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## Gempa Perekat:

# The movement to process garbage becomes an educational game tool for early childhood through self-help groups for family welfare development



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## ABSTRACT

Garbage is a major problem in urban areas. One of the efforts that can be made against the waste problem is reprocessing it into useful materials. The Family Welfare Development Group (PKK) is a community action coaching group that demonstrates ways that people can turn waste into media material for educational games for PAUD students through self-help groups. This community service project and research aimed to empower and assist PKK activist groups in optimizing waste as an educational game tool for young children. The mixed-methods research followed guantitative and gualitative approaches. The guantitative data were in the form of demographic data, knowledge, and skills. Meanwhile, the gualitative data were collected from structured interviews and focus group discussions (FGDs) with a grid of questions about waste, the efforts that have been made, and the benefits of recycling the waste as an educational game tool. The measuring tool used was a questionnaire about waste knowledge and a waste processing checklist sheet. The research was conducted in June-August 2019 among 25 PKK groups at RW 02 of Merjosari subdistrict, Lowokwaru district, Malang City, because this location clearly shows a waste problem, and the community can manage it with facilities that can be readily utilized. This Gempa Perekat activity consisted of health education, FGDs, and forming self-help groups. The results of this activity indicated that the respondents' knowledge increased after receiving health education about waste management (0.000). The results showed an average value of 73 with description skills in processing waste into a good educational game tool. Respondents stated that waste was previously disposed of in plastic bags or burned. Furthermore, they hoped that there would be waste management approaches that could be useful for PAUD students by processing waste into educational games. This activity concluded that the Gempa Perekat program is a feasible form of intervention in dealing with garbage in the city by empowering the PKK as a self-help group in making educational game tools for PAUD students from waste.

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healthy lifestyle and the norms of the culture in the society.<sup>4</sup> Several sources explain that waste is of little use and value to society. Garbage is also interpreted as residual material from human activities. Garbage includes items thrown away and ignored until they become unwanted or are collected and piled up as unused material.<sup>5</sup> Several efforts can overcome the waste problem, such as recycling garbage into useful products.<sup>6</sup> Waste processing also requires active community participation in the form of empowerment in the community recycling projects.<sup>7</sup>

The Merjosari subdistrict, especially *Rukun Warga* (RW) 02, has problems processing waste. The waste processing

is of particular concern to the head of RW 02 because the Merjosari subdistrict is a densely populated sub-district, and the residences are predominately rented houses and student boarding houses. The results of the initial study conducted by initiating assessments and interviews with community health promotion units (Posyandu) cadres and community leaders in the Merjosari subdistrict stated that residents are always complaining about the amount of waste that is increasing day by day and the garbage stacks up in the gutters in front of the houses. Residents have also received training on waste recycling and using organic and nonorganic waste. However, this program

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## INTRODUCTION

The world's population is increasing, and the level of urbanization in each region is also increasing annually, making the waste problem even more significant and varied.<sup>1,2</sup> After a shift in demographic patterns away from rural residences, most of the global population now lives in urban areas.<sup>3</sup> The variety and amount of waste, especially in these urban areas, make the problem of waste management more complex and monumental.

Beyond public health and sanitation issues, the problem of waste management in Indonesia today continues to expand into cultural concerns.<sup>3</sup> This is very closely related to public choices of a clean and was not continued because there was no assistance from policymakers.

Based on the results of partner interviews, namely the Family Welfare Development Group (PKK) in RW 02 Merjosari subdistrict, Malang City, it was stated that the PKK activist group had been taught by one of the institutions in Malang City how to process waste, some of which was by making bags, flowers, tablecloths, and clothes hangers from waste from residents of RW 02 Merjosari subdistrict. The PKK activist group also said that many PKK activist members became early childhood education (PAUD) teachers in the Merjosari subdistrict so that making handicrafts from waste was not resumed. In addition, complaints from the PKK group members who are PAUD teachers stated that there had been very little income in PAUD, so the learning media and infrastructure, especially educational game tools, are minimal at the PAUD.

The main goals for the children attending PAUD schools are to change their behaviors, starting with cognitive, affective, and psychomotor skills.8 Changes in behavior are taught in early childhood following the growth and development of children, especially those aged 2-4 years.9 Children in PAUD have the fastest developments in religion, morals, social interaction, and intellectual and emotional development.<sup>10</sup> Character aspects in PAUD children can be developed using relevant themes and activities, resulting in cognitive, affective, and subtle psychomotor changes in language formation to social skills.<sup>11</sup>

The problems experienced by partners in RW 02, Merjosari subdistrict, Malang City, include the growing garbage piles and limited learning media in the Merjosari subdistrict PAUD. Efforts that the PKK can make include forming a self-help group (SHG). These SHGs aim to increase selfconfidence and provide mutual support and motivation in a group with the same problem.<sup>12</sup> The problems faced by the PKK group in RW 02 Merjosari subdistrict are waste and its processing. Moreover, learning and educational media for PAUD children are costly, so the educational game tools in PAUD are very minimal.

This research and community service project aimed to empower and assist the

PKK mobilizing group in optimizing waste as an educational game tool for children at an early age in the Merjosari subdistrict, RW 02, Lowokwaru district, Malang City. With these community service efforts and the research findings, it is hoped that it can increase the knowledge and skills of the PKK mobilizing group regarding waste processing as an educational game tool for early childhood. Furthermore, at the end of the activity, self-help group assistance activities were measured in a final assessment effort to demonstrate the effectiveness of these educational game tools to the community.

## **METHODS**

This research used quantitative and qualitative approaches to document community service efforts. The quantitative approach was used to measure demographic data such as age, education, employment, marital status, and knowledge and skills in processing waste for PKK mobilization groups. At the same time, the qualitative data were collected through the related directed interviews. Documentation was done of the efforts that residents or partners have made regarding waste, current efforts that intersect with other aspects of the subdistrict, and the benefits of educational game tools made by the PKK mobilizing group. The researchers used inclusion and exclusion criteria to select the sample. The indigenous peoples within the communities participating in the PKK shared their thoughts and were active in community activities. These activities were conducted in RW 02, Merjosari subdistrict, Lowokwaru district, Malang City, from June to August 2019. The sharing activity was done by discussing waste problems in the RW 02 Merjosari subdistrict with the PKK mobilizing group. The following activity involved waste-related health education, followed by a focus group discussion (FGD) with the PKK mobilizing group to form selfhelp groups in creating educational games for children from an early age. The next activity was for the PKK driving groups to practice making educational game tools for early childhood. Finally, the last result was the presentation of educational game tools for early childhood to the community

leaders and the head of the PKK RW 02 Merjosari subdistrict (Figure 1).

The instrument used in the community service project and this study was a questionnaire related to knowledge of waste processing that consisted of 20 questions with indicators of the meaning of waste, types of waste, methods of waste processing, and types of waste recycling. The questionnaire results range from 0 to 100, with correct and incorrect answer choices.13 The waste knowledge questionnaire was previously tested for validity and reliability with a Cronbach alpha value of 0.895. The waste management skills instrument, which was used for educational games. involved a checklist sheet with indicators of cooperation, skills, and usefulness. The result of the checklist sheet is a score between 0-100. The instrument was also tested for validity and reliability, with a Cronbach alpha value of 0.910.

Qualitative data were collected using the FGD method with guided questions in the PKK mobilizing group that participated in self-help group activities. The FGD was conducted with 25 PKK groups selected according to the criteria. Topics discussed in FGDs with questions asked were in the form of open-ended questions, which included: What is the problem with garbage in Merjosari Subdistrict, what has been done so far in processing the waste, what efforts can be made to solve the waste problem, and how to process waste to make educational game tools for schoolchildren in the early grades.

The results of the data analysis used for quantitative data were presented in the form of frequency for continuous data and the mean and standard deviation (SD) in the presentation of numerical data. The paired t-test statistic test was used with a p-value of <0.05, considered a significant difference. The qualitative analysis used the thematic analysis method for each question during the FGD. The results of the FGD were analyzed by searching for keywords and finding appropriate themes. The results of the analysis were used as input for improving the activities involved in forming subsequent self-help groups. This community service project and research received ethical approval from the ethical committee of the Ministry of Health. This research and community service also received approval from the research ethics committee of the Chakra Brahmanda Lentera institution.

## RESULTS

Analysis of the qualitative results with interviews through FGD on the PKK mobilizing group in the RW 02 Merjosari sub-district, Dinoyo District, revealed that: "Garbage is disposed of in plastic bags, and there are cleaners who pick it up." Some respondents revealed the following concerns: "Furthermore, almost all residents do not understand or care about selecting waste that can be used for recycling." "In addition, residents also often burn garbage."

The interviews involving the PKK driving group revealed a perception regarding proper and sustainable waste management. Several PKK mobilizing groups said "that they had an early childhood education (PAUD) school but did not have supporting facilities for learning media." Furthermore, the results of the FGD agreed on making educational game tools from the garbage in the Merjosari subdistrict. In addition, they also argued for the sustainability of the program.

Based on the results of these interviews, the researchers summarized the 5 main themes, namely: 1) Perceptions of the PKK mobilizing group regarding the waste problem in their area; 2) Ignorance regarding waste segregation; 3) Solving the garbage problem by burning trash; 4) Residents have good skills; and 5) Lack of supporting facilities for waste processing activities.

The characteristic data of the PKK RW 02 mobilizing group, Merjosari subdistrict, Lowokwaru district, are explained in Table 1.

Characteristic data from respondents or partners show that all of them are women with an average age of 43. Meanwhile, most respondents held jobs as housewives (48%) with married status (88%). Most respondents were also from Rukun Tetangga 2 (RT 2) (44%).

The results of health education about waste management in the PKK driving group RW 02, Merjosari subdistrict, Lowokwaru district (n = 25) previously

ble 1.	Characteristic data of the PKK driving gro	up RV	N 02,	Merjosari		
	Subdistrict, Lowokwaru District (n = 25).					

Characteristics	
Age (years, mean $\pm$ SD)	$43 \pm 6.09$
Gender	
Man	0 (0%)
Woman	25 (100%)
Profession	
Housewife	12 (48%)
Civil Servant (ASN)	4 (16%)
Private employee	4 (16%)
teacher	5 (20%
Status	
Marry	22 (88%)
Not married yet	3 (12%)
Residential/Rukun Tetangga (RT)	
RT 1	7 (28%)
RT 2	11 (44%)
RT 3	7 (28%)

SD: standard deviation.

Table 2.	The level of knowledge before and after being given health education		
	about waste management in the PKK RW 02 mobilization group,		
	Merjosai village, Lowokwaru District (n = 25).		

Variable	Average	SD	p	
Prior knowledge	60.80	13.820	0.000	
After knowledge	82.40	11.824		

SD: standard deviation.

# Table 3. The results of the skills assessment in making educational game tools by the PKK RW 02 Merjosari Subdistrict District of Lowokwaru through self-help groups.

Variable

Skills in making educational game tools (grade, mean $\pm$ SD)	$73 \pm 7.7$
SD: standard deviation	

SD: standard deviation.

obtained the data normality test using the Kolmogorov-Smirnov test with a result of 0.010 (>0.05), and the data had a normal data distribution. Moreover, the Levene test had a result of 0.810, indicating the value was >0.05, which meant the data were homogeneous between the two variables of knowledge before and after being given health education related to waste processing.

The knowledge results before and after being given health education from the PKK driving group RW 02, Merjosari subdistrict, Lowokwaru district, showed a change in the level of knowledge (Table 2). The next stage of activity involved conducting another FGD related to the waste management plan in RW 02 Merjosari subdistrict, Lowokwaru district.

The assessment results of the PKK RW 02 Merjosari subdistrict, Lowokwaru district revealed the self-help group had an average score of 73 out of 100. This value was close to the highest value (Table 3).

## DISCUSSION

Sustainable management of garbage is a challenging problem to overcome. Many waste problems around the community are often processed into fertilizer if organic waste, and otherwise, the garbage is burned.<sup>14,15</sup> However, only a little is reused to manufacture new items that the community can use or utilize.<sup>16</sup> Communities can do various empowerment programs to recycle useful and sustainable waste.<sup>17</sup>

Currently, urban waste also creates a monumental problem that does not involve finding a sustainable solution or plan to recycle discarded items. Currently, many government programs

#### **ORIGINAL ARTICLE**







(d)

Figure 1. Activities in the community included: (a) health education activities and FGDs related to waste management; (b) making educational game tools carried out by PKK RW 02, Merjosari Subdistrict, Lowokwaru District through self-help groups; (c) presentation activities of educational game tools to all partners and respondents; and (d) giving awards and certificates to the PKK mobilizing group RW 02, Merjosari Subdistrict, Lowokwaru District.

and sub-district official efforts have always promoted or innovated programs for recycling waste.<sup>18</sup> However, despite the existence of these innovative programs, sometimes it does not involve continuous monitoring and evaluation, so as a result, sometimes the program becomes neglected.<sup>19</sup> Empowerment programs in the community, such as Gempa Perekat, are aimed at processing household waste into tools or media for PAUD children. This program, which involves the PKK mobilizing group, must become a model for support and waste management done properly and sustainably and demonstrate the benefits of using waste as a student learning medium.

This program, which targeted the PKK of RW 02 Merjosari subdistrict, Lowokwaru district, could increase the participants' knowledge, particularly in processing waste into goods useful to the PAUD students. Besides that, the FGD method also found one of the right solutions: processing waste into an educational game tool for PAUD students. The next step in the program was to make educational game tools from household waste through self-help groups. This self-help group was formed to provide mutual support and problem-solving motivation.<sup>20,21</sup> Furthermore, his self-help group aimed to help each other make educational game tools for the PKK RW 02 driving group, Merjosari sub-district, Lowokwaru district.

Some of these models that have been implemented for community empowerment have been integrated into the form of health education, FGDs, and self-help groups.<sup>22,23</sup> Health education is one of the initial forms of community empowerment that can be conducted with any target.<sup>24</sup> This form of health education can change a person's behavior through the stages of cognitive change or knowledge. Changes in knowledge can cause a person to act in making a decision based on the outcomes of cognitive processing.<sup>25</sup> In addition to the decisions that have been determined, someone will perform actions that have been previously accepted due to knowledge and attitudes.

Changes in behavior resulting from this knowledge can be understood as related to proper waste management. The results of this increase in knowledge can be influenced by several factors, ranging from gender, age, and level of education to the model of education or health promotion used in the program, such as an active or passive model in providing health education. Good health education often uses an active approach because, with this active approach, all participants become involved in providing health education.<sup>26</sup>

The FGD was the next part of the Gempa Perekat program, which involved a discussion process in determining whether the PKK driving group could successfully conduct the program. FGD is a discussion model with a brainstorming approach and analyzes some of the problems found in the community.<sup>27</sup> With the FGD model, the participation of participants in determining a problem and finding solutions together makes this model very appropriate for mobilizing or empowering communities. Several models of the FGD approach, frequently conducted by these community empowerment programs, can drive societal changes toward more healthy ways of life.28

The next empowerment model involved changing knowledge and attitudes through health education and FGDs. The empowerment that can be done through mutual assistance and peer support can effectively improve one's life skills.<sup>29</sup> Self-help groups are an effective form of group support and peer motivation for improving skills.<sup>30</sup> What distinguishes this empowerment model is that there are experts in the group. The expert is a companion or mentor who previously had expertise in a particular field.

The PKK group is a form of mobilization in the community that can empower the community through activities or programs owned by the sub-district or village. One of these driving groups is involved in driving educational programs such as those in early childhood education.<sup>31</sup> PAUD itself is a form of guidance formed by the PKK. However, while it should have sustainable facilities as learning media, the PAUD program is minimal. This effort can be driven through the PKK driving program by seeking learning facilities and modules for PAUD students.

Some people became PAUD teachers in the PKK RW 02 mobilizing group in the Merjosari subdistrict, Lowokwaru district. To understand the problems experienced by PAUD in the RW 02 area, the teacher becomes an expert capable of providing facilities for or facilitating the manufacture of this educational game tool. As a result, this self-help group program has the potential to become a form of empowerment that the PKK group can do by facilitating or creating educational game tools.

The advantage of this Gempa Perekat program is that the program is implemented enthusiastically by all PKK in RW 02 Merjosari subdistrict, Lowokwaru district. The existence of a team of experts in making and innovating the manufacture of educational game tools for PAUD students can be a facility, especially for the PKK in RW 02 Merjosari subdistrict, Lowokwaru district, which is not able to make educational game tools for PAUD students. With this program, the educational game tools that became learning models or facilities were obtained at a lower cost. However, in the absence of this program, educational game facilities or tools for PAUD students may only last for a while because some of the materials use too much paper and can easily decompose.

## CONCLUSIONS

Activities from the Gempa Perekat Empowerment Program are part of the innovative programs in processing waste into educational games for PAUD students, with the target being the PKK activist group. This Gempa Perekat activity provides an overview of waste management in urban areas, which can be used as a model or facility for educational games. This activity program could increase knowledge in the PKK driving group and improve their skills in making educational game tools for PAUD students through self-help groups. Gempa Perekat can be used as a form of intervention in dealing with waste to recycle it into materials or models that are useful for PAUD students

and integrate them into the ten main PKK programs, namely character education and skills building.

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## **CONFLICT OF INTERESTS**

There was no conflict of interest.

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