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Improving MAN 3 Mandailing Natal Students Understanding of the Use, Storage, and Management of Veterinary Drug Waste through Educational Seminar and Demonstration Activities

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ABSTRACT

The use of veterinary drugs is increasing, but many animal owners do not have an adequate understanding of the proper use and storage of drugs. This is an important concern because the correct use and storage of drugs greatly affects the achievement of the desired therapeutic effect. Proper storage of drugs is essential to maintain the quality of the drugs, thus avoiding physical damage or chemical changes that can reduce their effectiveness or even endanger animal health. Medicines that are no longer in use, either due to physical damage or because they have passed the expiration date, must be disposed of immediately with the correct procedure. Improper management of drug waste has the potential to cause negative impacts on the environment, such as pollution of water, soil and surrounding ecosystems. Medicines that are no longer in use have the potential to re-circulate in the community, which can lead to the risk of poisoning or even death if consumed inappropriately. Improper disposal of drugs can pollute the environment and can be consumed by animals looking for food in the disposal area, resulting in fatal consequences. To provide additional knowledge on how to use, store and dispose of veterinary drugs. The method of providing material was through educational seminars and demonstrations. From this community service activity, researchers managed to collect data related to increasing the knowledge and understanding of MAN 3 Mandailing Natal student participants regarding how to treat veterinary drugs, starting from the method of administering drugs orally to pets, criteria for drugs that can still be stored, proper drug storage procedures, the right time to dispose of drugs, to the correct way to dispose of drugs. This finding shows that education through seminars and hands-on demonstrations that we conducted in our community service activities were able to influence respondents' knowledge in the correct use, storage, and disposal of veterinary drugs.

1. INTRODUCTION

Problem that arises in the field today is the increasing use of veterinary drugs, but many animal owners do not have an adequate understanding of the proper use and storage of drugs. This is an important concern because the correct use and storage of drugs greatly affects the achievement of the desired therapeutic effect. Proper drug administration will ensure that the amount of drug entering the animal's body is in accordance with the prescribed dose and through the appropriate route of administration, so that the effectiveness of treatment can be achieved. In addition, proper drug storage is very important to maintain the quality of the drug, so as to avoid physical damage or chemical changes that can reduce its effectiveness or even endanger animal health (Fauziah et al., 2022). Drug storage is a process that involves the placement and protection of pharmaceutical preparations to maintain their quality. This activity includes actions to keep medicines in a safe and secure place, to prevent undue access and to maintain their stability and effectiveness. Proper storage must ensure that pharmaceutical preparations are protected from factors that can reduce their quality, such as exposure to inappropriate temperatures, humidity, light, or contamination (Susanto, 2017). The main objective of drug storage is to ensure that the quality of pharmaceutical preparations is maintained throughout the storage period. This includes protection against various factors that can damage the stability of the drug, such as exposure to light, temperature, humidity, or contamination. Proper storage also plays a role in preventing improper use of drugs, for example by unauthorized parties or through use that is not in accordance with the recommended dose (Ministry of Health, 2019). Drug storage in the community without proper knowledge can lead to irrational drug use and inappropriate storage. Incorrect storage can reduce the quality of drugs used (Gul et al., 2016).

Medicines that are no longer in use, either due to physical damage or because they have passed the expiration date, must be disposed of immediately with the correct procedure. Improper management of drug waste has the potential to cause negative impacts on the environment, such as pollution of water, soil, and surrounding ecosystems. In addition, if medicine disposal is done carelessly, there is a risk that the medicines could be utilized by irresponsible parties. They may collect, recycle, or even trade drugs that are no longer fit for use, posing a health threat to people who may use these drugs without knowing their condition (Shabaan et al., 2018). Expired drugs are drugs that have passed the time limit for product quality assurance by the manufacturer, which is determined based on the storage of drugs under ideal conditions in accordance with the manufacturer's recommendations (Ministry of Health, 2017; Atinafu, 2014). The use of drugs that have passed the expiration date can cause side effects, such as loss of drug effectiveness and potential risks from the chemical content in it (Savira, 2020). Improper disposal of drugs can pose a dangerous risk to human health and the surrounding environment. Improper disposal practices have the potential to cause contamination, either through water, soil, or air, which in turn can have a negative impact on public safety and the surrounding environmental ecosystem (Heba et al., 2018). Medicines must be disposed of in an

appropriate manner to prevent environmental pollution and avoid misuse by irresponsible parties (Viswasanthi et al, 2018).

Medicines that are no longer in use have the potential to re-circulate in the community, which can lead to the risk of poisoning or even death if consumed inappropriately. Improper disposal of drugs can pollute the environment and can be consumed by animals looking for food in the disposal area, resulting in fatal consequences. In an effort to overcome this problem, it is necessary to increase the knowledge of animal lovers about the correct handling of medicines. The proposed solution is through education that focuses on "Improving MAN 3 Mandailing Natal Students Understanding of the Use, Storage, and Management of Veterinary Drug Waste through Educational Seminar and Demonstration Activities". To measure the level of knowledge and understanding of the participants, data was collected through pretest and posttest questionnaires with the same questions. The results of the questionnaire will be analyzed to see the increase in understanding before and after the provision of material related to proper drug handling. Data analysis was carried out by calculating the increase in knowledge in terms of correctness and accuracy of drug handling or reduction of errors in treating drugs. The results of data processing are presented in the form of percentages.

2. RESEARCH METHODS

Materials used as presentation media include Drontal Cat® dewormer, Vita Plus® cat vitamins, drinking water, feed, and five cats as demonstrators. The method of providing material is by seminar activities and educational demonstrations. This activity was attended by all MAN 3 Mandailing Natal students. The seminar activities were carried out using the direct delivery method. Materials related to the use, storage, and disposal of veterinary drugs were delivered using Microsoft PowerPoint® media. This was followed by a live demonstration on how to administer oral medication in both solid and liquid form to cats. The drug administration process was practiced directly by the veterinarian on duty.

Population refers to a general area or group consisting of objects or subjects with certain quantities and characteristics. In this context, the population is considered homogeneous if it consists of a set of objects that have very similar values and characteristics, so that the difference between one object and another is considered insignificant (Sugiyono, 2010). Samples refer to a subset of the number and characteristics present in the population (Sugiyono, 2013). With a population of less than 100 people, the entire population is sampled, but if the population is more than 100 people, the sample taken ranges from 10-15% or 20-25% of the population (Arikunto, 2010). The population in this study was the number of MAN 3 Mandailing Natal students, which was 718 people, so the sample studied was 15% of the population, which means it consisted of 108 MAN 3 Mandailing Natal students.

This research is descriptive in nature which aims to describe the state or status of existing phenomena. Descriptive research focuses on describing and describing the situation being analyzed. The method used in this research is the survey method, with data collection techniques through questionnaires. The survey method explained by is a type of research

that involves many subjects and aims to collect opinions or information about the status of a symptom at the time the research is conducted (Arikunto, 2013). Data regarding students' knowledge about the use, storage, and disposal of veterinary drugs were obtained using the pretest and posttest methods given to seminar participants. The process began with a pretest given before the seminar to measure the participants' initial level of knowledge on the topic to be discussed. The pretest included a series of questions designed to evaluate the participants' understanding of the correct practices in the use, storage and disposal of veterinary drugs. After the seminar was completed, a posttest was administered to participants with the aim of assessing the improvement in their knowledge following the seminar materials. The posttest contained the same questions as the pretest, allowing for a direct comparison between initial knowledge and knowledge after the seminar. The results of these two tests were analyzed to determine the effectiveness of the seminar in improving participants' understanding and to identify the extent to which the information delivered during the seminar had influenced students' knowledge of veterinary drug management.

3. RESULTS & DISCUSSION

The number of samples in this study were 108 students at MAN 3 Mandailing Natal, which were divided into 38 male students and 70 female students. The condition of the community service participants is limited to whether they have pets and whether they have ever given oral medication to their pets. Based on the results of the pretest and posttest conducted (Table 1), it is known that 71 participants who have pets and 37 people do not have pets. The pets owned included dogs, cats, chickens, otters, birds, fish, sugargliders, and rabbits.

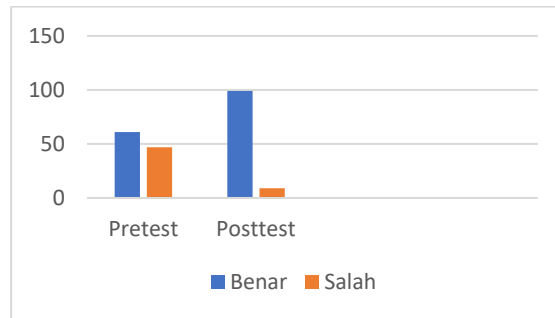
Table 1. Overview of participants' conditions.

Criteria	Pretest answer		Posttest answer	
	Yes	No	Yes	No
Having a pet	71	37	71	37
Ever given medicine orally to a pet	43	65	48	60

The pretest results in the table above show that there are 43 students who have given oral veterinary medicine to their pets, while 65 others have never given oral veterinary medicine. The posttest results show an increase to 48 students who have given oral medication to animals and 60 students have never given oral medication to animals. The increase in the number of students who have given veterinary medicine orally to pets is due to the fact that during the seminar students were given the opportunity to try a direct demonstration of giving medicine orally to pets. Respondents were given the opportunity to choose the correct answer on how to administer peroral medication to pets. The first option is by pressing the side of the mouth with the hand, after the mouth is open, the medicine can be inserted, then the area under the neck is gently rubbed. The second option is that the medicine can be given directly into the animal's mouth by forcibly and quickly inserting the fingers into the pet's mouth. Out of 108 students, 61 students answered correctly on the procedure for administering drugs orally to pets, while 47 students

answered incorrectly on the procedure for administering veterinary drugs orally. These results can be seen in the picture below:

Figure 1. How to administer veterinary drugs orally

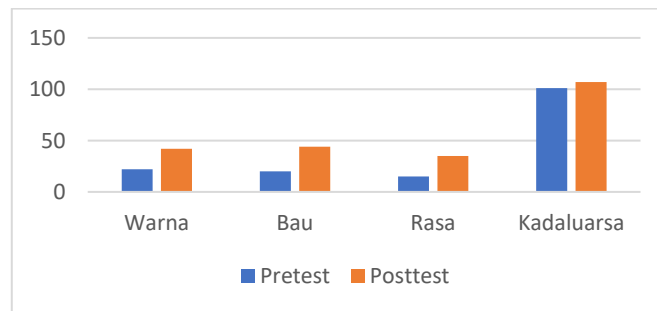


Based on the figure above, 99 people answered correctly during the posttest after the seminar, while the remaining 9 people answered incorrectly. This shows an increase in the number of student respondents who answered correctly, which is an increase of 38 people or 62.3%. How to give medicine orally to pets is by pressing the side of the mouth using the hand, after the mouth is open, the medicine is inserted, then the area under the neck is gently stroked. This pressure aims to open the animal's mouth, while gently stroking the neck area aims to stimulate the swallowing reflex, so that the drug can be swallowed properly and enter the pet's stomach.

Raja et al (2018) state that drug storage can be divided into two categories, namely general and special. Drug storage in general includes several important rules including drugs should be stored out of the reach of children, drugs should be stored in their original packaging and in tightly closed containers to maintain their quality, storage areas should be cool and protected from direct sunlight exposure, drugs should not be left in cars for long periods of time, and expired drugs should be disposed of immediately and not stored. There are different guidelines for tablet/capsule drugs and liquid drugs. Tablets and capsules should be stored in a place that is not hot or humid to prevent deterioration, while liquid medicines should not be stored in a refrigerator or freezer to avoid freezing, unless the instructions on the etiquette or medicine packaging suggest such storage. Based on the way the medicine is stored, the medicine that can still be stored is the one that has not

changed, color, smell, taste, and expiration date. Respondents' answers can be seen in the following figure:

Figure 2. Category of drugs that cannot be stored

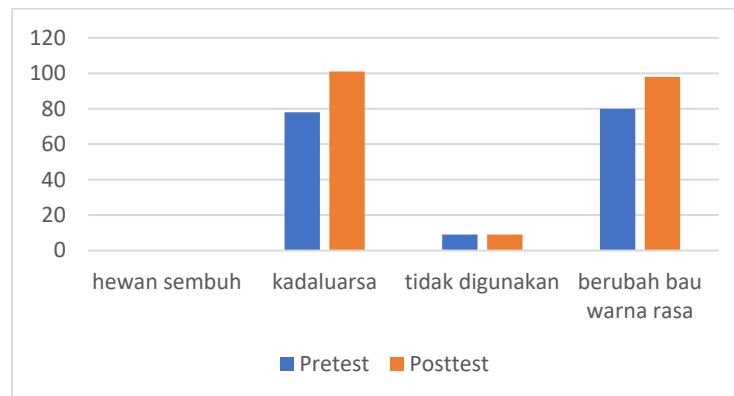


Respondents who answered that the drugs that changed color during the pretest were 22 students, increasing during the posttest to 42 students. This shows an increase of 90.9%. Respondents who answered that the medicine had a change in odor during the pretest were 20 students, increasing during the posttest to 44 students. This shows an increase of 120%. Respondents who answered that the medicine had a change in taste during the pretest were 15 students, increasing during the posttest to 35 students. This shows an increase of 133%. Respondents who answered drugs that have expired during the pretest were 101 students, increasing during the posttest to 107 students. This shows an increase in knowledge by 5.9%.

Respondents were asked the appropriate time to dispose of medicine. The pretest answers were 0 respondents answered after the animal recovered from the disease, 78 people answered after the medicine expired, 9 people answered when the medicine was no longer in use, 80 people answered after the medicine changed its smell, taste, and color. Posttest answers were 0 respondents answered after the disease was cured, 101 people answered after the drug expired, 9 people answered when the drug was no longer used, and 98 people answered after the drug changed its smell, taste, and color. The most appropriate answers to the question of when to dispose of medicine were after the medicine has expired and after the medicine has changed its color, smell and taste. The percentage increase in the respondent's knowledge score about medicine should be disposed of after the animal has recovered from the disease is 0%, medicine should be disposed of after expiration is 29%, medicine should be disposed of after not being used is 0%, and medicine should be

disposed of after the medicine changes its smell, taste, and color is 22.5%. The results can be seen in the figure below:

Figure 3. The medicine is discarded when it has already been experienced



Respondents were given a choice of the correct way to dispose of medicines, including disposal with household waste, disposal in the sewer, disposal in the toilet, or the medicine is taken out of the package and crushed (for solid medicine) and then disposed of mixed household waste and medicines containing antiviral, antibacterial, antifungal, chemoterapeutic should not be disposed of directly in the toilet. The most appropriate answer to this question is the last one. A total of 108 students during the pretest answered that the medicine is taken out of the package and crushed (for solid medicine) then disposed of mixed household waste and medicine containing antiviral, antibacterial, antifungal, chemotherapy should not be disposed of directly into the toilet. A total of 108 students during the posttest answered that the medicine is taken out of the package and then crushed (for solid medicine) and then disposed of with household waste and drugs containing antiviral, antibacterial, antifungal, chemotherapy should not be disposed of directly into the toilet. This shows that all respondents knew the correct way to dispose of medicine. The proper way to dispose of medicine is to take the medicine out of the package, then grind it first (for solid medicine) before disposing it along with household waste. Grinding and mixing the medicine with household waste aims to prevent the medicine from being picked up by scavengers and resold. Medicines such as antiviral, antibacterial, antifungal, and chemotherapy should not be disposed of directly into the toilet as they can disrupt normal flora and environmental balance. Medicines that have the potential to affect other living things should be disposed of by lowering their effectiveness first before being discharged into the environment.

From this community service activity, researchers managed to collect data related to increasing the knowledge and understanding of MAN 3 Mandailing Natal student participants regarding how to treat veterinary drugs, starting from the method of administering drugs orally to pets, criteria for drugs that can still be stored, proper drug storage procedures, the right time to dispose of drugs, to the correct way to dispose of drugs. This finding shows that education through seminars and hands-on demonstrations

that we conducted in community service activities were able to influence respondents' knowledge in the correct use, storage and disposal of veterinary drugs.

4. CONCLUSION & SUGGESTION

There was an increase in the knowledge of MAN 3 Mandailing Natal students about how to give peroral drugs, drugs that can still be stored, how to store drugs correctly, when drugs should be disposed of, and how to dispose of veterinary drugs correctly after they received education in community service with the theme Increasing the Understanding of MAN 3 Mandailing Natal Students about the Use, Storage, and Management of Veterinary Drug Waste through Seminars and Educational Demonstrations.

A recommendation for future research would be to expand the scope of the study to include a broader outreach on various types of medications. Rather than focusing solely on medications administered orally, it would be beneficial for future researchers to also address topical medications, which are applied directly to the skin. By doing so, students could gain a more comprehensive understanding of how different medications work depending on their method of administration. Furthermore, it is crucial to provide detailed explanations regarding medications administered via injection. This would enable students to not only grasp the basic principles behind each type of medication but also to differentiate between oral, topical, and injectable forms. Such an expanded approach would enhance students' overall knowledge and prepare them better for practical applications in the medical field, ultimately enriching their learning experience and deepening their understanding of pharmacology.

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