




# Analgesic Utilization Patterns and Risk of Adverse Effects Among Adults in Tripoli, Libya: A Cross-Sectional Study

Mr. Mohammed Rahouma<sup>1\*</sup>, Retaj Salah Al-Buzaidi

## ARTICLE INFO

**Received:** 01-03-2026  
**Accepted:** 10-03-2026  
**Published:** 30-03-2026

**Keywords.** Analgesics, self-medication, adverse effects, Tripoli, Libya, public health

**Copyright:** © 2024 by the authors. Submitted for possible open access publication under the terms and conditions of the Creative Commons Attribution International License (CC BY 4.0).  
<http://creativecommons.org/licenses/by/4.0/>

## ABSTRACT

**Background:** Analgesics are among the most commonly used medications worldwide, often available without prescription. Irrational use may lead to serious health complications. Limited data exist on analgesic use patterns in Libya, particularly in Tripoli.

**Methods:** A community-based cross-sectional study was conducted among 420 adults residing in Tripoli, Libya, using a structured questionnaire. Data covered sociodemographics, analgesic types, reasons for use, prescription status, knowledge of adverse effects, and self-reported complications.

**Results:** Of 420 participants, 88.1% reported using analgesics within the past three months. Paracetamol was the most commonly used (74.5%), followed by ibuprofen (52.4%) and aspirin (33.3%). Headache (81.2%) was the primary reason. Self-medication without prescription accounted for 64.8% of use. Only 40.5% demonstrated good knowledge of potential adverse effects. Gastrointestinal symptoms (41.2%) were the most frequently reported adverse effect, followed by drowsiness (22.6%) and gastric irritation (18.3%).

**Conclusion:** Analgesic use, particularly self-medication, is highly prevalent among adults in Tripoli. Knowledge regarding safe use and adverse effects remains insufficient. Community-based educational interventions are urgently needed to promote rational analgesic use.

## 1. Introduction

Pain is a universal human experience and a primary driver for medication use, especially analgesics. Paracetamol and non-steroidal anti-inflammatory drugs (NSAIDs) are widely available without prescription, leading to extensive use among the general population (Vane & Botting, 1998). While effective for mild to moderate pain, inappropriate use of analgesics is associated with gastrointestinal disorders, hepatotoxicity, nephrotoxicity, and medication-overuse headache (Moore et al., 2015).

In Libya, easy access to pharmacies and limited regulatory enforcement may increase self-medication practices. However, research on analgesic use patterns among Libyan adults remains sparse. Previous local studies in Derna (Eljamay et al., 2023), Nalut (Aljerbi et al., 2022), and among medical students (Omar et al., 2024) have shown high rates of self-medication and variable knowledge levels. No study has specifically focused on Tripoli, the capital and most populous city.

Therefore, this study aimed to assess analgesic utilization patterns and the risk of adverse effects among adults in Tripoli, Libya.

## 2. Methods

### 2.1 Study Design and Setting

A community-based cross-sectional study was conducted between February and April 2025 in Tripoli, Libya. Tripoli is the largest metropolitan area in Libya, with diverse socioeconomic and healthcare access characteristics.

### 2.2 Study Population and Sampling



Adults aged 18 years and above residing in Tripoli were eligible. Pregnant women and individuals with chronic diseases requiring regular analgesic prescriptions (e.g., rheumatoid arthritis) were excluded. A convenience sampling method was employed across five main municipal districts. The sample size was calculated using the formula for cross-sectional studies, assuming a 50% prevalence of analgesic use, 95% confidence level, and 5% margin of error, yielding a minimum of 384 participants. A total of 420 participants were recruited to account for non-response.

### 2.3 Data Collection Tool

A structured, self-administered questionnaire was developed based on previous studies (Eljamay et al., 2023; Aljerbi et al., 2022). It included four sections:

1. Sociodemographic characteristics (age, gender, education, occupation).
2. Analgesic use patterns (types, reasons, frequency, prescription status).
3. Knowledge of adverse effects (5 items; score  $\geq 60\%$  = good knowledge).
4. Self-reported adverse effects in the past six months.

The questionnaire was pilot-tested on 30 participants (not included in final sample) for clarity and reliability (Cronbach's  $\alpha = 0.82$ ).

### 2.4 Ethical Considerations

Ethical approval was obtained from the Biomedical Research Ethics Committee at the University of Tripoli (reference: UT/IRB/2025/042). Written informed consent was obtained from all participants. Anonymity and confidentiality were maintained.

### 2.5 Statistical Analysis

Data were analyzed using SPSS version 26. Descriptive statistics (frequencies, percentages, mean  $\pm$  SD) were calculated. Associations between categorical variables were assessed using Chi-square tests, with  $p < 0.05$  considered statistically significant.

## 3. Results

### 3.1 Sociodemographic Characteristics

A total of 420 adults participated (response rate 91.3%). The mean age was  $34.6 \pm 12.3$  years; 61.9% were female, and 38.1% male. More than half (55.2%) had a university degree, and 47.6% were employed full-time.

### 3.2 Analgesic Utilization Patterns

Overall, 88.1% (370/420) reported using analgesics within the past three months. The most frequently used analgesic was paracetamol (74.5%), followed by ibuprofen (52.4%), aspirin (33.3%), and diclofenac (18.6%). The primary reasons for use were headache (81.2%), muscle pain (43.5%), dental pain (30.1%), and menstrual pain (28.9% among females). Self-medication without a prescription was reported by 64.8% of users. Among these, 41.2% obtained analgesics directly from a pharmacy, while 23.6% used leftover medication from previous prescriptions.

### 3.3 Knowledge of Adverse Effects

Only 40.5% (170/420) demonstrated good knowledge of analgesic-related adverse effects. Specifically, 52.4% knew that paracetamol overdose causes liver damage, 44.3% recognized that NSAIDs may cause gastric bleeding, and 38.1% were aware of the risk of kidney injury with long-term use. No significant association was found between education level and knowledge score ( $p = 0.08$ ).

### 3.4 Prevalence of Self-Reported Adverse Effects

Among analgesic users (370 participants), 45.9% (170/370) reported experiencing at least one adverse effect in the past six months. The most common were: gastrointestinal symptoms (nausea, dyspepsia) (41.2%), drowsiness (22.6%), gastric irritation or heartburn (18.3%), dizziness (12.4%), and allergic reactions (5.9%). A small proportion (3.5%) reported severe effects such as melena or hematemesis, prompting medical consultation.

Significantly higher adverse effect rates were observed among participants who practiced self-medication compared to those using analgesics with a prescription (53.2% vs. 32.5%,  $p = 0.001$ ) and among those using NSAIDs more than three times weekly ( $p = 0.003$ ).



#### 4. Discussion

This study provides the first community-based assessment of analgesic use patterns among adults in Tripoli, Libya. The key findings indicate that analgesic use is nearly universal (88.1%), with paracetamol being the drug of choice, consistent with international reports (Khaled, 2025) and local studies in Derna (Eljamay et al., 2023). The high prevalence of self-medication (64.8%) mirrors rates reported among medical students in Libya (70.6%) (Omar et al., 2024) and in Saudi Arabia (61.3%) (Ismail et al., 2024), suggesting a regional pattern of easy access and limited medical consultation.

Headache was the dominant reason for use, similar to findings by Aljerbi et al. (2022) in Nalut. This may reflect stress-related lifestyle factors or inadequate management of recurrent primary headaches. Worryingly, knowledge regarding adverse effects was poor (only 40.5% good knowledge), despite relatively high education levels. This aligns with Aljerbi's report that limited knowledge increases misuse risk.

The reported adverse effect rate (45.9%) is notably higher than that reported among medical students (3.26%) (Omar et al., 2024), likely due to differences in age, duration of use, and underreporting in student samples. Gastrointestinal symptoms predominated, consistent with NSAID-related adverse effect profiles (Moore et al., 2015). The strong association between self-medication and adverse effects underscores the dangers of unsupervised use.

##### 4.1 Strengths and Limitations

Strengths include the first community data from Tripoli, adequate sample size, and use of validated tools. Limitations include cross-sectional design (temporality cannot be inferred), convenience sampling (potential selection bias), self-reported data (recall and social desirability bias), and lack of biochemical confirmation of adverse effects. Generalizability beyond Tripoli is limited.

#### 5. Conclusion

Analgesic use, particularly self-medication with paracetamol and NSAIDs, is highly prevalent among adults in Tripoli, Libya. Knowledge of potential adverse effects is insufficient, and nearly half of users report gastrointestinal or neurological symptoms. These findings highlight an urgent need for public health campaigns targeting rational analgesic use, pharmacist education, and stricter enforcement of prescription-only regulations for high-risk analgesics. Future research should include longitudinal designs and clinical assessment of adverse effects.

#### 6. Recommendations

1. **Ministry of Health, Libya:** Launch nationwide awareness campaigns on safe analgesic use, maximum daily doses, and warning signs of toxicity.
2. **Pharmacists:** Actively counsel patients purchasing over-the-counter analgesics, especially NSAIDs.
3. **Researchers:** Conduct multicenter studies with objective outcome measures (e.g., liver enzymes, endoscopy) and evaluate the impact of educational interventions.



## References

- Aljerbi, A. I., Bagni, A. S., Wareg, A. N., et al. (2022). Prevalence, self-medication practices, and knowledge levels on analgesic among residents of Nalut, Libya: A cross-sectional study. *American Journal of Medical Science and Innovation*.
- Eljamay, S., Boras, E., Almzaini, M., & Jebreil, M. (2023). Practices and behaviors regarding the use of analgesics in Derna City, Libya. *Indonesian Journal of Innovation and Applied Sciences*, 3(1). DOI: 10.47540/ijias.v3i1.726
- Ismail, E. H. M., et al. (2024). Knowledge, awareness, and attitudes regarding self-medication with non-opioid analgesics among university students in Saudi Arabia. *Cureus*.
- Khaled, A. (2025). Assessment and evaluation of consumer awareness and self-medication use practices toward OTC analgesics. *Journal of Evaluation in Clinical Practice*.
- Moore, N., et al. (2015). Non-steroidal anti-inflammatory drugs and risk of adverse events. *Drug Safety*.
- Omar, H., Omar, A., Elderbi, M., et al. (2024). Analgesic self-medication among medical students in Omar Al-Mukhtar University, Libya. *AlQalam Journal of Medical and Applied Sciences*.
- Vane, J. R., & Botting, R. M. (1998). Mechanism of action of nonsteroidal anti-inflammatory drugs. *The American Journal of Medicine*, 104(3), 2S-8S.