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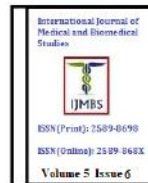
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[ARTICLES](#)

[PDF](#)

[RESEARCH ARTICLES](#)

[RESEARCH ARTICLES](#)

## DETERMINANTS OF SELF MEDICATION RATIONALITY IN PHARMACY VISITORS

GREACE SYLVANA MAIPAUW, MEIYANTI

[PDF](#)

[SHORT REVIEW](#)

## THE AUDITORY REACTION TIME MEASUREMENT WITH OBSERVER-BASED PSYCHOPHYSICAL PROCEDURE

YASAM YILDIRIM BASKURT, GUNAY KIRKIM

[PDF](#)

[MAKE A SUBMISSION](#)





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## DETERMINANTS OF SELF MEDICATION RATIONALITY IN PHARMACY VISITORS

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### Abstract

**Background:** As a developing country, Indonesia has a high prevalence of self-medication, with a potential risk of irrational use of drugs. Meanwhile, factors such as educational level, economic status, age, gender, knowledge level affect the rationality of drug use. Therefore, this study aims to analyze the factors related to the rationality of self-medication in order to improve drug use rationality in Indonesia.

**Method:** An observational analysis study was used with a cross-sectional design involving 193 pharmacy visitors. Furthermore, this study was conducted in April-May 2018, and data were collected through guided interviews and filling out questionnaires for socio-demographic data, level of self-medicated knowledge, and drug use rationality. Also, sampling was done by consecutive non-random sampling, and data analysis used SPSS V.21, Chi-square and Fisher statistical tests with a significance level of 0.05.

**Results :** Out of the 193 subjects, 59.6% were aged 17-25 years, 59.1% were female, 62.7% had moderate education level, 50.3% had moderate levels of self-medicated knowledge, and 70.5% were rational drug users. Based on the chi-square and Fisher test, it was found that gender, educational and knowledge levels were significantly related to treatment rationality with a value of  $p = 0.014$ ,  $p = 0.000$ , and  $p = 0.000$ .

**Conclusion:** There was a significant correlation between gender, educational level and level of self-medicated knowledge of the drug use rationality.

**Keywords:** self-medication, rationality, drugs

### Introduction:

Drug use rationality refers to the use of tailored drugs to an individual's clinical needs, in a dose and time period that suits these needs, and at an affordable price.<sup>(1)</sup> When an individual takes medication that is not in accordance with the definition of rational drug use, then such practice is said to be irrational, which can have an impact on morbidity and mortality.<sup>(1,2)</sup>

Self-medication is an individual's attempt to self-medicate. Furthermore, it is the use of drugs to treat symptoms without obtaining advice from a health professional or a doctor's prescription. It is the most common effort made by the community to overcome the symptoms of a disease before seeking help from health workers. The implementation of self-medication is based on the idea that the practice is sufficient to overcome health problems without consulting a doctor.<sup>(3)</sup> Another reason for self-medication is the increasingly high cost of medical treatment, insufficient time available for treatment, or lack of access to health facilities.<sup>(4,5)</sup>

Self-medication is practiced mainly to treat common diseases experienced by the community. It includes several conditions such as buying or obtaining drugs without a doctor's prescription, buying doctor's prescribed drugs for previous illnesses, sharing drugs with friends, relatives or other family members, and using leftover drugs stored at home. In fact, the diseases are usually treated with over-the-

counter drugs, limited over-the-counter drugs, and pharmacy mandatory drugs.<sup>(2,6,7)</sup>

Based on results of the 2013 Basic Health Research (RISKESDAS) in Indonesia, there were 103,860 or 35.2% of 294,959 households in Indonesia storing drugs for self-medication.<sup>(8)</sup> Furthermore, data from the World Health Organization (WHO) showed that there is still a high number of inappropriate drug use.<sup>(9)</sup>

It is often found that self-medication is very wasteful because of taking unneeded drugs, or it can be dangerous. For example, because of inaccordant use with the rules, there is a negative interaction between drugs. Also, when mistakes occur continuously for a long time, it is feared that it will have a negative impact on health.<sup>(2,5,6)</sup> Therefore, knowledge is the dominant factor in shaping one's actions. Previous studies on prevalence found that irrational use of self-medicated drugs was 40.6%<sup>(10)</sup>. This is similar to other African countries, where the prevalence was 75.5% and had various adverse effects.<sup>(11)</sup>

According to previous studies, it was found that self-medication knowledge was related to drug use rationality.<sup>(10)</sup> However, other studies found that there was no significant effect of knowledge level on drug use habit.<sup>(12)</sup> Also, some studies concluded that apart from knowledge, there are other factors related to self-medicated rationality such as attitude, gender, educational level, age,

occupational level, number of children, and residence.<sup>(13-15)</sup> Regarding the inconsistent results and possible factors associated with self-medication, further research is required. Therefore, this study aims to determine the factors associated with self-medicated rationality.

## Method

### 2.1 Research design

This study used an analytic observational method with a cross-sectional design, and was conducted at Apotik K-24, Tanjung Duren, West Jakarta from April to May 2018. The subjects were a total of 193 pharmacy visitors. Furthermore, the inclusion criteria were those aged 17-55 years, buying drugs for self-use, having a history of self-medication in the past 1 month, willing to be research subjects, and signed informed consent. Meanwhile, those unable to communicate effectively and bought drugs using a doctors prescription were excluded.

Data collection was carried out by interview using a questionnaire to determine socio-demographic characteristics (age, gender, education level), sources of drug information, places to obtain drugs, complaints/symptoms of disease, types of drugs used, and history of subjects taking self-medication in the last 1 month. Furthermore, the questionnaire to assess the respondent's level of self-medicated knowledge consists of 10 questions with a score of 1 for each correct answer.

Also, the level of self-medicated knowledge was categorized into poor levels at 0-4, moderate at 5-7, and good at 8-10. Six questions were used to assess the drug use rationality, with a score of 1 for each correct answer. Treatment rationality was classified as rational self-medication when the score was 6, and irrational when the score was 1-5. The data were descriptively presented in percentage. Furthermore, Chi-square and Fisher's tests were used to analyze the correlation between the level of self-medicated knowledge and treatment rationality. Also, the significance level used was 0.05.

This study protocol obtained ethical eligibility from the Medical Faculty Research Ethics Commission with No.33 / KER-FK / I / 2018.

## Results

Meanwhile, the majority of subjects were in the criteria for late adolescence 17-25 years with a total of 115 (59.6%), based on gender, as many as 114 people (59.1%) were females. Furthermore, based on educational level, it was found that most respondents had a moderate level. From the subjects with moderate knowledge level of 97 people (50.3%), 74 (38.3%) had a good level of self-medication, while the rest had a bad level. In addition, the rationality of treatment was obtained from the results that most subjects were included in the category of rational drug use as much as 70.5% (136 subjects). (Table 1).

**Table 1: Characteristics of Research Subjects ((n=193))**

Variable	n (%)
<b>Age (year)</b>	27,03 ± 9,81 ( $\bar{X} \pm SD$ )
Adolescence (17-25)	115 (59,6)
Adult (26-45)	59 (30,6)
Early elderly ( >45)	19 (9,8)
<b>Gender</b>	
Male	79 (40,9)
Female	114 (59,1)
<b>Education Level</b>	
Low (Junior high school)	17 (8,8)
Moderate (Senior high school)	121 (62,7)
High (Higher education)	55 (28,5)
<b>Level of Self-Medication Knowledge</b>	
Bad	22 (11,4)
Moderate	97 (50,3)
Good	74 (38,3)
<b>Rationality of Drug Use</b>	
Irrational	57 (29,5)
Rational	136 (70,5)

Chi-square test showed that the relationship between age and drug use rationality was not significant with a value of  $p = 0.708$ . Meanwhile, the chi-square test showed that the relationship between gender and drug use rationality was significant with a value of  $p = 0.014$ . Furthermore, Fisher's test showed that educational and self-medicated knowledge levels were significantly related to drug use rationality with a value of  $p = 0.000$  and  $p = 0,000$  (Table 2).

Table 2: The relationship between age, sex, educational level, self-medicated knowledge level and drug use rationality

Variable	Rationality of drug use			P
	No n (%)	Yes n(%)	Total n (%)	
<b>Age</b>				
Late adolescent	36 ( 31.3)	79 (68,7)	115 (100)	0.708
Adult	15 (25.4)	44 (74.6)	59 (100)	
Early elderly	6 (31.6)	13 ( 68.4)	19 (100)	
<b>Gender</b>				
Male	31 (39.2)	48 (60.8)	79 (100)	0.014*
Female	26 (22.8)	88 (77.1)	114 (100)	
<b>Education Level **</b>				
Low	16 (94.1)	1 (5.9)	17 (100)	0.000*
Moderate	30 (24.8)	91 (75.2)	121 (100)	
High	11 (20)	44 (80)	55 (100)	
<b>Self-medicated knowledge level**</b>				
Bad	22 (100)	0 (0)	22 (100)	0.000*
Moderate	35 (36.1)	62 (63.9)	97 (100)	
Good	0 (0)	74 (100)	74 (100)	

\* p&lt; 0.05 \*\* Fisher test

## Discussion

The results of this study showed that out of 193 respondents, most were aged  $\leq 45$  years, in late adolescent and adult categories with a percentage of 59.6% and 30.6%. The results were not different from previous studies which showed that self-medicated users were aged 18-35 years. Based on the knowledge level, it was found that the most respondents with a moderate level were 97 people (50.3%) with rational drug use of 136 respondents or 70.5%. These same results were obtained by previous studies that most of the respondents' knowledge level was moderate with the rational drug use range of 52-96%.<sup>(12,16)</sup> Furthermore, a fairly high level of rationality for drug use is possible due to the issuance of a decree by the minister of health related to free drugs distribution and limited over-the-counter drugs which aim to protect consumers regarding drugs quality. It also provides information that needs to be included on the drug product packaging related to dosage, indications, method of use, side effects and additional information to contact a doctor when pain persists.<sup>(7)</sup> Furthermore, when purchasing drugs for self-medication at a pharmacy, there is a service for consulting the pharmacist. The above matters greatly influence the increase in the rationality of using self-medicated drugs in Indonesia.

In this study, 59.1% of self-medication was carried out by women. In fact, they are mostly involved in treatment for themselves and their families, and as housewives, they usually provide backup drug at home. Other reasons for the higher prevalence of self-medication than men are due to

limited mobility outside the home. This made them attempt to treat their disease complaints before consulting health professionals. They also prefer self-medication because of its low cost.<sup>(5,17)</sup> Furthermore, this study showed that the majority of respondents buy drugs for self-medication at a pharmacy. Some factors that are considered for purchasing drugs at a pharmacy are more complete, guaranteed drugs, buyers can ask about which drugs can be purchased according to complaints or symptoms of the disease, and can consult on the usage. Apart from pharmacies, drugstores, supermarkets, and stalls are the preferred places to obtain drugs because they are closer to respondents' residence and cheaper. Also, sources of information on drugs used for self-medication come from personal experiences in accordance with the efficacy and suitability of drugs taken previously as well as advertisements from electronic and social media.<sup>(6,18)</sup>

The drugs that are mostly purchased for self-medication are limited or free class drugs to treat symptoms that arise such as influenza drugs, non-steroidal anti-inflammatory drugs to treat pain, and anti-pyretic drugs. These medications are used to treat complaints of coughs, colds, fever, and pain. Similar results were also shown from previous studies for both drug class and category used for self-medication.<sup>(6,19,20)</sup> There are various reasons for self-medication, which include complaints of minor illnesses, therefore there is no need to consult a doctor, cheaper than consultation fees, for initial treatment, emergency conditions, previously used the drugs, and others.<sup>(21)</sup>

Also, several factors are related to the use of self-medicated drugs such as age, gender, educational and knowledge level, occupation, economic level, location of residence, social, and local culture/customs.<sup>(15,17,21-23)</sup> The results showed no relationship between age and drug use rationality. The same results were obtained in previous studies that age was not related to the rationality of using self-medicated drugs.<sup>(24-25)</sup> This is because the current development of informatics technology makes information easy to obtain from advertisements, online sources, and drug information websites. Therefore, respondents' in late adolescence, adulthood, and early elderly can easily perform the rational treatment. Age is one of the factors that influence self-medication behavior. In fact, increasing age is related to a decrease in one's health due to the degeneration process which results in the emergence of several chronic diseases, inadequate food intake, and decreased immunity. Elderly patients with chronic disease will experience decreased medication adherence, and those with certain chronic disease conditions have an average compliance level, and it is related to the quality of life.<sup>(26)</sup> Also, lack of motivation to take drugs and a decrease in physical condition due to age causes various complaints. This will lead to the use of several drugs to simultaneously overcome complaints as an attempt to cure themselves. Meanwhile, different results are concluded by other studies that age has a significant effect on rational self-medication behavior. Therefore, lack of ability to obtain information via internet media and unavailability of health workers to provide information is a problem.<sup>(27)</sup>

This study showed that there is a relationship between gender and drug use rationality among pharmacy visitors. Also, gender can affect this rationality because females are more directly involved in the treatment of family members than males. In fact, females usually prepare certain medicines that can be used for emergencies such as fever, illness, and others. Furthermore, they often exchanged stories about disease conditions and medicines with their neighbors. These things will directly or indirectly influence rational treatment behavior. Nevertheless, this is different from other studies that gender does not significantly influence drug use rationality.<sup>(28)</sup>

The research data showed that there is a significant relationship between the educational level and the rationality of drug use among pharmacy visitors. Education is a basic human need for self-development, and a high level can increase intellectual maturity and insight. Furthermore, it has a significant effect on the drug use rationality in self-medication. A person with higher education has better knowledge than others. Therefore, education has an important role in determining human quality, where the higher a person's education, the more the life quality.<sup>(29)</sup> Also, educational level is related to economic level and concern about health and life quality. This level affects a person's understanding about the disease, management and prevention, therefore it will further increase rationality. The level of medicine and disease knowledge can be accessed through various media such as

leaflets, radio, television, internet and social media. Moreover, when drugs are used in the children group, the level of parental education greatly influences the adherence and treatment success.<sup>(30)</sup> In contrast to other research, it is concluded that there is no relationship between education and the behavior of independently using drugs. Meanwhile, respondent groups with a low education and knowledge level can still perform rational treatment, which can be supported by information through available media, such as television or labels on packages.<sup>(25)</sup> Information about active ingredients, dosage, method of use, and side effects can be found in limited free and over-the-counter drugs packages which are usually the choice for self-medication. This study showed that there is a relationship between the level of self-medication knowledge and drug use rationality. Knowledge greatly influences one's actions, and a comprehensive knowledge about drugs will affect rationality of use. This is related to dosage, duration of use, precaution, and adverse effects<sup>(2,14)</sup>. However, other research concluded that there was no significant effect between knowledge level and drug use habits. Also, the rationality of drug use is more influenced by the different attitudes, beliefs, values, health facilities, media, and health worker services.<sup>(16)</sup>

The ability to obtain or access information will have an effect on increasing knowledge. Meanwhile, some aspects that cause irrational drug use are lack of knowledge, lack of skills in analyzing or independently seeking drug information, improper promotion, lack of information from health personnel, lack of strict regulations and others. Furthermore, knowledge related to the advantages and disadvantages of self-medication influences the treatment rationality. The advantages include reduced health costs, as well as time and cost efficiency. Meanwhile, the disadvantages include increased load and expenditure due to adverse effects associated with irrational drug use, long-term independent use and side effects.<sup>(31-33)</sup> Furthermore, irrational treatment will cause drug resistance problems, especially antibiotic resistance. Delays in seeking appropriate medical advice, as well as drug-drug and food-drug interactions are a disadvantage of self-medication.<sup>(34)</sup> Although the prevalence is quite high in developing countries with various reasons and advantages, but in certain diseases, it is important to consult a health worker. Moreover, a good relationship between doctors and patients is an effective way to avoid inappropriate drug use. This is because doctors can provide information and instructions for properly using medicines, therefore drug use is rational.<sup>(2)</sup>

In this research implementation, there are limitations that it is necessary to consider other risk factors, such as economic level, access and available health facilities, family support, and health workers. In addition, it is important to consider other chronic diseases that affect treatment choice as well as drug-drug and drug-food interactions.

### Conclusion

This study concluded that there was a significant relationship between gender, educational level, and level of



self-medication knowledge towards drugs use rationality.

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# DETERMINANTS OF SELF MEDICATION RATIONALITY IN PHARMACY VISITORS

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## DETERMINANTS OF SELF MEDICATION RATIONALITY IN PHARMACY VISITORS

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### Abstract

**Background:** As a developing country, Indonesia has a high prevalence of self-medication, with a potential risk of irrationally using drugs. Meanwhile, factors such as educational level, economic status, age, gender, knowledge level affects the rationality of drug use. Therefore, this study aims to analyze the factors related to the rationality of self-medication in order to improve drug use rationality in Indonesia.

**Method:** An observational analysis study was used with a cross-sectional design involving 193 pharmacy visitors. Furthermore, this study was conducted in April-May 2018, and data were collected through guided interviews and filling out questionnaires for socio-demographic data, level of self-medicated knowledge, and drug use rationality. Also, sampling was done by consecutive non-random sampling, and data analysis used SPSS V.21, Chi-square and Fisher statistical tests with a significance level of 0.05.

**Results :** Out of the 193 subjects, 59.6% were aged 17-25 years, 59.1% were female, 62.7% had moderate education level, 50.3% had moderate levels of self-medicated knowledge, and 70.5% were rational drug users. Based on the chi-square and fisher test, it was found that gender, educational and knowledge levels were significantly related to treatment rationality with a value of  $p = 0.014$ ,  $p = 0.000$ , and  $p = 0.000$ .

**Conclusion:** There was a significant correlation between gender, educational level and level of self-medicated knowledge of the drug use rationality.

**Keywords:** self-medication, rationality, drugs

### Introduction:

Drug use rationality refers to the use of tailored drugs to an individual's clinical needs, in a dose and time period that suits these needs, and at an affordable price.<sup>(1)</sup> When an individual takes medication that is not in accordance with the definition of rational drug use, then such practice is said to be irrational, which can have an impact on morbidity and mortality.<sup>(1,2)</sup>

Self-medication is an individual's attempt to self-medicate. Furthermore, it is the use of drugs to treat symptoms without obtaining advice from a health professional or a doctor's prescription. It is the most common effort made by the community to overcome the symptoms of a disease before seeking help from health workers. The implementation of self-medication is based on the idea that the practice is sufficient to overcome health problems without consulting a doctor.<sup>(3)</sup> Another reason for self-medication is the increasingly high cost of medical treatment, insufficient time available for treatment, or lack of access to health facilities.<sup>(4,5)</sup>

Self-medication is practiced mainly to treat common diseases experienced by the community. It includes several conditions such as buying or obtaining drugs without a doctor's prescription, buying doctor's prescribed drugs for previous illnesses, sharing drugs with friends, relatives or other family members, and using leftover drugs stored at home. In fact, the diseases are usually treated with over-the-

counter drugs, limited over-the-counter drugs, and pharmacy mandatory drugs.<sup>(2,6,7)</sup>

Based on results of the 2013 Basic Health Research (RISKESDAS) in Indonesia, there were 103,860 or 35.2% of 294,959 households in Indonesia storing drugs for self-medication.<sup>(8)</sup> Furthermore, data from the World Health Organization (WHO) showed that there is still a high number of inappropriate drug use.<sup>(9)</sup>

It is often found that self-medication is very wasteful because of taking unneeded drugs, or it can be dangerous. For example, because of inaccordant use with the rules, there is a negative interaction between drugs. Also, when mistakes occur continuously for a long time, it is feared that it will have a negative impact on health.<sup>(2,5,6)</sup> Therefore, knowledge is the dominant factor in shaping one's actions. Previous studies on prevalence found that irrational use of self-medicated drugs was 40.6%<sup>(10)</sup>. This is similar to other African countries, where the prevalence was 75.5% and had various adverse effects.<sup>(11)</sup>

According to previous studies, it was found that self-medication knowledge was related to drug use rationality.<sup>(10)</sup> However, other studies found that there was no significant effect of knowledge level on drug use habit.<sup>(12)</sup> Also, some studies concluded that apart from knowledge, there are other factors related to self-medicated rationality such as attitude, gender, educational level, age,

occupational level, number of children, and residence.<sup>(13-15)</sup> Regarding the inconsistent results and possible factors associated<sup>3</sup> with self-medication, further research is required. Therefore, this study aims to determine the factors associated with self-medicated rationality.

## Method

### 2.1 Research design

This study used an analytic observational method with a cross-sectional design, and was conducted at Apotik K-24, Tanjung Duren, West Jakarta from April to May 2018. The subjects were a total of 193 pharmacy visitors. Furthermore, the inclusion criteria were those aged 17-55 years, buying drugs for self-use, having a history of self-medication in the past 1 month, willing to be research subjects, and signed informed consent. Meanwhile, those unable to communicate effectively and bought drugs using a doctors prescription were excluded.

Data collection was carried out by interview using a questionnaire to determine socio-demographic characteristics (age, gender, education level), sources of drug information, places to obtain drugs, complaints/symptoms of disease, types of drugs used, and history of subjects taking self-medication in the last 1 month. Furthermore, the questionnaire to assess the respondent's level of self-medicated knowledge consists of 10 questions with a score of 1 for each correct answer.

Also, the level of self-medicated knowledge was categorized into poor levels at 0-4, moderate at 5-7, and good at 8-10. Six questions were used to assess the drug use rationality, with a score of 1 for each correct answer. Treatment rationality was classified as rational self-medication when the score was 6, and irrational when the score was 1-5. The data were descriptively presented in percentage. Furthermore, Chi-square and Fisher's tests were used to analyze the correlation between the level of self-medicated knowledge and treatment rationality. Also, the significance level used was 0.05.

This study protocol obtained ethical eligibility from the Medical Faculty Research Ethics Commission with No.33 / KER-FK / I / 2018.

## Results

Meanwhile, the majority of subjects were in the criteria for late adolescence 17-25 years with a total of 115 (59.6%), based on gender, as many as 114 people (59.1%) were females. Furthermore, based on educational level, it was found that most respondents had a moderate level. From the subjects with moderate knowledge level of 97 people (50.3%), 74 (38.3%) had a good level of self-medication, while the rest had a bad level. In addition, the rationality of treatment was obtained from the results that most subjects were included in the category of rational drug use as much as 70.5% (136 subjects). (Table 1).

**Table 1: Characteristics of Research Subjects ((n=193)**

Variable	n (%)
<b>Age (year)</b>	27,03 ± 9,81 ( $\bar{X} \pm SD$ )
Adolescence (17-25)	115 (59,6)
Adult (26-45)	59 (30,6)
Early elderly ( >45)	19 (9,8)
<b>Gender</b>	
Male	79 (40,9)
Female	114 (59,1)
<b>Education Level</b>	
Low (Junior high school)	17 (8,8)
Moderate (Senior high school)	121 (62,7)
High (Higher education)	55 (28,5)
<b>Level of Self-Medication Knowledge</b>	
Bad	22 (11,4)
Moderate	97 (50,3)
Good	74 (38,3)
<b>Rationality of Drug Use</b>	
Irrational	57 (29,5)
Rational	136 (70,5)

Chi-square test showed that the relationship between age and drug use rationality was not significant with a value of  $p = 0.708$ . Meanwhile, the chi-square test showed that the relationship between gender and drug use rationality was significant with a value of  $p = 0.014$ . Furthermore, Fisher's test showed that educational and self-medicated knowledge levels were significantly related to drug use rationality with a value of  $p = 0.000$  and  $p = 0.000$  (Table 2).



**Table 2: The relationship between age, sex, educational level, self-medicated knowledge level and drug use rationality**

Variable	Rationality of drug use			P
	No n (%)	Yes n(%)	Total n (%)	
<b>Age</b>				
Late adolescent	36 (31.3)	79 (68.7)	115 (100)	0.708
Adult	15 (25.4)	44 (74.6)	59 (100)	
Early elderly	6 (31.6)	13 (68.4)	19 (100)	
<b>Gender</b>				
Male	31 (39.2)	48 (60.8)	79 (100)	0.014*
Female	26 (22.8)	88 (77.1)	114 (100)	
<b>Education Level **</b>				
Low	16 (94.1)	1 (5.9)	17 (100)	0.000*
Moderate	30 (24.8)	91 (75.2)	121 (100)	
High	11 (20)	44 (80)	55 (100)	
<b>Self-medicated knowledge level**</b>				
Bad	22 (100)	0 (0)	22 (100)	0.000*
Moderate	35 (36.1)	62 (63.9)	97 (100)	
Good	0 (0)	74 (100)	74 (100)	

\* p&lt;0.05 \*\* Fisher test

## Discussion

The results of this study showed that out of 193 respondents, most were aged  $\leq 45$  years, in late adolescent and adult categories with a percentage of 59.6% and 30.6%. The results were not different from previous studies which showed that self-medicated users were aged 18-35 years. Based on the knowledge level, it was found that the most respondents with a moderate level were 97 people (50.3%) with rational drug use of 136 respondents or 70.5%. These same results were obtained by previous studies that most of the respondents' knowledge level was moderate with the rational drug use range of 52-96%.<sup>(12,16)</sup> Furthermore, a fairly high level of rationality for drug use is possible due to the issuance of a decree by the minister of health related to free drugs distribution and limited over-the-counter drugs which aim to protect consumers regarding drugs quality. It also provides information that needs to be included on the drug product packaging related to dosage, indications, method of use, side effects and additional information to contact a doctor when pain persists.<sup>(7)</sup> Furthermore, when purchasing drugs for self-medication at a pharmacy, there is a service for consulting the pharmacist. The above matters greatly influence the increase in the rationality of using self-medicated drugs in Indonesia.

In this study, 59.1% of self-medication was carried out by women. In fact, they are mostly involved in treatment for themselves and their families, and as housewives, they usually provide backup drug at home. Other reasons for the higher prevalence of self-medication than men are due to

limited mobility outside the home. This made them attempt to treat their disease complaints before consulting health professionals. They also prefer self-medication because of its low cost.<sup>(5,17)</sup> Furthermore, this study showed that the majority of respondents buy drugs for self-medication at a pharmacy. Some factors that are considered for purchasing drugs at a pharmacy are more complete, guaranteed drugs, buyers can ask about which drugs can be purchased according to complaints or symptoms of the disease, and can consult on the usage. Apart from pharmacies, drugstores, supermarkets, and stalls are the preferred places to obtain drugs because they are closer to respondents' residence and cheaper. Also, sources of information on drugs used for self-medication come from personal experiences in accordance with the efficacy and suitability of drugs taken previously as well as advertisements from electronic and social media.<sup>(6,18)</sup>

The drugs that are mostly purchased for self-medication are limited or free class drugs to treat symptoms that arise such as influenza drugs, non-steroidal anti-inflammatory drugs to treat pain, and anti-pyretic drugs. These medications are used to treat complaints of coughs, colds, fever, and pain. Similar results were also shown from previous studies for both drug class and category used for self-medication.<sup>(6,19,20)</sup>

There are various reasons for self-medication, which include complaints of minor illnesses, therefore there is no need to consult a doctor, cheaper than consultation fees, for initial treatment, emergency conditions, previously used the drugs, and others.<sup>(21)</sup>

Also, several factors are related to the use of self-medicated drugs such as age, gender, educational and knowledge level, occupation, economic level, location of residence, social, and local culture/customs.<sup>(15,17,21-23)</sup> The results showed no relationship between age and drug use rationality. The same results were obtained in previous studies that age was not related to the rationality of using self-medicated drugs.<sup>(24-25)</sup>

This is because the current development of informatics technology makes information easy to obtain from advertisements, online sources, and drug information websites. Therefore, respondents' in late adolescence, adulthood, and elderly can easily perform the rational treatment. Age is one of the factors that influence self-medication behavior. In fact, increasing age is related to a decrease in one's health due to the degeneration process which results in the emergence of several chronic diseases, inadequate food intake, and decreased immunity. Elderly patients with chronic disease will experience decreased medication adherence, and those with certain chronic disease conditions have an average compliance level, and it is related to the quality of life.<sup>(26)</sup> Also, lack of motivation to take drugs and a decrease in physical condition due to age causes various complaints. This will lead to the use of several drugs to simultaneously overcome complaints as an attempt to cure themselves. Meanwhile, different results are concluded by other studies that age has a significant effect on rational self-medication behavior. Therefore, lack of ability to obtain information via internet media and unavailability of health workers to provide information is a problem.<sup>(27)</sup>

This study showed that there is a relationship between gender and drug use rationality among pharmacy visitors. Also, gender can affect this rationality because females are more directly involved in the treatment of family members than males. In fact, females usually prepare certain medicines that can be used for emergencies such as fever, illness, and others. Furthermore, they often exchanged stories about disease conditions and medicines with their neighbors. These things will directly or indirectly influence rational treatment behavior. Nevertheless, this is different from other studies that gender does not significantly influence drug use rationality.<sup>(28)</sup>

The research data showed that there is a significant relationship between the educational level and the rationality of drug use among pharmacy visitors. Education is a basic human need for self-development, and a high level can increase intellectual maturity and insight. Furthermore, it has a significant effect on the drug use rationality in self-medication. A person with higher education has better knowledge than others. Therefore, education has an important role in determining human quality, where the higher a person's education, the more the life quality.<sup>(29)</sup> Also, educational level is related to economic level and concern about health and life quality. This level affects a person's understanding about the disease, management and prevention, therefore it will further increase rationality. The level of medicine and disease knowledge can be accessed through various media such as

leaflets, radio, television, internet and social media. Moreover, when drugs are used in the children group, the level of parental education greatly influences the adherence and treatment success.<sup>(30)</sup> In contrast to other research, it is concluded that there is no relationship between education and the behavior of independently using drugs. Meanwhile, respondent groups with a low education and knowledge level can still perform rational treatment, which can be supported by information through available media, such as television or labels on packages.<sup>(25)</sup> Information about active ingredients, dosage, method of use and side effects can be found in limited free and over-the-counter drugs packages which are usually the choice for self-medication.

This study showed that there is a relationship between the level of self-medication knowledge and drug use rationality. Knowledge greatly influences one's actions, and a comprehensive knowledge about drugs will affect rationality of use. This is related to dosage, duration of use, precaution, and adverse effects.<sup>(2,14)</sup> However, other research concluded that there was no significant effect between knowledge level and drug use habits. Also, the rationality of drug use is more influenced by the different attitudes, beliefs, values, health facilities, media, and health worker services.<sup>(16)</sup>

The ability to obtain or access information will have an effect on increasing knowledge. Meanwhile, some aspects that cause irrational drug use are lack of knowledge, lack of skills in analyzing or independently seeking drug information, improper promotion, lack of information from health personnel, lack of strict regulations and others. Furthermore, knowledge related to the advantages and disadvantages of self-medication influences the treatment rationality. The advantages include reduced health costs, as well as time and cost efficiency. Meanwhile, the disadvantages include increased load and expenditure due to adverse effects associated with irrational drug use, long-term independent use and side effects.<sup>(31-33)</sup> Furthermore, irrational treatment will cause drug resistance problems, especially antibiotic resistance. Delays in seeking appropriate medical advice, as well as drug-drug and food-drug interactions are a disadvantage of self-medication.<sup>(34)</sup> Although the prevalence is quite high in developing countries with various reasons and advantages, but in certain diseases, it is important to consult a health worker. Moreover, a good relationship between doctors and patients is an effective way to avoid inappropriate drug use. This is because doctors can provide information and instructions for properly using medicines, therefore drug use is rational.<sup>(2)</sup>

In this research implementation, there are limitations that it is necessary to consider other risk factors, such as economic level, access and available health facilities, family support, and health workers. In addition, it is important to consider other chronic diseases that affect treatment choice as well as drug-drug and drug-food interactions.

## Conclusion

This study concluded that there was a significant relationship between gender, educational level, and level of

self-medication knowledge towards drugs use rationality.

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