



Comparison of Early Childhood Asthenopia Levels Between Traditional Marsitekka or Engklek Guess the Picture Games and Digital Games

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ABSTRACT

Gadgets it can be a problem when parents take the initiative to give gadgets to their children excessively which can result in Asthenopia (eye fatigue). The aim of this research is to find out how the level of asthenopia or eye fatigue in early childhood compares between the traditional game marsitekka or engklek GTP (Guess the Picture) and modern games. The research method used is experimental research using a mix method technique. Statistical tests use statistical analysis of the t test or difference test (t-test) and qualitative research is analyzed using Kohlberg theory. The results obtained is having an average difference with a value of 5,467, so this data shows that asthenopia in early childhood has a level of difference between traditional games and use of gadget set, with the level of asthenopia in traditional games being lower than in modern games. The impact of this research is expected to be one way to prevent the occurrence of Asthenopia in early childhood by developing traditional game models which are starting to be forgotten in the current technological era.

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1. INTRODUCTION

In the current era of modernization, technological developments are increasingly sophisticated. The development of games has changed from traditional games to technology-based games that use internet networks or are called online games. A game is a play activity that is controlled and characterized by mutually agreed rules and provides a learning experience for the players (Hayati & Putro, 2021).

Modern games are a form of gaming activity which is a development of traditional games. Modern games are games that originate from industry and generally use technology in their creation and play (Nur & Asdana, 2020). Meanwhile, traditional games are a national culture that has been played since ancient times and have great value for children in order to fantasize, be creative, exercise, which is also a means of practicing social life, skills, manners and dexterity (Revelation, 2022). The traditional creative game model is child-centered, with this learning model, which prioritizes traditional games, it will make it easier for children to understand their own local culture (Ulfah et al., 2024).

Online games are the latest innovation in visual-based games by utilizing technology such as gadgets. This online game is a game that has various challenges which of course attracts children's interest as a means of entertainment and adds new friendships and communities (Zahra, 2023). Children who ask their parents for gadgets, on average, use them to play online games. The number of gadget users in Indonesia is quite high, this can be seen from Indonesian telecommunications statistics data, the percentage of internet users aged 5 years and over has increased from around 25.84% to 50.92% in 2018, while in rural areas in 2014 around 8.37% increased to 25.56% in 2018 source from the Sub Directorate Communication and Information Technology, 2018 (Rahayu et al., 2021). Early childhood children who often use gadgets will result in children often forgetting their surroundings and will prefer to play using gadgets rather than playing with friends in the neighbourhood where they live (Ariston & Frahasini, 2018).

Gadgets It can no longer be separated from human life, from children to adults using gadgets in their daily lives. Gadgets can be the biggest problem in the era of globalization when parents have the initiative to give and buy gadgets for their children. According to Anggraeni in his research, using gadgets that exceed the time limit has risks to health, so the role of parents in accompanying and supervising gadget use is very important (Anggraeni, 2019). Behind the many benefits and advantages of using gadgets, it turns out that there are also many disadvantages and negative impacts, especially on health. Based on the research team's observations, it was found that children who are addicted to using gadgets to the point of losing track of time and have no limits on their use can also result in children developing asthenopia.

Asthenopia or eye fatigue is a collection of symptoms related to vision (visual), eye (ocular) and musculoskeletal problems. This term is often replaced with Computer Vision Syndrome (CVS) or Digital Eye Strain (DES), which means complaints triggered by prolonged use of digital devices (Pratama et al., 2021). Common complaints that often occur with tired eyes according to several studies are headaches, sore and/or itchy eyes, blurred vision, epiphora, dry eyes, double vision, photophobia, and the sensation of a foreign body in the eye (Yurika et al., 2022).

Children aged 1-4 years should not use or use gadgets for more than an hour (Lanca & Saw, 2020). PremKumar et al (2019) also revealed that the effect of using screens on a person depends on several factors and the most important factor is how long they spend looking at the screen. Long-term use can affect the frontal cortex of the brain and has almost the same

effect as cocaine (PremKumar et al., 2019). In Giri and Dharmadi's 2013 research, 81.4% of respondents who played PlayStation more than 10 hours per week experienced vision problems (Zogara, 2023). Based on research conducted by Gumunggilung et al (2021) it was found that 82.5% of respondents complained of asthenopia due to smartphone use.

Based on the research team's observations when conducting a field survey in one of the kindergartens in the city of Medan, which is an area with a majority of Batak ethnic groups, there were many children found who, when their parents came to pick them up from school, the children immediately asked for their parents' cellphones and gadgets. He immediately obeyed his son's wishes. This is done by parents so that children do not get fussy and disturb the activities their parents are doing, without paying attention to the impact that occurs when children use gadgets excessively. Therefore, in this modern and sophisticated era, a solution is needed that can prevent asthenopia in early childhood. Traditional games such as engklek and patok lele have begun to be forgotten.

In fact, traditional games are very good for various children's development and are very good for maintaining health and preventing various diseases, one of which is asthenopia. Therefore, the aim of this research is to find out how the level of asthenopia or eye fatigue in early childhood compares. between the traditional game Marsitekka or Engklek GTP (Guess the Picture) and modern games.

2. METHODS

This research uses mix method research with a sequential explanatory design and the model or design used is ADDIE (analyze, design, development, implementation, evaluation). The sampling technique used non-probability sampling in saturated sampling and a sample of 38 people was obtained. The data collection uses triangulation in the form of distributing questionnaires, observation and interviews as well as documentation. Data analysis in this quantitative research uses inferential statistical tests in the form of the Anova test and in qualitative research it is analyzed using Kohlberg theory. With stages using the concurrent embedded method with a cooperative model approach for processing quantitative data and the Miles and Huberman model approach for processing qualitative data. The instrument indicators in this research can be seen in **Table 1**.

Table 1. Instrumental indicators.

No	ASTENOPIA INDICATORS
1.	Eye fatigue: around the eyes feel sore, hot, red and dry
2.	Eye strain: the eyes feel pulled and the eyes water
3.	Vision problems: sensitivity to light, double or blurred vision
4.	The surface of the eye is disturbed: pain around the eyes
5.	Disorders in areas other than the eyes: pain in the head, neck feels tense, vomiting, nausea, back pain and pain in the waist and fatigue quickly
6.	Environmental factors (lighting intensity): dazzling lighting
7.	Ghostly view: letters look stuck together and wobbly
8.	Objects that are very close
9.	Size of the object being viewed: small objects require close viewing distance
10.	Long duration of Control vision
11.	Respondent characteristics (gender and age)

3. RESULTS AND DISCUSSION

The development of Marsitekka or Engklek GTP (Guess the Picture) products and Marsukkil or Patok Lele products as creative traditional games that can prevent asthenopia in early childhood has provided results which will be discussed in the following discussion.

3.1. Analysis Stage (Analyze)

The analysis stage is in the form of pre-planning or basic ideas about what kind of traditional game product will be developed. The choice to develop marsitekka or Engklek GTP (Guess the Picture) products and marsukkil or peg catfish game products was based on the widespread use of excessive gadgets which can result in asthenopia or eye fatigue in early childhood. Technology is currently developing rapidly and is starting to spread widely to early childhood education circles, so it is not surprising that many children prefer to play with gadgets at home all day and rarely play games that involve physical activity which is good for body health. Apart from that, children's use of gadgets also has an impact on reducing children's social interactions with friends and their environment.

Based on the results of these observations, it is necessary to develop traditional marsitekka or engklek game products GTP (Guess the Picture) and marsukkil game products or patok lele, so that children can become active again doing lots of physical activities, start learning and open up to their friends and environment and most importantly Children can also avoid excessive exposure to gadget monitor screen light which can cause asthenopia in early childhood.

3.2. Design Stage (Design)

This stage is divided into two things, namely:

a) Design of game tools

At this stage, the design of the game equipment is carried out, such as the marsitekka or engklek GTP (Guess the Picture) game, namely determining the footing base, background color, determining the shape of the footing box used, design and size. For marsukkil game tools or catfish stakes, namely choosing the material, size, color and protection so that it is safe for children.

b) Planning how to play

At this stage, planning is carried out on how to play, such as the marsitekka or engklek GTP (Guess the Picture) game, namely determining the box jump, theme and image, and for the marsukkil or catfish peg game, namely the selection of teams and the order of play.

3.3. Development Stage (Development)

a) Develop new products

The traditional game Engklek or in Batak language called Marsitekka is a game played individually by jumping over patterned boxes in sequence using one foot (Yani, 2017). The Engklek or marsitekka game has several benefits, namely to train speed, agility, strength, agility and balance. By playing this game, it is hoped that young students will be able to move without any obstacles or difficulties during their activities (Darmawati & Widyasari, 2022). The innovation from researchers in the traditional game marsitekka or engklek is engklek GTP (Guess the Picture), which is a traditional game made by printing the game in the form of a banner leaflet measuring 2X1 meter, this is done so that children do not have to look for land to be able to draw a box. or look for a large field to be able to make a crank box so that this game can be easier and more practical to make and is environmentally friendly because there is no need to draw or dirty the area around the game. At the end of the game, after the child jumps on the engklek box without gacuk, the child will be challenged to name the picture that the child chose according to the marsitekka or engklek theme which has been designed to be as attractive as possible. If the child can answer the question,

The Patok Lele game or in Batak language called Marsukkil is a game that tests your dexterity in catching and hitting small pieces of wood with a wooden stick as a bat (Simamora & Sibarani, 2022). We made the traditional marsukkil or peg leleini game by adapting it to young children, namely using two pieces of wood of different sizes that are appropriate for the child's height and two supports so that they don't have to look for ground for the wood to stand on or a hole to be able to place the wood. The way we play is that there is a hitter and one child who catches the stick that is hit and is done as a team and grabs the wooden stick that is thrown. If a team can catch it then the team will get a point, but if the team doesn't catch it then the throwing team will be swapped.

b) Create instruments to measure product performance

The instruments referred to here are product suitability indicator questionnaires as well as product attractiveness and convenience questionnaires that use a Likert scale in the final assessment.

c) Product validation

Before the finished product can be used, the finished product is evaluated through expert calculations to find out and obtain data about the product's results in terms of appearance and content so that deficiencies can be identified and what needs to be improved in the product.

3.4. Implementation Stage (Implementation)

After revisions have been made to the product at the development stage and it is declared feasible, the finished product is implemented for early childhood which was carried out at Kindergarten ABA 06 Medan can be considered to have gone well because they were able to participate in activities according to the scheduled timeline. The first step in collecting experimental data was carried out in July by direct observation of children in Kindergarten ABA 06 by dividing the children into two groups, namely the control group, gadget-based learning in the games candy crush and angry birds. Then the experimental group learned with traditional Marsitekka or Engklek GTP (Guess the Picture) and Marsukkil or Patok Lele. After obtaining research data, the next step is to carry out data analysis with the results. The results of the average comparison of modern games with traditional games are as shown in **Figure 1**.

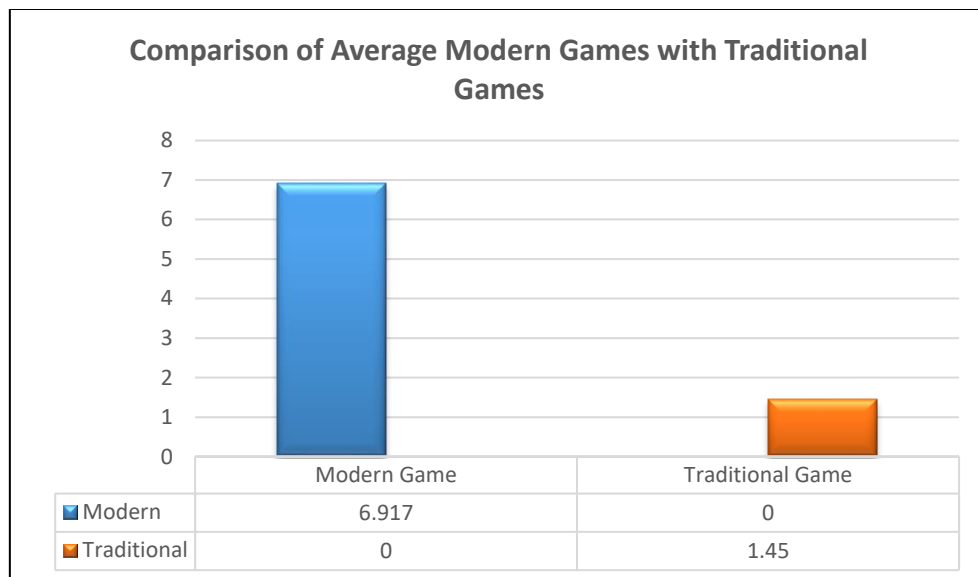


Figure 1. Results of average differences between modern games and traditional games in preventing asthenopia in early childhood.

The results achieved in the graphic results are that there is a significant average difference between the control group with a value of 6.917 and the experimental group with a value of 1.45 with average difference with a value of 5.467, so that traditional games can also be used as a solution to prevent asthenopia in early childhood. The traditional game Marsitekka or Engklek GTP (Guess the Picture) succeeded in diverting children from using gadgets to traditional games because this game prevents excessive light reflections hitting the child's eyes which can cause asthenopia. Marsitekka or Engklek GTP (Guess the Picture) often involves active movement outdoors, which can help reduce prolonged exposure to monitor screens and can also help maintain children's eye health by reducing the risk of eye strain and vision problems associated with excessive exposure to screens. The difference in average results between the control group and the experimental group in preventing asthenopia in early childhood can be seen in **Figure 2**.

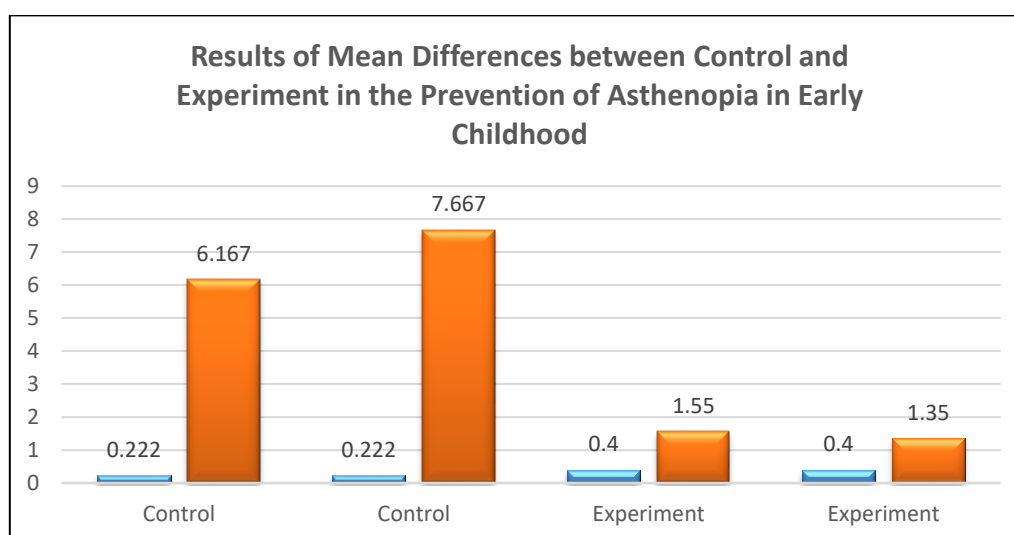


Figure 2. Results of the average difference between modern Candy Crush and Angry Bird games and traditional games Marsitekka or Engklek GTP (Guess the Picture) and Marsukkil or Lele Patok in the prevention of asthenopia in early childhood.

The difference between control and experimental games certainly has a very big difference, games that use gadgets have a higher rate of asthenopia compared to traditional games. The results of the graph and table show that among the four games that have been researched on children, the modern game Angry Bird is in first place which has the impact of asthenopia in early childhood, with an average pretest score of 0.222 after carrying out the treatment. posttest was 7,667, followed by the modern game Candy Crush with an average pretest score of 0.222. After carrying out the treatment, the posttest average score was 6,167, then the traditional game Marsukkil or Patok Lele with an average pretest score of 0. (Guess the Picture) with an average pretest score of 0.4 after carrying out the treatment the average posttest score was 1.35.

The Angry Bird game is the highest because this game is the most popular and most liked by children so that the level of focus on the monitor screen is higher than the Candy Crush game which is apparently not very popular with children so the impact of asthenopia is higher in the Angry Bird game. Then the Marsitekka or Engklek GTP game (Guess the Picture) has the lowest value, because the object focus in this game can move from one box to another, compared to the Marsukkil or Patok Lele games which also have a focus on one wooden object that must be captured. The results of the differences in the criteria levels of the control group and the experimental group in the Marsitekka game are as shown in **Figure 3**.

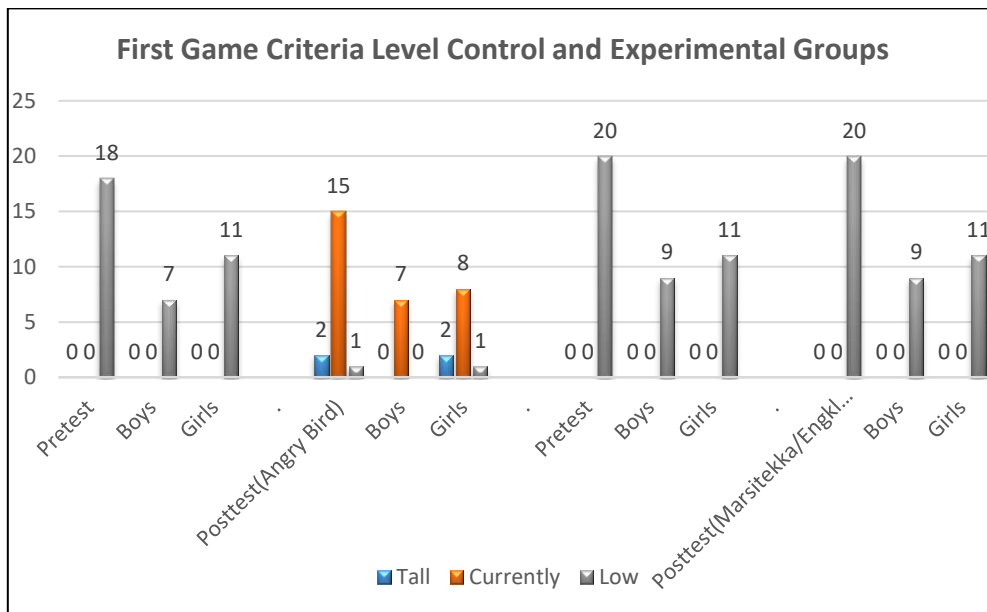


Figure 3. Results of differences in criteria levels between the control group and the marsitekka experimental group in the prevention of asthenopia in early childhood.

Based on the results of the analysis above, the pretest Asthenopia level of the 18th respondent in the Angry Bird game and the 20th respondent in the Marsitekka or Engklek GTP game (Guess the Picture) is in the low level category. The results of the level of asthenopia criteria after playing the Angry Bird game were obtained by 2 respondents in the high level category, 15 people in the medium category, and 1 person in the low level category. Compared with the results obtained after playing Marsitekka or Engklek GTP (Guess the Picture) It was obtained that the level of asthenopia of the 20 respondents was in the low level category. The results of the differences in the criteria levels of the control group and the experimental group in the Marsukkil game are as shown in **Figure 4**.

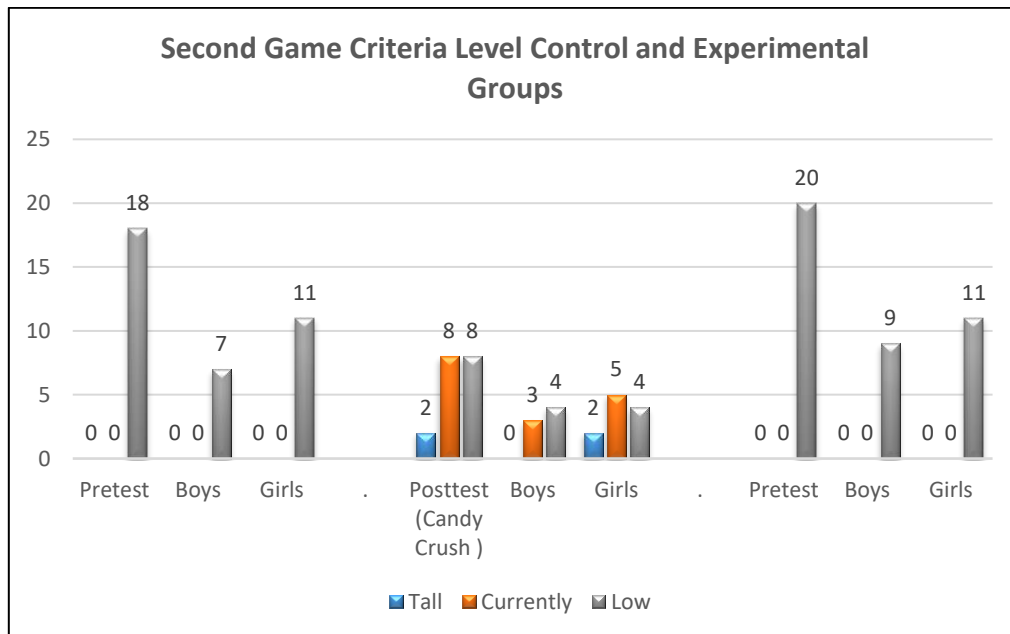


Figure 4. Results of differences in criteria levels between the control group and the marsukkil experimental group in the prevention of asthenopia in early childhood.

Based on the results of the analysis above, the pretest level of Asthenopia of the 18 respondents in the Candy Crush game and the 20 respondents in the Marsukkil or catfish peg game were in the low-level category. The results of the level of asthenopia after playing Candy Crush were obtained by 2 respondents in the high-level category, 8 people in the medium category, and 8 people in the low-level category. Compared with the results obtained after playing the Marsukkil or catfish peg game, it was found that the asthenopia level of the 20 respondents was in the low-level category. In conclusion, after conducting the experiment, it turned out that the highest level of criteria for asthenopia in children was in the control group.

As a result, this can be handled by the experimental group which apparently has a low level of criteria for asthenopia because the child's eyes do not only focus on one point. This analysis is also supported by the results of interviews with parents, that children are given by their parents to play with gadgets at home such as playing games, watching YouTube videos or using camera applications. Several studies also state that the use of gadgets in early childhood can train children's creativity with the various application features contained in them (Hidayatuladkia et al., 2021). However, if the use of gadgets is given without supervision, it can be feared that children will discover things that young children should not know and this will later affect their cognitive aspects and character.

Parents also mentioned that most parents do give their children a limit on playing with gadgets, such as one hour and 15 minutes, but it turns out that children are at home more than outside the house so that children have less physical activity and play with gadgets more. The principal of Kindergarten ABA 06 Medan also said that during the research process, it was seen that children in the control class were interested in participating in learning in the experimental class with traditional games. Apart from parents, teachers also have an important role in preventing asthenopia in early childhood, one of which is that teachers can introduce various traditional games to children. Traditional games also have charm and fun in playing them (Yuniarni, 2019).

Then teachers can also provide motivation and socialize the impact of using gadgets in young children, especially on eye health in parents of young children, so that parents also start paying attention to their children. The changes that appeared in the control or gadget group were very high where the average eye fatigue in children increased very high, in contrast to the experimental group or traditional games, the changes that appeared were very low due to eye fatigue or asthenopia. The control group that had the highest incidence of asthenopia was the control group that played Angry Birds. The results obtained from the graph show that the control game and the experimental game have a significant difference in asthenopia symptoms.

3.5. Evaluation Stage (Evaluation)

The traditional game activity Marsitekka or Engklek GTP (Guess the Picture) can help reduce the risk of asthenopia, which is eye fatigue caused by long-term use of digital screens or activities that require intense visual focus. By playing the traditional game Marsitekka or Engklek GTP (Guess the Picture), the eyes have the opportunity to rest from screen exposure and more varied eye movements, helping to prevent or reduce the symptoms of asthenopia. According to Raihana & Sari in their research, the traditional game of engklek influences the physical development of gross motor skills in children aged 5-6 years at the Puri Air Cool Housing Complex, RT 03 (Raihana & Sari, 2021). This is also in line with research by Nailufar et al, entitled "Introduction of the Traditional Engklek Game to Early Age Children" in which the researchers held a social project "Let's Play Movement Without Gadgets for Early Childhood" which aims to stimulate development in early childhood. This engklek game

researcher is in great demand by children and they focus more on the traditional engklek game rather than gadgets (Nailufar et al., 2023). Game implementation research Traditional Marsitekka or Engklek GTP (Guess the Picture) In addition to preventing asthenopia based on the theory of moral development by Kohlberg, play can help children understand moral values and develop their moral reasoning along with growth and development. Play marsitekka or engklek turns out that GTP (Guess the Picture) can also make children have moral reasoning, where children learn to queue when playing and children learn to take turns so that children become disciplined and responsible children.

4. CONCLUSION

Modern games are a form of gaming activity which is a development of traditional games. Today's modern games are games that come from industry and generally use technology where one of the devices that children often use are gadgets which have become a habit for parents to give children freedom in their use, thus causing the impact of asthenopia in early childhood. Asthenopia or eye fatigue is a collection of symptoms related to vision (visual), eye (ocular) and musculoskeletal problems caused by long-term use of digital devices. Therefore, providing a solution that can prevent asthenopia in children is by using creative traditional games Engklek GTP (Guess the Picture).

Engklek GTP (Guess the Picture) is a traditional game made by printing the game in the form of a banner flyer measuring 2x1 meter and at the end of the game there is a challenge to name the picture that the child has chosen according to the engklek theme which has been designed to be as attractive as possible. The marsitekka or engklek game can help prevent asthenopia in children by involving physical movement and focusing on a specific goal. These games can help stimulate the eyes differently and prevent eye fatigue associated with long-term use of screens or activities that require close focus. Based on the results of experiments to compare the level of asthenopia in early childhood between the traditional game Engklek GTP (Guess the Picture) and modern games, it shows differences.

These results have shown differences in the level of asthenopia in the two forms of game, where the level of asthenopia is higher in the modern game compared to the traditional game Engklek GTP (Guess the Picture). Apart from that, based on the level of criteria, it also shows that traditional games are always in the low category, while most modern games are in the medium category. The results of this research are also supported by the results of interviews with parents who stated that children do more activities at home by playing with gadgets than playing outside the house directly with friends and do little physical activity when playing at home. Further research can be carried out to: find effective ways to prevent asthenopia in early childhood. Developing traditional game models that are starting to be forgotten in the current technological era. Examining the relationship between traditional games and the prevention of asthenopia in early childhood due to excessive use of gadgets.

5. AUTHORS' NOTE

The author declares that there is no conflict of interest regarding the publication of this article. The author ensures that the paper is free from plagiarism.

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