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Integrated Waste Management System Among College Students

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Abstract

Integrated Waste management system was the important thing to protect and control the transmission disease. Waste was still the main problem in Indonesia. The College students were the agent of change to better environmental, essecially to manage the waste. The purpose of this study is to analyze the knowledge, attitude and practice of the college students about the waste management system in their campus. The method of this research is a cross sectional study that conducted in Jember, Indonesia on Agustus 2019. The sample were 1230 college students that token randomly. The results showed that the characteristic of respondents were 63,1 % female, 75,1 % living in the boarding house and their parent`s job were farmer, fisherman etc (46,1 %). The knowledge were good (94%), positif attitute (97,2%) and moderate practice (73,7%) on waste management system. The respondents have good knowledge and positive attitude but their practice had moderate. There were sig correlation spearman between knowledge (p=0,00), attitude (p=0,019) and their practice. The college students were the key to change the community practice abaut intergrated management system, so they should have had good practice in the waste management system.

Keyword :
Integrated Waste Management System, Knowledge, Attitude, Practice

1   INTRODUCTION

Management waste was crucial for our environment and health. The Capacity of the environment to support human life is limited. The instability of the environment can make human health decrease. The theory of H.L Blum (1956) concept said that the environment had the biggest proportion of human health status (40%). Transmitted diseases can occur when the waste wasn't good to manage. The waste can be the nest of some vector of diseases like flies, rodents, and mosquitoes. Waste is still the main problem in Indonesia. The production of Indonesia's waste was reached 65 million tons per day and 187,2 million tons per year. Household waste was the main source of waste in Indonesia. Most wastes threw away in the final waste disposal and that will have the potential to pollute the environment. We still find that their people are dumping waste in the river, open dumping in the field, burn the waste, etc. The people were hard to separate the waste based on their characteristics, like organic waste and inorganic waste. Flooding, disaster, an outbreak of disease, global warming, climate change, polluted water, air, and soil are the problems caused by the waste. Waste can pollute the soil when they were open dumping on the field, and also produce some toxic gases when they burn. Some greenhouse gases are produced from waste disposal like Carbon dioxide, Methan, etc. Human activities always produced waste. Households, industries, offices, institutions, markets, etc are produced waste every day. There were a lot of problems with waste management in the community. Some research said that most people still had poor practice toward waste disposal (Shahzadi et al., 2018). There were 46,6% of respondents live around the railway line's area, Indonesia hadn't good at behavior waste management. Most households have had bad behavior in waste management (Juniardi et al., 2018). The people (71%) do not support to shorting the waste according to the type, such as organic and inorganic waste (Harun, 2017). The waste has their characteristic toward their activity. The shorting waste type was important to manage the waste. The household waste characteristic was organic waste, like kitchen waste, food waste, etc. The university as an institution produces waste. The university as an institution had a specific character type. The university`s students produce common generate waste as vegetable wastes, papers/tissues, and plastic wrappers (Dolipas et al., 2018). The observation in the university Jember district area showed that the type of waste was organic waste like leaves, food waste, papers, and some plastics that used to wrap the foods. The capacity of the environment to degrade and decompose the waste was limit. It means that every person must have the responsibility to manage their waste. The Reduce, Reuse, and Recycle (3R) waste were the most principal in waste management, Although the implementation was not easy. People change their behavior often depend on their advantage. Unfortunately, people think that manage the waste didn't give them the advantage directly. The implementation of the 3R principles in the community was the key to get the next step of waste management. When the community used to be implementation on 3R principles, it will be easier to handle the waste. The community should be separate their waste base on their characteristic. It wasn't easy to motivate the community to do that. It must be needed the figure that can influence the people from doing it. The college students are the student that has high education and an influential figure in the community. They can be the influence on their community to involve waste management. The universities can be the leader to create the excellent generation for waste management. The research (Minhas and Tandon, 2015) said that majority of people in university support to make the institute environmentally sustainable. That's not easy to produce college students who had good knowledge, attitude, and practice in waste management. That is because of the waste management were not a compulsory curriculum in Indonesia. The Integrated Waste management system is the concept of environmental sustainability. The waste management system is how to complexity manage the waste include cost and coordination multi-stakeholder that is involved in every stage of waste management. The community involvement was crucial to succeed in the integrated waste management system. Some research conducted among college students showed that the practice of waste management was low (Barloa et al., 2016). The research that analysis the campus officer in Indonesia about waste management showed that the respondents (43,3%) had bad behavior in waste management (Saputra SNA and Mulasari, 2017). The good knowledge, attitude, and practice among college students are one of the power to change the attitude toward waste management in the community. The college students will be the role model to change the practice of waste management in the community, especially to implementation the shorting the waste in the waste point source base on characteristics and to implementation the 3R Principles. The problem with the waste management in the community is the motivation to separate the waste in their characteristic, implantation in principle 3R dan there had have been role models. It should be the

challenge of the university to produce well-educated students that commit problems to solve waste management in the community. College students are the young generation that should be carrying the environmental sustainability. The college students are the young generation that strategic to change the community because they are the role model for the next generation. Base on these problems, the research was conducted to analyze the knowledge, attitude, and practice waste management among college students. This informations were very essential for University to arrange the new curriculum for their college students to contribute as a role model in the community waste management.

2 METHOD

This research was a cross-sectional study conducted in Jember, Indonesia on Agust 2019. The sample were college students who randomize sample of 1230 students. The criteria of respondents were college students that had been studying at the university for more than one year. Respondents were randomly collected from exact and social science. There were 10 questions to measure the knowledge that categorized in less, moderate and good; attitude (10 questions) were categorized negative, positive, and neutral, and the practice (10 questions) were categorized in less, moderate and good. Data were collected with an interviewed base on a structured questionnaire. The data were analyzed within SPSS 19. The correlation between characteristic respondents and knowledge, attitude, and practice were analyzed with the Contingency coefficient, and the correlation between knowledge, attitude, and practice were analyzed with the Spearman rank test with alpha 0,05.

3   RESULT AND DISCUSSION

The respondent characteristic

The respondents were 776 female students (63,1%) and 454 male students (36,9%). There were 234 (19%) students living with their parents, 924 (75,1%) students live in a boarding house, and 72 (5,9%) students living with their families. The type of respondents living can contribute to knowledge. Every place that the respondents living always had the regulation, include the regulation about the waste management system. Some boarding houses may have a regulation about how the students throwing the waste after activity. It could be a difference with the regulation of the waste management system if the students living with their parents or their family. The parents` job of respondents were government employees 378 (30,7%), there are 285 (23,3%) students were a other jobs, and the others such farmer, traders were 567 (46,1%) students. The background of the family of the respondents may suggest creating a different habit in the waste management system. The culture had a lot of influence to build personal habits. The family farmer often living in the village which had a large field, so the waste often wasn`t a problem. That was a difference with the government employee that often living the crowded city which waste often became a problem. The education had sig correlation between the knowledge (Laor *et al.*, 2018); (Tatlonghari and Jamias, 2010). The respondents of this research were college students which had been in the university for more than one year so the education relatively the same. But the student studied the exact science and social science, it probably contributes to how their knowledge, attitude, and practice on the waste management system.

Table 1. The Respondents Characteristic

No	Respondents Characteristic	Amount (n)	%
1	**Gender**		
	Female	776	63,1
	Male	454	36,9
	Total	**1230**	**100**
2	**Living with**		
	Parents	234	19
	Boarding house	924	75,1
	Other families	72	5,9
	Total	**1230**	**100**
3	**Parents Job**		
	Government	378	30,7
	Employee	285	23,2
	Other jobs (farmer, fisherman, etc)	567	46,1
	Total	**1230**	**100**

Knowledge

Most of the respondent's knowledge was good (94%). There was only 1 (0,1%) respondent which had less knowledge. The knowledge was measure about the definition of waste, the sources, the characteristic, the management of the waste, the impact of waste, waste borne disease, and the solution of waste problems. Much of the respondents don`t know about the waste borne disease (65,4%). The waste borne disease is a disease caused by bad waste management. Some research showed that solid waste can cause some diseases to the respondents like malaria, diarrhea, dysentri, cholera, typhoid dan intestinal worm. The location of solid waste disposal have identified some bacteria like Salmonella typhimurium, Shigella dysenteriae, Citrobacter freundii, Citrobacter amalonaticus (8,3%), Aerobacter aerogenes (8,3%), Proteus vulgaris (16,7%), Klebsiella oxyotoca (8,3%), Klebsiella (8,3%), E.coli (8,3%) (Chengula A BK Lucas and A Mzula, 2015). Some respondents (47,7%) couldn`t identify the characteristic of waste. The identifying characteristic of waste was very important to separate the waste into the container and then make it easy to manage it. The knowledge of the respondents about the waste management system was good may because the was a college student. Some research in the students which less than 21 years old were good (Ramos JN and ES Pecajas, 2016). The waste management system is a part of the eco campus. The other research showed that college students had good knowledge about the Eco Campus (Moelyaningrum AD and Ningrum, 2017). On the other hand, some research in the students showed that knowledge still had moderate (Desa A NBA Kadir and Yusooff, 2011) and less (L Handayani and SS Moersidik, 2017). The gender and leaving with had sig correlation (p=0,043; p=0,049) with the knowledge. The distribution of knowledge showed that females had higher knowledge than males. There was 34,4% male that have good knowledge, but the female had 59,6%. The female environment knowledge higher than males (Sarkawi, 2012). The respondents who live in a boarding house is the best knowledge (71%). Living in a boarding house probably gives much information about the waste management system. The groups of the boarding house were the student college, which has some activity, including talk about waste management. Every boarding house usually has its regulation to make everyone an enjoyable life in a boarding house, so respondents who live in the boarding house had more information than living with a parent and other families. There was no sig correlation between parents' job and knowledge (p=0,066). (see table 2, 3)

Table 2. The knowledge of waste

Knowledge	Amount (n)	%
Less	1	0,1
Moderate	73	5,9
Good	1156	94
Total	**1230**	**100**

Table 3. The correlation between characteristic and knowledge

	Gender				Leaving with						Parent Job					
	Male		Female		Parent		Boarding House		Other Families		Government		Employ		Other Jobs	
Knowledge	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Less	1	0,1	0	0	0	0	1	0,1	0	0	1	0,1	0	0	0	0
Moderate	30	2,4	43	3,5%	16	1,3	50	4,1	7	0,6	21	1,7	23	31,5	29	39,7
good	423	34,4	733	59,6	218	17,7	873	71	65	5,3	356	28,9	262	22,7	538	45,6
Total	**454**	**36,9**	**775**	**63,1**	**234**	**19**	**924**	**75,2**	**72**	**5,9**	**378**	**70,7**	**285**	**23,3**	**567**	**46,1**
P= 0,043; > 0,05					p=0,049; <0,05						p=0,066; > 0,05					

Attitude

Base on ten questioners into 1230 respondents, data were categorized as negative, neutral dan positive. The research showed that there was no negative attitude. Attitude is a feeling or opinion about something or someone, or a particular feeling or opinion (https://dictionary.cambridge.org/dictionary/english/attitude). There were 1196 (97,2%) respondents who had a positive attitude and 2,8% had neutral. The data said, that there were still 29,5% respondents agree to burn the solid waste. Burning the waste is dangerous because it can pollute the air and then affected the health. There were 15,4 % respondents didn`t agree to separate the waste base on the characteristic. Some respondents also disagree that waste disposal on their container was easy to do. And there were 18,9 % respondents agree to throw the waste although they didn't find the waste container.

The most positive attitude was female (61%), live in a boarding house (75,1%), and parents who have private employment jobs (45%). The contingency showed that there ware a correlation between gender, leaving with and parent`s job with attitude (p=0,049; p=0,047; p=0,037). The Female is a higher positive attitude than male. Gender Perspektive in waste management was much studied. That was important to arrange the waste management program. Some research showed that females had had the responsibility to clean the environment, they have an instinct as women should do it every day for their family (Yuliati, 2019). Living In the boarding house had together value believe. The attitude can develop with interaction in the boarding house group, include the attitude about waste management. A positive attitude may form in the groups of boarding houses. Parent`s jobs may affect the construction of the attitude. The parent's job contributes to the family economic, family habits that can affect the attitude. The most positive attitude was respondents who had a private employment job, it probably because the private employment had dominated by the farmer, the fisherman who had waste value in the environment. The major of the respondents had a positive attitude about the waste management system. This is the potential to continued in the good practice of waste management systems.

Table 4. The attitude towards waste disposal

Attitude	Amount (n)	%
Neutral	34	2,8
Positive	1196	97,2
Total	**1230**	**100**

Tabel 5. The correlation between characteristic and attitude

	Gender				Living with						Parent Job					
	Male		Female		Parent		Boarding House		Other families		Government		Employ		Other jobs	
Attitude	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Netral	8	0,7	26	2,1	10	29,4	23	1,9	1	2,9	9	26,5	11	32,4	14	1,1
Possitive	446	36,3	750	61	224	18.7	901	73,3	71	5,9	369	30	274	22,9	553	45
Total	**454**	**36,9**	**776**	**63,1**	**234**	**19**	**924**	**75,1**	**72**	**59**	**378**	**30,7**	**285**	**23,2**	**567**	**46,1**
p=0,049; < 0,05				p=0,047; < 0,05						p=0,037; > 0,05					

Practice

The good practice of the waste management system was the final purpose of sustainability and a healthy environment. Although most of the knowledge and attitude of the respondents were in good, most practices of the respondents were moderate (73,7%). It means that many variables depending on the practice such as education, gender, salary, etc (Banga, 2011). This research showed that females had a higher score in moderate (46,9%) and good practice (11.3%) than males (23,7%); (6,1%). Waste management practices often relate to culture. Female identity with mothers who producing waste from the kitchen, so they get used to managing the waste. The male identic with the head of the family that focuses on working outside. The Contingency coefficients test showed that there wasn`t a correlation between gender and practice (P=0,05). Respondents who live in the boarding house had better practice than living with a parent and other families. There were 54,9% respondents who had moderate practice and 4,5% of respondents had good in practice, although there was not sig correlation between living with and practice (p=0,07). The parent`s job had a significant correlation (p=0.01) with practice waste management. A parent`s job is probably related to the parent`s salary, culture, the family value of the respondent's family, etc. There were 8,9% respondents who had less practice in waste management. Data showed that there were 15,2 % of respondents often throwing the waste, not on the waste container. And also there were 15,2% of respondents often involve burning solid waste. Dumping waste in the river was doing 11,6% of respondents. Separate the waste to the waste container rarely doing by the respondents (39,1%), and the respondents didn't care how the other people throw their waste into the environment (40,6%). There were 43,3 % of respondents never reuse the waste.

Table 6. The waste disposal behavior

Practice	Amount (n)	%
Less	110	8,9
Moderate	906	73,7
Good	214	17,4
Total	**1230**	**100**

Table 7. The correlation between characteristic and practice

	Gender				Leaving with						Parent Job					
	Male		Female		Parent		Boarding House		Other families		Government		Employ		Other Jobs	
Practice	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Less	50	4,1	60	4,9	27	2,2	80	72,7	3	0,2	24	2	37	3	49	4
Moderate	329	23,7	577	46.9	176	14,3	675	54,9	55	4,5	296	24,1	204	16,6	406	33
Good	75	6,1	139	11,3	31	2,5	55	4,5	14	1,1	58	4,7	44	3,6	112	9,1
Total	**454**	**36,9**	**776**	**63,1**	**234**	**19**	**924**	**75,1**	**72**	**5,9**	**378**	**30,7**	**285**	**23,2**	**567**	**46,1**
	p=0,056; > 0,05				p=0,074 ; > 0,05						P=0,01; <0,05					

This research showed that there was a sig correlation between knowledge (p=0,00), attitude (p=0,019), and practice among college students on Integrated Waste Management system. Good knowledge and a positive attitude do not always get good practice. Some research showed that good knowledge and positive attitude in the waste management system but the practice were still not good (Kiran *et al.*, 2015). But some research showed that knowledge, attitude, and practice were a correlation with the practice. The research (Shewasinad *et al.*, 2017) said that good knowledge, a positive attitude will get the good practice too, and when the knowledge and attitude were moderate will get the moderate practice too (Rahmaddin MY, Hidayat and Yanuwiadi, 2015). There was a sig correlation between knowledge, attitude, and practice in waste management (Syam, 2016); (Alimohammadi *et al.*, 2018).

The waste management system was an important thing to do to control the quality of health life (Simarmata, Pandia and Mawengkang, 2018). The waste management system is the strategy to control the environment and health. Community involvement should be doing together with the government to create a healthy life. Educational about reusing the waste (Thirumarpan *et al.*, 2015) and community involvement (Essuman, 2017) should be one of the programs to reach the good practice in the waste management system.

Table 8. the Correlation between knowledge, attitute and practice

	Practice	
Knowledge	Sig P= 0,00	< 0,05
Attitude	Sig P= 0,019	< 0,05

4 CONCLUSIONS

The knowledge of the respondents was good, the attitude was positive, but the practice of waste management system was moderate. There was a sig correlation between knowledge, attitude, and practice among college students. The college curriculum may have been an improvement to increase the knowledge, attitude, and practice among the college students in waste management. The college students can be role models and agents of change in the community to save the environment.

REFERENCE

Alimohammadi, M. *et al.* (2018) 'Dataset on The Knowledge, Attitude and Practices of Biomedical Wastes Management among Neyshabur Hospital's Healthcare Personnel', *Data in Brief*, 17, pp. 1015–1019. Doi: 10.1016/j.dib.2018.02.024.

Banga, M. (2011) 'Household Knowledge, Attitudes and Practices in Solid Waste Segregation and Recycling : The Case of Urban Kampala Recycling : The Case of Urban Kampala', *Zambia Social Science Journal*, 2(1). https://scholarship.law.cornell.edu/cgi/viewcontent.cgi?article=1019&context=zssj

Barloa, E. P. *et al.* (2016) 'Knowledge , Attitudes , and Practices on Solid Waste Management among Undergraduate Students in a Philippine State University', *Enviornment and Earth Science*, 6(6), pp. 146–153. https://www.iiste.org/Journals/index.php/JEES/article/view/31197.

Chengula A BK Lucas and A Mzula (2015) 'Assessing the Awareness, Knowledge, Attitude and Practice of the Community towards Solid Waste Disposal and Identifying the Threats and Extent of Bacteria in the Solid Waste Disposal Sites in Morogoro Municipality in Tanzania', *Journal of Biology, Agriculture and Helthcare*, 5(3), pp. 54–66. https://www.iiste.org/Journals/index.php/JBAH/article/view/20188.

Desa A NBA Kadir, F. and Yusooff (2011) 'A Study on the Knowledge , Attitudes , Awareness Status and Behaviour Concerning Solid Waste Management', in *Procedia Sociial and Behavioral Science*, pp. 643–648. doi: 10.1016/j.sbspro.2011.05.095. https://www.sciencedirect.com/science/article/pii/S1877042811012080.

Dolipas, B. *et al.* (2018) 'Waste Handling Practices and Values of University Student', *Athens Journal of Health*, 5(3), pp. 213–232. Doi: 10.30958/ajh.5-3-3. https://www.athensjournals.gr/health/2018-5-3-3-Dolipas.pdf

Essuman, K. (2017) 'Knowledge, Attitudes and Practices of Coastal Communities on Waste Management in Ghana', *Journal of Teacher Education for Sustainability*, 17(1), pp. 23–91. Doi: 10.1515/jtes-2015-0005.

Harun, H. (2017) 'Gambaran Pengetahuan dan Perilaku Masyarakat Dalam Proses Pemilahan Sampah Rumah Tangga Di Desa Hegarmanah', *Jurnal Aplikasi Ipteks untuk Masyarakat*, 6(2), pp. 86–88. http://journal.unpad.ac.id/dharmakarya/article/view/14789/7890.

Juniardi, A. *et al.* (2018) 'Perilaku Ibu Rumah Tangga dalam Pengelolaan Sampah Rumah Tangga', *Jurnal Publikasi Kesehatan Masyarakat Indonesia*, 7(21), pp. 10–15.

Kiran, K. G. *et al.* (2015) 'KAP Study of Solid Waste Disposal of Households in Kuttar & Manjanadi Panchayath Covered Under Gramaskhema Programme of K.S. Hegde Medical Academy'. https://nitte.edu.in/journal/sep%202015/7.o.pdf.

Handayani L and SS Moersidik (2017). 'Hazardous Waste Minimization Challenge in Autocomponent Industry , West Java , Indonesia.', in *IOP Converence Series : Earth and Environmental Science*, p. 67. Doi :10.1088/1755-1315/67/1/012012.

Laor, P. *et al.* (2018). 'Knowledge, Attitude and Practice of Municipal Solid Waste Management among Highland Residents in Northern Thailand', *Journal of Health Research*, 32(2), pp. 123–131. Doi: 10.1108/JHR-01-2018-013.

Minhas, M. and Tandon, K. (2015). 'Integrated Solid Waste Management Systems for Environmental Sustainability at Institutional Level – Case Study.', *International Journal on Occupational Health & Safety, Fire & Environment – Allied Science*, 5(1), pp. 20–26. http://ohsfejournal.com/wp-content/uploads/2015/10/Article-05-Vol-5-Issue-1-July-1-to-Sep-31-2015_Final.pdf.

Moelyaningrum, A.D and Ningrum, PT. (2017) 'Are Your Campus Eco ? A Perception Students About Environmental Education, Jember Indonesia', *Pancaran Pendidikan*, 6(3), pp. 63–76. Doi: 10.25037/pancaran.v6i3.52.

Rahmaddin MY, Hidayat, T. and Yanuwiadi, B. (2015) 'Knowledge, Attitude, and Action of Community towards Waste Management in River Bank of Martapura', *International ournal of Applied Psychology*, 5(4), pp. 96–102. Doi: 10.5923/j.ijap.20150504.03.

Ramos JN and ES Pecajas (2016) 'Knowledge, Attitudes and Practices in Solid Waste Management', *International Journal Of Engineering Science & Research Technology*, 5(7), pp. 1452–1463. Doi: 10.5281/zenodo.58607.

Saputra SNA and Mulasari, S. A. (2017) 'Pengetahuan, Sikap, dan Perilaku Pengelolaan Sampah pada Karyawan di Kampus', *KesMas : Jurnal Fakultas Kesehatan Masyarakat*, 11(1), pp. 22–27. Doi: 10.12928/kesmas.v11i1.4212.

Sarkawi, D. (2012) 'Pengaruh Jenis Kelamin dan Pengetahuan Lingkungan Terhadap Penilaian Budaya Lingkungan (Studi Ex Post Facto di Akademi Manajemen Informatika dan Komputer Bina Sarana Informatika Jakarta)', *Cakrawala - Jurnal Humaniora*, 12(2), pp. 123–131. http://ejournal.bsi.ac.id/ejurnal/index.php/cakrawala/article/view/3553.

Shahzadi, A. *et al.* (2018) 'Determination the Level of Knowledge, Attitude, and Practices Regarding Household Waste Disposal among People in Rural Community of Lahore', *International Journal of Social Sciences and Management*, 5(3), pp. 219–224. Doi: 10.3126/ijssm.v5i3.20614.

Shewasinad, S. *et al.* (2017) 'Assessment of Knowledge Attitude and Practice towards Solid and Liquid Waste Management among Addis and Kometa Kebele Community Mizan-Aman Town, Bench – Maji', *Journal of Science & Technical Research*, 1(5), pp. 1–9. Doi: 10.26717/BJSTR.2017.01.000434.

Simarmata, V., Pandia, S. and Mawengkang, H. (2018) 'SEM Model Medical Solid Waste Hospital Management In Medan City SEM Model Medical Solid Waste Hospital Management In Medan City', in *IOP Converence Series : Material Science and Engineering*, p. 300. Doi: 10.1088/1757-899X/300/1/012063.

Syam, D. M. (2016) 'Hubungan Pengetahuan dan Sikap Masyarakat dengan Pengelolaan Sampah di Desa Loli Tasiburi Kecamatan Banawa Kabupaten Donggala', *HIGIENE: Jurnal Kesehatan Lingkungan*, 2(1), pp. 21–26.

Tatlonghari, R. V and Jamias, S. B. (2010) 'Village-Level Knowledge, Attitudes and Practices on Solid Waste Management in Sta. Rosa City, Laguna, Philippines', *Journal of Environmental Science and Management*, 13(December 2005), pp. 35–51.

Thirumarpan, K. *et al.* (2015). 'Household Knowledge, Attitudes and Practices in Solid Waste Segregation and Management : A Study in Eravur Urban Council Area, Batticaloa District', in *5th International Symposium 2015, SEUSL*, pp. 199–206.

Yuliati, U. (2019) 'Analisis Peran Perempuan Dalam Pengelolaan Analysis of the Role of Women in Managing Household Waste (Study in the Community of Batu City)', *Jurnal Perempuan dan Anak*, 2(1), pp. 39–46.

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