




# The Relationship Between Knowledge Levels and Rationality of Analgesics Use in Self-Medication for Pain in Denpasar

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**Keywords:** Self-Medication for Pain, Analgesic, Knowledge Levels, Rationality.


**Abstract:** Background: Self-medication practices are not entirely safe, especially with irresponsible self-medication. The complaint most often reported as a reason for self-medication is pain. Although analgesics are effective and have a broad therapeutic index, they also have potentially serious side effects even when used in the right dosage; therefore, the self-medication practice for pain should be balanced with rational analgesic use. Objective: This study aimed to define the relationship between knowledge levels with the rationality of analgesic use in self-medication for pain in Denpasar. Methods: This study used a cross-sectional correlation design involving 196 respondents who used analgesics in self-medication for pain. Respondents were selected non-randomly, using consecutive sampling by distributing questionnaires in six pharmacies in Denpasar. Result: Among 196 respondents, the majority (60.7%) had low knowledge of analgesics used in self-medication for pain. Meanwhile, about half (50.5%) of respondents used analgesics irrationally in self-medication. Furthermore, the chi-square test found that there was a significant relationship between the level of knowledge and rational analgesic use in self-medication ( $p < 0.001$ ). Conclusion: Level of knowledge is significantly related to rational analgesic use in self-medication practices; therefore, it is necessary to provide appropriate information and education to the public about the rational use of analgesics in self-medication practices.


## 1 INTRODUCTION


Self-medication is an element of primary healthcare, in which a person treats their disease and condition with drugs that are approved and available without a prescription (WHO, 1998). Self-medication has several benefits in improving access to healthcare and services (Bennadi, 2013; Ruiz, 2010; Selvaraj, Kumar, & Ramalingam, 2014). However, self-medication is not entirely safe, especially with irresponsible self-medication practices (Ruiz, 2010). Previous studies found that 75% of people in Ethiopia chose self-medication to treat minor illnesses (Shafie, Eyasu, Muzeyin, Worku, & Martin-Aragon, 2018). Meanwhile, self-medication prevalence in Indonesia reached 57.4% in urban areas and 54.1% in rural areas (Kemenkes, 2010).

The most common complaint that encourages communities to conduct self-medication practices is pain (Rahmayanti, 2017; Shafie et al., 2018). Pain is a symptom that involves disturbances in the body such as inflammation, infection, and muscle spasms (Depkes, 2006). Pain can be treated by using analgesic drugs, which are substances that can reduce pain without eliminating consciousness (Tjay, 2015). Although analgesics are effective and have a broad therapeutic index, they also have potentially serious side effects even when used in the right dosage. Gastrointestinal disorders are one of the most common analgesic side effects. The prostaglandin inhibition mechanism in the gastric wall by analgesics can cause inflammation, bleeding, and ulceration (Abbott & Fraser, 1998).

A previous study found that the average frequency of analgesic use in self-medication by the community

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reached 10.71 times in a month (Halim, Setiadi, & Wibowo, 2018); therefore, is necessary to use analgesics rationally to avoid drug abuse and misuse (Depkes, 2006). The irrational analgesic use incidence varies widely across several regions in Indonesia, namely 20.8% in Kediri, 24.30% in Sidoarjo, 39% in Sukoharjo, 40.6% in Penyabungan, and 75% in Sukoharjo (Artini, 2020; Damayanti, 2017; Harahap, Khairunnisa, & Tanuwijaya, 2017; Husna & Dipahayu, 2017; Ilmi, Suprihatin, & Probosiwi, 2021). Inconsistent findings in terms of the relationship between knowledge levels and rational analgesic use in self-medication were also present in previous studies. Several studies in Indonesia found that knowledge levels were significantly related to rational self-medication using analgesics (Afifah, 2019; Husna & Dipahayu, 2017). Meanwhile, previous studies in Lilongwe found the opposite (Sambakusi, 2019).

The sick population in Bali Pwho only self-medicated has reached 66.64% (BPS, 2018). However, studies related to the knowledge levels and rationality of analgesic use in self-medication for pain in Bali, especially in Denpasar, are still lacking. This study aimed to examine the relationship between knowledge levels and rationality of analgesic use in self-medication for pain in Denpasar.

## 2 METHODS

### 2.1 Study Design

This research used a cross-sectional correlation study design, and was conducted at six pharmacies in Denpasar .

### 2.2 Sample

The inclusion criteria of this study were respondents aged 17-65 years old, could read, and had self-medicated for pain (in the last 3 months). Meanwhile, the exclusion criteria were respondents with an educational background in health, vision or hearing problems, and previously prescribed analgesic drugs by doctors.

### 2.3 Research Instrument

This study utilized a questionnaire. The questionnaire consisted of three forms covering demographic data, knowledge level, and rationality of analgesic use in self-medication practices.

### 2.4 Data Collection Procedure

This study consisted of 196 respondents from six Denpasar pharmacies that were selected by non-random sampling, specifically consecutive sampling. Data were collected from patients who came to the pharmacy in Denpasar, met the inclusion criteria, and did not meet the exclusion criteria.

### 2.5 Data Analysis

The data obtained in this study were analyzed descriptively and inferentially using SPSS version 15. Knowledge levels were divided into three categories, namely high (80-100%), moderate (60-79%), and low (<59%) (Abdullahi et al., 2016). Data related to rationality were analyzed based on the median score obtained from the total respondents, and categorized as rational if the score was greater, and irrational if the score was less than the median.

### 2.6 Ethical Considerations

This study paid attention to research ethics such as anonymity, informed consent, and confidentiality. This study has obtained ethical eligibility issued by the Research Ethics Commission of the Faculty of Medicine, Udayana University/Sanglah Central General Hospital Denpasar (Number 2020.01.2.0301 dated April 17, 2020).

## 3 RESULTS

The results of this study are presented in the following tables.

Table 1: Respondents' General Characteristics.

General Characteristics	Frequency (f)	Percent (%)
Sex		
Male	71	36.2
Female	125	63.8
Age group (years)		
17-25	107	54.6
26-35	51	26.0
36-45	17	8.7
46-55	17	8.7
56-65	4	2.0
Educational level		

Primary-secondary education	94	48.0
University and higher education	102	52.0
Occupational status		
Unemployed	83	42.3
Employed	113	57.7
Income level		
Low (<Minimum wage)	119	60.7
High (>Minimum wage)	77	39.3

Respondents' general characteristics are shown in Table 1. Table 1 shows that the 196 total respondents consisted of 71 males and 125 females. Most of the respondents in this study were 17-25 years old, and had higher educational levels, and low income levels (Table 1).

Profiles of analgesic use by the communities in Denpasar are presented in Tables 2 and 3.

Table 2: Proportion of Analgesic Types.

Types of Analgesics	Frequency (f)	Percent (%)
Paracetamol	87	44.4
Mefenamic acid	70	35.7
Ibuprofen	14	7.1
Diclofenac Sodium	9	4.6
Methampiron	9	4.6
Methylprednisolone	4	2.0
Piroxicam	3	1.6
Total	196	100

Table 3: Proportion of Pain Types.

Types of Pain	Frequency (f)	Percent (%)
Headache	88	44.9
Menstrual pain	37	18.9
Tooth pain	28	14.3
Muscle ache	26	13.3
Wound pain	13	6.6
Nerve pain	2	1.0
Chest pain	1	0.5
Fracture pain	1	0.5
Total	196	100

Based on the types of analgesics, most respondents (44.4%) used paracetamol in self-medication for pain (Table 2). The majority of

respondents (44.9%) used analgesics in self-medication to relieve headaches (Table 3).

Table 4: Respondents' Rationality of Analgesic Use.

Rationality Category	Frequency (f)	Percent (%)
Rational	97	49.5
Irrational	99	50.5
Total	196	100

The rationality of analgesic use in self-medication for pain by the community in Denpasar is presented in Table 4. The results show that 49.5% of respondents used analgesics rationally in self-medication, while the remaining 50.5% of respondents used it irrationally (Table 4).

Table 5: Respondents' Knowledge Levels.

Knowledge Levels	Frequency (f)	Percent (%)
Low	119	60.7
Moderate	49	25.0
High	28	14.3
Total	196	100

Respondents' knowledge levels in terms of analgesics use in self-medication for pain is presented in Table 5. The majority of respondents (60.7%) had low levels of knowledge regarding analgesic use. Meanwhile, 25% of respondents had moderate knowledge levels, and the remaining 14.3% had high knowledge levels (Table 5).

Table 6: The Relationship Between Knowledge Levels and Rationality of Analgesic Use in Self-Medication for Pain.

Knowledge Levels	Rationality		x <sup>2</sup>	p-value
	Rational f (%)	Irrational f (%)		
Low	45 (37.8)	74 (62.2)	17.498	<0.001
Moderate	31 (63.3)	18 (36.7)		
High	21 (75.0)	7 (25.0)		

The relationship between knowledge levels and rationality of analgesic use in self-medication for pain is shown in Table 6. The chi-square test showed that there was a significant relationship between knowledge levels and rationality of analgesic use (p <0.001).

## 4 DISCUSSION

### 4.1 General Characteristics of Respondents

The results of this study indicate that the majority of analgesic use in self-medication for pain was carried out by female respondents. These results are consistent with a previous study regarding the use of oral analgesics, where most respondents were female. The study conducted in Rembang also found that the use of analgesics in self-medication was dominated by female respondents (Mardiyah, 2016). However, these results contradict a study in Spain, where the analgesic use was dominated by male respondents (Carrasco-Garrido et al., 2014). The difference in results can be caused by most women using analgesics every month to relieve menstrual pain. This result is in line with a study in Malaysia that found the majority of women used analgesics every month to relieve menstrual pain (Ali, Ibrahim, & Palaian, 2010). Women also tend to pay more attention to treatment cost and effectiveness (Lukovic et al., 2014); therefore, they will choose self-medication as an effort to relieve their pain complaints.

This study found that the majority of self-medication practices for pain was found in respondents aged 17-25 years, followed by the 26-35 year age group. The results of this study are in line with a previous study that mostly found analgesic use in the 16-39 year age group (Carrasco-Garrido et al., 2014). Meanwhile, a previous study about abusing and misusing OTC pain relievers in adult populations in Poland showed that the majority of analgesics use was found in the 45-64 year age group (Wójta-Kempa & Krzyzanowski, 2016). This contradictory finding can be attributed to a large amount of information about non-prescription drugs possessed by the young age group. This information can be obtained through advertisements, social media, or other sources that are available on the internet.

The majority of respondents' education level in this study were university and higher. This finding is in line with a study in Spain that found the majority of analgesics users had received university-level education or higher (Carrasco-Garrido, Jiménez-García, Barrera, & Gil de Miguel, 2008). Meanwhile, studies related to analgesic use in Surabaya found that patients with low education levels used analgesics more often in self-medication practices (Halim et al., 2018).

Based on employment status, the majority of respondents were employed. This result is consistent

with a study in Sleman, which found that self-medication for pain was mainly carried out by respondents who were working (Kristina, Prabandar, & Sudjaswadi, 2008). This can be caused by a lack of rest time and work stress in employed groups, which can trigger pain (Lumley et al., 2011). Other research also showed that the incidence of pain such as headaches, neck pain, and back pain were mostly found in the employed group; this is related to workplace safety and ergonomics (Malińska & Bugajska, 2010).

In this study, the majority of respondents earned a monthly income under the Denpasar minimum wage. This finding is in line with a previous study which found self-medicators were usually individuals with low income levels (Kristina et al., 2008). Income levels affect someone's scale of priorities to meet daily needs, especially in self-medication practices (Notoatmodjo, 2014). This is why respondents with a low income would prefer to self-medicate to reduce treatment costs, travel time, and doctor consultation time (Bennadi, 2013).

### 4.2 Profile of Analgesic Use

This study found that the majority of respondents used analgesics to relieve headaches. These results are in line with a study in Surabaya which found that the majority of respondents used analgesics in self-medication to treat headaches (Halim et al., 2018). In addition, previous studies in Demak and Iran also mentioned similar results (Afif & Wahyuni, 2015; Sarahroodi, Maleki-Jamshid, Sawalha, Mikaili, & Safaeian, 2012).

Based on the type of analgesic, most respondents in this study used paracetamol in self-medication for pain. This result is in line with a study conducted by Stosic et al. (2011) in Australia, which found that the use of paracetamol in self-medication was higher than NSAID analgesics. These results are also similar to research conducted by Afif and Wahyuni (2015) in Demak, Halim et al. (2018) in Surabaya, and Sarahroodi et al. (2012) at an Iranian university. The high use of paracetamol in self-medication practices can be caused by paracetamol being the first over-the-counter (OTC) analgesic that is available without a prescription. In addition, paracetamol was more suitable than ibuprofen for use in a larger proportion of the general population (Clarke, Adams, & Dunagan, 2008). This is also supported by the higher suitability rate of paracetamol in comparison to NSAIDs. This could be due to fewer contraindications, warnings, and drug interactions of paracetamol (Stosic et al., 2011). As a result,

communities tend to choose paracetamol as their primary option for self-medication for pain.

### **4.3 Knowledge Levels of Analgesic Use in Pain Self-Medication**

In this study, respondents' knowledge levels reached 14.3% at the high level, 25% at the medium level, and 60.7% at the low level. These results showed that most of the respondents had low knowledge levels about the use of analgesics in self-medication. This finding is almost in line with previous studies conducted by Sulistiyana and Irawan (2014) in Majalengka and Artini (2020) in Sukoharjo that found the majority of respondents had low knowledge levels regarding analgesic use. However, the results of this study contradict a study in Sidoarjo that found most respondents had good knowledge about the use of oral analgesics in self-medication (Husna & Dipahayu, 2017).

In this study, respondents' knowledge levels on analgesic use were assessed based on several aspects such as drug class, selection, allergic conditions, use, side effects, and storage of analgesic drugs. The high number of low knowledge levels in this study may be caused by the lack of information and education received by the communities in Denpasar regarding the use of analgesics in self-medication practice. These low knowledge levels can lead to inappropriate drug consumption by these communities (Depkes, 2006). As a result, the provision of information and education is necessary to increase public knowledge about the use of analgesics in self-medication. The community must at least be knowledgeable about recognizing disease symptoms, drug choices, instructions, and monitoring (therapy outcome, possible side effects of drugs) (Depkes, 2008).

### **4.4 The Rationality of Analgesic Use in Self-Medication for Pain**

Some of the rational drug use criteria were observed in this study regarding analgesic use in self-medication for pain. There were several criteria including the right drug selection, right dose, right information, right indication, right interval, right route of administration, affordable price, drug side effects alert, right duration, and proper assessment of the condition. The results of this study indicate that about half (50.5%) of the respondents used analgesics irrationally in self-medication practices for pain. This finding is consistent with the results of a previous study conducted by Afif and Wahyuni (2015), which found that the irrational use of analgesics in self-

medication reached 54%. Other studies on dental pain self-identification also mentioned a similar result, that 75% of respondents used analgesics inappropriately (Damayanti, 2017). However, previous studies in Sidoarjo and Kediri found the opposite--that the majority of respondents had good behavior and used analgesics rationally in self-medication practices (Husna & Dipahayu, 2017; Ilmi et al., 2021).

The high number of irrational analgesic use in this study can be caused by the lack of knowledge and information possessed by the community in Denpasar about the rational use of analgesics in self-medication practices. Besides increasing medical costs and length of hospital stay as a result of adverse drug reactions, irrational self-medication can also lead to dangerous conditions such as polypharmacy and drug interactions (Wilcox, Cryer, & Triadafilopoulos, 2005). Due to this, self-medication practices in the community need to be supported with appropriate information and education from health workers, especially pharmacists. Pharmacists have an important role as communicators and health promoters in terms of self-medication practices in the community (WHO, 1998). Furthermore, clinical communication has a significant relationship with positive health outcomes (WHO, 2014). Since community pharmacists are the closest and most accessible health workers in these communities, pharmacists' advice about health information and education, especially self-medication, will have an important impact on public health (Carrasco-Garrido et al., 2014).

### **4.5 The Relationship Between Knowledge Levels and Rationality of Analgesic Use in Self-Medication for Pain**

Results of the chi-square test in this study showed a significant relationship between knowledge levels and rationality of analgesics used in self-medication for pain. This finding is in line with previous studies conducted by Afifah (2019) in Pasuruan, Husna and Dipahayu (2017) in Sidoarjo and Afif and Wahyuni (2015) in Demak, where there was a significant relationship between knowledge levels and rationality of analgesic use in self-medication practices for pain. However, another study in Lilongwe found that there was no significant relationship between knowledge levels and rationality of analgesic use (Sambakusi, 2019).

The results of this study are supported by the theory mentioned by Green, Kreuter, Deeds, and Patridge (1980) that knowledge is one of the



supporting factors needed for the realization of attitudes into real actions. In addition, human behavior is the result of various experiences and human interactions with the environment which are manifested in the form of knowledge, attitudes, and actions (Azwar, 2007); therefore, a high level of knowledge will result in the rational use of analgesics, which will help avoid drug abuse and misuse.

## 5 CONCLUSION

More than half of the respondents had low levels of knowledge regarding analgesic use in self-medication for pain. Furthermore, half of the respondents used analgesics irrationally in self-medication practices. The level of knowledge was found to be significantly related to the rationality of analgesic use in self-medication; therefore, it is necessary for pharmacists to provide the appropriate information and education about the rational use of analgesics in self-medication practices to the community.

## CONFLICT OF INTEREST

The authors declare that there is no conflict of interest in this study.

## ACKNOWLEDGEMENT

The authors would like to thank the International Bali University Pharmacy lecturer who has guided them and provided support, as well as the pharmacies in Denpasar that helped in facilitating the data collection for this study.

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