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Bridging the Gap: Knowledge, Attitude and Practice of Healthcare Professionals on NSAID Safety in a Tertiary Care Teaching Hospital in Maharashtra, India

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ABSTRACT

Aim and Objective: To evaluate the knowledge, attitudes and practices (KAP) of healthcare professionals (HCPs) concerning Nonsteroidal Anti-Inflammatory Drug (NSAID) Safety in a tertiary care teaching hospital in Maharashtra, India.
Materials and Methods: This study was a cross-sectional, questionnaire-based study, conducted among 200 healthcare professionals (HCPs) at a tertiary care teaching hospital in India. The data for this study was collected using a self-designed, pre-validated questionnaire, which evaluated KAP on NSAID safety, including prescribing patterns, risk awareness and mitigation strategies. Descriptive statistics were used for analysis.
Results: Most participants (92%) correctly identified COX enzyme inhibition as the primary mechanism of NSAIDs. However, gaps were observed in risk awareness (e.g., only 60% recognized ketorolac as having the highest gastrointestinal toxicity). While 88% expressed concern about gastrointestinal side effects, only 80% routinely co-prescribed gastroprotective agents in high-risk patients. Over-the-counter availability (85%) and patient non-compliance (72%) were cited as major challenges.
Conclusion: This study highlights that despite having adequate foundational knowledge, certains gaps persist in risk awareness and mitigation practices of healthcare professionals. Educational interventions and stricter prescribing guidelines are needed to improve safety of NSAID use.

Keywords*: NSAIDs, drug safety, healthcare professionals, knowledge-attitude-practice, India.*

INTRODUCTION

Nonsteroidal anti-inflammatory drugs (NSAIDs) are among the most widely prescribed and consumed medications worldwide, primarily for the treatment of pain, fever, and inflammation. Their popularity stems from their proven efficacy, widespread availability, and relative affordability. However, despite these therapeutic benefits, NSAIDs are associated with a range of adverse effects that warrant cautious use, particularly when used without medical supervision (Bindu et al, 2020). The World Health Organization has consistently advocated for rational medication use, yet multiple studies demonstrate persistent issues with NSAID misuse through improper prescribing patterns (Whitner et al, 2020), widespread self-medication practices and lack of proper awareness regarding their risks (Krasniqi et al, 2024). Common adverse effects of NSAIDs include gastrointestinal (GI) bleeding, cardiovascular risks, and renal impairment (Wongrakpanich et al, 2018).

In populations predisposed to GI bleed, such as the elderly or those with comorbidities, concomitant prescription of proton pump inhibitors (PPIs) (Scarpignato et al, 2016) and careful monitoring (Bindu et al., 2020) is crucial. While COX-2 inhibitors were initially marketed as overall safer alternatives, evidence has shown they are not devoid of cardiovascular

risks (Kearney et al., 2006). These challenges are particularly concerning in India, where lack of strict regulation of over-the-counter drug sales exacerbates the potential risks (Kumar et al 2023).

Healthcare professionals serve as gatekeepers for ensuring appropriate NSAID utilization, and therefore their understanding and approach regarding NSAID safety is of paramount importance. Prior studies highlight variability and gaps in NSAID prescribing patterns and risk awareness among healthcare professionals (Gondane et al, 2024), (Ho KY, 2020), which emphasizes the need for localized studies. This study was therefore designed to systematically evaluate the knowledge, attitudes, and practices concerning NSAID safety among healthcare professionals in a tertiary care teaching hospital in Maharashtra, with the goal of identifying specific areas requiring intervention and improvement.

MATERIAL AND METHODS

Study design and setting: This study was a cross-sectional, survey-based study conducted to assess the knowledge, attitudes, and practices of HCPs regarding NSAID safety, at a tertiary care teaching hospital in India. The study was conducted after obtaining approval from the Institutional Ethics Committee (IEC).
Informed consent was taken from all study participants.

Study duration: The study was conducted for a duration of two months, starting from 20st of March 2025. The inclusion criteria for participants in this study was healthcare professionals willing to participate in the study. The exclusion criteria was HCPs who submitted incompletely filled questionnaire.

Data Collection Methods and Tools: The data for this study were collected through a self- designed, semi-structured, pre-validated questionnaire circulated through Google forms to HCPs. The questionnaire consisted of questions related to knowledge, attitudes, and practices related to NSAID safety. The questionnaire was validated by circulating it to a panel of 10 experts in the subject who were asked to review and evaluate the design, content, and relevance of the questionnaire as well as assess its comprehensibility and readability which was consequently modified slightly based on their feedback. The responses were then collected anonymously.

Study procedure: The questionnaire was structured with a total of 21 questions– out of which 10 were about knowledge, 6 about attitude and 5 about practice, designed specifically to determine awareness about NSAID safety. Before commencement of the questionnaire, the objectives of the study were mentioned in the google forms. It was assured that the data which was collected would be used only for research purposes and the identity of participants will remain anonymous.

Statistical Analysis:
The collected data was analyzed using descriptive statistics such as percentages.

RESULTS

A total of 200 healthcare professionals participated in this cross-sectional study, including resident doctors (52.5%), MBBS interns (11%), resident dentists (30%), and nursing staff (6.5%). More than half of them (53.5%) had less than 1 year of experience, and majority of them (65%) prescribed NSAIDs daily or atleast several times a week. (Table 1)

Table 1: Demographic Highlights

Demographic Parameters (N = 200)		Values
Work Profile	Resident Doctors	105 (52.5%)
	MBBS Interns	22 (11%)
	Resident Dentists	60 (30%)
	Nursing Staff	13 (6.5%)
Years of Practice	<1 year	107 (53.5%)
	1- 3 years	43 (21.5%)
	3- 5 years	25 (12.5%)
	>5 years	25 (12.5%)
Prescription Frequency	Daily/Several times a week	65%
	Rarely	15%

With respect to knowledge, the majority of participants demonstrated a sound understanding of the pharmacological mechanism of NSAIDs, with 95% correctly identifying COX enzyme inhibition as the primary mode of action. When questioned about gastrointestinal (GI) toxicity risk, Ketorolac (40%) was most frequently cited as having highest toxicity. Naproxen (60%) was accurately identified as a safer choice in patients with cardiovascular comorbidities.

Despite this, certain knowledge gaps were identified. Approximately 20% of respondents erroneously believed that COX-2 inhibitors such as celecoxib carry no cardiovascular risk. Furthermore, 15% misidentified the NSAID safest for use during pregnancy, highlighting the need for improved education on NSAID risk stratification.

Attitudinal responses reflected a generally cautious approach. A combined 88% of respondents reported being either "very concerned" or "somewhat concerned" about NSAID-induced GI side effects. Additionally, 45% opposed the availability of NSAIDs as over-the-counter (OTC) medications, citing potential misuse and lack of supervision. (Figure 1)

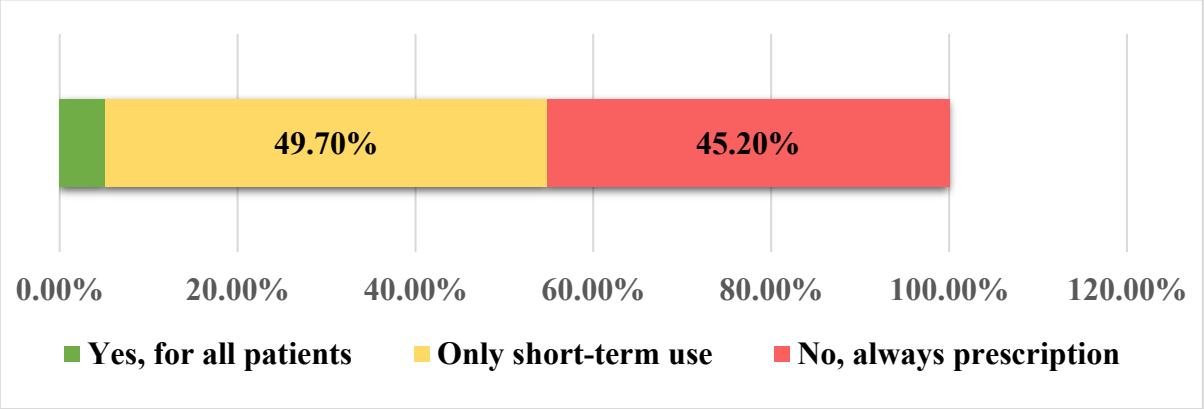

Figure 1: Should NSAIDs be available without prescription?

Participants strongly endorsed interventions to promote safe NSAID use. 75% supported stricter OTC regulations, 70% favoured regular Continuing Medical Education (CME) sessions, and 60% recommended integration of risk assessment tools into clinics.

Practice patterns varied among respondents. The most commonly prescribed NSAIDs included Diclofenac (30%), Aceclofenac (25%), and Ibuprofen (20%). While most clinicians adhered to safety measures, 20% reported not consistently co-prescribing proton pump inhibitors (PPIs) in high-risk patients receiving NSAIDs. This raises concern, especially in those predisposed to GI complications. Also, notably, in response to question regarding how often they educate patients about NSAID risks, we found that more than half of the respondents (56%) educate their patients only 'sometimes'.

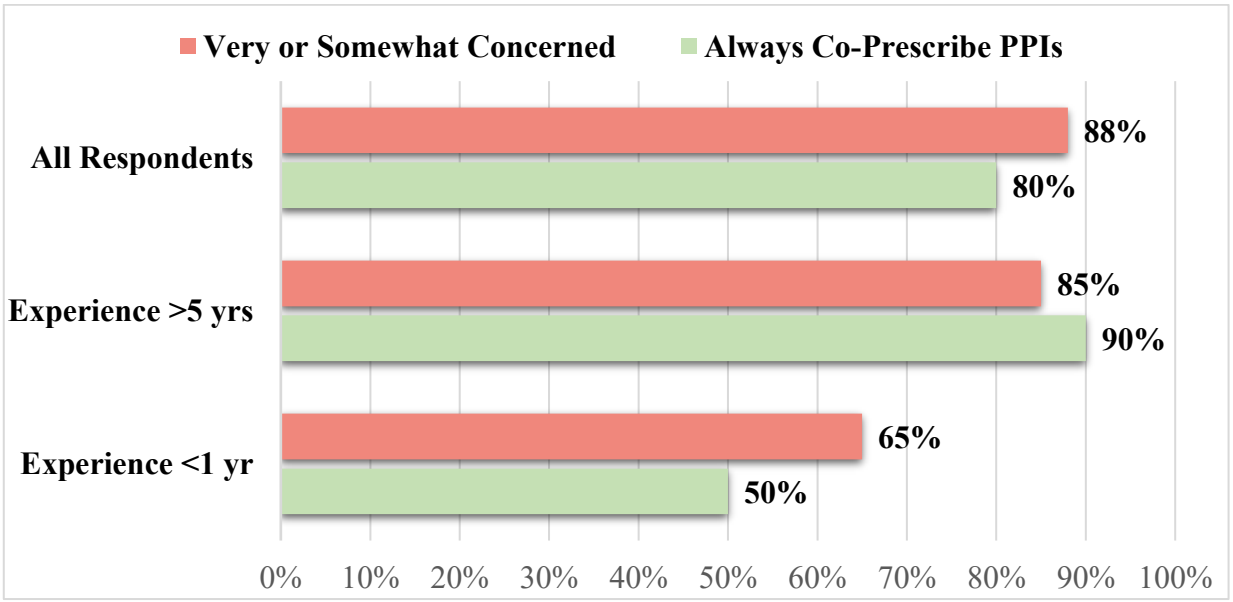

Figure 2: Although 88% of respondents were somewhat or very concerned about GI risks, only 80% co-prescribed PPIs. This is a critical disconnect. Experienced prescribers bridge this gap better.

Self-medication and unregulated use were also noted, with 30% of healthcare professionals reporting observed misuse of NSAIDs among their peers. Monitoring of laboratory parameters was generally adequate, with 75% checking renal function, 60% monitoring liver function, and 40% assessing coagulation profiles in patients on long-term NSAID therapy. However, 25% admitted to rarely monitoring electrolyte levels, despite their clinical relevance in prolonged NSAID use.

DISCUSSION

The findings of this study reveal both strengths and gaps in HCPs' knowledge, attitudes, and practices concerning NSAID safety. A high proportion (95%) correctly identified COX inhibition as the primary mechanism of NSAIDs, aligning with established pharmacological principles (Vane & Botting, 1998). However, 20% erroneously believed COX-2 inhibitors had no cardiovascular risk, a misconception contradicted by robust evidence (Kearney et al, 2006). This highlights the need for ongoing education on NSAID pharmacodynamics.

A critical gap identified in this study was the failure of HCPs to routinely educate patients about NSAID risks. This finding aligns with prior research indicating that patient counseling on NSAID-related adverse effects is often overlooked (Jarernsiripornkul et al, 2019), (Phueanpinit et al, 2017). Proper patient education is essential to mitigate self-medication risks, particularly given the widespread OTC availability of NSAIDs. Studies have shown that informed patients are less likely to misuse NSAIDs and more likely to adhere to protective measures, such as PPI co-therapy (Laine et al, 2009). The lack of structured patient counseling in this study suggests a missed opportunity to enhance medication safety.

Ketorolac was cited for GI toxicity, consistent with literature (Garcia et al, 1998), while naproxen was correctly recognized as safer for cardiovascular patients (Ray et al, 2009). Despite this awareness, 20% of respondents did not consistently co-prescribe PPIs for high-risk patients, a practice strongly recommended by guidelines (Scarpignato et al, 2016). This discrepancy between knowledge and practice has been documented in other settings, where time constraints and clinical inertia contribute to suboptimal adherence (Tsiga et al, 2013).

Notably, 30% of respondents observed self-medication among HCPs themselves, a concerning trend given their role in modeling appropriate medication use (Hem et al, 2005). Monitoring practices were also suboptimal, with 25% rarely checking electrolytes during long-term NSAID use, despite known risks of NSAID-induced electrolyte imbalances (De Marco et al, 2024).

Respondents advocated for stricter OTC regulations (75%), regular training (70%), and integration of risk assessment tools (60%), mirroring recommendations from prior studies (Cavazos et al, 2008). However, the addition of structured patient education programs should be prioritized, as informed patients are critical partners in reducing NSAID-related harm.

Limitations:

The study only includes participants from a specific hospital, limiting generalizability of results to other settings or populations. The knowledge and attitudes of healthcare professionals can vary widely based on location and experience. Self-reported data is subject to recall bias and is thus a confounding factor.

CONCLUSION

In conclusion, while HCPs demonstrated sound foundational knowledge, critical gaps persist in practice, particularly in patient education. To tackle this, multifaceted interventions - combining education, policy changes, and clinical tools - are essential to minimize NSAID-related risks.

Conflicts of interest: Nil
Sources of funding: Nil

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