



Use of NSAIDs and self-medication prevalence among medical students in the Sarajevo Canton

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Abstract: The study aimed to gather comprehensive data on students' knowledge regarding NSAIDs, personal habits, experiences with side effects, and perceptions of drug tolerance among medical students. This cross-sectional study employed an anonymous online survey structured into four main sections: general demographics, use of NSAIDs and paracetamol, side effects and overdoses, and drug tolerance. The survey of 105 respondents from four faculties (Medicine 50%, Pharmacy 25%, Dentistry 16%, Health Studies 10%) revealed that the majority were female (72%) and aged 21-25 years (63%). Most respondents used NSAIDs orally (93%) and consumed them with water (98%), while their frequency of use ranged from "sometimes" (47%) to "very rarely" (20%), with limited consultation with doctors (47% neutral, 36% agree/completely agree). The findings of this study will contribute to the broader discussion on responsible medication use in healthcare education and practice. It emphasizes the need for comprehensive medical training that addresses not only the theoretical aspects of pharmacology but also the practical and ethical considerations of personal health management for future healthcare professionals. This research ultimately aims to foster a culture of judicious NSAID use among medical students, potentially influencing their future prescribing practices and patient counselling.

Keywords - NSAIDs, medical students, adverse effects, self-medication

I. INTRODUCTION

Nonsteroidal anti-inflammatory drugs are a heterogeneous group of drugs that reduce symptoms of inflammation, such as pain, swelling, redness and edema by inhibiting the enzyme cyclooxygenase (COX) and consequently prostaglandin synthesis. Aspirin, as the oldest representative, introduced a new era of drugs that provided symptom relief to patients with diseases characterized by chronic inflammation and severe pain, such as rheumatoid arthritis [1,2]. Since the advent of aspirin, there has been a great effort to improve the efficacy of nonsteroidal anti-inflammatory drugs (NSAIDs) and reduce the manifestation of side effects [3].

Considering the anti-inflammatory, analgesic and antipyretic effects, NSAIDs are used for a diverse group of indications, such as the characteristic pain of varying intensity in headaches, toothaches, migraines.

The existence of topical forms of drugs has facilitated their use in suppressing pain in joint dislocations, swelling and inflammation at the site of injuries [4].

NSAIDs are widely available drugs, they have many benefits due to their wide spectrum of action and the possibility of use in heterogeneous indications for benefit populations, and the fact that they are available to everyone in pharmacies around the world, putting them among the number one used drug. However, they also show numerous unwanted effects, which are worth discussing, if they are used chronically, especially in high doses, and in certain situations they can be contraindicated, such as periods of pregnancy and lactation [5].

Many studies have described the use of NSAIDs among the student population, especially in the group of medical schools, considering the greater knowledge of these students about drugs, their indicated use and possible side effects. Considering their wide possibilities, self-treatment without consultation with a doctor and possible abuse are a big risk [6-8].

In order to be able to determine the benefit-risk ratio, it is important to evaluate knowledge and awareness about the use of NSAIDs and their side effects. The data could help in creating guidelines for the prevention of inappropriate use, but also abuse, the reduction of side effects and increasing their effectiveness in indicated cases. The aim of our study is to examine the attitudes, habits and knowledge about the use of NSAIDs among medical students, considering that they will have to use the applied knowledge about NSAIDs in their future work.

II. MATERIALS AND METHOD

2.1. Study design and sample

In this cross-sectional study, an online anonymous survey was used for self-assessment among students of the medical group of faculties: University of Sarajevo - Faculty of Medicine, University of Sarajevo - Faculty of Dentistry, University of Sarajevo - Faculty of Health Studies, University of Sarajevo - Faculty of Pharmacy. The survey was distributed to students of all years, from the first to the sixth year. Ethics committee approval was not required, given that a completely anonymous data collection approach was used.

2.2. Data collection

The survey consisted of 29 questions, which were divided into four sections. The first section of questions included a section of general questions, where the main goal was to collect the basic data of respondents related to gender, age group, social status and selected faculty. The second section of questions is related to the use of NSAIDs and paracetamol, their dosage and method of administration, and is divided into two parts: the first part includes questions from general knowledge about NSAIDs and paracetamol, and the second part is questions related to the respondents' habits regarding these drugs, which includes methods of application, cases in which they are used, methods of acquisition and consumption in combination with coffee and alcohol. The third section covered questions related to side effects and overdoses and also consisted of two parts: the first part was questions from general knowledge about side effects and the possibility of overdose, while the second part of the questions examined the occurrence of certain side effects in the respondents and in what way subjects are informed about side effects. The fourth section had a group of questions that examined the tolerance of the respondents to individual NSAIDs and paracetamol and whether there is a different time period of its formation in the comparison of drugs.

The online, anonymous survey used a Likert scale, where respondents could respond with one of five offered answers in their self-assessment: 1 - completely disagree, 2 - disagree, 3 - neutral, 4 - agree, 5 - I completely agree. In addition to the Likert scale, in the section with general knowledge questions, respondents were offered to respond to the offered statements with one of three possible answers: 1 - True, 2 - False, 3 - Maybe.

2.3. Statistical analysis

Statistical analysis was done using SPSS version 23, with $p < 0.05$ considered statistically significant. Reliability of the questionnaire was calculated as a measure of internal consistency (Cronbach's α coefficient). Statistical significance was assessed with Spearman's assessment for ordinal data.

III. RESULTS

The total sample from four faculties consisted of 105 respondents: Faculty of Medicine 52 respondents (50%), Faculty of Health Studies 10 respondents (10%), Faculty of Dentistry 17 respondents (16%), Faculty of Pharmacy 26 respondents (25%). Of the total number of respondents from four faculties, 76 were female (72%), and 29 were male (28%). The age groups of the respondents were classified into three categories: age group 18-21 years 38 respondents (36%), age group 21-25 years 60 respondents (63%), age group >25 years 4 respondents (4%).

Of the six years of study, 29 respondents responded from the first year, 16 respondents from the second year, 21 respondents from the third year, 27 respondents from the fourth year, 12 respondents from the fifth year, and 0 respondents from the sixth year.

To the survey question "Who do you live with during your studies?", 16 respondents answered that they live alone, 61 respondents answered that they live with their parents, 20 respondents answered that they live with a roommate, 3 respondents answered that they live with a boyfriend/girlfriend, 3 respondents answered that they live in a marriage with children, and 2 respondents answered that they live in a marriage without children.

When asked how often they use NSAIDs, respondents answered on a Likert scale from very rarely to very often: very rarely 21 respondents (20%), rarely 13 respondents (12%), sometimes 49 respondents (47%), often 19 respondents (18%), and very often 3 respondents (3%).

Respondents were asked to indicate for what purpose they used the drugs ibuprofen, naproxen, diclofenac, aspirin and paracetamol (Fig. 1).

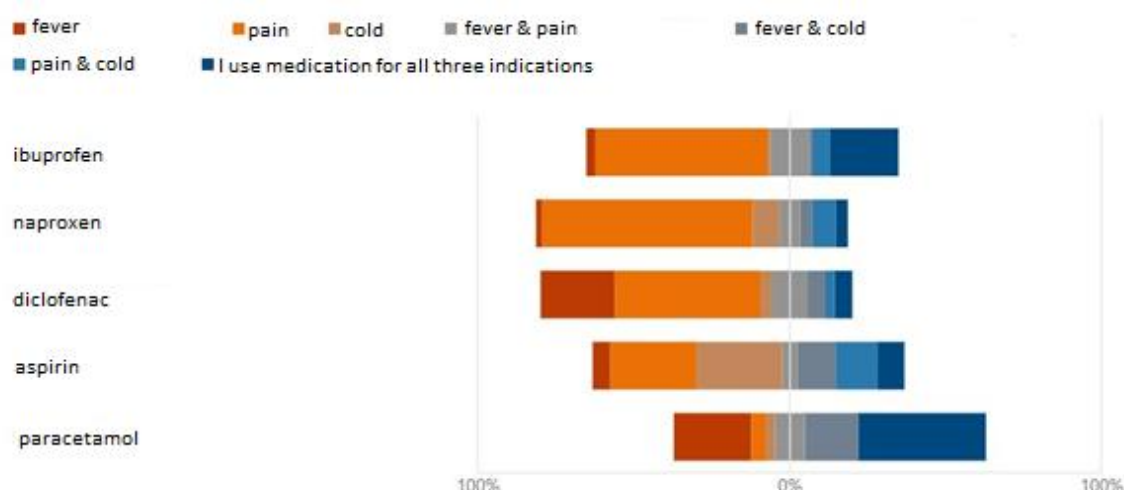


Figure 1. Frequency of use of NSAIDs in different indications

For the most common method of application of NSAIDs, 105 respondents answered that they use the oral method of application (93%), 1 respondent answered that they use the parenteral

(intramuscular/intravenous) method of application (1%), 5 respondents answered the rectal method of application (4%) and 2 respondents answered that their most common method of application is topical (2%).

Given the increasing global consumption of coffee and alcohol, respondents were asked to answer on a Likert scale how often they consume NSAIDs with alcohol and coffee. Most of the respondents (100) never consumed NSAIDs in a combination with alcohol, 1 respondent answered very rarely, sometimes and often, 2 respondents answered sometimes. NSAIDs were combined with coffee in 63 cases.

In addition to alcohol and coffee, respondents were asked about their habits of consuming NSAIDs with water or some other beverage: 103 respondents answered that they most often drink NSAIDs with water (98%), while 2 respondents answered with non-carbonated drinks, and 0 respondents answered with carbonated drinks and milk/yogurt.

To the statement 'Before using non-steroidal anti-inflammatory drugs, you should consult a doctor, regardless of the reason for using the drug', the respondents answered on a Likert scale: 6 respondents completely disagree (6%), 13 respondents disagree (12%), 49 respondents with neutral (47%), 27 respondents with agree (26%) and 10 respondents with completely agree (10%).

In the third section of questions, a section of general knowledge questions on side effects and overdose, respondents answered 11 questions with true/maybe/false (Fig. 2):

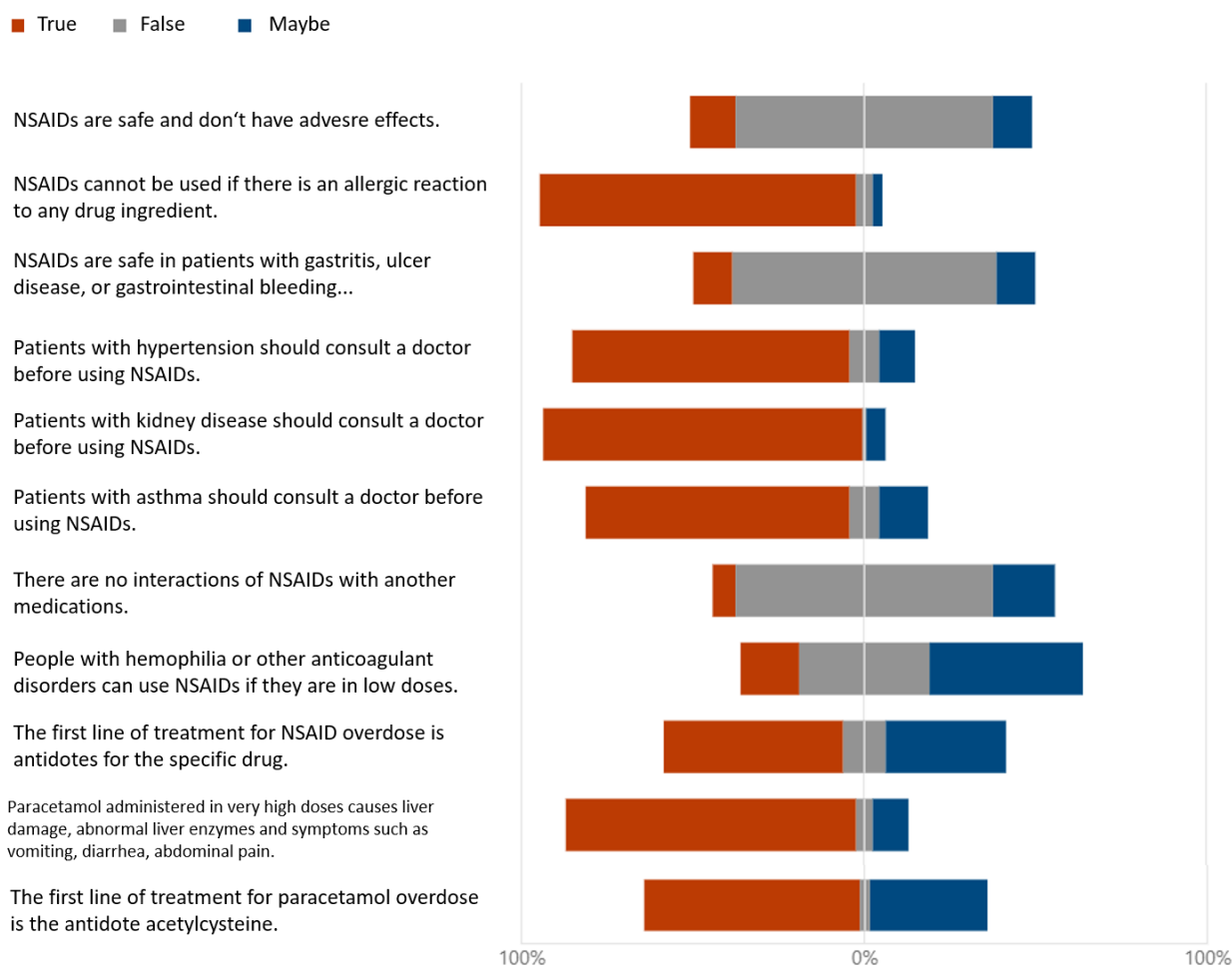


Figure 2. General knowledge questions on side effects and overdose

In the last, fourth section of questions regarding tolerance testing, respondents were asked to indicate how long it took them (after a few days, weeks, months) to replace the medication they were using with another one from the offered ones (ibuprofen, naproxen, diclofenac, aspirin, paracetamol) or increase the dose to reduce the effect, or to indicate that they had been using the medication for years without any change in effect or not using the medication at all (Fig. 3).

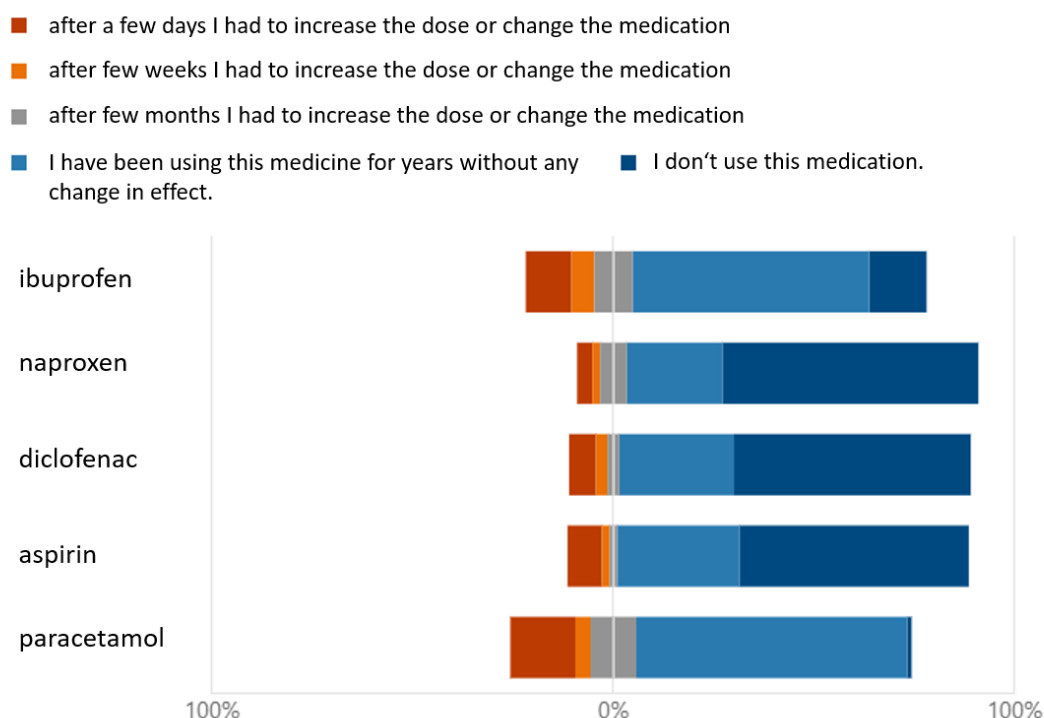


Figure 3. Modalities of use of NSAIDs within students

IV. DISCUSSION

Self-treatment with non-steroidal anti-inflammatory drugs (NSAIDs) among medical students is a multifaceted topic with significant implications for healthcare and education. Our study shown that medical students, situated uniquely as both learners and potential patients, often engage in self-medication practices, reflecting the intersection of their medical knowledge, accessibility to drugs, and the demands of their rigorous training. Studies indicate that self-medication with NSAIDs is highly prevalent, with some reporting rates as high as 70-90% globally. Common reasons include time constraints, perceived competence in self-diagnosing, easy access to over-the-counter NSAIDs, and familiarity with these medications from their curriculum. Additionally, stress and physical demands contribute to the frequent use of NSAIDs for headaches, menstrual pain, musculoskeletal discomfort, and flu-like symptoms.

However, this practice carries potential risks, such as misdiagnosis, inappropriate dosing, drug interactions, and delayed medical consultations [9]. There is also concern about the development of chronic self-treatment habits that may persist into professional life, influencing future patient care. Ethical issues, such as the inappropriate use of prescription-strength NSAIDs and the potential for poor role modeling, add further complexity. Interestingly, a gap often exists between medical students' knowledge and their practices, highlighting a disconnect between understanding best practices and applying them to personal health behaviors.

A study in Palestine with a sample of 206 students showed a high percentage of NSAID use among students. Students' knowledge of the use of these drugs and their side effects increased with the age of the students, although the mean value of correctly answered questions was 60-70 [6].

A study in Jordan with 198 respondents also showed a high percentage of NSAID use, and that it largely depends on the type of faculty and gender, where 49% fall on medical students, especially in the higher years of study, and that use is slightly higher among males, around 33% [7].

A study was conducted at the University College Farasan Campus, in which 177 respondents participated, and the target population was students of medical schools, where as many as 87% responded that they use over-the-counter drugs, and paracetamol was used most often, while ibuprofen took first place among NSAIDs [8].

Institutions have responded by implementing educational programs and policies to promote responsible self-medication, aiming to address these concerns. Cultural and regional differences also play a role, as societal norms and healthcare access significantly influence self-treatment behaviors. Long-term implications of these habits are profound, potentially shaping future physicians' professional conduct, with both positive and negative outcomes possible. This topic offers ample research opportunities, including longitudinal studies and interventions to evaluate the effectiveness of educational programs on self-treatment practices, providing a pathway for improved health behaviors among medical students and their future patients.

V. CONCLUSION

In conclusion, self-treatment with NSAIDs among medical students is a complex issue that reflects the intersection of medical knowledge, personal health practices, and the unique pressures of medical education. While their knowledge may provide some safeguards, it doesn't eliminate the risks associated with self-medication. This topic underscores the importance of fostering a culture of responsible medication use, even among those training to be healthcare providers. It also highlights the need for medical education to address not just the theoretical aspects of medication use, but also the practical and ethical considerations of personal health management for healthcare professionals.

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