

Utilization Patterns And Self-Reported Adverse Effects Of Commonly Dispensed Generic Medicines In Community Pharmacies: A Descriptive Study In Rote Ndao, Indonesia

Tadeus Andreas Lada Regaletha¹, Rr Listyawati Nurina¹, Muhajirin Dean¹

¹Pharmacy Study Program, Faculty of Medicine and Veterinary Medicine, Nusa Cendana University, Kupang, East Nusa Tenggara, Indonesia (tadeus.regaletha@staf.undana.ac.id)

Abstract

Background: Generic medicines are widely utilized in Indonesia due to their affordability and bioequivalence to branded products. However, concerns regarding potential adverse effects persist, particularly for high-consumption drugs.

Objective: To analyze utilization patterns and self-reported adverse effects of the most frequently dispensed generic medicines in community pharmacies in Rote Ndao, Indonesia.

Methods: A six-month observational descriptive survey was conducted in high-volume pharmacies. Pharmacy sales records identified the most dispensed generic drugs, while 100 adult respondents completed structured questionnaires assessing adverse effects. Data were analyzed descriptively using frequency distributions and charts.

Results: Antibiotics (amoxicillin), analgesics/antipyretics (paracetamol, mefenamic acid), and antihistamines (chlorpheniramine maleate) were the most frequently dispensed medicines. Most respondents did not report significant adverse effects. Mild symptoms such as nausea, diarrhea, dizziness, drowsiness, and dry mouth were occasionally reported. Severe reactions, including serious allergic responses or hospitalization, were rare. Cold medications were more commonly associated with drowsiness compared to other drug groups.

Conclusion: Commonly dispensed generic medicines in Rote Ndao demonstrated a generally favorable safety profile, with predominantly mild and self-limiting adverse effects. These findings support the continued use of generic medicines while emphasizing the importance of rational drug use, patient counseling, and pharmacovigilance monitoring.

Keywords: Generic medicines; Adverse drug reactions; Drug utilization patterns; Community pharmacy; Pharmacovigilance.

1. Introduction

The use of generic drugs has become a primary choice in healthcare systems worldwide, including in Indonesia, due to their more affordable prices compared to branded drugs (Straka et al., 2017). Rote Ndao, as one of the regions in Indonesia, relies on generic drugs to meet the healthcare needs of its population (BPOM, 2020). Pharmacies, as a key point in drug distribution, play an essential role in ensuring the availability and quality of the generic drugs sold (Hassali et al., 2014). Although generic drugs have been clinically proven to have the same quality as patented drugs, Adverse Effects that may arise from their use are still a concern (Dunne S and Dunne C, 2015). This is especially important for drugs with the highest sales, as high usage rates can increase the risk of unforeseen Adverse Effects (Downing et al., 2017).

Despite the approval of generic drugs by the Food and Drug Administration (BPOM) for their quality and effectiveness, there are still concerns about Adverse Effects experienced by some patients (Andrade, 2015). The variability in the quality of generic drugs circulating in the market, influenced by various factors including excipients, can contribute to the occurrence of unintended Adverse Effects. Therefore, a study on the Adverse Effects of the most sold generic drugs in pharmacies in Rote Ndao is crucial to ensure their safety in use (Tschabitscher et al., 2008).

This study aims to examine the Adverse Effects associated with the use of the most widely sold generic drugs in pharmacies in Rote Ndao, as well as to analyze factors that may influence the occurrence of these Adverse Effects. The results of this research are expected to provide deeper insights into the safety of generic drugs and offer recommendations to relevant parties for enhancing the supervision of generic drugs circulating among the public.

2. Materials and Methods

2.1 Study Design and Setting

This study was an observational descriptive survey conducted over six months in pharmacies with the highest sales volume in Rote Ndao Regency, Indonesia.

2.2 Data Collection

Two sources of data were used:

Pharmacy sales records: to identify the most frequently dispensed generic drugs.

Patient questionnaires: a simple form distributed to patients using generic medicines, containing questions about experienced Adverse Effects and their perceptions of generic drug use.

2.3 Participants

A total of 100 individuals who agreed to participate and were using generic medicines were included as respondents in this study. A quota sampling technique was applied to ensure representation from the main pharmacies.

2.4 Data Presentation

Drug utilization data were presented in tables and bar charts to illustrate the most frequently used medicines, including categories such as antibiotics, analgesics, and flu medications. Questionnaire results were displayed descriptively in tables and simple diagrams.

2.5 Ethical Considerations

All participants provided written informed consent prior to data collection. Ethical approval was obtained from the relevant ethics committee under approval number 65/UN15.21/KEPK-FKKH/2025, and confidentiality was maintained throughout the study.

3. Results

Drug Utilization Patterns in Pharmacies

This study presents an analysis of drug purchasing patterns in pharmacies located in the Rote Ndao region based on recorded usage frequencies. The data visualization reveals that the most frequently purchased medications are categorized into three main therapeutic groups: antibiotics, analgesics/anti-inflammatory drugs, and antihistamines (cold medications). The results of the analysis are shown in Figure 1.

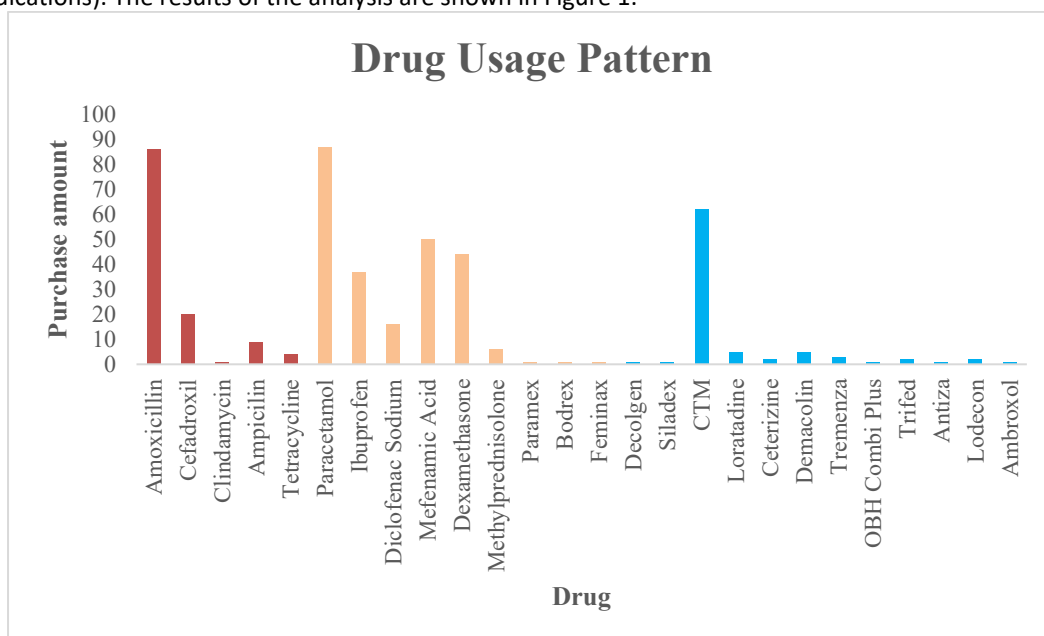


Figure 1. Diagram of Drugs Usage Pattern

The diagram above illustrates the total number of purchases for each medication over a specified period. Amoxicillin was the most frequently purchased drug, leading the chart with more than 80 recorded uses. Following amoxicillin, paracetamol and mefenamic acid were also commonly utilized. Chlorpheniramine maleate (CTM), typically prescribed for allergic symptoms such as the common cold, demonstrated a noticeable increase in use; however, its overall utilization remained substantially lower than that of the other medications.

Adverse Effect of Antibiotic

The results from 100 respondents regarding their experiences with adverse effects associated with antibiotic use are summarized in the diagrams presented in Figure 2 and Figure 3. Five statements in both Questionnaire A and Questionnaire B assessed the prevalence of specific adverse effects related to antibiotic use. The descriptions of the statements included in Questionnaire A and Questionnaire B are provided in Table 1 and Table 2.

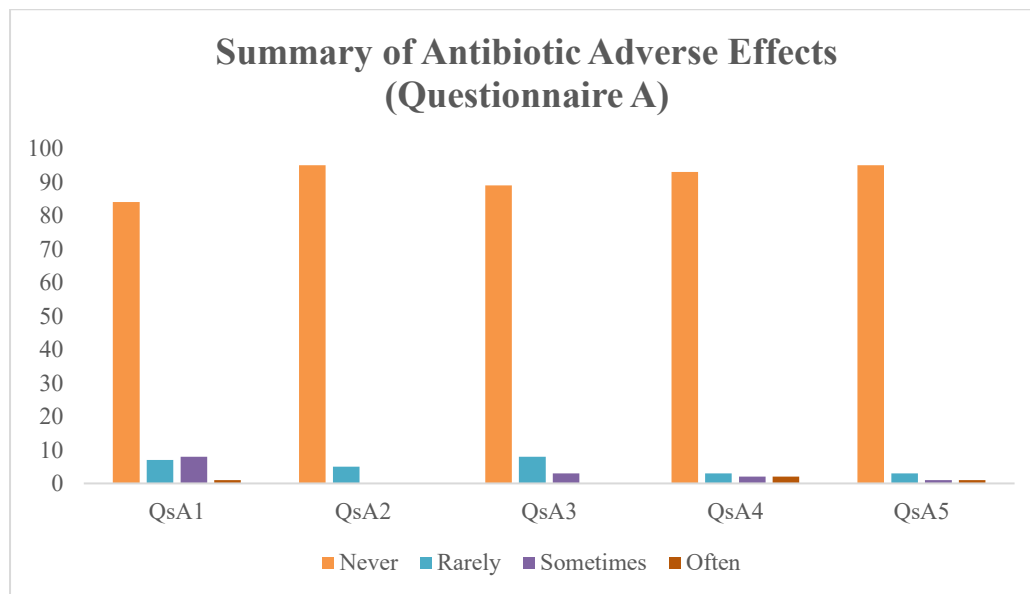


Figure 2. Distribution of Self-Reported Adverse Effects of Antibiotics Based on Questionnaire A

Table 1. Distribution of Self-Reported Adverse Effects of Antibiotics Based on Questionnaire A

Code	Statement	Never	Rarely	Sometimes	Often
QsA1	I experienced nausea after taking antibiotics	84	7	8	1
QsA2	I experienced diarrhea after taking antibiotics	95	5	0	0
QsA3	I experienced dizziness after taking antibiotics	89	8	3	0
QsA4	I experienced rashes or allergic reactions after taking antibiotics	93	3	2	2
QsA5	I felt that antibiotics worsened my health condition	95	3	1	1

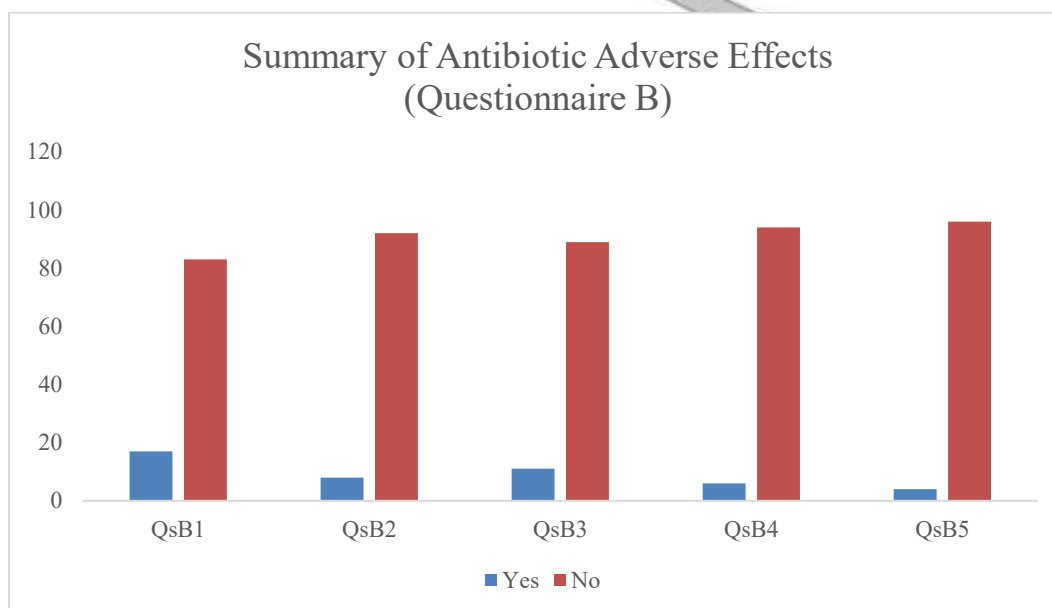


Figure 3. Distribution of Self-Reported Adverse Effects of Antibiotics Based on Questionnaire B

Table 2. Distribution of Self-Reported Adverse Effects of Antibiotics Based on Questionnaire B

Code	Statement	Yes	No
QsB1	I have experienced mild nausea after taking antibiotics	17	83
QsB2	I have experienced diarrhea because of antibiotic use	8	92
QsB3	I have experienced mild allergic reactions (such as skin rashes)	11	89
QsB4	I have experienced shortness of breath or severe allergic reactions after taking antibiotics	6	94
QsB5	I have been hospitalized due to adverse effects from antibiotics	4	96

Based on the analysis of responses from the two questionnaires, most respondents did not report experiencing common adverse effects associated with antibiotic use, such as nausea, diarrhea, dizziness, skin rash, or worsening health conditions. However, a small proportion of respondents reported mild adverse effects, including nausea, diarrhea, and cutaneous rash. More severe reactions, such as serious allergic responses or hospitalization, were rarely observed. Overall, mild adverse effects were reported more frequently, whereas serious complications occurred infrequently.

Adverse Effect of Analgesic

The results from 100 respondents regarding their experiences with adverse effects associated with analgesic use are summarized in the diagrams presented in Figure 4 and Figure 5. Five statements in Questionnaire A and six statements in Questionnaire B assessed the prevalence of specific adverse effects related to analgesic use. The descriptions of the statements included in Questionnaire A and Questionnaire B are provided in Table 3 and Table 4

Figure 4. Distribution of Self-Reported Adverse Effects of Analgesic Based on Questionnaire A

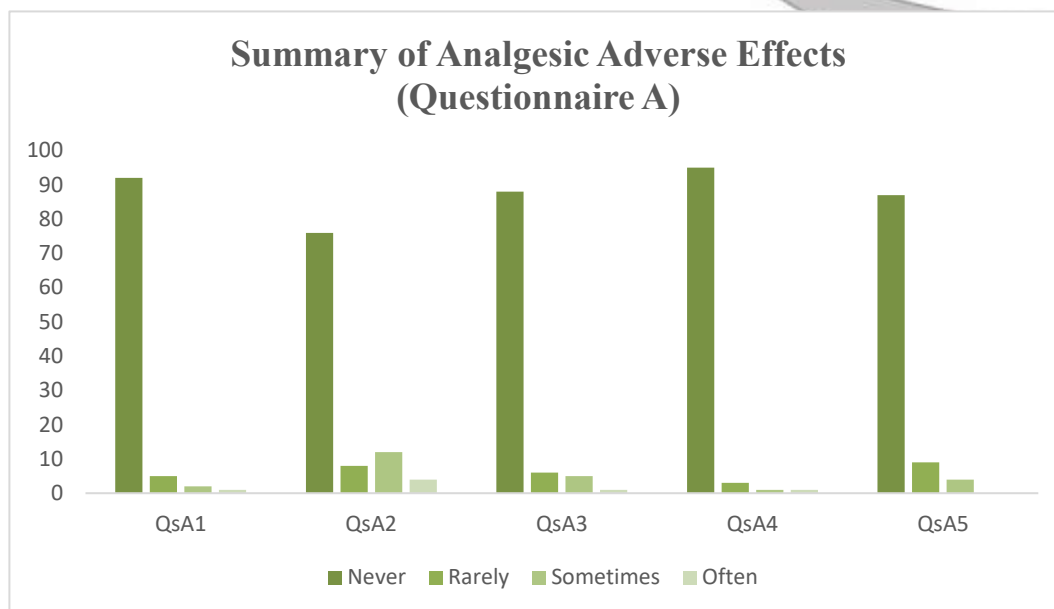


Table 3. Distribution of Self-Reported Adverse Effects of Analgesic Based on Questionnaire A

Code	Statement	Never	Rarely	Sometimes	Often
QsA1	I feel nauseous after taking painkiller medication	92	5	2	1
QsA2	I feel dizzy or drowsy after taking painkiller medication	76	8	12	4
QsA3	I experience digestive issues (such as stomach pain or constipation)	88	6	5	1
QsA4	I experience allergic reactions (rash, itching, or swelling)	95	3	1	1
QsA5	I feel that using painkiller medication affects my daily activities	87	9	4	0

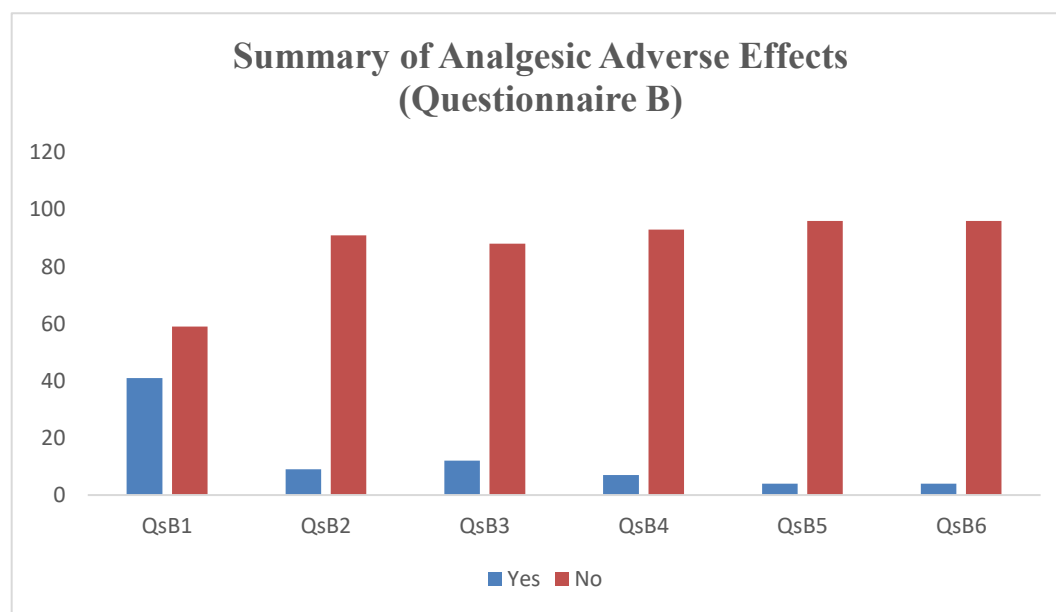


Figure 5. Distribution of Self-Reported Adverse Effects of Analgesic Based on Questionnaire B

Table 4. Distribution of Self-Reported Adverse Effects of Analgesic Based on Questionnaire B

Code	Statement	Yes	No
QsB1	I have felt drowsy after taking painkiller medication	41	59
QsB2	I have experienced nausea or stomach pain after taking this medication	9	91
QsB3	I have experienced constipation or other digestive issues	12	88
QsB4	I have experienced a rash or itching due to painkiller medication	7	93
QsB5	I have experienced difficulty breathing or severe allergic reactions	4	96
QsB6	I have been hospitalized due to Adverse Effects of painkiller medication	4	96

The results indicate that most respondents did not experience significant adverse effects following the use of analgesic medications. However, a small proportion reported mild symptoms, including nausea, dizziness, and gastrointestinal disturbances such as constipation. Severe reactions, including serious allergic responses and hospitalization, were rarely reported. Overall, most participants did not report any substantial impact on their daily activities or overall health status.

Adverse Effect of Cold Medicine

The results from 100 respondents regarding their experiences with adverse effects associated with cold medication use are summarized in the diagrams presented in Figure 6 and Figure 7. Five statements in Questionnaire A and six statements in Questionnaire B assessed the prevalence of specific adverse effects related to the use of cold medications. The descriptions of the statements included in Questionnaire A and Questionnaire B are provided in Table 5 and Table 6.

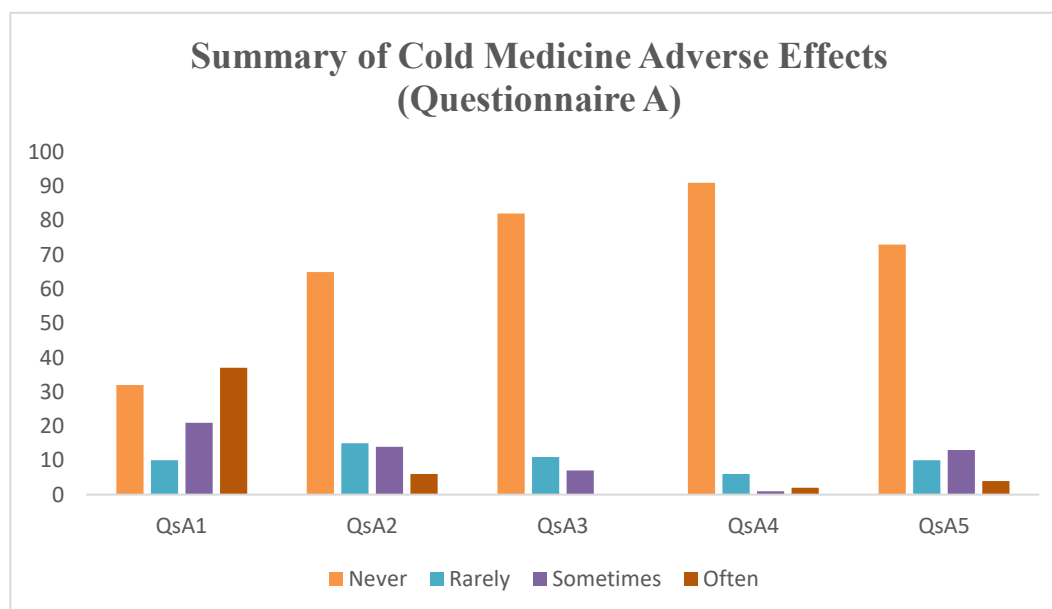
**Figure 6. Distribution of Self-Reported Adverse Effects of Cold Medicine Based on Questionnaire A**

Table 5. Distribution of Self-Reported Adverse Effects of Cold Medicine Based on Questionnaire A

Code	Statement	Never	Rarely	Sometimes	Often
QsA1	I feel drowsy after taking cold medicine	32	10	21	37
QsA2	I experience dry mouth after taking cold medicine	65	15	14	6
QsA3	I experience dizziness after taking cold medicine	82	11	7	0
QsA4	I experience nausea or digestive issues after using cold medicine	91	6	1	2
QsA5	I feel difficulty concentrating after using cold medicine	73	10	13	4

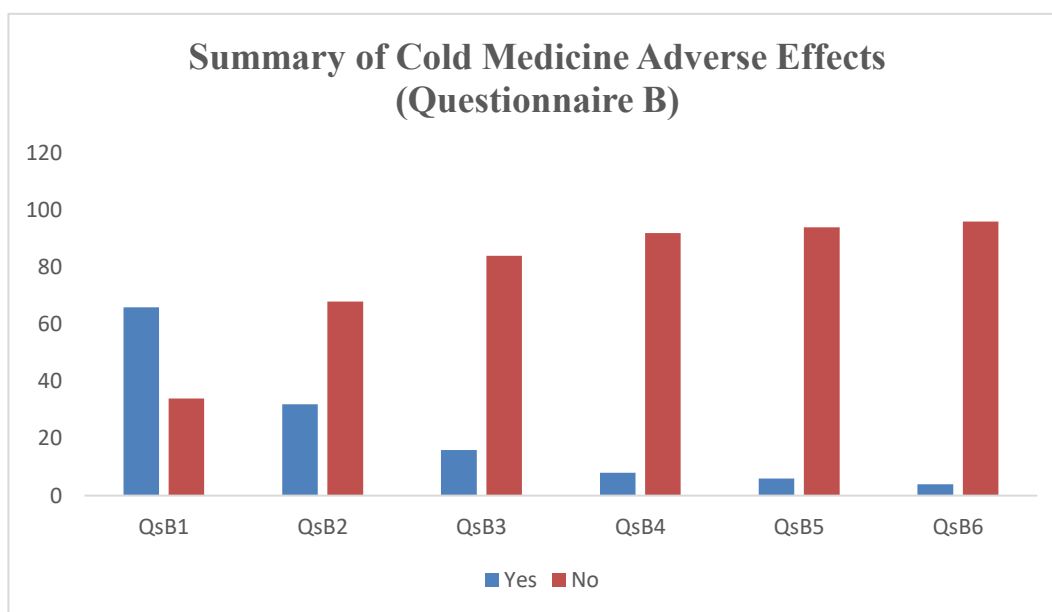


Figure 7. Distribution of Self-Reported Adverse Effects of Cold Medicine Based on Questionnaire B

Table 6. Distribution of Self-Reported Adverse Effects of Cold Medicine Based on Questionnaire B

Code	Statement	Yes	No
QsB1	I have felt slightly drowsy after using cold medicine	66	34
QsB2	I have experienced dry mouth or dry throat after taking cold medicine	32	68
QsB3	I have experienced severe dizziness after taking cold medicine	16	84
QsB4	I have experienced allergic reactions such as rashes or itching after taking cold medicine	8	92
QsB5	I have had trouble breathing or severe allergic reactions due to cold medicine	6	94
QsB6	I have had to see a doctor or be hospitalized due to Adverse Effects from cold medicine	4	96

The results indicate that although most respondents did not experience significant adverse effects from cold medications, mild symptoms such as drowsiness, dry mouth, and dizziness were reported by a subset of participants. Severe reactions, including allergic rash, respiratory difficulty, or hospitalization, were rarely observed. Overall, most respondents did not report any substantial impact on their health status or daily activities.

4. Discussion

Generic medicines are generally considered safe; however, adverse effects may still occur, particularly due to differences in formulation or individual sensitivity to specific components. Therefore, pharmacies, as the primary distribution channel, must ensure that the generic medicines dispensed meet established quality standards and are safe for use, while also providing clear information regarding potential adverse effects (Kesselheim et al., 2020).

Drug Utilization Patterns in Pharmacies

The medications most frequently purchased at pharmacies in the Rote Ndao region were categorized into three principal groups: antibiotics, analgesics/anti-inflammatory agents, and antihistamines (cold medications). Amoxicillin was recorded as the most purchased drug, followed by paracetamol and mefenamic acid, which belong to the analgesic and antipyretic classes, respectively. The high utilization of amoxicillin likely reflects the substantial burden of bacterial infections within the community, whereas the frequent use of paracetamol and mefenamic acid indicates a considerable demand for the management of pain and fever, symptoms commonly associated with a wide range of medical conditions (Hassali et al., 2014).

Chlorpheniramine maleate (CTM) also demonstrated a relatively high rate of use, although its overall consumption remained lower than that of the other medications. CTM is primarily indicated for the management of allergic symptoms, including those associated with the common cold, suggesting a notable prevalence of flu-like or allergic manifestations in the community. Nevertheless, despite its frequent use, CTM consumption was substantially lower than that of antibiotics and analgesics, highlighting distinct patterns of medication demand within the population (Klein et al., 2018; Daveluy et al., 2021).

This pattern of medication use is consistent with findings from previous studies indicating that antibiotics and analgesics/antipyretics are among the most frequently dispensed drugs in community pharmacies, largely due to the high prevalence of infectious diseases and pain-related conditions in the general population. These findings underscore the importance of aligning pharmaceutical policies with prevailing patterns of medication use to ensure that drugs are utilized according to appropriate medical indications. Furthermore, rational use strategies are essential to minimize inappropriate consumption particularly of antibiotics which may contribute to the development and escalation of antimicrobial resistance (Kesselheim et al., 2020).

Adverse Effect of Antibiotic

Although antibiotics are essential for the treatment of bacterial infections, they remain associated with a range of adverse effects, including nausea, diarrhea, dizziness, and allergic reactions such as rash. In the present study, most participants reported that they rarely experienced these adverse effects. This finding is consistent with previous research (Straka et al., 2017).

While these symptoms are generally mild and self-limiting, a small proportion of respondents reported more severe outcomes, including allergic reactions and hospitalization. This observation aligns with earlier evidence emphasizing that, although serious adverse reactions to antibiotics are relatively uncommon, they may be severe when they occur, particularly among individuals with heightened susceptibility or predisposing risk factors (Blumenthal et al., 2018).

A significant factor that may explain these mild reactions is variation in the formulation of generic antibiotics, in which excipients and inactive ingredients may differ from those used in branded formulations (Cotia et al., 2023). Such differences may influence tolerability in certain individuals, particularly those with specific sensitivities to non-active components. Nevertheless, as noted in previous research, the overall safety profile of generic antibiotics remains comparable to that of branded products, given their demonstrated bioequivalence and adherence to regulatory standards (Andrade, 2015).

Adverse Effect of Analgesic

Analgesic medications, such as mefenamic acid and paracetamol, are widely used for the management of pain and inflammation. The questionnaire findings indicate that most respondents did not report significant adverse effects associated with analgesic use, with only a small proportion experiencing mild symptoms such as nausea, dizziness, or constipation. This observation is consistent with the existing literature, in which mild gastrointestinal disturbances are among the most frequently reported adverse effects of nonsteroidal anti-

inflammatory drugs (NSAIDs) and other analgesics (Hasyim and Gerfan, 2026).

Serious reactions, including respiratory difficulty or hospitalization, were rarely reported. Previous studies similarly note that although adverse effects related to analgesics may occur, they infrequently result in hospitalization or long-term health consequences. The limited impact on daily activities, as reported by 87% of respondents, further suggests that the analgesics used in this study did not substantially impair normal functioning. These findings support the conclusion that the overall safety profile of these medications remains favorable when used appropriately and according to recommended guidelines (Cazacu et al., 2015).

Adverse Effect of Cold Medicine

Cold medications, including antihistamines and decongestants, were reported to cause mild adverse effects such as drowsiness, dry mouth, and dizziness in a subset of respondents. The common adverse effects of cold medications are frequently related to the sedative properties of antihistamines and the drying effects of decongestants. However, more severe reactions such as respiratory distress or serious allergic responses were reported by only a small proportion of participants, in line with previous findings indicating that such events are rare but clinically significant (De Sutter et al., 2022).

The frequent occurrence of drowsiness following the use of cold medications warrants particular attention, as it may interfere with daily activities, especially among individuals who drive or operate machinery. This observation is supported by prior research emphasizing the importance of public awareness regarding the sedative effects associated with certain cold preparations (Simons F and Simons K, 2011).

5. Conclusion

Antibiotics, analgesics/antipyretics, and cold medications were the most frequently purchased drugs in community pharmacies in the Rote Ndao region, reflecting common patterns of infection, pain, and flu-like symptoms in the population. Overall, the majority of respondents did not experience significant adverse effects, and when reported, these were predominantly mild and self-limiting, such as gastrointestinal disturbances, dizziness, or drowsiness, while serious reactions were rare. These findings indicate a generally favorable safety profile of commonly used medications when appropriately utilized, while underscoring the continued importance of rational drug use, patient education, and careful monitoring to minimize potential risks, including antimicrobial resistance

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