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Knowledge and Practice regarding Waste Management among Community People of Gokarneshwor Ward-05, Nepal

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Abstract: This descriptive study entitled “Knowledge and practice regarding waste management among community people of Gokarneshwor. The objective of this study is to assess the level of knowledge and practice regarding waste management among community people. A total number of 87 respondents were selected by using probability simple random sampling technique of lottery method. Sample size was 60 respondents from 60 household which were selected by using nonprobability purposive sampling technique from Prabhuram Colony ward-05, Gokarneshwor, Kathmandu. Data were collected by face to face interview by using semi structured interview schedule. The obtained data were analyzed by using descriptive statistics and inferential statistics. Out of 60 respondents, 23.33% respondents were illiterate and half of the respondents were engaged in household work. Majority (86.70%) respondents answered waste as unwanted or unusable things. The study reveals that majority 98.30% of respondents had moderate level of knowledge on waste management whereas only 41.70% respondents had good practice level. The study concluded that majority respondent had moderate level of knowledge whereas majority of respondent had poor practice level. The study shows that there is no association between knowledge and practice. Different awareness and intervention program must be carried out in the community to improve the practice of people regarding waste management and to improve the waste management system.

Keywords: knowledge; waste; community people

1. Introduction

Waste is defined as any discarded material, which has no value in normal use or for ordinary use. Generation of wastes is inevitable. Waste can take any form that is solid, liquid, or gas and each have different methods of disposal and management. Municipal or household wastes are often generated from several sources where variable human activities are encountered. Several studies indicate that much of the municipal solid waste from developing countries are generated from households (55–80%), followed by commercial or market areas (10–30%) with varying quantities from streets, industries, institutions among others (Babaei, et al 2015; Abikusno, 2003; Bernardo, 2008).

In United Kingdom 2004/2005 for instance, it was estimated that out of, 36 million tons of municipal waste generated, 30 million tons was collected from households. Current waste generation in Bangladesh

is around 22.4 million tons per year or 150 kg/cap/year. There is an increasing rate of waste generation in Bangladesh and it is projected to reach 47,064 tons per day by 2025 (Bhuiyan, 2010). Javadekar has stated that India will, in another couple of decades, generate nearly thrice the waste it currently does – "165 million tons by 2030 and 450 million tons by 2050." Only 22-28 percent of the waste now collected is processed or treated (Das and Das, 2017). A survey conducted by Asian Development Bank in all 58 municipalities of Nepal in 2012 found that the average municipal solid waste generation was 317 grams per capita per day. This translates into 1,435 tons per day or 524,000 tons per year of municipal solid waste generation in Nepal (Asian Development Bank, 2013). In this 21st century, waste management is part of the important service, which is sustaining our society especially in urban area. It has now become basic human right, which is part of basic human needs (Guerrero, 2013).

Waste management is a growing problem in Nepal. For this reason the government of Nepal and different NGOs have taken various measures to promote for reusing and recycling of waste amongst its population (Asian Development Bank, 2013).

Waste management is intended to reduce adverse effects of waste on health and the environment. Waste management practices are not uniform among countries, regions and sectors (Barloa, Lapie, & de la Cruz, 2016). The management of waste should focus on how to find the value and redirect it back to the community. But unfortunately, the collecting and dumping process mix and crush everything together; and make separation an expensive and sometimes impossible task to properly manage wastes (Laor, et al. 2018; Pandey, 2004; Pokhrel & Viraraghavan, 2005). Poor Domestic waste management also displays an ugly scenario of the environment (Iwu et al. 2016; Jin, Wang, & Ran, 2006). Some of the waste on the other hand may also contain poisonous substances like Mercury, lead, cadmium from batteries, old medicines, household cleaning & Decorating chemicals and garden chemicals (Shekdar, 2009). We can conclude that majority of the problem can be avoided if the household waste is properly managed.

Objectives

General objective: to assess the knowledge and practice regarding waste management among community people.

Specific objectives:

- To find out the knowledge regarding waste management of community people.
- To identify the practices regarding waste management of community people
- To find out the association between knowledge and practice regarding waste management

2. Methods

2.1. Research Design

Descriptive, cross-sectional study design was used while conducting this study among community people of Prabhuram Colony, Gokarneshwor Ward-5.

2.2. Research Area/Setting

Prabhuram Colony, Gokarneshwor ward no.5. was the research area. In this colony there are total 60 households and there is poor practice related waste management in this area which have brought negative impact on the health of the community people living there.

2.3. Study Population and Sample

One member from one house of Prabhuram Colony, Gokarneshwor ward -5 was the study population. The total Household of Prabhuram Colony, Gokarneshwor ward -5 is 60.

Sample size

The total Household (n)=60

The sample for the study will be collected in 60 households of People living in Prabhuram Colony, Gokarneshwor Ward -5.

Sampling technique

Purposive sampling technique was used to select the area and sample for the study.

Inclusion Criteria: The total household will be included during data collection period.

Exclusion Criteria: People who cannot communicate will be excluded.

2.4. Research Instruments/Tools

A semi-structured questionnaire was developed and interview method was used to measure the research variable regarding knowledge and practice regarding waste management among community people. Researcher herself in simple and understandable language developed the questionnaire. The interview schedule was divided into three parts:

1. Demographic data (age, sex, family type, size of family, educational level, occupation)
2. Knowledge related questions about waste management (waste, types of waste, effect of waste, method of disposal)
3. Practice related questions about waste management

Review of literature, and consultation experts was done to maintain the content validity. Simple and understandable language was used in the questionnaire for obtaining response from the respondents. Questionnaire was developed in English and translated to Nepali language with the help of Nepali translator for the convenience of the respondents. Reliability was maintained by pretesting of the question in 10% of the sample size at Ramkot, Kathmandu Community. The study tool was revised and finalized on the basis of results obtained from pretest.

2.5. Data Collection Procedure

The researcher used different approach of data collection that was guided by objectives.

- Data collection was conducted in community
- Purpose of the study was explained at first to the community people.
- Written consent was taken with the participants.
- Data was collected using interview technique
- 30 minutes time was provided to answer the questions.
- After 30 minutes collected questionnaire was privately handled.
- Data was collected from 1st -30th Shrawan

2.6. Ethical consideration

Permission

The approval to perform research was taken from concerned authority of ethical board of Kathmandu model hospital.

Informed consent

- The purpose and objectives of study was explained in clear and understandable terms to the respondent.
- Full information about the research was given to students.
- Nobody was forced for participation.

Anonymity

- Anonymity was established as the study will not collect identifying information of individual subjects (e.g., name, address, Email address, etc.) and will use code number as 1,2,3.
- Confidentiality
- It was maintained by not disclosing their information.
- Information was used only for research purpose.

Security

Privacy was maintained by preserving the filled questionnaire in locked cupboard until three years.

No discrimination

Human rights and justice were maintained during the study of population without any discrimination of age, ethnicity, and socio-economic condition.

2.7. Data processing and analysis technique

- The collected data was check and organized for completeness and accuracy.
- Any errors, incompleteness and inconsistencies in the data that could distort the result of the study were removed.
- The data was coded and analyzed using computer package with software SPSS (Statistical Package for Social Science) version 20.
- Frequency and percentage was calculated to measure socio-demographic variable.
- Percentage, mean, standard deviation was used to measure the level knowledge among community people
- Chi-square test was used to show the association between knowledge and practice
- The data was presented in tabular form

3. Results

The data obtained from 60 households for exploring knowledge and practice regarding waste management among community people of Gokarneshwor ward 5 is presented on the tables to facilitate interpretation. The data were analyzed according to the research objectives. This chapter is divided into three parts: socio-demographic information of respondents, knowledge regarding waste management, practice regarding waste management.

3.1. Socio-demographic Information

The following table contains the socio-demographic information of the participants which includes age, gender, education, family type, and occupation.

Table1. Socio-demographic characteristics of respondents (n=60).

Description	Number	Percent
Age in completed years		
Young adulthood (18-40)	37	61.70
Middle adulthood (40-65)	22	36.7
Elder (>65 years)	1	1.7
Gender		
Female	41	68.30
Male	19	31.70
Education		
Basic Education	7	11.70
Secondary Education	30	50.00
Higher Education	9	15.00
Illiterate	14	23.33
Type of family		
Nuclear family	50	83.30
Joint Family	7	11.70
Extended Family	3	5.00
Occupation		
Household	31	51.70
Agriculture	-	-
Service	7	11.70
Laborer	5	8.30
Business	17	28.30

Table 1 shows that the 37 (61.70%) respondents were of age group 18-40 in which 41 (68.30%) Female and 19 (31.70%) male had participated in the study. Out of 60 respondents, 30 (50%) respondents had secondary education whereas 14 (23.33%) respondents were illiterate. 50 (83.30%) respondents were from Nuclear family and half of the respondents were engaged in Household work.

3.2. Knowledge regarding Waste Management

Table 2 shows knowledge regarding waste; majority 52 (86.70%) respondents answered waste as unwanted or unusable things. Majority 54 (90%) respondents answered Health care area as common area of waste generation.

Table 2. Knowledge regarding waste (n=60).

Description	Number	Percent
Meaning*		
Unwanted or unusable things	52	86.70
Items discarded by the people	44	73.30
Waste that can cause harm to human and the environment	37	61.70
Peelings of fruits and vegetables	43	71.70
Source of waste generation*		
Municipal waste	52	86.70
Industrial	52	86.70
Institutional	39	65.00
Agriculture	48	80.00
Health care	54	90.00
Commercial wastes	43	71.70
Common Categories of Municipal waste*		
Household waste	57	95.00
Construction and demolition debris	50	83.30
Sanitation residue	10	16.70
Waste from streets	32	53.30
Multiple responses*		

Table 3. Knowledge regarding Household waste (n=60).

Description	Number	Percent
Categories of Household waste*		
Plastic	59	98.30
Food waste	56	93.30
Paper products	52	86.70
Glass	46	76.70
Clothes	44	73.30
Collection of Household waste*		
Plastic Bag	48	81.70
Waste Bin	25	41.70
Cartons	-	-
Dump pits	4	6.70
Municipal buckets	3	5
Others	-	-
Reason*		
To generate Income	3	5.00
To manage the waste efficiently	52	86.70
To Minimize the waste	40	66.70
To reuse the waste	3	5.00

To recycle the waste	3	5.00
To prevent from harm	34	56.70
Multiple responses*		

Table 3 shows 48 (81.70%) respondent answered plastic bag can be used to collect waste and 3 5%) Respondent answered as Municipal Buckets. In categories of waste majority 59 (98.30%) respondents selected plastic followed by food waste 56 (93.30) respondents and minority 44 (73.30%) clothes. Majority 52 (86.70%) respondents' knowledge regarding reason for the separating waste was "to manage waste efficiently" whereas minority 3 5%) respondents answer was to generate income, reuse waste and to recycle the waste.

Table 4. Knowledge regarding Biodegradable waste (n=60).

Description	Number	Percent
Meaning		
Substance that break down into simpler substances by microorganisms.	57	95.00
Common types of Biodegradable waste*		
Wood/crumbles	26	43.30
Food waste	60	100.00
Paper waste	43	71.70
Yard/ green waste	40	66.70
Sewage / sewage sludge	36	60.00
Pieces of clothes	14	23.30
Method of waste disposal*		
Collecting in Waste tank	4	6.70
Composting	23	38.30
Throwing outside house	-	-
Dumping in kitchen garden	3	5.00
Dumping in Road	-	-
Dumping in Rivers	-	-
Give in municipalities	45	75.00
Multiple responses*		

Table 4 shows knowledge regarding Biodegradable waste, majority 57 (95%) respondents answered, "As Substance that break down into simpler substances by microorganisms". Majority 60 (100%) respondent answered Food waste as common Biodegradable waste whereas 14 (23.30%) respondents answered as Pieces of clothes. Majority 45 (75%) respondent answered 'Give in municipality' 3 (5%) Respondent answered as Dumping in kitchen garden as the management of Biodegradable waste.

Table 5 shows knowledge regarding Non-biodegradable waste, majority 54 (90%) respondent answered, "As Substance that cannot be transformed into a natural harmless state". Majority 60 (100%) respondent answered Plastic bags and water bottles as common Non-Biodegradable waste whereas 57 (95%) respondents answered as Rubber tyres. 42 (70%) respondent answered method of disposal for non-biodegradable as 'Recycling and proper disposal of item that cannot be reused or recycled.

Table 5. Knowledge regarding Non-Biodegradable waste (n=60).

Description	Number	Percent
Meaning		
Substance that cannot be transformed into a natural harmless state	54	90.00
Common non-biodegradable waste*		
Plastic bags	60	100.00
Water bottles	60	100.00
Tins	58	96.70
Rubber tyres	57	95.00
Method of disposal*		
Reduce our use of non-biodegradable products	40	66.70
Choose biodegradable alternatives whenever possible	1	1.70
Reusing non-biodegradable items if possible.	7	11.70
Recycling them when possible.	42	70.00
Proper disposal of item that cannot be reused or recycled.	42	70.00
Multiple responses*		

Table 6. Knowledge regarding Hazardous waste (n=60).

Description	Number	Percent
Meaning		
Waste that poses substantial or potential threats to public health or the environment.	58	96.70
Common Hazardous Wastes*		
Pesticides	58	96.70
Heavy metals	36	60.00
Petrol	50	83.30
Gas	49	81.70
Acids	54	90.00
Household cleaners	48	80.00
Paint residues	23	38.30
Electronics and pharmaceuticals	2	3.30
Multiple response*		

Table 6 shows knowledge regarding Hazardous waste; majority 58 (96.70%) respondent answered, “As Waste that poses substantial or potential threats to public health or the environment”. Majority 58 (96.70%) respondent answered Pesticides, only 2 (3.30%) answered as Electronics and pharmaceuticals common hazardous waste.

Table 7 shows knowledge regarding waste management 49 (81.70) respondent answered as Composting whereas 30 (50%) respondents answered consuming and discarding less. In Meaning of Recycling of waste, 51 (85%) respondents answered, “As Process of converting waste materials into reusable objects to prevent waste”. 43 (71.70%) respondent answered advantage of recycling waste as “reduces the amount of manufacture to make new products” whereas minority 16 (26.70%) respondent answered as Saves energy.

Table 7. Knowledge regarding management of waste (n=60).

Description	Number	Percent
Waste management*		
Composting	49	81.70
Producing environmentally friendly goods/products	45	75.00
Reusing items	44	73.30
Donating	39	65.00
Recycling	33	55.00
Consuming and discarding less	30	50.00
Meaning of recycling of waste		
Process of converting waste materials into reusable objects to prevent waste	51	85.00
Advantages of recycling waste*		
Saves product	41	68.30
Reduces the amount of manufacture to make new products	43	71.70
Save energy	16	26.70
Reduce global climate change	30	50.00
Multiple responses*		

3.3. Practice regarding waste management

Table 9 shows that Majority 59 (98.30%) respondent answered food waste whereas 3 (5%) respondents answered metals and yard wastes as the types of waste collected from house. Similarly 48 (81.70%) respondents used plastic bag whereas 3 (5%) respondents used Municipal Buckets to keep the household waste. Majority 45 (75%) respondent disposed household waste by giving in municipality whereas minority 3 (5%) respondents disposed by dumping in kitchen garden.

Table 9. Practice related to household waste (n=60).

Description	Number	Percent
Common Types of waste collected from house*		
Paper and cartoons	57	95.00
Plastics	57	95.00
Food waste	59	98.30
Tins/cans	15	25.00
Glass	12	20.00
Metals,	6	10.00
Yard wastes	3	5.00
Woods	3	5.00
Collection of Household*		
Plastic Bag	48	81.70
Waste Bin	25	41.70
Dump pits	4	6.70
Municipal buckets	3	5.00
Method of Household waste Disposal*		
Collecting in Waste tank	4	6.70
Composting	23	38.30
Throwing outside house	-	-
Dumping in kitchen garden	3	5.00
Dumping in Road	-	-
Dumping in Rivers	-	-
Give in Municipality	45	75.00
Multiple responses*		

Table 10 shows practice regarding waste separation; 37 (61.70%) respondents separated their waste whereas only 23 (38.30%) did not separate their waste. 37 respondents separated their waste as biodegradable and non-biodegradable. Among 60 respondents, 32 (86.50%) respondent's reason for separating waste was to manage the waste efficiently whereas 14 (37.80%) respondents answered to minimize the waste.

Table 10. Practice regarding waste separation (n=60).

Description	Number	Percent
Separation of waste		
Yes	37	61.70
No	23	38.30
Ways of waste Separation (n=37)		
Mix in one bucket	-	-
Separate as biodegradable and non biodegradable	37	61.70
Separate as recyclable and non recyclable	-	-
Others	-	-
Reason for separating waste*		
To generate Income	-	-
To manage the waste Efficiently	32	86.50
To minimize the waste	14	37.80
To reuse the waste	-	-
To recycle the waste	-	-
To prevent from harm	20	54.10
Multiple responses*		

Table 11 shows that Majority 21 (66.70%) respondent managed biodegradable waste by Composting and 2 (3.30%) respondents give to municipality and dump in kitchen garden. Whereas majority 56 (93.30%) respondent managed non-biodegradable waste by giving in municipality and minority 2 (3.30%) respondents manage by reusing the process.

Table 11. Practice regarding waste management (n=60).

Description	Number	Percent
Management of Biodegradable waste*		
Bury in land	18	31.70
Composting	21	66.70
Give to municipalities	19	98.30
Dump in Rivers	1	1.70
Dump in kitchen garden	1	1.70
Management of Non-Biodegradable waste*		
Recycling	4	6.70
Reusing	2	3.30
Dumping in river	-	-
Dumping in kitchen garden	3	5.00
Give to municipality	56	93.30
Multiple responses*		

Table 12 shows that in all household (100%) only family members were responsible for disposing of waste and the method used to collect waste in community was Waste.

Table 12. Responsible person and method for waste collection (n=60).

Description	Number	Percent
Responsible person for disposing household waste any family member	60	100
Method used in community for waste management waste van	60	100

Table 13 shows that majority 59 (98.30%) respondent had moderate level of knowledge whereas 1 (1.70%) respondent had low-level knowledge. The mean and standard deviation is 1.98 and 0.129 respectively.

Table 13. Knowledge level (n=60).

Description	Level	Number	Percent	Mean	Standard Deviation
Level of Knowledge					
Below 24	Low	1	1.70	1.98	0.129
24-71	Moderate	59	98.30		

Table 14 shows that majority 35 (58.30%) respondent had poor practice level whereas 25 (41.70%) respondent had good practice level. The mean and standard deviation is 1.42 and 0.497 respectively.

Table 14. Practice Level (n=60).

Description	Level	Number	Percent	Mean	Standard Deviation
Level of Practice					
Below 14	Poor	35	58.3	1.42	0.497
14-40	Good	25	41.70		

Table 15. Association of knowledge with practice (n=60).

Chi-square value	d.f	p-value	Remarks
1.42	1	0.41	p>0.05 (No association)

Table 15 reveals that there is no association between knowledge and Practice (chi-square=1.42 and p value=0.41) since p-value>0.05 level of significance.

Table 16. Possible Disease due to improper waste disposal (n=60).

Description	Number	Percent
Possible disease*		
Malaria	44	73.30
Typhoid	6	10.00
Diarrhea	58	96.70
Cholera	57	95.00
Helminthosis	6	10.00
Dysentery	51	85.00
Multiple responses*		

Table 8 shows Among 60 respondents, 58 (96.70%) respondent answered Common disease due to improper waste disposal as Diarrhoea followed by cholera 57 (95%) respondents and only 6 (10%) respondents answered as Helminthosis.

4. Discussion

The study focuses on the knowledge and practice regarding waste management among community people of Gokarneshwor ward-05. To achieve the objectives of the study, descriptive research design was adopted and purposive sampling technique was used to select the sample. The data was collected from 60 household responded by interview method.

The study revealed that the 61.70% respondents were of age group 18-40 in which 68.30% female respondents in this study. The study revealed knowledge regarding waste in which majority respondents answered waste as unwanted or unusable things. Majority respondents (90%) answered health care area as common area of waste generation. In categories of household waste, majority of respondents selected

plastic (98.30%) followed by food waste (93.30%) and only (73.30%) responses as clothes. Similar study was conducted by Bernado (2008) showed that the types of household wastes commonly generated are food/kitchen wastes, papers, bottles, metals, and cans, boxes/cartons, glass bottles, cellophane/plastics, and yard/garden wastes.

Majority (81.70%) of respondents answered plastic bag can be used to collect waste and only 3 (5%) respondent answered as municipal Buckets. Majority (86.70%) respondent's knowledge regarding reason for the separating waste was "to manage waste efficiently" whereas only 5% respondents answered to generate income, reuse waste and to recycle the waste. The study showed knowledge regarding Biodegradable waste, 95% respondents answered "As Substance that break down into simpler substances by microorganisms". All respondents answered Food waste as common Biodegradable waste whereas only 23.30% respondents answered as Pieces of clothes. Similarly 75% respondent answered management of biodegradable waste as 'Give in municipality' whereas only 5% respondent answered as dumping in kitchen garden. This finding is contradictory with a cross-sectional study conducted in Kersa Woreda, Eastern Ethiopia by Mengistie and Baraki (2010) to assess the status of household of waste management and hygiene practices shows that 66% households disposed solid waste in open dumps.

The study revealed that knowledge regarding non-biodegradable waste, majority (90%) respondent answered as "Substance that cannot be transformed into a natural harmless state". All respondents answered plastic bags and water bottles as common non-biodegradable waste and 70% respondents answered method of management for non-biodegradable as 'Recycling and proper disposal of item that cannot be reused or recycled'.

The study revealed that knowledge regarding Hazardous waste, which showed most of (96.70%) respondents answered "As Waste that poses substantial or potential threats to public health or the environment and 96.70% respondents answered type of hazardous waste as pesticides and only 3.30% answered as electronics and pharmaceuticals common hazardous waste.

The study revealed knowledge regarding waste management, 81.70% respondents answered as composting whereas half of respondents answered discarding. In Meaning of Recycling of waste, 85% respondents answered, "As Process of converting waste materials into reusable objects to prevent waste". More than half of respondent answered advantage of recycling waste as "reduces the amount of manufacture to make new products".

The study revealed that most of (96.70%) respondents answered common disease due to waste as Diarrhoea followed by cholera (95%) and 10% respondents answered as worm infestation. Similar study conducted in Eastern Ethiopia by Mengistie and Baraki (2010) showed that waste could lead to spread of various diseases like malaria, viral fever, dengue etc.

The study reveals that majority (98.30%) of respondents had moderate level of knowledge which is supported by a study conducted by Abikusno (2003) to determine household garbage management, specifically participation of 218 housewives, in Banjarsari village West Cilandak district of South Jakarta showed approximately 71% of active housewives had significantly moderate level of knowledge on garbage disposal.

In this study practice of waste separation, 37 (61.70%) respondents separated their waste, Among the 37 respondents who separated their waste they separated as biodegradable and non-biodegradable. Half of the respondents answered reason for separating waste was to manage the waste efficiently whereas only 14 (37.70%) respondents answered to minimize the waste

In the practice, 58.30% respondent had poor practice which differs from a study conducted in Ethiopia by Yemaneh, et al. (2017) showed that majority (76.9%) of participants have good practice toward waste management.

5. Conclusion

The study concluded that majority respondent had moderate level of knowledge whereas

Majority of respondent had poor practice level. The study reveals that there is no association between knowledge and practice.

Conflicts of Interest: No conflict of interest.

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