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The Phenomenon of Self-Medication of Analgesic in Patients with Toothache in Batudaa District, Gorontalo Regency, Indonesia

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ABSTRACT

Self-medication is an act of self-treatment performed by the community to overcome toothache. Many people who suffer from toothache choose to self-medicate with pain killers or herbal medicines. The phenomenon of self-medication arose because people felt that self-medication was an easier and more practical option than going to the dentist. The aim of the study was to determine the factors that influence the self-medication behaviour of patients with toothache in the community. The research method used was descriptive observational with a cross-sectional approach. The population in this study was the community of Batudaa district, and the sample was taken through accidental sampling method using questioner by google form. The results showed that majority of the respondents (91.66%) had practiced self-medication, 33.97% of them used chemical drugs while 41.02% combined chemical and herbal drugs. Mefenamic acid was the most commonly purchased analgesic from the pharmacy (33.97%), while saline solution was the most commonly used herbal medicine (42.94%). The main reason for self-medication by respondents was convenience and practicality (33.33%), followed by experience of recovery with the same medicine (30.76%), and several other reasons were given by respondents. The conclusion of this study emphasises that self-medication behaviour is influenced by convenience and practicality factors, with recommendations for the community to increase knowledge about the use of analgesics and to consult medical personnel before initiating any medication regimen and symptoms do not improve.

Keyword: Self-medication; toothache; analgesic drugs

Introduction

A toothache is a sensation of pain in the area of the tooth. Toothaches usually occur due to tooth decay caused by acid-producing bacteria in the mouth. These bacteria are responsible for breaking down fermented sugars. Acid-producing bacteria attack the *enamel* that protects the tooth, *corroding* it until it hits the nerve endings of the tooth, causing pain or soreness. Toothache is a feeling of pain in or around the tooth when the nerve of the tooth is irritated. Toothache or tooth pain is a symptom of pain which can arise due to exposure to various

kinds of stimuli, such as stimuli from foods or drinks that are sweet, too hot or cold and sticky foods. problems like this greatly impact people's daily activities, such as school, work, sleep disturbances, and eating disorders [1]

If someone is sick then someone will try to get healthy again. The usual thing for someone to do to get well is to see a doctor or treat themselves. Self-medication or what is commonly called self-medication is the most common thing people do before going to a health worker. Self-medication is an attempt at self-medication, usually done to overcome minor illnesses, such as fever, pain,

dizziness, cough, influenza, diarrhea, skin diseases [2].

Based on the results of the Basic Health Research (RISKESDAS) in 2018, it shows that the dental health conditions of the Indonesian people tend to be unfavorable. From the results of a health survey involving 13,781 dentists, 57.6% of the Indonesian population experienced oral problems and only 10.2% received services from dental medical personnel. From the 2018 Research Health of Gorontalo Province data, 51.63% of Gorontalo Regency residents self-medicate if they are experiencing oral health problems [3][4].

Several studies have reviewed self-medication behavior in Indonesia, but few have specifically examined the use of analgesics as a form of self-medication in toothache sufferers. In rural areas such as Batudaa District, where access to health services is still limited, this practice is estimated to be quite high but has not been scientifically documented. This study is important to fill in to overcome this while providing a comprehensive picture of the factors that influence individual behavior, so that it can be the basis for planning targeted interventions.

There are many medication errors in the implementation of self-medication. *Medication errors* are caused by a lack of medication information. Self-medication should follow the requirements of rational drug use. The use of a medication is said to be irrational if the possibility of negative effects received by the patient is greater than the benefits[5].

The public needs integrated guidelines to avoid medication errors when self-medicating. Self-medication according to the rules is when using medication in accordance with the rules listed on the packaging. Medication that are safe to use for self-medication are relatively free and limited free drugs. Medicines commonly used for self-medication are called non-prescription or over-the-counter drugs. These over-the-counter drugs can be obtained at stalls, pharmacies, and supermarkets. In contrast, drugs obtained with a doctor's prescription are commonly called prescription drugs [2].

People use analgesic to reduce or suppress pain. Analgesic that are usually used by the public are nonopioid analgesic such as aspirin, mefenamic acid, and paracetamol because nonopioid analgesic are not addictive like opioid analgesic. Nonopioid analgesic have side effects, namely, stomach and intestinal disorders, hypersensitivity reactions, kidney damage, and can cause liver damage if used in excessive doses [5][6].

Although medication can cure, there are many incidents that result in a person suffering from drug poisoning. A drug will be medicinal if it is used in the treatment of a disease at the right dose and at the right time. So if it is used inappropriately or with excessive doses, it will cause poisoning[5][6]. Therefore, this study aims to understand the factors that influence self-medication behaviour in the community, as well as provide an overview of the appropriate use of analgesic.

Methods

In this study using descriptive research, it can be explained as a process that aims to provide an overview and describe a situation obtained in the field in real terms regarding the phenomenon of self-medication of analgesic drugs in patients with toothache.

The population used in this study is the community of Batudaa District, Gorontalo Regency. The sample in this study was taken by *accidental sampling* method, namely the sample was obtained from the existing population / present at the time of data collection. Data collected included respondents' demographic information, self-medication behaviour, types of drugs used, and sources of information regarding the use of analgesic drugs. Data analysis was conducted univariately to describe respondents' characteristics and self-medication behaviour. This study also paid attention to research ethics by obtaining consent from respondents before data collection.

Results

The results and discussion contain scientific research / development findings and discussions. Scientific

Table 1. Distribution of Respondents by Gender and Age

Age	Male	Female	Total	Percentage (%)
17-26	40	73	113	72,43
27-40	10	12	22	14,10
41-60	8	13	21	13,46
Total	58	98	156	100

In table 1, it can be seen that most of the respondents are female, namely 98 respondents (62.82%) aged 17-26 years, namely 113 respondents (72.43%).

Table 2. Distribution of Respondents Based on Education

Education	Total	Percentage (%)
Higher Education	91	58,33
Senior High School	54	34,61
Junior High School	6	3,84
Elementary	5	3,20
Total	156	100

Table 2 shows that the education level of the respondents was mostly tertiary level, namely 91 respondents (58.33%).

Table 3. Distribution of Respondents Based on Occupation

Jobs	Total	Percentage (%)
Civil servant	25	16,02
Private employee	34	21,79
Labor	3	1,92
Merchant	7	4,48
Housewife	7	4,48
Self-employed	25	16,02
Farmers	6	3,84
Contract	9	5,76
Not working yet	40	25,64
Total	156	100

Based on table 3 shows that the distribution of respondents according to occupation, most of the 40 respondents (25.64%) were not working.

Table 4. Distribution of Respondents Based on Self-medication / Self-treatment

Self medication	Frekuensi	Presentase (%)
Yes	143	91,66
No	13	8,33
Total	156	100

Table 4 shows that most of the respondents did self-medication, totaling 143 respondents (91.66%).

Table 5. Distribution of Respondents Based on Treatment Methods

How to Treat	Total	Percentage (%)
Chemical Medicine	53	37,06
Herbs	26	18,19
Chemical and Herbal	64	44,75
Total	143	100

Table 5 shows that most respondents chose to treat their toothache with chemical and herbal

medicines, totaling 64 respondents (44,75%), followed by chemical drugs, totaling 53 respondents (37,06%).

Table 6. Distribution of Respondents Based on Analgesic Drugs purchased at Pharmacies

Analgesic Drugs	Total	Percentage (%)
Acetaminophen	35	24,47
Mefenamic Acid	53	37,06
Metampiron	2	1,39
Piroxicam	1	0,69
Ibuprofen	6	4,19
Antalgin	13	9,09
Diclofenac	9	6,29
Paracetamol	24	16,78
Total	143	100

Table 6 shows that the distribution of respondents based on Analgesic Drugs mostly chose mefenamic acid, namely 53 respondents (37,06%).

Table 7. Distribution of Respondents Based on Herbal Medicine

Herbal Medicine	Total	Percentage (%)
Salt Water Solution	67	46,85
Clove Oil	26	18,18
Garlic	9	6,29
Turmeric	14	9,79
Guava Leaf	3	2,09
Castor Leaf	6	4,19
Ice compress	7	4,89
Kakatu Oil	2	1,39
Etc.	9	6,29
Total	143	100

Table 7 shows that the distribution of respondents based on Herbal Medicine mostly chose salt water solution, namely 67 respondents (46,85%).

Table 8. Distribution of Respondents Based on Source of Information

Source of Information	Total	Percentage (%)
Advertising/social media/internet	16	10,25
Friends	34	21,79
Family	76	48,71
Acquaintance of medical personnel	30	19,23
Total	156	100

Table 8 shows that the distribution of respondents based on the source of information was mostly in the family, namely 76 respondents (48.71%).

Table 9. Distribution of Respondents Based on Reasons for Self-medication / Self-treatment

Reason	Total	Percentage (%)
Symptoms of mild illness	35	22,43
Easy and practical	52	33,33
Cheaper	21	13,46
Experience of recovery with the same drug	48	30,76
Total	156	100

Based on table 9 shows that distribution respondents based on reasons for self-medication/self-treatment were mostly in the easy and practical 52 respondents (33.33%).

Discussion

The practice of self-medication is a complex and multifaceted issue requiring thorough analysis in modern society. When it comes dental pain, a common health concern, self-medication becomes particularly noteworthy. While it is commendable that individuals take proactive steps to manage their health, demonstrating responsibility and independence, it is important to be aware of the risk involved. Unfamiliarity with the proper use of medications can lead to errors in drug selection, dosage, and route of administration, which may result in adverse effects such as gastric upset or drug toxicity.

Self-medication is influenced by various factors, including socioeconomic position, barriers to accessing healthcare, attitudes, and insufficient understanding about the potential detrimental effects of drugs [7]. Therefore, the practice of self-medication is a complex phenomenon that is shaped by a multitude of factors, including the characteristics of the population [8].

Our study shows that women are more likely to self-medicate than men, and younger people (under 40years old) are more likely to self-medicate for toothache. Female respondents were also more likely to self-medicate. In the context of dentistry, a possible explanation for the observed gender differences in self-medication patterns may lie in the higher prevalence of orofacial pain in women compared to men. Lower pain thresholds and greater anxiety about dental treatment have also been shown to be drivers for women to self-medicate [9][10]. Based on relevant research, it states that women are more concerned with their own and their family's health. Women tend to self-medicate compared to men [11].

Medication errors are common in self-medication. Medication errors are caused by lack of drug information. Self-medication should follow

the requirements of rational drug use. The use of a drug is said to be irrational when the possibility of negative effects received by the patient is greater than the benefits [5]. One major concern with self-medication is the lack of adequate knowledge about proper drug use. This can lead to mistakes in drug selection, dosage, and administration, potentially resulting in harmful effects such as gastric issues or drug poisoning [5][12]

Our research shows that lower social class with low family income significantly influences the reasons for choosing self-treatment for toothache before seeking treatment at a dental clinic. The main reasons are that toothache is considered a less serious pain and there is limited time to go to the dental clinic due to busy work and wasting time. This can be attributed to people's ignorance about dental problems and professions, coupled with the slow service (queuing) at dental health service places. In dentistry, dental emergencies, especially toothache, have been reported to be the primary motivation for self-medication and the search for dental services. However, using medication without guidance has reverberated in the worsening of oral health condition, loss, and impairment of dental function, in addition to the imminent risk associated with using analgetics, anti-inflammatory drugs, and antibiotics, the preferred classes sought by patients with orofacial pain [13]

The most commonly misused substances/drugs are analgesics/nonsteroidal anti-inflammatory drugs (aspirin, panadol/ataflam) and antibiotics (ampiclox, amoxicillin), while the least misused are alcoholic beverages, herbs and charcoal. This is because analgesics and antibiotics are widely available and easily obtained freely in our society. The use of analgesics, antibiotics, warm salt water mouthwash is "Touch and Go", meaning that it only relieves pain temporarily. Those in higher social classes commonly use analgesic or anti-inflammatory drugs purchased from pharmacies and herbal concoctions, alcoholic beverages and charcoal by those in lower social classes. Moreover, despite the weak knowledge of the efficacy of these drugs among patients, these alternative dental treatments may be more affordable and accessible to them, and provide temporary relief from toothache [13][14]

From our research shows that almost most respondents are very familiar with using mefenamic acid as an anti-pain medication. An obvious example of this phenomenon is the use of mefenamic acid, which is commonly used as an analgesic to relieve pain. Although mefenamic acid

is effective in reducing pain, adherence to the recommended dosage is essential to avoid adverse side effects.

Other groups of analgesics that are also commonly in use for self-medication in the community are acetaminophen. Acetaminophen is the most widely used over-the-counter (OTC) pain reliever available in community drug stores, local supermarkets, and even convenience stores [15][16]. The widespread, indiscriminate use of analgesics can carry risks and harmful side effects. Patients often use analgesics before seeking dental treatment due to ease of access and confidence in pain management. The use of anti-inflammatory drugs, such as ibuprofen, is also common when self-treating toothache. However, the use of these non-steroidal anti-inflammatory drugs may increase the risk of side effects such as cardiovascular events, stroke and gastrointestinal bleeding. This demonstrates the risks of self-medication for toothache and the need for a rational strategy in the use of anti-inflammatory drugs. Therefore, the use of analgesic and anti-inflammatory drugs should be done with caution and with an understanding of the potential risks involved [14][15]

Research shows that many people use this medication without medical supervision, highlighting the need for increased awareness and caution in self-medication practices. Like in this our research, that many people use mefenamic acid, an effective analgesic, for pain relief. However, adhering to the recommended dosage is critical to avoid adverse effects. Some people also turn to herbal remedies such as gargling with saltwater solution which are considered safer alternatives. The influence of family and other sources of information underscores the importance of promoting health education at the family level to improve understanding of medication use.

Another class of drugs commonly used in the self-treatment of toothache are anti-inflammatory drugs, especially ibuprofen. These findings are consistent with studies investigating self-medication practices for other reasons and found similar results. There is evidence in the literature that the use of nonsteroidal anti-inflammatory drugs is associated with an increased risk of adverse events such as cardiovascular events, stroke, and gastrointestinal bleeding which further emphasizes the risks of self-medication for toothache and the need to develop strategies for the rational use of anti-inflammatory drugs [12][14][15][16]

Given the risks and challenges of self-medication, it is vital to emphasize education on

rational drug use. Empowering individuals with knowledge about appropriate medication practices reduces the likelihood of errors, ensuring safer and more effective self-care. Ultimately, the goal is to enable people to make informed decisions about managing their health independently [11]

Self-medication involves selecting and using modern, herbal, or traditional medicines to address illnesses or symptoms. It represents a community effort to manage mild health issues using over-the-counter drugs without a doctor's prescription. However, self-medication should adhere to ethical standards of rational drug use, including appropriate drug selection, correct dosages, minimal side effects, no contraindications, no harmful interactions, and avoidance of unnecessary drug combinations [17]. Despite these guidelines, medication errors are common in self-medication, often due to insufficient information about the drugs used. Irrational drug use occurs when the risks outweigh the benefits to the patient [5]. Research involving 143 respondents who self-medication, revealed that many resort to self-medication for toothaches as their first step before consulting a healthcare professional. This trend arises because self-medication is perceived as a convenient, cost-effective, and time-saving alternative to visiting a dentist. Respondents cited ease, speed, reduced burden on healthcare services, and immediate relief as reasons for choosing self-care. These findings are research, which highlights practicality and familiarity with previously effective treatments as key motivators for self-medication. Other motivators for the practice of dental self-medication included beliefs, such as traditional/religious beliefs, traditional medicine is best and belief in side effects of medications, issues related to access to professionals and services, such as unavailability of doctors, inaccessibility of consultation and treatment, issues related to fear, such as fear of dentist, of medical instruments and dental treatment, among others [11]

Most individuals rely on over-the-counter medicines purchased from nearby pharmacies, with mefenamic acid being a popular choice for treating toothaches. As a non-steroidal anti-inflammatory drug (NSAID), mefenamic acid inhibits prostaglandin synthesis, a mediator of inflammation and pain, making it effective for mild to moderate pain relief [18]. In some cases, people also use herbal remedies, such as saltwater gargles, as alternatives when chemical medications do not yield satisfactory results [19] In the context of using saline for gargling, a study by Sholekhah (2021)

describes the effectiveness of gargling with saline on the number of *Streptococcus mutans* colonies in saliva. The study showed that gargling with saline can reduce the number of colonies of the bacteria, which is one of the main causes of tooth decay. This provides scientific evidence that traditional remedies such as saline gargling have the potential to be used in the self-treatment of dental pain. However, while herbal and traditional remedies are often considered safer, it is important to remember that not all natural ingredients are risk-free. For example, the use of garlic as a folk remedy for toothache should be considered. While garlic has antimicrobial and anti-inflammatory properties, its improper use can cause irritation to oral tissues. Therefore, awareness of the proper use and potential side effects of these ingredients is essential [19][20]

Herbal therapy presents numerous potential benefits, with certain botanical extracts showing effectiveness that may exceed that of traditional pharmaceuticals in enhancing overall health. This effectiveness is largely due to the synergistic interactions of bioactive compounds, which can bolster preventive measures, enhance immune defenses, and prepare the body for external challenges. Herbal therapies are generally associated with minimal side effects and tend to provide more sustainable therapeutic effects due to improved tolerance and physiological adaptability. Unlike conventional medications that target specific diseases, herbal remedies can address multiple health issues simultaneously or serve as complementary therapies alongside standard medical treatments. Nonetheless, it is crucial to approach the integration of herbal remedies with other medications cautiously, ensuring it occurs under appropriate medical supervision. While herbal medicines may offer significant benefits, they are not without risks. The toxicity of herbal preparations can vary widely based on factors like the plant species, the parts used, and dosages. Some botanical agents have been linked to negative outcomes, including teratogenic effects, adverse interactions with anesthetics during surgeries, variations in vital signs, and an increased risk of postoperative bleeding [21]

Sociodemographic factors significantly influence dental self-medication, particularly age, with younger individuals more likely to self-medicate. Research indicates a higher prevalence of this behaviour among younger populations, while older adults tend to seek formal health services, leading to reduced self-medication. Educational attainment also plays a role, as those with higher

education often exhibit better health literacy and self-efficacy, promoting effective health-seeking behaviours. Motivations for self-medication include cultural and economic factors, barriers to access, high dental treatment costs, and a perception of dental issues as minor. Additionally, fear of dental professionals, easy access to medications, and beliefs about their effectiveness contribute to self-medication practices. This highlights the need for strategies focused on prevention and promotion in dentistry, alongside improved long-term access to dental services and oral health care [11][13]

This study investigates self-medication practices among respondents and aligns with previous research. The main information sources for self-medication were found to be the internet and advice from family, friends, and neighbors, highlighting the significance of familial trust and education in health decisions. Self-medication is increasingly common, raising questions about the reliability of information individuals use. Although the internet serves as a significant resource, it can present misleading information, leading to potential health risks. Additionally, social circles often act as informal health advisors, especially in communities where traditional healthcare is seen as inaccessible, perpetuating reliance on anecdotal rather than empirical evidence. The findings reveal broader public health implications, as self-medication can lead to inappropriate medication use and significant health risks, such as complications from untreated conditions. Cultural beliefs also play a role, as traditional remedies may be favored despite lacking scientific validation. Education emerges as crucial for promoting responsible self-medication, with those who have better health literacy making more informed choices. Initiatives that boost health literacy can help individuals critically assess online information and social advice. The intersection of self-medication and mental health is another vital area for further study, as individuals may self-medicate to cope with mental health issues, risking a reliance on harmful substances. Overall, a comprehensive strategy is needed to address the complexities of self-medication, including public health campaigns to raise awareness of its risks, effective communication between healthcare providers and patients, and continued research into diverse self-medication practices. Promoting health literacy and informed decision-making is essential for creating a healthier society [11][13] [17]

In further analysis, it is important to assess the social and cultural factors that influence the practice of self-medication in the community. In

many communities, there are norms and values that view alternative or traditional medicine as a better option than modern medicine. This is often due to lack of access to health services or mistrust of the formal health system. Better health education and wider access to accurate medical information are therefore needed to change these perceptions. The importance of health education cannot be overlooked in the context of self-medication. Educational programs designed to improve people's understanding of rational use of medicines can help reduce the risk of errors in self-medication. For example, campaigns that emphasize the importance of consulting a health professional before starting treatment can increase awareness of the potential risks and benefits of the drugs used [11][17]

In addition, the role of information technology in increasing public awareness and knowledge about health is becoming increasingly important. With access to information through the Internet and social media, people can easily find information about the right treatment for various diseases. However, it is important to remember that not all information available on the Internet can be trusted. Therefore, it is important to educate the public on how to use the Internet for health purposes. It is therefore important to guide the public in sorting out valid and accurate information.

This discussion concludes by emphasizing that self-medication, despite its potential to provide quick and efficient solutions to minor health problems, still requires a cautious and informed approach. Proper health education, access to accurate information and awareness of the risks associated with medication use are key to safe and effective self-medication practices. The public needs to be encouraged to take proactive steps in managing their health, while recognizing the importance of consulting with qualified healthcare professionals. In this way, it is hoped that the practice of self-medication can be made more sensible, risks reduced and the overall health of the community improved.

The phenomenon of self-medication of analgesic drugs in patients with toothache in the community is influenced by convenience and practical factors. The use of analgesic drugs such as mefenamic acid is quite common, but needs to be balanced with adequate knowledge about its use. Education to the public regarding the safe and effective use of drugs is needed to prevent medication errors and adverse side effects.

Conclusion

This discussion concludes that the phenomenon of self-medication with analgesics, especially in patients with toothache, is influenced by factors of convenience and practicality. Although the use of analgesics such as mefenamic acid is quite common, this needs to be balanced with adequate knowledge of how to use it. Public health education on the safe and effective use of drugs is essential to prevent misuse and side effects. Although self-medication can provide a quick solution to minor health problems, community-based education is needed in the safe use of analgesics. It is hoped that with increasing awareness and access to accurate information, self-medication practices will become wiser, minimize risks, and improve overall public health.

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