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## Knowledge of University Students About Use, Dose and Side Effects of Non-Steroidal Anti-Inflammatory Drugs

Mina D. Mustafa<sup>1</sup>, Mina E. Taha<sup>2</sup>, Maha. A. Hamdi<sup>1</sup>, Kahtan A. Kamel<sup>3</sup>

<sup>1</sup>College of Medicine, Tikrit University, Tikrit, Iraq.

<sup>2</sup>Tikrit University, College of pharmacy, Tikrit, Iraq

<sup>3</sup>Al-Taj Private Hospital, Baghdad , Iraq

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Citation

Corresponding author E mail:  
[Mina.Dawood@tu.edu.iq](mailto:Mina.Dawood@tu.edu.iq)

### ABSTRACT

**Background:** Nonsteroidal anti-inflammatory drugs (NSAIDs) are widely prescribed and used medications that are used as analgesics, antipyretics, or anti-inflammatories, but have a high risk of adverse effects.

**Methods:** A descriptive cross-sectional study was conducted among university students at Tikrit University, Iraq, during November 2021 to March 2022. A self-administered questionnaire by Google Form was used.

**Aim:** to assess the awareness among university students in Tikrit University, Iraq, about Non-Steroidal Anti-Inflammatory Drugs (NSAIDs). The students selected in this study were from different colleges (Medical and non-medical).

**Results:** The results of this work show that 65.3% of the university students had knowledge about NSAIDs, their uses and side effects. 69% of the students confirmed that they use NSAIDs; the majority of them were females. About 21% used NSAIDs continuously, and 47% on need. Regarding the frequency of use, 12.2% were used NSAIDs once daily, 13.2% twice daily and 5.3% three times daily. The knowledge about the appropriate dose is low; only 46% of the respondents knew about the safe dose of NSAIDs, and most of them were from a medical college. Only 40% of respondents think these drugs are safe for use, 35% think they're not safe, and 25% didn't know. The commitment to the dose is 77.2%.

**Conclusion:** The present study revealed a limited individual's knowledge about the NSAIDs usage, dosage and adverse effects among Tikrit University. Students need more education or consultations with the health care team, especially the pharmacists, in order to reduce their misuse or abuse or even unnecessary prescriptions.

## INTRODUCTION

Non-steroidal anti-inflammatory medications (NSAIDs) are a broad family of pharmaceuticals that have anti-inflammatory and analgesic effects by inhibiting prostaglandin G/H synthase (also called cyclo-oxygenase, or COX) through the action of its two known iso-enzymes, COX 1 and COX 2[1,2].

Given that these medications' gastrointestinal side effects are mostly caused by COX-1 inhibition and that their therapeutic effectiveness is heavily mediated by COX-2 inhibition [3]. The 1990s saw the development of NSAIDs that specifically inhibit COX-2 in order to lower the risk of gastrointestinal damage in therapeutic settings [4]. The most commonly given medications for the management of pain and inflammation in a variety of illnesses, such as rheumatoid arthritis and osteoarthritis, are non-steroidal anti-inflammatory medicines, or NSAIDs [4,5].

The more recent medications that have entered the market are COX-2 selective medications; nimesulide, nabumetone, meloxicam, etodolac, celecoxib, and rofecoxib are a few examples [6,7].

Clinicians are beginning to use celecoxib and rofecoxib more frequently because they are thought to be safer, more acceptable, and more effective with maximum therapeutic output [8]. However, a number of problems must be resolved before COX-2 is widely advised in circumstances when traditional NSAIDs are beneficial [9].

The understanding that the negative effects of conventional NSAIDs are caused by suppression of the COX-1 isoform, while the good effects, like analgesia and anti-inflammatory effects, are caused by COX-2. This knowledge has been brought about by the need for novel NSAIDs[10].

An increase in COX-2 production occurs at the sites of inflammation since it is an inducible isoform[11]. On the other hand, a lot of issues have been raised about these medications. There is proof that COX-2 medications are already gaining popularity in various nations despite getting [12].

## AIM OF THE STUDY

The aim of this study is to assess the awareness among university students in Tikrit University, Iraq, about Non-Steroidal Anti-Inflammatory Drugs (NSAIDs). The students selected in this study were from different colleges (Medical and non-medical).

## SUBJECT & METHOD

### STUDY DESIGN

Cross-sectional study.

### SAMPLING TECHNIQUE

The sample of the study was a simple random sampling.

### METHODS

A questionnaire- based cross-sectional analysis. Data were collected from a sample of 300 university students, who answered a questionnaire online by using a survey from 1st of December 2021, to the 1<sup>st</sup> of February 2022.

### DATA ANALYSIS

Done by manual statistical methods. All results had been represented by suitable tables, charts and figures. The descriptive analysis focused on frequencies and percentages.

### ETHICAL AND ADMINISTRATIVE ISSUES

Permission was obtained from the concerned authority.

## RESULTS

Of the 300 university students in the whole sample, roughly 68% were aware of the uses, side effects, and precautions of NSAIDs, while 32% were unaware of these medicines. Out of the 300 total samples, 204 students used NSAIDs; the table indicates that females used NSAIDs at a higher rate than males, with 67.6% of females and 32.4% of males. Age-wise, NSAID use is as follows: (48.5%) for those aged 21 to 24 years; (28.4%) for those aged 25 to 30 years; and (23.1%) for those aged 18 to 20 years. Of the 300 samples taken in total, about 21% took NSAIDs regularly, 47% used them on need, and 32% didn't use them at all. Out of the 300 available samples, 204 students—or 12.2% of the sample—used NSAIDs once daily. 13.2% utilize NSAIDs twice a day. 69.1% of people use NSAIDs for other purposes, 5.3% use them three times a day. Of the 300 samples in total, roughly 54% were unaware of the proper dosage of NSAIDs, and 46% were aware of it.

Out of the 300 samples, approximately 40% believe that using NSAIDs is safe, 25% disagree, and 35% say they are unsure. Out of the 300 entire samples, roughly 77.2 per cent indicated they took safety seriously and were committed to the dosage, while 22.8% said they weren't. Approximately 50.7% of the 300 samples experienced heartburn or peptic ulcers, 22.2% had headaches or dizziness, 18.5% had other symptoms, and 14.2% had no symptoms at all for those who use drugs daily

About 12.7% of them had heartburn or peptic ulcers, 12.2% had headaches or dizziness, 24.8% had various adverse effects, and 39.2% had no symptoms. Of these, 47% used NSAIDs when necessary.

## DISCUSSION

In the current study, 82.3% of medical students were aware of NSAIDs; in a different survey done in Ardabil, Iran, 69.3% of medical students were aware of NSAIDs [13]. In this study, 49.7% of non-medical students reported knowing about NSAIDs. In contrast, 70.5% of non-medical students in a different survey done in Riyadh, Saudi Arabia, reported knowing about NSAIDs [14]. Due to the fact that patient education and counselling are recognised to support the proper use of medications, which may result in effective treatment outcomes and drug adherence. This study found that 18% of users took NSAIDs regularly or daily, while 47% only took them when necessary. In a different survey carried out in Riyadh, Saudi Arabia, only 10% of respondents indicated they took NSAIDs on a daily basis, while 38% stated they only used them when necessary [14].

Another study from Ardabil University in Iran found that 69.6% of participants used NSAIDs frequently or continuously [13]. In one study, around 12.2% of patients used NSAIDs once daily, and 13.2% used them twice daily. In contrast, in another study, 36.5% and 34.5% of patients, respectively, consumed NSAIDs once daily or twice daily [15]. They don't utilise these drugs unless they are prescribed by a doctor or pharmacist because of their excellent healthcare system in their nation.

In this particular study, 46% of samples knew the proper dosage of NSAIDs, whereas only 44% of samples were unaware of it. However, in a different study carried out in Hamburg, Germany, the majority of samples (61%) were aware of the proper dosage [15]. The study revealed that the greatest proportion of participants were unaware of the recommended dosage of NSAIDs. This was attributed to a lack of

educational initiatives about drug use and indifference to the effects of drug use, which resulted in a lack of adherence to recommended guidelines.

About 40% of students in this survey thought that NSAIDs are safe to use, but about 50% of students in another study done at Lubin University in Poland agreed that NSAIDs are safe to consume[16]. These high percentages can be attributed to the fact that most students are unaware of the item's side effects, as well as the fact that these medications are readily available and prescribed over the counter. Regarding safety and risks, the majority of students (77.2%) said they were committed to taking the recommended dose, and (22.8%) said they weren't. While this may not seem like a bad percentage, the percentage of students who weren't committed to taking the recommended dose is actually higher because half of the study participants were from medical colleges, where they were more knowledgeable about NSAIDs than other college students. Thus, education level matters in this regard. However, in other industrialised nations, a higher number of people take safety seriously and adhere to their dosage regimens; this is associated with both a high level of education and a healthy lifestyle. In the current study, approximately 60 % of users had side effects from NSAID use, with gastrointestinal issues such as peptic ulcers and heartburn accounting for 50.7% of these cases. In contrast, 58 % of participants in a different study carried out at Irbid University in Jordan had negative effects from NSAID use, with the majority of them being gastrointestinal issues (peptic ulcers) [17]. This research and the Jordanian study are roughly comparable.

## CONCLUSIONS

1. Medical students are generally well-informed; 82.3% of them are aware of the applications and adverse effects of NSAIDs. In contrast, just 49.7% of students at other non-medical colleges are aware of the benefits and drawbacks of NSAIDs.
2. Women take NSAIDs more frequently than men do; according to this study, almost 68% of women utilised these medications, compared to 32% of men. The age group of 21–24 years old accounts for a large portion of all users (48.5%). About 47% of students reported using NSAIDs just when necessary or when symptoms started to show. In contrast, 18% took NSAIDs on a daily basis.
3. A significant portion of samples (54%) lacked knowledge of the proper dosage of NSAIDs.
4. Dose commitment and drug safety. About one-third (40%) of the samples believe that NSAIDs are safe to take, 25% believe that they are not, and 35% said they didn't really know. About 77% of sample responses indicated that they were taking precautions and were dedicated to the dose, whereas 23% said they were not.
5. Of the total samples, about 21% took NSAIDs on a daily basis, 50.7% experienced peptic ulcers or heartburn, 47% used NSAIDs when necessary, and roughly 50.3% experienced no side effects.

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## TABLES

Table 1. The awareness of medical and non-medical students about NSAIDs

	Know about NSAIDs and their uses and side effects	Not know about NSAIDs and their uses and side effects	Total
Medical	<b>(121)</b> <b>82.3%</b>	<b>(26)</b> <b>17.7%</b>	<b>147</b> <b>49%</b>
Non-Medical	<b>(76)</b> <b>49.7%</b>	<b>(77)</b> <b>50.3%</b>	<b>153</b> <b>51%</b>
Total	<b>(197)</b> <b>65.7%</b>	<b>(103)</b> <b>34.3%</b>	<b>300</b>

Table 2. Number & Percentage of use according to age and gender

Variable	Category	Number of users	Percentage
Gender	<b>Females</b>	<b>138</b>	<b>67.6 %</b>
	<b>Males</b>	<b>66</b>	<b>32.4 %</b>
Age/years	<b>18-20</b>	<b>47</b>	<b>23.1 %</b>
	<b>21-24</b>	<b>99</b>	<b>48.5 %</b>
	<b>25-30</b>	<b>58</b>	<b>28.4 %</b>

Table 3. Frequency of NSAIDs use among university students

Use	Number of users	Percentage
Daily or Continually	<b>63</b>	<b>21 %</b>
On need	<b>141</b>	<b>47 %</b>
Don't use	<b>96</b>	<b>32 %</b>

Table 4. Frequency of NSAIDs dose among university students

Use	Number of users	Percentage
Once daily	<b>25</b>	<b>12.2 %</b>
Twice daily	<b>27</b>	<b>13.2 %</b>
Three times daily	<b>11</b>	<b>5.3 %</b>
Other	<b>141</b>	<b>69.1 %</b>

Table 5. Adverse effects of NSAIDs and their relation to duration of use

Use	Heart burn/ Gastric ulcer	Head ache/ Dizzi ness	Other sympt oms	Don't have sympt oms	To tal
Daily or Contin ually	(32) 50.7 %	(12) 22.2 %	(10) 18.5 %	(9) 14.2 %	(63)
On need	(18) 12.7 %	(17) 12.2 %	(35) 24.8 %	(71) 50.3 %	(141)
Total	(50) 24.5 %	(29) 14.2 %	(45) 22%	(80) 39.2 %	(204)

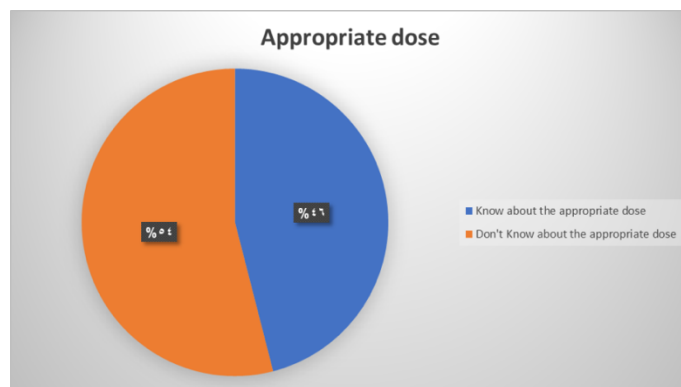


Figure 2. Knowledge of students about the appropriate dose

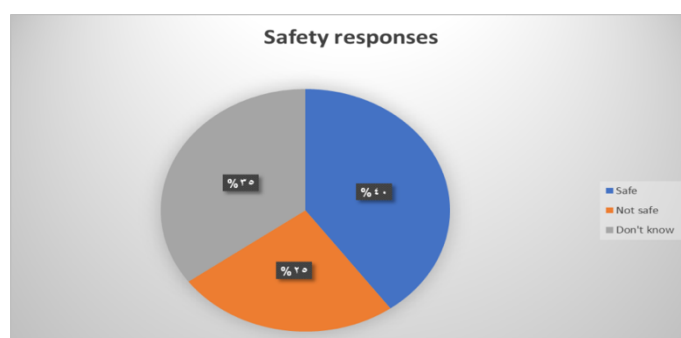


Figure 3. Knowledge of students about risks and safety usage of NSAIDs

FIGURES

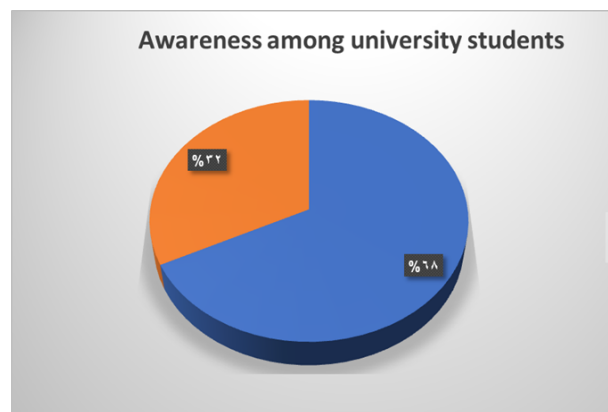


Figure 1. The percentage of awareness in university students about NSAIDs.

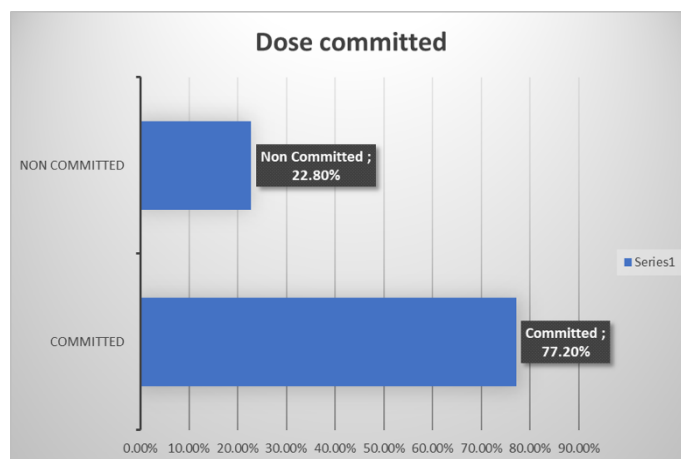


Figure 4. Dose commitment among university students.