

Consumption patterns of NSAIDs in central Portugal and the role of pharmacy professionals in promoting their rational use

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Abstract

Background Non-steroidal anti-inflammatory drugs (NSAIDs) are among the most widely used of all therapeutic agents. In spite of their therapeutic efficacy, concern over the use of NSAIDs is largely related to their adverse effects in different organic systems, as well as their indiscriminate use. There is a lack of studies about the pattern of use of NSAIDs in Portugal.

Objective The aim of this study was to characterize the consumption pattern of NSAIDs by adult users in the central region of Portugal, as well as the role of the community pharmacy professionals in counseling and promoting their rational use.

Methods A questionnaire survey to determine sociodemographic information and NSAID use characterization was administered to a sample of 450 pharmacy customers between October and November of 2013.

Results The prevalence of NSAID use was 57.6 % (95 % CI 53–62). Most of the 259 NSAID users were aged 18–39 years (61.4 %), female (67.6 %), urban zone inhabitants (70.7 %) and practiced self-medication (64.2 %). Self-medication with NSAIDs was significantly ($p \leq 0.001$) related to age, employment status and the use of gastroprotective drugs. The concomitant use of NSAIDs and other medications revealed the possibility of drug interactions in people aged ≥ 65 years (prevalence ratio

6.3). Of the NSAID users, 47 % reported that they sometimes, rarely or never received pharmacy professional recommendations. However, the majority (76 %) of respondents said that they read medicine leaflets, and considered NSAIDs to be effective and remarkably safe.

Conclusions Considering the main results of this study, it is imperative to promote the re-education of the population and improve the consultative role of the pharmacy professionals regarding NSAID use.

Introduction

Non-steroidal anti-inflammatory drugs (NSAIDs) are frequently used worldwide to treat a large number of common acute and chronic inflammatory conditions. These drugs possess different chemical and clinical profiles, but essentially exert the same therapeutic properties and are associated with similar adverse drug reactions (ADRs) [1–3]. Besides gastrointestinal injuries (the most common ADR caused by this group) [4], there is evidence to link these agents to toxicities affecting the cardiovascular [5, 6] and renal [7] systems, as well as the liver [8]. Studies have shown that both therapeutic and adverse effects of NSAIDs are dependent on cyclo-oxygenase (COX) inhibition [9]. Indeed, the COX enzyme can be divided into two isoforms: a constitutive and cytoprotective isoform (COX-1), which is responsible for maintaining normal function in the gastrointestinal and renal tracts; and an inducible isoform (COX-2), which is found in inflamed tissues. Traditional NSAIDs inhibit both isoforms, while specific COX-2 inhibitors have a substantially higher specificity for the COX-2 isoform, thus preserving the anti-inflammatory property of

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COX-2 inhibition and reducing the ADRs related to inhibition to the COX-1 isoform, which results in a superior gastrointestinal and renal safety profile when compared with the non-selective COX inhibitors. However, COX-2 inhibitors increase the risk of serious cardiovascular events [7].

In Portugal, according to the “Medicine and healthcare products statistics 2014” compiled by the National Authority of Pharmacy and Medicines (INFARMED), NSAIDs were the eighth highest pharmacotherapeutic subgroup with regard to the number of packages sold [10]. The statement is in line with another study, which showed that NSAIDs placed fifth among chronically used medicines and that they were used by 12–15 % of the study participants [11]. Moreover, ADRs related to NSAID use, especially gastrointestinal complications, continue to be reported to the Portuguese Drug Prescription Vigilance System, representing 11 % of overall reports, and often causing hospitalization [12]. Similar results were obtained in France [1] and Spain [13].

Physicians have a key role in evaluating the need for anti-inflammatory therapies, and if deemed necessary, in selecting and prescribing the most suitable currently available NSAID, taking into account their tolerability profiles and possible negative influence on health. According to the European Medicine Agency’s Committee on Medicinal Products for Human Use, NSAIDs should be prescribed at the lowest effective dose and for the shortest period necessary for symptom control [14]. Moreover, individual risk factors and the possibility of individual variability in response to NSAIDs must be considered by practitioners to improve patient management [15].

Some NSAIDs can be purchased without prescription, which allows patients to take responsibility for their therapy. Therefore, pharmacy professionals have a key role to play in counseling and promoting the appropriate selection of NSAIDs, as they are the last link to patients before NSAID use.

The absence of data reflecting the prevalence and pattern of use of NSAIDs in the Portuguese population, and the attitudes and knowledge of healthcare providers, namely pharmacy professionals, towards the promotion of their rational use, has prompted the undertaking of this study. A survey, using an investigator-administered questionnaire, was conducted in the central region of Portugal in order to evaluate NSAID use by the adult population, to characterize NSAIDs users, and to evaluate the role of community pharmacy professionals in NSAID use.

Materials and methods

This was a cross-sectional study, with a questionnaire survey developed by the authors being used as the data collection instrument. Data collection took place in

community pharmacies in the Portuguese districts of Aveiro, Castelo Branco, Guarda and Viseu between October and November of 2013. As this is an observational study, based on the results of a survey, no formal approval from any committee was required.

The target population included all adults aged >18 years who were residents of the Portuguese districts of Aveiro, Castelo Branco, Guarda and Viseu. According to the 2011 Portuguese National Statistics Institute census, the base population in these districts was 847,581. Based on this population and a sampling error of 5 % plus 12.5 % to cover possible non-response, the estimated total sample size was 450 (using the Taro Yamane equation). The sample was stratified to reflect the proportional population of each district, resulting in 170 participants from Aveiro, 76 from Castelo Branco, 75 from Guarda and 129 from Viseu. Respondents, aged >18 years and resident in one of the four districts, participated voluntarily and anonymously, and were informed of the scope and objectives of the study. The survey of pharmacy customers was conducted by personal interview (mean duration 15 min), with a single investigator recording the answers in a printed questionnaire in order to avoid errors that could lead to invalid answers. The researchers contacted all pharmacies in each district and obtained permission from a group of pharmacies to interview their customers within a given time period, thereby obtaining a convenience sample. To obtain the 450 completed surveys, it was necessary to request the participation of 502 individuals.

The questionnaire survey was developed using a systematic approach, with the objectives of being concise and easy to understand. After pre-testing the survey in eight individuals from the target population, changes were made in the text of some questions in order to improve understanding. The survey had two parts, and included closed questions, with single or multiple choice responses, and one question with an open response. The first part inquired about the sociodemographic characteristics of respondents, and the second asked about their health status and NSAID use, focusing primarily on issues relating to their pattern of consumption of NSAIDs. Respondents were asked if they had taken NSAIDs in the last 6 months; only those participants who had taken NSAIDs in the last 6 months answered the remaining survey questions, which were related to the identification of used NSAIDs and factors associated with their consumption. The recall period of 6 months was chosen to obtain data regarding recent NSAID use. Individuals who had taken NSAIDs in the last 6 months indicated which NSAIDs they had used from a list of drugs (including brand-names), the signs and symptoms that motivated their use, and whether or not the individual had a prescription for the NSAID, received recommendations from pharmacy professionals when the

NSAID was acquired, knew the adverse effects of the NSAID or had read the NSAID-related leaflets.

Descriptive data analysis provided the sociodemographic characterization and description of health status and usage profile issues of the sample. The Fisher's exact test was used for dichotomous variables. Pearson's Chi-squared test and, in other cases, the prevalence ratio (PR) and its 95 % confidence interval (CI) were applied to study the association between qualitative variables. There was also the comparison of means (*t* test for two independent samples), in the case of a quantitative variable, to complement the association study. The results were analyzed for a significance level of 5 %. Data processing and analysis were conducted using Google Drive and SPSS version 20.

Results

With regard to the sociodemographic characteristics of the 450 respondents (Table 1), the data indicated that the majority lived in an urban zone (66 %), were female (63 %), were young adults aged between 18 and 39 years (58 %) and had a civil status of married/civil partnership or single (91 %). Regarding academic qualifications and employment status, 64 % of respondents did not have higher education (diploma course/bachelor or higher), and 33 % had no income or had low income (housewife/househusband, students and unemployed), with the remaining 67 % being retired, employers and dependent or independent workers. Of note, the professional activities with the largest representation in the sample were related to health (17 %), technology (11 %) and economics, management and accounting (11 %). A third of respondents (34 %) reported having a chronic disease, most commonly hypertension, hypercholesterolemia, diabetes and musculoskeletal system problems.

In order to understand the attitude of individuals towards the use of common drugs, the survey included questions regarding the consultation of medicine leaflets. The majority of respondents (343; 76.2 %) read the medicine leaflet, which might indicate that they considered the information it contained to be important.

When respondents were asked about the consumption of NSAIDs in the last 6 months, 259 (57.6 %; 95 % CI 53.0–62.2) provided an affirmative answer to the question, with these respondents using an average of 1.7 (95 % CI 1.6–1.8) NSAIDs. The remaining 191 respondents (42.4 %) had not used an NSAID in the past 6 months (Fig. 1) and, therefore, were not asked to complete the rest of the questionnaire.

Based on the sociodemographic characteristics of the 259 NSAIDs users (Table 1), most were aged 18–39 years

(61.4 %), female (67.6 %), urban zone inhabitants (70.7 %) and involved in health study or labor activity (21.6 %).

According to the answers to the question “Which NSAIDs did you consume?” ibuprofen was the most commonly used (188; 72.6 %), followed by diclofenac (79; 30.5 %) and nimesulide (58; 22.4 %) [Fig. 2]. The NSAIDs referred to by one or two respondents (i.e. aceclofenac, bendazac, celecoxib, dexibuprofen, etodolac, naproxen, piroxicam, bendazac, ketoprofen, dexketoprofen, fenbufen, flufenamic acid, symphytum officinale and diethylamine salicylate plus sodium heparin plus menthol) were counted together and classified as “others” (19; 7.3 %).

For the most commonly used NSAIDs, the number of daily doses administered varied, with 108 respondents (41.7 %) taking the NSAID once daily, 102 (39.4 %) twice daily, 43 (16.6 %) three times daily and 6 (2.3 %) more than three times per day. Of note, 35 (13.5 %) of NSAID users responded that they had used two NSAIDs simultaneously.

The most commonly used NSAID dosage form was solid oral preparations (228 respondents; 88 %), followed by cutaneous and transdermal forms (78; 30.1 %), oral solutions/suspensions (29; 11.2 %), gingival/buccal solutions (27; 10.4 %) and, finally, parenteral preparations (4; 1.5 %) [individuals could use more than one dosage form]. The majority of respondents (234; 90.3 %) took NSAIDs during or after meals, and the remaining 25 (9.7 %) took the medication at a non-recommended time (7.4 % took it before meals and 2.3 % fasting), which might worsen the adverse effects of these drugs. Most NSAID users (218; 84.2 %) took NSAIDs for up to 5 days and the remaining 41 users (15.8 %) for longer than 5 days.

Considering that the use of NSAIDs could lead to gastrointestinal damage, a gastroprotective agent is usually co-prescribed, although its use, suitability, effectiveness and safety should be considered [16]. Most NSAID users (217; 83.8 %) did not use a gastroprotector. Of the 42 users (16.2 %) who did, most used proton pump inhibitors (PPIs), including omeprazole, pantoprazole and esomeprazole (29, seven and two users, respectively); the anti-ulcer drug sucralfate was used by two patients, and other gastroprotective drugs, such as histamine H₂-receptor antagonists, were less frequently used.

Respondents were requested to indicate the signs and symptoms that motivated the use of NSAIDs (Fig. 3). Headaches were the motivation reported by 113 (43.6 %) of NSAID users. Most respondents used NSAIDs for pain associated with musculoskeletal system, with emphasis on joint pain (73 respondents; 28.2 %), backache pain (66; 25.5 %), pain in the limbs (56; 21.6 %), body pain (34; 13.1 %) or pain associated with fracture or trauma (19; 7.3 %).

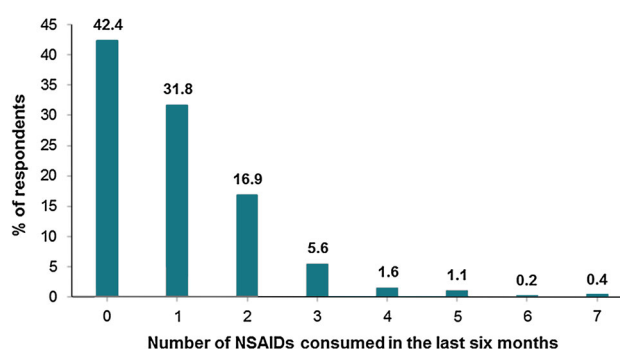
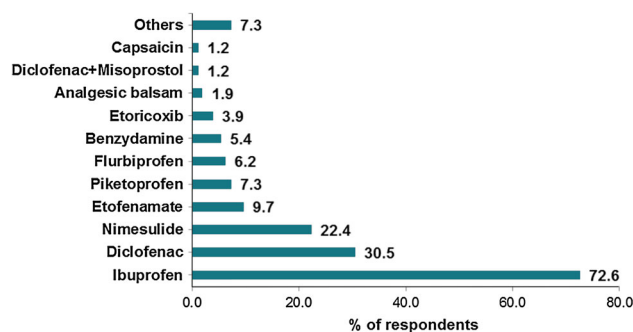
Table 1 Sociodemographic characteristics of respondents (*n* = 450)

Characteristic	No. of respondents (%)		
	NSAID users	Non-NSAID users	Total
Gender			
Female	175	108	283 (63)
Male	84	83	167 (37)
Residence zone			
Urban	183	115	298 (66)
Rural	76	76	152 (34)
Age (years)			
18–29	102	73	175 (39)
30–39	57	29	86 (19)
40–49	25	27	52 (12)
50–64	47	40	87 (19)
≥65	28	22	50 (11)
Civil status			
Single	112	88	200 (44)
Married/civil partnership	124	86	210 (47)
Divorced	12	7	19 (4)
Widow/widower	11	10	21 (5)
Education level			
No official educational level	4	5	9 (2)
1st cycle of basic education	32	20	52 (12)
2nd cycle of basic education	9	13	22 (5)
3rd cycle of basic education	27	28	55 (12)
High school	88	61	149 (33)
Diploma/bachelors degree	11	7	18 (4)
Graduate	76	48	124 (28)
Masters degree	11	7	18 (4)
PhD	1	2	3 (1)
Employment status			
Unemployed	29	27	56 (12)
Independent worker	19	12	31 (7)
Dependent worker	110	77	187 (42)
Student	51	34	85 (19)
Retired	40	35	75 (17)
Employer	7	3	10 (2)
Housewife/househusband	3	3	6 (1)
Area of study or labor			
Science	14	18	32 (7)
Health	56	21	77 (17)
Technology	28	22	50 (11)
Agriculture/natural resources	5	9	14 (3)

Table 1 continued

Characteristic	No. of respondents (%)		
	NSAID users	Non-NSAID users	Total
Architecture/arts/design	4	3	7 (2)
Educational sciences/teacher education	26	16	42 (9)
Law/social sciences/services	17	19	36 (8)
Economics/management/accounting	29	19	48 (11)
Humanities/administration/translation	29	12	41 (9)
Physical education/sport/performing arts	5	6	11 (2)
Domestic worker	10	12	22 (5)
Retail/restaurant workers	26	24	50 (11)
Factory worker	10	10	20 (4)

NSAID non-steroidal anti-inflammatory drugs

**Fig. 1** Distribution of the number of non-steroidal anti-inflammatory drugs (NSAIDs) consumed in the last 6 months**Fig. 2** Percentage of respondents who used non-steroidal anti-inflammatory drugs (NSAIDs)

As for the improvements felt after taking NSAIDs, 245 (94.6 %) respondents who used NSAIDs in the past 6 months said they felt improvements, which points out the effectiveness of these medicines. There was no association

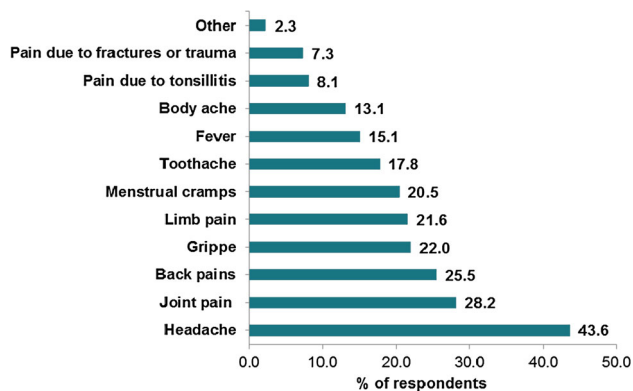


Fig. 3 Signs and symptoms that motivated the use of non-steroidal anti-inflammatory drugs (NSAIDs)

($p = 0.119$) between the improvement of health status and duration (up to 5 days or longer than 5 days) of NSAID treatment. Of the 218 respondents who had been treated for up to 5 days, 207 (95.0 %) said that their health status had improved, indicating that short-term treatment with NSAIDs is generally effective.

With regard to whether individuals were prescribed NSAIDs or were self-medicating, 165 of 257 (64.2 %) NSAID users who answered this question practiced self-medication.

Based on an ordinal scale of the frequency of recommendations from pharmacy professionals about how to take the medicine, 79 (30.5 %) of NSAID users frequently received recommendations, 58 (22.4 %) always received recommendations and 44 (17 %) sometimes received recommendations. However, >30 % of NSAID users never (53; 20.5 %) or rarely (25; 9.6 %) received recommendations given by the pharmacy professional. The 181 NSAID users who sometimes, frequently or always received pharmacy professional recommendations were asked to identify the recommendations. The answers were analyzed, processed and standardized. The distribution of answers is shown in Fig. 4. The timing of doses (78 responses; 30.1 % of answers); daily recommended dose (55; 21.2 %) and posology (52; 20.1 %) were the most frequently mentioned recommendations.

Of the 259 NSAID users, 233 (90.0 %) said that they did not have any complications after taking these drugs. However, 14 respondents (5.4 %) reported nausea, nine (3.5 %) diarrhea, six (2.3 %) difficulty in digestion and only two (0.8 %) other ADRs, such as vomiting and heartburn (some individuals reported more than one ADR).

The individuals were questioned about the concomitant use of other medications with NSAIDs, as drug interactions could arise. Most NSAIDs users (159; 61.4 %) did not use NSAIDs simultaneously with other medications, while 100 (38.6 %) said that they took one or more medications at the

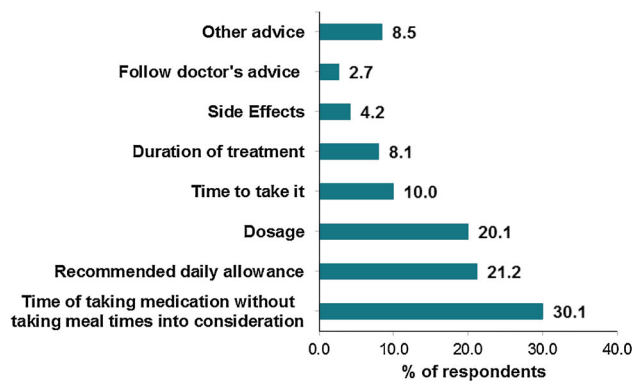


Fig. 4 Advice given by the pharmacy professional

same time. Of these 100 individuals, 31 % indicated the simultaneous use of antihypertensives, 6 % anticoagulants and 5 % digoxin, and the majority (58 %) chose the survey option 'other' and mentioned a lipid-lowering, antidiabetic or analgesic drug; 54 % of these respondents said that the pharmacy professional had knowledge that they did so, with the remaining 46 % stating that the professionals did not have this information. NSAIDs were used concomitantly with other medications by 24 of the 27 individuals aged ≥ 65 years (PR 6.3; 95 % CI 2.2–18.3), but only by 69 of the 227 individuals aged <65 years, indicating that elderly patients are more likely to use NSAIDs with other medications.

NSAIDs are contraindicated in certain situations/conditions. Of the NSAID users, 202 (78 %) did not report any pathology. The remaining 57 NSAID users (22 %) had one or more clinical situations in which taking NSAIDs is contraindicated: 34 respondents with hypertension, eight with heart failure, eight with renal failure, seven with active peptic ulcer, four who were pregnant or breast-feeding and one with hypersensitivity to constituents.

An evaluation of the possible association between NSAID use in the last 6 months and the sociodemographic characteristics of respondents indicated that there was a statistically significant association with gender ($p = 0.018$), with women consuming more NSAIDs than men (PR 1.2), and residence zone ($p = 0.026$), with those living in an urban zone consuming more NSAIDs than those in rural zones (PR 1.2) [Table 2]. The latter result might be related to how easy it is to acquire NSAIDs in the urban zone and to the lifestyle of these residents. The average number of NSAIDs used was also significantly higher in women ($p = 0.009$) and in the urban zone ($p = 0.018$), but there were no significant differences between the number of drugs used and the professional situation or educational level.

There was a significant association between NSAID use in the last 6 months and reading the information contained in the medicine leaflet ($p = 0.005$; PR 1.3) [Table 2].

Table 2 Association between NSAID consumption in the last 6 months and gender, residence zone and reading the medicine leaflet ($n = 450$)

Characteristic	No. of respondents (% ^a)		Statistical analysis	
	NSAID users	Non-NSAID users	<i>P</i> value	Prevalence ratio (95 % CI)
Association between NSAID use and gender				
Female	175 (61.8)	108 (38.2)	0.018	1.2 (1.0–1.5)
Male	84 (50.3)	83 (49.7)		
Association between NSAID use and residence zone				
Urban	183 (61.4)	115 (38.6)	0.026	1.2 (1.0–1.5)
Rural	76 (50.0)	76 (50.0)		
Association between NSAID use and reading the medicine leaflet				
Leaflet readers	210 (61.2)	133 (38.8)	0.005	1.3 (1.1–1.7)
Leaflet non-readers	49 (45.8)	58 (54.2)		

NSAID non-steroidal anti-inflammatory drugs

^a Percentages refer to the total individuals in the category represented by row

Table 3 Association between reading the medicine leaflet and gender and age ($n = 450$)

Characteristic	No. of respondents (% ^a)		Statistical analysis	
	Leaflet readers	Non-leaflet readers	<i>P</i> value	Prevalence ratio (95 % CI)
Association between reading the leaflet and gender				
Female	243 (85.9)	40 (14.1)	<0.001	1.4 (1.3–1.6)
Male	100 (59.9)	67 (40.1)		
Association between reading the leaflet and age (years)				
18–29	139 (79.4)	36 (20.6)	<0.001	1.1 (1.0–1.2)
30–39	76 (88.4)	10 (11.6)		1.2 (1.1–1.3)
40–49	39 (75.0)	13 (25.0)		1 (0.8–1.2)
50–64	64 (73.6)	23 (26.4)		1 (0.8–1.1)
≥65	25 (50.0)	25 (50.0)		0.6 (0.5–0.8)

^a Percentages refer to the total individuals in the category represented by row

There was also a significant ($p < 0.001$) association between reading the medicine leaflet and gender (PR 1.4 for women vs. men) and age (PR 1.1 for individuals aged 18–29 years, 1.2 for those aged 30–39 years and 0.6 for those aged ≥ 65 years) [Table 3].

Self-medication with NSAIDs was significantly associated with only two sociodemographic variables, namely age ($p < 0.001$) and employment status ($p = 0.001$). Self-medication was more common in individuals aged < 40 years (PR 1.4 for individuals aged 18–29 years and 1.1 for those aged 30–39 years) [Table 4], with this practice less frequent in older age groups. Retired people and housewife/househusband acquired NSAIDs by prescription (PR for both 0.5), whereas the unemployed were more likely to self-medicate (PR 1.3). Importantly, a significant ($p < 0.001$) association between self-medication with NSAIDs and the use of gastroprotective drugs was found, with individuals who self-medicated being more unlikely to take a gastroprotective drug when taking NSAIDs (PR

0.6) compared with those who got NSAIDs by prescription (PR 2).

Discussion

In our study, the prevalence rate of NSAID use was 57.6 % (95 % CI 53–62.2), which is comparable with that in the scientific literature and medicine consumption studies of the Portuguese Health National Authority, showing a high level of consumption of this group of medicines. Ibuprofen was the drug that had the highest rate of use, followed by diclofenac and nimesulide. Of the top 50 active substances with the highest number of packages sold in the Portuguese National Health System, ibuprofen was in ninth place and diclofenac was in twenty-seventh place [10]. This consumption tendency was also reported by other studies [17–19]. However, in a study conducted in Serbia [20], diclofenac accounted for ≈ 50 % of NSAID consumption

Table 4 Association between self-medication with NSAIDs and age, professional status and gastroprotection

Characteristic	No. of respondents (% ^a)		Statistical analysis	
	Self-medicators	Non-self-medicators	<i>P</i> value	Prevalence ratio (95 % CI)
Association between self-medication with NSAIDs and age (years)				
18–29	79 (78.2)	22 (21.8)	<0.001	1.4 (1.2–1.7)
30–39	40 (71.4)	16 (28.6)		1.1 (1.1–1.4)
40–49	14 (56.0)	11 (44.0)		0.9 (0.8–1.2)
50–64	21 (44.7)	26 (55.3)		0.7 (0.8–1.1)
≥65	11 (39.3)	17 (60.7)		0.6 (0.5–0.8)
Association between self-medication and employment status				
Unemployed	23(79.3)	6 (20.7)	0.001	1.3 (1.0–1.6)
Independent worker	12(63.2)	7 (36.8)		1 (0.7–1.4)
Dependent worker	75 (69.4)	33 (30.6)		1.1 (1.0–1.4)
Student	36 (70.6)	15 (29.4)		1.1 (0.9–1.4)
Retired	14 (35.0)	26 (65.0)		0.5 (0.3–0.8)
Employer	4 (57.1)	3 (42.9)		0.9 (0.5–1.8)
Housewife/househusband	1 (33.3)	2 (66.7)		0.5 (0.1–2.6)
Association between self-medication with NSAIDs and concomitant use of gastroprotective drugs				
Use	16 (39.0)	25 (61.0)	<0.001	0.6 (0.4–0.8)
Do not use	149 (69.0)	67 (31.0)		2 (1.4–2.7)

NSAID non-steroidal anti-inflammatory drugs

^a Percentages refer to the total individuals in the category represented by row

during the observation period, followed (in much smaller quantities) by ibuprofen.

Of the 259 NSAID users in our study, 83.8 % did not consume any gastroprotective agent and 16.2 % used gastroprotective drugs, primarily omeprazole. In a general practitioner-based survey in France that evaluated gastroprotective drug co-prescription, 29.5 % of NSAID prescriptions included a gastroprotective agent, with omeprazole accounting for 58 % of these co-prescriptions [21]. In a similar study conducted in Portugal, the proportion of patients taking gastroprotective drugs was 40 %, with PPIs being the most commonly used [12]. In fact, in our study the proportion was lower (16.2 %) than 40 % and, as stated by the authors [12], the percentage obtained was a result of an interview perception on an “intention-to-treat basis” and might be an overestimation.

The practice of taking NSAIDs concomitantly with other medications was more common in older individuals, with 89 % of individuals aged ≥65 years doing so. This may be due to the fact that the elderly population had chronic pathologies and, as such, practiced polypharmacy [22].

Almost half of the sample (43.6 %) considered headaches the reason for taking NSAIDs. A study conducted in Italy [23] also found that NSAIDs were frequently used to treat painful and non-inflammatory conditions (e.g. headache, unspecified pain, etc.) that could be treated with other

first-line treatments. ADRs were reported by only 10.1 % of respondents. NSAIDs have high acceptability, but are associated with cardiovascular and gastrointestinal ADRs, especially at the highest and most efficacious dosages [5]. Nonetheless, as NSAID use is episodic and limited to shorter periods, the respondents could not relate the adverse effects to these medicines.

Furthermore, despite the low (22 %) proportion of respondents who had contraindications to the use of NSAIDs, it is important to closely supervise and monitor the use of NSAIDs, especially in high-risk patients.

About 70 % of the individuals said they received recommendations from pharmacy professionals about NSAID use, which were primarily concerned with NSAID administration. Similar conclusions were made in a study conducted in Thailand [24], where the authors stressed that patients received NSAID information mostly from health-care professionals, but safety information was limited.

Self-medication represents an important public health issue, but little data exists regarding its risk [25]. In this study, 64.2 % of respondents practiced self-medication with NSAIDs. A study conducted in Italy reported a comparable high proportion (44 %) of NSAID self-medication [23].

With respect to counseling by pharmacy professionals, our study showed that there are still some flaws, as a high proportion of NSAID users reported rarely or never having

received any recommendation for their rational consumption. As NSAIDs are usually used in a regimen of self-medication, a certain negligence was attributed to the community pharmacy professionals with regard to their dispensation, counseling and education of users as to how to promote the correct use of these medicines in order to assure quality, efficacy and safety and, especially, to alert users to severe complications. Moreover, individuals who practice NSAID self-medication are less likely to take gastroprotective drugs.

There are some limitations in our work. Foremost, we did not get a randomized sample and, therefore, the sample may not be representative of the target population. However, the personal interview technique increases the response rate, which increases the likelihood that everyone in our population is represented. Regarding the characterization of the pattern of NSAID use, two issues were identified. Firstly, the period considered for NSAID use (last 6 months) could lead to a subestimation of prevalence, as respondents could not precisely report NSAID use in this period, and it was not possible to distinguish between incident and prevalent users. Secondly, even when shown the list of all NSAIDs and their brand-names, some respondents did not remember the name of the NSAID. As a personal interview was conducted, it was possible to address this issue in part, because the researcher could help respondents to remember some details that allowed the NSAID's identification.

Conclusions

This study investigated the profile of NSAID use by adult pharmacy customers in the central region of Portugal and assessed the role of pharmacy professionals in promoting the rational use of these medicines, through the use of a structured interview. The surveyed sample revealed many shortcomings in the knowledge about the indications and complications associated with NSAID use. A high proportion of NSAID users rarely or never received recommendations on NSAID use from pharmacy professionals. Furthermore, the majority of NSAIDs users practiced self-medication, with this population being less likely to take gastroprotective drugs. Therefore, an urgent re-education of the population regarding NSAID use is needed. NSAID users at high risk of ADRs should be monitored and their treatment regimens appropriately tailored. Pharmacy professionals should re-evaluate their conduct regarding counseling and recommendations pertaining to NSAIDs, with the purpose of promoting the rational use of this group of medicines.

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