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

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ABSTRACT

Background: Analgesics are among the most commonly used medications worldwide, with widespread availability over-the-counter contributing to frequent self-medication. However, inappropriate use may lead to significant adverse effects. This study assessed analgesic utilization patterns, awareness, and adverse effect prevalence among adults in Tripoli, Libya.

Methods: A descriptive cross-sectional study was conducted among 68 adults aged ≥18 years in Tripoli, Libya, using a structured electronic questionnaire. Data were analyzed using SPSS, with descriptive statistics presented as frequencies and percentages.

Results: All participants (100%) had used analgesics. Paracetamol was the most commonly used (75%), primarily for headache (47.1%). Self-medication was highly prevalent: 33.8% always used analgesics without medical consultation, and 50% did so sometimes. Although 97.1% demonstrated awareness of potential adverse effects, inappropriate practices persisted, including dose escalation (42.6%). Adverse effects were reported by 33.8%, predominantly gastrointestinal symptoms (stomach pain 16.7%, nausea 13.9%).

Conclusion: Despite good awareness, self-medication and inappropriate analgesic use remain common, with one-third of users experiencing adverse effects. The gap between knowledge and practice necessitates enhanced public health education, pharmacist involvement, and regulatory measures for over-the-counter analgesic sales.

1. Introduction

Pain represents one of the most prevalent health complaints globally and serves as a primary driver for medication use, particularly analgesics. These medications, including paracetamol and non-steroidal anti-inflammatory drugs (NSAIDs), are widely available without prescription, facilitating their extensive use among general populations [1]. While analgesics effectively manage mild to moderate pain and improve quality of life, their inappropriate or excessive use carries significant risks, including gastrointestinal disorders, hepatotoxicity, renal impairment, and cardiovascular complications [2].

Epidemiological evidence suggests that a substantial proportion of individuals use analgesics repeatedly for temporary pain without professional consultation, potentially increasing adverse health outcomes [3]. In Libya, research examining analgesic utilization patterns and public awareness of associated risks remains limited, creating an urgent need for context-specific evidence to guide public health interventions.

This study aimed to assess analgesic utilization patterns, evaluate awareness of adverse effects, and determine the prevalence of self-reported adverse effects among adults in Tripoli, Libya.

2. Methods

2.1 Study Design and Setting

A descriptive cross-sectional study was conducted among adults residing in Tripoli, Libya, between March and April 2025.

2.2 Participants

Adults aged 18 years and above residing in Tripoli were eligible to participate. A convenience sampling technique yielded 68 participants.

2.3 Data Collection Instrument

A structured electronic questionnaire was developed based on study objectives, comprising four sections: demographic characteristics, analgesic utilization patterns, awareness of proper use, and adverse effects experienced. The questionnaire was distributed electronically to adults in Tripoli.

2.4 Data Analysis

Data were coded and analyzed using the Statistical Package for the Social Sciences (SPSS). Descriptive statistics, including frequencies and percentages, were calculated for all variables.

2.5 Ethical Considerations

Participation was voluntary and anonymous. Completion of the questionnaire implied informed consent.

3. Results

3.1 Participant Characteristics

Among 68 participants, the majority were aged 18–25 years (52.9%), male (70.6%), and single (63.2%). Most held a bachelor's degree (77.6%), and employees constituted the largest occupational group (38.8%) (Table 1).

Table 1. Demographic Characteristics of Participants (N=68)

Characteristic	n	%
Age		
18–25 years	36	52.9
25–30 years	14	20.6
30–35 years	6	8.8
35–40 years	6	8.8
≥40 years	6	8.8
Gender		
Male	48	70.6
Female	20	29.4
Marital Status		
Single	43	63.2
Married	23	33.8
Education		
Secondary	5	7.5
Intermediate diploma	9	13.4
Bachelor's degree	54	77.6

3.2 Analgesic Utilization Patterns

All participants (100%) reported prior analgesic use. Paracetamol was the most commonly used (75%), followed by naproxen (8.8%) and ibuprofen (7.4%) (Table 2). Headache was the primary indication (47.1%), followed by menstrual pain (20.6%) and tooth pain (14.7%).

Table 2. Analgesic Utilization Patterns (N=68)

Variable	n	%
Analgesic type		
Paracetamol	51	75.0
Ibuprofen	5	7.4
Naproxen	6	8.8
Other	6	8.8
Frequency of use		
Once weekly	5	7.3
Only when needed	55	80.9
Rarely	8	11.8
Source of analgesics		
With prescription	12	17.6
OTC without prescription	25	36.8
Pharmacist advice	10	14.7
Family/friend advice	6	8.8
Self-use	15	22.1

Self-medication was highly prevalent: 33.8% always used analgesics without medical consultation, and 50% did so sometimes. While 57.4% reported adhering to recommended dosages, 42.6% had escalated doses for faster or stronger effects. Medication leaflets were read always by 23.5%, sometimes by 50%, and never by 26.5%.

3.3 Awareness of Adverse Effects

High awareness levels were observed: 97.1% knew that frequent or excessive analgesic use may cause side effects, and 88.2% recognized potential stomach, kidney, or liver problems with misuse. Expiration dates were checked by 83.8% of participants. Most (76.5%) correctly believed that over-the-counter availability does not guarantee complete safety. Combining multiple analgesics without professional consultation was reported by 26.5%.

3.4 Adverse Effects Experienced

Adverse effects were reported by 33.8% of participants (Table 3). Gastrointestinal symptoms predominated: stomach pain/burning (16.7%), nausea (13.9%), and vomiting (8.3%). When side effects occurred, 63.4% discontinued the medication, 14.6% reduced dosage, 14.6% sought medical advice, and 12.2% ignored symptoms.

Table 3. Adverse Effects Reported Among Participants (N=68)

Adverse Effect	n*	%†
Stomach pain/burning	11	16.7
Nausea	9	13.9
Dizziness/vertigo	8	11.1
Gastrointestinal disturbances	8	11.1
Vomiting	6	8.3
Drowsiness/fatigue	6	8.3
Allergic reaction/skin rash	3	5.6
Other symptoms	17	25.0

*Multiple responses possible; †Percentage of total participants (N=68)

A quarter of participants (25.0%) required medical or pharmaceutical consultation due to problems after analgesic use. Overwhelmingly (94.1%), participants believed that community awareness about correct analgesic use needs strengthening.

4. Discussion

This study provides critical insights into analgesic utilization patterns and associated adverse effects among adults in Tripoli, Libya. The universal prevalence of analgesic use (100%) exceeds that reported in recent Libyan research (66%) [4], potentially reflecting increasing OTC accessibility or sample characteristics.

Paracetamol emerged as the dominant analgesic (75%), consistent with findings from Saudi Arabia [5] and Germany [6]. Its widespread preference likely reflects perceptions of safety, affordability, and availability. Headache as the primary indication (47.1%) aligns with international literature identifying headache and musculoskeletal pain as leading drivers of analgesic consumption [7].

The high prevalence of self-medication (83.8% using without prescription sometimes or always) is concerning yet consistent with regional data. Among Libyan medical students, 70.6% reported analgesic self-medication [8], while a community study in Nalut, Libya found approximately 13% prevalence [9], though methodological differences limit direct comparisons. Notably, our finding that 42.6% of participants escalated doses for faster effects represents a particularly hazardous practice, increasing risks of hepatotoxicity with paracetamol [10] and gastrointestinal bleeding with NSAIDs [6].

A striking disconnect emerged between awareness and practice. Although 97.1% recognized potential adverse effects, inappropriate behaviors remained common. This knowledge-practice gap has been documented elsewhere [5,8] and suggests that factual knowledge alone insufficiently drives behavioral change. Factors such as perceived low personal risk, habitual use patterns, and cultural norms around pain management may override cognitive awareness.

The 33.8% adverse effect prevalence, predominantly gastrointestinal, mirrors findings from Beshna (2025) [4] and reinforces the clinical significance of inappropriate analgesic use. That 25% required professional consultation indicates that a subset experiences moderate-to-severe complications. Encouragingly, most participants (63.4%) discontinued medication upon experiencing side effects, demonstrating appropriate risk-responsive behavior.

The overwhelming consensus (94.1%) favoring enhanced community awareness reflects public recognition of this health issue and provides a mandate for intervention.

4.1 Limitations

Several limitations warrant consideration. The convenience sampling method and modest sample size (n=68) limit generalizability to the broader Tripoli population. The predominantly young, male, highly educated sample may not represent older adults or those with lower educational attainment. Self-reported data may introduce recall and social desirability biases. The cross-sectional design precludes causal inferences about relationships between utilization patterns and adverse effects.

4.2 Implications for Practice and Policy

These findings support several actionable recommendations. First, public health campaigns should move beyond awareness-raising to address behavioral determinants of self-medication, including perceived susceptibility and cue-to-action messaging. Second, pharmacists require training and support to provide effective counseling for OTC analgesic purchases, including explicit warnings about dose limits and drug interactions. Third, regulatory consideration of restricting certain analgesic pack sizes or requiring pharmacist consultation for specific NSAIDs may reduce inappropriate use. Fourth, integration of medication safety education into school and university curricula could establish rational use norms early.

5. Conclusion

This study demonstrates that analgesic use is universal among adults in Tripoli, Libya, with paracetamol the agent of choice for headache relief. Self-medication without professional consultation is highly prevalent, and one in three users experiences adverse effects, predominantly gastrointestinal. Critically, high awareness of potential harms does not translate into safe practices, indicating a substantial knowledge-practice gap.

Addressing this gap requires multifaceted interventions: enhanced public education targeting behavioral change, active pharmacist counseling, and strengthened regulation of OTC analgesic sales. Without such measures, the burden of preventable analgesic-related adverse effects will likely persist in this population.

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