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Knowledge, Attitude, and Practice of Self-Medication Among the Population of Balikpapan During COVID – 19 Pandemic

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ABSTRACT

Over the past three years, the COVID-19 pandemic has caused significant changes in people's lives. One of the significant changes was the increase in self-medication activities. This study aims to provide an overview of the knowledge, attitudes, and practices among Balikpapan's population in self-medication during the COVID-19 pandemic. A total of 385 respondents were obtained from October 2022 until January 2023. The average value of respondents's self-medication knowledge was 64.39% ± 21.37, with 28.6% included in the category of having good knowledge, while 37.9% and 33,55% of respondents had moderate and poor knowledge, respectively. The average self-medication attitude score was 74.60% ± 8.69, with most respondents having a neutral attitude towards self-medication (69.6%). In comparison, 38.1% of respondents had a positive attitude, and 2.3% had a negative attitude. The most common symptoms reported for self-medication included flu (22.12%), fever (20.92%), and cough (20.84%). The drugs most used by respondents in self-medication were paracetamol (29.09%), antacids (11.42%), mefenamic acid (4.17%), and cough syrup (3.95%). Inappropriate self-medication practices found that 13.54% of drugs used and 9.23% kept were prescription-only drugs, including antibiotics. Of 48.05% of respondents inappropriately disposed of expired drugs.

INTRODUCTION

Over the past three years, the COVID-19 pandemic has caused significant changes in people's lives. One of the significant changes that occurred in people's lives during the COVID-19 pandemic was the increase in self-medication activities. Self-medication is an effort to choose and use medicines to treat self-recognized illnesses or symptoms (Susheela *et al.*, 2018). According to data obtained from the Central Statistics Agency, the percentage of the population who carry out self-medication during the COVID-19 pandemic has increased. The percentage of the population in Indonesia who carried out self-medication in 2020 was 72.19% and has increased from 2021 to 2022, namely 84.23% and 84.34%, respectively. Meanwhile, in East Kalimantan, the percentage of the population who self-medicated in 2020 was 67.93%, which then experienced a quite large increase in 2021 to 84.37% and has increased again in 2022 to 85.24%.

The implementation of self-medication, if carried out correctly, can be beneficial, such as being able to relieve mild symptoms or complaints that are easily recognized, increasing

self-satisfaction because patients can play an active role in making personal health decisions, being more practical, saving time and money, and can help reduce the economic burden on the health care system (Bennadi, 2014). However, in practice, errors in drug use in self-medication still often occur, especially due to inaccuracies in drug selection and dosage. If these errors occur continuously and over a long period, it is feared that it will have a negative impact on health (Fadlillah, 2021). In addition, some studies show an increase in the incidence of adverse drug reactions (ADR) related to self-medication during the COVID-19 pandemic. Research by Gras et al. (2021) shows that ADR reporting related to self-medication in 2020 in the French pharmacovigilance data center was 3.7%, which has increased compared to the number of ADR reports related to self-medication in 2019, which was 1.6%.

Knowledge about self-medication plays an important role in self-medication practice. Therefore, in carrying out self-medication, a person needs to have good knowledge of self-medication so that they can avoid detrimental things that can arise from inappropriate self-medication practice. Based on data on community self-medication activities, which were quite high during the COVID-19 pandemic, it is necessary to show data on whether the community has a good level of knowledge, attitudes, and self-medication practice. The lack of research regarding self-medication among Balikpapan city residents during the COVID-19 pandemic has made this problem a consideration for conducting this research. It is hoped that the results of this can serve as a guide for professional health workers in determining appropriate interventions and as a guide in making policies for the Balikpapan city government, especially the Health Service and related agencies. To increase self-medication knowledge and promote rational self-medication practice.

METHODS

The research design used was descriptive observational research. This research was conducted among the population of Balikpapan, East Kalimantan province, Indonesia. Before the research was conducted, the research proposal was approved by the Health Research Ethics Committee of the Faculty of Medicine, Muhammadiyah University of Surakarta, with reference number 4576/B.1/KEPK-FKUMS/XI/2022.

Research Sample

The inclusion criteria for this study were Balikpapan city residents aged 17-64 years who had carried out self-medication during the COVID-19 pandemic and were willing to be respondents. The minimum sample size was determined based on Lwanga & Lemeshow (1991) equation with a population of Balikpapan city residents of productive age (15-64 years) of 466,190 people (Balikpapan Central Statistics Agency, 2021) with a 95% confidence interval and a 5% margin of error, and the minimum number was obtained. The minimum sample was 384 respondents.

Research Instrument

This research used a questionnaire that consisted of 4 parts developed by researchers with validated by experts. The first part is the demographic identity of the respondent, which consists of the respondent's gender, age, domicile, marital status, level of education, occupation, monthly income, and distance from the respondent's resident to health facilities. The second part concerns the level of self-medication knowledge with 12 multiple choice questions consisting of 4 domains, namely knowledge related to getting medicine, using medicine, storing medicine, and disposing of medicine. The third part of the questionnaire contains 12 multiple-choice questions regarding self-medication attitudes consisting of 4 domains, namely attitudes towards obtaining medication, using medication, storing medication, and disposing of medication. The fourth part of the questionnaire contains 11 short answer questions regarding self-medication practice.

Before data collection was carried out, validity and reliability tests were first carried out with a test sample of 30 respondents. The number of question items before the validity and reliability test was 16 items in the knowledge section and 16 items in the attitudes section. Validity testing was carried out using the Pearson product-moment correlation method, with table value $r = 0.3494$ ($\alpha = 0.05$). The results of the validity test showed that there were four invalid question items in the self-medication knowledge level section and four invalid question items in the self-medication attitude

section. These invalid question items were then not included in the research questionnaire. The reliability test was carried out using Cronbach's Alpha analysis method with a reliability coefficient value of >0.70 (Yusup, 2018). The reliability test results show a reliability coefficient value of 0.839 for the self-medication knowledge section of the questionnaire and 0.789 for the self-medication attitude section. Both parts of the questionnaire met the requirements for a reliability coefficient value of > 0.70, so the questionnaire was declared reliable.

Data Collection

The data collection technique was carried out using the convenience sampling method. The electronic questionnaire research instrument used is *Google Forms*, and it was distributed from October 2022 to January 2023 through social media. Before filling out the questionnaire, respondents received a written explanation regarding the research objectives, respondent inclusion criteria, and the definition of self-medication by reading the informed consent page listed at the beginning of the questionnaire.

Data Analysis

Questions in the knowledge level domain are scored according to the respondent's answers. The favorable question with a correct answer is given a value of 1 (one), and questions with an incorrect or "don't know" answer are given a value of 0 (zero). Meanwhile, for the unfavorable question type, each question with an incorrect answer is given a value of 1 (one), and questions with a correct or "don't know" are given a value of 0 (zero). The maximum score that can be obtained is 12. The respondent's score is then processed into a score in percentage form with equation (2). Then, the respondent's level of knowledge was categorized according to *Bloom's cut-off point*. If the percentage value is in the range of 80%–100% (score 10-12), the respondent is categorized as having a high knowledge of self-medication. Suppose the percentage value is in the range of 60%–79% (score 7-9). In that case, the respondent is categorized as having moderate knowledge, and if the percentage value is <60% (score <7), the respondent is categorized as having poor self-medication knowledge.

The attitude domain questionnaire questions are measured based on a *Likert scale* with a score of (5) Strongly Agree, (4) Agree, (3) Doubtful, (2) Disagree, and (1) Strongly Disagree for the favorable question type. For the unfavorable questions, the score is (1) Strongly Agree, (2) Agree, (3) Doubtful, (4) Disagree, and (5) Strongly disagree. The maximum score that can be obtained is 60. The respondent's score is then processed into a score in percentage form with equation (2). Then, the respondents' attitudes are categorized according to *Bloom's cut-off point*. If the percentage value is in the range of 80%–100% (score 48-60), then the respondent is categorized as having a positive self-medication attitude. Suppose the percentage value is in the range 60%–79% (score 36-47). In that case, the respondents are categorized as having a neutral self-medication attitude, and if the percentage value is <60% (score <36), the respondent is categorized as having a negative self-medication attitude (Mannasaheb *et al.*, 2021). Responses to self-medication knowledge and attitudes were analyzed using the *IBM SPSS Statistics version 21* program and presented in the form of percentages and mean ± SD. In contrast, the demographic characteristics of respondents and answers to the self-medication practice section of the questionnaire were analyzed and presented in the form of numbers (N) and percentages.

RESULT AND DISCUSSION

A total of 385 respondents participated in this research, mostly female (78.13%) and 17-24 years old (84.41%), students (58.70%), and had an income under IDR 2,000,000 (62.60%) (**Table 1**). These results are in line with research by Pariyana et al. (2021), that the majority of respondents who carried out self-medication during the COVID-19 pandemic in the city of Palembang were women (64%), 46% of respondents were students, and 56% had monthly incomes below the regional minimum wage. Research on self-medication practice in the city of Bengkulu in 2022 by Susilo & Meinisasti (2022) also showed that 64% of respondents who carried out self-medication were women, and there was a relationship between the gender variable and self-medication practice (p=0.043).

Table 1. Demographic Characteristics of Respondents (n=385)

No	Respondents characteristic	N	%
1	Gender		
	Women	301	78.13
	Men	84	21.88
2	Age group (years old)		
	17-24	325	84.41
	25-34	13	3.38
	35-44	23	5.97
	45-54	21	5.45
	55-64	3	0.78
3	Subdistrict domicile		
	South Balikpapan	115	29.87
	North Balikpapan	111	28.83
	Central Balikpapan	64	16.62
	Balikpapan City	50	12.99
	East Balikpapan	27	7.01
	West Balikpapan	18	4.68
4	Marital Status		
	Single	324	84.16
	Married	61	15.84
5	Level of education		
	Junior high school	4	1.04
	High School	213	55.32
	Associate's degree	38	9.87
	Undergraduate degree	124	32.21
	Post-graduate degree	6	1.56
6	Occupation		
	Employee	76	19.74
	Entrepreneur	11	2.6
	Teacher/lecturer	11	2.86
	Housewife	31	8.05
	Student	226	58.70
	Healthcare Professional	4	1.04
	Freelance	3	0.78
7	Monthly Income		
	<IDR 2.000.000	241	62.60
	IDR 2.000.000 – IDR 3.118.397	42	10.91
	IDR 3.118.398 – IDR 4.000.000	20	5.19
	IDR 4.000.001 – IDR 5.000.000	30	7.79
	>IDR 5.000.000	52	13.51
8	Distance from respondent's residence to healthcare facility		
	<1 km	120	31.17
	1-2 km	146	37.92
	>2 km	119	30.91

The majority of respondents had a high school education (55.32%), were in the age group of 17-24 years (84.41%), and were single (84.16%). In research on self-medication practice during the COVID-19 pandemic in Wonosobo district by Amalia *et al.* (2022), the majority of respondents who carried out self-medication during the COVID-19 pandemic were also respondents with a high school education (71.96%), and were in the 18-25 year age group (74.76%). Self-Medication Knowledge

The level of knowledge is one of the indices of public health development. A good level of public knowledge shows that the public understands the importance of rational self-medication practice (Ministry of Health of the Republic of Indonesia, 2020). The average self-medication knowledge score of 385 respondents was 64.39 ± 21.37%, with 28.6%, 37.9%, and 33.5%

categorized as having high, moderate, and low levels of knowledge, respectively. This shows that the majority of respondents already have the knowledge needed to carry out rational self-medication. Similar results were also obtained in research by Wicaksono *et al.* (2022). The average level of knowledge of the people of Magelang City during the COVID-19 pandemic was categorized as moderate level, with a score of 59.56.

Most respondents (>50%) were able to answer questions in the domain of using medicine and storing medicine correctly. However, in the domain of getting medicine and disposing of medicine, there are still several questions that have not been answered correctly. Only 44.7% of respondents answered the first question correctly in the domain of getting medicine, while 42.8% answered "don't know" and 12.5% answered incorrectly (**Table 2**). This can indicate that the majority of respondents do not understand the classification of drugs. Knowledge regarding the classification of drugs, especially over-the-counter drugs and limited over-the-counter drugs, is important knowledge for the public to understand before doing self-medication. If people understand the classification of drugs, the detrimental impacts of inappropriate drug use in self-medication can be avoided (Wicaksono *et al.*, 2022).

The question that most of the respondents still have not answered correctly in the domain of dispensing medication is the last question item (**Table 2**). Many respondents do not know that before throwing away medication. The packaging must first be separated, such as by removing the lid from the packaging. Pharmaceutical waste that is not handled correctly can increase the risks of misuse, which can lead to illegal drugs or fake medicines, which can have a greater impact both in terms of health and social (Ministry of Health of the Republic of Indonesia, 2021).

Table 2. Response to the Self-Medication Knowledge Questionnaire

Domain	Item	Expected ideal response	Respondent's Answers (%)		
			correct	incorrect	don't know
Getting Medicine	Q1. Medicines that have a blue circle with a black outline on the packaging can be purchased without prescription	correct	44.7	12.5	42.8
	Q2. Medicines that have a green circle with a black outline on the packaging can be purchased without a prescription	correct	53.0	7.0	40.0
	Q3. Antibiotic drugs (for example, Amoxicillin) can be purchased at shops or supermarkets	incorrect	31.0	57.8	11.2
Using Medicine	Q1. It is better to chew antacids rather than swallow them directly	correct	77.4	11.2	11.4
	Q2. Use of CTM drugs can cause drowsiness	correct	77.9	2.3	19.8
Storing medicine	Q1. Medicines can be stored not in the original packaging	incorrect	21.3	58.7	20.0
	Q2. Medicines that are still in their original packaging may be stored in a place exposed to direct sunlight	incorrect	4.9	89.9	5.2
	Q3. Medicines can be stored in the car for long periods	incorrect	3.4	84.1	12.5
Disposing of medicine	Q1. The left-over contents of the medicine don't need to be removed from the packaging when being thrown away	incorrect	17.4	61.3	21.3
	Q2. liquid medicine can be thrown directly in the trash	incorrect	19.2	56.4	24.4
	Q3. Medicine packaging in the form of a box must be cut first before being thrown away.	correct	70.9	5.2	23.9
	Q4. The ointment/cream cap does not need to be thrown away separately from the packaging	incorrect	27.5	40.6	31.9

Self-Medication Attitude

The average value of the self-medication attitude obtained was 74.60% ± 8.69. Most respondents (69.60%) had a moderate self-medication attitude, while 28.1% and 2.3% had high and low attitudes, respectively. Similar results were also presented by research (Sukrawi, 2021). The self-medication attitude of the people of Palembang City during the COVID-19 pandemic mostly tended to be positive (63.8%), and another 36.2% were in the negative category. Attitudes are closely related to beliefs and practice, so attitudes can be used as a predictor of a person's interest in practice (Pakpahan *et al.*, 2021).

Based on **Figure 1**, some 53%-89% respondents were able to correctly answer the questions in the domain of getting medicine and storing medicine. In contrast, in the domain of using medicine and disposing of medicine, the majority of respondents (>50%) had not answered the question correctly. One of the questions that has not been answered correctly is about using the same medicine for productive coughs and dry coughs. This can be influenced by the respondent's knowledge of the differences between dry cough medicine and productive cough medicine. According to research results by Nugraha and Suwendar (2021), about 57.14% of respondents did not know the difference between expectorant cough medicine and antitussive cough medicine, and about 59.52% found it difficult to know the difference between the cough medicine they consumed. A lack of knowledge regarding the difference between cough medicines can cause errors in the selection and use of cough medicines. Accuracy in choosing medication according to the type of cough is a very important factor that has an impact on the maximum effectiveness of therapy (Nugraha and Suwendar, 2021). One way to avoid errors in drug selection in self-medication is to read the drug information on the packaging (Kementerian Kesehatan RI, 2020).

Figure 1. Respondents respond to Self-Medication Attitude Questions

The first question that many respondents answer incorrectly in the domain of disposing of medication is the question regarding throwing away eye drops that have been opened for more than one month (**Figure 1**). The beyond-use date or storage time for eye drops that have been opened is 30 days, so eye drops that have been opened for more than 30 days cannot be used because they are at risk of being contaminated with germs (Indonesia Food and Drug Administration, 2005). If the eye drops are not thrown away immediately, it is feared that the medicine will be reused, and there is a risk of causing further irritation and side effects. The

next question that most respondents could not answer correctly was the question of throwing away medication without removing the remaining contents first. The main principle in managing pharmaceutical waste, especially in the household, is to remove the drug contents from the primary packaging (Ministry of Health of the Republic of Indonesia, 2021). This principle applies to both solid and liquid medicines, so it can be said that the majority of respondents still do not understand the principles of disposing of medicines correctly.

The number of respondents who answered questions incorrectly regarding self-medication attitudes in the domain of disposing of medicines was similar to respondents' response in the self-medication knowledge section. Most respondents also did not answer correctly in the knowledge section on disposing of medicines (**Figure 1**). Knowledge is the basis for making decisions and determining actions to face the problems faced (Pakpahan *et al.*, 2021). In the context of this research, it can be understood that the respondent's knowledge can also determine attitudes regarding the issue of self-medication. It can be said that the majority of respondents do not have good knowledge, and this has an impact on attitudes that tend to be negative in the disposal of medicines.

Self-Medication Practice

Most respondents (41.15%) had done self-medication for less than one month, as presented in **Figure 2.** This data shows that self-medication is still an option for most respondents to deal with complaints or symptoms of disease. This is supported by research by Sukrawi (2021), which shows that 63.8% of respondents from Medan city residents agree with the implementation of self-medication during the COVID-19 pandemic, which has increased compared to before the COVID-19 pandemic, 59% of respondents from Medan city residents do not agree with the implementation of self-medication before the pandemic.

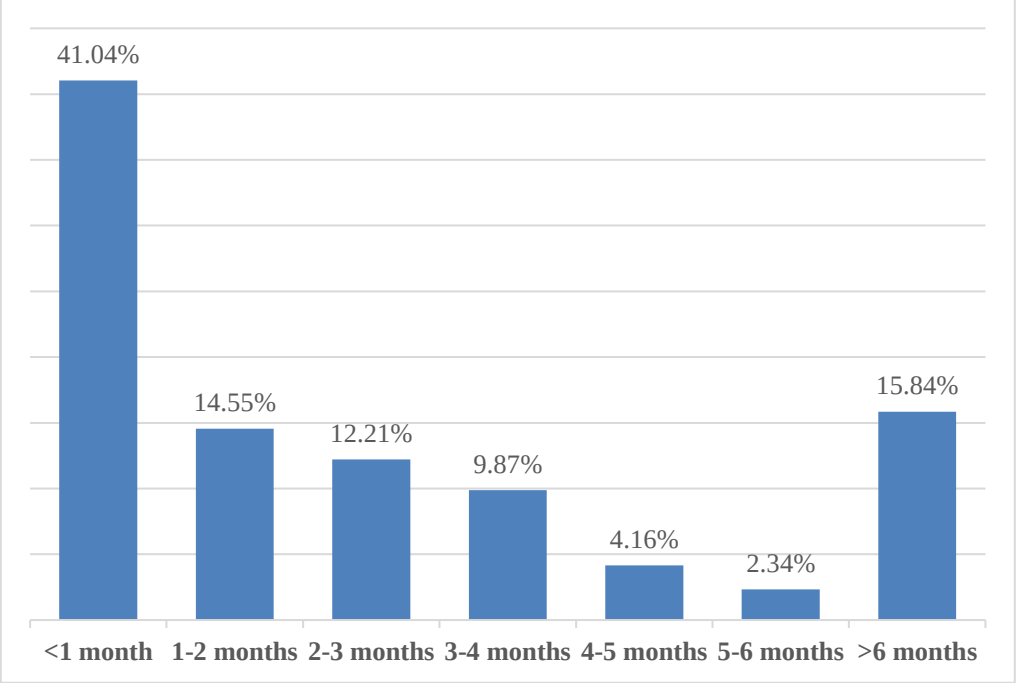

Figure 2. Last time doing self-medication

Based on Table 3, the most common reasons respondents chose to carry out self-medication included mild pain (54.53%), saving time (17.96%), emergency (15.98%), and cheaper (10.87%). Most respondents obtained information on self-medication based on personal or family experience (65.81%) (Table 3). This shows that the majority of respondents carried out self-medication based on previous experience, so it is very important to ensure that self-medication has been carried out rationally in the first place because it has the potential to be carried out again on other occasions. If self-medication has been carried out irrationally from the start, it is feared that this practice will continue in the future. The majority of respondents obtained medicines for self-medication from pharmacies (88.31%), supermarkets (4.42%), and drug stores (3.64%).

Table 3. Complaints/Symptoms, Reasons, Sources of Information, and Sources of Drugs in Carrying Out Self-Medication

Complaints/Symptoms of Illnesses	N (1331)	%
Flu	295	22.16
Fever	278	20.89
Cough	277	20.81
Indigestion	163	12.25
Pain	151	11.34
Diarrhea	113	8.49
Fungal skin infection	44	3.31
Allergy	4	0.30
Sore throat	2	0.15
Anemia	1	0.08
Emergency contraception	1	0.08
Dry eyes	1	0.08
Wound	1	0.08
Reasons for self-medication	N (607)	%
Mild pain	331	54, 5 3
Saving time	109	17, 96
Emergency	97	15.98
Cheaper	66	10.87
Have a supply of medicine	4	0.66
Information on self-medication	N (389)	%
Personal/family experience	256	65.81
Recommendations from others	68	17.48
Print/electronic media advertising	44	11.31
Internet	12	3.09
Pharmacist recommendation	6	1.54
Recommendations from other health professionals	3	0.77
Source of medicine for self-medication	N (385)	%
Pharmacy	340	88.31
Supermarket	17	4.4 2
Drug store	14	3.64
Roadside stall	12	3.12
Given by other people	2	0.52

The drugs most frequently used by respondents in self-medication include paracetamol (29.12%), antacids (11.43%), mefenamic acid (4.18%), and cough syrup (3.96%). About 13.54% of drugs used during self-medication are prescription-only, including antibiotics, which are amoxicillin (48.08%), FG troches meiji ® (15.38%), and ampicillin (1.92%). Apart from antibiotics, other prescription-only drugs used by respondents are corticosteroids, such as methylprednisolone (9.62%), dexamethasone (5.77%), and other

prescription-only drugs, as listed in **Table 4**. Research on community self-medication practice in the city of Medan by Sukrawi (2021) also shows that 8.9% of the drugs used by respondents are antibiotics. Research on the use of antibiotics by Karuniawati *et al.* (2020) shows that most respondents still access antibiotics without a doctor's prescription. Other research by Karuniawati *et al.* (2023) also shows that 16% of respondents are self-medicating with antibiotics, with the most widely used antibiotics being amoxicillin and tetracycline. Research on the behavior of antibiotic use among the population of Boyolali also showed that as many as 40% of respondents received antibiotics without a doctor's prescription (Karuniawati *et al.*, 2021).

Table 4. Prescription-only medicines that have been used & Medicines Stored for Self-Medication

Prescription-only medicine used for Self-Medication	N (52)	%
Amoxicillin	25	48.08
FG Troches Meiji ® (Fradiomycin 2.5 mg, Gramicidin-S HCl 1 mg)	8	15.38
Methylprednisolone (oral)	5	9.62
Ambroxol	4	7.69
Dexamethasone (oral)	3	5.77
Domperidone	3	5.77
Loperamide	2	3.85
Lansoprazole	1	1.92
Ampicillin	1	1.92
Medicines Stored for Self-Medication	N(531)	%
Paracetamol	153	28.81
Antacid	66	12.38
Mefenamic acid	32	6.03
Paratusin® (Paracetamol 500 mg, glyceryl guaicolate 50 mg, phenylpropanolamine HCl 15 mg, noscapine 10 mg, chlorpheniramine maleate 2 mg)	12	2.26
Amoxicillin	10	1.88
Bodrex® (Paracetamol 600 mg, caffeine 50 mg)	10	1.88
Paramex® (Paracetamol 250 mg, propyphenazone 150 mg, caffeine 50 mg, dexchlorpheniramine maleate 1 mg)	9	1.69
Diapet ® (*Psidii Guajava Folium* 240 mg, *Curcumae Domestica Rhizoma* 204 mg, *Terminalia Cherbulae Fructus* 64 mg, *Punicae Granati PericaIDRium* 72 mg)	8	1.51
FG Troches Meiji® (Fradiomycin 2.5 mg, gramicidin-S HCl 1 mg)	8	1.51

Prescription-only medicines are medicines that can only be purchased at pharmacies with a prescription (Department of Health of the Republic of Indonesia, 2007), so the use of prescription-only medicines in self-medication is a form of irrational self-medication practice. According to data obtained by WHO, the majority of drug use in the world (>50 %) is used irrationally. Irrational use of drugs can result in therapy being ineffective and inefficient, which can develop into more serious health problems. Apart from that, the high use of antibiotics without a prescription can also cause serious bacterial resistance problems (Ministry of Health of the Republic of Indonesia 2020).

About 71.88% of respondents had medicine supplies for self-medication. The drugs that most of the respondents stored in the household are paracetamol (28.81%), antacids (12.38%), and mefenamic acid (6.03%) (**Table 4**). In addition, there are still respondents who still keep prescription-only drugs (6.97%), including antibiotics (3.77%). These medicines can be a leftovers from treatment for previous illnesses or can be deliberately purchased for self-medication supplies. The 2013 Basic Health Research results also show that 35.2% of Indonesians have a supply of medicines in the household, either obtained from a doctor's prescription or purchased independently. The proportion of people who stock up on prescription-only drugs without a reaches 81.9%, including antibiotics (Ministry of Health of the Republic of Indonesia, 2020). The high practice of storing medicines in households, including antibiotics and prescription-only medicines, can cause various health risks. This

problem must be one of special concern to the government and health workers, especially pharmacists.

During self-medication, 22.92% (n = 88) of respondents experienced side effects. The side effects most frequently experienced by respondents were drowsiness (77.45%) and nausea (4.90%). Most of the side effects experienced by respondents were in the mild category and could be handled by themselves. However, it cannot be ensured that the side effects experienced by respondents will not cause more serious impacts, especially if experienced by high-risk patients. The factor of knowledge regarding the side effects of the drug plays a very important role in preventing side effects during self-medication. Therefore, the role of professional medical personnel, especially pharmacists, is needed to provide education regarding the side effects of the drugs and the risks, especially in patients with certain conditions, such as pregnancy and breastfeeding women, elderly, children, and patients with decreased kidney and liver function.

Respondent's practice towards expired medicines included throwing away the medicine after removing the contents from the packaging (51.95%). In comparison, 47.53% of other respondents threw away the medicine without removing the content, and 52% of respondents still kept the expired medicine. More than 50% of respondents have shown good practice in disposing of medicines, but some still have not disposed of medicines properly and even keep expired medicines. Medicines that have passed their expiry date and are not disposed of immediately may be at risk of being accidentally reused by the owner. Medicines that have expired or are damaged must be disposed of in accordance with applicable guidelines, like removing the contents from the packaging and separating the parts of the packaging, both for solid medicines and liquid medicines (Ministry of Health of the Republic of Indonesia, 2021).

CONCLUSIONS

The average self-medication knowledge score of respondents was 64.39% ±21.37, with 28.6% of respondents categorized as having high knowledge, 37.9% of respondents with moderate knowledge, and 33.5% of respondents with low knowledge. The average self-medication attitude score was 74.60% ± 8.69, with the majority of respondents having a moderate attitude (69.6%). These two assessments show that the majority of respondents already have sufficient knowledge and attitudes to carry out rational self-medication. However, the majority of respondents (>50%) still do not understand how to properly dispose of medicines, which is indicated by quite a number of respondents who have not answered questions correctly, and there is still the inappropriate practice of disposing of expired medicines (48.05%). Moreover, there is still inappropriate self-medication practice (13.54%) of respondents use prescription-only drugs, including antibiotics, and (6.97%) keep prescription-only drugs, including antibiotics. The role of healthcare professionals, especially pharmacists, is needed. Increasing knowledge and appropriate self-medication practices can be implemented, such as promoting the "DAGUSIBU" and "GEMA CERMAT" campaigns to the community. It is hoped that with this research, the government and interested parties will always participate in continuing to promote rational self-medication practices.

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AUTHORS' CONTRIBUTIONS

Conceptualization: HK, NAT; Data curation: NAT; Analysis: HK, NAT; Project administration: NAT, WII; Supervision: HK; Validation: HK, WII; Writing original draft: NAT; Writing review and editing: HK, WII; All authors have read and agreed to the published version of the manuscript.

CONFLICT OF INTERESTS

All authors declare No. conflict of interest.

ETHICAL CONSIDERATION

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BIBLIOGRAPHY

Amalia, R.N., Annisaa', E. and Dianingati, R.S., 2022. Wonosobo Community Self-medication Behavior during the Covid-19 Pandemic. Majalah Farmaseutik, 18 (3), 290. https://doi.org/10.22146/farmaseutik.v18i3.66442

Balikpapan Central Statistics Agency, 2021. Results of the 2020 Balikpapan City Population Census. Berita Resmi Statistik, No.02/01/6, 1–8. Available in: https://balikpapankota.bps.go.id/pressrelease/2021/01/21/161/hasil-sensus-penduduk-2020-kota-balikpapan.html. [Accesessed on January 7th 2023]

Bennadi, D., 2014. Self-medication: A current challenge. Journal of Basic and Clinical Pharmacy, 5 (1), 19. doi: 10.4103/0976-0105.128253

Department of Health of the Republic of Indonesia, 2007. Guidelines for the Use of Over-the-counter and Limited Over-the-counter Drugs. Jakarta: Department of Health of the Republic of Indonesia.

Fadlillah, Z.N., 2021. Overview of the Level of Knowledge about Self-medication in the Community in Baciro Village and Terban Village Yogyakarta (Undergraduate thesis, Universitas Islam Indonesia-Faculty of Mathematics and Natural Science).

Gras, M., Gras-Champel, V., Moragny, J., Delaunay, P., Laugier, D., Masmoudi, K. and Liabeuf, S., 2021. Impact of the COVID-19 outbreak on the reporting of adverse drug reactions associated with self-medication. Annales Pharmaceutiques Francaises, 79 (5), 522–529. doi: 10.1016/j.pharma.2021.02.003

Indonesia Food and Drug Administration., 2005. How to Use the Drug Correctly. Available in: https://www.pom.go.id/new/view/more/berita/75/Cara-Penggunaan-Obat--yang-Benar.html. [Accesessed on July 07th 2022]

Karuniawati, H., Hassali, M.A.A., Suryawat,i S., Ismail, W.I., Taufik, T. and Wiladatika, A., 2020. Public practices towards antibiotics: A qualitative study. Clinical Epidemiology and Global Health, 8 (4), 1277–1281. DOI: 10.1016/j.cegh.2020.04.027

Karuniawati, H., Hassali, M.A.A., Suryawati, S., Ismail, W.I., Taufik, T. and Hossain, M.S., 2021. Assessment of knowledge, attitude, and practice of antibiotic use among the population of Boyolali, indonesia: A cross-sectional study. International Journal of Environmental Research and Public Health, 18 (16). DOI: 10.3390/ijerph18168258

Karuniawati, H., Suryawati, S., Sulaiman, S.A.S., Taufik, T., Ismail, W.I. and Hossain, M.S., 2023. Practice and associated factors determination of self-medication with antibiotics among community residents in Boyolali, Indonesia: A cross-sectional study. Journal of Applied Pharmaceutical Science, 13 (8), 227–235. DOI: 10.7324/JAPS.2023.104931

Lwanga, S.K. and Lemeshow, S., 1991. Sample Size Determination in Health Studies : A Practical Manual. Geneva: World Health Organization.

Mannasaheb, B.A., Al-Yamani, M.J., Alajlan, S.A., Alqahtani, L.M., Alsuhimi, S.E., Almuzaini, R.I., Albaqawi, A.F. and Alshareef, Z.M., 2021. Knowledge, attitude, practices and viewpoints of undergraduate university students towards self-medication: An institution-based study in Riyadh. International Journal of Environmental Research and Public Health, 18 (16). https://doi.org/10.3390/ijerph18168545

Ministry of Health of the Republic of Indonesia, 2020, Guidelines for the Implementation of the Smart Community Movement Program Using Drugs (GeMa CerMat), Jakarta: Ministry of Health of the Republic of Indonesia,

Ministry of Health of the Republic of Indonesia, 2021. Guidelines for the Management of Damaged and Expired Drugs in Health Care Facilities and Households. Jakarta: Ministry of Health of the Republic of Indonesia,

Nugraha, W. and Suwendar, 2021. Study on Self-medication Knowledge Patterns in Overcoming Cough Symptoms of Community in Cibeber Hamlet, Cikalong District, Tasikmalaya Regency, West Java. Pharmaceutical Proceedings, 7 (1), 78–87.

Pakpahan, M., Siregar, D., Susilawaty, A., Tasnim, Mustar, Ramdany, R., Manurung, E.I., Sianturi, E., Tompunu, M.R.G., Sitanggang, Y.F. and M M., 2021. Health Promotion &; Health Behavior, Medan: Yayasan Kita Menulis.

Pariyana, Mariana and Liana, Y., 2021. Self-medication Behavior During the Covid-19 Pandemic in Palembang City Community. Proceedings of the National Seminar STIKES syedza saintika, 403–415.

Sukrawi, F.H., 2021. The Influence of the COVID-19 Pandemic on the Self-medication Attitude of the People of Asam Kumbang Village in Medan City (Undergraduate thesis, Universitas Sumatera Utara-Faculty of Pharmacy)

Susheela, F., Goruntla, N., Bhupalam, P.K., Veerabhadrappa, K. V., Sahithi, B. and Ishrar, S., 2018. Assessment of knowledge, attitude, and practice toward responsible self-medication among students of pharmacy colleges located in Anantapur district, Andhra Pradesh, India. Journal of Education and Health Promotion, 7 (August), 1–6. DOI: 10.4103/jehp.jehp_175_17

Susilo, A.I. and Meinisasti, R., 2022, Analysis of Self-medication Practices in Bengkulu City. Journal of Nursing and Public Health Vol. 10 No. 2 Oktober 2022, 10 (2), 242–254. DOI: https://doi.org/10.37676/jnph.v10i2.3203

Wicaksono, A.B., Yuliastuti, F. and Nila ,S N.M.A., 2022. Level of Knowledge and Community Self-medication Behavior during the Covid-19 Pandemic in Magelang City. Journal of Clinical Pharmacy and Science. 2 (1), 66.

Yusup, F., 2018, Test of Validity and Reliability of Quantitative Research Instruments. Tarbiyah Journal: Educational Scientific Journal, 1 (1), 17–23. DOI: https://doi.org/10.18592/tarbiyah.v7i1.2100