elementary School in academic year 2019/2020, Turi, Sleman Regency. Together, there is a significant relationship between the use of digital media and physical activity on the physical fitness of 4th and 5th grade students of the state of Ngablak Elementary School in academic year 2019/2020, Turi, Sleman Regency.

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Conflict of interest

All the authors of this research declare if there is no conflict of interest for this research.

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ВЗАЄМОЗВ’ЯЗОК ВИКОРИСТАННЯ ЦИФРОВИХ МЕДІА ТА ФІЗИЧНОЮ АКТИВНОСТІ З ФІЗИЧНОЮ ПІДГОТОВЛЕНІСТЮ УЧНІВ 4-ГО ТА 5-ГО КЛАСІВ ПОЧАТКОВОЇ ШКОЛИ

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Авторський вклад: А – дизайн дослідження; В – збір даних; С – статаналіз; Д – підготовка рукопису; Е – збір коштів

Метою дослідження було визначити взаємозв’язок використання цифрових медіа та фізичної активності з фізичною підготовленістю учнів 4-го та 5-го класів початкової школи штату Нгаблак 2019/2020 навчальному році.

Матеріали та методи. Це дослідження є корелятивним дослідженням, метою якого є з’ясувати, чи існує взаємозв’язок між незалежними та залежними змінними. У дослідженні прийняли участь 49 учнів 4-го та 5-го
Listyarini, A.E., Alim, A., Oktaviani, A.D., Putro, K.H., Kristiyanto, A., Margono, A., & Pratama, K.W. (2021). The Relations of Using Digital Media and Physical Activity with the Physical Fitness of 4th and 5th Grade Primary School Students. ТМФВ, 2021, том 21, № 3

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