

CHAPTER 1

INTRODUCTION

A. Background

Cognitive development in early childhood is a fundamental aspect in children's growth and development. This development is seen as an important issue in various countries because it has a direct impact on children's learning ability and quality of health in the future (WHO, 2020). According to UNICEF (2023) The age range of 0–6 years is *Golden Age* or the golden phase, when the brain undergoes accelerated growth and builds millions of connections between nerve cells. During this period, children begin to process various basic skills such as recognizing shapes, colors, numbers, language, storing information to controlling their actions and emotions (UNICEF, 2023). This whole process can only develop optimally if the child gets adequate stimulation through play activities and supportive interactions (Budhyanti, 2022).

According to Solar Panels (2024) If less stimulation is given, children are more susceptible to developmental delays, difficulties in the learning process, maladaptive behavior, and even the risk of mental health disorders in the next stage. This condition is not only seen in the short term, but also has the potential to affect children's readiness in formal education and adaptability in the social environment. International institutions such as WHO and UNICEF emphasize the importance of early stimulation as part of efforts to maximize children's growth and development as a whole (WHO & UNICEF, 2023).

A number of international reports show that delayed cognitive development is still a common problem in various developing countries. An analysis of 396,596 children aged 3–4 years in 73 countries showed that about 11.5% of children had cognitive delays, even as high as 20.7% in low-income countries (Emerson & Llewellyn, 2023). WHO and UNICEF (2022) reports that in low- and middle-income countries there are about 219 million children or 39% of children under the age of five who do not reach their potential cognitive and social-emotional development. In addition, research in China, as a country with

large geographical gaps, shows that only 39% of children in rural areas develop consistently without cognitive barriers (Money) *et al.*, 2021).

A study conducted on 134 kindergarten children in North Palu District showed that some children have not reached cognitive achievement according to their age stage, with 8.3% belonging to the undeveloped category and 17.9% being in the developing stage (Nirmala, 2021). In addition, from the results Indonesian Health Survey (2023) It is known that 21.5% of toddlers experience stunting, which has a direct effect on children's cognitive function and learning abilities. However, exact data on cognitive development do not yet exist nationally. Central Statistics Agency (2024) reports that Indonesia has 30.83 million children aged 0–6 years, but children's access to health services has only reached 75.82%, still below the national target of 85%, so some children are at risk of not receiving adequate developmental monitoring.

Cognitive development disorders at an early age can have a wide impact on the learning process, social skills, and quality of life of children in the later stages (WHO and UNICEF, 2023). Barriers to basic abilities such as understanding number concepts, shape recognition, and the ability to group objects, and understanding instruction will affect school readiness and academic achievement (Money) *et al.*, 2021). If left unstimulated, these disorders can continue to become learning difficulties, low educational achievement, social skills barriers, and emotional regulation problems as children grow up (Johnstone) *et al.*, 2021). In the long run, this can limit adaptability, career choices, and independence in adulthood. Therefore, early identification and appropriate cognitive stimulation are essential to prevent such long-term impacts and support optimal child development (WHO and UNICEF, 2023).

Although the importance of cognitive stimulation has been widely emphasized, learning practices in various Kindergartens still do not fully meet these needs. Studies have shown that children's learning activities are still dominated by written exercises and repetitive methods, so that the space for exploration is limited (Sholehata *et al.*, 2025). This condition is in line with the findings Alfaeni and Kurnianti (2023) which explains that the role of play in

PAUD is often replaced by structured academic activities, causing children to have less concrete and sensory learning experiences. In fact, a passive learning approach can hinder cognitive development because children are not given the opportunity to try, manipulate objects, and solve problems independently (Dewi, 2022).

Piaget's theory of cognitive development states that children aged 4–6 years are in the preoperational stage, when the ability to think symbolically and logical thinking develops through exploration and play (Madanagopal, 2020). This stage is reinforced by Vygotsky's view that emphasizes the importance of object manipulation and social interaction in shaping the ability to think through the zone of proximal development (Veraksa and Samuelsson, 2021). This cognitive development can be stimulated by giving children the opportunity to play. Priyanti (2025) explained that play is a fundamental medium that is able to improve children's cognitive abilities, because through play activities children develop understanding of concepts, reasoning, exploration of cause and effect, and creative thinking.

Research conducted by Yuniyartika and Sudaryanti (2024) shows an increase in children's cognitive development after being stimulated through games *playdough*. Other research conducted by Shirley *et al.* (2024), also showed an improvement in cognitive development after the intervention *Loose Parts Play*.

Play therapy *playdough* It is a manipulative activity that allows children to press, squeeze, shape, and blend soft dough to create a comfortable and soothing sensory experience. This manipulation process helps children focus their attention, reduce distractions, and improve their ability to control hand movements when exploring geometric shapes, counting the number of objects, and grouping the resulting shapes (Yuniyartika & Sudaryanti, 2024). In research Yuniyartika and Sudaryanti (2024) which was carried out at Pembina Sekayu State Kindergarten, South Sumatra, involving 60 children aged 5–6 years (30 intervention groups and 30 control groups). The results of the study show that there is a significant influence of games *playdough* Regarding cognitive

development with a score of ($P < 0.0001$), the average cognitive score in the intervention group reached 52.93, while the control group was 46.77, with an average difference of 6.16 points.

Games *Loose Parts Play* is a form of manipulative stimulation that is given by providing various loose objects such as geometric educational buttons, bottle caps, small blocks, stones, or other natural materials that are safe for children to explore (Widyaningrum *et al.*, 2024). Children are directed to take a comfortable playing position, then use both hands to arrange, group, arrange objects, or modify objects according to their imagination and game goals. This activity is carried out without pressure or rigid instructions, so that children are free to determine the shape, pattern, or structure they want to build. This method functions to provide cognitive stimulation that calms, improves focus, and helps children understand the concept of numbers, count the number of objects, recognize shapes, and group objects based on certain characteristics. In addition, the process of manipulating loose objects has also been proven to support children in making decisions, controlling emotions, and solving problems during play activities (Widyaningrum *et al.*, 2024).

Research conducted by Shirley *et al.* (2024) in PAUD/kindergarten under the auspices of STKIP 'Aisyiyah Riau involved 50 children aged 5–6 years, namely 25 children in the intervention group and 25 children in the control group. Children who get stimulation through activities *Loose Parts Play* experienced a higher increase in cognitive development than the control group. The results showed a score ($p < 0.0001$), and the average increase in cognitive score in the intervention group was 14.32, while in the control group it was 11.60, with an average difference of 2.72 points.

Although research on *playdough* and *Loose Parts Play* already many Yuniyartika and Sudaryanti (2024) that focuses on effectiveness *playdough* towards fine motor and cognitive aspects, while the review São Paulo *et al.* (2025) show a relationship *Loose Parts Play* with the ability to *Problem solving* and executive functions. Until now, no research has been found that combines the two games as one integrated intervention. In addition, the majority of

research comes from the realm of early childhood education, not from the perspective of nursing, so that the promotive and stimulation aspects of cognitive development are still less given attention in the children's health literature. This condition shows a scientific gap, especially in studies that associate play interventions with pediatric nursing approaches. Similar research has not been found in the kindergarten where this research was conducted, so this research is important to fill this gap.

Seeing the existence of gaps in previous research, the study of the combination of *playdough* and *Loose Parts Play* It is necessary to provide scientific evidence on the effectiveness of this intervention as cognitive stimulation in early childhood. Research Yuniyartika and Sudaryanti (2024) shows that *playdough* able to improve fine motor and cognitive aspects, while review São Paulo *et al.* (2025) prove that *Loose Parts Play* related to problem solving and executive function as part of cognitive development. Practically, the findings of the research can be a reference for health workers, especially nurses, in choosing simple, cheap, and safe stimulation methods in the school environment and at home. Theoretically, this study expands the child health literature by confirming that play activities can be an evidence-based nursing intervention to optimize early childhood cognitive function.

Based on an interview with teachers at TKIT Auladuna Sawah Lebar, Bengkulu City on August 20, 2025, the cognitive development stimulation provided so far still focuses on letter and number recognition activities, such as playing letter cards, singing alphabet songs, and doing simple tasks related to symbols. The teacher also provides *puzzles*, but their use is only an additional activity and has not been directed to practice the ability to classify and recognize geometric shapes. Although these activities help with early literacy, the stimulation provided has not touched other important cognitive aspects at an early age, so the stimuli that children receive are limited and provide less opportunities to explore independently through sensory and manipulative experiences.

The results of the initial survey conducted on August 20, 2025 at TKIT Auladuna Bengkulu City showed that there were 175 children with 45 kindergarten A children and 130 kindergarten B groups. In 24 children in kindergarten B, it was found that 9 children (37.5%) still had difficulty grouping objects according to categories, 6 children (25%) were still unable to sort objects from largest to smallest, and 4 children (16.67%) were unable to pair pictures. These findings suggest that cognitive development problems are not only seen in national data, but also manifest in the classroom, so interventions are needed to improve cognitive stimulation. Observations and interviews also revealed that teachers have carried out learning according to the curriculum, but have not implemented manipulative stimulation such as *playdough* or *loose parts play*. The activities given focus more on symbol recognition than exploration and critical thinking processes that allow children to understand concepts through hands-on experience. This condition emphasizes the need for a more varied and real-experience cognitive stimulation strategy according to the principles of early childhood growth and development.

Based on the results of the description above, the researcher is interested in conducting research related to the effect of *playdough* and *loose parts play* therapy on cognitive development in early childhood. Researchers also wanted to find out whether *playdough* and *loose parts play* therapy could be used as non-pharmacological stimulation to improve early childhood cognitive development, particularly in logical thinking and symbolic thinking skills.

B. Problem Formulation

Early childhood cognitive development is an important aspect that needs to be stimulated early because this period is known as the golden age, where the child's brain develops very rapidly. However, in the field, there are still many early childhood children who experience delays in cognitive development due to lack of proper stimulation. One of the efforts that can be made is through play therapy, such as *playing Playdough* and *loose parts play*, which have been proven to stimulate children's thinking skills, creativity, and problem-solving. The problem in this study is that there is still a limited use of varied and

structured play therapy in kindergarten, so that children's cognitive development is not optimal and the effect of *Playdough* play therapy and *loose parts play* on cognitive development in early childhood is not scientifically known. Thus, the formulation of the problem in this study is: "Is there an effect of *Playdough* play therapy and *loose parts play* on cognitive development in early childhood?"

C. Research Objectives

1. General Purpose

It is known that the effect of *Playdough* and *loose parts play* therapy on cognitive development in early childhood at TKIT Auladuna Sawah Lebar, Bengkulu City

2. Special Purpose:

- a. It is known that the description of the respondents' characteristics includes age, gender, parental education, and parental work at TKIT Auladuna Sawah Lebar Bengkulu City.
- b. It is known that the average score of cognitive development in early childhood before and after treatment was carried out in the intervention and control group at TKIT Auladuna Sawah Lebar, Bengkulu City.
- c. It is known that there is a difference in the average score of cognitive development before and after treatment in the intervention and control group in early childhood at TKIT Auladuna Sawah Lebar, Bengkulu City.
- d. It is known that the effect of *playdough* and *loose parts play* therapy on cognitive development in early childhood at TKIT Auladuna Sawah Lebar, Bengkulu City.

D. Research Benefits

1. TKIT Auladuna Sawah Lebar Bengkulu City

It can provide information on the application of *playdough* and *loose parts play* as an educational intervention in stimulating early childhood cognitive development. The results of this study can be considered for schools in integrating play activities into learning and as an education for parents about the importance of children's cognitive stimulation through play activities.

2. For the Nursing Study Program of the Ministry of Health of the Ministry of Health of Bengkulu

It can be a scientific reference in children's nursing learning, especially related to the stimulation of cognitive development through play therapy. The results of this study can also support the development of nursing science in the application of non-pharmacological interventions based on children's play activities.

3. For Other Researchers

It can be a reference for future researchers in developing studies on the stimulation of early childhood cognitive development through play therapy. Subsequent research can expand the number of samples, the location of the study, and consider other variables that affect cognitive development

