Jurnal Farmasi Ma Chung: Sains Teknologi dan Klinis Komunitas

p–ISSN : **2986-8270**
e-ISSN : **2986-5972**
DOI: 10.33479/jfmc.v4i2.178
Research Article

The Correlation between Knowledge Level and Self-Medication Behavior on Nonsteroidal Anti-Inflammatory Drugs (NSAIDs)

Article History:
Accepted: 18 August 2026
Revised: 12 October 2026
Published: 23 November 2026

Keywords:
Nonsteroidal Anti-inflammatory Drugs (NSAIDs);
Knowledge;
Behaviour;
Self-medication

Putri Adella Anggraeni[1], Chilmia Nurul Fatiha[2*]

Copyright: © 2023 by the authors. Submitted for possible open access publication under the terms and conditions of the Creative Commons Attribution (CC BY) license (https://creativecommons.org/licenses/by/4.0/).

Nonsteroidal anti-inflammatory drugs (NSAIDs) are among the medicines most often bought without a prescription for pain, fever and minor inflammation. Customers who know little about them risk gastrointestinal injury, kidney damage and dosing errors. We examined whether NSAID knowledge was related to self-medication practice among customers buying these drugs without a prescription at Khotidjah Pharmacy, Banjarnegara. In this cross-sectional survey, 100 adult customers recruited by purposive sampling completed a validated questionnaire on NSAID knowledge and self-medication practice, and associations were tested with Pearson's chi-square (α = 0.05). Knowledge was poor in 44% of respondents, fair in 34% and good in 22%. In contrast, 85% showed good practice and the remaining 15% fair practice. Knowledge and practice categories were significantly related (χ^2=7.361,p=0.025; Cramér's V = 0.271). Although most customers behaved appropriately, gaps in safety knowledge were common, which supports more structured pharmacist counselling at the point of sale.

When people treat their own minor symptoms with medicines bought without a doctor's prescription, they are practising self-medication. Many choose this route because it saves time and money, and community pharmacies make the products easy to obtain. In Indonesia, it is often the first response to everyday complaints such as pain, fever and mild inflammation, for which analgesics and nonsteroidal anti-inflammatory drugs (NSAIDs) are sold over the counter. Its popularity rests on easy access to medicines, earlier experience with the same products and a common belief that such complaints do not need professional attention [1], [2].

NSAIDs such as ibuprofen, mefenamic acid, diclofenac sodium and meloxicam are among the products people buy most often for self-treatment. Their appeal lies in their combined analgesic, antipyretic and anti-inflammatory actions, which arise because NSAIDs block cyclooxygenase (COX-1 and COX-2) and so lower the production of prostaglandins, the mediators that drive pain, fever and inflammation [3]. Taken at the wrong dose or for too long, however, NSAIDs can irritate the stomach, cause gastrointestinal bleeding, impair kidney function and raise cardiovascular risk.

Indonesian surveys report frequent self-treatment with NSAIDs and other analgesics. Ridwan et al.

[1]Pharmacy Professional Programme, Faculty of Pharmacy, Sultan Agung Islamic University, Semarang, Indonesia
[2]Bachelor's Degree Programme in Pharmacy, Faculty of Pharmacy, Sultan Agung Islamic University, Semarang, Indonesia

email: chilmia@unissula.ac.id

judged NSAID use at a community health centre to be only partly rational, with problems mainly in drug choice and length of use [4]. Susanti and Dewi likewise observed pharmacy customers taking analgesics with little regard for dosing instructions or possible harms [5]. Self-treatment, in other words, often runs ahead of what people know about using medicines rationally. Women also appear to self-medicate more often than men, possibly because they watch their health more closely and seek care more actively [2].

Our preliminary observation at Khotidjah Pharmacy, Banjarnegara, showed that most customers bought NSAIDs for pain, fever or mild inflammation without a prescription. Few of them seemed to know the correct dose, how often to take it, how long to continue, or which side effects to watch for. Self-treatment under these conditions is likely to lead to avoidable drug-related problems.

Knowledge shapes how people use medicines. Someone who understands what an NSAID is for, how much to take, how to take it and what harm it can cause is better placed to use it safely. Earlier Indonesian studies found that better-informed customers chose more suitable products, kept to the recommended dose and were more alert to adverse effects [6], [7].

Most of this work, however, has looked at analgesics in general or at the rationality of NSAID use, and few studies have tested directly whether customers with different levels of NSAID knowledge behave differently when they treat themselves. Evidence from district-level pharmacies outside large cities is particularly scarce. We therefore assessed NSAID knowledge and self-medication practice among customers of Khotidjah Pharmacy, Banjarnegara, and tested whether the two were related.

Results and Discussion

Customers who self-medicated with NSAIDs at Khotidjah Pharmacy were mostly young adults, women and people with secondary schooling. A similar profile was reported in Surabaya, where working-age adults turned to analgesics because they were busy and wanted quick relief from minor pain without visiting a health facility [2]. Ready access to medicines, saving time and familiarity with the products seem to underlie self-treatment in this age group across Indonesia. Beyond the shared age and gender pattern, however, the predominance of secondary-education respondents in this semi-rural pharmacy setting contrasts somewhat with studies showing that educational level is closely linked to NSAID-related knowledge and self-medication practice [10]. This divergence suggests that in smaller-city or district-level settings such as Banjarnegara, geographic proximity and limited access to primary healthcare facilities may play a more decisive role in shaping self-medication decisions than formal education level.

Most respondents knew what NSAIDs are used for but knew much less about how to take them, their side effects, storage and the risks of long-term use. Probosiwi et al. described the same imbalance: people understood that analgesics relieve pain far better than they understood dosing, interactions and harms [11]. Pratiwi et al. likewise found that knowledge of over-the-counter medicines centred on their benefits rather than on the principles of rational use. The consistency of this indication–safety knowledge gap across multiple Indonesian studies conducted in different regions and years suggests that the gap is structural rather than incidental, as information encountered at the point of purchase tends to reinforce indication-related knowledge more readily than safety-related instructions [12]. This is corroborated by the present study's own data: although 70% of respondents were aware that long-term NSAID use could cause gastric disturbance, only 40% recognized the risk to renal function and just 58% understood the interaction risk with antihypertensive medications, indicating that even within the safety domain, awareness remains skewed toward more commonly publicized risks. This pattern is not unique to the Indonesian context; a cross-sectional study among osteoarthritis patients similarly found that recognition of NSAID indications did not correspond with adequate understanding of their safety profile, suggesting that this indication–safety gap may reflect a broader, cross-cultural pattern in NSAID self-medication rather than a locally specific educational shortfall [13].

Most respondents said pharmacy staff had advised them when they bought their medicine. Studies of drug information services in community pharmacies show that such advice improves customers' grasp of dosing, directions and possible adverse reactions and so supports more rational use [10]. Yet many customers still repurchased medicines without asking for advice, so rational self-medication is not yet routine. Notably, 80% of respondents acknowledged the importance of understanding the side effects of the diclofenac sodium–dexamethasone combination, yet 65% reported using it daily, demonstrating that risk awareness does not reliably translate into safer use. This discrepancy suggests that one-time, point-of-sale verbal counseling, while valuable for initial understanding, may be insufficient to alter entrenched repurchasing habits, particularly for combination products perceived as low-risk due to their easy accessibility [14].

Respondent Characteristics

Table 1. Profile of Respondents at Khotidjah Pharmacy, Banjarnegara

Characteristic	Category	Frequency (n)	Percentage (%)
Age	18–30 years	44	44.0
	31–50 years	22	22.0
	>50 years	34	34.0
	Total	100	100
Gender	Male	39	39.0
	Female	61	61.0
	Total	100	100
Education	Primary School	19	19.0
	Junior High School	26	26.0
	Senior High School	41	41.0
	Diploma/Bachelor's Degree (D1/S1)	4	4.0
	Master's Degree (S2)	4	4.0
	Other	6	6.0
	Total	100	100
Chief Complaint	Analgesic (Pain)	50	50.0
	Antiinflamatory	13	13
	Antipyretic	37	37.0
	Total	100	100
Type of NSAID	Mefenamic Acid	26	26.0
	Ibuprofen	37	37.0
	Diclofenac Sodium	13	13.0
	Meloxicam	24	24.0
	Total	100	100
Duration of Use	< 1 month	75	75.0
	1–3 months	22	22.0
	3–6 months	3	3.0
	Total	100	100

The largest groups of respondents were aged 18–30 years (44%), female (61%) and educated to senior high school level (41%) (Table 1). Young adults and women may be more inclined to self-medicate because they find health information more easily and pay closer attention to their health [1], [10], [15].

Pain was the main reason for buying an NSAID (50%), and ibuprofen was the product chosen most often

(37%). Three-quarters of respondents had used NSAIDs for under a month, which points to short courses for acute complaints; those using them for longer remain exposed to adverse effects [2], [16], [17], [18].

Knowledge of Self-Medication

Respondents generally recognised what common NSAIDs are used for, especially pain relief. Correct answers were frequent for mefenamic acid for toothache (86%), meloxicam for joint pain (65%) and ibuprofen for menstrual pain (65%), knowledge that people probably gain from their own use and from family and friends [2].

Safety knowledge was weaker, particularly on storage, on using over-the-counter products without professional advice, and on dosing [12]. Awareness of long-term risks was uneven: 70% knew about stomach problems and 58% about interactions with antihypertensives, but only 40% knew that prolonged use can harm the kidneys. Just 6% knew that a missed dose should not be made up by doubling the next one. Pharmacists clearly need to give more thorough advice on safe NSAID use [12], [19].

Table 2. Respondents' Knowledge Level Categories

Knowledge Category	Number (n)	Percentage (%)
Good (76–100%)	22	22%
Fair (56–75%)	34	34%
Poor (<56%)	44	44%
Total	100	100%

Overall, 44% of respondents had poor knowledge, 34% fair and 22% good (Table 2), so knowledge of rational NSAID use in this population is clearly insufficient.

Self-Medication Behavior

Some respondents used the diclofenac sodium–dexamethasone combination without professional supervision, and 41% said they took it often. Easy availability in pharmacies may encourage people to use anti-inflammatory products on their own initiative [19]. On the other hand, 73% had received advice from pharmacists or pharmacy staff at purchase, which shows how much pharmacy personnel contribute to informing customers about indications, doses and side effects [14].

Most respondents agreed that it is important to know a medicine's side effects (80%) and said they followed a doctor's or pharmacist's directions (70%). Even so, some took their medicine every day, 56% bought more without consulting anyone, and some did not restrict use to times of need. Knowing about safety, therefore, does not always lead to safe practice [14], [20].

Table 3. Respondents' Behavior Categories

Behavior Category	Number (n)	Percentage (%)
Good (76–100%)	85	85%
Fair (56–75%)	15	15%
Total	100	100%

Practice was classified as good in 85% of respondents and fair in 15% (Table 3). Although most customers used NSAIDs reasonably well, further education on safe use is still warranted.

Relationship Between Knowledge and Self-Medication Behavior

Knowledge and practice categories were significantly associated ($\chi^2 = 7.361$, $p = 0.025$), although the association was only modest (Cramér's V = 0.271; Table 4). The pattern was not strictly graded: good practice was most common in the fair-knowledge group (33 of 34), followed by the good-knowledge group (19 of 22) and the poor-knowledge group (33 of

44). The main contrast therefore lies between respondents with poor knowledge and the rest, in line with studies that link better knowledge to more suitable product choice, correct dosing and attention to side effects [6], [11].

Understanding indications, directions, dose and side effects is a precondition for rational self-medication, and earlier studies have linked better knowledge to safer and more responsible use. Counselling by pharmacists and other pharmacy staff is therefore a practical way to raise the quality of self-medication in the community [6], [7], [11].

Table 4. NSAID Self-Medication Practice by Knowledge Level

Knowledge Level	NSAID Self-Medication Behavior		Total	Cramer's V (Effect Measure)	*p-value*
	Good	Fair			
	N (%)	N (%)			
Good	19 (19%)	3 (3%)	22	0.271 (95% CI: 0.141 - 0.431)	0.025*
Fair	33 (33%)	1 (1%)	34		
Poor	33 (33%)	11 (11%)	44		
Total	85 (85%)	15 (15%)	100		

*p-value significant < 0,05

Good practice predominated at every knowledge level: it was reported by 19 of the 22 respondents with good knowledge, 33 of the 34 with fair knowledge and 33 of the 44 with poor knowledge (Table 4).

Conclusion

Customers of Khotidjah Pharmacy, Banjarnegara, who bought NSAIDs without a prescription generally knew little about these drugs, particularly about their safety, yet most reported appropriate self-medication. Knowledge and practice were significantly but modestly associated ($\chi^2 = 7.361, p = 0.025$). Pharmacists should use each sale to explain the correct dose, how long to continue and the main risks of NSAIDs.

Materials and Methods

Study Design

We conducted an analytical cross-sectional survey in which knowledge and self-medication practice were measured at the same visit, without any intervention. Data were gathered between February and March 2026.

Population and Sample

The target population comprised customers of Khotidjah Pharmacy, Banjarnegara, who bought oral NSAIDs without a prescription. Sample size was estimated with Cochran's formula, assuming Z = 1.96 (95% confidence), a precision of e = 0.10 and, because no prior estimate was available, p = q = 0.50: ($n_0 = \frac{Z^2 pq}{e^2}$), which gives ($n_0 = \frac{(1.96)^2(0.50)(0.50)}{(0.10)^2} = 96.04$). We rounded the required 96 up to 100 participants and recruited them purposively. Customers were eligible if they were at least 18 years old, were buying an oral NSAID without a prescription, could read and write, and agreed to take part. Incomplete questionnaires and purchases made with a prescription were excluded.

Research Instrument

The questionnaire had three parts: demographic details, NSAID knowledge and self-medication practice. Knowledge items, adapted from Urfiyya and Arjuliant, covered indications, dosing, adverse effects, interactions and correct use [8]. Practice items were adapted from Dewi and Desiani's survey of diclofenac sodium–dexamethasone use and asked how medicines were taken, whether directions were followed and whether a health professional was consulted [9]. We adjusted the wording of all items to the local setting and tested validity and reliability before the main survey.

Each correct or appropriate answer scored 1 and every other answer 0. Section totals were expressed as a percentage of the maximum score and classified,

following Urfiyya and Arjuliant, as good (76–100%), fair (56–75%) or poor (<56%) [8].

Data Collection

Eligible customers were approached in the pharmacy and given a paper questionnaire once the purpose of the study had been explained and written consent signed. They filled it in on their own. The researcher stepped in only to clarify the instructions, reading from a fixed script and giving no hints about the answers, to limit both missing data and response bias. Completed forms were checked, coded and entered into a database for analysis.

Data Analysis

Knowledge category (independent variable) and practice category (dependent variable) were cross-tabulated, and their association was tested with Pearson's chi-square test. The test was applied only after confirming that no expected count in the 3 × 2 table was below 1 and that fewer than 20% of cells had expected counts below 5. Associations with $p < 0.05$ were treated as significant, and Cramér's V was reported as the effect size.

Ethical Clearance

The Health Research Ethics Committee of RSI Sultan Agung approved the protocol (No. 90/KEPK-RSISA/V/2026) before any data were collected. Participants were told the aims, procedures and benefits of the study and their rights, joined voluntarily and signed a consent form. Their responses were kept confidential and used for this study only.

References

1. F. Alhomoud, Z. Aljamea, L. Basalelah, R. Almahasnah, and F. Alhomoud, "Self-medication and self-prescription with antibiotics in the Middle East: A systematic review," J. Infect. Public Health, vol. 10, no. 2, pp. 136–145, 2017, [Online]. Available: https://www.sciencedirect.com/science/article/pii/S1876034116300715/pdfft
2. A. Siswidiasari, A. A. P. Sapto, M. N. Ulfa, H. Wati, and D. Nurmawati, "Analysis of Analgesic Drug Use in Self-Medication Among the Community in Surabaya City," J. Pharmasci, vol. 9, no. 1, pp. 45–52, 2023.
3. I. Ghlichloo and V. Gerriets, "Nonsteroidal anti-inflammatory drugs (NSAIDs)," 2023, StatPearls Publishing.
4. B. A. Ridwan, Y. Fety, and Nurlinda, "Evaluation of the Rational Use of Nonsteroidal Anti-inflammatory Drugs (NSAIDs) at Poli-Polia Community Health Center, East Kolaka Regency," J. Mandala Pharmacon Indones., vol. 7, no. 1, pp. 1–8, 2021.
5. A. D. Susanti and S. R. Dewi, "A Study of the Level of Knowledge and Self-Medication Behavior Regarding Analgesic Drugs Among Patients at a Pharmacy in Samarinda City," J. Ris. Kefarmasian Indones., vol. 4, no. 3, pp. 385–392, 2022.
6. G. Kurniawan, M. R. Pahlevi, H. Wati, and W. A. Sujatmiko, "The Relationship Between Knowledge and Self-Medication Behavior Regarding NSAIDs at Pharmacy X in Banjarmasin," J. Ilm. Farm., 2023.
7. N. Probosiwi, T. Ilmi, N. F. Laili, Y. Saristiana, and D. A. N. Sukmawati, "Analysis of the Level of Knowledge and Self-Medication Behavior Regarding Analgesic Drugs at Sumber Urip Jaya Pharmacy," J. Inov. Farm. Indones., vol. 6, no. 1, pp. 70–82, 2024.
8. Q. A. Urfiyya and Z. D. Arjuliant, "Patterns of Use and Patient Knowledge Regarding the Use of Nonsteroidal Anti-inflammatory Drugs at Perdana Pharmacy Yogyakarta," CERATA J. Ilmu Farm., vol. 15, no. 1, pp. 13–22, 2024.
9. R. Rahmaniah Dewi and E. Desiani, "The Relationship Between Knowledge and the Use Patterns of the Diclofenac Sodium–Dexamethasone Combination Among the Community in Sidomulyo Village," J. Anestesi, vol. 3, no. 2, pp. 1–10, 2025.
10. V. Anggita, Z. Trisno, and Z. Qorrotul'Aini, "The Relationship Between Educational Level and

Knowledge of NSAIDs in Self-Medication Therapy," J. Ilm. Farm. Attamru, vol. 6, no. 1, 2025.

11. A. A. Sopiany and M. Rosmiati, "Analysis of the Relationship Between Knowledge Level and Self-Medication Behavior Regarding NSAID Pain Medications at Sukagalih Pharmacy," J. Pharm. Student, 2024.
12. S. Kristina, Y. Prabandari, and R. Sudjaswadi, "Community Self-Medication Behavior and Its Influencing Factors," J. Manaj. dan Pelayanan Farm., 2020, [Online]. Available: https://journal.ugm.ac.id/jmpf/article/download/294/219
13. D. Gong and others, "Knowledge, attitude, and practice toward NSAIDs among osteoarthritis patients: A cross-sectional study," Sci. Rep., vol. 14, no. 1, p. 76171, 2024.
14. S. Kurniawati, N. Hidayah, and B. Prasetyo, "The Relationship Between Knowledge and the Appropriateness of NSAID Self-Medication Among Adult Patients at Pharmacies," J. Ilm. Kefarmasian, vol. 10, no. 1, pp. 45–53, 2022.
15. A. Hussain, A. Khanum, and H. Mahmood, "Self-medication practices among adults: A cross-sectional study," Pharm. Pract. (Granada)., vol. 17, no. 2, 2019.
16. T. Lestari, N. Astuti, Z. V. R. S., and others, "Overview of Analgesic and Antipyretic Self-Medication Practices," Medimuh J. Kesehat. Muhammadiyah, vol. 5, no. 2, pp. 110–118, 2024.
17. N. A. Pratiwi, A. Nabiilah, A. A. Sari, and others, "Knowledge of Non-Health Students Regarding the Self-Medication Use of Antipyretic Drugs," J. Farm. Komunitas, vol. 9, no. 1, pp. 23–30, 2022.
18. A. Anggriani, D. A. Fitriani, and I. Lisni, "Patterns of NSAID Use in Self Medication at Community Pharmacies," J. Ilm. Farm. Bahari, vol. 15, no. 2, pp. 97–105, 2024.
19. N. Aeni, D. Rahmawati, and A. Lestari, "The Effect of Knowledge Level on Self-Medication Behavior Regarding Nonsteroidal Anti-inflammatory Drugs Among the Community," J. Farm. Indones., vol. 19, no. 2, pp. 112–120, 2022.
20. R. Fauziah, P. Ananda, and A. Wibowo, "Self-Medication Behavior Regarding Nonsteroidal Anti-inflammatory Drugs Based on the Community's Level of Knowledge in Semarang City," J. Sains Farm. dan Klin., vol. 8, no. 3, pp. 201–209, 2022.