



RESEARCH ARTICLE

Overuse of Non-Steroidal Anti-Inflammatory Drugs and Associated Safety Concerns Among Adults in Rural Communities: A Community-Based Cross-Sectional Study

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Abstract

Background: Non-steroidal anti-inflammatory drugs are commonly used for pain, fever, musculoskeletal complaints, headache, dental pain, and inflammatory disorders. Easy availability, reuse of previous prescriptions, and purchase without medical consultation may lead to overuse, particularly in rural populations. Prolonged or inappropriate NSAID use can cause gastrointestinal, renal, cardiovascular, and hypersensitivity-related adverse effects.

Aim: To assess the prevalence, pattern, determinants, and safety concerns related to NSAID overuse among adults residing in rural communities.

Materials and Methods: A community-based cross-sectional study was conducted among 420 adults aged 18 years and above from selected rural villages in the field practice area. A pretested interviewer-administered questionnaire was used to collect information regarding NSAID use during the previous six months, indication, source of medicine, duration, repeated use, concurrent medicines, awareness of adverse effects, and symptoms suggestive of NSAID-related toxicity. NSAID overuse was defined as use without a current medical prescription for more than three consecutive days, repeated use for recurrent complaints without consultation, use of more than one NSAID-containing product simultaneously, use beyond prescribed duration, or use in the presence of risk factors without medical review. Data were analyzed using descriptive statistics and chi-square test.

Results: Of 420 participants, 238 (56.7%) reported NSAID use during the previous six months. NSAID overuse was identified in 126 of 238 users (52.9%). Diclofenac was the most frequently used NSAID, followed by ibuprofen, paracetamol-containing analgesic combinations, nimesulide-containing preparations, and aspirin. Musculoskeletal pain and headache were the commonest indications. Pharmacy purchase without a current prescription was reported by 46.2% NSAID users, while 31.5% reused old prescriptions. Use beyond three consecutive days was observed in 39.5%, and concurrent use of two analgesic products was reported by 18.5%. Dyspepsia, abdominal pain, reduced urine output, pedal edema, and dizziness were reported more frequently among NSAID overusers than appropriate users.

Conclusion: NSAID overuse was common in the surveyed rural population and was associated with direct pharmacy purchase, previous prescription reuse, and poor awareness of adverse effects. Community education, pharmacist counseling, rational dispensing, and early identification of high-risk users are necessary to reduce NSAID-related harm.

Keywords: Adverse Drug Reactions, Community Pharmacology, NSAID Overuse, Rural Population, Self-Medication, Rational Drug Use.

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1 | INTRODUCTION

Non-steroidal anti-inflammatory drugs are among the most commonly used medicines for pain, fever, and inflammation. Their main therapeutic action is related to inhibition of prostaglandin synthesis through cyclooxygenase inhibition. This mechanism produces analgesic, antipyretic, and anti-inflammatory effects but also contributes to gastrointestinal, renal, cardiovascular, and hypersensitivity-related adverse effects (1).

NSAIDs are frequently used for backache, joint pain, body ache, headache, fever, dental pain, menstrual pain, and minor injuries. Their rapid symptomatic relief and easy availability make them popular among the general population. However, repeated or prolonged use without proper medical supervision may expose individuals to avoidable toxicity (2).

Rural populations may be more vulnerable to inappropriate NSAID use because of limited availability of qualified medical practitioners, long distance from health facilities, financial constraints, previous prescription reuse, and easy purchase of medicines from local pharmacies. Over-the-counter medicine use can be beneficial for minor self-limiting illnesses but may lead to misuse when consumers have inadequate knowledge regarding dose, duration, contraindications, and adverse effects (3).

NSAID-induced gastrointestinal toxicity ranges from dyspepsia and gastritis to peptic ulceration, bleeding, and perforation. Gastrointestinal risk is increased in older adults, patients with previous ulcer disease, alcohol use, concomitant corticosteroid or anticoagulant use, and prolonged NSAID exposure (4). NSAIDs can also affect renal function by reducing prostaglandin-mediated renal blood flow. Individuals with dehydration, diabetes mellitus, hypertension, chronic kidney disease, heart failure, or diuretic therapy are at increased risk of sodium retention, edema, reduced urine output, and acute kidney injury (5).

Cardiovascular safety is another important consideration. Some NSAIDs may increase blood pressure, worsen fluid retention, and increase cardiovascular risk, particularly when used at higher doses or for prolonged periods (6).

Regular review of NSAID use is essential because many individuals may take multiple analgesic products without realizing that they contain similar or overlapping ingredients. Such therapeutic duplication may increase the risk of adverse effects without providing additional benefit (7).

The present study was undertaken to assess the prevalence, pattern, determinants, and safety concerns related to NSAID overuse among adults residing in rural communities.

2 | MATERIALS AND METHODS

This community-based cross-sectional observational study was conducted in selected rural villages within the field practice area associated with tertiary care centre. The study was carried out over six months after obtaining approval from the Institutional Ethics Committee.

Adults aged 18 years and above who had been residing in the selected villages for at least one year were included. Participants who were severely ill, unable to communicate, unwilling to provide consent, or unable to recall medicine use during the previous six months were excluded.

The sample size included 420 adults. Villages were selected from the rural field practice area. Households were selected through systematic sampling. One eligible adult was selected from each household. In households with more than one eligible participant, one adult was selected by simple random method.

A structured interviewer-administered questionnaire was prepared in English and translated into the local language. The questionnaire was reviewed by faculty members from Pharmacology and Community

Supplementary information The online version of this article ([10.15520/ijmhs/2019/9-5-99](https://doi.org/10.15520/ijmhs/2019/9-5-99)) contains supplementary material, which is available to authorized users.

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Medicine for clarity and relevance. It was pretested among 25 adults from a nearby village who were not included in the final study. Necessary modifications were made after the pilot testing.

The questionnaire collected information on age, gender, education, occupation, household income, distance from health facility, pain-related complaints, fever, headache, dental pain, menstrual pain, joint pain, backache, and other reasons for NSAID use. Participants were asked about the name of medicine, dose, duration, frequency, route of administration, source of medicine, use of old prescriptions, leftover drugs, pharmacist advice, family advice, and self-purchase from pharmacy.

Whenever possible, participants were asked to show medicine strips, empty packets, old prescriptions, or stored medicines at home. Medicines were identified from available labels. Participants who could not recall the exact medicine name were asked about the colour, packaging, local brand name, or indication for which the medicine was used.

NSAID overuse was defined as one or more of the following: use of an NSAID without a current medical prescription for more than three consecutive days; repeated use for recurrent pain without consultation; simultaneous use of two analgesic or NSAID-containing products; continuation beyond the prescribed duration; use despite history of peptic ulcer disease, renal disease, uncontrolled hypertension, or known drug allergy without medical review; or use with corticosteroids, anticoagulants, diuretics, or other high-risk medicines without consultation.

Participants were asked about history of acidity, dyspepsia, abdominal pain, nausea, vomiting, black stools, reduced urine output, pedal edema, rash, breathlessness, dizziness, and elevated blood pressure after NSAID use. They were also asked whether they knew about gastrointestinal, renal, or cardiovascular adverse effects of prolonged painkiller use.

Data were entered in Microsoft Excel and analyzed using descriptive statistics. Frequency, percentage, mean, and standard deviation were calculated. NSAID users were categorized as appropriate users or overusers according to the operational definition. Chi-square test was used to compare symptoms between the two groups. A *p* value less than

0.05 was considered statistically significant.

Institutional Ethics Committee approval was obtained before commencement of the study. Written informed consent was obtained from all participants. Personal identifiers were not included in the analysis. Participants with warning symptoms were advised to attend the nearest health facility.

3 | RESULTS

A total of 420 adults were included in the study. The mean age was 42.6 ± 14.8 years. There were 226 males and 194 females.

Among 420 participants, 238 (56.7%) had used at least one NSAID or NSAID-containing analgesic during the previous six months. NSAID overuse was identified in 126 of 238 users, accounting for 52.9% of NSAID users and 30.0% of the total study population.

Diclofenac was the commonest NSAID reported by users, followed by ibuprofen and paracetamol-containing analgesic combinations.

Musculoskeletal pain was the most frequent indication for NSAID use, followed by headache and fever with body ache.

Direct pharmacy purchase without a current prescription was the most common source of NSAIDs. Old prescription reuse was also frequently reported.

Multiple responses were possible.

Use of NSAIDs beyond three consecutive days without medical review was reported by 94 users. Recurrent use for the same complaint and simultaneous use of two analgesic products were also common.

Gastrointestinal and renal-related symptoms were more common among NSAID overusers than among appropriate users.

Awareness of adverse effects was low. Only 68 users knew that NSAIDs could cause gastritis or ulcer, and only 34 users knew that prolonged use could affect kidneys.

TABLE 1:

Characteristic	Number (%)
Male	226 (53.8)
Female	194 (46.2)
Age 18–30 years	96 (22.9)
Age 31–50 years	188 (44.8)
Age 51–60 years	78 (18.6)
Age above 60 years	58 (13.8)
No formal education	72 (17.1)
Primary education	158 (37.6)
Secondary education	142 (33.8)
Graduate and above	48 (11.4)

TABLE 2:

NSAID Use Pattern	Number (%)
No NSAID use in previous six months	182 (43.3)
Appropriate NSAID use	112 (26.7)
NSAID overuse	126 (30.0)
Total	420 (100.0)

TABLE 3:

Medicine or Preparation Used	Number among NSAID Users, n=238 (%)
Diclofenac	82 (34.5)
Ibuprofen	54 (22.7)
Paracetamol-containing analgesic combination	42 (17.6)
Nimesulide-containing preparation	22 (9.2)
Aspirin	14 (5.9)
Naproxen or other NSAIDs	12 (5.0)
Name not recalled	12 (5.0)

TABLE 4:

Indication	Number (%)
Backache, joint pain, or body ache	104 (43.7)
Headache	46 (19.3)
Fever with body ache	34 (14.3)
Dental pain	18 (7.6)
Menstrual pain	16 (6.7)
Minor injury or trauma	12 (5.0)
Other pain complaints	8 (3.4)

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TABLE 5:

Source of NSAID	Number (%)
Pharmacy purchase without current prescription	110 (46.2)
Current doctor prescription	74 (31.1)
Old prescription reuse	75 (31.5)
Advice from family or friends	42 (17.6)
Leftover medicine at home	34 (14.3)
Informal healthcare provider	28 (11.8)

TABLE 6:

Overuse Pattern	Number among NSAID Users (%)
Use for more than three consecutive days without review	94 (39.5)
Repeated use for recurrent complaint	82 (34.5)
Simultaneous use of two analgesic products	44 (18.5)
Use despite gastritis or ulcer symptoms	38 (16.0)
Use with hypertension, diabetes, or renal disease	32 (13.4)
Use with alcohol intake	28 (11.8)
Use with steroids, anticoagulants, or diuretics	18 (7.6)

TABLE 7:

Symptom	Appropriate Users n=112	NSAID Overusers n=126	p value
Acidity or dyspepsia	16 (14.3)	42 (33.3)	<0.01
Abdominal pain	8 (7.1)	26 (20.6)	<0.01
Nausea or vomiting	6 (5.4)	18 (14.3)	0.02
Reduced urine output	2 (1.8)	12 (9.5)	0.01
Pedal edema	2 (1.8)	10 (7.9)	0.04
Dizziness	8 (7.1)	20 (15.9)	0.03
Skin rash or itching	4 (3.6)	8 (6.3)	0.34

TABLE 8:

Awareness Item	Number among NSAID Users (%)
Knew NSAIDs may cause gastritis or ulcer	68 (28.6)
Knew prolonged NSAID use may affect kidneys	34 (14.3)
Checked expiry date before use	102 (42.9)
Read dose instructions	76 (31.9)
Knew not to combine two painkillers	58 (24.4)
Consulted doctor after adverse symptoms	40 (16.8)

4 | DISCUSSION

In the present study, 56.7% of rural adults had used NSAIDs during the previous six months, and NSAID overuse was observed in 52.9% of NSAID users. Musculoskeletal pain was the commonest indication, and diclofenac was the most frequently used

NSAID. Direct pharmacy purchase, old prescription reuse, and poor awareness of adverse effects were important contributors. In a study by Kochhar et al., self-prescribed analgesic use was assessed among consumers in a rural area of Delhi. They reported that paracetamol was the most frequently used self-prescribed analgesic and that most consumers were

unaware of analgesic-related adverse effects (8). In contrast, diclofenac was the most commonly used NSAID in the present study. However, both studies showed poor awareness of possible adverse effects and frequent unsupervised analgesic use. In a study by Ahmad et al., self-medication practices were evaluated among residents of rural Sahaswan in northern India. They found that self-medication was common and was influenced by accessibility, previous experience, and direct purchase of medicines (9). Similar findings were observed in the present study, where pharmacy purchase without a current prescription and reuse of old prescriptions were frequent sources of NSAIDs. In a study by Hughes et al. (10), benefits and risks of self-medication were discussed, and the authors emphasized that responsible self-medication requires correct drug choice, appropriate dose, limited duration, and adequate consumer knowledge. In the present study, more than one-third of NSAID users continued treatment for more than three consecutive days without medical review, indicating an unsafe pattern of use.

In a study by Wolfe et al. (11), gastrointestinal toxicity of NSAIDs was described as an important safety concern, ranging from dyspepsia to ulceration, bleeding, and perforation. In the present study, acidity or dyspepsia and abdominal pain were significantly more common among NSAID overusers than appropriate users, supporting the known gastrointestinal risk of repeated NSAID exposure.

In a study by Langman et al. (12), the risk of bleeding peptic ulcer was found to vary among individual NSAIDs. In the present study, diclofenac and ibuprofen were commonly used, and many participants took these medicines without assessment of ulcer history or gastrointestinal risk factors. This indicates the need for better counseling and risk screening before NSAID use.

Henry et al. (13), demonstrated gastrointestinal complication risk varied among individual NSAIDs, and dose-related exposure was important. In the present study, exact dose information was not available for every participant, but use beyond three days and repeated use for recurrent pain were common. These patterns may increase the risk of gastrointestinal toxicity.

In a study by Griffin et al., (14) NSAID use was associated with increased risk of peptic ulcer disease

in elderly persons. In the present study, elderly participants constituted 13.8% of the total population, and some used NSAIDs without regular medical review. This group requires special attention because age-related comorbidities and concurrent medicines may increase toxicity.

In a study by Lanza et al., (15) prevention of NSAID-induced ulcers was emphasized through identification of high-risk patients, use of the lowest effective dose, shortest possible duration, and gastroprotective strategies when indicated. The present findings support the need for similar interventions at the rural community level, especially for people with gastritis, ulcer symptoms, renal disease, hypertension, diabetes, or concomitant diuretic and steroid use.

The study has certain limitations. NSAID use was self-reported and may have been affected by recall bias. Exact dose and duration could not be confirmed in all participants. Renal and liver function tests were not performed. The study was restricted to selected rural villages and may not represent all rural populations.

5 | CONCLUSION

NSAID overuse was common among adults in the studied rural population. Diclofenac and ibuprofen were frequently used for musculoskeletal pain, headache, fever, and dental pain. Direct pharmacy purchase, old prescription reuse, repeated self-treatment, and inadequate knowledge of adverse effects were major contributors to unsafe NSAID use. Gastrointestinal symptoms and renal-related complaints were more common among NSAID overusers. Community education, pharmacist counseling, rational dispensing, warning labels, and early referral of high-risk individuals are needed to reduce NSAID-related harm.

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How to cite this article: Agrawal A. **Overuse of Non-Steroidal Anti-Inflammatory Drugs and Associated Safety Concerns Among Adults in Rural Communities: A Community-Based Cross-Sectional Study**. *Innovative Journal of Medical and Health Science*. 2019;1445–1450. <https://doi.org/10.15520/ijmhs/2019/9-5-99>