

Original Article

Assessing Community Knowledge and Usage Patterns of Non-Steroidal Anti-Inflammatory Drugs (NSAIDs) in Zawia City: A Cross-Sectional Study.

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ABSTRACT:

Background: Non-steroidal anti-inflammatory drugs (NSAIDs) are among the most commonly used medications worldwide, known for their effectiveness in relieving pain and reducing inflammation. This study aims to assess the patterns of NSAID usage and the level of awareness regarding their benefits and potential side effects among the general public of Zawia city. **Material and Methods:** A cross-sectional survey was conducted over a period of three months from June 2024 through August 2024 in Zawia city, Libya, where a self-administered questionnaire was used. Descriptive statistics were used to analyze the data using the statistical package for the social sciences (SPSS V27). **Result:** The study involved 290 participants, mostly female (78.6%) and aged between 20-30 years (47.2%). A majority held a bachelor's degree (61.4%) and were employed (58.6%). The primary reasons for NSAID use were headaches and colds (42.4%), followed by toothaches (35.5%). Most recommendations came from doctors (54.1%) and pharmacists (26.9%). 58.3% of respondents believed NSAIDs were not safe, and 67.6% thought they were overused. 52.8% were unaware of cardiovascular risks, and 59% were uncertain about the safety of NSAIDs during pregnancy. 83.8% believed that not all NSAIDs should be sold without a prescription. **Conclusion:** Despite high usage, most respondents perceive NSAIDs as potentially unsafe and overused, indicating a disconnect between awareness and behaviour.

Keywords: NSAIDs, knowledge, attitude, awareness, side effects, overuse, safety perceptions

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INTRODUCTION

Non-steroidal anti-inflammatory drugs (NSAIDs) are among the most widely used medications globally for the management of pain, fever, and inflammation. These drugs play a crucial role in treating conditions ranging from acute injuries to chronic diseases like arthritis. The frequent use and easy accessibility of NSAIDs have raised concerns about the potential for misuse and overuse. Long-term or inappropriate use can result in adverse outcomes, including gastrointestinal disorders, kidney damage, and cardiovascular events. Additionally, individuals with underlying health conditions, such as hypertension or chronic kidney disease, may be more vulnerable to the side effects of these medications [1]. Awareness of proper dosage and the importance of consulting healthcare providers before initiating NSAID use is essential for minimizing risks [2].

NSAIDs are typically divided into groups based on their chemical structure and selectivity: acetylated salicylates (aspirin), non-acetylated salicylates (diflunisal, salsalate), propionic acids (naproxen, ibuprofen, acetic acids (diclofenac, indomethacin), enolic acids (meloxicam, piroxicam), anthranilic acids (meclofenamate, mefenamic acid), naphthylalanine (nabumetone), and selective COX-2 inhibitors (celecoxib, etoricoxib) [2].

Although NSAIDs are indeed effective for their intended purposes, potential side effects such as major upper gastrointestinal bleeding, acute renal injury, and cardiovascular outcomes such as myocardial infarction (MI) and stroke have also been reported [3].

A previous study showed that the reasons behind the prevalent use of NSAIDs could include the following: the desire to save money, the presence of minor health problems that do not need a visit to the physician, prior experience with NSAID efficacy, and the long waiting time at physician's clinic or hospitals [4]. The majority of university students select NSAIDs for the treatment of headaches [4]. In Jordan, self-medication among public was reported to be high in the Jordanian public (42.5%) [5]. This could be attributed to the higher level of medical and

pharmaceutical knowledge about medications and their uses among the public; thus, it is likely that this knowledge is sufficient to practice self-treatment [5]. In Libya, a study showed that neighbors and family, personal decisions, and the internet were frequent resources for NSAID use among students [6]. Another study reported that friends and family, chemists, and the internet were the three primary resources for NSAID use among undergraduate students in Nepal [7]. One documented predictor of NSAID use is the gender of the students. Some studies have shown that female students take NSAIDs more than male students [8, 9].

This study aims to assess both the patterns of NSAID usage and the level of awareness among users regarding the risks associated with these drugs. With a sample size of 290 participants, the research will provide valuable insights into how individuals in the population interact with NSAIDs and whether they are informed about their safe consumption. The findings of this project will also highlight areas where health education initiatives can be enhanced to improve the public's knowledge and promote more responsible use.

MATERIALS AND METHODS:

From June 2024 to August 2024, a cross-sectional survey study was conducted among community centers, workplaces, and universities using a snowball sampling method. For inclusion in the study, participants were required to be at least 20 years old and residents in Zawia city is a city in northwestern Libya, situated on the Libyan coastline of the Mediterranean Sea about 47 km (29 mi) west of Tripoli, having a population which is 200000).

A validated, self-administered questionnaire was used to collect basic socio-demographic data from the participants, as well as information regarding NSAID usage, patterns of use, and knowledge of their potential side-effects. The self-administered questionnaire was divided into two sections. The initial part of the questionnaire focused on assessing the participants' socio-demographic characteristics, including gender, age, level of education, and

occupation. The second part aimed to explore the participants' knowledge, attitudes, and behaviors regarding the use of NSAIDs through a total of 22 questions; every participant directly received a questionnaire.

To evaluate the responses of the study sample, descriptive statistics were used to analyze the data using the Statistical Package for the Social Sciences (SPSS V27), which includes: frequency tables, bar

charts, chi chi-square test for goodness of fit. To evaluate their responses, the completed questionnaires from each participant were collected. This survey's data are displayed as percentages (%). Descriptive statistics with a percent component were used for statistical investigations. Results for categorical variables were displayed either graphically or as percentage-based values. Incomplete questionnaires were not included in the study.

RESULT

Table 1: Socio-demographic characteristics of the participants

Question	Count	%
Gender		
Female	228	78.6
Male	62	21.4
Total	290	100.0
Age		
20-30	137	47.2
30-40	65	22.4
40-50	49	16.9
50-60	39	13.4
Total	290	100.0
Educational level		
High school	28	9.7
Bachelor's degree	178	61.4
Master's/PhD	17	5.9
Other	67	23.1
Total	290	100.0
Employment status		
Student	78	26.9
Employed	170	58.6
Housewife	31	10.7
Retired	11	3.8
Total	290	100.0

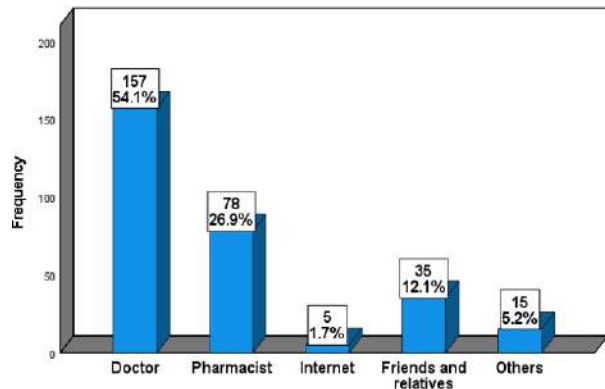
In **table 1** the study examining public awareness and knowledge of Non-Steroidal Anti-Inflammatory

Drugs (NSAIDs) use in Zawia city included a total of 290 participants.

Table 2: For what purpose do you take non-steroidal anti-inflammatory drugs (painkillers)?

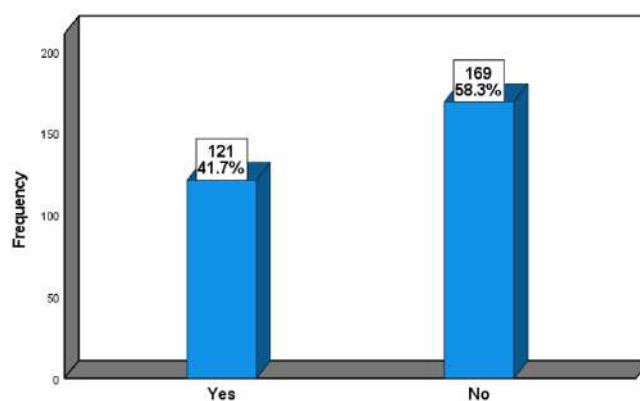
Answer	Count	%	Chi square	P-value
Fever	26	9.0	182.028	< 0.001
Common cold	123	42.4		
Sore throat	52	17.9		
Headache	123	42.4		
Toothache	103	35.5		
Menstrual pain	81	27.9		
Muscle pain	26	9.0		
Arthritis	28	9.7		
Total	290	100.0		

The results presented in **Table 2** examined the purposes for which participants used non-steroidal anti-inflammatory drugs (NSAIDs). A chi-square test revealed significant differences in the reported uses ($\chi^2 = 182.028$, $p < .001$).

**Figure 1:** Who recommended the use of these drugs?

The results represented in **Figure 1** revealed significant differences in the sources of NSAID recommendations ($\chi^2 = 265.310$, $p < .001$).

The results presented in **Figure 2** indicate a significant difference in respondents' beliefs about the safety of non-steroidal anti-inflammatory drugs (NSAIDs).

**Figure 2:** Do you believe that the use of non-steroidal anti-inflammatory drugs (painkillers) is safe

The results presented in **Figure 3** examine whether respondents received explanations about the side effects, drug interactions, adverse effects, and proper use of non-steroidal anti-inflammatory drugs (NSAIDs).

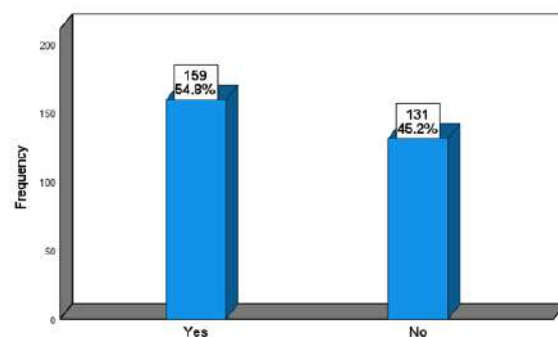


Figure 3 : Has anyone explained to you the side effects of non-steroidal anti-inflammatory drugs (painkillers), drug interactions, adverse effects, and how to use them?

The results presented in **figure 4** detail the types of side effects experienced by respondents who reported adverse reactions to non-prescription non-steroidal anti-inflammatory drugs (NSAIDs).

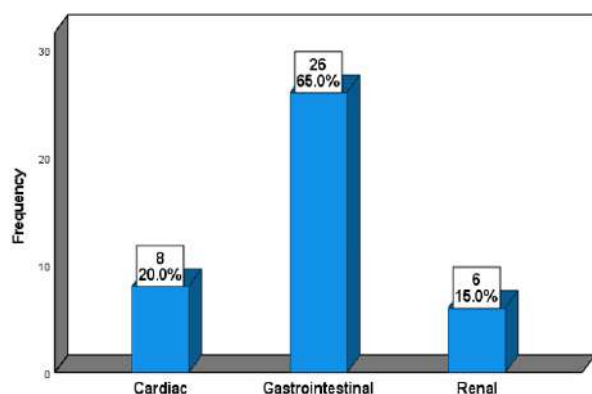
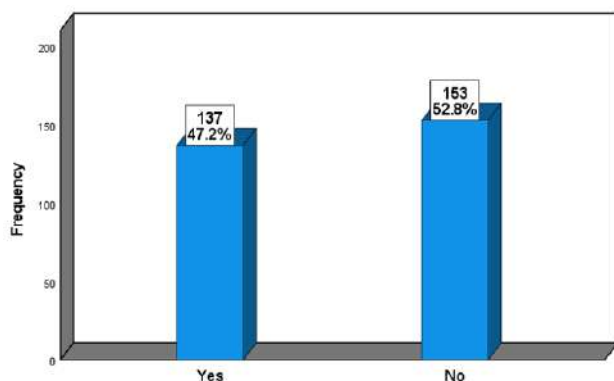


Figure 4: What side effects that experienced as a result of taking non-steroidal anti-inflammatory drugs (painkillers) without a prescription.

The results presented in **Figure 5** examined public awareness of potential cardiovascular risks associated with non-steroidal anti-inflammatory drugs (NSAIDs) in Zawia city.



Figure(5): Did you know that non-steroidal anti-inflammatory drugs (painkillers) can cause high blood pressure and heart disease?

The results presented in **figure 6** showed that 54.1% of respondents were aware that NSAIDs could cause digestive issues, while 45.9% were unaware of this potential side effect.

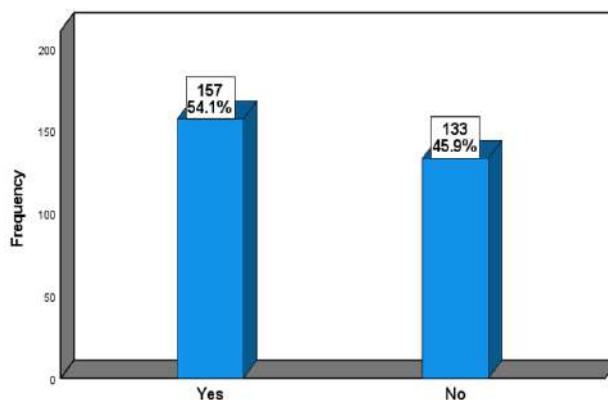


Figure 6: Did you know that non-steroidal anti-inflammatory drugs (painkillers) can cause digestive issues?

The results presented in **Figure 7** revealed a significant disparity in knowledge among participants.

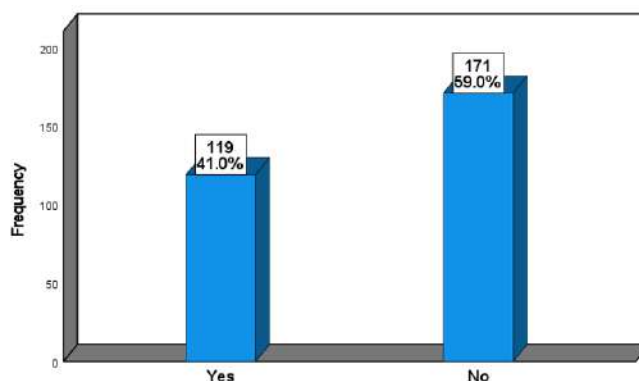


Figure 7 : Do you know whether non-steroidal anti-inflammatory drugs (painkillers) are safe during pregnancy?

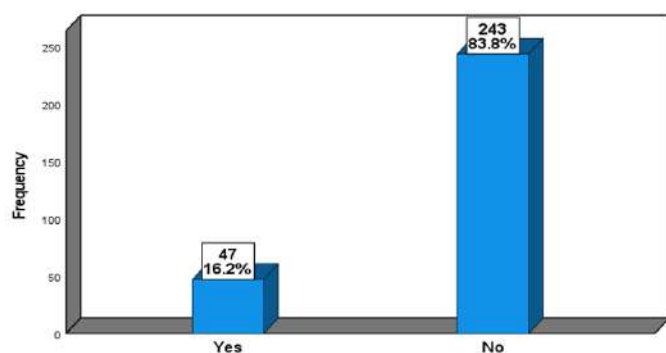


Figure 8: Do you think that all non-steroidal anti-inflammatory drugs (painkillers) should be sold without a prescription?

DISCUSSION

Table 1 shows that the majority of samples were females (78.6%) compared with males 21.4%). However, in a similar study conducted in Kerman city of Iran, it was found that females received NSAIDs more than males by 51.2% and males by 48.8% it could be due to conditions like migraines, menstrual pain, and arthritis that are more common in women. Also, the demographics of participants may also influence this study where female participants more than males [16]. Some studies have shown that female students take NSAIDs more than male students [17, 18].

The distribution of the sample according to age (N = 290) was skewed towards younger participants. The largest age group was 20-30 years old (47.2%), followed by 30-40 years (22.4%), 40-50 years (16.9%), and 50-60 years (13.4%). This age distribution suggests that the study predominantly captured the perspectives of younger adults, with nearly half of the participants being under 30 years old. Also, in previous studies has been reported that the higher use of NSAIDs in younger patients [19].

The educational background of the sample was predominantly composed of individuals with a bachelor's degree (61.4%). The second largest group was classified as "Other" (23.1%), followed by those

with a high school education (9.7%), and lastly, those with advanced degrees (Master's/PhD) (5.9%). This distribution indicates a highly educated sample, with over two-thirds of participants having at least a bachelor's degree. While in a study conducted in kerman, Iran the education level of most of NSAIDs purchasers were more than diploma, and, among all the participants, the doctorate clients had more information about NSAIDs in kerman city of Iran[16].

The most common reasons for NSAID use were headaches and common colds (both 42.4%), followed by toothaches (35.5%), and menstrual pain (27.9%). Less frequent reasons included sore throat (17.9%), arthritis (9.7%), fever and muscle pain (both 9.0%) as represented in table 2. These findings suggest that NSAIDs are used for a variety of conditions, with pain management being a primary motivation. The high frequency of use for common colds is noteworthy, as NSAIDs are not typically recommended as a primary treatment for viral infections. This pattern of use may indicate a need for improved public education on appropriate NSAID indications. And in study conducted in Lublin city, Poland it was found that 48.62% participants in this survey was conducted amongst individuals between the ages of more than 20, not burdened with major diseases. They reach for NSAIDs in order to relieve headache, belly pains, and pain associated with menses. Of note, some respondents state that they take these medicines for longer periods of time, and five individuals stated that they have a psychological dependence upon them [21]. While in study conducted in Jordan the majority of university students select NSAIDs for the treatment of headaches [9].

The results represented in Figure 1 revealed a significant difference in the sources of NSAID recommendations ($\chi^2 = 265.310$, $p < .001$). The majority of respondents (54.1%) reported receiving recommendations from doctors, followed by pharmacists (26.9%). Friends and relatives were cited as the source by 12.1% of participants, while a small percentage relied on the internet (1.7%) or other sources (5.2%) for NSAID recommendations. The highly significant p-value ($p < .001$) indicates that

these differences are extremely unlikely to be due to chance and likely represent genuine variations in the population's sources of NSAID recommendations. These findings highlight the crucial role of healthcare professionals, particularly doctors and pharmacists, in guiding NSAID use, accounting for 81% of recommendations collectively. And while in a study conducted in kerman city of Iran. More than half of all the purchasers received NSAIDs use recommendation either by physicians (36%) or pharmacists (20.7%). And some others participants purchased NSAIDs from the internet (1.5%), and others advised to take them by relatives and friends (30.5%), and (11.3%) purchased from non-significant source of recommendation which is stated by others in the survey [3]. Also In Libya, a study showed that neighbours and family, personal decisions, and the internet were frequent resources for NSAID use among students [20]. Another study reported that friends and family, chemists, and the internet were the three primary resources for NSAID use among undergraduate students in Nepal [21].

A chi-square test of independence of Figure 2 was performed to examine the relationship between the belief in NSAID safety and response frequency. The relationship between these variables was statistically significant, $\chi^2 = 7.945$, $p = .005$. The majority of respondents (58.3%) did not believe that the use of NSAIDs is safe, while 41.7% believed they are safe. This finding suggests that there is a notable concern among the surveyed population regarding the safety of NSAIDs, with a significantly higher proportion expressing doubts about their safety. And a comparison study conducted in Lublin, Poland, about half of the participants stated that they believe NSAIDs are safe to take (46.58%) [19].

The results presented in Figure 3 examine whether respondents received explanations about the side effects, drug interactions, adverse effects, and proper use of non-steroidal anti-inflammatory drugs (NSAIDs). The analysis yielded a non-significant result, $\chi^2 = 2.703$, $p = .100$. Of the respondents, 54.8% reported having received explanations about NSAIDs, while 45.2% indicated they had not received such information. Although a slightly higher proportion of participants reported receiving

explanations, the difference between the two groups was not statistically significant. This finding suggests that there is a relatively even distribution between those who have and have not received information about NSAID use and associated risks. While in study conducted in kerman city in Iran, it was found the most common reason for OTC use of NSAIDs was musculoskeletal pain and also 63.8% of the consumers used NSAIDs as needed and 23.3% of them used usual dose. In addition, 79.2% of the participants were not aware of NSAIDs side effects [16].

Concerning Figure 4 the analysis revealed a highly significant result, $\chi^2 = 18.200$, $p < .001$. Among those who experienced side effects, gastrointestinal issues were the most commonly reported (65.0%), followed by cardiac effects (20.0%), and renal effects (15.0%). The significant chi-square value indicates that the distribution of side effect types was not uniform, with gastrointestinal side effects occurring at a notably higher frequency than the other types. These findings align with the known side effect profile of NSAIDs, where gastrointestinal complications are typically the most common. However in study conducted in Walden University in Minneapolis, Minnesota were found The least endorsed awareness items in the study were personal experience of having side effects (16.9%) of gastrointestinal complications [19].

Results of Figure 5 indicated that 52.8% of respondents were unaware that NSAIDs could cause high blood pressure and heart disease, while 47.2% reported being aware of these risks. A chi-square test was conducted to assess the statistical significance of the difference between these two groups ($\chi^2 = 0.883$, $p = .347$). The non-significant p-value suggests that the observed difference in awareness levels could be due to chance rather than representing a true difference in the population. This finding highlights a potential gap in public health education regarding NSAID risks, with implications for improving medication safety awareness in the community and in similar study in Jordan the finding of awareness among participants that NSAIDs cause high blood pressure and heart disease were (32.9%) and they answered yes and (67.1) of participants answered no and probably they were not aware [22].

About Figure 6 results A chi-square test was performed to evaluate the statistical significance of this difference ($\chi^2 = 1.986$, $p = .159$). The non-significant p-value suggests that the observed difference in awareness levels could be attributed to chance rather than representing a true difference in the population. Despite a slight majority being aware of the digestive risks, the substantial proportion of unaware individuals indicates a need for continued public health education regarding the gastrointestinal effects of NSAIDs. This finding has implications for improving medication safety awareness and promoting informed decision-making among NSAID users in the community. However a similar study also in Jordan most of the respondents were aware of NSAIDs-related gastrointestinal side effects (52.6%) and the percent of participants who do not know about these side effects are (47.4%) [22].

Figure 7 reveals that the majority of respondents (59.0%) indicated they did not know whether NSAIDs were safe during pregnancy, while 41.0% reported having knowledge about this issue. A chi-square test was performed to evaluate the statistical significance of this difference ($\chi^2 = 9.324$, $p = .002$). The significant p-value ($p < .01$) suggests that this disparity in awareness is unlikely to be due to chance and likely represents a genuine difference in the population's knowledge. This finding highlights a critical gap in public understanding of medication safety during pregnancy, specifically concerning NSAIDs. However a similar study conducted in Jordan the participants who were aware of using of NSAIDs are safe (47%) [22].

The results presented in figure 8 revealed a strong majority (83.8%) of respondents believed that not all NSAIDs should be sold without a prescription, while only 16.2% supported unrestricted over-the-counter sales. A chi-square test was performed to evaluate the statistical significance of this difference ($\chi^2 = 132.186$, $p < .001$). The highly significant p-value ($p < .001$) indicates that this disparity in opinion is extremely unlikely to be due to chance and likely represents a genuine difference in the population's

views. This finding suggests a widespread recognition among the public of the potential risks associated with unrestricted access to NSAIDs. The strong preference for some level of prescription control reflects a cautious attitude towards these medications, possibly indicating an awareness of their side effects and potential for misuse. And when have found in a conducted study in Lublin, Poland that the percent of participants who think that it is appropriate that (painkillers) should be sold without a prescription was (42.13%) and the rest of them answered no (57.9%) [19].

CONCLUSION

There is a significant gap in public knowledge regarding NSAIDs safety and side effects, particularly concerning cardiovascular and pregnancy-related risks. Despite high usage, most respondents perceive NSAIDs as potentially unsafe and overused, indicating a disconnect between awareness and behaviour. Healthcare professionals play a crucial role in recommending and educating about NSAIDs, but there's room for improvement in patient education. The public generally supports stricter regulation of NSAIDs sales and opposes their promotion on social media, suggesting a cautious attitude towards these medications. Improved awareness of side effects could significantly impact NSAIDs usage patterns, with most respondents indicating they would use these drugs more cautiously or avoid them if better informed healthcare workers must make additional efforts to educate their patients with regards to both acute problems related to NSAIDs utilization, such as an allergic reaction which may progress to life-threatening anaphylaxis, as well as long-term complications like kidney failure, peptic ulcer disease and elevated blood pressure with cardiovascular risk. The findings of this study may help define priorities in the libyan healthcare system, establish health policies on the national level, and aid in the counselling of patients regarding the appropriate use and possible adverse effects of NSAIDs.

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