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Assessment of medical students' knowledge and consumption of non-steroidal anti-inflammatory drugs (NSAIDs) at Al-Bayan University

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ABSTRACT

Background: Self-medication is one of the irrational drugs used; it is defined as using medicines to treat self-diagnosed diseases without consulting a healthcare professional. Nonsteroidal anti-inflammatory drugs (NSAIDs) are groups of analgesic medications that are used by millions of people around the world with or without prescription. Inappropriate self-medication can have several potential risks, such as harmful interactions with prescribed medicines and inappropriate duration of use. **Aim:** This study aimed to assess the pattern of NSAID consumption among medical students in private University in addition to evaluating their knowledge towards NSAIDs. **Methodology:** The study was conducted cross-sectional among (218) undergraduate medical students in a pharmacy college at a private University. The questionnaire was spread via Google Forms online and the informed consent of the participants were collected. **Results:** Our data showed that aspirin was the most common type of NSAIDs used by male and female students 67 (30.7%); the second medicine for females was ibuprofen 44 (33.3%), while diclofenac was the one preferred by male students 20 (23.3%). Most of the participants based on the results were taking NSAIDs to relieve headache pain 67 (30.7%) for both males and females. In addition, results show that dysmenorrhea was another purpose for using NSAIDs among females and musculoskeletal pain among males, 23 (17.6%) and 47 (26.7%), respectively. About half of the students, 103 (47.2%), used NSAIDs after they asked the pharmacist. Most of the students, 170 (78%), stated that they have an idea about the general adverse effects of these medicines, 141 (64.7%), and 146 (67%) of them believe that NSAIDs are abused. **Conclusion:** The results of the present study demonstrated that the knowledge of medical students regarding the adverse effects of NSAIDs is high. The majority of students believe that NSAIDs may be abused and that they should not be sold without a prescription. The most common NSAIDs used are aspirin then, ibuprofen, and diclofenac; the purpose was to relieve the pain of headaches, dysmenorrhea, and musculoskeletal.

KEYWORDS

NSAIDs, knowledge, consumption, self-medication, medical students

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1. INTRODUCTION

Self-medication (SM) is one of the irrational drug uses, it is defined as using the medicines to treat self-diagnosed diseases without consulting healthcare professional [1]. Nonsteroidal anti-inflammatory drugs (NSAIDs) are groups of analgesic medications that are used by millions of people around the world with or without prescription [2]. They can be obtained without prescription, as they are freely available over the counter drugs (OTC) [3].

These medicines are considered as OTC due to their safety and wide therapeutic index if used in short-term use, if they are consumed for a long period, they can cause adverse effects such as gastrointestinal bleeding, cardiovascular complications, and kidney problems [4]. There are several factors for the prevalence of SM with NSAIDs use including saving money, and minor health problems that do not need a visit to the physician, other reason is the promotion of such medicines that increase their availability [5].

NSAIDs are the most commonly used medications by health care providers because of their high efficacy and wide range of uses as pain killers and low potential abuse [6]. They are also used to reduce inflammation in osteoarthritis and musculoskeletal conditions. They are also prescribed for relieving pain associated with back, headache, toothache, fever, and dysmenorrhea [7].

NSAIDs act through inhibition of cyclooxygenase 1 and 2 (COX1 and COX2) enzymes. Their pharmacological effects are due to inhibition of COX2 isoforms, while side effects appear due to inhibition of COX1 isoform enzyme [8].

Drug interactions occur when they are used with, anticoagulants, and antihypertensive drugs [9] non-aspirin NSAIDs are contraindicated during pregnancy, as they may cause congenital malformation [10].

According to prospective analysis on adverse drug reactions (ADR), NSAIDs were the most common medicines involved, leading to the admission of 6.5% of about 22,000 hospitalized patients due to adverse drug reactions. As individuals age, the long-term use of these medications rises. Approximately 10-40% of the elderly population (over 65 years old) take prescribed or over-the-counter NSAIDs daily. [11].

Several studies in different countries demonstrated the prevalence of utilization OTC drugs among medical and non-medical students such as Iran, Saudi Arabia, Brazil, and Jordan [12,13].

In Baghdad, A study among medical students showed that SM with analgesics (acetaminophen, mefenamic acid, ibuprofen, and diclofenac) is

highly prevalent [14].

The aim of this study was to assess the pattern of NSAIDs consumption among medical students in the private University in addition to evaluating their knowledge towards NSAIDs.

2. METHODOLOGY

This is a questionnaire-based cross-sectional analysis. The study was conducted among undergraduate medical students in pharmacy college in private University. The questions were constructed by drawing from many published studies. The online questionnaire was distributed via Google Forms online platform following the distribution of written informed consent. The questions comprise of the following: Section one covers the socio-demographic information of participants, section two details the most commonly used NSAIDs, section three explains the reasons for taking NSAIDs, section four identifies the sources of information about NSAIDs, and section five assesses participants' knowledge of NSAIDs with Yes or No responses. We utilized the Statistical Package for the Social Sciences (SPSS) to analyze the data.

3. RESULTS

In total, 218 students participate in this study from pharmacy, dentistry, and nursing college in Al-Bayan University. 132 (60.6%) of them were female and 86 (39.4%) were male. Their age was (18-25) years. According to the results of the survey, aspirin was the most common member of NSAIDs used by students (30.7%). Ibuprofen came after aspirin (27.1%) then (21.1%) for mefenamic acid and (15.1%) for diclofenac. The types of NSAIDs used by students are presented in Table (1).

Table 1. The type of NSAIDs used by participants.

Drug's name	Number	Percentage%
Aspirin	67	30.7
Ibuprofen	59	27.1
Diclofenac	33	15.1
Naproxen	10	4.6
Celecoxib	3	1.4
Mefenamic acid	46	21.1

Table 2 summarized the indications for using NSAIDs by students. Large proportion of participants were taking NSAIDs for pain relieving effects. (30.7%) for headache, (21.6%) musculo-

skeletal pain, (17.4%) for toothache (15.1%) of them use NSAIDs as antipyretic, whereas only (10.6%) use NSAIDs for dysmenorrhea.

Table 2. Purpose for using NSAIDs among participants.

Purpose	Number	Percentage%
Headache	67	30.7
Musculoskeletal	47	21.6
Dysmenorrhea	23	10.6
Toothache	38	17.4
Colic pain	5	2.3
Antiplatelets	5	2.3
Fever	33	15.1

About half of students (47.2%) use NSAIDs after they ask the pharmacist, 17 % of them depend on their information from the internet, 7.3% read the leaflets of the medicines before usage, 3.7 % use these medicines as prescribed by the physician and 21.1% of them have other sources of information (Table 3).

Table 3. Sources of information about NSAIDs

Source	Number	Percentage%
Pharmacist	103	47.2
Leaflet of drug	46	7.3
Physician	8	3.7
Internet	37	17
Relatives and friends	8	3.7
Others	46	21.1

Table 4 shows that most of students (78%) stated that they have an idea about the general adverse effects of these medicines and (64.7%) of them have awareness about the risks of NSAIDs during pregnancy, (67%) of them believe that NSAIDs are abused. Only (23.9%) of them think that they should be sold without prescription. After using NSAIDs, (29.8%) of them suffer from side effects.

Regarding the preferred medicine and the most common purpose for using NSAIDs, the findings revealed that the second medicine for

females was ibuprofen 44 (33.3%), while diclofenac was the one preferred by male students 20 (23.3%). The majority of them were taking NSAIDs to relieve headache pain 67 (30.7%) for both males and females. In addition, results show that dysmenorrhea was another purpose for using NSAIDs among females and musculoskeletal pain among males, 23 (17.4%) and 47 (26.7%), respectively (Table 5).

Table 4. The type of NSAIDs preferred among male and female students.

Type of NSAIDs	% of Female	% of Male
Aspirin	31.1	30.2
Celecoxib	0.8	2.3
Diclofenac	9.8	23.3
Ibuprofen	33.3	17.4
Mefenamic acid	22	19.8
Naproxen	30	7

Table 5: The purpose of using NSAIDs among male and female students

Purpose of using NSAIDs	% of Female	% of Male
Anti-platelets	2.3	2.3
Colic pain	2.3	2.3
Dysmenorrhea	17.4	0
Fever	15.2	15.1
Headache	28	34.9
Musculoskeletal pain	18.1	26.7
Toothache	16.7	18.6

4. DISCUSSION

Self-medications with NSAIDs are prevalent among population in developing countries including Iraq, such OTC drugs could be beneficial in preventing and treating non-emergency medical conditions [15].

Regarding the cause of NSAIDs use among our participants, the results show that the most common reason for taking pain killer was headache (30.7%), this result agree with research

output from Iran, Jordan, Nigeria, and Iraq [13-16]. The other reasons for using NSAIDs in descending orders were muscle skeletal, toothache, fever, and dysmenorrhea which is similar to results of one study conducted in Iran [5]. The most frequently used medicine among our participants was aspirin, which aligns with findings from research conducted among medical students in Jordan. [7] and Nigeria [17], Researchers from Germany, Saudi Arabia, and Iraq found that ibuprofen was the most commonly used medicine among their participants, which differs from our data. [11,18,19].

Concerning the source of information about NSAIDs, the majority of our participants stated that they ask pharmacist before using NSAIDs, these results agree with study among medical students in Egypt [20] and Saudi Arabia [21]. Other Routes for getting the knowledge were via the internet, reading the leaflet, and family and friends. They demonstrate a profound understanding of the appropriate usage of NSAIDs. when compared with study among Indian students where high percentage of them use these medicines by themselves without asking pharmacist or physician.

The age of participants in this study was [18 to 25] years, we expect that they have no major diseases, so they use these medicines to relieve headache and musculoskeletal pain. This finding similar to results recorded among population in Poland [22].

Regarding the student's knowledge about NSAIDs adverse effects, most of them (78%) had good knowledge about adverse effects in contrast to other studies revealed poor user's knowledge of NSAIDs side effects [11]. (67%) of our participants feel that NSAIDs can be abused which is agree with study from Saudia Arabia [11], whereas low proportion of respondents thought that these medications can be abused in Poland [22].

A low proportion of our participants thought that these medicines should be available without prescription, these results in contrast with results revealed in Saudia (third of students) and other study (40%) [11,22].

Regarding the preferred medicine and the most common purpose for using NSAIDs, the findings relieved that the second medicine for females was ibuprofen 44 (33.3%), while diclofenac was the one preferred by male students 20 (23.3%). In addition, results show that dysmenorrhea was another purpose after headache for using NSAIDs among females and musculoskeletal pain among males, 23 (17.4%) and 47 (26.7%), respectively. To the best of our knowledge, there were no studies demonstrated the difference between male and female in using the preferred medicine of NSAIDs and the purpose of their using.

Large percentage (64.7%) of students were aware about the risk associated with using NSAIDs during pregnancy comparing with Iran only 9.3% [5].

5. CONCLUSION

The results of the present study demonstrated that the knowledge of medical students regarding the adverse effects of NSAIDs is high. The majority of students believe that NSAIDs may be abused and that they should not be sold without a prescription. The most common NSAIDs used are aspirin then, ibuprofen, and diclofenac; the purpose was to relieve the pain of headaches, dysmenorrhea, and musculoskeletal.

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REFERENCES

1. Sinha R. R., Ahmad I., Agrawal R., Datta B.: Exploring self-medication practices and patterns among medical and nursing students: a cross-sectional study. *Journal of Population Therapeutics and Clinical Pharmacology*. 30(18): 2324-2330 (2023). DOI: [10.53555/jptcp.v30i18.3443](https://doi.org/10.53555/jptcp.v30i18.3443)
2. Roshi D., Toçi E., Burazeri G., Schröder-Bäck P., Malaj L., Brand H.: Users' knowledge about adverse effects of non-steroidal anti-inflammatory drugs in Tirana, Albania. *Mater Sociomed*. 29(2): 138-142 (2017). DOI: [10.5455/msm.2017.29.138-142](https://doi.org/10.5455/msm.2017.29.138-142)
3. Bjamason I., Hayllar J., MacPherson A. J., Russell A. S.: Side effects of nonsteroidal anti-inflammatory drugs on the small and large intestine in humans. *Gastroenterology*. 104(6): 1832-1847 (1993). DOI: [10.1016/0016-5085\(93\)90667-2](https://doi.org/10.1016/0016-5085(93)90667-2)
4. Sostres C., Gargallo C. J., Arroyo, M. T., Lanás A.: Adverse effects of non-steroidal anti-inflammatory drugs (NSAIDs, aspirin and coxibs) on upper gastrointestinal tract. *Best Pract Res Clin Gastroenterol*. 24(2): 121-32 (2010). DOI: [10.1016/j.bpg.2009.11.005](https://doi.org/10.1016/j.bpg.2009.11.005)
5. Amirimoghadam P., Zihayat B., Dabaghzadeh F., Kiani K., Ebrahimi J., Ghazanfari M., Arjmand S.: Evaluation and awareness of over the counter use of non-steroidal anti-inflammatory drugs. *Journal of Applied Pharmaceutical Science*. 7(3): 154-159 (2017). DOI: [10.7324/JAPS.2017.70325](https://doi.org/10.7324/JAPS.2017.70325)
6. Brune K., Patrignani P.: New insights into the use of currently available non-steroidal anti-inflammatory drugs. *J of Pain Res*. 8: 105-118 (2015). DOI: [10.2147/JPR.S75160](https://doi.org/10.2147/JPR.S75160)

7. Al Masoudi W., Al Dweik R., Al-Dweik G.: Knowledge and practices regarding the use of non-steroidal anti-inflammatory drugs among university students in Jordan. *The Open Public Health Journal*. 16(1) (2023). DOI: [10.2174/18749445-v16-230714-2022-181](https://doi.org/10.2174/18749445-v16-230714-2022-181)
8. Al-Taie A., Hussein A. N., Albasry Z.: Prescription pattern of non-steroidal anti-inflammatory drugs (NSAIDs) among community patients with musculoskeletal and comorbid conditions: A cross-sectional study from an Iraqi province. *Tropical Journal of Pharmaceutical Research*. 20(1): 203-210 (2021). DOI: [10.4314/tjpr.v20i1.29](https://doi.org/10.4314/tjpr.v20i1.29)
9. Goldstein J. L., Cryer B.: Gastrointestinal injury associated with NSAID use: a case study and review of risk factors and preventative strategies. *Drug Healthc Patient Saf*. 7: 31-41 (2015). DOI: [10.2147/DHPS.S71976](https://doi.org/10.2147/DHPS.S71976)
10. Zhang X., Donnan P. T., Bell S., Guthrie B.: Non-steroidal anti-inflammatory drug induced acute kidney injury in the community dwelling general population and people with chronic kidney disease: systematic review and meta-analysis. *BMC Nephrol*. 18(1): 256 (2017). DOI: [10.1186/s12882-017-0673-8](https://doi.org/10.1186/s12882-017-0673-8)
11. Abougambou, S. S., Abdoun, S. A., SayerAlharbi, N.: Awareness of Non-Steroidal Anti-Inflammatory Drugs (NSAIDs) use among population in Saudi Arabia. *Open J Pharm Sci Res*. 1: 40-45 (2019). DOI: [10.36811/ojpsr.2019.110003](https://doi.org/10.36811/ojpsr.2019.110003)
12. Sarahroodi S., Maleki-Jamshid A., Sawalha A. F., Mikaili, P., Safaeian L.: Pattern of self-medication with analgesics among Iranian University students in central Iran. *J Family Community Med*. 19(2): 125-129 (2012). DOI: [10.4103/2230-8229.98302](https://doi.org/10.4103/2230-8229.98302)
13. Albusalih F. A., Naqvi A. A., Ahmad R., Ahmad, N.: Prevalence of Self-Medication among Students of Pharmacy and Medicine Colleges of a Public Sector University in Dammam City, Saudi Arabia. *Pharmacy*. 5(3): 51 (2017). DOI: [10.3390/pharmacy5030051](https://doi.org/10.3390/pharmacy5030051)
14. Al-Imam A., Motyka M. A., Mishaal M., Mohammad S., Sameer N., Dheyaa H.: The Prevalence of Self-Medication With Painkillers Among Iraqi Medical Students. *Global Journal of Health Science*, 12(7): 38-47 (2020). DOI: [10.5539/gjhs.v12n7p38](https://doi.org/10.5539/gjhs.v12n7p38)
15. Jasim A. L., Fadhil T. A., Taher S. S.: Self Medication Practice among Iraqi Patients in Baghdad City. *Science and Education Publishing*. 2(1): 18-23 (2014). DOI: [10.12691/ajps-2-1-4](https://doi.org/10.12691/ajps-2-1-4)
16. Alshogran O. Y., Alzoubi K. H., Khabour O. F., Farah S.: Patterns of self-medication among medical and nonmedical University students in Jordan. *Risk Manag Healthc Policy*. 11: 169-176 (2018). DOI: [10.2147/RMHP.S170181](https://doi.org/10.2147/RMHP.S170181)
17. Awodele O., Fadipe A. O., Adekoya M., Adeyemi O. O.: Prescribing Pattern of Non-Steroidal Ant-inflammatory Drugs at the Outpatient Pharmacy Department of Lagos University Teaching Hospital, Nigeria. *Ghana Med J*. 49(1): 25-29 (2015). DOI: [10.4314/gmj.v49i1.5](https://doi.org/10.4314/gmj.v49i1.5)
18. Barrenberg E., Knopf H., Garbe E. Over-the-counter (OTC) drug consumption among adults living in Germany: Results from the German Health Interview and Examination Survey for Adults 2008–2011 (DEGS1). *Pharmacy*. 6(2): 52 (2018). DOI: [10.3390/pharmacy6020052](https://doi.org/10.3390/pharmacy6020052)
19. Jabbar L., Thiab A., Khalaf F., Kadhem A.: NSAIDs pattern of use in Nasiriya City-South of Iraq. *Sys Rev Rev Pharm*. 11(6): 259-261 (2020). DOI: [10.31838/srp.2020.6.41](https://doi.org/10.31838/srp.2020.6.41)
20. Helal R. M., Abou-ElWafa H. S.: Self-Medication in University Students from the City of Mansoura, Egypt. *Journal of Environmental and Public Health*. (1) (2017) DOI: [10.1155/2017/9145193](https://doi.org/10.1155/2017/9145193)
21. Asiri O. A., Alzahrani A. A., Alshehri K. M., Althomali O. W., Alameen A. A. I., Serwah M. A.: Prevalence of non-steroidal anti-inflammatory drugs usage and assessment of knowledge related to its complications among Saudi population; a cross-sectional study. *International Journal of Medicine in Developing Countries*. 4(2): 296-296 (2020). DOI: [10.24911/IJMDC.51-1571228702](https://doi.org/10.24911/IJMDC.51-1571228702)
22. Wawryk-Gawda E., Chylinska-Wrzos P., Lis-Sochocka M., Jodlowska-Jedrych B.: Consumption and awareness of students about nonsteroidal anti-inflammatory drugs. *Current Issues in Pharmacy and Medical Sciences*. 27(3): 175-178 (2014). DOI: [10.1515/cipms-2015-0010](https://doi.org/10.1515/cipms-2015-0010)