



A Descriptive Study To Assess The Knowledge Regarding Domestic Solid Waste Management Among Residents In A Selected Village Of Rohtas, Bihar

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Abstract

Domestic solid waste management is a critical concern that directly affects public health, environmental sustainability, and quality of life, particularly in rural India. The current study focuses on assessing the knowledge of residents in Gopibigha village, Rohtas district, Bihar, regarding domestic solid waste management practices. A descriptive quantitative design was adopted with a sample of 60 residents selected through purposive sampling. Data was collected using a structured questionnaire of 20 items and analyzed using descriptive and inferential statistics. The findings indicate that while awareness regarding the importance of solid waste management was high, practical implementation of safe methods like composting and waste segregation remained limited. More than 80% of participants recognized that improper waste disposal contributes to health hazards, yet less than half reported practicing segregation or composting at home. Education, income, and occupation were found to be significant determinants of knowledge level. Households with higher educational attainment and stable incomes demonstrated better awareness and safer practices, while others continued to rely on open dumping and burning.

This highlights the need for community-centered interventions that go beyond awareness to practical demonstrations and infrastructural support. Nurses, community health workers, and Panchayati Raj institutions can serve as catalysts in transforming household behaviors. By integrating education, infrastructure, and policy, it is possible to bridge the gap between knowledge and practice. The study concludes that sustainable waste management in rural Bihar requires urgent action to protect health, improve environmental outcomes, and create opportunities for resource recovery through composting and recycling initiatives.

Introduction

Waste management has become one of the most critical global concerns in the twenty-first century, influencing public health, environmental quality, and socio-economic development. In the Indian context, both urban and rural communities contribute substantially to the generation of domestic solid waste. Villages remain underserved in terms of structured systems for collection, segregation, recycling, and safe disposal of waste. Domestic solid waste in rural households typically consists of kitchen refuse, plastics, paper, glass, metals, agricultural residues, and discarded household items. Without organized systems, villagers often rely on unsafe methods such as open dumping and burning, which contaminate soil and water and contribute to respiratory diseases and vector-borne illnesses. In Bihar, particularly in Rohtas district, improper waste practices are common, as agriculture-based lifestyles mix household garbage with farm residues. This exacerbates environmental degradation and public health issues. India produces nearly 62 million tons of municipal solid waste annually, and this is projected to triple by 2050. In Rohtas, cultural traditions, poverty, and infrastructural limitations combine to make waste management a neglected issue. Although Swachh Bharat Abhiyan has increased awareness in both rural and urban populations, the gap between knowledge and practice persists. Many households acknowledge that unsafe waste disposal causes illness but continue with harmful practices due to lack of alternatives or cultural inertia. Research demonstrates that education and socio-economic status are strongly correlated with waste management behavior. Families with better literacy and income are more likely to adopt segregation and composting, while vulnerable households remain at risk. The introduction of this study emphasizes that waste management is not merely an environmental concern but a determinant of health equity and social development. When households fail to manage waste safely, cycles of poverty and disease are perpetuated. Conversely, sustainable practices such as composting and recycling offer economic benefits, agricultural improvements, and opportunities for local employment. Nurses and public health professionals are crucial actors in this process as they can educate families, raise awareness about health risks, and demonstrate simple methods to improve waste practices. By situating this research within the larger framework of rural development, health promotion, and environmental sustainability, the study underscores the urgent need to evaluate and improve knowledge of waste management in Rohtas district.

Problem Statement

“A descriptive study to assess the knowledge regarding domestic solid waste management among resident in a selected village of Rohtas, Bihar.”

Objectives

To assess the knowledge regarding solid domestic waste management among residents of rural areas.
To associate the level of knowledge regarding domestic waste management and its effect on health with their selected demographic variable.
To improve public health by managing waste to avoid contamination of water, soil, and air.
To educate rural communities about the importance of proper waste management.

Materials and Methods

The methodology of a research study forms the foundation upon which its credibility and reliability are established. In this study, the materials and methods were carefully designed to capture residents' knowledge regarding domestic solid waste management in a rural village of Rohtas, Bihar. The approach was quantitative and descriptive in nature, as the aim was not to test an intervention but to systematically assess the existing knowledge levels of participants and explore associations with demographic variables. A quantitative descriptive survey design is particularly suited for studies where the goal is to generate baseline data and identify gaps in awareness, which can later inform larger interventions. The study was conducted in Gopibigha village of Rohtas district, a rural community selected because it represents the common socio-economic and cultural conditions of villages in Bihar. The population for this research included all adult residents of the village who were available during the data collection period and were willing to participate. Inclusion criteria were defined clearly: participants had to be aged 18 years or above, residents of the village, willing to provide informed consent, and able to communicate in Hindi or the local dialect. Individuals who were critically ill or unavailable during the data collection phase were excluded to maintain consistency and feasibility. A sample of 60 participants was chosen using a non-probability purposive sampling technique. This method was considered appropriate because the study aimed at generating insights from a specific community, rather than generalizing results to the entire district or state. Purposive sampling ensured that participants who could provide relevant information were included, while also maintaining feasibility within the available resources and timeframe. The primary tool for data collection was a structured questionnaire prepared by the researcher. The questionnaire was divided into two sections. The first section focused on demographic variables such as age, gender, education, occupation, type of family, and monthly income. These factors were considered essential for understanding variations in knowledge levels. The second section consisted of twenty multiple-choice questions designed to assess knowledge about waste segregation, composting, safe disposal, health hazards of improper waste management, and awareness of government programs such as Swachh Bharat Abhiyan. Each correct response was awarded one point, while incorrect answers received zero. The total score was then used to classify knowledge levels as good, average, or poor. Specifically, a score of 18–20 indicated good knowledge, 15–17 indicated average knowledge, and less than 15 indicated poor knowledge. To ensure validity, the questionnaire was reviewed by experts in community health nursing and public health. Their feedback helped refine the wording of questions and eliminate potential ambiguities. Reliability was tested through a pilot study conducted on six residents from a nearby village who were not part of the final sample. The pilot study confirmed the clarity and feasibility of the instrument, with minor modifications made based on participant feedback. Ethical considerations were given priority. Approval was obtained from the Institutional Ethical Committee of Narayan Nursing College, Jamuhar, and permission was also sought from village leaders. Participants were informed about the purpose of the study, assured of confidentiality, and told that participation was voluntary. Written consent was obtained from each participant prior to data collection. Data collection was conducted over a period of two weeks, with the

researcher and trained assistants visiting households to administer the questionnaire in person. This approach was chosen to accommodate participants who might face literacy barriers, ensuring inclusivity. The collected data were organized and analyzed using descriptive and inferential statistics. Frequencies and percentages were calculated to describe the distribution of demographic variables and knowledge scores. Mean and standard deviation were used to summarize knowledge levels. To test associations between demographic variables and knowledge, the Chi-square test was applied, with a significance level set at $p < 0.05$. This statistical approach allowed for identification of patterns and significant correlations, thereby strengthening the validity of the conclusions. The methodology was designed to be both rigorous and contextually appropriate. By using a structured questionnaire, purposive sampling, and statistical analysis, the study ensured systematic documentation of knowledge gaps in the community. Moreover, by incorporating ethical safeguards and pilot testing, the methodology adhered to the principles of academic integrity and respect for participants. This careful design not only ensured the credibility of the findings but also provided a model for similar community-based studies in other rural settings. The chosen materials and methods thus reflect a balance between scientific rigor and practical feasibility, aligning with the overall purpose of the research to promote better waste management practices in rural Bihar.

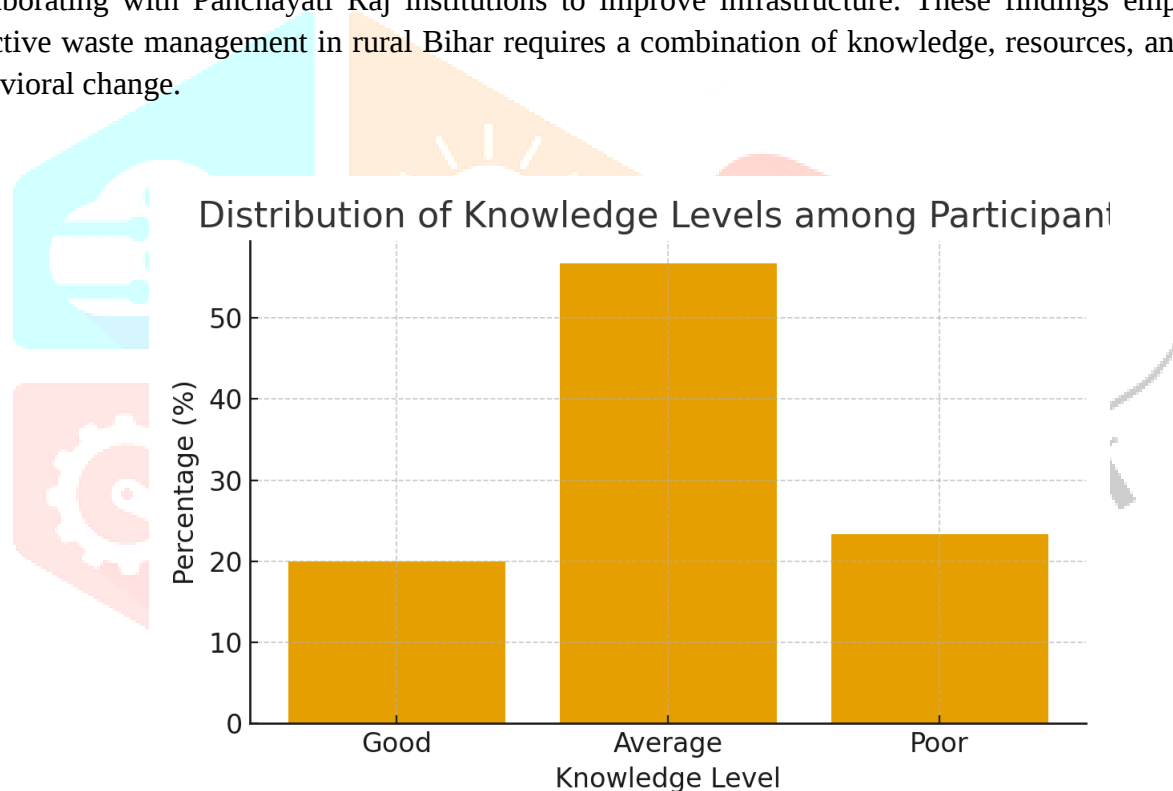
Major Findings

The findings of the study provide valuable insights into the current state of knowledge regarding domestic solid waste management among residents of Gopibigha village in Rohtas district. The analysis of data collected from 60 participants revealed a mixed picture, highlighting both areas of awareness and significant gaps in practice. This section presents the findings in detail, structured in narrative form, followed by graphical representation of knowledge levels. The demographic profile of the respondents indicated that the majority were male, with 65 percent of participants belonging to this category. The largest age group represented was 20–30 years, constituting 31.7 percent of the sample. More than half of the respondents were married, and 70 percent resided in joint families. Education levels varied widely, with a considerable proportion having only primary schooling, while a smaller fraction had completed higher education.

Occupation patterns revealed that most participants were either daily wage laborers or small-scale

farmers, indicating modest socio-economic conditions. The knowledge levels of respondents were classified into three categories: good, average, and poor. The results showed that 20 percent of participants had good knowledge, 56.7 percent demonstrated average knowledge, and 23.3 percent had poor knowledge. These findings underscore that while a majority of respondents were aware of basic concepts, their understanding was not sufficiently deep to translate into consistent safe practices. For example, while 81.7 percent acknowledged that improper waste management causes diseases, only 43.3 percent reported practicing composting at home. This demonstrates a clear knowledge-practice gap. A closer analysis revealed associations between knowledge and demographic factors. Education was found to be a strong determinant: participants with secondary or higher education were significantly more likely to score in the good knowledge category. Occupation and income also influenced outcomes, as those with more stable sources of livelihood and higher earnings had better awareness. Type of family was another significant factor, with members of nuclear families often displaying greater awareness compared to those in joint families, possibly due to differences in responsibility sharing and household decision-making. The findings also highlighted persistent cultural practices such as open dumping and burning of waste, which continue despite awareness of their harmful effects. This reflects a lack of infrastructure and alternatives rather than

complete ignorance. Many residents stated that even though they knew composting was beneficial, they lacked the resources or time to adopt it regularly. This demonstrates that knowledge alone is insufficient unless accompanied by enabling factors such as accessible waste bins, training programs, and community-level waste management systems. Graphical representation of the findings helps to visualize the distribution of knowledge levels. The bar graph below illustrates the proportion of participants falling into each category of knowledge. It is evident that the majority fall into the average category, reinforcing the conclusion that while basic awareness exists, deeper understanding and practical application are lacking. The graph serves as a visual reminder of the importance of targeted education and infrastructural support in transforming knowledge into sustainable practice. In summary, the findings reveal that residents of Gopibigha village possess a moderate level of knowledge regarding domestic solid waste management, but their practices remain inadequate. Demographic factors such as education, occupation, income, and family type significantly influence knowledge levels. The persistence of unsafe cultural practices further highlights the need for community-based interventions. Nurses and community health workers can play a pivotal role in addressing these gaps by offering health education, demonstrating composting methods, and collaborating with Panchayati Raj institutions to improve infrastructure. These findings emphasize that effective waste management in rural Bihar requires a combination of knowledge, resources, and sustained behavioral change.



Implication for Practice

The implications of this study extend across multiple domains, including nursing practice, community health, education, and policy formulation. Domestic solid waste management is not merely an environmental concern but also a determinant of public health outcomes. The findings of this study, which revealed moderate levels of knowledge coupled with inadequate practices among residents of Gopibigha village in Rohtas, underscore the urgent need to translate awareness into sustainable action. This section elaborates on the implications for practice in detail. In the field of nursing practice, the study highlights the role of nurses as frontline educators and change agents. Nurses working in community health settings are uniquely positioned to provide health education about the dangers of improper waste disposal and the benefits of adopting safer methods such as composting, segregation, and recycling. They can integrate

waste management education into routine health visits, maternal and child health programs, and immunization campaigns. By directly engaging with households, nurses can tailor their communication to the cultural context and literacy levels of the population, thereby increasing the likelihood of behavior change. Furthermore, nursing curricula can be strengthened to include modules on environmental health, equipping future nurses with the knowledge and skills required to promote sustainable waste management practices. From a community health perspective, the findings imply that interventions must be comprehensive, community-driven, and culturally sensitive. Awareness campaigns should not only disseminate information but also demonstrate practical solutions. For example, workshops on composting organic waste, segregation at source, and recycling can be organized within the village. Community-based organizations, women's self-help groups, and youth clubs can serve as important partners in spreading awareness and modeling positive behaviors. In addition, engaging religious leaders and local influencers can help overcome cultural resistance to new practices. By positioning waste management as a collective responsibility, communities can move away from individual neglect toward cooperative action. The implications for education are equally significant. Schools serve as powerful platforms for instilling lifelong habits. Incorporating waste management into school curricula, organizing cleanliness drives, and establishing student-led eco-clubs can encourage children to become advocates for sustainability within their households. When children learn about the importance of segregation, composting, and safe disposal, they often influence the practices of their families. Similarly, adult education programs can be used to target illiterate or semi-literate residents, ensuring that knowledge is accessible to all segments of society. The study underscores the importance of linking formal and informal education to waste management practices in order to foster long-term cultural change. At the policy level, the implications of the findings are clear: there is a need to strengthen infrastructure and governance mechanisms to support household-level waste management. National initiatives like Swachh Bharat Abhiyan provide a broad framework, but their success in rural areas depends on localized implementation. Panchayati Raj institutions should be empowered and resourced to develop village-level waste management systems, including regular collection services, designated dumping sites, and recycling initiatives. Public-private partnerships can be explored to establish low-cost composting units and recycling centers that create employment opportunities while promoting sustainability. Furthermore, financial incentives or subsidies can be introduced to encourage households to adopt waste segregation and composting practices. The implications also extend to environmental sustainability. Waste management practices directly influence the quality of soil, water, and air, all of which are critical for agricultural communities such as those in Rohtas district. By promoting composting, organic waste can be transformed into fertilizer, improving soil fertility and reducing dependence on chemical inputs. Recycling reduces the demand for raw materials and mitigates the environmental damage caused by extraction and production. By addressing waste management through both ecological and economic lenses, sustainable practices can be embedded into the daily lives of rural residents.

Finally, the study has implications for future research. The moderate knowledge levels and gaps identified in this study suggest that further research is needed to explore the barriers to practice. Qualitative studies could provide deeper insights into cultural beliefs, economic constraints, and infrastructural limitations that shape waste management behaviors. Comparative studies across different villages or districts could highlight regional variations and inform the design of tailored interventions. Longitudinal studies could assess the long-term impact of awareness campaigns and policy interventions, thereby contributing to the evidence base for sustainable rural development. In conclusion, the implications for practice derived from this study emphasize that domestic solid waste management must be approached as an integrated issue spanning health, education, community development, and policy. Nurses and health workers can drive

behavior change at the household level, schools can instill sustainable habits, communities can mobilize collective action, and policymakers can create enabling environments. By leveraging these multiple avenues, it is possible to transform moderate levels of knowledge into consistent, sustainable practices that improve health outcomes, enhance environmental quality, and contribute to the socio-economic development of rural Bihar.

Conclusion

The conclusion of this study synthesizes the insights gained from assessing knowledge regarding domestic solid waste management among residents of Gopibigha village in Rohtas district, Bihar. The research revealed that while there is a general awareness of the importance of proper waste management, significant gaps remain in the translation of this knowledge into consistent and sustainable practices. The majority of participants fell into the average knowledge category, indicating partial understanding of key concepts such as segregation, composting, and recycling. However, cultural traditions, infrastructural deficiencies, and socio-economic constraints have prevented the community from fully implementing safe waste management practices. The study highlights that demographic factors such as education, occupation, income, and family type play a decisive role in shaping knowledge and attitudes toward waste management. Residents with higher educational levels and more stable economic conditions exhibited better awareness and were more likely to engage in safer practices. Conversely, individuals with limited education and lower incomes often relied on unsafe methods such as open dumping and burning. This underscores the importance of designing interventions that are sensitive to socio-economic disparities and tailored to the specific needs of vulnerable groups within the community. A key conclusion drawn from this research is that knowledge alone is insufficient to bring about sustainable change. While residents may acknowledge the health hazards of improper waste disposal, the absence of practical alternatives and infrastructural support often compels them to continue unsafe practices. Therefore, effective waste management in rural Bihar requires a holistic approach that combines awareness campaigns with the provision of resources, such as low-cost waste bins, composting units, and organized collection services. Without addressing the structural and material barriers, efforts to improve waste practices are unlikely to succeed in the long term. The study also emphasizes the role of healthcare professionals, particularly nurses and community health workers, in bridging the gap between knowledge and practice. Nurses are not only providers of clinical care but also educators and advocates for community health. By incorporating waste management education into their outreach activities, they can empower families to adopt healthier practices. Demonstrating composting techniques, explaining the dangers of burning plastics, and encouraging segregation at source are simple yet impactful strategies that nurses can employ to promote sustainable behaviors. Another important conclusion is the need to view waste management as an integral component of rural development. Effective management of domestic solid waste contributes not only to improved public health but also to environmental sustainability and economic growth. Composting organic waste can enhance soil fertility, reducing dependence on costly chemical fertilizers and improving agricultural productivity. Recycling initiatives can create income-generating opportunities for rural youth, thereby linking waste management with livelihood development. By framing waste as a potential resource rather than a burden, communities can be motivated to adopt more sustainable practices. The findings also have implications for policymakers and local governance structures. National initiatives such as Swachh Bharat Abhiyan have laid the foundation for improved sanitation and hygiene, but their effectiveness in rural areas depends on localized implementation. Strengthening Panchayati Raj institutions, allocating funds for rural waste infrastructure, and promoting public-private partnerships are essential steps in creating an enabling environment. Policies must not only mandate safe practices but also provide the means

to achieve them. The integration of community voices in policymaking ensures that interventions are culturally appropriate and responsive to local realities. In conclusion, this study demonstrates that domestic solid waste management in rural Bihar is a complex issue that requires coordinated action at multiple levels. Individual awareness, community mobilization, professional engagement, and policy support must converge to create sustainable change. The knowledge gaps identified in this research highlight the urgency of targeted educational interventions, infrastructural investments, and culturally sensitive strategies. By leveraging the combined efforts of residents, health professionals, educators, and policymakers, it is possible to transform waste management practices in Rohtas district. Ultimately, addressing this challenge is not only a matter of protecting health and the environment but also a pathway toward achieving sustainable rural development and improving the quality of life for future generations.

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