
Analysis of Knowledge and Understanding of Regarding Waste Management in the Aie Dingin Landfill Area in Balai Gadang Koto Tengah District Padang City

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Abstract. Children's behavior can be changed by building awareness to keep the environment clean and healthy. To determine the level of knowledge and understanding of elementary school students regarding waste management in the final disposal site (FDS) area, it is necessary to conduct this research with the aim of determining the level of knowledge and understanding of elementary school students regarding waste management in the FDS area. This research uses a quantitative descriptive approach with a survey method. The population of this study was 75 students of class V SDN 30 Aie Dingin. The sampling technique used is total sampling. Data collection uses valid and reliable test instruments. Data were analyzed by descriptive quantitative. Based on the research results, it was obtained that elementary school students' knowledge and understanding of waste management in the Aie Dingin area of Balai Gadang, Koto Tengah District, was in the medium category with a value of 46%, where the level of student knowledge about waste was 66% and the level of understanding of waste management was 54%. It can be said that the knowledge and understanding of fifth grade elementary school students regarding waste management is still low.

Keywords: Knowledge, Understanding, FDS.

Introduction

Most of human's activities always leave wastes that commonly known as trashes. According to Rosnawati (2018) trashes are residues from human's daily activities. This is in accordance with Yusuf et al. (2022) waste is defined as a leftover/residue from a work or human's activity. Most of human's activities produce trashes. Those wastes often thrown away by people to the environment, meanwhile the number of wastes that are produced increases along with the increasing amount of citizens and technology advancement and economy. When reaching certain quantity and concentration, wastes that are thrown away to the environment could cause negative effects to the environment. Meanwhile, the environment is a receptacle for effective learning facilities and infrastructure. The environment is everything that is external to the individual, because the environment is a source of information obtained through the five senses which is then received by the brain (Andin et al., 2021; Hardiana, 2018; Siskayanti et al., 2022). The environment provides various things that can be used as learning materials. The number of learning resources available in this environment is unlimited. Hence, the environment must be keep clean and away from any waste sources, be it domestic waste, industrial, and commercial.

The efforts to preserve and maintain the environment so that it is free from wastes is by processing the reduce, reuse, and recycle (3R) pattern of waste. The 3R pattern consists of reduce, reuse, and recycle (Susanti et al., 2021). The 3R concept encourages the community to handle waste from the source, such as sorting waste and packaging waste properly, encouraging the application of waste utilization that has economic value, starting from scavengers to the waste recycling industry (Barloa et al., 2016; Simbolon et al., 2022; Barma et al., 2022). Andina (2019) stated UU no. 18 of 2008 4th chapter mentioned that waste management aims to improve public health and environmental quality and turn waste into a source of income. Through the processing of wastes into value for use materials, it can create jobs for the community (Barma et al., 2022). Furthermore, wastes management in a good way can provides great benefits in life and gives positive effects towards regional economy. Structured waste management planning by the government provides a great opportunity for home industries to improve a product (Andina, 2019). Craft products that utilize organic and inorganic waste raw materials are one of the crafts that can maintain the value and potential of a region (Hendri et al., 2018). As is the case with coconut shell waste processing which is used by bag and wallet craftsmen. In addition, craftsmen of woven bamboo for household furniture. These handicraft products not only provide aesthetic value but also have a meaning in cultural preservation. Utilization of natural raw materials into a handicraft product is also called ethnobotany (Hendri et al., 2018). Therefore, a deep and planned concept is needed in processing waste as a value-for-use material.

The concept of waste management can be obtained through the learning process (Hoshim et al., 2022; Uloma et al., 2022; Ali et al., 2022). Through the learning process a person has knowledge. The learning process is a process that involves teachers and students in acquiring knowledge, understanding, attitudes, and skills. This is in accordance to Ali et al., (2022) that intrust learning is a student's effort to learn lesson material as a result of the teacher's treatment, through the learning process students can learn so that behavior occurs in them. These changes in behavior include knowledge, understanding, attitudes, skills, as well as interests and talents. But in reality, applying the knowledge and understanding gained about waste management in the school environment is still low. Knowledge is a very important domain for the formation of one's actions (Ramli et al., 2022). The knowledge possessed by students refers to their knowledge of interesting topics such as in this case is sustainable waste management. Understanding refers to their feelings or attitudes towards sustainable waste management.

The city of Padang as the largest city in West Sumatra faces a waste problem that needs to be taken seriously, that is the waste escalation which continues to increase every year. Hardiana (2018) states that the average urban waste escalation is 0.0035 m³/person/day or equivalent to 0.9 kg/person/day. In the year 2030, with a population of 1,871,534 people, it is estimated that the daily amount of waste in Padang City will reach 3,050 m³ (784 tons), while only 400 tons/day (51%) of the waste generated can be transported to the fds in Aie Dingin (Hardiana, 2018; Raharjo et al., 2014). The uncollected wastes are usually collected in temporary disposal sites (TPS) located on the roadside, at the intersection of roads or certain road bodies. This condition can have negative impacts on the surrounding environment, causing unpleasant odors, reducing traffic flow, reducing the beauty of the city, and even becoming a breeding ground for diseases. Sustainable waste management should be a concern for everyone, from children to adults, rich or poor. The formation of sustainable waste management behavior in elementary school students oriented towards sustainable development can become a role model for sustainable waste management behavior in their families and communities (Raharjo et al., 2020; Sriwahyuni et al., 2022). This study aims to determine the level of knowledge and understanding of

students about waste management so that both inorganic and organic waste can be utilized to become something useful, thus reducing the accumulation of waste in the FDS Aie Dingin area, and the need for more attention from the government and the whole community.

Methods

The research is a quantitative descriptive study, describing the current state of the research subjects or objects based on observable facts. The method used is a survey method. The survey method involves sampling from a population and using a questionnaire as the primary data collection tool (Sugiyono, 2018).

The subjects in this study are all fifth-grade students at SDN 30 Aie Dingin, Balai Gadang Koto Tengah District, Padang City, totaling 75 individuals, consisting of Va, Vb, and Vc, each with 25 students. The sampling technique employed in this research is total sampling, where the entire population becomes the research subjects (Sugiyono, 2018).

Data collection techniques involve using a test instrument to assess students' knowledge and understanding of waste management. According to Sari et al. (2022), a test instrument is a tool that measures skills, knowledge, understanding, abilities, or talents possessed by individuals or groups. The test instrument used consists of 30 multiple-choice questions with four options: A, B, C, and D. Data collection is done by distributing the validated and reliable test instrument to all fifth-grade students at SDN 30 Aie Dingin.

Data analysis in this study uses quantitative descriptive data analysis techniques. According to Sugiyono (2018), quantitative descriptive statistics are used to analyze data by describing it as it is, without intending to make general conclusions or generalizations. Data is quantitatively analyzed using the percentage technique as described by Sugiyono (2018).

$$P(\%) = \left(\frac{f}{N}\right) \times 100$$

Remark:

P = Percentage number

f = frequency that is being calculated for its percentage.

N= *Number of Case* (frequency number of individual count)

The scores obtained are given meaning and are categorized into complex forms based on the existing levels. Categorization is done using the Mean and Standard Deviation, following norm-referenced assessment (PAN) as per Saifuddin (2017). You can refer to Table 1. for more details on the assessment norms.

Table 1. Assessment norm

Interval	Category
$M + 1.5 S < X$	Very high
$M + 0.5 S < X \leq M + 1.5 S$	High
$M - 0.5 S < X \leq M + 0.5 S$	Medium
$M - 1.5 S < X \leq M - 0.5 S$	Low
$X \leq M - 1.5 S$	Very low

Remark:

M : Mean

X : score

S : *standard deviation*

Results and Discussion

The analysis of the knowledge and understanding of fifth-grade students at SDN 30 Aie Dingin on waste management in the Aie Dingin FDS area, Balai Gadang Koto Tengah district, Padang city has been conducted using a 30-item objective test that has been validated. The test used consists of two indicators, namely knowledge about waste management and the respondents' understanding of attitudes about waste management. The frequency distribution of the research data on the knowledge and understanding of fifth-grade students at SDN 30 Aie Dingin on waste management obtained the lowest score (minimum) of 13, the highest score (maximum) of 30, a mean of 17.88, a median of 18, a mode of 18, and a standard deviation (SD) of 2.29.

Based on the mean and standard deviation, the frequency distribution of the knowledge and understanding of fifth-grade students at SDN 30 Aie Dingin on waste management in the Aie Dingin TPA area, Balai Gadang village, Koto Tengah district, Padang city is presented in Table 2.

Table 2. Distribution of frequency of knowledge and understanding of fifth grade students

No.	Interval	Category	Frequency	%
1	$21.315 < X$	Very High	8	10.6
2	$19.025 < X \leq 21.315$	High	19	25.3
3	$16.735 < X \leq 19.025$	Medium	35	46.7
4	$14.445 < X \leq 16.735$	Low	10	13.3
5	$X \leq 14.445$	Very Low	3	4

Based on Table 2 above, it can be seen that the knowledge and understanding of fifth grade elementary school students about waste management in the Aie Dingin landfill area, Balai Gadang, Koto Tengah district, Padang city, is in the moderate category with a value of 46.7%. There were 35 students in the moderate category. This is because there are still students who do not know the types of waste and waste sorting. The lack of students' knowledge about waste can worsen the environment due to unmanaged waste generated from daily activities. Through education, it is expected that knowledge about waste management can be conveyed in the learning process. The learning process is an interaction between teachers and students that are interconnected, through learning students are expected to move from unawareness to awareness and from incompetence to competence (Sari et al., 2017; Sari et al., 2019). In addition, one of the aims of education is to instill environmental care values.

Instilling environmental care values can be done from an early age, so that it is reflected in the behavior of disposing of waste in its proper place and sorting waste by type (Barloa et al., 2016; Simbolon et al., 2022; Barma et al., 2022; Siskayanti et al., 2022). Introducing the types of waste from an early age by disposing of waste according to its type is a simple habit that will have a significant impact on the environment (Siskayanti et al., 2022; Raharjo et al., 2020), and this attitude is crucial to be formed as a good habit for future generations. Although disposing of waste and sorting waste by type may seem simple, forming the habit is not easy, especially for young children who still need guidance and supervision from parents. Therefore, the participation of all parties in waste management is crucial. This is in line with Simatupang's statement (2021; Raharjo et al., 2020; Sriwahyuni et al., 2022) that one aspect that affects the effectiveness of waste

management is community participation in sorting waste by type. Without community participation in waste management, the dream of creating a healthy and clean environment will not be realized. A clean environment is very beneficial in life, besides providing beauty and comfort, it also gives harmony.

In essence, garbage is not something harmful to humans. Garbage can be turned into something useful if people know the proper processing techniques. However, many people are still unaware of waste management. Waste management can be done by sorting organic and inorganic waste (Purnami, 2020). Organic waste is waste that can be naturally decomposed, while inorganic waste is waste that is difficult to decompose naturally. Waste management can be done with the 3R method. Purnami (2020) and Siskayanti (2022) state that waste management through reduce is by reducing the amount of waste generated. In daily life, this pattern has been applied in several supermarkets that enforce rules to pay for plastic bags for shopping, intended for consumers to use as few plastic bags as possible when shopping. Reduction in the amount of waste, especially household plastic waste, is also carried out through socialization by the department of environment.

Reuse management is an effort to manage waste by reusing it (Hendri et al., 2018). Reuse can be done in daily life by using materials that have the potential to become waste for reuse. The recycling pattern of waste management is by recycling existing waste into more economically valuable forms. Some examples of recycling include processing plastic waste into baskets, flowers, and other products that have more economic value.

In general, Image 1 below illustrates the level of knowledge and understanding of fifth-grade students at SDN 30 Aie Dingin regarding waste management in the TPA Aie Dingin area, Balai Gadang Village, Koto Tengah District, Padang City.

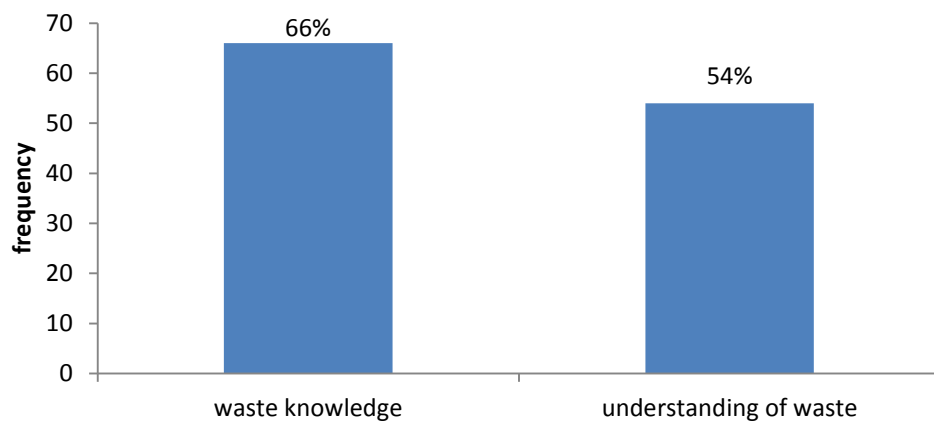


Figure 1. The level of knowledge and understanding of students regarding waste management.

Based on the Figure 1 above, it is known that the level of knowledge of fifth grade students at SDN 30 Aie Dingin regarding waste management in the TPA Aie Dingin area, Balai Gadang Village, Koto Tengah District, Padang City is quite high with a value of 66%, and the students' understanding of waste management is in the moderate category with a value of 54%. This indicates that the knowledge of SDN 30 Aie Dingin's fifth grade students regarding waste management is still low. The low level of knowledge of students regarding waste management is influenced by several factors. One of the factors that affects the level of student knowledge is learning experiences. Experience is the knowledge gained and experienced by students as a result of learning and interaction with learning content and activities (Simbolon et al., 2022; Sriwahyuni et al., 2022). Learning

experiences are organized based on continuity, sequence, and integration. Continuous experience refers to providing opportunities for students to continuously perform various activities or skills. Sequence refers to the relationship between all learning experiences (Hoshim et al., 2022; Uloma et al., 2022; Ali et al., 2022). Meanwhile, integration refers to the connection between the material of a topic with other topics. In the learning process, it is expected that the concept of waste management can be taught properly and effectively so that students can apply the knowledge gained in their daily lives, especially in waste management. Simply put, students are expected to understand how to manage organic and inorganic waste originating from their own activities (Ali et al., 2022; Purnami 2020; Raharjo, 2020).

Sustainable waste management is a necessity to address the negative impacts of waste. Sustainable waste management is considered an effective measure to reduce the cost of waste collection, transportation, and processing (Raharjo, 2020; Hardiana, 2018). Sustainable waste management behavior is defined as efforts to reduce waste (reduce), reuse usable items (reuse), recycle waste (recycle), and convert waste into energy (waste to energy). According to Raharjo (2020; Saputra, 2017), waste management is all activities carried out to handle waste from its generation to final disposal. Broadly speaking, waste management activities include landfill control, waste collection, transfer and transport, management, and final disposal. In line with what Purnami (2020; Saputra, 2017) conveyed, waste management is a comprehensive effort to handle waste generated from various human activities, grouped into six separate elements: generation control, storage, collection, transfer and transport, processing, and disposal.

]Based on the gender of fifth grade students at SDN 30 Aie Dingin towards knowledge and understanding of waste management in FDS Aie Dingin area, Balai Gadang, Koto Tengah district, Padang city based on gender, can be seen from Figure 2.

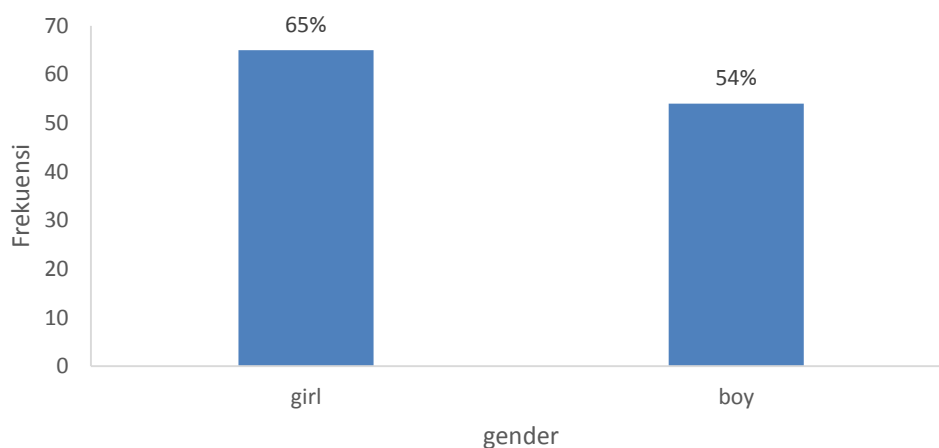


Figure 2. Level of knowledge and understanding of students about waste management by gender

Based on Figure 2 above, it is known that the level of knowledge and understanding of students regarding waste management is based on gender, where female students have a higher level of knowledge and understanding of waste management than boys, namely 65% girls and 54% boys. There is a very significant difference between the knowledge and understanding of male and female students in waste management. This is because women are more sensitive in managing the environment (Hermawan, 2019). This is in line with

what was done by Mariwah, et al (2012), that women tend to be able to maintain cleanliness than men. Moreover, women are closely related to the environment. Without involving women, the environment cannot be preserved (Prince, 2020). If the environment is damaged, women will be the first to be affected (Hermawan, 2019), because women have a lower level of immune system than men (Clough, 2010). Women in psychology are underestimated by some parties (Suen, 2019), even though women's potential is enormous in protecting and preserving the environment. By involving women in waste management, such as sorting household waste, making compost, and recycling simple waste, the quality of women and the environment will be better.

Gender differences form different perceptions that affect different attitudes and knowledge between men and women (Clough, 2010). Prince, (2020) states that gender and education are important social determinants of health that have an impact on health behavior. Differences in gender and education have an effect on sedentary behavior. The reality is that women are more diligent, diligent, and thorough when given assignments or doing something (Suen, 2019). Gender is a factor that facilitates a person to behave. According to Hermawan (2019) men and women have an equal share in efforts to improve their health which can be applied in everyday life through clean and healthy living behaviors.

Conclusion

Based on the results obtained from the analysis of elementary school students' knowledge and understanding of waste management in the Aie Dingin area, Balai Gadang, Koto Tangah district, Padang city, is in the medium category with a value of 46%, where the level of student knowledge about waste is 66% and the level of understanding of waste management is 54%. This indicates that the knowledge and understanding of elementary school students in grade V regarding waste management is still low.

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