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INTRODUCTION Antibiotics are the most frequently prescribed, sold, and used drugs around the world1. In developing countries, many antibiotics are available without a prescription and cause someone to use antibiotics wisely2,3. Careless use of antibiotics causes the organism to adapt to antibiotics. Furthermore, it causes a decrease in the effectiveness of the antibiotics and resistance, which initially only occurs in hospitals but gradually also in the community4,5. The latest report from the World Health Organization (WHO) in Antimicrobial Resistance: Global Report on Surveillance also shows that Southeast Asia has 64% of antibiotic use without a prescription and the highest in cases of antibiotic resistance.

WHO released data that at least 2,049,442 cases were due to antibiotic resistance, and 23,000 of them died6. According to Riset Kesehatan Dasar (Riskesdas, Basic Health Research) 2013 results, 103,850 (35.2%) of 294,959 households in Indonesia stored drugs for self-medication or self-medication, including antibiotics obtained without a physician's prescription amounting to 86.1%. South Kalimantan Province is the third highest in Indonesia (90.6%) of households that store antibiotics without a doctor's prescription7. Knowledge and attitudes are social cognitive factors that are interrelated with one another. Based on the results of Kurniawan et al.8

study, there was a relationship between the level of knowledge about antibiotics and the use of antibiotics without a physician's prescription in Teling Atas Community Health Center, East Indonesia. This is reinforced by Fimanggara et al.9, which states that there is an influence of knowledge on the use of antibiotics among College Students in Jatinangor. Banjarbaru City is one of the areas in South Kalimantan Province, Indonesia. Cempaka is the only rural area in Banjarbaru City10. There is no drugstore and pharmacy in the Village of Cempaka. Rural communities usually have low knowledge about medicine and have limited access to health services and medicines11.

Limited access to health services and medicines, which is generally due to low-income levels, is one of the problems in rural areas. This is further exacerbated by the lack of availability of health personnel and drug information services in primary health facilities so that it has the potential to encourage the practice of antibiotic self-medication12. The limited health facilities available in Cempaka District could be one of the causes of the lack of information about drugs, and this is thought to affect the use of appropriate antibiotics. Pratiwi et al.13 reports that knowledge and attitudes influence the rationality of antibiotic use behavior. Therefore, the study aimed to investigate knowledge and the attitude toward using antibiotic use among the public in the Village of Cempaka, Banjarbaru.

MATERIALS AND METHODS Materials Data collection was carried out using a

questionnaire, which was adopted and modified according to the circumstances of the local population from several reports13-17. The questionnaire used was a structured questionnaire consisting of an informed consent sheet and the main questionnaire sheet: Part I. Socio-demographic Data of Respondents (gender, age, highest education level, and monthly income); Part II. Antibiotic knowledge (definition of antibiotics, their classification, for example, indications, use, resistance, side effects, and place of purchase); Part III.

Attitudes toward Antibiotic Use (attitude of using antibiotics, how to get antibiotics, when to use antibiotics, and antibiotic recommendations to friends or family). The questionnaire could be accessed at http://bit.ly/kuesioner-pengetahuan-sikap-antibiotik Methods This research was a descriptive and observational analytic study by a cross-sectional survey approach. Data collection was performed by using a questionnaire as a research instrument. The independent variable in this study was knowledge of antibiotic use among the public rural Village of Cempaka, while the dependent variable was the attitude toward antibiotic use among the public rural Village of Cempaka.

This research was conducted in the Village of Cempaka (Figure 1), including sub district of Palam, Bangkal, Sungai Tiung, and Cempaka. The research was conducted between January to April 2019. The population in this study was 34,853 people in the Village of Cempaka10. The sample in this study was selected randomly using a proportional stratified random sampling technique18. The number of samples was calculated using a formula with an error of 5% and a confidence level of 95%—the number of samples calculated based on Formula 119. / Figure 1. Research location (Cempaka Village) ??= ??. ?? 2 1- ?? 2 .??.?? ?? 2 ??-1 + ?? 2 1- ?? 2 .??.?? ... [1] n : Sample size N : The sample size of the target population (Palam, Bangkal, Sungai Tiung, and Cempaka) p : Estimated proportion (prevalence) of the dependent variable in the population q = 1 – p Z : Z statistic (e.g. Z = 1.96 for ? = 0.05) d : Delta, the absolute precision or desired margin of error on either side of the proportion The inclusion criteria in this study included: Permanent residents or residents who have lived for more than six months in the study area Adults 18-65 years Using antibiotics in the last six months.

While the exclusion criteria in this study included: People who were not willing to be respondents People who experience problems in communication (deaf and mute) People who were sick, so it would be difficult for researchers to communicate Health workers. The univariate analysis aims to explain or describe the characteristics of each research variable. The form of univariate analysis depends on the type of data. For numerical data, the mean or average, median, and standard deviation are used. In general, this analysis only produces a frequency distribution and percentage of each

variable20. The level of knowledge and attitude towards antibiotic use is classified according to Widoyoko21, as listed in Tables I and II.

Bivariate analysis was carried out on two variables thought to be related or correlated. The data interpretation was seen from the significance value. If the significance value obtained was <0.05, it could be concluded that variables 1 and 2 have a strong relationship, vice versa20. Table I. Level of knowledge21 Score _Category _ _15-21 _Good _ _8-14 _Moderate _ _1-7 _Poor _ _ Table II. Level of attitude towards antibiotic use21 Score _Category _ _23-44 _Positive _ _12-22 _Moderate _ _0-11 _Negative _ _ RESULTS AND DISCUSSION Socio-demographic data of respondents More female respondents in this study were 55.5% (207) than male respondents with 45.5% (173). Age characteristics show an age range of 18-40 years with 72.1% (274), while the age range of 41-65 years was 27.9% (106). This shows that more people were on productive age in the Village of Cempaka.

The education level shows that the residents of the Village of Cempaka have a low level of education, as evidenced by a large number of people who graduate from primary schools with 51.6% (196), junior high school graduates with 25.8% (98), high school graduates with 20.3% (77), and college/university graduates with 2.4% (9). Meanwhile, the characteristics of the monthly income of Village of Cempaka people who earn <South Kalimantan Province Minimum Wage (UMP) in 2019 (Rp. 2,651,781, -) were 85.5% (326), and those who earn >UMP was 14.5% (54). Complete data on the characteristics of the respondents were presented in Table III. Table III.

Socio-demographic data of respondents (n= 380) Variables _Frequency (n) _Percentage (%) _ _Gender _ _Male Female _173 207 _45.5 55.5 _ _Age (years old) _ _ _ _18-40 41-65 _274 106 _72.1 27.9 _ _Highest education level _ _Elementary school Junior high school Senior high school College/University _196 98 77 9 _51.6 25.8 20.3 2.4 _ _Monthly income _ _< South Kalimantan UMP in 2019 (Rp. 2,651,781, -) > South Kalimantan UMP in 2019 (Rp. 2,651,781, -) _326 54 _85.5 14.2 _ _ Knowledge of respondents on antibiotics use Definition of antibiotics Antibiotics fight bacterial infections with a correct answer of 97.1% (369); this was in line with research conducted by Oh et al.15, which reported that respondents understood that antibiotics were used for bacterial infections by 76.7%. It can be concluded that most of the Village of Cempaka residents understand that antibiotics were intended at fighting infections caused by bacteria.

However, on the other hand, as many as 80.3% (350) of the public believe that antibiotics could cure viral infections. This was different from Oh et al.15, which reported that respondents were unsure that antibiotics could cure viral infections. These findings might be due to people's ignorance of the difference between bacteria and viruses.

Furthermore, 77.1% (293) of the public believed that antibiotics could be used for all types of infections. This was supported by direct interviews with the community, with frequent use of antibiotics during fever, flu, cough, and tract infections.

Hence, it can be assumed that most people did not fully understand the use of antibiotics; people think that antibiotics could be used to fight all types of infections. The results of this study were consistent with previous studies conducted by Al Rasheed et al.22, which reported that antibiotics were most often used independently in coughs, sore throats, fevers, and colds. The results of this study indicate that there is irrationality in the use of antibiotics. According to Pavyde et al.23, irrational use of antibiotics reflected a patient's failure to comply with clinical instructions regarding how to use antibiotics and inappropriate antibiotic prescribing. The rational use of antibiotics should be based on the correct indications.

Example of antibiotics The sub-dimension of antibiotic drug samples obtained results as much as 95.8% (364) answered correctly that amoxicillin was an antibiotic drug, so it was concluded that the majority of people know examples of antibiotics. This was following previous research conducted by Fernandez24, who reported that most respondents knew that amoxicillin was an example of an antibiotic drug as much as 80.56%. Furthermore, 53.3% (202) of the public answered correctly that paracetamol was not an example of an antibiotic drug. This was the same as research conducted by Oh et al.15, which reported that 66.6% of respondents thought paracetamol was an antibiotic. This was possible.

Because people were free to find antibiotics at the nearest food stall, the same thing as paracetamol which could be purchased at the nearest shop, and the use of antibiotics and paracetamol together when they were not feeling well. As many as 53.9% (209) of the public answered that the CTM/chlorpheniramine was not an example of an antibiotic. This follows the research by Oh et al.15, which reported that respondents disagreed that this allergy drug was included as an antibiotic. It can be concluded that the majority of the knowledge in the Village of Cempaka already knows about examples of antibiotics. Role of antibiotics The results in the sub-dimension of the role of antibiotics show that as many as 77.4% (294) of the public understand that antibiotics were not used to treat pain and inflammation. This was different from research conducted by Oh et al.15, which reported that respondents answered incorrectly that antibiotics were used to treat pain and inflammation. The community misinterprets the role of antibiotics to treat fever as much as 63.4% (241).

This was in line with the research of Al Rasheed et al.22, which reported that people use antibiotics when they have a fever, and the public knows that digestive tract infections

use antibiotics as much as 75.8% (288). This was in line with research by Mouhieddine et al.16, which reported that antibiotics (penicillin) were used for digestive infections (53.1%). It can be concluded that the majority of people are well-informed and understand the role of antibiotics. Administration of antibiotics The sub-dimension of antibiotic administration was 56.1% (213), in which the majority of people did not know that antibiotics should not be taken two tablets at the same time. This was in line with Kim et al.14, which reported that respondents believed that the dosage two times the effect was faster. It can be concluded that the irrational use of antibiotics, especially because of inappropriate doses, can lead to resistance to antibiotics in the future.

Most people also did not know that antibiotics must be spent even though the condition has recovered from an illness by 61.1% (232). This is reinforced by WHO6, which reported that from 12 countries, including Indonesia, as many as 53-62% people stopped taking antibiotics when they felt they were better. This is due to laziness, which the community acknowledges retaking medicine when they feel cured even though the medicine is still left.

The majority of people understand that the efficacy of antibiotics would decrease if the antibiotics were not consumed by 62.6% (234). This was in line with a study conducted by Mouhieddine et al.16, with 59% of people knowing that the efficacy of antibiotics would decrease if not spent. Antibiotics resistance The results in the sub-dimensions of knowledge about antibiotic resistance were 62.6% (238). Most people know that if antibiotics were not used up, the bacteria would be resistant to antibiotics. This was different from research conducted by Kim et al.14, which reported that only 42.5% of respondents know that bacteria would be resistant if the antibiotic were less than the prescribed dose. Most people did not know that if antibiotics were used less than the specified dose, it would cause bacteria resistance to antibiotics by 37.4% (144). This was in line with Kim et al.14, which reported that respondents knew as much as 42.5% the use of antibiotics less than the prescribed dose would cause the bacteria to become resistant to antibiotics.

The majority of people know that excessive use of antibiotics would cause bacteria to be resistant to this antibiotic 58.4% (222). This is confirmed by Mouhieddine et al.16, which reported that people know that excessive use of antibiotics could cause bacteria to be resistant to antibiotics. Adverse effects of antibiotics The results in the sub-dimensions of knowledge about the side effects of antibiotics, 62.6% (238) of the public know that a person could experience allergies to antibiotics. This is in line with Mouhieddine et al.16, which reported that 66.7% of respondents know that a person can experience an antibiotic allergy.

Most people did not know that antibiotics have side effects of 52.1% (198). This is in contrast to research conducted by Kim et al.14, which reported that respondents know that 70.5% of antibiotics have side effects, with the results of interviews conducted reporting that they did not feel any side effects from the antibiotics they were taking. The community knew that nausea and vomiting were among the adverse effects of the antibiotics by 55.8% (212). It can be concluded that the sub-dimension of knowledge on the side effects of antibiotics in the Village of Cempaka community is quite good.

Place of antibiotics purchase The results in the sub-dimensions of knowledge about the place of antibiotics purchase, the majority of people know that antibiotics could only be purchased at pharmacies by 53.4% (203). In comparison, only 15% (57) of the public knew that antibiotics could not be purchased at drugstores. Lastly, 23.9% (91) of the public knew that antibiotics could not be purchased at the shop. The complete results of this section were presented in Table IV. Table IV. Knowledge of respondents on antibiotics use Statements _Correct
n (%) _Incorrect n (%) _ _Definition of antibiotics _ _Antibiotics work to fight infection bacteria _369 (97.1) _11 (2.9) _ _Antibiotics are drugs that can treat infections because of a virus _350 (80.3) _75 (19.7) _ _Antibiotics can cure all kinds of infections _293 (77.1) _87 (22.9) _ _Example of antibiotics _ _Amoxicillin is an antibiotic _364 (95.8) _16 (4.2) _ _Paracetamol is an antibiotic _202 (53.2) _178 (46.8) _ _CTM is not an antibiotic _205 (53.9) _175 (46.1) _ _Role of antibiotics _ _Antibiotics can be used to treat taste pain and inflammation _294 (77.4) _86 (22.6) _ _Antibiotics can be used for treat fever _136 (36.6) _241 (63.4) _ _Antibiotics can be used to treat infections digestive tract _288 (75.8) _92 (24.4) _ _Administration of antibiotics _ _If you take 2 tablets of antibiotics in one take, the drug will be work faster _213 (56.1) _197 (43.9) _ _You can stop using antibiotics when you get better, even if it's antibiotics has not been exhausted _232 (61.1) _148 (38.9) _ _Antibiotics efficacy will decrease if antibiotics are not spent _234 (61.6) _136 (38.4) _ _Antibiotics resistance _ _If the use of antibiotics is not spent, the bacteria will become resistant to it antibiotics _238 (62.6) _142 (37.4) _ _The use of antibiotics less than the prescribed dose will cause bacteria are not resistant to antibiotics _236 (62.1) _144 (37.9) _ _Excessive use of antibiotics can cause bacteria resistant to antibiotics _222 (58.4) _158 (41.6) _ _Adverse effects of antibiotics _ _A person can experience allergies when using antibiotics _238 (62.6) _142 (37.4) _ _Antibiotics have no effect side _198 (52.1) _182 (47.9) _ _Nausea and vomiting are side effects of antibiotics _212 (55.8) _168 (44.2) _ _Place of antibiotics purchase _ _Antibiotics can only be purchased at the pharmacy _203 (53.4) _177 (46.6) _ _Antibiotics can purchased at the Drugstore _323 (85) _57 (15) _ _Antibiotics can be purchased at the shop _289 (76.1) _91 (23.9) _ _ Attitude of respondents towards antibiotics use Attitude towards antibiotics use The data shows that 35.8% of respondents (136) did not agree that they expect the physician to prescribe antibiotics if they had a headache.

This proves that the public understands that there was no need for antibiotics for headaches, and as much as 51.8% (162) disagreed with taking antibiotics if you felt unwell. This is in line with Oh et al.15, who reported that 53.3% of respondents did not agree to take antibiotics when they felt unwell; this shows that people have understood that there is no need to take antibiotics when they are not feeling well. The majority of the community, 59.7% (227), agree that they would see the expiration date before taking antibiotics. This is the same as research by Oh et al.15, which reported that 92.2% of respondents agreed to see an expired label on the package before taking antibiotics.

This confirms that the community is careful before taking antibiotics.The majority of people did not agree that if they catch the flu, they take antibiotics to get better quickly, as much as 26.1% (99). This is in line with research from Kim et al.14, which reported that respondents disagreed with the use of antibiotics when exposed to flu so that they quickly get well. People already understand that antibiotics cannot speed up the recovery of a person with flu. Most people did not agree to keep antibiotic stocks at home for emergencies by 57.1% (217). They agreed that taking antibiotics should be done according to the instructions on the packaging label. Previous research15 reported that 80.1% of respondents disagreed with antibiotics being kept for emergencies. This is true because antibiotics must be consumed within a predetermined time25. Most people agree that taking antibiotics must see the label instructions on the drug packaging by 73.9% (281). This was in line with previous research15, which reported that respondents took antibiotics following the instructions from the drug packaging label by 98.1% by looking at packaging labels to minimize errors when taking antibiotics.

Source of antibiotics The data shows that respondents agreed to choose antibiotics prescribed by physicians rather than nurses, with 69.5% (264). Antibiotics must be obtained using a doctor's prescription because inappropriate use of antibiotics can cause resistance. His research also states that only 32% use prescriptions to get antibiotics. This suggests that most of the Village of Cempaka community understands that antibiotics could only be prescribed by physicians rather than nurses. As much as 40.8% (155) of respondents disagree with media statements that the internet helps determine the right antibiotic. This shows that respondents understand that the internet should not be used to determine the right antibiotic.

Antibiotics recommendations for colleagues and family As many as 66.6% (253) of respondents disagree with giving antibiotics to sick families. This illustrates that respondents understood that there was no need to give antibiotics to families who were sick. As many as 58.4% (222) of respondents answered that they agree not to give antibiotics to sick friends. This illustrates that respondents understand that antibiotics

did not need to be recommended to friends who were sick. As much as 57.6% (219) of respondents answered that they did not agree to give antibiotics to sick neighbors.

This illustrates that respondents understand that antibiotics did not need to be handed over to sick neighbors. This is in line with a study conducted by Oh et al.15, which reported that as many as 88.2% did not agree to give antibiotics when their family was sick. This is appropriate because antibiotics can only be purchased at pharmacies with a doctor's prescription. The complete results of this section were presented in Table V. Table V. Attitude of respondents towards antibiotics use Statements _Strongly Disagree n (%) _Disagree n (%) _Agree n (%) _Strongly Disagree n (%) _ _Attitude towards antibiotics use _ _When I have a headache, I expect the doctor to prescribe antibiotics _8 (2.1) _136 (35.8) _211 (55.5) _25 (6.6) _ _I will take antibiotics when I don't feel well _12 (3.2) _162 (51.8) _197 (51.8) _12 (3.2) _ _Before taking antibiotics, I will check their expiration date _5 (1.3) _30 (7.9) _227 (59.7) _118 (31.1) _ _I keep a stock of antibiotics at home for emergencies _6 (1.6) _160 (42.1) _217 (48.2) _31 (8.2) _ _When I caught a cold I would take antibiotics to get better soon _14 (3.7) _99 (26.1) _217 (57.1) _50 (13.2) _ _I took antibiotics according to the directions on the medicine package label _4 (1.1) _37 (9.7) _281 (73.9) _58 (15.3) _ _Source of antibiotics _ _I would prefer an antibiotic prescribed by a doctor over a nurse _5 (1.3) _43 (11.3) _264 (69.5) _68 (17.9) _ _I believe the internet is helpful in determini-ng the right antibiotic _14 (3.7) _155 (40.8) _191 (50.3) _20 (5.3) _ _Antibiotics recommendations to colleagues and family _ _I will suggest antibiotics to my family who are sick _29 (7.6) _253 (66.6) _92 (24.2) _6 (1.6) _ _I am not going to suggest antibiotics to my friend who is sick _8 (2.1) _125 (32.9) _222 (58.4) _25 (6.6) _ _I will suggest antibiotics to my neighbor who is sick _25 (6.6) _219 (57.6) _125 (32.9) _11 (2.9) _ _ The results of the questionnaire assessment regarding the level of knowledge of the Village of Cempaka community in this study was included in the moderate category with 83.2% (316) of respondents.

The results of the questionnaire assessment were divided into three categories concerning the attitude of using antibiotics, viz positive, moderate, and negative. Most residents had positive attitudes toward antibiotic use, with 97.4% (370). This was the same as research conducted by Pratiwi et al.13 in the people of the village of East Lampung district, which reported that 60% of people's attitudes towards antibiotics were in a positive category. Complete results were presented in Figures 2 and 3. / Figure 2. Level of knowledge towards antibiotics use at the Village of Cempaka / Figure 3.

Level of attitude towards antibiotics use at the Village of Cempaka Association between the level of knowledge and attitude towards antibiotics use The analysis of the association between the level of knowledge and attitude towards antibiotics was used by bivariate analysis. It was known that there were 33.3% that had an expected

frequency of less than 5, so the chi-square test could not be used; instead, the Kruskal-Wallis test was used by looking at the significant value on the test statistics. The asymp sig was 0.216; this value is >0.05, which means there was no significant association between knowledge and attitude towards antibiotics use among the public in the Village of Cempaka.

Attitudes are influenced by several factors, including personal experience, which must leave an impression26. CONCLUSION The majority of the knowledge of antibiotics in the Village of Cempaka has a moderate level of knowledge, 83.2%. It is recommended for appropriate authorities to conduct strategic planning to enhance proper antibiotic use by targeting rural areas besides the general public in cities or suburban areas. Although the attitude towards antibiotic use in the Village of Cempaka has a positive level of 97.4%. There is no significant association between both knowledges of antibiotics and attitude towards antibiotic use in the Village of Cempaka.

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