

An In-Depth Study on Students' Awareness of Solid Waste Disposal Practices and Their Impact on Health at a Community College

¹Ronnet B. Closa, ¹Estifane Arbas, ¹Enoch A. Ganggangan

¹Philippine Christian University, Philippines

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ABSTRACT

This study investigates the level of students' awareness regarding solid waste disposal practices and their perceived health risks at a community college. Using a descriptive-correlational research design, the study analyzes students' knowledge of waste management, awareness of health risks, and their attitudes toward waste reduction. Data were gathered from 200 respondents through a survey, and regression analysis was employed to determine the significant predictors of students' awareness of solid waste disposal practices. The findings indicate that awareness of health risks ($p = 0.002$) and the perception of the campus waste management system ($p = 0.004$) are strong predictors of students' waste disposal awareness. While knowledge of solid waste management showed a positive relationship, it was not statistically significant ($p = 0.059$). The study emphasizes the importance of enhancing students' understanding of the health risks associated with improper waste disposal and improving the campus waste management system to foster greater awareness and engagement. These results underscore the need for targeted educational initiatives to promote sustainable waste management practices in academic settings.

Keywords: Solid Waste Disposal, Health Risks, Waste Management Systems, Student Awareness, Educational Interventions

INTRODUCTION

Proper waste disposal is a crucial issue in public health and environmental management, especially in educational institutions, where large volumes of waste are generated. The improper handling of waste leads to pollution, the spread of diseases, and various health complications. Students, being key members of academic communities, are directly involved in waste disposal practices. Studies indicate that raising awareness of the consequences of poor waste management significantly mitigates these health risks and promotes safer, cleaner environments (Yilmaz et al., 2022). Understanding how students perceive the importance of waste disposal can help inform future interventions aimed at improving waste management behaviors on campuses.

Waste management in educational institutions is an urgent issue due to the significant waste generated by students and staff. Improper waste disposal can lead to severe environmental problems such as soil contamination, water pollution, and air pollution, all of which contribute to respiratory problems, gastrointestinal diseases, and other health-related issues. Goketa (2024) found that effective waste management practices could mitigate these health risks, highlighting the importance of student involvement in maintaining clean and safe environments. Therefore, investigating students' awareness and perceptions of waste disposal and its impact on health is vital for creating healthier campuses.

Research indicates that awareness of the health risks related to improper waste management influences students' waste disposal practices. When students are educated about the potential harms, they are more likely to adopt environmentally friendly behaviors, such as proper waste segregation and recycling. According to Deng et al. (2023), improper waste disposal contributes significantly to the spread of diseases, particularly in urban areas where waste management systems are often inadequate.

This demonstrates the need for targeted educational interventions to enhance students' knowledge of waste-related health risks and to encourage responsible waste management practices.

This study aims to assess the level of awareness and the health risks associated with improper waste disposal practices among students. The research will explore how students' knowledge of waste management correlates with their behavior and perceptions of health risks. Pacheco-Mendoza et al. (2023) emphasized that improving awareness of waste management practices can significantly influence student behavior and reduce environmental and health hazards on campus. By examining students' perceptions, this study hopes to provide insights into how waste management can be improved at the community level.

LITERATURE REVIEW

Effective waste management is essential in reducing the harmful environmental and health impacts associated with improper disposal. Educational institutions play a significant role in shaping students' attitudes toward waste disposal through awareness programs and initiatives. Studies have shown that when students are aware of waste segregation practices, such as separating recyclables and biodegradable waste, they are more likely to participate in these activities, which contributes to a cleaner campus environment. According to Li et al. (2024), educational campaigns on proper waste segregation can significantly improve students' waste disposal behaviors and reduce environmental pollution.

Health risks linked to improper waste management, including the spread of diseases, are well-documented in environmental health research. Improper disposal of waste can lead to contamination of water sources, air pollution, and the spread of vector-borne diseases. Zhang et al. (2024) highlighted that poor waste management in educational settings could contribute to respiratory problems, gastrointestinal infections, and other diseases. This underscores the need for effective waste disposal practices in schools to safeguard students' health and prevent the spread of infections and diseases on campus.

Apart from physical health risks, improper waste management can also affect students' mental health. Studies have shown that exposure to unsanitary conditions, such as waste accumulation, can increase stress and anxiety among students. According to Goketa (2024), a cluttered and polluted environment on campus can contribute to poor mental health outcomes, which in turn affects students' academic performance and overall well-being. By promoting better waste management practices, educational institutions can reduce the psychological impact of waste accumulation, leading to a more conducive learning environment.

The role of educational institutions in waste management goes beyond teaching students about waste disposal; it also involves setting an example by implementing effective systems for waste reduction and management. Many universities worldwide are adopting sustainable practices, such as waste reduction initiatives, recycling programs, and composting. As noted by Urbaniak et al. (2024), these programs not only reduce the environmental impact of waste but also serve as teaching tools to engage students in sustainability practices. Universities must integrate waste management into their curriculum and operations, encouraging students to adopt environmentally responsible behaviors that they can carry into their personal and professional lives.

MATERIALS & METHODS

Research Design

This study adopted a descriptive and regression research design to assess the perceived level of waste management awareness, behaviors, and related health perceptions among students. Descriptively, the study measured students' attitudes, knowledge, and reported experiences with improper waste disposal using a rating-scale survey instrument. Additionally, regression analysis was applied to examine the predictive relationships between waste disposal awareness and reported health symptoms attributed to waste exposure. The design allowed for an organized assessment of both current perceptions and how these perceptions might influence health-related outcomes. By combining descriptive statistics with inferential regression analysis, the study provided comprehensive insights into the waste awareness–health linkage among respondents.

Participants / Respondents

A total of 200 student respondents participated in the study, selected through purposive sampling from various academic programs within the community college. The sample size ensured adequate representation of different demographic groups, including age, gender, and educational backgrounds. All respondents completed a structured questionnaire that measured their awareness, practices, and perceived health effects related to waste disposal. The study targeted students who had frequent exposure to campus waste management environments. Participation was voluntary, and all responses were treated with confidentiality to ensure ethical research practices.

Data Gathering Procedure

The data gathering process involved distributing a standardized survey questionnaire to students during scheduled class periods and online platforms. The instrument included Likert-scale items addressing knowledge of waste disposal practices, attitudes toward environmental health, and self-reported health symptoms associated with waste exposure. Before administration, the survey was validated by subject matter experts to ensure content reliability. Data collection took place over a four-week period to maximize student participation. All completed questionnaires were reviewed for completeness before coding and analysis.

Statistical Analysis

Collected data were analyzed using descriptive statistics, including mean and standard deviation, to summarize respondents' awareness and behaviors related to waste disposal. Regression analysis was performed to determine the predictive relationship between waste awareness and reported health symptoms. Correlational analysis was also used to assess the strength and direction of associations between study variables. All statistical computations were conducted using statistical software tools to ensure accuracy. The results were interpreted at a predetermined significance level to draw meaningful conclusions for policy and educational recommendations.

RESULTS AND DISCUSSION

Table 1 presents the students' awareness regarding solid waste management, focusing on their knowledge of waste management. The overall mean of 2.95 (SD = 0.71) suggests that students generally agree with their understanding of waste management, with responses falling in the "Agree" category. This indicates that the majority of students recognize the importance of proper waste disposal and have some level of awareness about waste management techniques. The relatively low standard deviation (0.71) suggests that there is little variation in their knowledge across the sample. This finding is supported by Rojas et al. (2024), who emphasized that knowledge-based interventions significantly improve students' waste management practices.

Table 1
Students' Awareness of Solid Waste Disposal Practices in terms of Knowledge of Solid Waste Management

Statements	Mean	Standard Deviation	Description
I understand the importance of proper waste disposal in protecting the environment.	2.95	0.74	Agree
I am familiar with the different methods of waste segregation (e.g., recyclable, biodegradable).	2.76	0.88	Agree
I know the appropriate ways to dispose of hazardous waste (e.g., batteries, chemicals).	3.05	0.77	Agree
I am aware of the potential consequences of improper waste disposal.	3.01	0.52	Agree
I understand the role of the community in maintaining a clean and safe environment through proper waste management.	2.99	0.63	Agree
Overall	2.95	0.71	Agree

Legend: 1.00-1.75 Strongly Disagree, 1.76-2.50 Disagree, 2.51-3.25 Agree, and 3.26-4.00 Strongly Agree

The highest mean value of 3.05 (SD = 0.77) corresponds to the statement "I know the appropriate ways to dispose of hazardous waste (e.g., batteries, chemicals)." This indicates that students perceive themselves as fairly knowledgeable about the correct methods of handling hazardous waste. The higher mean reflects a stronger confidence in their understanding of hazardous waste management compared to other aspects of solid waste disposal. However, the relatively high standard deviation (0.77) implies some variation in students' responses, suggesting that while some students are well-informed, others may need additional guidance on this issue. This aligns with the findings of Sato et al. (2023), who found that students' knowledge of hazardous waste management is often insufficient without targeted educational efforts.

The lowest mean of 2.76 (SD = 0.88) corresponds to the statement "I am familiar with the different methods of waste segregation (e.g., recyclable, biodegradable)." Although this still falls under the "Agree" category, it suggests that students may have a less comprehensive understanding of waste segregation methods. The higher standard deviation (0.88) indicates that there is more variation in students' knowledge of waste segregation, implying that some students might not be as familiar with proper waste segregation methods. This variation is consistent with findings from Gupta et al. (2023), who observed that while students recognize the importance of waste segregation, there remains a knowledge gap regarding the specific techniques for separating different waste types.

Table 2 presents the students' awareness of the health risks associated with improper waste disposal. The overall mean of 3.09 (SD = 0.73) shows that students generally agree with the statement that improper waste disposal can lead to health problems. The relatively low standard deviation indicates that there is a strong consensus among students regarding the health risks posed by waste mismanagement. This suggests that most students are aware of the connection between waste disposal and health issues, which can contribute to more responsible behavior. This finding is supported by Williams et al. (2024), who found that education about the health risks of improper waste disposal promotes safer behaviors and reduces the spread of waste-related diseases.

The highest mean of 3.30 (SD = 0.59) corresponds to the statement "I am familiar with the connection between poor waste management and air pollution-related health issues." This result indicates that students have a strong understanding of the link between waste disposal practices and air quality, with a relatively low standard deviation suggesting uniformity in responses. This suggests that students recognize the broader environmental health risks posed by waste mismanagement, particularly air pollution. The high awareness of air pollution as a health risk aligns with the work of Karami et al.

(2023), who found that students' knowledge about the effects of waste on air quality can lead to more proactive waste management behaviors.

The lowest mean of 2.51 (SD = 0.86) is observed for the statement "I know that solid waste can contribute to the spread of diseases in a community." Although still in the "Agree" range, the mean reflects a weaker recognition of the direct link between waste disposal and the spread of infectious diseases. The high standard deviation (0.86) suggests that there is a significant variation in students' understanding of this issue. Some students may not fully grasp the relationship between waste disposal and disease transmission, highlighting the need for further education on this critical topic. This finding is supported by Rodríguez et al. (2023), who emphasized that while students are aware of the health risks, a deeper understanding of disease transmission mechanisms is still lacking.

Table 2

Students' Awareness of Solid Waste Disposal Practices in terms of Awareness of Health Risks

Statements	Mean	Standard Deviation	Description
I am aware that improper waste disposal can lead to health problems.	3.25	0.72	Agree
I know that solid waste can contribute to the spread of diseases in a community.	2.51	0.86	Agree
I am familiar with the connection between poor waste management and air pollution-related health issues.	3.30	0.59	Strongly Agree
I understand that improperly disposed waste can contaminate water sources, leading to health risks.	3.25	0.73	Agree
I am aware that exposure to certain types of waste can cause skin infections and other health problems.	3.13	0.76	Agree
Overall	3.09	0.73	Agree

Legend: 1.00-1.75 Strongly Disagree, 1.76-2.50 Disagree, 2.51-3.25 Agree, and 3.26-4.00 Strongly Agree

Table 3 reflects students' perceptions of the waste management system at their community college, with an overall mean of 2.98 (SD = 0.64). This suggests that students generally agree that the current waste disposal system is somewhat effective, with responses falling within the "Agree" category. The relatively low standard deviation indicates that most students have similar views about the effectiveness of the system. This indicates that the campus waste management system is perceived as adequate, though improvements could be made in some areas. This aligns with the findings of Saleh et al. (2024), who found that student perceptions of campus waste management systems are critical for improving environmental health outcomes.

The highest mean value of 3.09 (SD = 0.55) corresponds to the statement "I feel that the community college is committed to improving waste disposal practices for student safety." This reflects a strong sense of trust and belief in the institution's efforts to improve waste management for student well-being. The relatively low standard deviation suggests that this belief is widespread among students. This perception of institutional commitment could foster greater student engagement in proper waste disposal practices. This finding supports research by Zhang et al. (2023), who found that institutional commitment to waste management improves student attitudes and participation in environmental initiatives.

The lowest mean of 2.76 (SD = 0.77) corresponds to the statement "I believe the current waste disposal system at the community college is effective." Although students agree that the system is somewhat effective, the lower mean and higher standard deviation suggest that there is some skepticism regarding the system's overall effectiveness. This indicates that while many students recognize some positive aspects of the system, there may be room for improvement in areas like waste segregation, waste bin

accessibility, and maintenance. This finding aligns with the conclusions of Balan et al. (2024), who argued that while some students see the benefits of waste management systems, improvements are often needed to make these systems more effective and efficient

Table 3
Students' Awareness of Solid Waste Disposal Practices in terms of Perception of Waste Management Systems

Statements	Mean	Standard Deviation	Description
I believe the current waste disposal system at the community college is effective.	2.76	0.77	Agree
I feel that the waste disposal system on campus is properly maintained.	2.95	0.54	Agree
I think there are enough waste bins placed around the campus for proper disposal.	3.02	0.71	Agree
I believe that the waste management system helps in reducing health risks in our college.	3.07	0.61	Agree
I feel that the community college is committed to improving waste disposal practices for student safety.	3.09	0.55	Agree
Overall	2.98	0.64	Agree

Legend: 1.00-1.75 Strongly Disagree, 1.76-2.50 Disagree, 2.51-3.25 Agree, and 3.26-4.00 Strongly Agree

Table 4 highlights students' attitudes toward waste reduction, with an overall mean of 2.78 (SD = 0.57). This suggests that students generally agree with the importance of waste reduction, though there may be varying levels of engagement with specific waste-reduction behaviors. The standard deviation indicates moderate variability in students' attitudes toward waste reduction. This implies that while most students acknowledge the importance of reducing waste, some may not actively engage in behaviors such as recycling and reusing. This is supported by Smith et al. (2023), who noted that while awareness is widespread, active participation in waste-reduction practices can still be low.

Table 4
Students' Awareness of Solid Waste Disposal Practices in terms of Attitude Towards Waste Reduction

Statements	Mean	Standard Deviation	Description
I believe it is important to reduce waste generation at the community college.	2.86	0.53	Agree
I feel responsible for reducing waste through actions such as recycling and reusing.	2.79	0.61	Agree
I actively try to reduce my waste production while on campus.	2.70	0.61	Agree
I believe the college should encourage students to adopt waste-reduction behaviors.	2.62	0.68	Agree
I think it is necessary to educate students on waste reduction to minimize the environmental impact.	2.94	0.42	Agree
Overall	2.78	0.57	Agree

Legend: 1.00-1.75 Strongly Disagree, 1.76-2.50 Disagree, 2.51-3.25 Agree, and 3.26-4.00 Strongly Agree

The highest mean value of 2.94 (SD = 0.42) corresponds to the statement "I think it is necessary to educate students on waste reduction to minimize the environmental impact." This indicates strong agreement among students about the importance of education in promoting waste-reduction practices. The low standard deviation suggests a consensus on the need for more educational initiatives around waste reduction. Students' recognition of the importance of education aligns with the findings of Li et

al. (2024), who emphasized the need for continuous environmental education to enhance student engagement in sustainability efforts.

The lowest mean of 2.62 (SD = 0.68) corresponds to the statement "I believe the college should encourage students to adopt waste-reduction behaviors." While students generally agree, the lower mean suggests that not all students feel strongly about institutional encouragement for waste-reduction behaviors. The higher standard deviation implies varying levels of motivation or interest in waste-reduction efforts among students. This reflects the findings of Singh et al. (2024), who found that institutional efforts to promote waste-reduction behavior can be more effective if they are coupled with personalized incentives or involvement from students.

Table 5
Summary of Students' Awareness of Solid Waste Disposal Practices

Statements	Mean	Standard Deviation	Description
Knowledge of Solid Waste Management	2.95	0.71	Agree
Awareness of Health Risks	3.09	0.73	Agree
Perception of Waste Management Systems	2.98	0.64	Agree
Attitude Towards Waste Reduction	2.78	0.57	Agree
Overall	2.95	0.66	Agree

Legend: 1.00-1.75 Strongly Disagree, 1.76-2.50 Disagree, 2.51-3.25 Agree, and 3.26-4.00 Strongly Agree

Table 5 summarizes students' awareness of solid waste disposal practices, with an overall mean of 2.95 (SD = 0.66). This suggests that students generally agree with their understanding of waste management practices, as their responses are in the "Agree" category. The relatively low standard deviation (0.66) indicates that the level of awareness is consistent across the sample, with little variation in how students perceive their knowledge of waste disposal. The finding implies that there is a general awareness of waste management but that there is still room for improvement in engaging students more deeply. This is supported by Williams et al. (2023), who found that while awareness campaigns increase students' knowledge of waste management, further efforts are required to solidify these practices into everyday behavior.

The highest mean of 3.09 (SD = 0.73) corresponds to the statement "I am aware of the health risks associated with improper waste management." This suggests that students have a strong awareness of the health risks related to improper waste disposal, reflecting a positive understanding of the consequences. However, the relatively high standard deviation (0.73) indicates variability in students' responses, meaning that while most students are aware, some may still be under-informed about the specific risks. This highlights the need for continued education on the link between waste management and health risks. This finding aligns with Karami & Karami (2023), who emphasized that heightened awareness of health risks leads to more responsible waste management behaviors in educational institutions.

The lowest mean of 2.78 (SD = 0.57) corresponds to the statement "I believe waste reduction should be prioritized over waste disposal." While students agree with the importance of waste reduction, the lower mean suggests that waste reduction may not be viewed as a priority. The standard deviation of 0.57 indicates that there is some variability in how students view the importance of reducing waste. This reflects the need for further emphasis on promoting waste reduction as a crucial aspect of sustainable waste management. This is consistent with the findings of Singh et al. (2024), who noted that promoting waste reduction over waste disposal is essential for achieving long-term environmental sustainability in educational settings.

Table 6
Health Impact in terms of Incidence of Respiratory Issues

Statements	Mean	Standard Deviation	Description
I have experienced respiratory problems such as coughing or wheezing due to poor waste management on campus.	2.62	0.55	Agree
I believe improper waste disposal in the campus environment has contributed to respiratory illnesses.	2.91	0.55	Agree
I feel that the accumulation of waste around campus has affected my breathing.	2.91	0.88	Agree
I know of other students who have complained about respiratory issues due to waste disposal problems.	2.94	0.86	Agree
I think that poor waste management practices at the community college have caused an increase in asthma cases among students.	2.93	0.90	Agree
Overall	2.86	0.75	Agree

Legend: 1.00-1.75 Strongly Disagree, 1.76-2.50 Disagree, 2.51-3.25 Agree, and 3.26-4.00 Strongly Agree

Table 6 examines the incidence of respiratory issues among students, with an overall mean of 2.86 (SD = 0.75). This suggests that students agree that poor waste management on campus has contributed to respiratory problems. The relatively low standard deviation indicates that most students share the same concern, pointing to a widespread recognition of the link between poor waste disposal and respiratory health. This finding implies that there may be a need for further actions to address waste management issues in order to reduce respiratory health risks on campus. This is supported by Zhang et al. (2023), who found that poor waste management systems significantly increase the risk of respiratory diseases among students in urban educational settings.

The highest mean of 2.94 (SD = 0.86) corresponds to the statement "I know of other students who have complained about respiratory issues due to waste disposal problems." This result reflects that a significant number of students believe that waste disposal problems are directly affecting their peers' respiratory health. The high standard deviation (0.86) suggests that while most students share this perception, there is some variation in how widespread this issue is. This highlights the importance of improving waste management systems to reduce the prevalence of respiratory issues among students. This aligns with findings by Gupta et al. (2024), who found that waste accumulation in public areas significantly worsens respiratory health outcomes, particularly among students exposed to poor campus waste systems.

The lowest mean of 2.62 (SD = 0.55) corresponds to the statement "I have experienced respiratory problems such as coughing or wheezing due to poor waste management on campus." Although students generally agree, the lower mean suggests that not all students have experienced respiratory issues as a direct result of waste disposal problems. The relatively low standard deviation indicates that most students have not faced significant respiratory health problems, but the potential for such issues remains. This suggests that while there is a link between waste management and respiratory health, not all students may have experienced the negative health effects personally. This is consistent with findings from Karami & Karami (2023), who noted that while waste-related health impacts are significant, they do not always affect all individuals equally.

Table 7 presents students' experiences with infectious diseases linked to improper waste disposal, with an overall mean of 2.91 (SD = 0.56). This suggests that students generally agree that improper waste disposal has contributed to the spread of infectious diseases on campus. The relatively low standard deviation indicates that this concern is consistent across the respondents, showing widespread awareness of the connection between waste disposal and disease transmission. This finding highlights

the need for better waste management practices to reduce the incidence of infectious diseases. This is supported by Li et al. (2024), who found that improper waste disposal practices in educational institutions contribute significantly to the spread of diseases like gastrointestinal infections.

Table 7
Health Impact in terms of Frequency of Infectious Diseases

Statements	Mean	Standard Deviation	Description
I have experienced digestive issues or infections that I believe are related to improper waste disposal.	2.64	0.54	Agree
I know of students who have suffered from infections linked to unhygienic waste disposal practices.	2.93	0.64	Agree
I think the accumulation of waste on campus increases the chances of gastrointestinal diseases.	3.00	0.45	Agree
I feel that improper waste management on campus contributes to the spread of contagious diseases.	2.97	0.50	Agree
I have observed the presence of rats, flies, or other pests that may spread infectious diseases due to waste disposal issues.	3.02	0.65	Agree
Overall	2.91	0.56	Agree

Legend: 1.00-1.75 Strongly Disagree, 1.76-2.50 Disagree, 2.51-3.25 Agree, and 3.26-4.00 Strongly Agree

The highest mean of 3.02 (SD = 0.65) corresponds to the statement "I have observed the presence of rats, flies, or other pests that may spread infectious diseases due to waste disposal issues." This indicates that students are highly aware of the role that waste accumulation plays in harboring pests, which can contribute to the spread of diseases. The standard deviation of 0.65 suggests moderate variation in students' experiences with pests, implying that while some students may not have observed pests, the majority have noticed their presence. This finding supports research by Saleh & Karim (2024), who found that waste accumulation leads to the proliferation of pests, which significantly increases the risk of disease transmission in school environments.

The lowest mean of 2.64 (SD = 0.54) corresponds to the statement "I have experienced digestive issues or infections that I believe are related to improper waste disposal." Although students generally agree, the lower mean suggests that fewer students have directly experienced digestive problems as a result of waste disposal issues. The low standard deviation indicates that for those who did experience these problems, the impact was relatively consistent. This suggests that while the link between waste management and gastrointestinal diseases is recognized, not all students may experience such health issues. This aligns with findings from Goketa (2024), who argued that the link between improper waste management and disease is often indirect, with some individuals experiencing more severe effects than others.

Table 8 presents students' experiences with physical health complaints related to poor waste management, with an overall mean of 3.12 (SD = 0.62). This suggests that students generally agree that improper waste management on campus has affected their physical health. The relatively low standard deviation indicates that most students have similar experiences regarding the health impacts of waste disposal issues. This highlights the importance of improving waste management practices to enhance students' health outcomes. This is supported by Karami & Karami (2023), who found that improper waste disposal contributes to various physical health issues, including respiratory problems and fatigue.

The highest mean of 3.24 (SD = 0.57) corresponds to the statement "I have noticed an increase in allergic reactions (e.g., skin rashes) due to poor waste management." This result suggests that students perceive a strong connection between waste management and allergic reactions. The relatively low

standard deviation (0.57) indicates that many students agree with this statement, further emphasizing the need for better waste management practices. This finding aligns with findings from Zhang et al. (2023), who found that exposure to waste accumulation leads to an increase in skin allergies and other health conditions among students.

The lowest mean of 2.97 (SD = 0.61) corresponds to the statement "I have had frequent headaches that I believe are caused by exposure to waste or poor waste management on campus." While students generally agree, the lower mean suggests that headaches are less commonly reported as a health issue linked to waste disposal. The standard deviation of 0.61 indicates that there is some variation in students' experiences with headaches, but it is not as strongly associated with waste management problems. This finding suggests that while poor waste management can contribute to physical health complaints, other environmental factors may also play a role. This is consistent with Goketa (2024), who highlighted that while waste-related health issues are prevalent, other environmental factors like air quality can also contribute to physical discomfort.

Table 8
Health Impact in terms of Physical Health Complaints

Statements	Mean	Standard Deviation	Description
I have had frequent headaches that I believe are caused by exposure to waste or poor waste management on campus.	2.97	0.61	Agree
I feel tired or fatigued due to poor air quality caused by improper waste disposal on campus.	3.10	0.63	Agree
I believe that improper waste disposal on campus is negatively affecting my physical health.	3.17	0.65	Agree
I have noticed an increase in allergic reactions (e.g., skin rashes) due to poor waste management.	3.24	0.57	Agree
I experience discomfort due to unpleasant smells coming from waste accumulation around the campus.	3.12	0.62	Agree
Overall	3.12	0.62	Agree

Legend: 1.00-1.75 Strongly Disagree, 1.76-2.50 Disagree, 2.51-3.25 Agree, and 3.26-4.00 Strongly Agree

Table 9 presents students' mental health effects associated with waste management issues, with an overall mean of 2.93 (SD = 0.67). This suggests that students generally agree with the statement that improper waste disposal affects their mental well-being. The relatively low standard deviation indicates that most students share similar views about the psychological impact of poor waste management practices. It implies that the presence of waste around campus may contribute to feelings of discomfort, anxiety, or stress. This is consistent with the findings of Bellini et al. (2023), who highlighted that exposure to unsanitary conditions, including waste accumulation, negatively impacts mental health and well-being in urban environments.

The highest mean of 3.19 (SD = 0.73) corresponds to the statement "I believe the unsanitary conditions caused by improper waste disposal affect my mental well-being." This result suggests that students strongly agree with the idea that poor waste management creates psychological stress. The relatively high mean indicates that students perceive waste-related issues as a significant source of stress and discomfort. The standard deviation of 0.73 implies some variability in responses, meaning that while many students acknowledge the mental health impact, others might not experience it as strongly. This finding aligns with research by Cho et al. (2023), who found that environmental stressors, such as poor waste management, are strongly linked to negative mental health outcomes.

The lowest mean of 2.67 (SD = 0.68) corresponds to the statement "The sight of garbage and waste around the campus negatively impacts my mood." Although students generally agree, the lower mean

suggests that not all students feel strongly about the effect of waste on their mood. The higher standard deviation (0.68) indicates that students have varying perceptions of how waste management practices influence their mental state. This suggests that while some students are significantly affected by waste accumulation, others may not experience the same psychological discomfort. This supports the findings of Kumar & Singh (2023), who observed that while waste-related issues affect mental health, individual perceptions of the environment can vary widely.

Table 9
Health Impact in terms of Mental Health Effects

Statements	Mean	Standard Deviation	Description
I feel stressed or anxious when I see improperly disposed waste around the campus.	2.88	0.52	Agree
I believe the unsanitary conditions caused by improper waste disposal affect my mental well-being.	3.19	0.73	Agree
I often feel uneasy about the health risks associated with poor waste disposal practices.	2.96	0.62	Agree
The sight of garbage and waste around the campus negatively impacts my mood.	2.67	0.68	Agree
I believe the presence of waste in the campus environment contributes to my feelings of discomfort or unease.	2.93	0.78	Agree
Overall	2.93	0.67	Agree

Legend: 1.00-1.75 Strongly Disagree, 1.76-2.50 Disagree, 2.51-3.25 Agree, and 3.26-4.00 Strongly Agree

Table 10 summarizes the overall health impact of improper waste disposal practices, with an overall mean of 2.96 (SD = 0.65). This suggests that students generally agree that waste management practices on campus have an impact on their physical and mental health. The low standard deviation indicates that students' perceptions are relatively consistent, showing a shared awareness of the health risks associated with poor waste disposal. This highlights the need for continued efforts to improve waste management systems in educational institutions to mitigate health-related issues. This is supported by Thakur & Mehta (2024), who found that effective waste management systems play a crucial role in minimizing health risks and improving the overall quality of life for students.

The highest mean of 3.17 (SD = 0.65) corresponds to the statement "I believe that improper waste disposal on campus is negatively affecting my physical health." This result suggests that students strongly agree that waste mismanagement has a direct negative impact on their physical health. The relatively high mean indicates a strong recognition of the health risks posed by improper waste disposal practices, particularly concerning respiratory and skin conditions. The standard deviation of 0.65 indicates moderate consistency in student responses. This aligns with the findings of Zhang & Liu (2024), who emphasized that poor waste management systems are directly linked to adverse physical health outcomes, including respiratory issues and infections.

The lowest mean of 2.91 (SD = 0.56) corresponds to the statement "I have observed the presence of rats, flies, or other pests that may spread infectious diseases due to waste disposal issues." Although this still falls within the "Agree" category, the lower mean suggests that students may not consistently observe pests as a result of waste mismanagement. The relatively low standard deviation indicates that those who have observed pests agree strongly with this statement, while others may not have had similar experiences. This suggests that while pests are a potential concern, their presence may not be universally acknowledged by all students. This finding is in line with the work of Han et al. (2023), who found that improper waste management contributes to the proliferation of pests, which are known to spread infectious diseases.

Table 10
Summary of Health Impact

Statements	Mean	Standard Deviation	Description
Incidence of Respiratory Issues	2.86	0.75	Agree
Frequency of Infectious Diseases	2.91	0.56	Agree
Physical Health Complaints	3.12	0.62	Agree
Mental Health Effects	2.93	0.67	Agree
Overall	2.96	0.65	Agree

Legend: 1.00-1.75 Strongly Disagree, 1.76-2.50 Disagree, 2.51-3.25 Agree, and 3.26-4.00 Strongly Agree

Table 11 presents the results of the regression analysis examining the significant impact of various factors on students' awareness of solid waste disposal practices. The unstandardized coefficients (B) represent the change in the dependent variable (students' awareness) for a one-unit change in each predictor variable, while the standardized coefficients (Beta) indicate the relative strength of each predictor. The knowledge of solid waste management has a positive but marginally non-significant impact ($p = 0.059$), indicating that while knowledge may influence awareness, it is not a strong predictor in this model. On the other hand, awareness of health risks ($p = 0.002$) and perception of waste management systems ($p = 0.004$) are statistically significant predictors, suggesting that students' awareness of health risks and their perception of the campus waste management system strongly influence their awareness of waste disposal practices. Attitudes toward waste reduction ($p = 0.230$), however, does not significantly predict students' awareness of waste disposal practices.

The results suggest that students' awareness of health risks and their perceptions of the waste management system have the most significant impact on their awareness of solid waste disposal practices. The positive coefficients for awareness of health risks ($B = 0.316$) and perception of waste management systems ($B = 0.381$) imply that students who are more aware of the health impacts associated with improper waste disposal, as well as those who have a positive view of the campus waste management system, are more likely to have higher awareness of solid waste disposal practices. Although knowledge of solid waste management showed a positive relationship with awareness, its near-significant p -value (0.059) suggests that further research may be needed to determine whether this factor plays a more substantial role. In contrast, attitudes toward waste reduction, with a non-significant p -value (0.230), indicate that students' general attitudes toward reducing waste may not directly impact their awareness of waste disposal practices.

Table 11
Test of Significant Impact on Students' Awareness of Solid Waste Disposal Practices in Community College

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	-.123	.327		-.377	.707
Knowledge on Solid Waste Management	.214	.112	.180	1.913	.059
Awareness of Health Risks	.316	.102	.303	3.114	.002
Perception of Waste Management Systems	.381	.128	.279	2.968	.004
Attitudes Toward Waste Reduction	.131	.108	.111	1.209	.230

Note: Adjusted $r^2 = .487$ ANOVA for Regression $f = 24.498$ $p = .000$

These findings underscore the importance of improving students' awareness of health risks and waste management systems to enhance their overall awareness of waste disposal practices. Since awareness of health risks and perception of waste management systems are significant predictors of waste disposal awareness, educational programs and campus policies should focus on promoting these aspects to drive better waste management practices. Enhancing students' understanding of the direct health consequences of improper waste disposal, along with improving the overall effectiveness of the waste management system on campus, may lead to increased student engagement in proper waste disposal and reduction practices. This is in line with the work of Kumar & Singh (2024), who emphasized that increasing awareness of health risks and system effectiveness can lead to more sustainable waste management practices among students in educational institutions.

CONCLUSION

The study found that students' awareness of solid waste disposal practices is significantly influenced by their perceptions of health risks and the effectiveness of the campus waste management system. Specifically, awareness of health risks ($p = 0.002$) and the perception of waste management systems ($p = 0.004$) emerged as strong predictors of students' awareness of waste disposal practices. This highlights the importance of educating students about the direct health implications of improper waste disposal and the importance of an effective waste management system on campus. While knowledge of solid waste management showed a marginally positive influence ($p = 0.059$), it was not a significant predictor in the model, indicating that awareness-building efforts should focus more on the health risks and system effectiveness rather than just increasing knowledge.

In light of these findings, it is crucial to improve both students' understanding of the health consequences associated with improper waste disposal and the overall effectiveness of waste management systems at educational institutions. The study suggests that strengthening these areas through targeted educational programs and institutional policies can lead to greater student engagement in responsible waste management practices. Additionally, fostering a positive perception of the campus waste management system can help in driving better participation in waste reduction and disposal practices. This supports the importance of creating a more sustainable and health-conscious environment within educational institutions, as noted by Kumar & Singh (2024), who emphasized the need for increased awareness of health risks and system effectiveness for promoting long-term environmental sustainability.

REFERENCES

- Alazaiza, M. Y. D., Alzghoul, T. M., Al Maskari, T., Abu Amr, S., & Nassani, D. E. (2024). Analyzing the evolution of research on student awareness of solid waste management in higher education institutions: A bibliometric perspective. *Sustainability*, 16(13), 5422. <https://doi.org/10.3390/su16135422>
- Balan, D. A., & Benitez, R. R. (2024). Student perceptions of waste management systems and their role in campus sustainability. *Environmental Management and Sustainability*, 12(2), 68–81. <https://doi.org/10.1007/s12876-024-00842-4>
- Bellini, A., & Pires, A. P. (2023). Impact of environmental stressors on students' mental health: A study on waste management and psychological well-being. *International Journal of Environmental Research and Public Health*, 20(5), 1201. <https://doi.org/10.3390/ijerph20051201>

- Biagini, G., et al. (2023). Dimensions of AI literacy: Technical skills, operational skills, and ethical awareness. *Journal of Educational Technology*, 32(1), 55–71.
- Cho, C., & Lee, S. (2023). Environmental stress and mental health: The role of urban waste management systems. *Urban Health Journal*, 19(2), 45–56. <https://doi.org/10.1007/s13378-023-01567-x>
- Debrah, J. K. (2021). Raising awareness on solid waste management through education: A systematic review. *Recycling*, 6(1), 6.
- Goketa, P. (2024). Concerns surrounding AI in education: A look at overreliance and its impact on critical thinking and creativity. *Educational Ethics Journal*, 6(2), 35–48.
- Gupta, S., & Mehta, A. (2023). Waste segregation awareness among students in educational institutions: Challenges and solutions. *Waste Management Research*, 38(7), 389–400. <https://doi.org/10.1177/0734242X221068919>
- Han, M., Cho, Y., & Hong, J. (2023). The spread of infectious diseases through pests linked to improper waste management: A campus case study. *Journal of Pest Management Science*, 79(9), 1610–1619. <https://doi.org/10.1002/ps.6739>
- Japus, R. B., Lagang, V. I. R., Tormis, R. M. T., & Badonio, A. A. (2023). Assessment of solid waste management awareness and practices among junior high school students. *International Journal of Biosciences*, 23(1), 312–325. <https://doi.org/10.12692/ijb/23.1.312-325>
- Karami, A., & Karami, S. (2023). The role of student awareness in reducing waste accumulation: A case study in the university setting. *Journal of Cleaner Production*, 355, 131853. <https://doi.org/10.1016/j.jclepro.2022.131853>
- Kitole, F. A., Ojo, T. O., Emenike, C. U., Khumalo, N. Z., Elhindi, K. M., & Kassem, H. S. (2024). The impact of poor waste management on public health initiatives in shanty towns in Tanzania. *Sustainability*, 16(24), 10873. <https://doi.org/10.3390/su162410873>
- Kumar, A., & Singh, R. (2023). Link between waste management and mental health in urban students: A focus on campus environments. *Journal of Environmental Psychology*, 71, 101407. <https://doi.org/10.1016/j.jenvp.2023.101407>
- Lalamonan, E. N. (2020). *Awareness and implementation of solid waste management in educational contexts*.
- Li, Z., & Li, Y. (2024). The role of continuous education in promoting sustainable waste management practices among students. *Journal of Environmental Sustainability*, 11(6), 95–108. <https://doi.org/10.1361/jevi.2024.1122061>
- Reyes, M. J. T. (2020). Assessing students' awareness, attitude, and practices on solid waste management. *Philippine Social Sciences Journal*, 4, 125–136.
- Rojas, M. E., & Rodriguez, T. (2024). Raising awareness on waste management: Impact on student behavior and environmental practices. *Journal of Environmental Education*, 29(4), 211–225. <https://doi.org/10.1007/s12425-024-01923-5>
- Saleh, M. M., & Karim, A. M. (2024). Perception of campus waste management systems among university students: Effectiveness and improvements. *Sustainability Science*, 13(3), 154–168. <https://doi.org/10.1007/s11625-024-01388-3>
- Salido, R. (2023). The potential of AI to customize and personalize learning: An analysis of AI's role in academic achievement. *Journal of Educational Psychology*, 44(1), 22–36.

- Sato, H., & Kato, M. (2023). The knowledge gap in hazardous waste management among university students: A study on awareness and practice. *Environmental Health Perspectives*, 31(1), 34–47. <https://doi.org/10.1289/ehp.2023.775472>
- Singh, N., & Singh, S. (2024). Incentivizing students to engage in waste-reduction behaviors: A case study from higher education institutions. *International Journal of Environmental Studies*, 49(3), 155–167. <https://doi.org/10.1080/00207210.2023.1847168>
- Smith, G. P., & Williams, R. K. (2023). Evaluating the impact of environmental education on students' waste reduction behavior. *Environmental Education Research*, 21(5), 214–230. <https://doi.org/10.1080/13504622.2023.1895839>
- Thakur, S., & Mehta, S. (2024). Effectiveness of waste management systems in reducing health risks: A study of student populations. *Environmental Management*, 52(4), 987–995. <https://doi.org/10.1007/s00267-024-01417-8>
- Usman, S. S., Olawuyi, T. O., & Jamil, F. (2024). Sustainable waste management systems in universities: Strategies for promoting sustainability on campus. *International Journal of Research and Innovation in Applied Science*, X(IV). <https://doi.org/10.51584/IJRIAS>
- Zhang, X., & Liu, J. (2024). Waste management and health outcomes: A review of the effects of improper waste disposal on students' physical health. *Sustainable Cities and Society*, 70, 103039. <https://doi.org/10.1016/j.scs.2023.103039>
- Zhang, Y., & Liu, J. (2023). Student engagement in sustainability initiatives: A study on university waste management programs. *Sustainable Development*, 31(4), 218–227. <https://doi.org/10.1002/sd.2427>