Awareness and Practices on Solid Waste Management among Grade 6 Pupils

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ABSTRACT

Solid waste management (SWM) is essential for safeguarding environmental and public health, yet many communities struggle with poor waste practices and limited awareness. Integrating SWM into early education helps build responsible habits among young learners, making schools vital in promoting sustainable waste solutions. This study investigated the relationship between awareness and solid waste management (SWM) practices among Grade 6 pupils. Awareness was the independent variable, while SWM practice served as the dependent variable measured through segregation, reduction, reuse, recycling, and disposal indicators. A quantitative approach using random sampling and a descriptive correlational design was employed. Data were analyzed using the mean and Pearson r. The mean awareness score was 4.61 ($p = 0.000$), and the mean score for SWM practices was 4.68, both statistically significant at 0.05. The findings revealed a significant positive relationship between awareness and SWM practices. These further suggest that enhancing students' awareness of solid waste management contributes to developing more responsible and sustainable waste-handling behaviors at a young age.

Keywords: Awareness, Practices, Solid Waste, Segregation, Reduce, Reuse, Recycle, Disposal, Davao Region, Philippines

INTRODUCTION

Waste brings various problems that impact the people's health, well-being, and environment of learning institutions like schools, colleges, and universities. Although individuals across the globe know about the negative impacts of incorrect garbage disposal, improper attitudes, and practices, on most occasions, create destruction. Solid waste management is still a significant issue in most nations, including the Philippines, because of the disparity in solid waste collection, segregation, and treatment (Wynne et al., 2018). The Philippines is considered among the most significant sources of plastic trash in the seas. The failure to strictly enforce solid waste management standards has resulted in unmanaged waste, particularly plastics, that gradually damages the aquatic bodies (Diola et al., 2020). Numerous people continue to disregard appropriate solid waste management practices that may lead to intense health threats to communities and environmental problems such as contaminated water, soil pollution, bad air, and flash floods. These issues also aggravate socioeconomic problems (Senate Economic Planning Office, 2017).

Moreover, our environment has been facing a waste crisis because of attributes, so solid waste management practices should be fortified (Choi, 2016). Properly managing waste is essential for ensuring a healthy living environment. Strict attachment to proper waste management practices in society will protect residents from harmful and dangerous environmental conditions while also improving people's living standards (Adogu et al., 2015). By understanding the benefits they acquire from practicing solid waste management, they will likely support and, under these terms, acceptable options in solid waste management. Proper segregation is a solid waste management practice that is important that involves separating various materials found in solid waste at

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the point of origin to promote the recycling and reuse of resources while also reducing the volume of waste that must be collected and disposed of Republic Act 9003 Article 2, Section 3. (Ambayic & et al. 2013) stated that reduction is lowering the amount of trash generated by purchasing items that create much trash. It instills in students a culture of willingness to take responsibility for waste management while also assisting schools in reducing waste.

People's attitudes toward garbage will shift because of increased solid waste management awareness. People grew up believing that garbage is garbage and that it should not be touched or approached. They previously thought all garbage should be disposed of in a single container (Sarino, 2014). According to Baula, as stated by Punongbayan (n.d), awareness followed by involvement is the key for students to be included in the waste management program of the institutions where successful and sustainable implementation of good waste management practices may be accomplished. Colleges and universities are essential for influencing social behavior that is good for the environment and society (Rahmada et al., 2019). Solid waste management awareness aims to educate people about managing waste to have a clean environment. Hence, awareness is one of the essential components for students to engage in proper waste management programs at higher education institutions, where an efficient and sustainable objective can be acquired.

There are several studies on solid waste management; however, there are no specific studies on the relationship between solid waste management awareness and practices among Grade 6 pupils. This age group is at a crucial stage of cognitive and behavioral development, where values and habits related to environmental responsibility can be effectively shaped. Furthermore, while students may know solid waste management principles, many still fail to practice proper waste disposal. This study investigates the relationship between awareness and the solid waste management practices of Grade 6 pupils at Nanyo Central Elementary School. It aims to shed light on the current waste management behaviors of learners who may be experiencing issues with improper disposal and segregation, to inform more effective environmental education strategies at the elementary level.

Furthermore, this study provides relevant data to raise students' awareness of solid waste management and practices. Researchers discovered that it is urgent to determine how much students know about solid waste management. Thus, students' awareness and practices help determine what interference should be implemented and become aware of solid waste management practices. This study aims to assess the students from Grade 6 to educate them about solid waste management and stimulate their awareness and practices when solid waste management occurs. Educating and providing information through television, radio, and social media are the sources of this awareness. According to UNESCO, environmental education can raise awareness of the environment and its associated challenges. It fosters the specific skills and expertise required to deal with ecological challenges and the attitudes, motivations, and commitments needed to make decisions and take responsible actions.

Researchers are eager to conduct this study because there is no specific study about awareness and practices on solid waste management among grade 6 pupils. Researchers can assist in evaluating grade 6 students' existing waste management processes. Researchers can find areas for improvement and build interventions to promote positive behavior change by knowing their waste patterns and attitudes. Pupils can be encouraged to embrace environmentally friendly actions involving trash reduction, recycling, and proper waste segregation through focused education and awareness initiatives.

This study is based on the Reasoned Action Theory, which emphasizes the correlation between behaviour and behavioural intention. It contends that behavioural intention comes before action. This theory provides a framework for explaining, understanding, and predicting human behaviours when individuals participate voluntarily and self-controllably; the hypothesis is founded on the premise that individuals' behavioural intentions are closely related to their opinions. The idea of reasoned action regards an individual's purpose to do or not perform as an initial predictor of the action. As a result, this theory is appropriate for predicting a student's desire to engage in a given behaviour related to solid waste management (Fishbein & Ajzen, 1975).

Based on the Environmental Protection Agency (n.d.), environmental education is a continuous process by which people and communities become aware of their surroundings and develop the attributes, abilities, and passions to act to address current and future problems. This EPA will aim to make students fully aware of the damage of

solid waste to the environment and educate them to be more environmentally conscious. Education, an essential and accessible way to address rubbish, contributes to increased awareness of environmental issues and finding suitable approaches for long-term growth (Przydatek, 2019).

Furthermore, researchers have widely recognized the importance of increasing public awareness of and community involvement in waste disposal to create sustainable disposal systems and encourage environmental citizenship among residents (McAllister (2015). People are more inclined to participate in waste management activities, such as recycling, when they see others in their neighborhood doing so. Education is of the utmost importance for increasing public awareness concerning safeguarding the environment to guarantee waste management (Muljaningsih & Galuh, 2018).

Awareness, defined as the perception or awareness of an occurrence, is acknowledged as the first stage, serving an essential role in likely behavioral change and successful teaching, particularly concerning environmental concerns (Twumasi, 2017). Solid waste management awareness can help reduce or remove negative ecological and human health impacts to support economic growth and enhance the quality of life. In our polluted world, learning the proper methods for dealing with waste has become vital. Awareness is indeed an environmental movement that intends not only to educate people about the consequences of building and managing waste but also to teach their best attitude, motivating them to engage in preferred waste disposal practices at home, university, and elsewhere (Dharmasiri, 2019).

As future generations, our learners must be highly aware of and effectively integrate solid waste management practices and actively fix environmental-related problems, as this is a worldwide concern. They facilitate a possible role as change agents in dealing with environmental issues. Poor waste management approaches are compromised by a lack of individual awareness and environmental comprehension, which results in problems enduring for generations to come (Ampofo, 2020).

Solid Waste Management Practices refer to the actions taken to generate, store, collect, transport, treat, recycle, incinerate, use a flame torch, recover resources, or dispose of solid waste (Marello et al., 2014). Solid waste management practices are essential to lessen the problem of waste management that has caused harm to people's health and the environment. Pollution levels have begun to increase quickly. The use of plastics and other non-biodegradable substances has only exacerbated the problem. According to the Environmental Protection Agency. (n.d.), one way to address this is to use fewer such items; reusing and recycling them is the best practice. The systematic management, intervention, and disposal of solid waste materials accumulated through people's actions have been referred to as solid waste management procedures. These techniques aim to reduce waste development's negative environmental results and improve long-term garbage disposal.

According to Pandey et al. (nd), segregation is essential in solid waste management, specifically when dealing with minimal economic resources. After segregation, we can know which particular waste the garbage belongs to. The 3R (reduce, reuse, and recycle) concept is one of the most successful ways of handling waste (Naria et al., 2018). Individuals, local governments, trash management firms, and recycling industries must work together to implement segregation projects and effectively achieve prospective waste management goals.

Reducing the quantity of garbage disposed of by purchasing goods that purposefully produce much rubbish. It instills in children a culture of responsible trash management while also assisting schools in reducing waste, as cited by Ambayic et al. (2013). According to Almasi et al. (2019), reducing or eliminating waste by minimizing the materials that people initially used is a practice. We can help our school environment by reducing our waste by using reusable bags or clothing for cleaning and consuming less if we do not need the things that much.

Reusing waste involves getting any goods or product components and reusing them in their original or new feature (repurposing or innovative reuse) (Villalba, 2020). In addition, reusing garbage for something else or in an alternative way is referred to as reuse. (Dharmasiri, 2019). Reusing can save the energy and resources that would have been required to create a new product, resulting in fewer things being thrown away and ending up in landfills. Aside from saving money and old things, we can also help protect our environment from global climate change.

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Recycling converts waste into innovative materials, substances, and stuff (Villalba, 2020). Recycling means transforming things old becomes something new. Through recycling, we can help to fix the ongoing problem of improper waste management, like air pollution and water and soil contamination that can cause infection and transmit diseases. In addition, recycling is beneficial because it helps reduce global warming that will threaten our earth (Geyer et al. 2017). Assert that recycling is vital to effective waste management plans. The authors emphasize the value of recycling in preventing environmental contamination, cutting greenhouse gas emissions, and protecting natural resources. People stress that recycling helps to create a circular economy by closing the material loop and simplifying one's dependence on virgin materials.

The release, deposit, emptying, spilling, leaking, or placement of solid waste into or on any land is considered waste disposal. In contrast, disposal sites are regions where solid waste is eventually discharged and placed (Environmental Management Bureau n.d). Despite its importance in managing residual garbage, it is considered the least preferred form of solid waste management. Garbage disposal strives to collect garbage that cannot be recycled, repurposed, or recovered safely and does not endanger ecosystems, water resources, or people's health. One of the primary contributors to environmental degradation is incorrect solid waste disposal management, which has been identified as a significant source of pollution and illness outbreaks in many countries worldwide. Dispropriate disposal of solid waste can result in outbreaks of illnesses, as well as air, water, and soil contamination (World Bank. 2018).

This study aimed to determine the significance of the correlation between awareness and practices on solid waste management among grade 6 pupils. Specifically, it sought answers to the following research questions: (1) To what extent are Grade 6 pupils aware of solid waste management; the level of practices on solid waste management among Grade 6; and the significant relationship between solid waste management awareness and practices among Grade 6 pupils. The study's null hypothesis was tested at a 0.05 level of significance, stating that there is no significant relationship between awareness and practices of solid waste management.

METHODS

Participants

This study employed a simple random sampling technique when choosing the respondents most likely to offer relevant information regarding the problem. Random sampling is a statistical analysis technique applied in research and surveys to choose individuals or items from a population so that every member has an equal probability of being selected for the sample. Random sampling aims to generate a representative sample that mirrors the entire population's characteristics well, enabling researchers to make more stable inferences and conclusions (Smith, 2015).

A total of 40 Grade Six pupils from Nanyo Central Elementary School were involved in the study. Simple random sampling was used so that every student had an equal chance to be selected, thus improving the external validity of the results. Research with children involved ethical precautions to protect their rights and well-being. The study was conducted by obtaining permission from the school principal and gaining parental or guardian permission and student assent. The assent process entailed describing the study in terms that children could understand and permitting the children to agree voluntarily to participate.

The inclusion criteria for this study comprised Grade 6 pupils who were officially enrolled at the selected primary school during the data collection period. Eligible participants were required to demonstrate regular school attendance, provide informed assent, and secure parental or guardian consent. Moreover, only pupils who expressed willingness and demonstrated the ability to participate in the data-gathering activities related to solid waste management were included. Conversely, the exclusion criteria eliminated students from grade levels other than Grade 6, those who lacked proper consent, and individuals with irregular attendance, as such factors could limit exposure to relevant environmental education. Additionally, pupils with special educational needs whose cognitive and curricular frameworks significantly differ from the standard Grade 6 program were excluded, along with newly transferred students who may not have had adequate familiarity with the school’s solid waste management initiatives. These criteria were established to ensure the validity, consistency, and reliability of the data collected.

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Materials/Instruments

The research instrument utilized for data collection was a survey questionnaire. Students answered each item using a corresponding scale regarding their knowledge, awareness, and practices on solid waste management. This instrument sought to assess the awareness and practices of Grade 6 pupils presently studying at Nanyo Central Elementary School. The study used a modified version of the questionnaire from a previous research conducted by Paghasian (2017), titled *"Awareness and Implementation of Solid Waste Management (SWM) Practices."* The questionnaire contained items that evaluated the respondents' awareness and implementation levels of solid waste management practices. The collected data were analyzed by a statistician and interpreted by the researchers. For its validity, the instrument was validated by two expert panel validators. Both the independent and dependent variables were pilot-tested and came up with 0.89 and 0.92 reliability coefficients, which is high internally.

A five-point Likert scale was administered to gauge students' awareness and practices about solid waste management. The students self-rated from 1 to 5 on their attitudes and experiences, where: (1) Never, (2) Seldom, (3) Sometimes, (4) Often, and (5) Always. The scale of interpretation for the levels of students' awareness was as follows: 4.20–5.00 – Very High (Always mindful), 3.40–4.19 – High (Often mindful), 2.60–3.39 – Moderate (Sometimes mindful), 1.80–2.59 – Low (Seldom mindful), 1.00–1.79 – Very Low (Never mindful), Likewise, the scale employed to measure the practice level in solid waste management was: 4.20–5.00 – Very High (Always practice), 3.40–4.19 – High (Often practice), 2.60–3.39 – Moderate (Sometimes practice), 1.80–2.59 – Low (Seldom practice), 1.00–1.79 – Very Low (Never practice).

Design and Procedure

This research employed a descriptive-correlational research design. Descriptive-correlational research is a quantitative approach to describe and study the relationship between variables. It entails measuring and comparing variables to establish the strength and direction of their relationship without manipulating any variables. This research approach focuses on identifying patterns, similarities, and relationships within the data (Jones & Smith, 2019).

The survey was carried out for one week to deliver the survey questionnaires to all the participants. The data collection process followed: First, the questionnaires were sent to validators for review, comments, and recommendations. Second, the researchers formally sought permission from the class advisers and the principal's office to conduct the study. A request letter, assent, and consent forms were forwarded to Nanyo Central Elementary School. Then, the questionnaires were personally distributed to the selected participating students in their classrooms. Lastly, after distributing the questionnaires, the data were gathered, counted, and tabulated for analysis. To analyze the data, the study utilized the following statistical instruments: mean, which was utilized to find the levels of awareness and practice towards solid waste management, and Pearson's r, which was utilized to determine the significant correlation between awareness and solid waste management practices as identified in research question three.

RESULTS AND DISCUSSION

This section presents the study's findings. The results show a summary weighted mean of the pupils' awareness and solid waste management practices regarding segregation, reuse, recycling, and disposal. Finally, the findings show a link between awareness and practices on solid waste management among grade 6 pupils.

Table 1 shows the awareness of solid waste management of grade 6 pupils. The mean result was 4.61, and the interpretation was very high; thus, the students' awareness of SWM was resilient, and they were informed about its significance. It also means that the pupils have sufficient knowledge about solid waste management. According to UNESCO, environmental literacy may raise awareness about the environment and its associated concerns.

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Table 1: Awareness of Solid Waste Management among Grade 6 Pupils

Variables	SD	Mean Result	Descriptive Equivalent
Awareness	0.63	4.61	Very High

Raising the extent of awareness in school will enhance the level of behavior and practice regarding the issue of solid waste management. This shows that awareness and practices work together to help us achieve our goals and become better versions of ourselves. The relationship between understanding and practices is significant because awareness informs our practices, and our practices reinforce our awareness. This relationship impacts our daily lives by helping us make informed decisions, understand ourselves and the world around us, and achieve personal growth and development (Nawawi et al., 2022).

Table 2: Practices on Solid Waste Management among Grade 6 Pupils

Variables	SD	Mean Result	Descriptive Equivalent
Practices			
Segregation	0.66	4.65	Very High
Reduce	0.58	4.64	Very High
Reuse	0.58	4.70	Very High
Recycle	0.48	4.75	Very High
Disposal	0.61	4.68	Very High

As shown in Table 2, Grade 6 pupils presented very high knowledge about practices on solid waste management. Similarly, Molina&Catan (2021) determined that Senior High School students had very high knowledge of solid waste management and followed the proper practices. Effective disposal practices are also vital for school initiatives and endeavours (lfegbesan et al., 2017). The tasks performed should be intellectual, emotional, and physical. Parts of the brain that control movement. Pupils must have knowledge and attitudes toward waste management and demonstrate such understanding and viewpoint through their actions (Muljaningsih & Galuh, 2018).

The mean result for segregation was 4.65, meaning it was very high that Nanyo Elementary School among grade 6 pupils followed SWM principles in terms of segregation. The pupils successfully separated the non-biodegradable items from the biodegradable ones, recyclable and non-recyclable. Pupils had solid waste management knowledge in terms of segregation. The description of renewable from non-biodegradable is regarded as very high. Hence, the majority of Grade 6 pupils possess expertise in solid waste management in terms of segregation.

The mean reduction result was 4.64, which is considered very high. Students bring their water containers and a reusable lunchbox to school. Each time, the pupils exhibited caution and accountability in the trash they generated. The pupils are vigilant and must take responsibility for any materials they generate. Pupils pack their lunch in a reusable lunch box and provide water in recyclable bottles rather than buying water in plastic bottles that are only used at school.

The findings indicated that the mean result A for reuse was high, at 4.70. Pupils effectively reuse blank and scratch papers, grocery bags, and washable food containers. The table's highest weighted average value of 4.75 was found on item 1. This means that the pupils reuse old materials instead of buying new ones. The pupils discovered maintaining unoccupied papers, utilizing them as scratch paper, and repurposing the remaining paper to make a notepad.

The mean result for recycling is 4.75, which is very high. Despite knowing about recycling, the students transformed much of the waste into new resources. It indicated that the most significant average weighted mean of 4.80 resulted as "very high" anchored on item 2," I make decors out of plastic wrappers and other colourful waste materials". Recycling minimizes the requirement for raw materials to be extracted and manufactured. Pupils work to protect the environment by reusing items such as cardboard, plastics, paper, and minerals. Students are educated on the importance of recycling and actively participate in recycling efforts.

The mean result for disposal was 4.68, which was extremely high. Proper garbage disposal contributes to a healthy and clean atmosphere on the school campus. As indicated in the table, "I dump waste things and leave them in the garbage", which received the highest average weighted value of 4.78. "I put hazardous/toxic/special rubbish in garbage cans, such as laboratory leftovers (chemicals) or electronic waste"; "very high" is the interpretation. Proper trash disposal adds to student safety. It aids with the prevention of injuries or collisions resulting from hazardous waste materials, pointed objects, or fragmented material. Pupils can avoid harm by putting waste in authorized containers and adhering to school safety policies.

Table 3: Correlation between Awareness and Practices on Solid Waste Management.

Variables	SD	Mean	Description	r-value	p-value
Awareness	0.63	4.61	Very High	675.	0.000
Practices	0.59	4.68	Very High		

The correlation between awareness and practices on Solid Waste Management is shown in Table 3. The overall mean of awareness is 4.61, with the description of very high, and the total mean of practices is 4.68, with the description of very high. The r-value of awareness and practices is 675, and the p-value is 0.000. The null hypothesis is rejected; since the p-value is less than 0.05, there is a significant relationship between awareness and practices on solid waste management. This indicates that, at this point, pupils are ready to support and conquer various issues in solid waste management (Lad et al., 2020).

CONCLUSIONS AND RECOMMENDATIONS

From the outcome analysis of the research, here are the conclusions regarding the Awareness and practices on Solid Waste Management among Grade 6 pupils. The result of awareness was 4.61, which has the descriptive equivalent of very high, meaning the pupils are fully aware of solid waste management. On the other hand, the dependent variable, the practices, gained an average weighted mean of 4.68 with the descriptive equivalent of very high, which means that the pupils properly practice solid waste management. As we conducted our final survey at Nanyo Central Elementary School, grade 6 pupils have more persistence in awareness and practices on SWM to improve their sustainable lifestyle and concluded that there is a significant relationship between awareness and practices on solid waste management. Effective solid waste management requires a combination of individual responsibility and collective action. When individuals are aware of the potential harm caused by improper waste disposal, they are more likely to take steps to reduce waste generation and properly dispose of waste.

In addition to individual action, effective solid waste management requires collective action from schools, local governments, and communities. Governments can be crucial in implementing policies and regulations to ensure proper waste disposal and management. Overall, increasing awareness and promoting sustainable waste management practices are essential steps toward reducing the negative impact of solid waste on the environment and human health.

Recommendation

Fostering solid waste management awareness and practices in elementary schools is important to creating an environmentally friendly future. These suggestions aligned with the result: (1) Students should be more aware of the school's orientation on the SWM Program. Coordinate with educational authorities to strengthen the implementation of awareness on the SWM Program; (2) Proper handling of waste and the separation of benign wastes from dangerous and toxic substances are vital for the protection of the environment and the safety of people. Provide proper labelling on waste bins or containers with clear and concise instructions on what types of waste should be disposed of; (3) Incorporate lessons about sustainability, waste reduction, and the impact of single-use plastics into the curriculum; (4) Motivate pupils to use their artistic abilities to embellish or customize their note pads. This can encourage inventiveness and pride in adopting environmentally friendly items; (5) Discover various approaches and ways for reusing or converting waste materials into a new product. Incorporate lessons and activities that highlight the benefits of reusing items instead of discarding them; and (6) Organize regular educational events and instructional activities to educate pupils, educators, and employees about the necessity of safe garbage disposal. Emphasize the adverse effects of inappropriate disposal on the environment,

individual wellness, and the community. Encourage appropriate waste management practices and provide instructions on properly disposing of specific prod.

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