



Patients' Understanding of the Risk of Gastric Irritation Associated with Analgesic Use at the Executive Pharmacy Depot, Pindad General Hospital

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Abstract. Analgesics are widely used for pain management, but their gastrointestinal safety profiles differ across drug classes. This study aimed to describe patients' understanding of the risk of gastric irritation associated with analgesic use at the Executive Pharmacy Depot of Pindad General Hospital. A descriptive quantitative approach was used among 55 respondents who voluntarily accessed and completed a barcode-based questionnaire during May 2026. The seven-item instrument assessed recognition of analgesics, prolonged-use precautions, label and expiry-date checking, dose limits, responses to adverse effects, use according to professional instructions, and consultation before analgesic use. Overall, 47 respondents (85.5%) were classified as having good understanding and 8 (14.5%) as having moderate understanding; none were classified as poor. The main knowledge gap concerned consultation with a healthcare professional before analgesic use. Meloxicam (38.2%) and paracetamol (34.5%) were the most frequently reported analgesics. Because recruitment depended on voluntary barcode access at a single pharmacy depot, the findings should be interpreted descriptively and not generalized beyond the study setting. The study supports Sustainable Development Goal 3 (Good Health and Well-Being) by highlighting medication safety, prevention of avoidable gastrointestinal adverse effects, and the role of pharmaceutical education in promoting rational analgesic use.

Keywords: Analgesics; Gastric Irritation; Medication Safety; Patient Understanding; Pharmaceutical Education; SDG 3

1. Introduction

Pain is one of the health complaints that frequently prompts patients to seek treatment. Analgesics comprise several drug classes, including nonsteroidal anti-inflammatory drugs (NSAIDs) and non-NSAID agents such as paracetamol. NSAIDs are widely used both under a physician's prescription and through self-medication, but inappropriate use can increase the risk of adverse effects (Babelghaith et al., 2019; Kim et al., 2022; Sinuraya et al., 2023). Gastrointestinal risk is particularly well established for NSAIDs, which can impair mucosal protection and are associated with dyspepsia, ulceration, and gastrointestinal bleeding. The magnitude of risk varies by drug, dose, duration, comorbidities, and concomitant therapy (Coxib and traditional NSAID Trialists' Collaboration, 2013; Haghbin et al., 2023; Lanas et al., 2015; Lanas & Chan, 2017; van de Laar et al., 2023). Paracetamol is not an NSAID and generally has a different gastrointestinal safety profile, although it should not be regarded as completely risk-free, particularly at higher doses (Roberts et al., 2016).

For patients, safe analgesic use therefore requires more than recognizing an analgesic. Important knowledge includes following the recommended dose and duration, checking

medication instructions, recognizing adverse effects, and seeking professional advice when necessary. Studies in different settings have shown that patients may underestimate the risks of NSAIDs and other over-the-counter analgesics, reinforcing the need for clear counseling and medication literacy (Almohammed, 2023; Babelghaith et al., 2019; Kim et al., 2022). At the Executive Pharmacy Depot of Pindad General Hospital, analgesics are frequently dispensed. Patients' understanding of safe use and potential gastric effects is therefore relevant to pharmaceutical care. Inadequate understanding may contribute to inappropriate self-use, delayed consultation, or failure to recognize adverse effects (Sinuraya et al., 2023; Urfiyya & Arjuliant, 2024).

Analgesics should not be treated as a single homogeneous group with identical gastric risk. In this study, the reported medicines included paracetamol and metamizole as non-NSAID analgesics, as well as ibuprofen, mefenamic acid, sodium diclofenac, and meloxicam as NSAIDs. The interpretation of gastric irritation in this manuscript therefore emphasizes that the strongest evidence for mucosal injury and gastrointestinal bleeding applies to NSAIDs, while paracetamol has a distinct safety profile (Coxib and traditional NSAID Trialists' Collaboration, 2013; Lanas & Chan, 2017). Medication understanding is also shaped by how clearly information is communicated. Pharmacist counseling can improve patients' confidence and knowledge regarding medicines, particularly when information is delivered in a structured and understandable manner (Eshiet et al., 2024; O'Mahony et al., 2023; Tadesse et al., 2023).

Accordingly, pharmacists have an important role in explaining appropriate analgesic selection, dose, duration, warning symptoms, and when professional consultation is required. Such education is central to medication safety and rational medicine use, especially for medicines that are commonly obtained or used without intensive supervision (Babelghaith et al., 2019; Kim et al., 2022). This study aimed to determine patients' level of understanding regarding the risk of gastric irritation associated with analgesic use at the Executive Pharmacy Depot of Pindad General Hospital. The study contributes to Sustainable Development Goal 3 (Good Health and Well-Being) by supporting safer medication use, prevention of avoidable gastrointestinal adverse effects, and improved health literacy through pharmaceutical education.

2. Methods

2.1. Study Design

This study employed a descriptive quantitative design to provide a factual description of patients' understanding regarding gastric irritation risk and safe analgesic use. The revised analysis is intentionally descriptive because the available study records did not provide sufficient respondent-level linkage to transparently verify the previously reported inferential cross-tabulations.

2.2. Time and Location

This study was conducted at the Executive Pharmacy Depot of Pindad General Hospital in May 2026.

2.3. Population and Sample

The study included 55 respondents from the Executive Pharmacy Depot of Pindad General Hospital who received analgesic and gastric medications and voluntarily completed

the barcode-accessed questionnaire during May 2026. The source study materials did not document a formal sample-size calculation, a sampling frame, a response rate, or explicit inclusion and exclusion criteria. Accordingly, the 55 respondents should be interpreted as a self-selected sample from the study site rather than a probability sample, and the findings should not be generalized to all hospital patients.

2.4. Data Collection Technique

Data were collected using a seven-item questionnaire (P1-P7) that the source study reported as having undergone validity and reliability testing. The item domains were: P1, recognition of analgesics; P2, awareness that prolonged use should not occur without professional supervision; P3, checking the expiration date and directions for use; P4, adherence to recommended dose limits; P5, appropriate action when adverse effects occur; P6, use according to need and healthcare-professional instructions; and P7, consultation with a healthcare professional before analgesic use. Items P1-P6 were scored 1 for a correct answer and 0 for an incorrect answer. P7 was scored 2 for an accurate answer, 1 for a less accurate answer, and 0 for an incorrect answer. Total scores were converted to percentages and categorized as good (76-100%), moderate (56-75%), or poor (<56%). The numerical item-validity coefficients, validity threshold, and reliability statistic (for example, Cronbach's alpha) were not available in the source manuscript and therefore cannot be reported without author verification.

2.5. Data Analysis

Data were summarized using frequencies, percentages, and mean questionnaire scores. The article reports the predefined good, moderate, and poor understanding categories. Inferential association testing was not retained in the revised manuscript because the available source data did not document a reproducible derivation of the binary 'Yes/No' outcome previously used in the association tables and did not provide respondent-level demographic linkage needed to verify expected cell counts or select an exact alternative test. This approach avoids unsupported statistical inference from the available descriptive dataset.

3. Results and Discussion

3.1. Respondent Characteristics

Age grouping in this study referred to the age classification used by the Departemen Kesehatan Republik Indonesia (2009), namely adolescents (18–25 years), early adulthood (26–35 years), late adulthood (36–45 years), and elderly (≥45 years). This classification was selected because it corresponds to the characteristics of the Indonesian population and provides a more detailed division of adult age groups, thereby supporting the analysis of respondent characteristics.

Table 1. Frequency Distribution of Respondent Characteristics by Age

Age Group	n	Percentage (%)
Adolescent (18–25 years)	21	38.2%
Early Adulthood (26–35 years)	15	27.3%
Late Adulthood (36–45 years)	17	30.9%
Elderly (≥45 years)	2	3.6%
Total	55	100%

Based on Table 1, of the 55 respondents, the majority belonged to the adolescent age group, comprising 21 individuals (38.2%), followed by the late adulthood group with 17 individuals (30.9%), the early adulthood group with 15 individuals (27.3%), and the elderly group with the smallest number of respondents, namely 2 individuals (3.6%). These results indicate that most respondents in this study belonged to the adolescent age group.

Table 2. Frequency Distribution of Respondent Characteristics by Educational Level

Educational Level	n	Percentage (%)
Elementary School	2	3.6%
Junior High School	20	36.4%
Senior High School	19	34.5%
Higher Education	14	25.5%
Total	55	100%

Based on Table 2, respondent characteristics according to educational level show that the majority of respondents had completed junior high school, comprising 20 individuals (36.4%), followed by senior high school with 19 individuals (34.5%), higher education with 14 individuals (25.5%), while respondents whose highest level of education was elementary school represented the smallest number, namely 2 individuals (3.6%). These results indicate that the majority of respondents in this study had completed junior high school as their highest level of education.

Table 3. Frequency Distribution of Respondent Characteristics by Sex

Sex	n	Percentage (%)
Male	14	25.5%
Female	41	74.5%
Total	55	100%

Based on Table 3, the distribution of respondents by sex shows that the majority were female, comprising 41 individuals (74.5%), while male respondents comprised 14 individuals (25.5%). These results indicate that the majority of respondents in this study were female. Overall, the sample was characterized by a predominance of respondents aged 18-25 years (38.2%), respondents with junior high school education (36.4%), and female respondents (74.5%). These distributions describe the composition of the study sample only and should not be interpreted as determinants of understanding.

3.2. Level of Understanding of the Risk of Gastric Irritation Associated with Analgesic Use

Patient understanding was assessed using the seven-item questionnaire described in the Methods. For P1-P6, correct answers received 1 point and incorrect answers 0 points. P7 allowed three response levels: accurate (2 points), less accurate (1 point), and incorrect (0 points). The maximum total score was 8. Scores were converted to percentages and categorized as good (76-100%), moderate (56-75%), or poor (<56%). The cut-off categories followed Notoatmodjo (2020).

Table 4. Item-Level Summary of Questionnaire Responses				
Item	Assessed domain	Correct/ accurate n (%)	Less accurate n (%)	Incorrect n (%)
P1	Recognition of analgesics	55 (100.0%)	-	0 (0.0%)
P2	Prolonged-use precaution	52 (94.5%)	-	3 (5.5%)
P3	Expiry date and directions for use	55 (100.0%)	-	0 (0.0%)
P4	Recommended dose limit	55 (100.0%)	-	0 (0.0%)
P5	Action when adverse effects occur	55 (100.0%)	-	0 (0.0%)
P6	Use according to need/professional instructions	55 (100.0%)	-	0 (0.0%)
P7	Consultation before analgesic use	4 (7.3%)	44 (80.0%)	7 (12.7%)

As shown in Table 4, the mean total score was 6.89 out of 8 (86.1%). Items P1 and P3-P6 were answered correctly by all respondents, while P2 was answered correctly by 52 respondents (94.5%). The clearest gap occurred in P7: only 4 respondents (7.3%) provided the most accurate response concerning consultation with a healthcare professional before analgesic use, while 44 (80.0%) provided a less accurate response and 7 (12.7%) provided an incorrect response. This item-level pattern indicates that education should place particular emphasis on when professional consultation is warranted.

Table 5. Frequency Distribution of Respondent Characteristics by Level of Understanding

Level of Understanding	n	Percentage (%)
Good	47	85.5%
Moderate	8	14.5%
Poor	0	0.0%
Total	55	100%

Table 5 shows that 47 respondents (85.5%) were categorized as having good understanding, 8 respondents (14.5%) had moderate understanding, and none had poor understanding. These categories summarize performance on the questionnaire and should be interpreted within the limits of the self-selected sample and the instrument information available.

The high proportion of respondents in the good category is consistent with the generally high item-level scores; however, this descriptive finding does not establish why respondents achieved those scores. Previous studies have shown that medication counseling and access to clear information can improve medication knowledge, but the present study did not directly measure prior counseling exposure, experience, or other determinants (Eshiet et al., 2024; O'Mahony et al., 2023). The lower performance on P7 is clinically relevant because patients may use analgesics without fully recognizing when professional advice is needed. International studies similarly report knowledge gaps regarding adverse effects and safe NSAID or analgesic use, supporting the value of pharmacist counseling on warning symptoms, duration, dose, and consultation (Babelghaith et al., 2019; Mulka-Gierek et al., 2022; Tadesse et al., 2023).

3.3. Item-by-Item Analysis of Patient Understanding (P1–P7)

Table 4 also supports an item-by-item interpretation. Respondents performed strongly on recognition of analgesics, checking labels and expiration dates, dose limits, responses to adverse effects, and use according to professional instructions. The main area requiring reinforcement was consultation before analgesic use. For P1, all respondents (100%) correctly identified examples of analgesics. This indicates high recognition of the medicines included in the questionnaire, but recognition alone should not be equated with complete knowledge of their different safety profiles (Sinuraya et al., 2023). For P2, 52 respondents (94.5%) understood that analgesics should not be used for a prolonged period without professional supervision. This precaution is especially important for NSAIDs because prolonged exposure can increase the risk of gastrointestinal and other adverse effects (Scarpignato et al., 2015). For P3, all respondents (100%) understood the importance of checking the expiration date and directions for use before taking medication. This is an important component of safe medication use and supports appropriate self-management.

For P4, all respondents (100%) understood that analgesics should not be used beyond the recommended dose even when pain has not subsided. This point is important because excessive dosing can increase adverse-effect risk, although the specific toxicity profile differs among analgesic classes (Kim et al., 2022). For P5, all respondents (100%) understood that analgesic use should be stopped and a healthcare professional consulted if adverse effects occur. Clear counseling on adverse effects and appropriate follow-up can strengthen patients' medication understanding and safety behavior (Eshiet et al., 2024; O'Mahony et al., 2023). For P6, all respondents (100%) understood that analgesics should be used according to need and in accordance with directions from healthcare professionals. This finding reflects strong knowledge of a basic principle of rational medicine use.

For P7, only 4 respondents (7.3%) gave the most accurate response, while 44 (80.0%) gave a less accurate response and 7 (12.7%) gave an incorrect response. This pattern suggests that counseling should more explicitly explain when patients should seek professional advice before starting or continuing an analgesic, particularly when NSAID-related gastrointestinal risk factors may be present (Babelghaith et al., 2019; Lanas & Chan, 2017; van de Laar et al., 2023).

3.4. Pattern of Analgesic Use

Table 6. Analgesics Used by Respondents

Analgesic Used	n	Percentage (%)	Drug class
Paracetamol	19	34.5%	Non-NSAID analgesic/antipyretic
Ibuprofen	2	3.6%	Nonselective NSAID
Mefenamic Acid	2	3.6%	Nonselective NSAID
Sodium Diclofenac	7	12.7%	Nonselective NSAID
Meloxicam	21	38.2%	NSAID (preferential COX-2 inhibitor)
Metamizole	4	7.3%	Non-NSAID pyrazolone analgesic

As shown in Table 6, meloxicam was the most frequently reported analgesic (21 respondents; 38.2%), followed by paracetamol (19; 34.5%), sodium diclofenac (7; 12.7%), metamizole (4; 7.3%), ibuprofen (2; 3.6%), and mefenamic acid (2; 3.6%). These frequencies describe medicine use only; the study did not collect diagnosis, indication, dose, duration, <https://journal.scitechgrup.com/index.php/jsi>

comorbidities, gastroprotective therapy, or prescriber rationale, so it cannot determine whether a particular analgesic was optimally matched to an individual patient's condition. Importantly, paracetamol is not an NSAID and generally differs from NSAIDs in gastrointestinal safety, whereas ibuprofen, mefenamic acid, diclofenac, and meloxicam belong to the NSAID class for which gastrointestinal mucosal injury and bleeding risks are well established (Coxib and traditional NSAID Trialists' Collaboration, 2013; Lanus & Chan, 2017; Roberts et al., 2016).

3.5. Study Limitations

This study has several limitations. First, respondents voluntarily accessed a barcode-based questionnaire at a single executive pharmacy depot, creating potential self-selection bias and limiting generalizability. Second, the source manuscript did not document a formal sample-size calculation, response rate, or explicit inclusion and exclusion criteria. Third, although the questionnaire was reported to have undergone validity and reliability testing, numerical validity coefficients and the reliability statistic were not available for reporting. Fourth, the study did not collect diagnosis, analgesic dose or duration, comorbidities, gastroprotective therapy, or prescriber rationale, so medicine-use frequencies cannot be interpreted as evidence of clinical appropriateness. Finally, the available source data did not permit transparent verification of the previously reported demographic association analyses; therefore, the revised manuscript focuses on descriptive results that are directly supported by the available data.

Conclusions

Based on the available data, most respondents at the Executive Pharmacy Depot of Pindad General Hospital demonstrated a good level of understanding regarding safe analgesic use and gastric-irritation risk: 47 of 55 respondents (85.5%) were in the good category and 8 (14.5%) were in the moderate category. Item-level results were strongest for recognition of analgesics, checking expiration dates and directions, dose limits, responses to adverse effects, and use according to professional instructions. The principal knowledge gap concerned the most appropriate response regarding consultation with a healthcare professional before analgesic use.

The reported analgesic pattern included both NSAIDs and non-NSAID agents, and these medicines should not be assumed to have equivalent gastrointestinal risk. Meloxicam was the most frequently reported medicine, followed by paracetamol; however, the study did not assess clinical indications, dose, duration, comorbidity, gastroprotection, or prescriber rationale and therefore cannot judge the appropriateness of individual drug selection. The findings support continued pharmacist-led education on drug-class differences, recommended dose and duration, warning symptoms, and circumstances requiring professional consultation. This contribution is consistent with SDG 3 through its focus on medication safety and prevention of avoidable adverse drug effects.

Recommendations: Future studies should use a clearly defined sampling strategy, document inclusion and exclusion criteria and response rate, report complete questionnaire validity and reliability statistics, and collect respondent-level demographic and clinical data that allow transparent statistical testing. A larger multicenter sample and assessment of indications, dosage, duration, comorbidities, gastroprotective therapy, and prior counseling would strengthen interpretation and generalizability.

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Conflicts of Interest

The authors declare no conflict of interest.

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