The Effectiveness of **Baeg** Games to Improve Early Childhood Gross Motor Skills

Ajeng Putri Pratiwi, Mohamad Syarif, Rusmono, Jarudin

**Abstract**

This research aims to develop Baeg games to improve gross motor skills in early childhood, 4-5 years old. They are using methods with qualitative and quantitative approaches and involving 20 respondents with a random sample-taking technique. The instruments used were pre-test and post-test. Data collection techniques were carried out through interviews, observation, documentation, and questionnaires with the Likers scale criteria. The data analysis technique used the T Paired test to determine the differences before treatment and after treatment. Based on the results of field tests, Baeg's game effectively improves gross motor skills in early childhood. The Baeg game is an innovation from combining the traditional games of clogs and stilts that already exist before, adapted to the characteristics of early childhood.

**Keywords:** Baeg games, Early Childhood, Gross Motor skills

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**Introduction**

Play is a basic need in children's growth and development. Therefore, learning in Kindergarten prioritizes the principle of playing while learning to optimize all the potential for intelligence during the golden age. Through play activities, children can explore, communicate, gain new knowledge, and do simple experiments about various things in their environment in a fun way. Different kinds of games can improve all aspects of a child's development. This is following research by Kabadayi (2014), which states that the game 'Counting Jingle' contributes to children's physical development through imitating movements and expressions when joking(Kabadayi, 2014). Physical motor stimulation provided through play can help coordinate the muscular and nervous systems, increase muscle strength, stamina, coordination, balance, agility, flexibility, responsiveness, and other physical fitness factors. Wang (2015) states that playing games teaches children to follow the rules and orders, know their abilities, their families, and the environment and socio-cultural values, and collaborate with others(Wang, 2015).

The Konya area results state that the implementation of 60 types of traditional games supports children's motoric development by 26.6%, social-emotional 26.6%, language, 23.3% cognitive, 18.3%, 5.0% take care of themselves(Gelisi and Yazici, 2015). Whereas in Iran, every part of the zurkhaneh game contains many moral values in developing physical, motoric, and social-emotional abilities(Dehkordi, 2017). Emotional development is significant in play activities; children associate play with strong positive emotions and cannot play with negative emotions and anxiety (Howard et al., 2017).

Based on the explanation of the different research results, it can be concluded that various kinds of games play an essential role in stimulating all aspects of child development, especially physical motor development. Gross motor skills are part of physical motor development related to body movements that involve coordinated activity of large muscles, nerves, and brain, including walking, rolling, running, climbing, kicking, jumping, throwing, catching, tiptoeing, swimming, cycling, gymnastics, dancing, playing traditional games, controlling objects, and performing various other playing activities that coordinate hand and foot movements. According to Loprinzi, Davis, and Fu (2015), developing motion skills from an early age will affect physical activity and motor skills in the long term(Loprinzi, Davis, and Fu, 2015). Also, if children and adolescents have low physical fitness, it is possible to experience difficulty coordinating gross motor movements (de Chaves et al., 2016). Therefore it is essential to develop gross motor skills as early as possible because it will affect motor skills and children's development in the future. Some of the relevant previous studies, as described, focus on fine motor skills, which have not addressed gross motor skills. Because it will affect motor skills and all aspects of child development in the future. As described, some of the relevant previous studies focus on fine motor skills and have not addressed...
gross motor skills. Because it will affect motor skills and all aspects of child development in the future, some of the relevant previous studies, as described, focus on fine motor skills, have not addressed gross motor skills. Based on the various explanations above, there is a lot of urgency for gross motor development in early childhood that can be developed through physical games. Namely, stilts clogs are abbreviated as Baek. The game of stilts clogs, or called the game "Baeg," is a combination of the traditional game of clogs with stilts which is designed into a new form of the game using child-friendly materials, safe, easy to use, and adjusts to the level of achievement of children's development standards. Clogs are a traditional game made using wood or coconut shell as raw material, carried out by pulling a rope tied to the shell. Meanwhile, stilts are a conventional game made of two bamboo blades of a specific size to train movements and balance. The innovation made is developing Baeg games through the stages of ergonomics by considering functional, aesthetic, and economic elements, one of which is by replacing the raw materials used as clogs, which are usually made of wood or coconut shells into sponges, which are designed to be more attractive with adjustable height. So it is safe for children to use. The bamboo stilts concept will be replaced with dacron wrapped in a doll cloth and attached to the front of the clog that the child will hold to play the game. When Baeg is played, the hand will pull upwards while the footsteps forward alternately. The child will try to maintain balance and coordinate all movements of his limbs to walk without falling.

Researchers are interested in innovating by combining the two games by replacing raw materials that are safer, easier to play, attractive, and environmentally friendly. Researchers want to train children's gross motor skills through the development of this game, especially in improving balance with fun playing activities. This research aims to produce a game of Baeg that can improve gross motor skills in early childhood. The research formula is how to develop Baeg games to strengthen gross motor skills in early childhood? And is the game Baeg effective in improving gross motor skills in early childhood? The novelty of research on the product being developed is a Baeg game that has never been done before.

Method

Sample

The research was conducted on group A children in Kindergarten, Pasuruan Regency, East Java Province, in the 2020 school year. Respondents as research subjects were 20 children in group A at TK PGRI 3 Pandaan. Sampling using criteria for children in the age range of 4-5 years. The sample collection technique was carried out using a simple random sampling technique. By using random sampling techniques, researchers provide the same opportunity to be research samples. Of the 27 children aged 4-5 years in group A TK PGRI 3 Pandaan, the researchers chose by drawing an attendance number according to the number of children needed in the field trial stage as many as 20 respondents.

Instrument

A research instrument is a tool used for data collection. Data collection techniques are carried out through interviews, observation, documentation. The observation instrument has been tested for validity by the expert. During the preliminary study, interviews and observations were carried out, namely to find out the problems and the initial description of the child's gross motor skills in the learning process. The observation instrument is arranged in the form of a value scale that is measuring; besides data collection, it is also equipped with notes on the results of interviews and observations and is provided with documentation in photos. The assessment criteria in this study used a 1-4 Likert scale with the following categories: 1 means not capable (NC); 2 means less capable (LC); 3 means Capable (C); 4 means Very Capable (VC). The instrument grid can be seen in table 1.

Table 1. Gross Motor Ability Instrument Grille

<table>
<thead>
<tr>
<th>No.</th>
<th>Indicator</th>
<th>Number of Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Coordination</td>
<td>3</td>
</tr>
<tr>
<td>2.</td>
<td>Balance</td>
<td>7</td>
</tr>
<tr>
<td>3.</td>
<td>Speed</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>14</td>
</tr>
</tbody>
</table>

Data analysis technique

The data analysis technique in this study used qualitative data analysis and quantitative analysis. Qualitative data were obtained from direct observation data describing children's gross motor skills, with a presentation in
the form of exposure. To support the qualitative data analysis, quantitative data analysis was also carried out: the acquisition of scores on the observation instrument and assessing gross motor skills on the observation sheet. The quantitative data from observations were analyzed using descriptive statistics presented using percentages and test result data (pre-test and post-test) using the t-test to see the effectiveness of the Baeg game developed.

Results and Discussion

Baeg Game Development Results

This study resulted in a game of stilts (Baeg) clogs to improve basic motor skills, which are innovative, systematically, and systematically designed. In developing the game, Baeg is carried out through several stages, including:

Needs Analysis Results

Preliminary research is the initial stage in observing learning activities to identify problems and potentials. Identification is made through interviews and observations of students, parents, and teachers who are research objects. Statements were made on student activities and facilities available at the PGRI 3 Pandaan Kindergarten school, Pasuruan Regency, East Java. This activity is carried out to explore children's understanding of the game of clogs egrang in improving children's gross motor skills. I was looking for information about the efforts that have been made by adults or educators around children in improving children's gross motor skills in early childhood.

The results obtained from needs analysis activities through conversing, question and answer, and observation with children aged 4-5 years stated that children did not know the Baeg game shown in observation activities. In some of the pictures shown to the children, around 76.33% of the children could not answer questions about various Baeg games. The results of the needs analysis show that understanding of Baeg's game includes motion coordination, balance of motion, and speed that are in accordance with the skills of children aged 4-5 years, as shown in Figure 1.

![Figure 1. Needs Analysis Results](image-url)
The results of interviews with teachers regarding the role of schools in introducing the theme of Baeg games for early childhood are still unthinkable about the various game models due to limited human resources and teacher educational backgrounds. In fact, at each place, a needs analysis was carried out; the interviewed teachers stated that they had not stimulated or provided information about Baek's play in early childhood. This is due to the limited resources and educational background of teachers. The teachers agree that as educators, they need an appropriate game model as an innovation in learning to be happy with various game models.

Based on data from observations with children aged 4-5 years and interviews with teachers, it provides facts about the importance of this game being developed to produce a product in the form of learning media that can improve gross motor skills of early childhood. Gross motor skills are aspects of early childhood development related to various theories and sciences, ergonomic theory, motion theory, neuroscience theory, multiple intelligence theory, early childhood development theory, cognitive theory, social theory, and play theory (Utesch et al., 2016; Veldman et al., 2019; Vella et al., 2019; Magistro et al., 2020). Gross motor skills are an essential part to be stimulated in children as early as possible through playing while learning.

The conclusion from the data collection results in the preliminary study is that what has been done is as follows:

1. 64% of children cannot coordinate limb movements.
2. 78% of children do not have a balanced body.
3. 87% of children do not have fast walking skills with Baeg.
4. The results of interviews with teachers indicate that there is no appropriate and fun game model for early childhood to improve gross motor skills.

Based on the preliminary study results above, it is necessary to play games that can improve gross motor skills in early childhood.

**Development Outcome**

Based on the problems found at the needs analysis stage, it is necessary to design and develop the Baeg game to improve the gross motor skills to be achieved, both the goals in the process and the results. After the needs analysis results are obtained, the game development planning stage is carried out, starting from preparing material regarding coordinating body limbs, balance, and walking speed from various sources for children aged 4-5 years. As well as compiling media material by referring to Baeg's game indicators to improve gross motor skills in early childhood originating from studying the theory and concepts of gross motor skills. The display of game media can be seen in Figure 2.

![Figure 2. Baeg Game Development Results](image)

**Test Results of Product Effectiveness Developed**

Field trials aim to see the effectiveness of Baeg's game in achieving predetermined learning objectives. Besides, it is also to obtain information about learning components, material components, and display components. The field trial was conducted with 20 students, using a random sampling technique for students in Kindergarten PGRI 3 Pandaan, Pasuruan Regency, East Java.

The primary trial process was carried out with students given the Baek game and given intervention with learning for eight meetings through the Zoom Meeting Cloud application. This is done because it is to identify deficiencies or weaknesses in the game model, be it material, instructional objectives, and the results of motor skills which are expected to improve gross motor skills. Following the primary goal of developing games to improve gross motor skills in early childhood, 4-5 years.
Before the intervention, the criteria for field trials were carried out a pre-test to see the students’ initial ability to Baeg games. At the end of the learning process, a post-test was given to measure gross motor skills. The pre and post-test results are as shown in Figure 3.

![Figure 3. Pre and Post-Test Results](image)

The average results of the post-test field trials were that 66.78% developed very well, and 33.22% developed according to expectations. 4-5 years old so that the products produced can be implemented for the learning process at TK PGRI 3 Pandaan Kindergarten, Pasuruan Regency, East Java. The results of the T-test can be seen in table 2.

<table>
<thead>
<tr>
<th>Pair 1</th>
<th>Pre and Post-test</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>T-statistic</th>
<th>T-table</th>
<th>df</th>
<th>Sig. (2-tailed)</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>-24.05</td>
<td>1.468</td>
<td>73,262</td>
<td>2,539</td>
<td>19</td>
<td>0.000</td>
</tr>
</tbody>
</table>

Based on table 2, the T statistic value is obtained = 73,262 when compared with the t table in DF 19. If the t statistic > t table = 2.539, it can be interpreted as significant, meaning that the pre-test score is different from the post-test. You can also see the Sig. (2-tailed) p-value 0.000. This means that there is a difference between before and after treatment. Because: p-value <0.05 with 95% level of confidence. The mean value of -24.05 is negative, meaning that there is a tendency to increase the score after treatment. The average increase was 24.05. It can be concluded that Baeg’s game is effective in improving gross motor skills in early childhood.

The Baeg game is an innovation from combining the traditional games of clogs and stilts that already exist before adapting to early childhood characteristics. The development of Beag games undergoes a series of instructional processes validated by expert experts and tested on students to achieve the expected learning objectives. This game is scheduled to train gross motor skills or basic movements of children, which consist of motor movement elements including coordination of motion, balance, and speed. This game can be played individually or in groups to develop motor skills, and all aspects of development are stimulated.

Baeg games are designed based on underdeveloped children aged 4-5 years in maintaining balance and coordination of movements in carrying out basic actions and games. The teacher lacks stimulation in developing gross motor skills through various game tools or various learning media. The game development designed in this study produces a Baeg game tool. It is equipped with a video game tutorial that is expected to make it easier for teachers, parents, and children to understand how to play and perform this game independently. The concept of the Baeg game originated from the concern of researchers about the scarcity of traditional games that children rarely play, namely clogs and stilts. These two classic games can stimulate children's gross motor skills, including training children to balance, coordinate movement, strength, agility, and speed. The Baeg game combines traditional clogs and stilts, the concept of clogs on a Baeg base, and stilts on the Baeg handle.

According to the research of Haugen and Johansen (2018) that the traditional games of clogs and stilts can improve gross motor skills when children coordinate large muscles (Haugen and Johansen, 2018). The two games can also develop other aspects of development, including social, emotional, cognitive, religious, and moral values, language, and art. Also supported by Shofyatun and Nirmala’s research (2018) entitled "Traditional Games as Efforts to Stimulate Early Childhood Development Achievement Levels.” The results of
the study explain that the games implemented in PAUD institutions are Kadende, Bakiak, Congklak, TapakKuda (kalempa), Simpai, Angklung, Jump Rope And Dragon Snake. 1) motoric physical development can be developed when the child begins to coordinate muscles and senses(Shofyatun and Nirmala, 2018). Based on the results of the initial and final tests in the field trials showed an increase in the results of the final examinations, so it can be concluded that learning with a learning model can improve the ability and effectiveness of the game model in improving gross motor skills of children aged 4-5 years. This result is supported by the opinion of Nie (2017), which states that media is effective in increasing the use of study time, especially short breaks during the workday, new strategies in reading subject matter, and low cost.(Nie et al., 2017). Researchers Sousa and Rocha (2019) also supported this research, stating that digital learning can be a driver for skills development(Cress et al., 2018; Sousa and Rocha, 2019). Researchers Hawlitschek and Joeckel (2017) also supported that digital media can motivate students to improve skills, improve performance, and performance satisfaction(Sartika, 2017; Jarudin, Ibrahim and Muslim, 2020). Students increasingly need to learn content and perspectives that are not provided as part of the curriculum; students need to build additional forms of support for learning through digital media(Ludvigsen et al., 2018).

Morrison (2012) states that constructivism is related to games; games provide opportunities for practice and thinking to get experience and learn everything around them. Physical activity in play encourages a child's natural ability to learn by touching, exploring, feeling, tasting, experimenting, speaking, and thinking. It is through this opportunity that children will learn to understand their world. The process of adaptation and active involvement is part of this research. The implementation of stilts clogs game so that it can be used to improve children's gross motor skills and social emotional through the process of assimilation, accommodation, and equilibrium. The process of assimilation occurs when group A children in Kindergarten already have the essential ability to walk using sandals and then are directed to use shoes. Children can use shoes to walk with various variations. When children are taught to play traditional games using clogs' Baeg' learning media, children associate their ability to walk using sandals and shoes with new tools, namely Baeg to walk, resulting in the accommodation process. Baeg game is a combination of clogs and stilts which have different levels of difficulty. Children must train balance, eye coordination, hands and feet, flexibility, strength, and agility when playing this game.

Conclusion

The Baeg game is an innovation from combining the traditional games of clogs and stilts that already exist before, adapted to early childhood characteristics. The development of beag games undergoes a series of instructional processes validated by expert experts and tested on students. Based on the research results, the game of Baeg can train gross motor skills or basic movements of children that consist of motor movement elements, including coordination of motion, balance, and speed. This game can be played individually or in groups to develop motor skills, and all aspects of development are stimulated. Gross motor skills are aspects of early childhood development related to various scientific theories, ergonomic theory, motion theory, neuroscience theory, multiple intelligence theory, cognitive theory, social theory, and play theory. Gross motor skills are an essential part of being stimulated in children as early as possible through playing while learning. There are weaknesses and strengths in the current Baeg game, including the materials used do not adjust the characteristics for early childhood.

Baeg should be developed and studied based on the ergonomics of making a product to meet good quality standards for early childhood use. The fundamentalergonomics rules in developing a product include anthropometry, biomechanics, physiological performance, manual material handling, environmental factors, and color. A product is good in ergonomics if it meets physiological, aesthetic, and economic elements.

References


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