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Awareness of Non-Steroidal Anti-Inflammatory Drugs (NSAIDs) use among population in Saudi Arabia

Salwa Selim Abougambou^{1*}, Siham Abdullah Abdoun² and Nora SayerAlharbi³

¹Discipline of Pharmacy Practice, Pharmacy College, Delta University for science and technology, Egypt

²Discipline of Pharmaceutics, Pharmacy College, Qassim University, Saudi Arabia

³Pharmacist College, Qassim University, Saudi Arabia

***Corresponding Author:** Salwa Selim Abougambou, Discipline of Pharmacy Practice, Pharmacy College, Delta University for science and technology, Egypt, Email: Salwasl2005@yahoo.com

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Abstract

Background: Non-Steroidal Anti-Inflammatory Drugs (NSAIDs) are one of the most frequently medicines used among the world. They are responsible for a wide range of adverse effects that are ranging from mild to life threatening in severe cases. The aimed of this study to ascertain user's knowledge about NSAIDs among population in Saudi Arabia

Methodology: A cross-sectional study including 449 participants, who were users of NSAIDs in Saudi Arabia during October-December 2017. The data were collected using online questionnaire. The questionnaire contained basic socio-demographic information of participants and questions about the participant's knowledge of adverse effects, their types and NSAIDs uses. SPSS 23; including, frequency, description and chi square were used for analysis.

Result: Majority, 80.6% of participants were female. Ibuprofen was the most common type of NSAIDs used by participants 61.9%. About 33% of participants were aware that these drugs can cause headache\dizziness and nausea\vomiting. However, 27.8% think that these drugs must be sold without a prescription. Additionally, the majority 87.5% feel that the use of NSAIDs is abused. There were a significant association between the availability of NSAIDs without a physician prescription with age, gender and employment status P-value (<0.05). While there was no significant association with educational status.

Conclusion: the present study revealed a limited individual's knowledge about the NSAIDs adverse effects among Saudi Arabia. People need more educations or consultations with health care team specially the pharmacists. In a way to reduce their misuse or abuse or even unnecessarily prescribed.

Keywords: NSAIDs; Saudi Arabia; Awareness; Knowledge; Saudi Arabia

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Background

Non-steroidal Anti-inflammatory Drugs (NSAIDs) are a class of medicines that are widely used among the world [1]. They have been prescribed extensively over the world. In the UK, above 22 million prescriptions are written each year and more than 70 million in the US [2,3]. At any one time, the NSAIDs are actively prescribed for one in each fifteen US adults [4]. More than 30 billion doses of NSAIDs are consumed annually in the United States alone with over-the-counter (OTC) use included [3]. To our knowledge, the annual figures of NSAIDs use in Saudi Arabia has not published so far, or in any other Arab countries. NSAIDs are available as OTC and as well as medical prescription [1]. NSAIDs are usually prescribed for lower back pain, osteoarthritis of the knee and shoulders, musculoskeletal trauma, rheumatology cases, dysmenorrhea, abdominal pain, headache, and high fever by inhibiting cyclooxygenase (COX) isozymes [5]. NSAIDs are used by children [6], adolescent [4], elderly [7] and even by athletes as they are using it for injury treatment and pain prevention before, during and after the race [8]. Chronic use of NSAIDs increases with age, 10-40 % of elderly population (over 65) are using prescribed or OTC NSAIDs each day [9]. However, 25% of adverse drug events (ADE) reported in the UK were accounted for NSAIDs use and 21% in the USA, this is due to widespread use of NSAIDs [4].

NSAIDs adverse effects are the major factor for hospital admission. In a prospective analysis on adverse drug reaction (ADR) as a case of hospital admission, 6.5% of about 22 thousand

hospitalized patients were admitted due to ADR and the NSAIDs were the most common drug involved [1]. Gastrointestinal tract (GIT) complications like dyspepsia, abdominal pain, heartburn and the most serious life-threatening gastrointestinal ulceration are the most common adverse effects associated with NSAIDs use [2]. The other adverse effects include, renal dysfunction (acute kidney injury, reduced glomerular filtration rate), hypertension, adverse cardiovascular events including myocardial infarction and stroke, heart failure and increased risk of death [1].

Many studies demonstrate that the persistent pulmonary hypertension of newborn (PPHN) is significantly associated with the use of NSAIDs during pregnancy [10]. Non-aspirin NSAIDs should be cautiously used in pregnant women [11]. The risk of major congenital malformations has been shown to increase with the use of NSAIDs during early pregnancy [11]. Furthermore, the use of these medications during early pregnancy has been shown to increase the risk of spontaneous abortion, by 2.4-fold, especially with ibuprofen, celecoxib, naproxen, rofecoxib and diclofenac alone or in combination [12].

The high doses of NSAIDs are associated with rapid deterioration in kidney function as well as decreased in mean glomerular filtration rate [13]. Accordingly, patient with chronic kidney disease should cautiously use the NSAIDs and avoid chronic exposure to them [13]. To prevent further kidney damage and progression of the disease an effective communication about the risk of NSAIDs use and chronic kidney disease screening in those who use NSAIDs in daily manner among the patients

with chronic kidney disease may be recommended [14]. In children, the use of NSAIDs is the cause of acute kidney injury [15]. They account for 2.7% of acute kidney injury in pediatric population [15].

The drug-drug interactions with NSAIDs are common. Many cases were reported bleeding complication after prescribe of NSAIDs along with warfarin [16]. NSAIDs were found to affect the serum concentration of warfarin by a competitive metabolism and substrate for cytochrome p450-dependent clearance mechanisms of NSAIDs [16] resulting in high risk of hemorrhage [17]. Hepatic dysfunction, renal failure and bone marrow toxicity were reported with patient taking high dose of methotrexate in combination with NSAIDs [17]. Close monitoring is compulsory when lithium is administered with NSAIDs due to increase the risk of lithium toxicity [17]. Elderly patients who taking digoxin, aminoglycosides and probencid with NSAIDs are required close monitoring as well [17]. The interaction between NSAIDs and cholestyramine or antacids can be avoided by separating the administration time by 1-2 hours [17]. The interaction of antihypertensive medications (angiotensin converting enzyme (ACE) inhibitors, angiotensin II receptor blockers (ARB), beta-blockers, loop and thiazide diuretics) with NSAIDs may result in increased blood pressure via decreasing the efficacy of antihypertensive medications through decreasing renal prostaglandin production [18]. NSAIDs used along with low dose aspirin may increase the gastrointestinal side effects [18]. Close monitoring and rational drug prescribing may restrict the incidence of such interaction [17].

The most common type of NSAIDs used is varying by population throughout the world. Aspirin either alone or in combination was found to be the most commonly OTC NSAID used in America in 2002 [19]. In another study in America, the most common OTC used for relief the pain was ibuprofen [20]. During the

year 2003 in Jordan, 69% of the overall use of NSAIDs was with Diclofenac [2]. In study done in Dar el Salam in Tanzania, 56% of drugs given in health facilities for relief pain was acetaminophen followed by 29% with diclofenac. In addition, diclofenac was also the most common drug used as OTC NSAID [19]. In study conducted in India concerning the awareness of the adverse effects of NSAIDs among its buyers from community pharmacies, fixed dose combination containing two NSAIDs were preferred over single drug NSAID, [21]. In the same context, Roshi et al. [1], said that ketoprofen and ibuprofen were the most NSAID types used in Tirana, Albania.

A lot of studies show that patient awareness regarding the proper use, appropriate indication and the possible side effects of NSAIDs has been demonstrated to be poor [2,21-23]. The reason for many patients fails to take their medications as prescribed is due to lack of information on medications [24]. Evidence suggests that increased information about NSAIDs and other drug therapy is a key factor in improving NSAIDs effectiveness and decreasing incidence of side effects [22].

The rationale of this study is the wide use of NSAIDs in Saudi Arabia. However, there is no information whether the users in Saudi Arabia have knowledge concerning the proper use, appropriate indication and the possible side effects of NSAIDs. The aim of this study was to ascertain user's knowledge about NSAIDs Saudi Arabia population and the socio-demographic factors associated with NSAIDs use.

Methods

This is a descriptive study. It is a questionnaire-based cross-sectional analysis. Data were collected from a sample of 499 consumers, who answered questionnaire online by using survey Monkey website from first to from 20th October to December 2017. The study aim is to assess Awareness of Non-Steroidal Anti-

Inflammatory Drugs (NSAIDs) use among adult consumers in Saudi Arabia. The people selected were who user of NSAID, aged aged18 years and above and Saudi nationality. The exclusion criteria for this study included any patient have comorbidity because of NSAID use, respondents less than 18 years old or older than 70 years old and health care providers.

Study instrument

Data collection tool was a structured questionnaire, which was designed by making use of other different published studies based on extensive literature review and adding questions that were considered of value based on NSAIDs. The questionnaire was prepared in English but prior to use in the study was translated from its original English version to Arabic. Web based survey was carried out by collection of data through self-administer electronic set of questions through a survey Monkey web link. The online questionnaire was made by Survey Monkey and distributed through the social media. The questionnaire was consisting of the following section: section one includes the socio-demographic of participants, section two include the type of NSAIDs used and the dosage form, section three includes the indication for NSAIDs use, Section four includes the source of information regarding NSAIDs.

Data collection

After validation of the questionnaire by a group of experts, the questionnaire was filled by NSAIDs consumers.

Statistical analysis

The data of this study was analyzed by using Statistical Package for Social Science (SPSS) version 23.0 software program. First, data were entered to Monkey spreadsheet and coded then transferred to SPSS for analysis. Standard methods were used to obtain descriptive statistics comprising means, percentages and standard deviations in order to describe demographic. We reported the frequency and distribution. The proportion of study subjects reporting to have knowledge about NSAIDs adverse health effects calculated and reported. For the comparison of categorical variables, we used the chi-square test. P-value <0.05 was considered statistically significant.

Results

In total, 449 individuals took part in the study, 362 women and 72 men, living in Saudi Arabia. The majority of participants were from female gender (80.6%). Of respondents (70.4%) reported were living in central Saudi Arabia. Most of participants have university and above educational status (72.2%). Table (1) shows the socio-demographic characteristics of participants.

Table 1: Socio-demographic characteristics of participants (n=449).

Variable	Category	n	%
Gender	Female	362	80.6
	Male	87	19.4
Age	18 – 25	221	49.2
	26 – 35	109	24.3
	36 – 45	76	16.9
	46 – 55	31	6.9

	>55	12	2.7
Region	Western Saudi Arabia	86	19.2
	Central Saudi Arabia	316	70.4
	Eastern Saudi Arabia	47	10.4
Education Status	Illiterate	2	0.4
	Primary\secondary school	14	3.1
	High school	109	24.3
	University and above	324	72.2
Employment status	Employed	95	21.2
	Unemployed	144	32.1
	Retired	14	3.1
	Student	196	43.7
	Total	449	100%

Values expressed as numbers (n) and percentage (%)

Most of participants had no past medical history (71.1%) followed by (12.2%) who have allergy to medications or allergic diseases, (4.9%) with diabetes, (3.8%) with hypertension, (3.8%) with peptic ulcer and (2.9%) with kidney disease, whereas (0.7%) had other disease condition, thyroid disorders and anemia were the most conditions mentioned. Table (2) represents the past medical history of participants.

Table 2: Past medical History of participants (n=449).

Category	n	%
Non	322	71.7
Diabetes	22	4.9
Hypertension	17	3.8
Kidney disease	13	2.9
Peptic ulcer	17	3.8
Allergy- medication\disease	55	12.2
Other	30	0.7

Values expressed as numbers (n) and percentage (%)

Ibuprofen was the most common type of NSAIDs used by participants (61.9%). Diclofenac came after ibuprofen (29.4%) then (10.9%) for aspirin high dose. However, (13.6%) of participants were chose other drugs type of NSAIDs that include low dose of aspirin. The types of NSAIDs used by participants are represented in table (3).

Table 3: The type of NSAIDs used by participants (n=449).		
Drug's name	n	%
Aspirin- high dose	49	10.9
Ibuprofen	278	61.9
Diclofenac	132	29.4
Meloxicam	9	2.0
Naproxen	6	1.3
Celecoxib	10	2.2
Mefenamic acid	11	2.4
Other	61	13.6
Values expressed as numbers (n) and percentage (%)		

From responses, the common dosage form used was tablet (74%), Whereas Cream\gel (10%), injection (7%), soluble forms (7%) and suppository (2%). The dosage forms of NSAIDs are shown in figure 1.

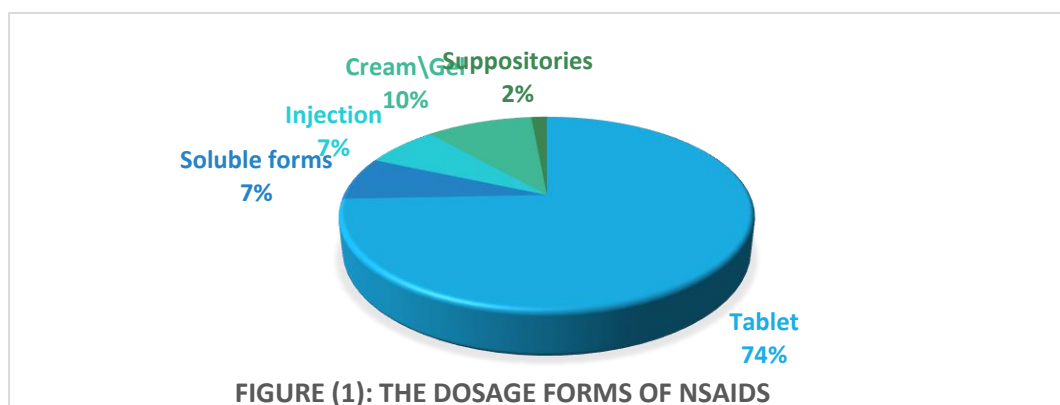
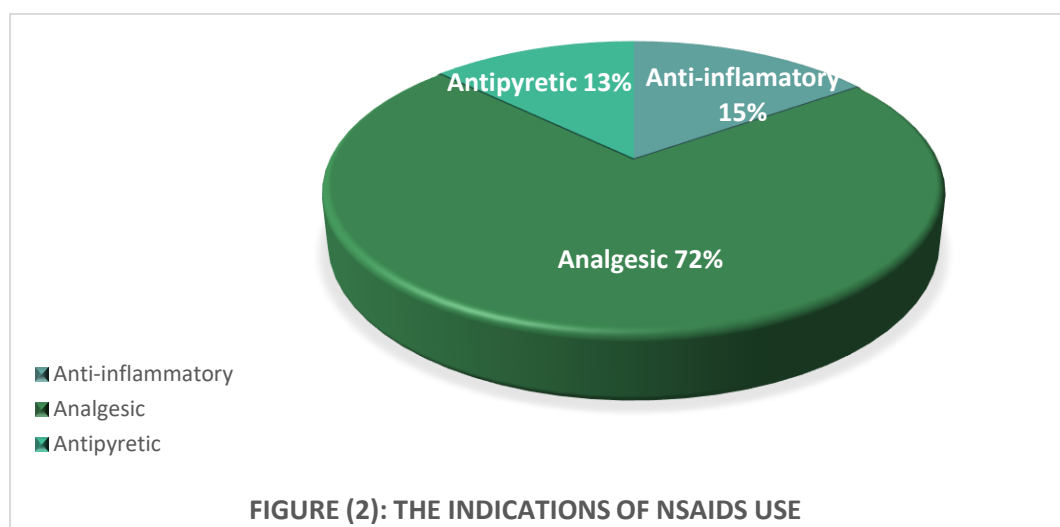


Figure 2 shows the indications for using NSAIDs by participants. Majority of them were taking NSAIDs for the analgesic effects (72%), whereas (15%) for anti-inflammatory effect and (13%) as antipyretic.



Acetaminophen was the first drug choice to relief the pain (86.9%) followed by ibuprofen (20.9%) and diclofenac (8.5%). Table 4 shows the first choice to relief the pain.

Table 4: The first choice to relief pain (n=449).		
Drug name	n	%
Acetaminophen	390	86.9
Aspirin high dose	6	1.3
Ibuprofen	94	20.9
Diclofenac	38	8.5
Meloxicam	2	0.4
Naproxen	2	0.4
Celebrex	2	0.4
Mefenamic acid	1	0.2
Values expressed as numbers (n) and percentage (%)		

More than third of participants (37%) were use NSAIDs after they ask a physician and (20%) by ask the pharmacist. Whereas, (20%) were used NSAIDs by themselves and (10%) after a friend recommendation. The sources of information regarding the use of NSAIDs are shown in Figure 3.

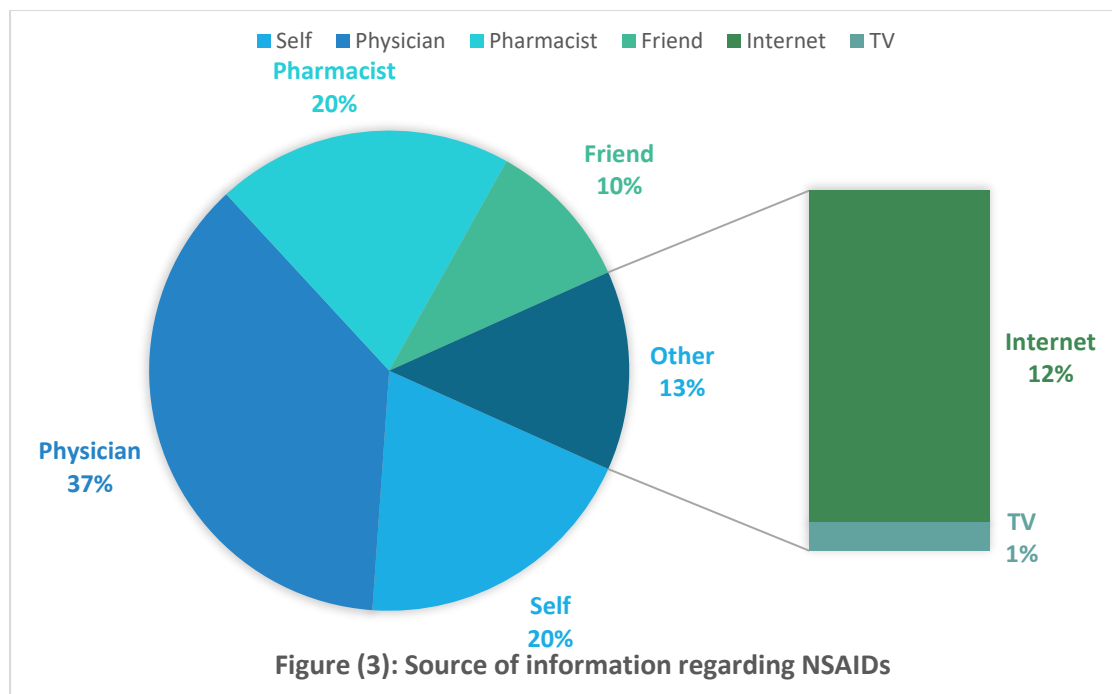


Table 5: The participants responses to questions regarding the use of NSAIDs.

Question	n(yes)	%
Do you know the adverse effects of NSAIDs use?	182	40.5
Did you suffer from any adverse effects from NSAIDs use?	67	14.9
Do you think that NSAIDs are abused?	393	87.5
Do you think that all medicines from the NSAIDs group should be sold without a prescription?	125	27.8

Values expressed as numbers (n) and percentage (%)

There were no significant association between the age and gender with the knowledge and use of NSAIDs except for selling of these drugs without a prescription (p -value < 0.05); these values are shown in Table 6.

Table 6: The association of gender and age with questions regarding the use of NSAIDs (n=449).

Questions:	Gender			Age					P-value
	Female n (%)	Male n (%)	P-value	18-25 n (%)	26-35 n (%)	36-45 n (%)	46-55 n (%)	>55 n (%)	
Do you know the adverse effects of NSAIDs? (Yes)	151 (83.4)	30 (16.6)	0.287	84 (46.1)	51 (28.3)	28 (15.6)	14 (7.8)	4 (2.2)	0.475
Did you suffer from any adverse effects from NSAID use? (Yes)	49 (77.8)	14 (22.2)	0.489	25 (39.7)	22 (34.9)	9 (14.3)	5 (7.9)	2 (3.2)	0.254
Do you think that NSAIDs are abused? (Yes)	319 (81.6)	72 (18.4)	0.352	191 (49.1)	94 (24.2)	67 (17.2)	27 (6.9)	10 (2.6)	0.653
Do you think that all drugs from the NSAID group should be sold without a prescription? (Yes)	88 (70.4)	37 (29.6)	<0.001	46 (36.8)	37 (29.6)	27 (21.6)	10 (8.0)	5 (4.0)	0.01

Values expressed as numbers (n) and percentage (%)
Significant of P-value < 0.05 , <0.005

Table 7 reveals no significant association between the educational status and the knowledge and use of NSAIDs.

Table 7: The association of educational status with questions regarding the use of NSAIDs (n=449).

Questions	Educational status				P-value
	Illiterate n(%)	Primary\ Secondary n(%)	High n(%)	University \above n(%)	
Do you know the adverse effects of NSAIDs? (Yes)	1(0.5)	6(3.3)	47(25.8)	128(70.3)	0.911
Did you suffer from any adverse effects from NSAID use? (Yes)	1(1.6)	3(4.8)	16(25.4)	43(68.3)	0.405
Do you think that NSAIDs are abused? (Yes)	1(0.3)	11(2.8)	94(23.9)	287(73.0)	0.204
Do you think that all drugs from the NSAID group should be sold without a prescription? (Yes)	0(0.0)	2(1.6)	30(24.0)	93(74.4)	0.530

Values expressed as numbers (n) and percentage (%)
Significant of P-value < 0.05, <0.005

There was a significant association of employment status with the question regarding the availability of NSAIDs without prescription. Whereas the other questions revealed no significant associations. These values are shown in Table 8.

Table 8: The association of employment status with questions regarding the use of NSAIDs (n=449)

Questions	Employment status				P-value
	Employed n(%)	Nonemploy ee (%)	Retired n (%)	Student n (%)	
Do you know the adverse effects of NSAIDs? (Yes)	35(19.2)	68(37.4)	5(2.7)	74 (40.7)	0.236
Did you suffer from any adverse effects from NSAID use? (Yes)	16(25.4)	23(36.5)	1(1.6)	23(36.5)	0.460
Do you think that NSAIDs are abused? (Yes)	83(21.1)	130(33.1)	13(3.3)	167(42.5)	0.325
Do you think that all drugs from the NSAID group should be sold without a prescription? (Yes)	40(32.0)	34(27.2)	7(5.6)	44(35.2)	0.001

Values expressed as numbers (n) and percentage (%)
Significant of P-value < 0.05, <0.005

Most of participants (86%) were take NSAIDs alone while (11%) take them with other drugs. Figure 4 displays the drug interaction with NSAIDs.

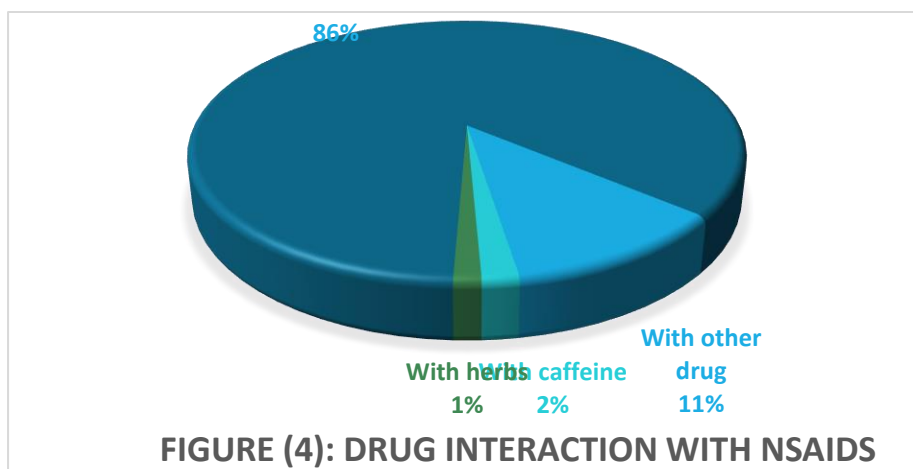


Table shows that there was a significant association between the drug interaction with gender of participants (P-value <0.05).

Discussion

The spread use of NSAIDs over the world and the serious adverse effects associated with their use is the cause of NSAIDs serious problem, (Wisłowska, 2004). Moreover, they are used in almost all population groups [4,6-8].

To the best of our knowledge, this is the first study investigating peoples' awareness regarding NSAIDs in Saudi Arabia despite their widely use. NSAIDs are known to have anti-inflammatory, analgesic and antipyretic effects [9,25-27]. Most of them in this study were reaching for NSAIDs because of their analgesic effects.

The study was limited by the poor population knowledge about the name of the drug class, which considering familiar in other countries as USA. In addition, low male participants comparing to female participants.

In Jordan, about 70% of the overall use was with diclofenac [2], whereas our study revealed that approximately 62% of Saudi population preferred drug is ibuprofen. In addition, oral tablet was the most common used dosage form with low proportions for the injection and

suppositories as they consistent with many studies. [2,21,23]

Participants were preferred acetaminophen as first drug they would seek to relief their pain instead of using NSAIDs.

More than thirty percent of participants took their information about NSAIDs from physicians and twenty percent were from pharmacists. Indicating that they have a great knowledge about the rational use of NSAIDs by comparing to an Indian study which they had high proportions of participants as they did not ask the physician or pharmacist for using NSAIDs, alternatively, they were used them by themselves [21]

Regarding the user's knowledge about NSAID adverse effects only (40.5%) were familiar with their adverse effects, which is similar to finding in other studies, indicating the poor users' knowledge of NSAIDs side effect in general.

Furthermore, the most widely known adverse effects were nausea, vomiting, headache and dizziness, more than thirty percent of the participants were aware about it. Moreover, less than one-third of participants were aware that gastritis, kidney failure and allergy are

associated with NSAIDs use. On the other hand, a very low proportion of participants were conscious of other associated adverse effects with other disease such as hypertension, asthma, osteoporosis, myopathy and cardiac toxicity. In other similar study conducted in Albania, the study population had poor knowledge of specific NSAID [1] and were fully consistent to our findings.

Waswryle- Gwda and his colleagues, 2014, were revealed in their study that about 40% of their study sample, think that NSAIDs to be available without a physician prescription. With regard to our findings, approximately third of participants stated that these drugs should be available without a prescription. Interestingly, there were a significant association between the availability of NSAIDs without a physician prescription with age, gender and employment status (P-value <0.05) while there was no significant association with educational status.

Moreover, in this study the majority of population (87.5%) found that these medications are abused, whereas about 40% of respondents in a study conducted in Poland thought that these medications can be abused, which is very low proportion [23].

Conclusion

The present study was investigating the Saudi population awareness regarding the NSAIDs among Saudi Arabia. The most common NSAIDs were used is ibuprofen. Peoples preferred to use acetaminophen to relief their pain instead of using NSAIDs. The majority of study population believe that NSAIDs are being abused. There is an intense need for public to be educated and consulted about the proper use NSAIDs to reduce their misuse or abuse or even unnecessarily prescribed.

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