



## Utilizing Herbarium Book of Medicinal Plants as a Medium to Improve Science Knowledge for Children Aged 5-6 Years at TK Dharma Wanita Yos Sudarso

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### Abstract

Science is a skill that enables children to process new information through real experiences around them. Through science learning, children are able to increase curiosity, problem-solving and critical thinking. One of the ways to increase scientific knowledge is the introduction of medicinal plants by using the “Medicinal Plant Herbarium Book” as a learning medium. This study aimed to determine the effect of using the “Medicinal Plant Herbarium Book” as a medium on increasing scientific knowledge in children aged 5-6 years at TK Dharma Wanita Yos Sudarso. The type of research used was a quantitative approach with a pre-experimental research method with a one-group pretest-posttest design. The sample used was children aged 5-6 years totalling 30 children. The sampling technique in this study was the saturation technique. Data collection techniques were using instrument sheets. Data analysis used paired sample t-test calculations. The results of this study indicate that at the level of scientific knowledge of children aged 5-6 years after the utilization of the “Medicinal Plant Herbarium Book” as a learning medium, the average result was 69.80 to 94.97, which means that there was an increase in scientific knowledge of 25.17. Based on the calculation of the t-test analysis, a Sig.(2-tailed) value of 0.000 was obtained, which is concluded ( $0.000 < 0.05$ ). Based on this, it shows that  $H_1$  is accepted and  $H_0$  is rejected; thus it can be concluded that the utilization of the “Medicinal Plant Herbarium Book” as a learning media can increase scientific knowledge in children aged 5-6 years at TK Dharma Wanita Yos Sudarso. The “Medicinal Plant Herbarium Book” be an alternative media for learning science in early childhood

### How to cite

## INTRODUCTION

Early childhood is the first period of life that is right to lay the foundation for developing abilities in children because at the age of 0-6 years, they are experiencing a process of rapid growth and development. This period is commonly referred to as the golden period or golden age, where at this time, children really need the right attention and stimulation for the next process of growth and development. (Ariyati, 2021).

Early Childhood Education or PAUD can assist parents in educating and guiding children to prepare them for the next level of education. The purpose of PAUD in general, is to create quality future generations of the nation and to develop their potential to the fullest by providing stimulation according to their age level, which includes six aspects of development religious and moral values, cognitive, physical-motor, social-emotional, language and art. Of all the existing aspects, cognitive development is the main aspect of improving children's intelligence. Science knowledge is one of the cognitive developments that need to be developed (Rahmi, 2019).

According to Muginik, Sumarni and Rohmalina, (2019:14) Science knowledge is the science of thoughts, behaviours, and attitudes that support the development of the natural environment so that children will preserve and protect the surrounding environment. Through science activities, early childhood will explore and investigate objects in nature from observation, then conducting simple experiments. In science knowledge for early childhood, they learn to love plants and animals and be sensitive to the surrounding environment (Fardiah et al., 2019).

Science learning for early childhood is fundamental to be implemented in PAUD teaching-learning process. Through learning science, they are able to get to know the universe through the introduction of what is around them. In accordance with Trudle's statement which states that learning science can provide benefits for children's development. In line with a statement by Genc Kumtepe et al., (2017), who stated that introducing science learning from an early age could improve critical thinking skills, help children more easily understand science in the future and develop a positive attitude towards nature. Worth in Genc Kumtepe et al., (2017) argued that learning science at in early age can also develop other important things such as working together, motor skills, language and early understanding of mathematics. In addition, learning science can train children to use their senses; through various

senses children will gain knowledge, even better children can also carry out simple experiments that can train children to think critically and logically, be able to solve problems on their own (Risnawati, 2020).

Based on the data results of observations at TK Dharma Wanita Yos Sudarso, children's science knowledge related to the surrounding environment has not developed optimally. It is known that there are still many children who still have difficulty recognizing the various medicinal plants around them. Where when the children were asked to guess and name medicinal plants, some of them could not name them correctly. In addition, children's involvement in scientific knowledge is still low. This can be seen in the children in the learning process who were less active; in other words, children were passive during the learning process. Moreover, it could be seen that when children were asked simple questions or when asked by their teachers, some of them just remained silent and did not respond. The children were less enthusiastic and busy talking to their friends during learning activities. Whereas in the science learning process, children will get a learning experience to directly observe the surrounding environment, which can help children be more active in learning and be able to stimulate curiosity and think logically.

The lack of teachers in optimizing learning media is also one of the inhibiting factors in learning science. In the learning process, teachers still often use LKA media and pictorial media such as magazines. The lack of use of media makes it difficult for children to understand the material presented, especially when learning science. In addition, the difficulties faced by teachers in learning science are time constraints. The data results of the interviews shown that science learning was only done once a week. It is only limited to understanding the concept of colour, dark and light, sinking and floating due to the teacher's lack of understanding of the proper and appropriate science learning in early childhood. In fact, learning science is not only limited to that but also introductions such as medicinal plants also need to be taught from an early age. The introduction of medicinal plants as one of the materials in the Early Childhood Education curriculum mentioned in KD points 3.8 and 4.8 states that early childhood is expected to have the ability to recognize the natural environment such as plants, animals, soil, water, climate and rocks. (Depdiknas, 2014).

In introducing several types of plants, the teacher could introduce several plants, one of

them being medicinal plants. Scientific knowledge in the introduction of medicinal plants needs to be applied from an early age so that children know that not only chemical medicine can be used for treatment yet medicinal plants that are around them have many health benefits. Likewise, in their study Srikartika and Nurlely, (2020 : 38) stated that scientific knowledge related to the introduction of medicinal plants is very important to be applied to children's learning processes. The introduction of plants from an early age will provide knowledge not only of chemical drugs that can be used to treat when we are sick but also medicinal plants that can be used for traditional herbal medicine that can nourish the body. Therefore, in learning science to attract children's attention, a new innovation is needed because at this stage, children are happy with learning activities which include illustrations, pictures, and activities that look more real, one of which is by using media for the learning process. (Harditya & Mukminin, 2018).

According to Wijayanti and Rahmawati (2019), Media is anything that can be used by educators as a tool to deliver messages from the sender to the recipient of the message so that it can stimulate the thoughts, feelings, concerns and interests of students so that the learning process occurs. The media makes it easier for teachers to convey material to students. Herbarium book media is expected could increase scientific knowledge in the introduction of medicinal plants. Herbarium book media contains a collection of plant specimens that have been preserved or dried and can be used by educators as a medium for learning science (Imran, Partikasari and Jahniar, 2020). Therefore, in this study the researchers developed a herbarium book called "Medicinal Plants Herbarium Book" as a medium to increase scientific knowledge in introducing various kinds of medicinal plants. The "Medicinal Plants Herbarium Book" as a media to develop science knowledge of medicinal plants is consists of medicinal plants collection which have been dried and then pasted on paper containing information on the names of medicinal plants and their benefits, then bound together so that they become a herbarium book containing a collection of medicinal plant specimens. The advantage of the "Medicinal Plants Herbarium Book" make learning activities more practical and efficient, because the book is easy to carry and easy to use at any time. Moreover, the "Medicinal Plants Herbarium Book" can be stored for a long time so that it can be used again for learning. Through this media it will be easier for children to understand

and accept the material presented. Based on the background above, the researcher is interested in conducting research entitled "Utilizing Herbarium Book of Medinical Plant as a Medium to Improve Science Knowledge for Children Aged 5-6 Years at TK Dharma Wanita Yos Sudarso"

## METHOD

This research used a type of quantitative approach. Quantitative research is a research method based on a positivist philosophy, which is used to examine a particular population or sample; data collection uses research instruments and statistical analysis with the aim of testing predetermined hypotheses (Sugiyono, 2015). The type of research used by researchers is experimental research with the One Group Pretest-Posttest Design. According to Sugiyono, (2015) One Group Pretest-Posttest Design is a research design that describes a comparison of conditions before and after receiving treatment. The reason the researchers used this design was because in this study the researchers wanted to compare the results of the abilities of the groups before being given treatment or treatment and after being given treatment. Design. The following is the one group pretest posttest research design as follows (Arikunto, 2019).

**Table 1.** One Group Pretest and Posttest Research Design

Class	Pretest	Treatment	Posttest
Eksperimen	Y1	X	Y2

Information :

X : Treatment/treatment for the experimental group using the "Medicinal Plants Herbarium Book" as a medium to improve science knowledge

Y1 : pretest results

Y2 : posttest results

The sample in this study used a saturated sampling technique with a total of 30 children aged 5-6 years at TK Dharma Wanita Yos Sudarso. Data collection techniques using observation and questionnaire methods. The instrument used in collecting data was a questionnaire using a Likert scale in the form of a checklist. Before the instrument is used, the validity of the data is carried out by calculating the validity test using the product moment correlation formula and reliability using the Cranbach alpha formula. The data analysis used to find out the difference in the results before and after the application of the

herbarium book media for medicinal plants was the normality test and then the hypothesis test by calculating the paired sample t-test.

## FINDINGS AND DISCUSSION

This section describes the results of research related to the scientific knowledge of children aged 5-6 years using the "Medicinal Plants Herbarium Book" as a learning media.

**Table 2.** Pretest and posttest descriptive data analysis

Descriptive Statistics					
	N	Mini - mum	Maxi - mum	Mean	Std. De- viation
Pretest	30	57	83	69.80	6.082
Posttest	30	86	105	94.97	6.489
Valid N (list-wise)	30				

Based on the table above, it is known that the pretest data values for 30 children ranged from 57 to 83. The post-test scores ranged from 86 to 105. Meanwhile, the average pretest value was 69.80, while the post test average was 94.97. Furthermore, the data that has been obtained is grouped into several groups to facilitate interpretation of the data. Interpretation is done by grouping the data into 4 categories: not yet developed (BB), starting to develop (MB), developing according to expectations (BSH), and developing very well (BSB).

**Table 3.** Categories of scientific knowledge pretest data scores.

Interval	Kriteria	Frekuensi	Persentase
100 - 120	BSB	0	0%
77 - 99	BSH	4	13%
54 - 76	MB	26	87%
30 - 53	BB	0	0%

On the table above Science knowledge of children aged 5-6 years before receiving treatment was in the MB category with 26 children with a percentage of 87% and in the BSH category 4 children with a percentage of 13%. This means that children's scientific knowledge on the introduction of medicinal plants is still not well developed. The hope is that after utilizing "Medicinal Plants Herbarium Book" as a learning

media could increase the scientific knowledge of children aged 5-6 years.

**Table 4.** Science knowledge posttest data score categories.

Interval	Kriteria	Frekuensi	Persentase
100-120	BSB	11	37%
77-99	BSH	19	63%
54-76	MB	0	0%
30-53	BB	0	0%

Based on the data above, after receiving treatment with the "Medicinal Plants Herbarium Book", 11 children were obtained in the BSB category with a percentage of 37%. while on the BSH criteria there were 19 children with a percentage of 63%. The percentage of science knowledge index for children aged 5-6 years at the Dharma Wanita Yos Sudarso Kindergarten has increased.

**Table 5.** Normality test results.

One-Sample Kolmogorov-Smirnov Test			
		Pretest	Posttest
N		30	30
Normal eters <sup>a</sup>	Param- Mean	69.80	94.97
	Std. Deviation	6.082	6.489
Most Extreme Dif- ferences	Absolute	.081	.210
	Positive	.078	.210
	Negative	-.081	-.190
Kolmogorov-Smirnov Z		.444	1.148
Asymp. Sig. (2-tailed)		.989	.143

a. Test distribution is Normal.

Table above was gained results *Asymp. Sig. (2-tailed)* data *pretest* and *posttest* is 0.989 and 0.143. It can be said that the results of the data have a significant value greater than 0.05, which means that the data is normally distributed.

**Table 6.** Hasil Uji Paired Sample T-Test

	t	df	S i g . (2-tailed)
Pair 1 Pre test - posttest	-25.826	29	.000

The hypothesis test aims to determine whether there are differences in results before and after the application of the herbarium book media for medicinal plants by calculating the paired sample t-test.

The hypothesis in this study is:

Ho : there is no effect of using medicinal plant herbarium book media to increase scientific knowledge in children aged 5-6 years.

H1: There is an effect of using the herbarium book media for medicinal plants to increase scientific knowledge in children aged 5-6 years. The basic criteria for the decision are:

Ho is rejected H1 is accepted if the significant value or probability is Sig. (2-tailed) < 0.05

Ho is accepted H1 is rejected if the significant value or probability is Sig. (2-tailed) > 0.05.

In this study, the sample in the experimental group was 30 respondents so that  $t_{table} = 2.042$ , with a significance level of 0.05. From the table above, the Sig. (2-tailed) value is 0.000, where  $0.000 < 0.05$ , then Ho is rejected. This means that H1 is accepted so that there is a significant difference in the results before and after receiving the treatment. So it can be concluded that there is an influence of medicinal plant herbarium book media on scientific knowledge in children aged 5-6 years at TK Dharma Wanita Yos Sudarso.

**Tabel 7.** Hasil rata-rata uji hipotesis

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pretest	69.80	30	6.082	1.110
	Posttest	94.97	30	6.489	1.185

In the table above it can be seen that the average value of the pretest and post test is 68.80 to 94.97 so that there is an increase in the score of 25.17. it can be concluded that scientific knowledge in children aged 5-6 years at TK Dharma Wanita Yos Sudarso has increased after the application of the herbarium book media for medicinal plants.

### 1. The Effect of “Medicinal Plants Herbarium Book” as a Medium to Increase Children’s Science Knowledge

Scientific knowledge is one of the cognitive developments that need to be developed. In line with opinion of Risnawati, (2020) who states that learning science in early childhood is able to provide great benefits for all aspects of its development.

According to Fauziyah et al. (2021) Science knowledge is important to be introduced early on with the aim that children are able to have good cognitive abilities, for example in the ability to solve problems, observe, compare, classify and inform. Meanwhile, based on Wahidah et

al., (2022) the purpose of science knowledge for early childhood is 1) to be able to help children recognize and cultivate a sense of love for the natural world around them, so that children are aware of the greatness and majesty of God Almighty. 2) Growing children’s interest in knowing and learning about objects and events in the surrounding environment. 3) help develop aspects of child development. 4) develop curiosity, diligent, critical, introspective, responsible, independence, and cooperative. 5) Helping children in solving problems.

Science knowledge in early childhood is included in the curriculum mentioned in points 3.8 and 4.8, which states that early childhood is expected to have the ability to recognize the natural environment such as plants, animals, soil, water, weather and rocks (Depdiknas, 2014). Therefore the researcher chose the theme of medicinal plants as a topic in science learning. Medicinal plants are plants that can be used as traditional medicinal ingredients that have many health benefits (Sundari et al., 2014).

Introduction to the types of medicinal plants in children from an early age is very necessary, this is so that children know that it is not only chemical drugs that heal, but the medicinal plants around them also have many health benefits. In line with Srikartika and Nurlely, (2020 : 38), which states that scientific knowledge related to the introduction of medicinal plants is very important to be applied to children’s learning processes. The introduction of plants from an early age will provide knowledge to children that not only chemical drugs can treat when sick, but there are medicinal plants that can be used as traditional medicines that are able to nourish the body.

Based on these reasons, researchers introduce medicinal plants to increase children’s scientific knowledge. Science knowledge is imparted to children through activities with educational content that are appropriate to the characteristics of early childhood, namely through fun and habitual activities, providing opportunities for children to touch and experience the science process directly (Rahayuningsih et al., 2020). One of the ways to stimulate early childhood development is through the provision of innovative and creative teaching and education as well as creating an interesting and fun learning atmosphere for children. Creative and innovative learning is inseparable from choosing the right learning strategy and accompanied by supporting media so that learning becomes more meaningful and enjoyable for children (Andikawati & Diana, 2017).

Indrawati et al. (2021) stated that media is

something that educators can use in conveying material, so that by using media, children will be more interested in learning and children will more easily accept it. The use of media in early childhood learning is the right tool, because the level of early childhood development is still at the concrete learning stage. This means that the use of media is important as a means of conveying message information for early childhood (Hasjiandito et al., 2016).

Then, in this study the researchers used the "Medicinal Plants Herbarium Book" as a medium to increase scientific knowledge in introducing various kinds of medicinal plants for children aged 5-6 years at TK Dharma Wanita Yos Sudarso. Herbarium media are plant specimens preserved in various ways used for collection and scientific purposes. Based on Imran et al., (2020) states that a herbarium as a collection of preserved plant specimens can be used by educators as a medium for learning science. Herbarium media can help in the early childhood learning process so that children are able to understand learning material well (Widiastuti et al., 2021)

Medicinal plant herbarium book media is the development of media from utilizing dry herbarium. A dry herbarium is a collection of plant specimens which have been preserved by drying and then pasted on paper, along with an explanation of the name of the plant for each preserved specimen. As for the development of the herbarium book media for medicinal plants, each specimen that has been dried is then put together and bound so that it becomes a herbarium book containing various collections of medicinal plant specimens.

The advantage of "Medicinal Plants Herbarium Book" is could be a learning media to increase scientific knowledge in introducing various kinds of medicinal plants for children aged 5-6 years. By using the medicinal plant herbarium book, learning will be more practical and efficient, easy to carry and use at any time, besides that the medicinal plant herbarium book media can be stored for a long time so that it can be used again for learning.

## 2. How to Make a Herbarium Book as a medium to Increase Children's Medicinal Plants Knowledge

In early childhood learning an innovation is needed so that the learning process is not monotonous and more enjoyable therefore, what is conveyed by educators will be more easily accepted by children. One of the ways to improve the quality of better learning is to use supporting

media. Researchers chose the herbarium book media for medicinal plants as a medium to increase scientific knowledge in introducing medicinal plants. Here are the steps in making "Medicinal Plants Herbarium Book" as follows:

### a. Tools and materials

1. Cutters
2. Books
3. Newspapers
4. Alcohol
5. Masking tape
6. Stone or wooden blocks
7. Ivory paper size A3
8. Medicinal plants (ginger, turmeric, kencur, cat whiskers, butterfly pea flowers, lemon grass, lemon grass, guava leaves, binahong)

### b. Steps to make a herbarium book media for medicinal plants:

1. Clean the plants from dirt and adhering soil using a cloth or tissue.
2. Prepare newspapers and cardboard with a size longer than the plant.
3. Spray the plant using 70% alcohol.
4. Put the plant on the newspaper. Furthermore, to strengthen the plant parts so they don't shift, use tape on the sides of the branches and plant stems.
5. Fold the newspaper so that all parts of the plant are completely covered. After that, do the pressing by pressing it with a pile of books or wood. Wait for the plants to dry for about 7 days.
6. After the plants are dry, place the plants on the ivory paper that has been arranged to form a book using a spiral.

Next, give a description of the name of the medicinal plant and the benefits of the medicinal plant for body health.

## CONCLUSION

Referring to the results of the research that has been carried out, the conclusions that can be drawn are as follows:

1. The "Medicinal Plants Herbarium Book" as a medium to increase scientific knowledge has an influence on scientific knowledge in children aged 5-6 years at TK Dharma Wanita Yos Sudarso. This can be seen from the calculation results of the paired sample t-test; the results obtained are Sig.(2-tailed) 0.000, where  $0.000 < 0.05$ , then  $H_0$  is rejected. This means that  $H_1$  is accepted so that there is a significant difference in the results before and after receiving the treatment.
2. From the results of increasing the scien-

tific knowledge of children aged 5-6 years it was concluded that by utilizing the "Medicinal Plants Herbarium Book" as a learning media could increase the scientific knowledge of children aged 5-6 years at TK Dharma Wanita Yos Sudarso. It can be seen from the results obtained from the average pretest score of 69.80, while the average posttest score is 94.97, so there is an increase in score of 25.17.

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