Assessment of Solid Waste Management at Source in Compliance With Guidelines Among Residents of Kawempe Division, Kampala, Uganda

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Abstract

Background: *Solid waste management poses a big challenge for many urban households, municipalities and cities, especially in developing countries, partly due to increasing urbanization. Overcrowding and informal settlements have emerged with illegal and indiscriminate waste disposal. Guidelines for proper management of solid waste are least observed at house hold level in such settings. The purpose of the study was to assess solid waste management at source in compliance with guidelines among residents of Kawempe municipality Kampala district.*

Methods: *It was descriptive and analytical cross-sectional study design, with both quantitative and qualitative methods. 385 households heads and four local leaders were interviewed using researcher administered questionnaires and interview guide.*

Results: *The study found that only 37.9% of households complied with guidelines for solid waste management at source. Factors of waste management practices were waste reduction (p=0.005), separation (p=0.001), reuse (p=0.001) and composting (p=0.027). Determinants such as gender (p=0.007), marital status (p=0.016), level of education (p<0.0001), occupation (p=0.007), household size (p=0.025), medium of community sensitization (p<0.0001), enforcement of bi-laws (p=0.005), type of waste generated (p<0.0001) and waste storage method (p=0.009) were implicated.*

Conclusion: *Compliance with guidelines in the management of household solid waste at source was still very low within the city. Authorities ought to intensify household solid waste management awareness campaigns.*

1.0 Background

Solid waste management (SWM) poses a big challenge for many urban households, municipalities and cities at large especially in the low income countries as a result of increasing urbanization (Mukama et al., 2016). It is projected that Sub-Saharan Africa will be the world's fastest-growing region for waste generation by 2050 due to increasing urbanization, yet it is poorly planned with inefficient solid wastes management strategies (Bello, et. al., 2016 and Aryampa, et. al., 2019). In Kampala city, about 54% of the population in live in crowded and slum areas located mostly in low-lying zones and in wetlands with inevitable development of unplanned informal settlements and consequently illegal and indiscriminate waste disposal methods. These poor waste management strategies predispose households to environmental and health hazards including waterborne diseases such as typhoid, diarrhea, hepatitis and respiratory ailments (Cruvinel et al., 2019).Household solid waste include refuse of day-to-day leaving mainly organic biodegradable wastes, including peelings from raw foods, fruit and vegetables, food remains and leaves, paper, textile and yard waste (Komakech et al., 2014), and partially degradable waste like disposable napkins, wood and sanitary residues, and non-degradable waste including plastics, leather, rubbers, glass, metal and electronic waste.

Most developing economies in low-income countries like Uganda have refined policies for SWM but residents reluctantly comply due to lack of enforcement of the policies/by-Laws and inadequate public education and awareness (Al-Khatib et al., 2010) cited in (McAllister, 2015). A study by Wadehra and Mishra (2017) in Delhi revealed a clear disconnect between the formulated household SMW guidelines by the authorities, the information being delivered to households and their practice in compliance with the guidelines. Whereas the guidelines and the knowledge of negative effects should be enabling the community members to reduce the generation of waste at source and to ensure proper disposal, individual households waste disposal practices largely don't conform to guidelines (Ishfaq, Puneet and Sukhwinder, 2021).

The Study had the following specific objectives

i. To investigate the solid waste management practices at source associated with compliance with guidelines among residents of Kawempe Division, Kampala District
ii. To establish socio-demographic determinants of solid waste management at source in compliance with guidelines among residents of Kawempe division Kampala District
iii. To determine the attitudes about solid waste management at source in compliance with guidelines among residents of Kawempe division Kampala District
iv. To examine the barriers of solid waste management at source affecting compliance with guidelines among residents of Kawempe Division, Kampala District

2.0 Methods

2.1 Study Design

A descriptive and analytical cross-sectional study design was used with both quantitative and qualitative techniques, hence a mixed methods study.

2.2 Study Population

All households of Kawempe division preferably the heads of the respective households and the key informants were chosen among local council leaders.

2.3 Sample Size

Cochran formula for large populations (Cochran, 1977) was used:

$$n_0 = \frac{Z^2 pq}{e^2}$$

Where: n_0 = the required sample size

Z^2 = the abscissa of the normal curve that cuts off an area α at the tails (1 - α equals the desired confidence level, 95% in this study) = 1.96,

e = the level of precision (error), set at 5% or 0.05 for this study,

p = estimated proportion of compliance with guidelines among households. We used a statistically conservative prevalence of 50% compliance with guidelines.

q = 1-p.

Thus, n_0 = 385 households heads

2.4 Sampling Technique

The sample size was distributed proportionately across all the Parishes in Division. The number of households in each of the Parishes were obtained from the Division offices and the sample from each parish was expressed as a proportion of the total study sample to obtain the number of respondents from each parish. The sampling interval for each parish was got by dividing the number of households by the sample from that particular parish. Systematic random sampling was then used where the pre-determined number of respondents per parish was attained. First respondent from each parish was selected randomly.

2.5 Data Collection Tools and Methods

A researcher-administered semi-structured questionnaire, an observational check list and interview guides for key informants were used. Both open and closed ended questions were included.

2.6 Data Entry, Analysis and Presentation

For quantitative data, the collected data were entered into Microsoft office excel 2019 for editing and cleaning then into STATA for analysis. Descriptive statistics was analyzed and presented in terms of frequencies and percentages in tables. The Chi-square test was used to determine the association between the two variables through bivariate analysis while odds ratios was used for the measure of association between the predictor and outcome variables for inferential statistics. Qualitative data were coded and transcribed, generating themes and sub-themes that were analyzed.

2.7 Ethical Approval

The required country ethical approval for the study was sought. Uganda Martyrs University Research Ethics Committee was quite helpful in the clearance. All other ethical requirements in research with human

subjects have been adhered to, including but not limited to confidentiality, informed consent and voluntary participation.

3.0 Results

3.1 Socio-demographic characteristics of the participants

Table 1 summarizes the socio-demographic characteristics. Majority of the respondents (50.4%), were aged 30 years above, 67.5% were female and 41.8% were either married or cohabiting. Most participants (52%) were of secondary level of education and only 1.3% had never attained school education. 28.1% of respondents were of the protestant religion, 59.7% lived with families of less than five and 46.8% had been residents for one to five years.

Table 1: Socio-demographic characteristics of the participants

Socio-demographic Variables	Frequency	Percentage
Age in years		
▪ <30	191	49.6
▪ >=30	194	50.4
Gender		
▪ Female	260	67.5
▪ Male	125	32.5
Marital status		
▪ Divorced/separated/widowed	91	23.6
▪ Married/cohabiting	161	41.8
▪ Others	1	0.3
▪ Single	132	34.3
Highest level of education		
▪ Primary	76	19.7
▪ Secondary	200	52
▪ Tertiary	104	27
▪ Never schooled	5	1.3
Religion	82	21.3
▪ Born again	85	22.1
▪ Catholic	103	26.7
▪ Muslim	8	2.0
▪ Others	108	28.1
▪ Protestant		
Number of people living in the house		
▪ <5	230	59.7
▪ 5-10	150	39
▪ >10	5	1.3
Duration lived in the place	71	18.4
▪ < 1 year	180	46.8
▪ 1-5years	70	18.2
▪ 6-10 years	64	16.6
▪ >10 years		

3.2 Solid Waste Management Practices Associated with Compliance with Guidelines

Compliance with guidelines was measured by scoring the respondent's solid waste management practices against each of the following six standards; waste reduction, separation, re-use, recycling, composting and responsible disposal, table 2. Bivariate analysis was made between the practice variable and compliance with guidelines. The chi square test was done to obtain crude odds ratios between the independent variables and the outcome variable. Statistically significant independent variables at bivariate analysis were then subjected to a multi-variable logistics regression model to test for their significance, table 3.

Table 2: Solid waste management practices in compliance with guidelines

Waste Management Variables	Compliance with Guidelines		Total	COR (95% CI: L – U)	*p -value*
	Complied (146)	**Didn't comply (239)**			
Taking shopping basket or bag when shopping					
▪ Always	97(66.4%)	149(62.3%)	246	1.0	**0.005**
▪ Most of the times	34(23.3%)	35(14.6%)	69	0.5(0.3-1)	
▪ Never	0(0%)	2(0.8%)	2	0.4(0.2-0.8)	
▪ Rarely	1(0.7%)	12(5%)	13		
▪ Sometimes	14(9.6%)	41(17.2%)	55	4.1(0.5-34.4)	
Do separate solid waste you generate at home					
▪ No	92(63%)	189(79.1%)	281	1.0	**0.001**
▪ Yes	54(37%)	50(20.9%)	104	2.2(1.4-3.5)	
Reuse of solid waste generated at home					
▪ No	16(11%)	60(25.1%)	76	1.0	**0.001**
▪ Yes	133(89%)	176(74.9%)	309	2.7(1.5-4.9)	
If yes, which of solid waste					
▪ Cardboard, papers and food leftovers	56(42.7%)	79(44.4%)	135	1.0	**0.002**
▪ Food leftover	10(7.6%)	8(4.5%)	18	0.9(0.3-2.4)	
▪ Food leftover and bottles	58(44.3%)	59(33.2%)	117	0.3(0.1-0.7)	
▪ Plastics bottles	6(4.6%)	31(17.4%)	37	0.2(0.1-0.5)	
▪ Plastics and glasses	1(0.8%)	1(0.6%)	2		
Do you recycle solid waste					
▪ No	141(96.6%)	235(98.3%)	376	1.0	0.310
▪ Yes	5(3.4%)	4(1.7%)	9	2.1(0.5-7.9)	
Do you compost some of your solid waste					
▪ No	127(87%)	224(93.7%)	351	1.0	**0.027**
▪ Yes	19(13%)	15(6.3%)	34	2.2(1.1-4.5)	
If no, what are the reasons					
▪ I don't know how to compost	26(21.0%)	59(26.7%)	85	1.0	**0.040**
▪ Lack space	27(21.0%)	33(14.0%)	60	0.6(0.3-1.6)	
▪ Lack space and I don't know to compost	13(10.5%)	47(21.3%)	60	1.8(0.7-4.1)	
▪ Lack of space and no nearby composing facility	36(29.0%)	48(21.7%)	84	0.5(1.3-0.6)	
▪ Lack of space and not interested in composting	9(7.3%)	18(8.1%)	27		
▪ No nearby composting facility	17(11.3%)	18(8.1%)	35		
Is there solid waste whose final disposal is within your home					
▪ No	43(29.5%)	102(42.7%)	145	1.0	**0.010**
▪ Yes	103(70.6%)	137(57.3%)	240	1.7(1.2-2.8)	
If yes, what kind of waste					
▪ Food remains	17(16.7%)	18(13%)	35	1.0	**<0.0001**
▪ Food remains and plastic waste	3(2.9%)	11(8.0%)	14	0.1(0.02-0.02)	
▪ Garden yard waste	5(4.9%)	17(12.3%)	22	0.1(0.1-0.69)	
▪ Garden yard and food remains	76(74.5%)	75(54.4%)	151	0.01(0.01-0.5)	
▪ Plastics waste	1(1.0%)	17(12.3%)	18		
How do you carry out final dispersal					
▪ Open burning	36(35.0%)	63(46.3%)	99	1.0	**0.005**
▪ Use as animal feed	5(4.9%)	15(11%)	20	1.7(0.9-2.9)	
▪ Use as animal feed and open burning	7(6.8%)	6(4.4%)	13	1.2(0.6-2.3)	
▪ Use animal and poultry feeds	20(19.4%)	9(6.6%)	29	0.1(0.1-1)	
▪ Use as poultry feed	13(12.6%)	17(12.5%)	30	0.6(0.3-1.3)	
▪ Use as poultry feeds and open burning	16(15.5%)	25(18.4%)	41		
▪ Others	6(5.8%)	2(0.7%)	8		
Do u have access to solid waste collection service at home					
▪ No	62(42.5%)	74(31.0%)	136	1.0(0.4-0.9)	**0.028**
▪ Yes	84(57.5%)	165(69.0%)	249		

Study findings indicate that only 146 (37.9%) of the households complied with guidelines in managing their solid waste at source. From table 4 above, solid waste reduction (p=0.005), separation (p=0.001), re-use (p=0.001), composting (p=0.002) and responsible disposal (p=0.027) were all statistically significant factors of household solid waste management practices.

Majority of participants,63.9%, always took a shopping bag while going shopping but only 39.4% of these complied with general guidelines. 0.5% never carried a shopping bag while going shopping. Most of the households (73%) did not practice solid waste separation at source. Those who separated their waste were 2.2 times more likely to comply with guidelines compared with those who did not (Crude odds ratio (COR): 2.2, CI: 1.4-3.5). 80.3% of participants practiced re-use of some of the generated solid waste although, 57% of these failed to comply with general guidelines. Those who practiced re-use of some waste were 2.7 times more likely to comply with guidelines compared with those who did not practice (COR: 2.7, CI: 1.5-4.9).

Also, only 8.8% of households practice composting of some of the solid waste and most of these (55.9%) complied with general guidelines. Majority of those who did not practice composting (24.6%, p=0.040), did not have knowledge of solid waste composting. Although 41.1% of households practiced open burning as a solid waste disposal method, those who used the waste as animal feeds were 1.7 times more likely to comply with guidelines compared with those who practiced open burning (COR: 1.7, CI: 0.9-2.9, p=0.005).

Table 3: Multivariable logistics regressionshowing compliance with guidelines

Variable	Adjusted odd ratios	95% CI L – U	*p- value*
Gender			
▪ Female	1.0		
▪ Male	1.9	1.21-3.04	0.006
Highest level of education			
▪ Primary	1.0		
▪ Secondary	1.3	0.13-12.04	0.839
▪ Tertiary	1.9	0.21-17.58	0.561
▪ Never schooled	5.9	0.64-54.7	0.118
Taking shopping basket or bag when shopping			
▪ Always	1.0		
▪ Most of the times	1.9	0.99-3.68	0.055
▪ Never	2.8	1.32-6.14	0.008
▪ Rarely	N/A		0.999
▪ Sometimes	0.2	0.01-2.05	0.194
Do separate solid waste you generate at home			
▪ No	1.0		
▪ Yes	0.4	0.28-0.71	0.001
Reuse of solid waste generated at home			
▪ No	1.0		
▪ Yes	0.4	0.21-0.68	0.001

3.3 Socio-demographic determinants of Solid Waste Management in Compliance with Guidelines

Determinants of compliance with guidelines in the management of solid waste at household level were established by asking related questions to participants and examining their socio-demographic characteristics. After entering responses in STATA, bivariate analysis was done, table 4.

Table 4: Socio-demographic determinants of solid waste management in compliance with guidelines

Socio-demographic Variables	Compliance with guidelines		Total	COR (95% CI: L - U)	*p- value*
	Complied (146)	Didn't comply (239)			
Age (years)					
▪ <30	63(43.2%)	128(53.6%)	191	1.0	0.059
▪ >=30	83(56.9%)	111(46.4%)	194	1.5(1-2.3)	
Gender					
▪ Female	111(76.0%)	149(62.3%)	260	1.0	**0.007**
▪ Male	35(24.0%)	90(37.7%)	125	0.5(0.3-0.8)	
Marital status					
▪ Divorced/separated/widowed	39(26.7%)	52(21.8%)	91	1.0	**0.016**
▪ Married/cohabiting	70(48.0%)	91(38.1%)	161	0.5(0.3-0.9)	
▪ Others	0(0.0%)	1(0.4%)	1	0.5(0.3-0.8)	
▪ Single	37(25.3%)	95(39.8%)	132		
Highest level of education					
▪ Primary	18(12.3%)	58(24.3%)	76	1.0	**<0.0001**
▪ Secondary	65(44.5%)	135(56.5%)	200	5.9(0.6-54.7)	
▪ Tertiary	62(42.5%)	42(17.6%)	104	4.7(2.5-9.2)	
▪ Never	1(0.7%)	4(1.7%)	5	3.1(1.9-5.1)	
Major occupation					
▪ Business	78(53.4%)	140(58.6%)	218	1.0	**0.007**
▪ Causal occupational	14(9.6%)	25(10.5%)	39	0.5(0.2-1.1)	
▪ Farming	12(8.2%)	11(4.6%)	23	0.5(0.2-1.3)	
▪ Others	2(1.4%)	7(2.9%)	9	0.3(0.1-0.7)	
▪ Professional	31(21.2%)	24(10.0%)	55	0.9(0.2-5.6)	
▪ Student	9(6.2%)	32(13.4%)	41	0.2(0.1-0.5)	
Number of people living in the house					
▪ <5	75(51.4%)	155(64.9%)	230	1.0	**0.025**
▪ 5-10	69(47.3%)	81(33.9%)	150	1.8(1.2-2.7)	
▪ >10	2(1.4%)	3(1.3%)	5	1.3(0.2-7.9)	
If yes, how					
▪ Over radio and television	82(56.6%)	64(26.9%)	146	1.0	**<0.0001**
▪ Over radio	60(41.4%)	150(63.0%)	210	0.2(0.01-3.3)	
▪ Over television	4(2.1%)	19(8.0%)	23	0.1(0.04-0.4)	
▪ Others	0(0.0%)	6(2.1%)	6	0.4(0.1-1.4)	
Enforcement of proper solid waste management by leaders					
▪ Once a week	52(35.6%)	88(36.8%)	140	1.0	**0.005**
▪ Once a month	76(52.1%)	92(38.5%)	168	0.7(1.3-0.4)	
▪ After every three months	8(5.5%)	39(16.3%)	47	0.2(0.01-2.3)	
▪ After every six months	3(2.1%)	4(1.7%)	7	0.4(0.1-1.2)	
▪ Have never seen them enforce	2(1.4%)	1(0.4%)	3	0.6(0.2-1.6)	
▪ Others	5(3.4%)	15(6.3%)	20		
Type of solid waste					
▪ Garden yard and peelings	1(0.7%)	16(6.7%)	17	1.0	**<0.0001**
▪ Plastics, garden yard, peelings and food waste	99(67.8%)	113(47.3%)	212	6.7(0.9-1.9)	
▪ Plastics	2(1.4%)	15(6.3%)	17		
▪ Plastics and paper	0(0.0%)	5(2.1%)	5	0.5(0.3-0.7)	

▪ Plastic, paper, food waste	4(2.7%)	12(5.0%)	16		
▪ Plastics, garden yard and peelings	40(27.4%)	78(32.6%)	118		
How do you store solid waste					
▪ Plastic bags	67(45.9%)	154(64.4%)	221	1.0	**0.009**
▪ Plastic bags and others	7(4.8%)	8(3.4%)	15	2.1(0.5-9)	
▪ Plastic bag, waste bucket and others	15(10.3%)	11(4.6%)	26	3.2(0.7-13.6)	
▪ Plastic bag and open pile outside	3(2.1%)	2(0.8%)	5		
▪ Waste basket and open container	5(3.4%)	3(1.3%)	8		
▪ Plastic bags and cardboard box	1(0.7%)	2(0.8%)	3		
▪ Others	48(32.9%)	59(24.7%)	107		

From table 4, gender (p=0.007), marital status (p=0.016), highest level of education (p<0.0001), major occupation (p=0.007), number of people living in the house (p=0.025), medium through which households were educated about proper solid waste management (p<0.0001), enforcement of proper of bi-laws (p=0.005), type of solid waste generated (p<0.0001) and solid waste storage method (p=0.009) were all significant determinants. Males were 0.5 times less likely to comply with guidelines compared with females (COR: 0.5, CI: 0.3-0.8). Most of the respondents were either married or cohabiting and that being of this marital status had 0.5 times less chances of complying with guidelines (COR: 0.5, CI: 0.3-0.9). Being of secondary, tertiary and the never schooled group, had 5.9, 4.7 and 3.1 times more chances of complying with guidelines compared with primary level of education respectively (COR: 5.9, CI (0.6-54.7); COR: 4.7, CI (2.5-9.2); COR: 3.1, CI (1.9-5.1)).Households with 5-10 and those with more than 10 people were 1.8 and 1.3 times more likely to comply with guidelines compared with households with less than five people (COR: 1.8, CI (1.2-2.7); COR: 1.3, CI (0.2-7.9)).

From key informant interviews presence of bi-laws was a determinant. One key informant said,

"[…] we held several community meetings to deliberate on solid waste management and came up with bi-laws which our members owned and are happy to abide by: for example, every household is required to have a sac or polythene bag to store their solid waste before the truck picks the waste […]".

3.4 Attitudes of Participants about Household Solid Waste Management in Compliance With Guidelines

Attitudes were examined and scored on a Likert scale with highest score of five, for 'very appropriate', and lowest score of one, for 'very inappropriate' attitudes. Respondents who scored an average of 4 and above were considered to have enabling attitudes to comply with guidelines, table 5.

Majority of households (62.5%,) indicated that it was appropriate to carry a shopping bag whenever they went shopping, and only one respondent (0.3%) thought that it was very inappropriate. 53.8% indicated that it was appropriate to recycle. For the rest, majority thought it was not so appropriate to separate

(49.9%), re-use (53.7%) and compost waste (57.1%,) respectively. Hence, the only practices in which participants had enabling attitudes with their mean score close to 4 were; waste reduction, with 64.6% responses scoring a mean of approximately 4 and waste recycling (65.2%).

Table 5: Attitudes of Households about Compliance with Guidelines

Attitudes	Very appropriate-ate	Appropriate-ate	Not so appropriate-ate	Inappropriate	Very inappropriate-ate	Mean (SD)
▪ Attitudes about taking a shopping bag when you go shopping	8(2.1)	240(62.5)	127(33.1)	8(2.1)	1(0.3)	3.6(0.6)
▪ Attitudes about solid waste separation	16(4.2)	170(44.4)	191(49.9)	6(1.6)	0(0)	3.5(0.6)
▪ Attitudes about re-use of some solid waste	5(1.3)	160(41.9)	205(53.7)	12(3.1)	0(0)	3.4(0.6)
▪ Attitudes about recycling	44(11.4)	207(53.8)	122(31.7)	12(3.1)	0(0)	3.7(0.7)
▪ Attitudes about composting solid waste	2(0.5)	76(19.7)	220(57.1)	73(19)	14(3.6)	2.9(0.7)

3.5 Other Barriers of Solid Waste Management at Source Affecting Compliance with Guidelines

Barriers were examined by asking related questions to households, and interviews with key informants who were local council leaders

For the key informant interviews, an interview guide and a mobile phone recorder were used. Codes were generated from which themes emerged and among others, that of barriers: Migrations, both rural-urban and within the city and illegal dumping was a significant challenge to household solid waste management in the city.

Three of the respondents expressed concerns about lack of space to designate as official dump sites which encouraged some individuals to illegally dump waste. All four (4) respondents reported challenges of internal migrations in that some new migrants usually come with varying practices and attitudes towards solid waste management and that it would take them some time to adapt to the community bi-laws. A respondent said:

"[…] our community is very congested that even households lack where to temporarily store their waste which sometimes forces them to just throw their wastes anywhere, especially when the KCCA truck spends more than three days without coming to pick the waste […]"

Barriers to practicing composting of some of the solid waste statistically was significant (p=0.040). Lack of space, knowledge of how to compost and nearby composting facility were among the barriers cited by households.

4.0 Discussion

4.1 Solid Waste Management Practices at Source Associated with Compliance with Guidelines

This study found that only 37.9% of the participants practiced household solid waste management in compliance with guidelines, comparable to findings by Ssemugabo et al. (2020) in which only 41.3% of the households exhibited proper waste management practices. 63.9% of households practiced waste reduction and 80.3% re-use, 12.1% practiced responsible disposal but 41.2% irresponsibly burnt waste. This finding is comparable to Aisa (2011) study in which 71% of households practiced waste reuse, 57.9% open dumping.Most households (72.9%) did not segregate their solid waste, a situation similar to the one in Ssemugabo et al. (2020) study in which 78.8% households did not segregate their waste.

4.2 Socio-demographic determinants of Solid Waste Management in Compliance with Guidelines

Findings from this study revealed that gender ($p=0.007$), marital status ($p=0.016$) highest education level of the participants ($p<0.0001$), major occupation ($p=0.007$) and number of people living in the household were the significant demographic determinants of compliance with guidelines in the management of household solid waste. Similar determinants were revealed in studies by studies by (Adzawla, et al., 2019, Banga,2011, Ashenafi, 2011, Longe, Longe and Ukpebor, 2009 and Abebaw2008) that indicate that female participants were more likely to comply with guidelines especially on solid waste separation than males and a combination of factors including, family size, age and education of the head of the household determined compliance.

4.3 Attitudes of Solid Waste Management at Source in Compliance with Guidelines

Study findings show that the only practices with enabling attitudes were waste reduction, 64.6%, and waste recycling (65.2%), both with mean score 4. Most waste management practices received a ‘not so appropriate attitude’, which was not enabling compliance with guidelines.

These findings are consistent with those from a study byBanga (2011), that revealed that about 60% of respondents had negative attitude and not in support of waste segregation or recycling and majority not bothered about dumping (Blakely and Leigh, 2010). On the contrary, a study by Mukama et al. (2016) in Kampala slums found a high percentage of respondents indicating willingness to segregate (76.6%) and compost (54.9%) solid wastes.

4.4 Other Barriers of Solid Waste Management at Source in Compliance with Guidelines

Findings from this study show that major barriers to compliance with guidelines in household solid waste management from key informant interviews were; lack of awareness, space, infrastructural (poor housing and congested settlements), technical (inability to segregate), irregularities in waste collection and rampant internal migrations. Among the studied practices, barriers to composting were statistically significant (p=0.040): 24.2% of the respondents did not know how to compost, 16.6% lacked space, 24.55% lacked both space and knowledge of composting. This finding is in agreement with that of McAllister (2015) that foundout that inadequate education and awareness about proper solid waste management led to irresponsible practices that encourage noncompliance with solid waste management reforms and guidelines. Mamady (2016), noted that majority of respondents (53.7%) whose residence was in unplanned areas mainly practiced open dumping. Another study by (Nachalida, Beverly and Kirstin, 2017) observed that irregularities in waste collection by authorities or private waste collectors adds to the barriers in that households who manage to sort their waste in bins get stuck with it for days or weeks which compels them to dump illegally.

5.0 Conclusion

Compliance with guidelines in the management of household solid waste at source is still very low even in a municipality within the capital city and yet, proper practice of such basic social actions is very essential for the transformation of lives of the city dwellers. Noncompliance with guidelines leads to poor solid waste management which has been associated with diseases of unhygienic conditions like Cholera and environmental degradation through water and air pollution with consequent reduction in the biodiversity. This reduces the quality of life of the residents affecting their social and economic productivity due to ill health, and hence a vicious cycle of poverty. On the other hand, for a developing city like Kampala, residents scoring low on basic social skills, delays transition into a modern city. This deters potential foreign investments in the city and reduces foreign exchange and earnings, and ultimately affects national development.

Declarations

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CONTRIBUTORSHIP

MP conceptualized the study, wrote the proposal and collected the data.

OK supervised the study, curated the study design, analyzed and interpreted the results, drafted the manuscript and addressed all correspondences related to the study.

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Conflict of Interest Disclosure

The authors declare no conflict of interest.

Consent for Publication

The authors do consent for publication of this work.

Data Availability

All data related to the study is available with the corresponding author and can be accessed on reasonable request.

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Supplementary Files

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- AppendixIQuestionaire.docx
- AppendixIIObservationChecklist.docx
- AppendixIIIKIIGuide.doc