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PREVENTING ANTIBIOTIC RESISTANCE THROUGH DAGUSIBU IMPLEMENTATION IN PASIR JENGKOL VILLAGE

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ABSTRACT

Antibiotic resistance occurs when microorganisms become unresponsive to antibiotic treatment, rendering common therapies ineffective against infections. As a result, the infection becomes increasingly challenging to treat, posing a heightened risk of severe disease progression and increasing the risk of spreading the disease. The causes of the emergence of antibiotic resistance include a number of factors, including excessive use of antibiotics from self-medication, to inappropriate disposal of antibiotic drugs. Karawang Regency, a region in West Java which consists of 10 sub-districts and has a population of more than 2.4 million people. Research conducted in Karawang shows the potential for antibiotic resistance based on use and the environment. It is known that the people of Karawang Regency have poor knowledge and perception regarding antibiotic resistance and use, one of which is Pasir Jengkol village. Therefore, it is necessary to increase understanding of medicines among the people of Karawang Regency, including by socializing the DAGUSIBU movement (Dapatkan, Gunakan, Simpan dan Buang Obat) or Proper Use, Storage and Disposal of Medications and its implementation as a measure to prevent antibiotic resistance. The output of this activity is primarily an increase in understanding of public knowledge through questionnaires which are analyzed using statistics. The results obtained were then tested using a statistical test showing a significant influence (Sig 0.002) increase in knowledge through the difference in pre-test and post-test scores. This outreach activity, which provides educational materials on preventing resistance, has positively impacted the Pasir Jengkol community's knowledge. Therefore, this socialization initiative can be replicated in other areas, particularly in Karawang Regency.

***Keywords**: Antibiotic, Drug Resistance*, DAGUSIBU, Karawang.

1. INTRODUCTION

Antibiotic resistance is a condition where bacteria, viruses and parasites can no longer be treated with commonly used antimicrobial drugs. As a result of antibiotic resistance, patients who experience infections become difficult to cure and cannot be treated with commonly used therapies, thereby increasing the risk of disease spreading, increasing the severity of the disease and increasing the use of drugs. (WHO, 2023). In fact, the high resistance to cephalosporins and methicillin in *Escherichia coli* and *Staphylococcus aureus* makes it difficult to cure infections with the standard

therapy of ampicillin, co-trimoxazole, and fluoroquinolones that are commonly used. (Murray et al., 2022). Apart from excessive use of antibiotics and misuse in treatment, inappropriate disposal of drugs also contributes to the occurrence of antibiotic resistance (Murray et al., 2022). Research conducted by Diniarti (2022) in Karawang Regency revealed that water sources in Karawang Regency contain bacteria that have intermediate activity against antibiotics, indicating the potential for antibiotic resistance. (Diniarti et al., 2022). Based on the results of Riskesdas (2013), around 35.2% of households store various types of medicine at home, 35.7% are hard medicines and 27.8% are antibiotic medicines which are kept for self-medication. In addition, around 47% of households kept 'leftover medicines' from doctor's prescriptions and previous use (Kementrian Kesehatan RI, 2013). This community service activity aims to increase the understanding of the Karawang Regency community regarding the use and disposal of antibiotic drugs to prevent antibiotic resistance. This activity was also strengthened by the GKSO activity program or Drug Aware Family Movement with DAGUSIBU (Dapatkan, Gunakan , Simpad dan Buang) or Proper Use, Storage and Disposal of Medications and its implementation outreach which was also launched by the Indonesian Pharmacists Association. (PP IAI ,2014).

2. PROBLEM AND QUESTION FORMULATION

Karawang Regency is one of the regions in West Java which consists of 10 sub-districts with a population of more than 2.4 million people. (BPS, 2020). The emergence of antibiotic resistance can be caused by many factors, including the fact that intensive use of antibiotic drugs can increase antibiotic resistance, including self-medication or 'swamedikasi', which is one of the factors that can trigger inappropriate drug use. (Olesen et al., 2018; Sachdev et al., 2022). Based on research conducted in Karawang Regency, people in urban areas have lower knowledge and false perceptions than people in suburban areas of Karawang. People in suburban areas generally use antibiotics when suffering from the flu (Gatera et al., 2022). Apart from use without diagnosis, the public should also have good compliance with drug use. At one of the community health centers in Karawang Regency, the level of compliance with TB drug use is still low at 42.9%(Dewi et al., 2023). Until the health administration stage, through an analysis carried out by Astuti (2022) at a hospital in Karawang Regency, the use of antibiotics in the hospital was quite high, where this evaluation is one of the parameters for controlling antibiotic resistance. (Astuti & Arfania, 2018). The partner for this activity is Majalaya sub-district, Karawang Regency, West Java Province. Majalaya District is 6.6 KM from Singaperbangsa University Karawang.

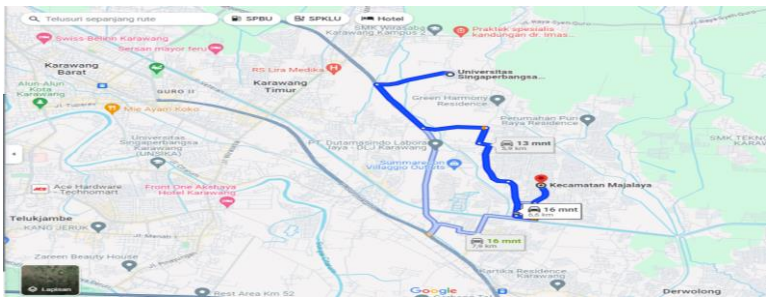

Figure 1. Activity Loacation

3. LITERATURE REVIEW

The problems that exist in Karawang Regency are the lack of compliance regarding the use of antibiotic drugs and the environment which shows the potential for antibiotic resistance due to insufficient knowledge about drugs. (Diniarti et al., 2022; Gatera et al., 2022). The problems are included in the social aspects of society. It is necessary to increase knowledge regarding the use of antibiotics and also their impact on the environment which is related to public health to prevent the occurrence of antibiotic resistance. Partners as the subject of this service are partners who are not economically productive, namely the Karawang community. The solution offered to deal with social problems related to health and environmental aspects regarding the use of antibiotics can be through socializing the dangers of antibiotic resistance and DAGUSIBU. DAGUSIBU is a drug awareness family movement as a real action that explains the procedures for obtaining drugs, using drugs, storing drugs, and disposing of drugs properly and correctly following the guidelines issued by the Indonesian Pharmacists Association (PP IAI, 2014).

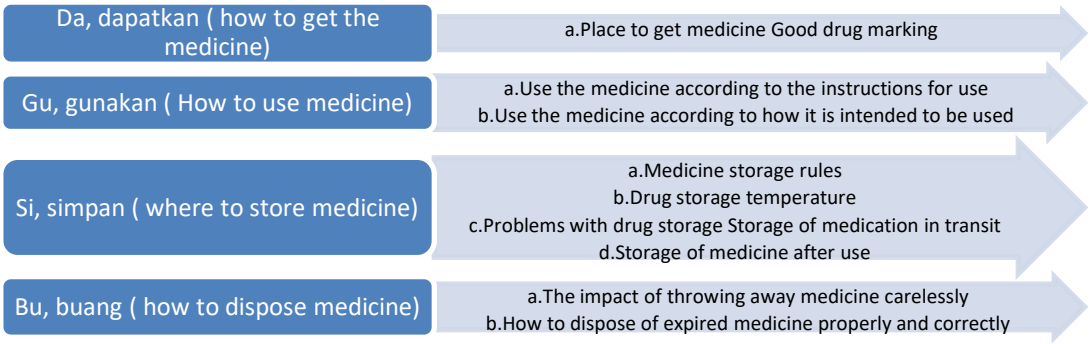

Figure 2. DAGUSIBU

It is known that improper disposal of antibiotics from unused and expired medicines can have an impact on the environment and ultimately increase the potential for antibiotic resistance.(Anwar et al., 2020). Some of the factors that trigger this problem are the lack of awareness and curiosity of the public to find out information regarding types of drugs, drug doses, uses of each drug, rules for using drugs, side effects of the drugs used, how to store drugs correctly and management procedures for medicine at home (Limato et al., 2022). Increasing knowledge about the use and disposal of antibiotics is very necessary to prevent antibiotic resistance. It is known that increasing knowledge about antibiotics is needed because lack of knowledge about antibiotics increases 3 times the use of inappropriate antibiotics (Akici et al., 2018; Guo et al., 2021). After this outreach activity, participants will be given a medication box as a tool to understand how to use antibiotics properly and correctly and will continue with counseling to help answer questions about medication. The use of medication boxes is known to increase the effectiveness of medical therapy (Schwartz, 2017).

4. METHODE

Figure 3. Stages of Implementation

The implementation flow is shown in Figure 3.The place of implementation was in Pasir Jengkol village, Majalaya District, Karawang Regency. Pasir Jengkol Village is one of the closest villages to Campus 2 of Singaperbangsa University Karawang. Activities were carried out twice at the village office in Dusun 2 for the people of Dusun 1 and 2 and at the posyandu in Dusun 3 for the people of Dusun 3, 4, and 5.

The implementation method, which was carried out as a solution to the problem of lack of understanding of drug use in the Karawang Regency community, was carried out in a series of activities as follows:

Preparation Stage

The activity preparation stage consists of 2 activities, namely coordination with village partners and presenters for the implementation of service. Coordination was carried out to determine the time and place for the service implementation with village partners in Karawang Regency. Coordination is carried out with village officials and local village organizations, including providing invitations from village officials to counseling participants. The presenters are representatives of the Indonesian Pharmacists Association or Pharmacists who work actively to provide DAGUSIBU material.

Table 1. Description of the Preparatory Stage of External parties

Activity	• Coordinating with Pasir Jengkol village • Coordinating with IAI Karawang
Description	• Ensure the time and place of implementation in Pasir Jengkol village • Coordinating materials and resource persons from IAI Karawang • Provide an introduction to the equipment used in implementing this service program as well as examples of work that will be used as a reference in implementing the service program
Time	• Mei- Juni 2024

Internal Preparation Stage

Preparation takes the form of designing a questionnaire, multiplying leaflets, and making medication boxes. The questionnaire prepared covers the public's knowledge about medicines starting from how to get medicines, how to store medicines, how to use medicines, and how to dispose of medicines properly and correctly (DAGUSIBU). The questionnaire also includes examples of cases of appropriate and inappropriate use of antibiotic

drugs as a parameter to determine the public's understanding of antibiotic drugs. Brochures and medication boxes were prepared for each participant present as tools to help them apply the DAGUSIBU material presented.

Table 2. Deskripsi tahap Persiapan Internal Kegiatan

Activity	• Preparation of activity questionnaires • Preparation of media used for outreach activities
Description	• Ensure that the questionnaire matches the description and material to be presented • Create a medication box design • Creating DAGUSIBU Brochures • Create leaflets on how to use the medication box
Time	• Mei- Juni 2024

Stages of Implementation

The inclusion criteria for this activity were residents of Pasir Jengkol Village who were able to read and write in Indonesian, and were willing to participate in the entire series of activities, including pre-test, educational session, and post-test. Exclusion criteria included individuals who did not complete all stages of the program, provided incomplete responses in the questionnaires, were non-residents of Pasir Jengkol Village.

The implementation stage consists of 6 activities, namely the pre-test stage, providing materials, socialization on the use of medical boxes for daily drug use, question and answer, post test and finally drug counseling. The activity began with a pre-test to determine the initial parameters of participants' understanding of DAGUSIBU and the use of antibiotic drugs. After carrying out the pre-test, material was given regarding the dangers of antibiotic resistance, the DAGUSIBU stages and a question and answer session with the presenters. Socialization on the use of medical boxes was carried out by those implementing the service activities along with case by case questions and answers regarding the problem of using antibiotics as an implementation of the DAGUSIBU material provided. Finally, a post-test was carried out to see the effect of providing material to partners.

Table 3. Description of the Activity in Implementation stage

Activity	• pre-test • provision of DAGUSIBU material • socialization of the use of medical boxes for daily medication use • question and answer • post-test • drug counseling.
Description	• Pretest and posttest as a measure of the success of the service program • Providing DAGUSIBU socialization material along with the dangers of antibiotic resistance which is the main material

	• Providing and socializing how to use medication boxes to increase public compliance in using medicines properly and correctly • Drug counseling for patients by pharmacists as a form of community service
Time	• 26 dan 28 Juni 2024 • Pretest (1 x 30 minutes) • Antibiotic Resistance and DAGUSIBU (1 x 60 minutes) • How to use medication box (1 x 60 minutes) • Question and Answer (1x 30 minutes) • Health and medication counseling with apothecary (1 x 60 Minutes)

Evaluation and data processing stage

Implementation activities are published in local media in the form of articles. Then the pre-test and post-test scores were processed using statistics to see the effect of providing material on Villagers' knowledge.

5. RESULT AND DISCUSSION

a. Result

Preparation Stage

In the preparation stage, coordination was carried out with the village head of Pasir Jengkol for the implementation of the activities shown in Figure 2. Then coordination was carried out with the IAI as a resource person represented by the chairman of the Karawang Regency IAI.

Figure 4. Coordination with Pasir Jengkol Village officials

Figure 5. DAGUSIBU Brochure

Apart from preparations from the parties involved, the media used are also prepared, such as leaflets, brochures, and medical boxes that will be used. The DAGUSIBU brochure in Figure 5 is used to socialize the procedures for obtaining medicines, using medicines, storing medicines, and disposing of medicines properly and correctly. This brochure was given to each participant.

Figure 6. Medication container and leaflets

Meanwhile, the provision and socialization of medical containers in Figure 6. are to increase community compliance in using drugs along with simulations of using antibiotic drugs at the right time and length of therapy.

Implementation Stage

This activity was attended by a total of 75 people who participated from the start to the end of the event and were divided into several groups based on educational demographics in Figure 7.

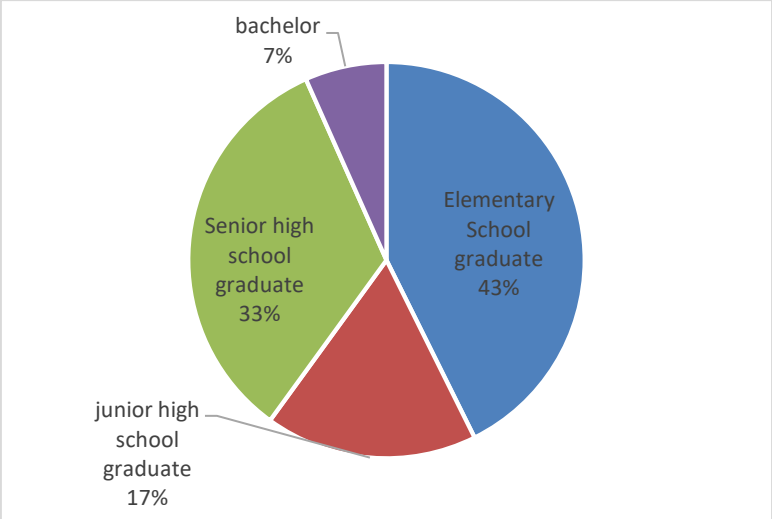

Figure 7. Educational Demographics of Socialization Participants

Figure 8. People are filling out questionnaires

(a) **(b)**

Figure 9. Participants in (a) First day and (b) second day

Figure 10. Presentation of DAGUSIBU by IAI

After socialization, participants will be given a medication box as a tool to understand how to use antibiotics properly and correctly and will continue with counseling to help answer questions about medication.

Figure 11. Medical Check Up and Counseling with Apothecary

Evaluation Stage

The results of the pre-test and post-test were analyzed using simple statistical methods to see the effect of the intervention on participants' understanding. The assessment shows an increase in participants' knowledge, which reflects the success of the materials and socialization methods.

b. Discussion

Preparation Stage

In its implementation, the activities were carried out over 2 days in different hamlets in Pasir Jengkol Village. This is done to increase the range of benefits from the service activities carried out. Activities at the village office and the posyandu are based on suggestions from village

officials. So, in preparation, the village is very enthusiastic about the service activities that will be carried out. IAI Karawang Regency was also represented by the chairman of IAI Karawang Regency who added to the content of the DAGUSIBU material provided.

Regarding the media prepared for carrying out service activities in the form of brochures and leaflets, enthusiastic residents were considered less interested, perhaps because the form of the leaflets and brochures was not attractive to adults. However, the response to providing medication boxes was considered quite good by residents who brought medication boxes or simply wanted to suggest to their families who use medication regularly.

Implementation Stage

The 2-day activity was considered to be optimal enough to attract residents' interest in participating in outreach activities. However, the duration of the activities, especially those carried out during weekdays, is enough to divide the participants' focus. So there were only 75 participants who completed the pretest and posttest. This socialization activity is considered to be able to attract the interest of residents seen from the number and activeness of participants asking questions in the question and answer session. Apart from that, the existence of free medical check-ups will increase the public's attention to health.

Evaluation Stage

At this community service evaluation stage, the main focus is to assess the success of educational activities regarding the concept of DAGUSIBU (Get, Use, Store, and Dispose of Medicines Correctly) in increasing public knowledge regarding antibiotic resistance. The evaluation was carried out to determine changes in participants' understanding and awareness after participating in this activity, especially in the aspect of rational and responsible use of antibiotics. This is described to ensure that the interventions that have been carried out have a positive impact in preventing inappropriate antibiotic use practices, which contribute to the problem of antibiotic resistance. The percentage of questionnaire results before and after socialization can be seen in Table 5.

Table 5. Questionnaire Results Before and After DAGUSIBU Socialization

Statement	Pre-test		Post-test		Result
	Correct Answer		Correct Answer		
	Correct	%	Correct	%	
Antibiotics can be purchased at grocery stores	68	81.0	72	85.7	Improvement
Antibiotics can be found at the pharmacy	66	78.6	71	84.5	Improvement
You can get antibiotics	47	56.0	62	73.8	Improvement

without having to use a doctor's prescription					
The meaning of drinking 3 times a day is consuming 3 tablets at once	63	75.0	68	81.0	Improvement
Antibiotic consumption must be finished	60	71.4	71	84.5	Improvement
You should consume all antibiotic tablets 3 times a day	31	36.9	43	51.2	Improvement
Store antibiotic tablets in the refrigerator	35	41.7	41	48.8	Improvement
Storing antibiotic tablets should be kept away from direct sunlight	66	78.6	72	85.7	Improvement
Storage of medicines should be out of reach of children	64	76.2	73	86.9	Improvement
The tablet is disposed of by crushing it first and then burying it in the ground	56	66.7	71	84.5	Improvement
Tablets are disposed of by throwing them directly in the trash	51	60.7	62	73.8	Improvement
Medicines past their expiration date must be thrown away	67	79.8	73	86.9	Improvement

The results obtained were then tested using the Wilcoxon statistical test to see the effect on providing socialization through the difference in correct pretest and posttest results. Through the post-test, the significance value was 0.002 ($p < 0.05$), so there was a significant difference before and after providing the material. Increasing understanding of medicines can be an opportunity to optimize the use of antibiotics (Limato et al., 2022). It has been proven in several studies that appropriate drug use increases along with patient or community knowledge regarding the drugs used (Astuti & Arfania, 2018; Dewi et al.,

2023; Wisudanti et al., 2023). Therefore, the education method can be a solution to increase public knowledge, which is expected to influence patient compliance with drug use (Detty et al., 2016).

6. CONCLUSIONS AND SUGGESTIONS

Antibiotic resistance is a serious threat to public health. The inappropriate use of antibiotics and lack of public awareness regarding how to obtain, use, store, and dispose of drugs properly and correctly is one of the causes. Outreach activities to prevent antibiotic resistance through DAGUSIBU, which was attended by 75 residents of Pasir Jengkol village, had a positive impact on increasing community knowledge.

Suggestion

To strengthen the impact of service programs, sustainability measures such as evaluating the program's impact on community behavior and levels of antibiotic resistance need to be carried out. Apart from that, collaboration with health agencies and community organizations can increase the usefulness of DAGUSIBU outreach activities, so that this program has a long-term and sustainable impact.

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