The Use of Over-the-Counter (OTC) Painkillers for Migraine Relief: A Survey-Based Study

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ABSTRACT:

The migraine is a common neurological disorder, which are recurrent headache attacks with symptoms including sensitivity to light and sound, nausea, and vomiting. Many people rely on over-the-counter (OTC) painkillers to relieve migraine pain without the advice of a health professional, given the disabling nature of migraine headaches and the availability of medicines. While these medications may offer some short-term relief, they can also have side effects, become less effective over time, increase dependency on medications and cause medication-overuse headaches if used inappropriately or for too long. The purpose of this study was to examine OTC painkiller usage patterns for migraine relief, and to examine perceptions of how effective the painkillers are, in terms of side effects, dependency concerns, and dosage practices. A well-organized survey was administered to people with migraine and those with migraine-like symptoms. The data were anonymised and analyzed to look at trends on use of medication, frequency of use, consultation and treatment outcomes. The results showed that OTC analgesics are common medicines, and that they were used occasionally rather than frequently. The most popular drug found was paracetamol. The overall effectiveness of the drugs found in the OTC section was moderate, and participants often said that OTC medicines were successful only sometimes in relieving migraine symptoms. Although not everyone reported experiencing any adverse effects, those that did reported symptoms such as stomach discomfort, dizziness, and increased heart rate. In addition, there was a high level of concern about dependency and limited access to health care professionals. Overall the study shows that OTC analgesics are still available for the treatment of migraine, but their efficacy is not always present, and they can have side effects. Increase awareness, use of appropriate dosing and more professional consultation are recommended to help ensure safer and more effective treatment for migraine.

Keywords

Migraine, OTC painkillers, medication dependency, self-medication, side effects

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INTRODUCTION

Migraines are intense headaches often accompanied by nausea, vomiting, and sensitivity to light and sound. Due to their episodic and debilitating nature, individuals frequently seek immediate relief through over-the-counter (OTC) painkillers such as ibuprofen, paracetamol, and aspirin.

However, excessive and unsupervised use of these medications can lead to side effects, medication overuse headaches, and dependency[1]. This study investigates the patterns of OTC painkiller use among individuals with migraines, their perceived effectiveness, and the potential risks associated with self-medication [2].

METHOD

2. Methodology

A structured survey was conducted to collect data on OTC painkiller use among individuals with migraines. The survey included questions about:

- Frequency of OTC medication use
- Common migraine symptoms
- Effectiveness of OTC medications
- Experienced side effects
- Dependency concerns
- Consultation with healthcare professionals
- Dosage determination methods

The data was collected anonymously and analyzed to identify trends and potential concerns regarding OTC painkiller use.

3. Results and Analysis

3.1. Demographics and Migraine Diagnosis

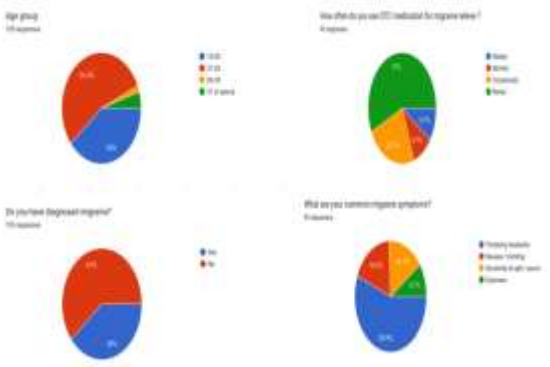


Figure 1 :Results of Survey Study

This figure shows the demographic profile and pattern of migraine of respondents. Most participants were aged 21–25 years (54.3%), while 39% were aged 15–20 years. Of those that responded, 39% had been diagnosed with migraine. Mostly used rarely (57%) was OTC medication. Throbbing headache was the most common symptom (55.9%).

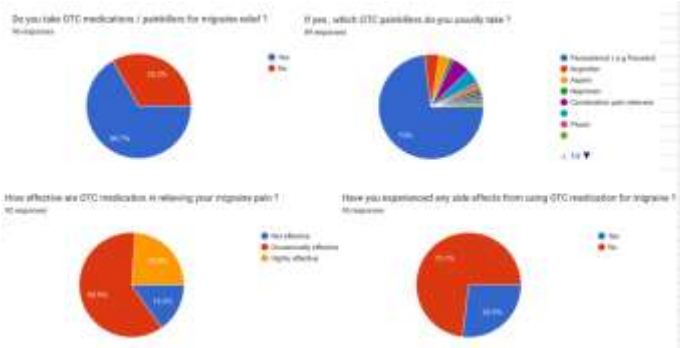


Figure 2:

This graph represents the participants' usage and perceptions of the OTC medications used to treat migraine. When asked about the use of OTC pain relievers, 66.7% of the respondents mentioned that they use any of the OTC pain relievers and paracetamol was the most commonly used medication (73%). In terms of effectiveness, 60.9% found OTC treatment ‘occasionally effective' and 73.1% stated that they did not experience any side effects after using OTC treatment.

This data depicts the behaviors and perceptions of the respondents related to OTC migraine drug use. Half or more of respondents said they were not addicted to medication obtained over the counter (54.7%), and most did not talk to a doctor or pharmacist (78.9%). Thirty-four percent (34.8%) of participants used personal experience to determine dosage, but not following professional or package instructions.

The survey included responses from individuals across different age groups. Notably, the majority of respondents fell into the 15-25 age range, with some reporting diagnosed migraines while others self-identified as having migraine symptoms.

3.2. Frequency of OTC Medication Use

Among the respondents:

Occasional use was most common, followed by weekly use.

Some respondents reported rarely using OTC medications, while a few indicated frequent use[3].

3.3. Common Migraine Symptoms

The most frequently reported symptoms included:

- Throbbing headaches
- Nausea and vomiting
- Sensitivity to light and sound [4]

3.4. Effectiveness of OTC Painkillers

A significant portion of respondents found OTC painkillers "occasionally effective." Some users reported that these medications were not effective at all. Only a few indicated that they found consistent relief [5].

3.5. Side Effects of OTC Painkillers

Some respondents reported experiencing side effects such as:

- Stomach pain
- Increased heart rate
- Drowsiness and dizziness [6].

3.6. Dependency and Consultation with Healthcare Professionals

Some individuals admitted to feeling dependent on OTC medications for migraine relief. A majority had never consulted a doctor or pharmacist regarding their OTC painkiller use [7].

3.7. Dosage Determination

Many respondents followed the instructions on the medication packaging. Some adjusted their dosage based on personal experience rather than medical advice [8].

DISCUSSION

This survey-based study examined how people use OTC medications for migraine pain relief and revealed key trends regarding medication frequency, effectiveness, side effects, dependency and seeking healthcare [9]. The results suggest that OTC medications are still a common self-management approach for treating migraine symptoms, especially for the younger population, and associated with concerns about treatment efficacy and treatment knowledge. The demographics revealed the majority of respondents were within the younger age group (21-25 years old) and then followed by the age group 15-20 years old. The trend could be due to increased self-medication behaviours among young people, who may be more likely to seek treatment from an easily available or cheap source, instead of a professional one. While not everyone reported being diagnosed with migraine, many people recognized migraine symptoms on their own[10]. This observation implies that there is a potential for underdiagnosis or misclassification of headache disorders and may support the decision making process for treatment. As far as presentation of symptoms, there was the most common symptom of throbbing headache, nausea and vomiting and sensitivity to light or sound. These results are consistent with previously described clinical migraine characteristics, in which pulsating headache and neurological

symptoms occur commonly [11, 12]. Reported symptom profiles by participants confirm the assumption of many respondents having had episodes of migraine without having received a diagnosis. When it came to OTC drug use, participants had used the drugs occasionally more frequently than every week or month. This pattern indicates that the respondents tended to use painkillers in acute migraine attacks more than for migraine prevention [13]. This is in keeping with current migraine management, where over-the-counter drugs are frequently used as first-line, for mild to moderate migraine attacks. But if you are using it from time to time without medical supervision, you might be more likely to get it wrong and miss the diagnosis of chronic migraine conditions [14]. Among the respondents, Paracetamol was used more than any other over-the-counter (OTC) painkiller, significantly more than ibuprofen, aspirin, naproxen and combination analgesics were used. This preference could be related to its accessibility, cost-effectiveness, and people's view that it is a safer drug. Based on current evidence, however, a multidrug approach to treating migraine may be more effective for some patients and currently available drugs – such as nonsteroidal anti-inflammatory drugs (NSAIDs) – appear to work better for some patients. A high percentage of one type of medicine category could, therefore, suggest that there is a low level of awareness of other alternative, evidence-based medicines. One significant result from this study was perceived effectiveness of OTC medications, which was of a moderate level. The majority of respondents reported that these medications were “occasionally effective” and fewer reported that these medications provided them with consistent symptom relief. This means that in some people taking OTC painkillers will lessen the severity of a migraine, but for others it will not offer meaningful control [15-19]. Migraine is a complex neurological disorder that is influenced by a variety of factors including biological, environmental and behavioural; therefore, the treatment of migraine symptoms may require a variety of interventions rather than just relying on non-prescription analgesics [20]. The evaluation of side effects revealed that most of the respondents did not have any side effects, but a significant number of them reported having side effects like stomach discomfort, dizziness, drowsiness, and elevated heart rate. The results of this study confirm the concern about unsupervised medication use, especially when adjustments are made without supervision. Analgesic exposure can often have gastrointestinal and neurological side effects that can impact patient quality of life. Respondents showed a significant proportion had some dependency on OTC drugs for the relief of migraine. This does not necessarily mean that the person is addicted to the medication, but could suggest behavioral dependence and repeated use of medication during recurring attacks. Clinically important, however, is the continued reliance on analgesics as this can lead to medication-overuse headache, a known drug-induced headache that over time increases headache frequency and can decrease the efficacy of treatment. Another interesting finding was that there was a low level of health care consultation [2, 21]. The majority of respondents said they do not talk to a doctor or pharmacist about their OTC use. This result reveals a lack of patient knowledge and awareness about migraine management. The involvement of the professional in the differentiation of migraine from other headache disorders, optimal selection of treatment, finding the triggers of migraine, and minimizing unnecessary exposure to medication are all

important roles [22]. The findings on dosage determination also add to the concerns about self-medication behavior. Some respondents indicated they took the dose as directed in a package or by a professional but many indicated they chose the dose according to their own experience or what they thought worked. These can lead to under/overdosing, lack of symptom control and avoidable side effects. This suggests that educational interventions focusing on safe dosing and evidence-based migraine management could positively impact patient outcomes. As a whole, this study highlights the role of nonprescribed medicines in the treatment of migraines, but such use tends to be based on convenience and personal experience, rather than clinical recommendations. The results highlight the importance of public health interventions around medication literacy, early diagnosis of migraine and increased interaction with healthcare providers to encourage more safe and effective management of migraine [23].

CONCLUSION

Over-the-counter (OTC) pain medications are still a common method of controlling the symptoms of migraine, as they are readily available, cost effective and convenient. The results suggest that effectiveness varies from user to user, many of whom responded that OTC medicine was used to get relief when needed. Some of the participants showed symptom improvement, while others found that their symptoms only improved somewhat and that there were side effects, such as discomfort and lack of satisfaction with treatment. Furthermore, dependency and unsupervised medication use emerged as pertinent issues to consider that could impact long-term migraine management and health outcomes [23-27].

The results highlight the importance of promoting informed and responsible use of OTC painkillers. People who have migraine headaches often or intensely should seek advice from a healthcare professional, such as a doctor or pharmacist, before taking medications regularly without a prescription. Professional advice will help with a correct diagnosis, choice of drug, and avoidance of complications due to medicine-overuse. Following the recommended dosage guidelines is also crucial to reduce the risk of side effects and ensure the safety of treatment. Additionally, even non-pharmacological measures like lifestyle modification, sufficient sleep, hydration, stress reduction, trigger avoidance and prescribed migraine therapies should be considered as part of comprehensive migraine management. Further studies are needed to explore the long-term consequences of repeated OTC painkiller use, and to investigate strategies to promote more effective and safer use of migraine medications [28].

REFERENCES

1. Andreou, A.P. and L. Edvinsson, *Mechanisms of migraine as a chronic evolutive condition.* The journal of headache and pain, 2019. **20**(1): p. 117.
2. Wenzel, R.G., C.A. Sarvis, and M.L. Krause, *Over-the-counter drugs for acute migraine attacks: Literature review and recommendations.* Pharmacotherapy: The Journal of Human Pharmacology and Drug Therapy, 2003. **23**(4): p. 494-505.
3. Naveed, S., et al., *A DEEP INSIGHT INTO INCIDENCE, PREVALENCE, COMPLETE EPIDEMIOLOGY, AND PREDICTIVE ASSOCIATIONS AMONG MULTIPLE FACTORS OF BREAST CANCER IN KARACHI, PAKISTAN: A CROSS-SECTIONAL SURVEY OF 2023.* Journal

of Medical & Health Sciences Review, 2025. **2**(4).
4. Silberstein, S.D., *Migraine symptoms: results of a survey of self-reported migraineurs.* Headache: The Journal of Head and Face Pain, 1995. **35**(7): p. 387-396.
5. Ruoff, G.M., *OTC analgesics vs opioids for pain management.* Journal of Family Practice, 2022. **71**(6).
6. KARŁOWICZ-BODALSKA, K., et al., *ASSESSMENT OF SAFETY OF PAIN CONTROL BY NON-OPIOID OVER-THE-COUNTER MEDICATIONS.* Acta Poloniae Pharmaceutica, 2020. **77**(6).
7. Hummelinck, A. and K. Pollock, *The relationship between healthcare professionals and the parents of chronically ill children: negotiating the boundaries between dependence and expertise.* International Journal of Pharmacy Practice, 2007. **15**(1): p. 3-9.
8. Elbarbry, F.A., M.M. Mabrouk, and M.A. El-Dawy, *Determination of the analgesic components of spasmomigraine® tablet by liquid chromatography with ultraviolet detection.* Journal of AOAC international, 2007. **90**(1): p. 94-101.
9. Waliszewska-Prosół, M., et al., *Consulting, diagnosis and treatment patterns in migraine: results from the Migraine in Poland cross-sectional survey.* Therapeutic Advances in Neurological Disorders, 2025. **18**: p. 17562864251338675.
10. Naveed, S., et al., *A survey study on awareness of Hepatitis-C in different groups.* World journal of pharmaceutical Sciences, 2014: p. 449-454.
11. Brusa, P., et al., *Self-medication for migraine: A nationwide cross-sectional study in Italy.* PLoS One, 2019. **14**(1): p. e0211191.
12. Sadia, H., et al., *To prescribe or not to prescribe in the elderly: a qualitative exploration of prescribing dilemmas among Pakistani healthcare providers.* BMJ open, 2025. **15**(4): p. e094545.
13. Dissing, A.S., et al., *Burden of medication overuse in migraine: a cross-sectional, population-based study in five European countries using the 2020 National Health and Wellness Survey (NHWS).* Neurology and Therapy, 2023. **12**(6): p. 2053-2065.
14. Becker, W.J., *Acute migraine treatment in adults.* Headache: The Journal of Head and Face Pain, 2015. **55**(6): p. 778-793.
15. Pardutz, A. and J. Schoenen, *NSAIDs in the acute treatment of migraine: a review of clinical and experimental data.* Pharmaceuticals, 2010. **3**(6): p. 1966-1987.
16. Maqbool, T., et al., *Future pharmacy practitioners' insights towards integration of artificial intelligence in healthcare education: preliminary findings from Karachi, Pakistan.* PloS one, 2025. **20**(2): p. e0314045.
17. Shakeel, S., et al., *Development, validation and psychometric evaluation of the Plagiarism and Research Ethics Questionnaire (PRE-Q) among pharmacy students in Karachi, Pakistan.* Scientific Reports, 2026.
18. Sultana, N., M.S. Arayne, and S. Naveed, *Simultaneous Quantitation of Captopril and NSAID's in API, Dosage Formulations and Human Serum by RP-HPLC.* Journal of the Chinese Chemical Society, 2010. **57**(1): p. 62-67.
19. Naveed, S., N. Sultana, and M.S. Arayne, *In vivo and in vitro interaction studies of enalapril with flurbiprofen on carrageenan induced inflammation rats (ciir).* Journal of the Chilean Chemical Society, 2014. **59**(4): p. 2678-2680.
20. Burstein, R., R. Noseda, and D. Borsook, *Migraine: multiple processes, complex pathophysiology.* Journal of Neuroscience, 2015. **35**(17): p. 6619-6629.
21. Taylor, F.R. and R.G. Kaniecki, *Symptomatic treatment of migraine: when to use NSAIDs, triptans, or opiates.* Current treatment options in neurology, 2011. **13**(1): p. 15-27.

22. Sheftell, F.D., *Role and impact of over-the-counter medications in the management of headache.* Neurologic Clinics, 1997. **15**(1): p. 187-198.
23. Orr, S.L., et al., *Paediatric migraine: evidence-based management and future directions.* Nature Reviews Neurology, 2018. **14**(9): p. 515-527.
24. Barbanti, P., et al., *The role of the combination paracetamol/caffeine in treatment of acute migraine pain: a narrative review.* Pain and therapy, 2024. **13**(3): p. 319-346.
25. Zafar, F., et al., *Quality assessment and dissolution profile comparison studies on 250-mg mefenamic acid tablets available in local market of Karachi.* 中国药学 (英文版), 2015. **24**(10): p. 673.
26. Sultana, N., et al., *RP-HPLC method for the simultaneous determination of lisinopril and NSAIDs in API, pharmaceutical formulations and human serum.* American Journal of Analytical Chemistry, 2012. **3**(2): p. 147.
27. Naveed, S., N. Sultana, and M.S. Arayne, *In vivo and in vitro interaction studies of ibuprofen with enalapril.* Journal of Coastal Life Medicine, 2016. **4**(4): p. 327-330.
28. Patel, N., et al., *Treatment of migraine: a review of disease burden and an update on the therapeutic landscape for pharmacists.* Drugs & Therapy Perspectives, 2021. **37**(2): p. 75-86.