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# Barriers Affecting Municipal Solid Waste Management Practices of Residents in Ozamiz City, Philippines

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***Abstract*—** Various activities, laws, and policies were implemented to address the emerging issue of solid waste management in cities and municipalities including the Local Government Units' mandated duty to create a Solid Waste Management Plan to address the emerging issues brought by solid wastes. Identified activities in the plan is the Information, Education, and Communication campaign to inform knowledge and skills and encourage public participation. This study is focused on identifying the barriers affecting proper solid waste management practices of the residents in 9 urban barangays in Ozamiz City, that affected their intention and actual behavior. A descriptive - correlational method was utilized in this study. The data were gathered using a researcher-made questionnaire. The results revealed that most of the respondents are elderly with the age 51 years old and above, married, and have reached college level. The respondents received information on segregation, 3Rs, and composting through Barangay assemblies. However, most of the respondents unsegregate solid wastes despite the knowledge gained in proper solid waste management due to dominating barriers under practicality and responsibility as categorized in the Value-Action Gap and discrepancies in attitude-behavior of the respondents, weak or conflicting subjective norms, and low perceived behavioral control based on Theory of Planned Behavior. Addressing these barriers are imperative such as helping ease the inconvenience perceived, collaborative efforts, strict implementation of policies and regular collection of wastes, and possible integration of incentives could encourage the residents to comply with proper solid waste management.

***Keywords*—** clean water and sanitation, information education and communication campaign, participatory programs, proper solid waste management practices, responsible consumption and production.

## INTRODUCTION

### *Background of the Study*

By 2050, total global waste production will reach 3542 Mt based on a 2015 value of 1999 Mt (Chuen Chen et al., 2020). This trend means that the amount of solid waste continually increases due to globalization. Continuous globalization has created various challenges, especially for developing countries, leading to several laws and policies imposed to ensure sustainable management of waste. In the Philippines, Republic Act No. 9003, otherwise known as the Philippines Ecological Solid Waste Management Act of 2000, mandates all local government units to prepare a solid waste management plan (Official Gazette, retrieved Feb 2025). The Information, Education, and Communication (IEC) campaign is one of the identified strategies in the plan to address the problems and concerns of solid waste management.

Along with law enforcement, capability building, and conducting research, the local government of Ozamiz City, in partnership with non-government agencies, and civic society organizations, has conducted an intensive Information, Education, and Communication (IEC) campaign on proper solid waste management, particularly on segregation, 3Rs- recycling, reducing and reusing, and composting in nine (9) urban barangays in Ozamiz City. All these efforts are to institutionalize the active participation of people in waste minimization and segregation at source, reuse, recycling, and composting (OCISWMP, 2014).

The IEC campaigns were developed, field-tested, and implemented by the local government from 2004 to the present on proper waste disposal through segregation, 3Rs, and composting. These were implemented through print media such as posters, stickers, billboards, and leaflets; mass media through local t.v. coverage during meetings and radio plugs; and announcements of garbage collection schedules and reminders through sound systems attached to city garbage trucks and barangay assemblies. Key messages on the IEC campaigns include the definition, methods, and importance of segregation and 3Rs, effects of improper waste disposal, methods of proper waste disposal, roles of the residents in solid waste management, and the prohibitions as mandated by RA 9003. Posters and billboards were installed in strategic public places,

including offices and schools, where people frequently go. The IEC materials were presented through colorful pictures and illustrated through cartoons and texts. Information is essential in promoting awareness, encouraging participation, and behavior change, which is communicated through different channels.

Through these initiatives, the residents of the nine (9) urban barangays in Ozamiz City, are expected to gain knowledge and provide means on the proper management of solid wastes. The participation of the residents of these urban barangays in Ozamiz City, the end users or audiences of the IEC campaign on solid waste management, is vital in the implementation and success of solid waste management programs.

The main goal in implementing IEC campaigns or environmental education is to transfer knowledge and skills and create venue that facilitates decision making among policy makers, stakeholders and general public to finally elicit active and collective action. With this, we aim to see positive impacts as results whether a change of behavior or improvement of a condition. Various studies have shown that the use of IEC campaigns to promote environmental awareness and behavior change is clear and imperative. According to Tjakraatmadja et al., (2021), the effectiveness of educational interventions in waste management heavily depends on the relevance of the educational content to the residents. When supported by various pre-existing factors, nurturing sustainable waste management behaviors becomes significantly more feasible, consequently leading to higher participation rates. The role of IEC campaigns are to raise awareness and encourage responsible behavior towards environmental issues, especially for solid waste management (World Bank, 2024). A couple of published studies such as the work of Ghazali, Moreover, IEC campaigns' goal is to inform, educate and inspire people to realize their roles and responsibilities, and benefits accumulating in investing in right waste management practices (Puri, 2017). In addition, in the studies of Mulasari et al. (2024) and Eugenio et al. (2024), the initial program implemented on Solid Waste Management and observational results have shown that community-based initiatives and willingness to participate can effectively tackle solid waste management (SWM) challenges. However, for long-term viability, they must operate alongside a dedicated and supportive Local Government Unit (LGU). Further, in order to encourage participation on individuals and proper implementation of solid waste management, there is the need to educate the citizens and raise awareness on the impacts of improper solid waste management (Festus et al, 2012). A study have showed that information, education and communication campaigns have positive impacts on the behavior of the residents who were environmentally educated compared with those who are less educated (Fredrick, et al., 2018) In contrast, some literature recorded that environmental literacy do not ensure significant impact on environmental action (Debrah, et al, 2021; Hwang, et al, 2000; Monroe 1993). It is due to the fact that dealing with environmental issues requires dealing with complexity of relationships that affects the outcomes wherein information-deficit perspective is inefficient (Marcinkowski and Reid, 2019). In the case of campaigns for behavioral change, that complexity includes the factors that affect the individual's behavior such as their demographic profile, attitude and perception on that particular campaign. Many studies have shown that socio-demographic profiles and environmental perception have helped understand people's views and thinking about environment. It occurs when act in a way that does not correlate with their values or in a way that contradicts those values entirely. This is due to the three barriers to positive behavior towards environment such as individuality (the person's attitude and temperament regarding environmental concern), responsibility (perceived locus of control with regards to environment act), and practicality (social and institutional constraints such as lack of money and facilities) (Advincula, 2014).

Moreover, the Theory of Planned Behavior by Icek Ajzen (1991) states that a person's intention to perform a behavior is predicted by three main factors: their attitude toward the behavior, the subjective norms (social pressures) they perceive, and their perceived behavioral control (belief in their ability to perform the behavior). The stronger these three components are, the stronger the intention to perform the behavior will be, and likely to occur.

***Problem Statement***

There were interventions implemented by the local government unit on solid waste management in the nine (9) urban barangays; however, there was no assessment done yet on whether or not these interventions have made an impact on the residents and the possible barriers that hindered the residents from applying the knowledge gained. It is deemed necessary to identify the barriers attenuating the practices of the residents on proper solid

waste management for the improvement and revision of interventions and policy-making that will address these barriers and increase resident participation. Thus, this study aimed to identify the barriers affecting the solid waste management practices that attenuated the effectiveness of the IEC campaign on solid waste management in Ozamiz City. Specifically, this study is directed to answer the following questions:

1. What are the practices of the residents after the IEC on solid waste management intervention?
2. What are the barriers to proper solid waste management practices among the residents of Ozamiz City?
3. What are the variations of the residents about the demographic profile according to low-income barangay, medium-income barangay, and high-income barangay?
4. Is there a significant difference between respondents' demographic profile and their perception of the IEC campaign on solid waste management?

***Materials and Methods***

This study utilized a descriptive – correlational method that focused in identifying the barriers on proper solid waste management affecting their intention and actual behavior in practicing proper solid waste management in Ozamiz City.

The study was conducted in 9 urban barangays in Ozamiz City, Misamis Occidental which were categorized into low, medium and high-income barangays. Barangays with low income are Tinago, Baybay Sta.

Cruz, and Malaubang. Barangays that belong to medium income are Gango, Maningcol and Carmen Annex. Barangays Aguada, Lam-an and 50th Barangay belong to high income barangays. The city has 51 barangays and in 2015 census, its population is 140, 334 (PSA, 2020).

A researcher-made questionnaire was the main data gathering tool in this study to identify their solid waste management practices and the barriers to proper solid waste management practices which were based on the Value-Action Gap (Blake, 1999) barriers to environmental act. There were five statements or situations under individuality, three under responsibility, and seven under practicality. To identify their awareness on the topics covered in the IEC campaigns, yes-no questions were asked. The questions were constructed in English then translated into Cebuano. The researcher-made questionnaire was externally validated by 3 experts and was run through the CRONBACH's Alpha Test for internal validation with an excellent score of .93. It was then pre-tested to 30 persons for comprehensibility and correct organization of questioning.

The respondents of the study were mothers, residents of Ozamiz City who are regarded as the main responsible persons of household chores which were selected through a systematized random sampling. Enumerators were distributed to each purok/village of the barangays. Guided by the residential map, starting point was the 1st household next to the purok/village center and the interval was 3 households.

To determine the sample size, online Raosoft calculator was used with a margin of error of ±10%. The purpose of the study was explained by the enumerators to the respondents prior to the distribution of questionnaires and were notified that all data collected will be confidential.

The sample was designed to represent low, medium and high-income barangays. There was a total of 571 randomly identified respondents. Prior to the interview, a letter of consent was sent to the local government offices of each barangay and each respondent.

Frequency and percentage were used to analyze the socio-demographic profile and the IEC campaign topics known to the residents, while solid waste management practices were ranked, and weighted mean was utilized to analyze the barriers to proper solid waste management practices of the residents.

As the analysis of the average weighted mean, the Hedonic scale was interpreted as follows: 5.00-4.20 Strongly Agree, 4.19-3.40 Moderately Agree, 3.39-2.60 Agree, 2.59-1.80 Moderately Disagree, 1.79-1.00 Strongly Disagree.

To find out the significant difference between demographic profile of the respondents and their perception on the IEC campaigns, ANOVA was used.

## RESULTS AND DISCUSSION

***Demographic profile of the respondents***

***Table 1.*** *Respondents' Demographic Profile*

| | | Low Income Barangays | Medium Income Barangays | High Income Barangays | % |
|---|---|---|---|---|---|
| **Age** | 18-29 | 22 | 25 | 15 | 10.86 |
| | 30-39 | 23 | 34 | 46 | 18.04 |
| | 40-50 | 65 | 40 | 44 | 26.09 |
| | 51 & above | 81 | 95 | 81 | 45.01 |
| **Status** | Single | 31 | 31 | 16 | 13.7 |
| | Married | 119 | 126 | 126 | 65 |
| | Separated | 23 | 15 | 15 | 9.3 |
| | Widow | 18 | 23 | 28 | 12.1 |
| **Education** | High School level | 51 | 46 | 28 | 21.9 |
| | High School Grad | 39 | 47 | 28 | 20 |
| | College Level | 46 | 38 | 53 | 24 |
| | College Grad | 27 | 38 | 47 | 19.6 |
| | Others | 2 | 1 | 6 | 1.6 |
| **Total** | | 190 | 195 | 185 | 100 |

As shown in Table 1, majority of the respondents from low, medium, and high-income barangays are 51 years or older, married, and have completed college. This suggests that the majority of IEC campaign audiences are elderly mothers who are traditionally responsible for household chores. However, due to other responsibilities, they may be passive about the ideas taught by IEC campaigns, frequently relying on their children for solid waste management. Chanda (1999) found that older residents are more concerned about environmental quality issues than younger residents. Furthermore, their educational attainment suggests that they understand the messages of the IEC campaigns. Recent studies confirm these findings, demonstrating that age and civil status significantly influence perceptions and behaviors toward waste management. Debrah et al. (2021) found that in developing countries, older and married individuals had different attitudes towards environmental issues than younger, single individuals. In the study of Fadhullah et al. (2022) it emphasized the importance of educational campaigns and easily accessible waste management facilities in promoting positive behavior among various demographics. The study found that integrating practical training and community engagement can bridge the gap between knowledge and action, particularly for older populations with established habits and a strong sense of responsibility for environmental stewardship. Furthermore, rewarding participation through policy enforcement and community rewards can encourage residents to actively engage in proper waste management practices.

***Table 2.*** *Known Topics in Information, Education and Communication Campaign*

| IEC Topics | | Low Income Barangays | % | Medium Income Barangays | % | High Income Barangays | % |
|---|---|---|---|---|---|---|---|
| **Segregation** | | Frequency | | Frequency | | Frequency | |
| | Yes | 189 | 99 | 192 | 98 | 163 | 88 |
| | No | 1 | 1 | 3 | 2 | 23 | 12 |
| **3Rs** | Yes | 175 | 92 | 180 | 92 | 117 | 63 |
| | No | 15 | 8 | 15 | 8 | 69 | 37 |
| **Composting** | Yes | 151 | 79 | 163 | 84 | 93 | 50 |
| | No | 39 | 21 | 32 | 16 | 93 | 50 |
| **Total** | | 190 | 100 | 195 | 100 | 186 | 100 |

Results in Table 2 show that all residents, regardless of their income, were informed of the segregation, 3Rs and composting. The campaign has long been implemented since 2004 up to present and this indicates that the local government unit is really performing their mandate in disseminating the information and educating the public. The most known topic among the respondents in the IEC campaigns is segregation, followed by the 3Rs and the least is the composting. Shown in Figure 1 are the examples of the multimodal IEC materials such as posters, and leaflets. The three main topics were written in English while the definition and explanation including the importance and examples of each were written in Visayan dialect. The 3Rs were even individually elaborated and discussed comprehensively. This approach ensures that everyone, regardless of language proficiency is informed. According to Waste Management (retrieved October 19, 2025), multilingual approaches in education can address gaps, reduces confusion, and upholds inclusivity within communities.

Based on actual solid waste management or disposal practices, one must segregate all types of wastes first before one can recycle or compost. This will also lead to the campaign of the local government on "No Segregation, No Collection" policy. Article I Section 2 (d) of RA 9003 emphasized that the comprehensive and ecological solid waste management program shall ensure the proper segregation along with collection, transport, storage, treatment and disposal of solid waste. In the Philippines, 95% of the waste disposal facilities are open and controlled dumps (Castillo et al., 2013) and Ozamiz City is one of those who collect all wastes and dump these in an open dumpsite wherein part of the ordinance implemented is the No segregation, No collection policy. This implies that only segregation is required from the residents to dispose their solid wastes, therefore, the one which is most known.

Multi-modal communication was used to deliver different information on solid waste management to the residents (Figure 2). Identifying the most effective and most known channel in disseminating the information on proper solid waste management will improve the mode of information transmission according to a specific audience in the future. Data in Figure 2 show that barangay assembly ranked 1st as the primary source of information of the respondents about proper solid waste management. Barangay assemblies are led by the Barangay officials and it has a wide reach of elder audiences. According to an article by the DILG, attendees in Barangay Assemblies are mostly middle-aged residents, senior citizens, housewives and the unemployed (DILG, retrieved January 18, 2021).


***Figure 1.*** *Examples of the multimodal IEC materials on SWM in Ozamiz City*

Azuelo et al (2016) found out in their study on the assessment of solid waste management strategies in Camarines Norte that forums, public announcement, and assemblies were highly effective in public information dissemination on the importance of segregation, recycling and re-use. Moreover, pursuant to the provisions of R.A. 9003, the Local Government Units (LGUs) are primarily responsible for the implementation and enforcement of the provisions (Official Gazette, retrieved February, 2025). This means that there was a level coordination between the OCSWEMO and the LGUs.

Both implementing bodies have executed their parts in the information education and communication component of the solid waste management plan.

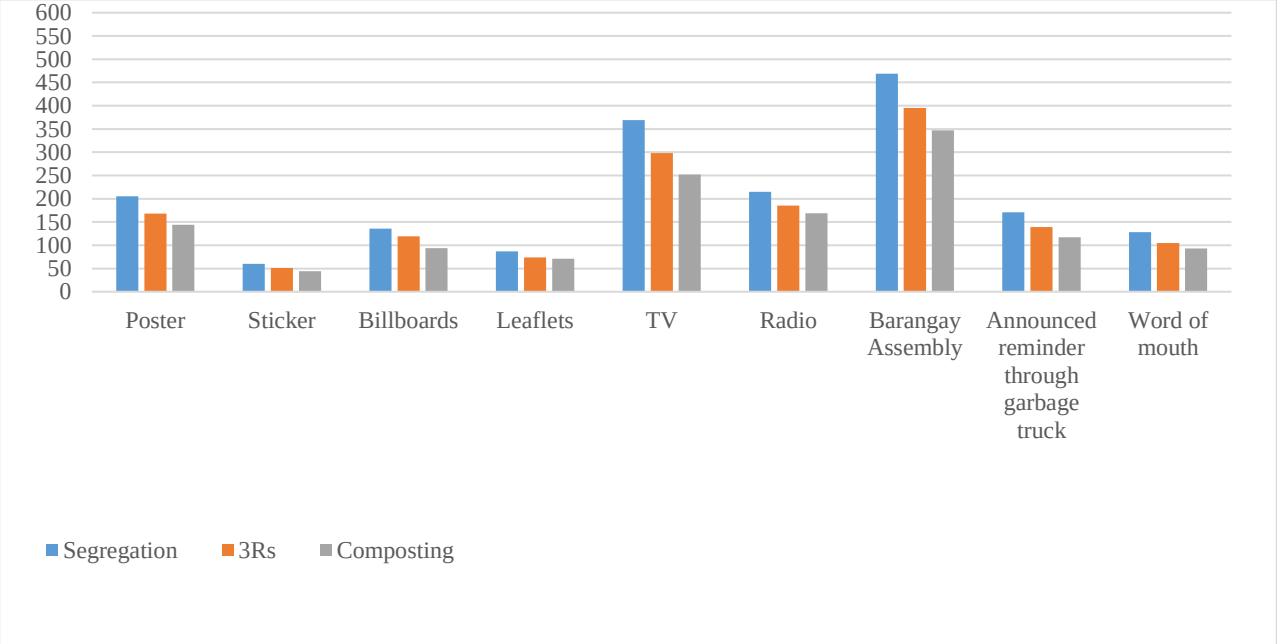


***Figure 2.*** *Channels of Information*

***Table 3.*** *Solid Waste Management Practices of the Respondents*

| | **Categories according to income** | | |
|---|---|---|---|
| **Types of Solid Wastes** | High Income Barangays | Medium Income Barangays | Low Income Barangays |
| **Plastic Bags** | Unsegregated and collected | Segregated and collected | Segregated and collected |
| **Plastic Bottles** | Sold | Sold | Sold |
| **Tetra Packs** | Unsegregated and collected | Segregated and collected | Segregated and collected |
| **Polystyrene** | Unsegregated and collected | Segregated and collected | Segregated and collected |
| **Rubber Materials** | Unsegregated and collected | Segregated and collected | Segregated and collected |
| **Batteries** | Unsegregated and collected | Segregated and collected | Unsegregated and collected |
| **Lead Batteries** | Unsegregated and collected | Segregated and collected | Hoarded |
| **Metals & Aluminum** | Unsegregated and collected | Sold | Sold |
| **Glass** | Unsegregated and collected | Segregated and collected | Unsegregated and collected |

| | | | |
|---|---|---|---|
| **Wood** | Unsegregated and collected | Fuel wood | Fuel wood |
| **Sanitary Napkin /Disposable diapers** | Unsegregated and collected | Segregated and collected | Segregated and collected |
| **Papers/Cartons** | Unsegregated and collected | Segregated and collected | Unsegregated and collected |
| **Leaves/branches** | Unsegregated and collected | Compost pit/ own yard or vacant lot | Unsegregated and collected |
| **Left-over foods/ food trimmings** | Unsegregated and collected | Fed to pets/pigs/poultry | Fed to pets/pigs/poultry |
| **Used clothes** | Unsegregated and collected | Recycled | Recycled |
| **Used oil** | Unsegregated and collected | Mixed with left-over foods and fed to pets/pigs | Mixed with left-over foods and fed to pets/pigs |

Choices for management practices on each type of household waste: Unsegregated and collected by city waste collector, Sold to collector of recyclable materials, Thrown into open dump site in own yard or vacant lot, Thrown into compost pit inside own yard or vacant lot, Thrown into communal open dump site in the neighbourhood, Thrown into bodies of water, Burned, Segregated and collected by city garbage collector, Recycled, Others, please specify.

The practices of the residents on solid waste management were identified to find out whether IEC campaign on proper solid waste management has influenced the practices of the residents. The practices define how the information from the IEC campaign altered the behavior of the audiences it reached. Data in Table 3 show that high income barangays consistently unsegregate all types of garbage except for plastic bottles which they sold to collectors of recyclable wastes or to the nearest junk shop. The medium and low-income barangays segregate almost all types of household solid wastes except for plastic bottles, metals and aluminum which are sold; woods used as fuel and used oils mixed in leftover foods are then fed to pets, pigs and poultry. Selling of plastic bottles, metals and aluminum is a good start of segregating at source and recycling at the same time, which imply that they segregate these type of wastes because they preserve the value of recyclables, and contribute to the economy while addressing environmental issues (Matter et al., 2013; Balaria et al., 2021). The same practice mentioned by Banga (2011) that majority of the households in Urban Kampala segregate waste because they earned an income from it. The only group that applies recycling is the medium income barangay, specifically on used clothes only. The leftover foods/food trimmings are fed to their cats/dogs, and backyard pigs and poultry.

Another notable finding is that low-income barangays hoard worn out lead batteries or store them in a sack/plastic bag under or near their houses due to the lack of knowledge on its proper disposal. The improper disposal of lead acid batteries imposed threat on their health and in the environment (University of North Carolina, retrieved October 2025). This indicates the need for further IEC specifically on how to deal with special wastes. Among the three categories, only medium income barangays showed variation of practices on their solid wastes: segregation, recycling and composting. The solid waste management IEC campaign contained these 3 practices primarily: segregation, 3Rs and composting. Participation of the residents in the solid waste management programs of the government is crucial in determining whether or not these interventions have effectively achieved its ultimate goal which is to institutionalize active participation of people on waste minimization and segregation at source, re-use, recycling and composting (OCISWMP, 2014).

The respondents in high income barangays solely practice unsegregation on all types of household wastes which imposes that they do not actively participate in the solid waste management practices encouraged by the local government unit. In contrary, the result of the study of Armenta-Vergara (2025) reveals that household with higher resources and stronger environmental orientations have significantly higher recycling probabilities. Waste separation is a behavior which requires considerable efforts on the part of individual as

household waste must be sorted, prepared and stored (Ghani et.al, 2013) and that this perceived inconvenience significantly negatively affect household's intention to segregate (Kushwah et al., 2023). In this note, the local authority may take a collaborative and enticing action with the residents and strictly implement these practices to increase active participation of the residents. In most cases, the respondents in medium and low- income barangays directly dispose the recyclables and other compostable wastes. This could imply that they do not have enough knowledge about varied ways of recycling and even in composting or they do not simply have the intention to comply with the imposed solid waste management practices.

***Table 4.*** *Barriers to Proper Solid Waste Management Practices for All Barangays*

| | **Low Income Barangay N= 190** | **Medium Income Barangay N= 195** | **High Income Barangay N= 185** |
|---|---|---|---|
| | Mean | | |
| *The inconvenience of segregating biodegradable wastes from non-biodegradable wastes.* | 2.7 | 2.5 | 3.2 |
| *Lack of time to segregate wastes due to a lot of work/chores.* | 2.6 | 2.4 | 3.3 |
| *Lack of interest in doing proper waste disposal.* | 2.3 | 2.2 | 3.1 |
| *Non-participation in any programs of proper waste management.* | 2.5 | 2.4 | 3 |
| *Non-conformity to proper waste management because others also do not conform to it.* | 2.4 | 2.3 | 3 |
| *Leave all the responsibility of implementing proper waste disposal to the local government unit.* | 2.5 | 2.4 | 3 |
| *The irresponsibility of other neighbors when it comes to waste disposal.* | 2.9 | 2.5 | 2.8 |
| *None or lack of government employee assigned to waste collection.* | 2.9 | 2.6 | 3 |
| *Non-participation in different proper waste disposal activities.* | 2.5 | 2.3 | 2.8 |
| *No available space or facility for composting.* | 2.9 | 2.6 | 2.9 |
| *Distance between our house and junk shops.* | 2.7 | 2.6 | 3 |
| *No access to any of the IEC campaigns on proper solid waste management.* | 2.4 | 2.4 | 2.7 |
| *Lack of information on proper solid waste management.* | 2.7 | 2.3 | 2.8 |
| *Lack of containers for different types of wastes.* | 2.9 | 2.5 | 3 |
| *None among the family members was assigned to manage household wastes.* | 2.5 | 2.5 | 3 |
| **Average Weighted Mean: 2.7** | | | |

Data shown in Table 4 are the barriers to proper solid waste management practices based on Blake (1999) Value-Action Gap identified as individuality, responsibility, and practicality. As seen in the weighted mean 2.7, the respondents from all barangay categories agree that these are the barriers to proper solid waste management practices. For low- income barangays, the barrier that got the highest score (2.9) are the

unavailability of space or facility for composting, the lack of containers for different types of wastes, none or lack of government employee assigned to waste collection and the irresponsibility of other neighbors when it comes to waste disposal are barriers to proper solid waste management. These barriers are under responsibility and practicality (Blake, 1999) respectively. This could imply that the residents in low-income barangays find difficulty in securing for an area for compost since mostly are situated in coastal area. Their geographic location might have contributed to the limitation in composting. However, one should not limit itself from composting in land areas as there are other facilities to use for compost. In addition this means that they lack knowledge on composting especially on other materials used as composting facilities like recycled plastic bins or pales and depend on the government's initiative when it comes to the collection of wastes.

Meanwhile, the medium-income barangays also considered the unavailability of area for composting, none or lack of government employee assigned to waste collection and the distance between their houses and junk shops as their primary barriers to proper waste management which has 2.6 weighted mean. This implies that the areas for composting in medium- income barangays are decreasing due to urbanization and the initiative of the government is also important for them. Singhirunnusorn (2012) cited that practicality barriers include the lack of time or storage space that could limit information or personal physical limitations although, specifically for recycling. For high-income barangays, the primary barrier to proper solid waste management practices is the lack of time to segregate wastes due to a lot of work/chores (3.3) which belong to practicality (Blake, 1999). This barrier explains the consistent unsegregation on all types of wastes in high-income barangays which may also due to the fact that they are in the heart of the city where trade and business happen. Despite the imposition of No Segregation, No Collection policy in the city, the residents still solely depend on the garbage collectors to take care of their solid wastes. According to the Theory of Planned Behavior (Ajzen, 1991), even if people have a positive attitude toward a behavior and perceive strong social support from their peers and community, they may refrain from engaging in that behavior if they believe they lack control over essential resources or opportunities. However, if they face practical barriers, such as the absence of waste segregation facilities, limited space for composting, or insufficient government support for waste collection, their perceived lack of control over these obstacles can prevent them from taking into action. Thus, even with positive attitudes and normative support, a sense of insufficient control over external factors can significantly impede the translation of intentions into actual behavior of the individuals living in this particular barangays. For instance, as residents perceive segregation as an inconvenience, or they lack resources for composting, these weaken their intention to practice these waste management initiatives and would result to lower actual practice. According to the Theory of Planned Behavior (Ajzen, 1991) weak or conflicting subjective norms such as nonconformity due to irresponsible neighbors on waste disposal practices also weakens the behavior due to a weak social expectation.

***Table 5.*** *Significant differences among groups and their perception on the IEC campaign on solid waste management*

| | f- Value | P-Value | Interpretation | Remarks |
|---|---|---|---|---|
| **Age** | 1.59 | 0.031 | Significant | $H_O$ rejected |
| **Civil Status** | 1.58 | 0.032 | Significant | |
| **Highest Educational Status** | 1.15 | 0.280 | Not Significant | |
| **Classification of Barangay according to income** | 1.37 | 0.104 | Not Significant | |

Results in Table 5 show that age and civil status of the respondents have significant differences with their perception on the IEC campaign on solid waste management. Younger and single groups may differ in perception with the older and married ones because they are more experienced in life especially with household chores and household waste management. However, there is no significant differences on their educational status and as to the type of barangays with their perception on the content and presentation of IEC campaign materials. Regardless of the respondents' educational attainment and income, it does not affect their perception on the IEC campaign materials. However, Social Surveys Section (2002) in Hong Kong results showed that a more diligent recycling habit was associated with higher income household with the age ranging from 30- 49 years old (Chung and Leung, 2007). Contrary to the findings of Despande (2024), income

was not a significant determinant of recycling but education was. Researches have examined the impact of age and civil status on perceptions of IEC campaigns in solid waste management and found significant differences. One study found that younger and single people have different perceptions than older and married people due to differences in life experiences and household responsibilities (Debrah et al., 2021). Another study found no significant differences in perceptions based on educational status or income, indicating that these variables have no influence on how people perceive IEC campaign materials (Singhirunnusorn, 2012). A third study supported these findings, emphasizing the importance of sociodemographic variables such as age and civil status in shaping perceptions of waste management initiatives (Fadullah et al., 2023).

### *Conclusion*

Based on the findings, the researcher concludes that among the three practices communicated in the IEC campaigns, segregation is most practiced only in low and medium income barangays. High income barangays do not practice proper solid waste management and totally depends on the garbage collectors to manage their wastes. Provision of knowledge on segregation, 3Rs, and composting should be reinforced with other initiatives to address the aforementioned barriers to proper solid waste management. The attitude-behavior gap was manifested in the failure to practice which suggests the need to help ease the inconvenience perceived by the respondents to increase their intention and actual practice. Weak or conflicting subjective norms specially for low income barangays are the main barriers which call for a collaborative and strict imposition of policies and collection schedules, and possible integration of incentivization that could encourage the residents to practice proper waste management. Practical and skills capability, infrastructure, and the inclusion of more IEC campaigns are also imperative to increase compliance on proper solid waste management.

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