

**PERCEIVED HEALTH PROBLEMS OF SOLID WASTE DISPOSAL AMONG RESIDENTS OF
RUSAU VILLAGE, JOS NORTH LGA OF PLATEAU STATE.**

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ABSTRACT

This study is aimed at the Perceive Health Problems of Solid Waste Disposal among the Residents of Russau Village, Jos North Local Government Area of Plateau State. Four objectives and four research questions guided the study. Literature relating to the study was reviewed, survey research design was adopted using structured questionnaire as instrument to collect information from two hundred and fifteen (215) respondents. The data collected from the respondents was analyzed using simple frequency and percentage method Cronbach Alpha method was used to determine the reliability of the instrument. It was done through half-split test method and reliability of 0.67 was obtained. The result revealed among others that, the respondents are well knowledgeable that proper waste disposal improves environmental hygiene (99.07%) and prevent health problems and diseases (97.21%), improper waste disposal causes spread of diseases such as cholera, ,nausea, malaria, (100%), improper handling of waste leads to air, water and land pollution (96.28%), Lack of environmental education (98.60%) and lack of individual social participation present poor waste management. Also recycling (93.95%), waste for land treatment (88.84%). Incineration (82.77%), sanitary landfill (75.81%) and reduction (71.16%), reuse (63.26%) was effective in solid waste disposal respectively. Based on the findings that the people are very much aware of the importance of proper refuse disposal, it was recommended that the government be aware of this fact and the health consequences of poor refuse disposal by making good and functional legislation at all level of governance for the maintenance of good and hygienic environment.

INTRODUCTION

An environment that is free from dirt and other hazards can be said to be of a health benefit to the occupants of that environment. Health is looked at by Stoke (1982) as a state characterized by anatomic, physiologic, and psychologic integrity: ability to perform personally family, work and community role. Ability to deal with physical, biological, psychological and social stress. In line with this World Health Organisation (WHO) (1986) posited that health as 'a resource for everyday life, not the object of living: a concept emphasizing social and personal resources as well as physical capacities. Also Huber, Knother, Green, and Vander (2011) defined health as the ability to adapt and to self-manage, which include the ability of people to adapt to their situation. From this perspective health is a means to living well, which highlights the link between health and participation in society.

According to Pervez and Hafeez (2013) who stated that, proper solid waste disposal is of great benefit to health and the environment as it reduces air, water, land pollution, greenhouse gas emissions (a contributing factor to global warming), reduces spread of diseases and other health related problems, keeps the surroundings tidy, and this can have a positive influence on an individual's mood and behaviour which is important to healthy living, reduced Vector, improved quality of life, Hygiene and environmental aesthetic. In addition they stressed that, Proper hospital waste disposal is important for many reasons from protecting public health and the environment to keeping your patients and co-workers safe, control zoonoses (diseases passed to humans through insects, birds, rats and other animals), avoid negative long-term health effect such as cancer, prevent illegal repackaging and resale of contaminated items and dramatically reduce HIV/AIDS, sepsis and hepatitis. Also Olusegun, Opeagbe and Amusa (2018) noted that generation of wastes

and its disposal, collection, transportation and processing are important for healthy ecosystem and the health of the people.

Inappropriate management of solid waste disposal causes all types of pollutions, and indiscriminate dumping of wastes contaminates surface and ground water supplies which clogs drains, creating stagnant water for insect breeding and floods during rainy seasons, uncontrolled burning of solid waste contributes significantly to urban air pollution and Greenhouse gases are generated from the decomposition of organic wastes in landfills, Insect and rodent vectors are attracted to the waste and can spread diseases such as cholera and dengue fever, while excreta, other liquids and solid waste from households and community are a major cause of serious health hazard and leads to the spread of infectious diseases, and using water polluted by solid waste for bathing, food irrigation and drinking can also expose human to disease organisms and other contaminants (Alam & Ahmade, 2013; Daura, Enaburekhan, & Rufia, 2014). Also Olusegun, opeagbe and Amusa (2018) noted that health outcomes have found to be statistically associated with exposure to waste: cancer and congenital malformations. In the same vein pragya (2013) explained that there are potential risk to human health from improper handling of solid waste. There are also specific risk in handling wastes from hospitals and clinics. For the general public the main risks to health are indirect and arise from the breeding of disease vectors primarily flies and rats. Uncontrolled hazardous wastes from industries mixing up with municipal waste create potential risk to human health.

These problems can be due to individual environmental health behaviour which is determined by individual's perception of threat, threat severity, the value placed on changing the behaviour as well as self-efficacy to change the behaviour (Rosenstock, 1974). The effects or problems associated with nonparticipation in environmental sanitation and improper waste disposal can also effect the perception of environmental sanitation positively.

Schater (2011) defined perception as organization, identification and interpretation of sensory information in order to represent and understand the present information. Perception is simply conscious understanding of something (e.g solid waste disposal). According to Otoniel, Liliana and Sara(2014) environmental perception is understood as the relationship human being have with the environment. Therefore health perception of solid waste disposal is the organization, identification and interpretation about solid waste disposal in order to understand their present effect to human life and the environment when properly managed or not. The conscious understanding of the health effect of solid waste disposal is very important as a factor that influence the attitude of people towards solid waste disposal in any environment.

The nature of the environment we live in is a determinant of health. An environment is an external factor affecting an organism(human). It also means all the circumstances, people, things and events around an organism, a person or a community that influences an organism life (Oyeniyi,2011). It is also the surrounding or condition in which a person, animal or plant lives or operate (Okecha, 2000). Environmental perception and sanitation plays a role for a healthy ecosystem and the residents.

The World Health Organization (WHO, 2008) defined environmental sanitation as the control of all those factors in man's physical environment which exercises or may exercise a deleterious effect on his physical development, health and survival. The concept of environmental sanitation to entail the control of water supplies, excreta disposal, waste water disposal, refuse disposal, vectors of diseases, housing conditions, food supplies and the safety of the working environment. Also Aduku (2014) and Faiza (2015) viewed that the poor environmental sanitation in schools affects both the intellectual and physical wellbeing of the students and there is a need for environmental education in schools to enlighten the students about good sanitation. Joshua and John (2019) indicate in their study that Participants living closer to dump site suffers air pollution, illness such as flu, eye irritation and weakness of the body.

In view of this Enegi, Enegi and Ngoka(2017) stated that waste disposal method such as open dumping, burning of waste, dumping at sea, burying, composting, unsanitary landfill have

effect on the environmental health status which includes: Increase in the concentration of pathogenic organisms in the environment, contamination of land and soil which may affect crop yield and production, destroy the aesthetics of the physical environment, organic matter serves as food for bacteria leading to oxygen depletion in aquatic environment, pollution of surface and underground water supply and also contribute to air pollution some of these heaps of waste on the street and gutters block flow of water thereby contributing to the problem of flood disaster in some Areas. The volume of waste generated as a result of increase rate of human population, urbanization and economic growth has overwhelmed the urban administrator's capacity to plan for waste collection and disposal. Thus, it has become breeding grounds for vectors and infectious disease causing organisms

Rapid urbanization, rural urban migration, little or no town planning efforts coupled attitudinal irresponsibility, lack of political will ineptitude and graft have independently and collectively created environmental challenge in Nigeria. Human exposure to this unlawful act has triggered more health problems to the populace which advertently affect the entire livelihood and their major landscape (Oguniran, 2019). He further noted that lack of appropriate storage facilities, inadequate waste management and planning, wrong perception by residents and nonchalant attitude towards environmental sanitation are the factors influencing this problems.

Waste according to Oyeniyi(2011) is any material which has been used and is no longer wanted for example because the valuable or useful part of it has been taken out . In line with this Oguniran (2019) defined waste as any useless and unwanted product of human domestic and industrial activities released into the environment; it can be solid, liquid, semisolid or container of gaseous material. While solid waste is any garbage, refuse or sludge from a waste treatment plant, water supply treatment and other discarded materials. Solid waste disposal is therefore how an individual, society, organization stow away human and animal materials that are no longer wanted or useful. This can be done through reuse, recycling, reduction and other effective waste disposal methods . these are considered in this work

There is no doubt that wastes, if properly disposed of or taken care of in the right manner, then it can be a health benefit and for the general safety. Therefore, proper solid waste management or disposal will be of great benefit to health as it Reduces air, water, land pollution, greenhouse gas emissions(a contributing factor to global warming), reduces spread of diseases and other health related problems, Keeps the surroundings tidy, and this can have a positive influence on an individual's mood and behaviour which is important to healthy living, reduced Vector, improved quality of life, hygiene and environmental aesthetic (Pervez and Hafeez, 2013)

Conversely, improper handling of solid waste can lead to great health risk such as skin reaction, fever, cholera Chemical poisoning through chemical inhalation Low birth weight Cancer, Congenital malformations, Neurological disease, Nausea and vomiting, life becomes unbearable, extreme weather, air, water and land pollution, greenhouse gas emissions(a contributing factor to global warming) and reduction in the quality of the environment (Ogunniran, 2019).

It is possible that the same situation exist in the present area of the study as there seems to be no resent study on the subject under discussion in the area. This provides the impetus for present study on the perceive health effect of solid waste disposal among the residents of Russau village, Jos North Local Government (LGA) of plateau state

Research Questions

To give direction to this work, the following research questions are stated

1. What are the health benefits of proper solid waste disposal?
2. What are the problems associated with improper solid waste disposal
3. What are the factors influencing solid waste disposal
4. What are the effective methods of solid waste disposal?

METHODS

This study utilized a descriptive survey design. Torchun (2006) stated that survey research is one of the most important researches of measurement. To him, the broad areas of survey research encompass any measurement procedures that involve asking questions from respondents. According to Kerlinger (1993) a survey gathers data at a particular point in time with the intention of describing the nature of existing conditions. It was there considered appropriate for the present study.

The population of this study is made up of all the residents of Russau village, Jos north local government of plateau state and it was estimated to be over 1000 residents. Two hundred and fifteen (215) volunteers respondents were sampled for the study. The questionnaire was made of four sessions. Section 1 elicited information on health benefit of proper solid waste disposal, Section 2 sought for information on health problems associated with improper solid waste disposal, while Section 3 looked for information on factors influencing solid waste disposal and Section 4 needed data on the methods of solid waste disposal.

To ensure the face and content validity of the instrument, the researchers subjected it to judgment of three experts so as to obtain the adequacy and comprehensiveness of the items as well as the clarity of expressions used. Based on the experts-advice, some items were modified, some were retained and others deleted. The instruments was pre-tested using 30 individuals of Anguwan Rogo who were not part of the main study and a reliability coefficient index of 0.83 was obtained which was considered very high for the study. Simple percentage method of data analysis was employed to analyze the data. The choice of simple percentage method of data analysis is appropriate because of clarity in the presentation of information thus facilitating the reader's understanding.

RESULTS

Research question 1: What are the health benefits of proper solid waste disposal? The data answering the research question is contained in Table 1 below

TABLE 1: Health Benefits of Proper Solid Waste Disposal

S/N	ITEM	YES		NO	
		f	%	f	%
1.	Healthy living is positively influenced by adequate waste disposal	206	95.81	9	4.19
2.	Proper waste disposal improves hygiene	213	99.07	2	0.93
3.	Adequate waste disposal keeps the surrounding clean	206	95.81	9	4.19
4.	Health problems and disease is avoided when waste is properly disposed	209	97.21	6	2.79
5.	Activities of rodents are reduced if waste is handled properly	206	95.81	9	4.19
6.	Proper handling of waste reduces air, water and land pollution	204	94.88	11	5.12
7.	Economy is improved if waste is properly managed	181	84.19	34	15.81
8.	The quality of the environment is enhanced when wastes are well managed	204	94.88	11	5.12
9.	Effective management of waste reduce global warming	188	82.44	27	12.56
10.	Waste if properly disposed conserves natural resource	192	89.30	23	10.70

The results in Table 1 reveal that Proper waste disposal improves environmental hygiene 213 (99.07%), health problems and disease is avoided when waste is properly disposed 209 (97.21%), healthy living is positively influenced by adequate waste disposal 206 (95.81%), Adequate waste disposal keeps the surrounding clean 206 (95.81%), activities of rodents are reduced if waste is handled properly 206 (95.81%), others are proper handling of waste reduces air, water and land pollution 204 (94.88%), the quality of the environment is enhanced when wastes are well managed 204 (94.88%), Waste if properly disposed conserves natural resource 192 (89.30%), effective management of waste reduce global warming 188 (87.44%) and economy is improved if waste is

properly managed 181 (84.19%) were the health benefits of proper solid waste disposal among the residents in Russau village, jos north LGA, Plateau state

Research question 2: What is the health problems associated with improper solid waste disposal? the data answering the research question is contained in Table 2

TABLE 2: Health Problems Associated with Improper Solid Waste Disposal

S/N	ITEM	YES		NO	
		f	%	f	%
1.	Inadequate waste disposal presents dirty surrounding	204	94.88	11	5.12
2.	Burying hazardous waste cause soil contamination	195	90.70	20	9.30
3.	Health problems and disease is influenced negatively by poor waste disposal	197	91.63	18	8.37
4.	Indiscriminate waste disposal present breeding site for rodents	199	92.56	16	7.44
5.	Extreme weather occurs when waste is not properly disposed	158	73.49	57	26.51
6.	Improper handling of waste leads to air, water and land pollution	208	96.74	7	3.26
7.	Waste if not properly disposed reduces environmental quality	204	94.88	11	5.12
8.	Burning of refuse indiscriminately present fire risk	203	94.42	12	5.58
9.	Waste if not properly disposed reduces environmental quality	207	96.28	8	3.72
10.	Improper waste disposal causes spread of diseases	215	100.00	0	0.00

The result in Table 2 shows that, improper waste disposal causes spread of disease such as cholera, nausea, malaria, congenital malformation 215 (100%), improper handling of waste leads to air, water and land pollution 208 (96.74%), waste if not properly disposed reduces environmental quality 207(96.28%), inadequate waste disposal presents dirty surrounding 204 (94.88%) and waste if not properly disposed reduces environmental quality 204 (94.88%). Others are indiscriminate waste disposal present breeding site for rodents 199 (92.56%), health problems and disease is influenced negatively by poor waste disposal 197 (91.63%), burying hazardous waste cause soil contamination 195 (90.70%) and extreme weather occurs when waste is not properly disposed 158 (73.49%) were the health problems associated with improper solid waste disposal among the residents if Russau village, Jos north LGA, Plateau state.

Research question three: What are factors influencing solid waste disposal? the data answering the research question is contained in Table 3

TABLE 3: Factors Influencing Sold Waste Disposal

S/N	ITEM	YES		NO	
		f	%	f	%
1.	Waste is properly managed when there is enough money	121	56.28	94	43.72
2.	Adequate budgeting enhances proper waste disposal	163	75.81	52	24.19
3.	Availability of equipment facilitates proper waste disposal	201	93.49	14	6.51
4.	Adequate waste management requires joint effort of government and private sector	196	91.16	19	8.84
5.	Individual social participation is needed for effective waste Management	210	97.67	5	2.33
6.	Lack of environmental education present poor waste management	212	98.60	3	1.40
7.	Low policy enforcement on waste disposal causes indiscriminate waste disposal	202	93.95	13	6.05
8.	Refuse is mismanaged if there is no adequate collection and				

disposal system	198	92.09	17	7.91
9. Littering of the surrounding increases when there is over population	207	96.28	8	3.72
10. Waste is not properly disposed if there is lack public awareness	202	93.95	13	6.05

The results in Table 3 shows that lack of environmental education present poor waste management 212 (98.60%), individual social participation is needed for effective waste management 210 (97.67%), littering of the surrounding increases when there is overpopulation 207 (96.28%), waste is not properly disposed if there is lack public awareness 202 (93.95%) and low policy enforcement on waste disposal causes indiscriminate waste disposal 202 (93.95%). Others are availability of equipment facilitates proper waste disposal 201 (93.49%), refuse is mismanaged if there is no adequate collection and disposal system 198 (92.09%), adequate waste management requires joint effort of government and private sector 196 (91.16%), adequate budgeting enhances proper waste disposal 163 (73.81%) and waste is properly managed when there is enough money 121 (56.28%) were the factors influencing waste disposal among the respondents in Russau village, jos north LGA of plateau state

Research question 4: What are the effect methods of proper solid waste disposal? The data answering the research question is contained in Table 4

TABLE 4: Effective Methods of Solid Waste Disposal

S/N	ITEM	YES		NO		I DON'T KNOW	
		f	%	f	%	f	%
1.	Waste is disposed by burying (composting) organic waste	184	85.58	18	8.37	13	6.05
2.	Sanitary land fill is a common means of disposing refuses	163	75.81	21	9.77	31	14.42
3.	Incineration is effective in waste disposal	177	82.33	13	6.05	25	11.63
4.	Animal excreta and plant waste is use as land treatment	191	88.84	13	6.05	11	5.12
5.	Recycling is means of handling plastics and other wastes	202	93.95	6	2.79	7	3.26
6.	Waste is reduced to make land fill and transfer station last longer	153	71.16	23	10.30	39	18.14
7.	Waste is compacted or compressed to break up large items in smaller unit	172	80.00	15	6.93	28	13.02
8.	Conversion of wood to charcoal, reduces waste	177	82.33	27	12.56	11	5.12
9.	Converting coal into town gas is way of avoiding waste	171	79.59	30	13.95	14	6.51
10.	Rubber and plastics waste is shredded and reuse in road construction	136	63.26	40	18.60	39	18.14

The results in Table 4 indicate that recycling is means of handling plastics and other wastes 202 (93.95%) , animal excreta and plant waste is use as land treatment 202 (93.95%), organic waste is disposed by burying(composting) the waste 184 (85.58%), incineration is effective in waste disposal 177 (82.77%) and conversion of wood to charcoal reduces waste 177 (82.77%). Others are waste is compacted or compressed to break up large items in smaller unit 172 (80.00%), converting coal into town gas is way of avoiding waste 171 (79.59%), sanitary land fill is a common means of disposing refuses 163 (75.81%), waste Is reduced to make land fill and transfer station last longer 153 (71.16%) and rubber and plastics waste is shredded and reuse in road construction 136 (63.26%) were the effective methods of proper solid waste disposal among the respondents of Russau village, Jos north LGA of plateau state.

DISCUSSION

The results in table 1 reveal that, proper waste disposal improves environmental hygiene (99.07%), Health problems and disease is avoided when waste is properly disposed (97.21%), healthy living is positively influenced by adequate waste disposal (95.81%), adequate waste disposal keeps the surrounding clean (95.81%), activities of rodents are reduced if waste is properly handled (95.81%) and the likes. These results were expected because the people are knowledgeable about environmental sanitation and have been practicing good sanitation of their environment. This in line with what (Pervez and Hafeez, 2013) emphasized, which explain that proper solid waste management or disposal is of great benefit to health and the environment as it reduces air, water, land pollution, greenhouse gas emissions(a contributing factor to global warming), reduces spread of diseases and other health related problems, keeps the surroundings tidy, and this can have a positive influence on an individual's mood and behaviour which is important to healthy living, reduced Vector, improved quality of life, Hygiene and environmental aesthetic

In addition secured (2018), stressed that, Proper hospital waste disposal is important for many reasons from protecting public health and the environment to keeping your patients and co-workers safe, control zoonoses (diseases passed to humans through insects, birds, rats and their animals), avoid negative long-term health effect such as cancer, prevent illegal repackaging and resale of contaminated items and dramatically reduce HIV/AIDS, sepsis and hepatitis.

The result in Table 2 shows that Improper waste disposal causes spread of disease such as cholera, nausea, malaria, congenital malformation (100%), improper handling of waste leads to air, water and land pollution (96.74%), waste if not properly disposed reduces environmental quality 207(96.28%), inadequate waste disposal presents dirty surrounding, reduces environmental quality (94.88%) and the likes. These results were not surprising because they are common illness known in most Nigerian communities. This is in agreement with what Sankohi, Yani and Trani (2013) who found out that resident nearby dumpsite suffered from disease such as malaria, chest pain, diarrhea and cholera. In the same vein Alam and Ahmed (2013) reported that inappropriate waste disposal causes all kinds of pollutions which include air, water and land. An indiscriminate dumping of refuses contaminates surface and ground water supplies. They also noted in urban area municipal waste clogs drains creating stagnant water for insect breeding and flood during rainy season. Uncontrolled burning of municipal waste significantly contributed to urban air pollution and greenhouses are generated from decomposition of organic waste in landfill and untreated leachate pollute surrounding soil and water bodies. They further noted that insect rodents and vectors attracted to the waste and can spread disease such as cholera and dengue fever, using water polluted by municipal solid waste for bathing, food irrigation and drinking water can also expose human to disease organism and other contaminants

Discussing further Prince, Joshua, & John (2019) noted on a study they carried out to evaluated the health and environmental effects of insanitary landfill on the residents living closer to the landfill that the health risk associated with landfill pollutants is very essential and the by-products of solid waste deposited in a landfill has adverse effects on the surrounding environment and humans living closer to landfill sites. They gathered that participants living closer to the landfill site indicated serious contamination of air quality evident from bad odours linked to the landfill site, Illnesses such as flu, eye irritation and weakness of the body were the problem reported due to indiscriminate waste disposal.

The results in Table 3 indicates that lack of environmental education present poor waste management (98.60%), individual social participation is needed for effective waste management (97.67%), littering of the surrounding increases when there is overpopulation (96.28%), waste is not properly disposed if there is lack of public awareness, low policy enforcement on waste disposal causes indiscriminate waste disposal (93.95%) and the likes. This is in agreement with expectation because good environmental education and public awareness, adequate waste collection and disposal system facilitate proper waste disposal just like what Adedibu (1984) posited that, master plans of Local Government Areas in Nigeria is not prepared and enforced as a guide for both private

and public authorities. Such policies will protect environmentally sensitive areas and address the waste management procedures which will be a control approach to environmental waste management in addition Agumnbwamba (1998) stressed that, inadequate infrastructures or lack of capacity to meet infrastructural services for waste generation is rapidly growing in Many Local Government areas. When vehicles to evacuate waste and other infrastructures are not provided or inadequate from the Local Government to the State Government, there will be problem in handling the waste generated by the populace

The results in Table 4 indicate that recycling is means of handling plastics and other wastes (93.95%) , animal excreta and plant waste is use as land treatment (93.95%), organic waste is disposed by burying(composting) the waste (85.58%), Incineration is effective in waste disposal (82.33%) and the likes. These were in line with expectation as people are knowledgeable on the effect of the various measures of solid waste disposal. This agrees with the findings of Enegi, Enegi and Ngoka (2017) who found out that, waste disposal method such as open dumping, burning of waste, dumping at sea, burying, composting, insanitary landfill have negative effect on the environment and the health of an individual. On the other hand the researchers also give that incineration, sanitary landfill, reduction of waste to smaller volume scientific burying of waste, recycling of discarded material into new and useful product, conversion of waste to fuel (pyrolysis) and resource recovery were considered positive and effective measure for solid waste disposal. This also goes with the findings of Ogwueleka (2009) who reported that solid waste management practices and problems in Nigeria is characterized by inefficient collection methods, insufficient coverage of the collection system and improper disposal. He added that open dumping, land filling, dig and bury is the most adapted method of waste disposal, and therefore recommended that government should adopt proper waste collection and disposal agency and appropriate dumpsites should be established in the area. The Local government council should ensure the evacuation of solid waste on daily basis.

CONCLUSION

It was concluded that the respondents used different methods of waste disposal, improper waste disposal leads to different types of health problems, individual social participation is needed for effective waste management in the area and different methods were used for waste disposal by the respondents.

RECOMMENDATIONS

Based on the summary and conclusions of the study, the following recommendations were made:

1. Due to the fact that the respondents responded to the statement that enough money is needed for proper waste disposal with the lower percentage is indicative that that item was not well understood by the respondent. It is recommended that the researchers need to allow the respondent to ask question not well understood for the purpose of the collection of information for research purpose which could be done by giving orientation before the distribution of instrument
2. Due to the fact that people are now aware of the importance of proper refuse disposal. It is recommended that government be aware of this fact and the health consequences of poor refuse disposal by making good and functional legislation at all levels of governance for the maintenance of good and hygienic environment.

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