



Article

Evaluating the Behaviour of the Libyan Population in Using Prescribed and Non-Prescribed Analgesics

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Abstract: Analgesics are usually used to relieve pain and inflammation analgesics are widely utilized, but do not tell anything about either the factors behind analgesic use or how over-the-counter (OTC) analgesics are being utilized. The research aimed to study the prevalence of frequent use of prescribed and OTC analgesics. It has been also investigated the background factors related to frequent analgesic use and assessed rationality of analgesic usage patterns. Addressed a survey to a random stratified population sample of 758, people aged 1 to more than 60 years. The risk of misuse of NSAID has been studied and explained. People's behavior towards the use of painkillers had varied. These were the most important recommendations, People who aged more than 45 years consulting their healthcare professional. Whereas, the younger participants were relying on the reading of the leaflet by their own selves. It has been found that there is diabetic patient who are taking Sugar coated NSAID such as Ibuprofen. Which may lead to increase in their blood sugar level. There also has been found that asthmatic participants taking NSAID and that may lead to increase the asthmatics attacks. Therefore, caution must be taken when using analgesics because of their potential health harm at all levels and the use must be subject to medical and pharmacist supervision.

Key words: Analgesics, over-the-counter (OTC), NSAID, asthmatics and diabetic.

INTRODUCTION

Analgesics are drugs that are used to control and relieve pain. Acetaminophen, no steroidal, anti-inflammatory medicines, antidepressants, antiepileptic, local anesthetics, and opioids are a few of the drug classes that they contain. The International Association for the Study of Pain (IASP) defines pain as an unpleasant sensory or emotional experience that is associated with or expresses actual or suspected tissue damage. There is a discussion over whether or not to change this

definition. However, according to **Alcock (2017); Cohen *et al.* (2018) and Aydede (2019)** the taxonomy of pain medications is consistent and consists of two categories: no opioid analgesic agents and opioid analgesic agents. Analgesics relieve symptoms but do not address the underlying cause; however, it is obvious that NSAIDs may be advantageous in both ways due to their dual activity.

Some analgesics are accessible over-the-counter (OTC) in many nations without a doctor's prescription. OTCs contain the same risks no matter where they are purchased, despite the fact that they are generally deemed safe when taken as prescribed, occasionally, and in the specified doses. In addition, to the fact that chronic unintended paracetamol overdose is linked to liver failure, the safety of long-term paracetamol use has recently come under scrutiny (**Dale *et al.*, 2005**). In addition, non-steroid anti-inflammatory drugs (NSAIDs) and acetylsalicylic acid (ASA) have the potential of significant drug interactions with other medications, as well as gastrointestinal and cardiovascular risks (**Pain Control, 2013**). As a result, the overall usage of these medications may have an impact on the general health of a population, not the least because of the possibility of inappropriate use as suggested by the concurrent use of prescribed medications and OTC medications that are comparable to them (**Turunen *et al.*, 2005**).

A clinically pertinent concern is the possibility of drug interactions when taking different drugs at the same time. Many people are not aware that taking over-the-counter (OTC) analgesics along with other popular medications like anticoagulants, corticosteroids, or antihypertensive drugs might result in potentially dangerous adverse effects. The increased incidence of upper abdominal gastrointestinal adverse effects in patients taking conventional nonsteroidal anti-inflammatory medications (NSAIDs) is particularly significant. This risk depends on the dosage and is further elevated in people who take several NSAIDs or who combine NSAIDs with specific other drugs. Some NSAIDs may lessen the antiplatelet effects of aspirin and raise blood pressure in people who already have high blood pressure. When prescribing new drugs, clinicians should be cautious of possible drug interactions with OTC analgesics. The effective and safe use of OTC analgesics should also be properly advised to patients (**Mark *et al.*, 2008**).

Ibuprofen, acetaminophen and aspirin, which are available over-the-counter (OTC) analgesics, are among the most frequently taken drugs, with 17 to 23% of people using them weekly. Elderly people who regularly use nonsteroidal anti-inflammatory medications (NSAIDs) or acetaminophen for pain management are most likely to use chronic over-the-counter analgesics (**Kaufman *et al.*, 2002**).

OTC analgesics are widely accessible, and their perceived safety has led to an increase in the prevalence of self-medication. Many patients are not aware of the dangers of long-term, improper use of OTC analgesics, including the risk of toxicity and harmful medication interactions. They might take overdoses of OTC analgesics or combine them in ways that increase the risk of harmful interactions. Additionally, patients might not be aware that over-the-counter analgesics can be found in common cough, cold, and flu drugs. Despite the fact that only a small number of users of OTC analgesics experience negative side effects, the medications' widespread use makes even a slight increase in population risk a clinically important problem (**Fendrick, 2005**).

There are currently 4 OTC oral analgesics available: acetaminophen, aspirin, ibuprofen, and naproxen (**Aches and Pains, 2006**). These over-the-counter analgesics offer mild to moderate pain, inflammation, and fever therapies that are generally safe, efficient, and affordable when used as directed. However, OTC analgesics are among the most often consumed medicines in overdoses due to their accessibility and presumption of safety (**Wazaify *et al.*, 2005**). According to **Graham and Scott (2005)**, prostaglandin (PG) synthesis in the central nervous system is thought to be inhibited by acetaminophen, which then has analgesic effects (**Graham and Scott, 2005**).

Alternative routes, such as peripheral rising of the pain threshold, have been proposed. Aspirin and other NSAIDs block the cyclooxygenase (COX) enzyme, which reduces the production of PGs and related chemicals that are essential for mediating a range of cellular processes as well as the inflammatory response. Even though aspirin is 170-fold more effective at suppressing COX-1 than COX-

2, conventional NSAIDs are nonselective for the two subtypes of the COX enzyme. Aspirin totally inactivates and irreversibly inhibits platelet COX-1, whereas typical NSAIDs' COX-1 inhibition is reversible, blocking the production of thromboxane A₂ (Patrono, 1994; Kaufman *et al.*, 2002; Graham and Scott, 2005).

Selective cyclooxygenase-2 (COX-2) inhibitors have been developed to lessen the risk of stomach irritation and bleeding while maintaining the analgesic and anti-inflammatory benefits of NSAIDs. With the exception of nimesulide, which is not yet accessible, studies on the use of selective COX-2 inhibitors in children have been reported. It is necessary to do more extensive research to assess efficacy, cost-benefit, and risk-benefit problems. Patients with RA take analgesics to lessen the amount of discomfort brought on by inflammatory symptoms. During flare-ups or other times when the disease is active, doctors frequently suggest or prescribe an analgesic to RA patients. This is typically suggested as a temporary pain relief technique. NSAIDs work to reduce inflammation in the affected joints by reducing the generation of pro-inflammatory substances by blocking the COX enzymes (Kim and Beckles, 2004 and Kaufman *et al.*, 2002).

What the side Effects of NSAIDs and Analgesics in RA patients. NSAIDs and analgesics can help preserve your stomach lining and lessen symptoms of pains and nausea if taken with food or soon after eating. There is a small chance of getting stomach ulcers or bleeding when using NSAIDs. An increased risk of heart attacks and strokes is associated with both NSAIDs and analgesics. If a patient smoke, has diabetes, high cholesterol, or high blood pressure, the doctor will be cautious about the sorts of NSAIDs and analgesics they provide. A pre-existing condition could be of concern because NSAIDs have the potential to raise blood pressure. Other possible side effects of NSAIDs include nausea, headaches, dizziness, and swelling in the legs. Compared to non-opioid analgesics, opioid analgesics have more adverse effects. Although it is feasible to combine opioids with other medications, doing so increases the risk of addiction (Silagy *et al.*, 1993; Aches & Pains 2006 and Graham and Scott, 2005).

The research aimed to study the prevalence of frequent use of prescribed and OTC analgesics in different ages, and with the most common chronic diseases such as hypertension, diabetes. As well as, the pregnancy and lactating mothers.

MATERIALS AND METHODS

1- Types of Analgesics and NSAIDs and RA, used in this study

NSAIDs come in more than 20 distinct varieties and can be purchased with or without a prescription. The most popular NSAID classes for treating RA symptoms are listed below:

- Ibuprofen (Advil, Motrin);
- Diclofenac (Voltaren, Cataflam);
- Ketoprofen (Orudis, Oruvail);
- Celecoxib (Celebrex) and
- Naproxen (Aleve).

Analgesics come in a variety of forms, each with a distinct subtype. Opioids and non-opioids are the two subcategories of analgesics. The most typical analgesic types are as follows:

- Aspirin
- Acetaminophen (Tylenol),
- Codeine,
- Tramadol (Ultram),
- Hydrocodone (Hysingla ER, Zohydro ER),

- Oxycodone (OxyContin),
- Meperidine (Demerol) and
- Methadone (Dolophine, Methadose Hydrocodone/acetaminophen combination (Lorcet, Lortab, Norco and Vicodin) (**Wazaify et al.,2005 and Graham and Scott, 2005**))

2- How do Analgesics Work

The majority of people refer to a group of medications together as analgesics as painkillers. Analgesics are used to reduce the perception of pain. Nerve endings deliver particular messages to the brain that generate the physical sensation of pain when a patient feels it. In order to reduce or eliminate pain perception, analgesics disrupt the communication between the brain and the nerve endings.

They do not reduce inflammation, unlike NSAIDs. Additionally, analgesics do not halt or stop the course of disease like DMARDs do. While patients wait for their other medications to start working, analgesics are only useful for temporarily dulling and alleviating pain (**Hoftiezer et al., 1982**).

3- Potential drug interactions to patients in this study

When OTC analgesics are combined with other medications, there are a number of possible drug interactions to be aware of. These interactions are divided into three categories in this study: 1) a higher risk of gastrointestinal (GI) bleeding; 2) a disruption of aspirin's antiplatelet effects: and 3) other possible interactions and problems.

Drug combinations	Effect	Management options/considerations
Aspirin and NSAIDs or multiple NSAIDs	Increased possibility of life-threatening GI issues. Risk rises as dose and agent count are increased.	If at all possible, refrain from using multiple NSAIDs at once. Give gastroprotective substances some thought.
Anticoagulants and NSAIDs	Increased oral warfarin activity and risk of bleeding (particularly GI bleeding)	Avoid taking NSAIDs at the same time; check your prothrombin time and look for hidden blood in your pee and stool.
Corticosteroids and NSAIDs	Increased gastrointestinal adverse effects, including as ulcers and bleeding	Avoid using NSAIDs concurrently, and think about adding a gastroprotective agent.
SSRIs and NSAIDs	Increased risk of GI bleeding	Avoid concurrent use of NSAID
Aspirin and ibuprofen or naproxen	Reduced antiplatelet effects of aspirin	Not seen with other NSAIDs or acetaminophen
Antihypertensive agents and NSAIDs	Use of NSAIDs may increase blood pressure	Monitor blood pressure and cardiac function
Antidiabetic agents (eg, sulfonylureas) and aspirin	Increased hypoglycemic effect	Avoid concurrent use and monitor blood glucose concentration
Lithium and NSAIDs	Increased steady-state lithium concentration and lithium toxicity	Monitor lithium concentrations. Interactions are less likely with aspirin than with naproxen or ibuprofen
Methotrexate and NSAIDs	Reduced renal clearance. Increased plasma methotrexate concentration	

4- Opinion polls for the population under study.

Survey was conducted as per the following questions

1. Age

- A. 1 to less than 8 years old;
- B. 8 to less than 18 years old;
- C. 18 to less than 25 years old;
- D. 25 to less than 45;
- E. 45 to 60 old and
- F. More than 60 years old.

2. Gender

- A. Male;
- B. Female;
- C. Pregnant and
- D. Lactating mother.

3. Do you read the instruction leaflet of the used analgesic?

- A. Yes
- B. No

4. What kind of pain you suffer to take the analgesic?

.....

5. Do you consult your pharmacist or doctor before you take the analgesic?

- A. Yes
- B. No

6. Do you use more than one analgesics to relieve pain?

- A. Yes
- B. No
- C. Maybe

7. What are the using rates of analgesic per month?

- A. 1 to 2 times per month
- B. 3 to 4 times per month
- C. 5 to 10 times per month
- D. More 10 times per month

8. Do you suffer from any chronic diseases?

- A. Hypertension

- B. Diabetes
- C. Asthma
- D. Rheumatoid
- E. Other
- F. There is no chronic disease

9. What are the analgesic drugs do usually taken?
.....

10. Is there any side effects or complications related to using of analgesics?

- A. Yes
- B. No
- C. Maybe

This is a questionnaire of cross sectional study conducted in RasAtoba Hospital in Misurata city and by sharing Google form link in social media. Sample size was 758 responses, statistics and graphs were performed by graph pad prism.

RESULTS

The results obtained indicate the following

1- 758 responses, 56% of people from 18-25 years old and 33.2% from 25-45 data collected from February to July 2019.

Age

758 responses

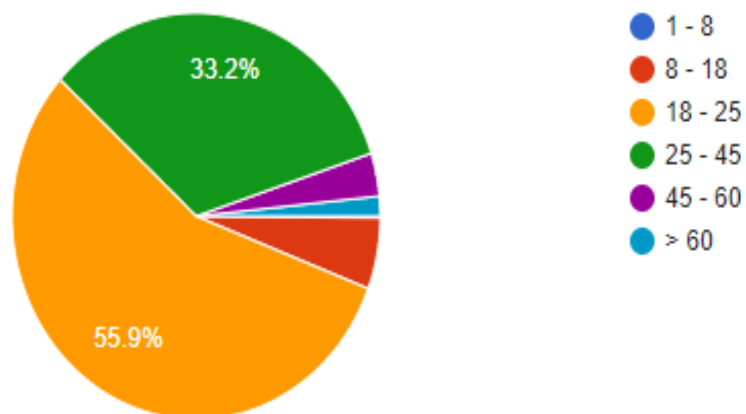


Fig. (1). It shows that there was zero response from 1 to less than 8 years old for using analgesics while there were 5.7% responses from 8 to less than 18 years old. Whereas, there were 55.9% responses for 18 to less than 25 years old. And 33.2% respondents for people aged from 25 to less than 45 years old. As well as 3.4% responses for people aged 45 to 60 years old. Moreover, 1.6% responses for people more than 60 years old.

2- When people was asked ‘Do you read the instruction leaflet of the used analgesic?’ Their responses were as the following pie chart

758 responses

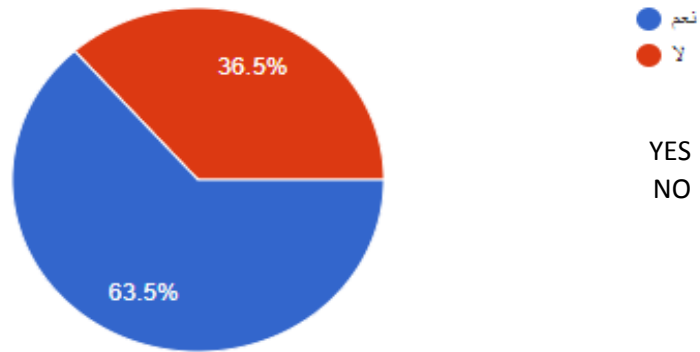


Fig. (2). It has been found that people who reads the instruction leaflet was 63.5%. Whereas, 36.5% was not.

3- When people was asked ‘What are the using rate of analgesic per month?’ The responses were as the following pie chart.

758 responses

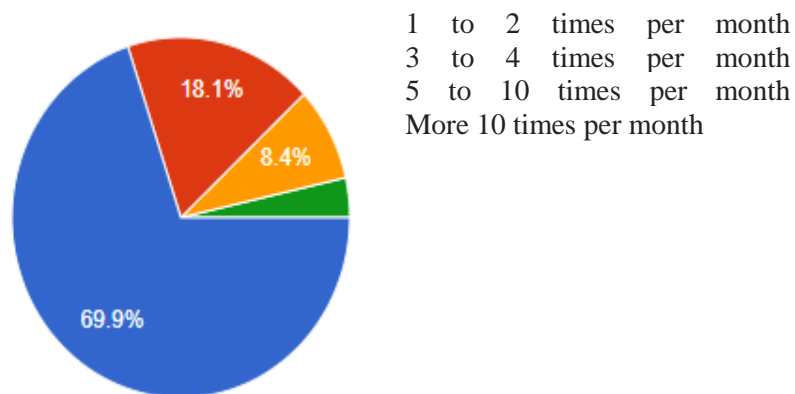


Fig. (3). The using rate of analgesics per month was 69.9% for individuals who are using analgesics for 1 to 2 times per month. While 18.1% for people who are using the analgesia drugs for 3 to 4 times per month.

There also 8.4% of using analgesics 5 to 10 times per month. And lastly, there was 3.6% for people who are using analgesics more than 10 times per month.

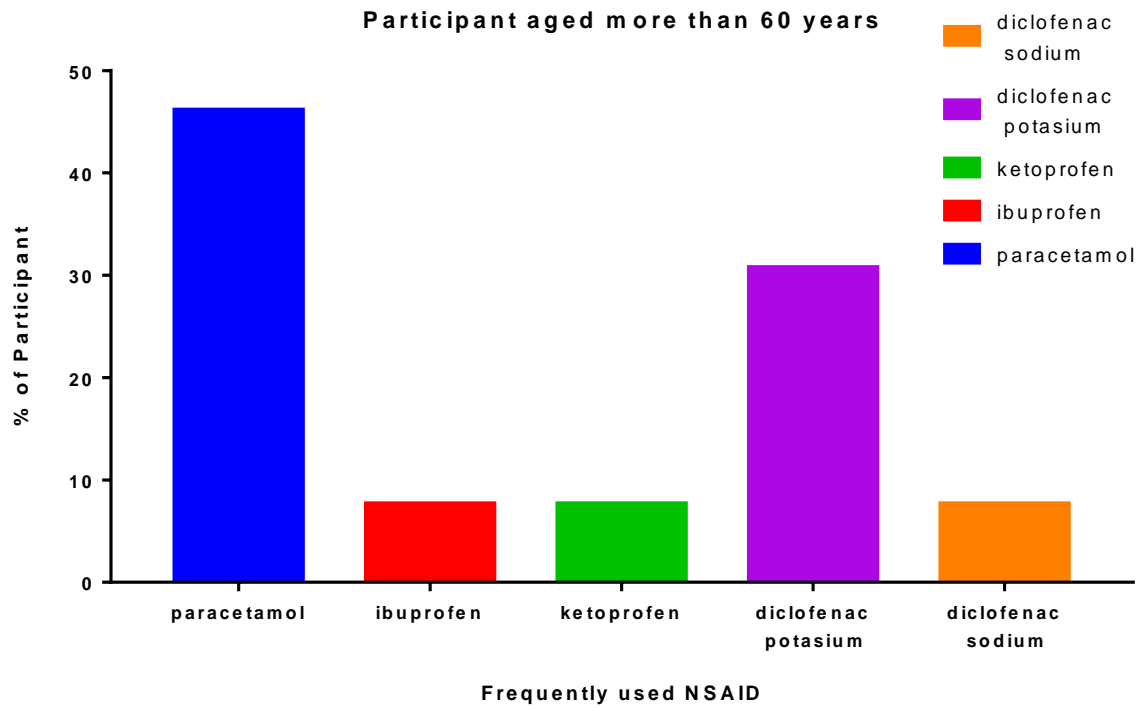


Fig. (4). This figure shows participants aged more than 60 years against frequently used non-steroidal anti-inflammatory drugs.

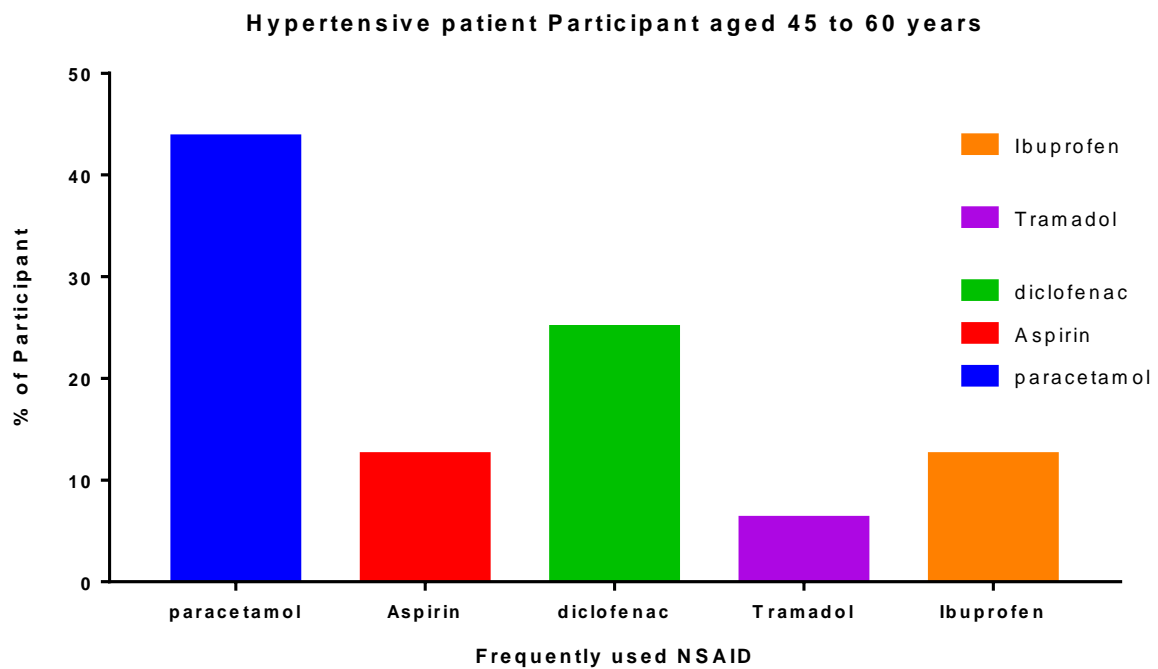


Fig. (5). This figure shows hypertensive patient participant aged 45 to 60 years against frequently used of non-steroidal anti-inflammatory drugs.

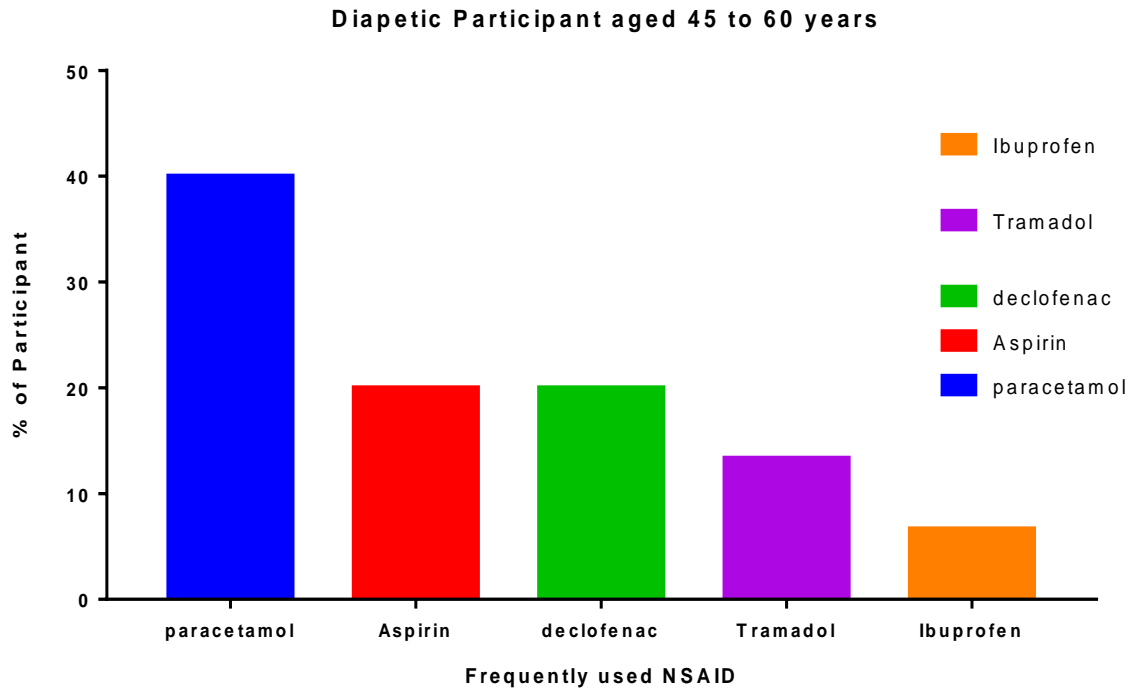


Fig. (6). This chart demonstrates diabetic patient participant aged 45 to 60 years, against frequently used of non-steroidal anti-inflammatory drugs.

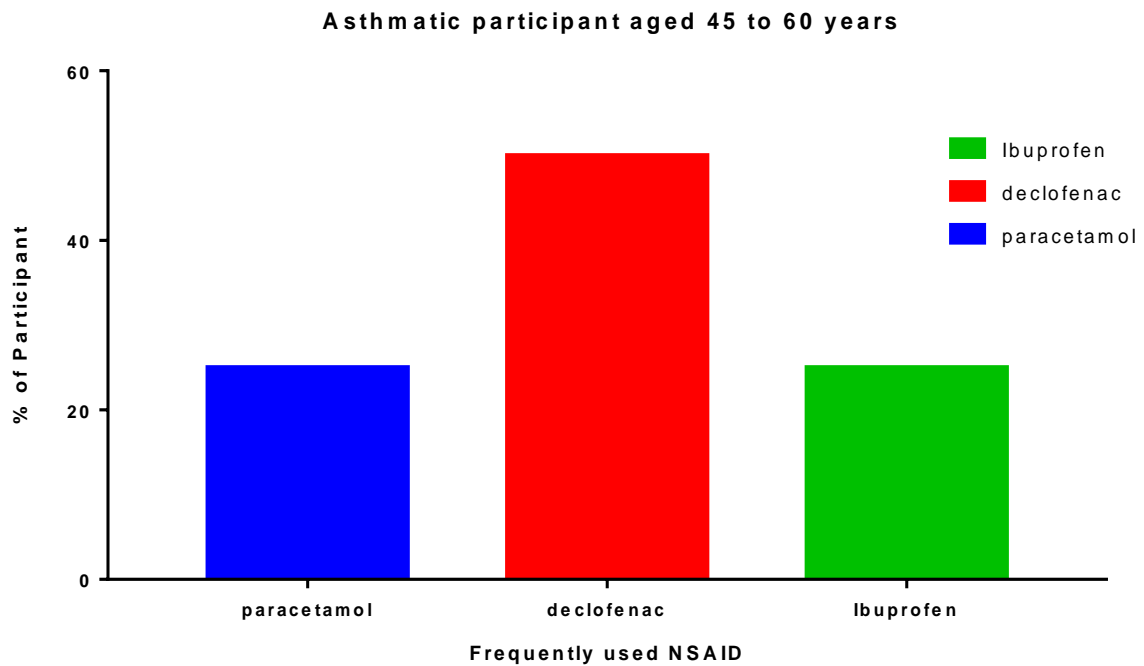


Fig. (7). This figure exhibits asthmatic patient participant aged 45 to 60 years, against frequently used of non-steroidal anti-inflammatory drugs.

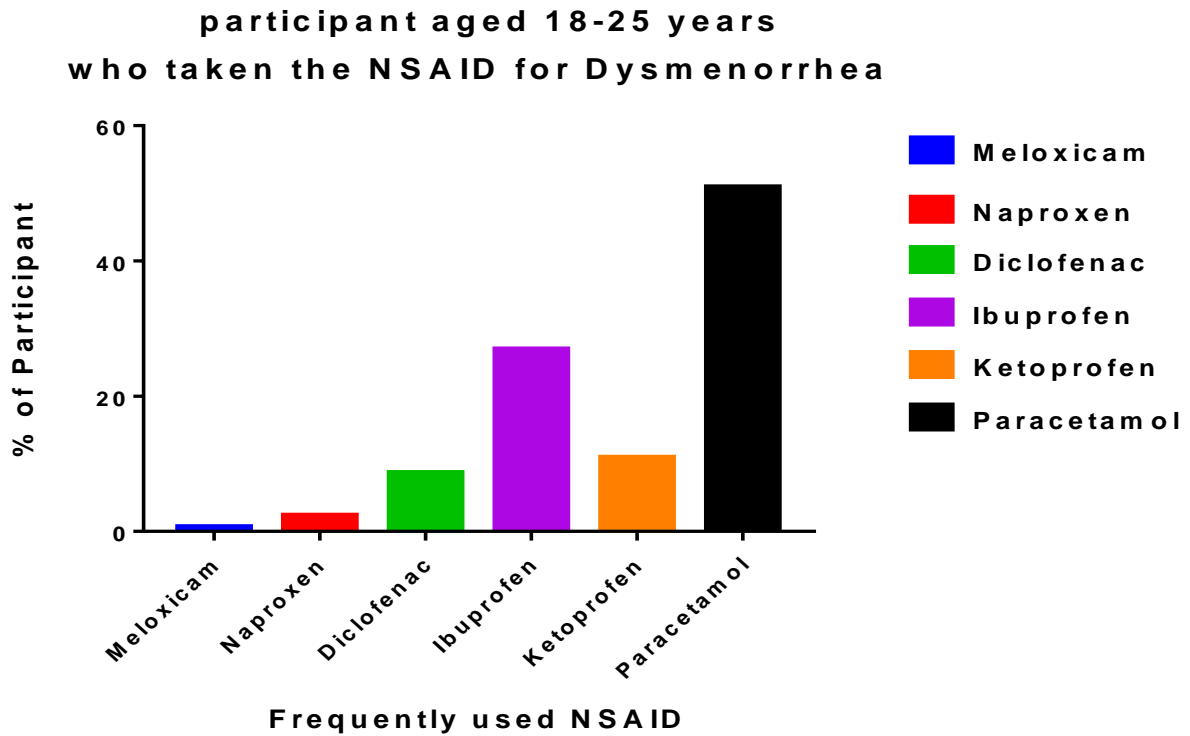


Fig. (8). This chart illustrates cases of dysmenorrhea aged 18-25 years against frequently Non-Steroidal anti-inflammatory drugs has been used.

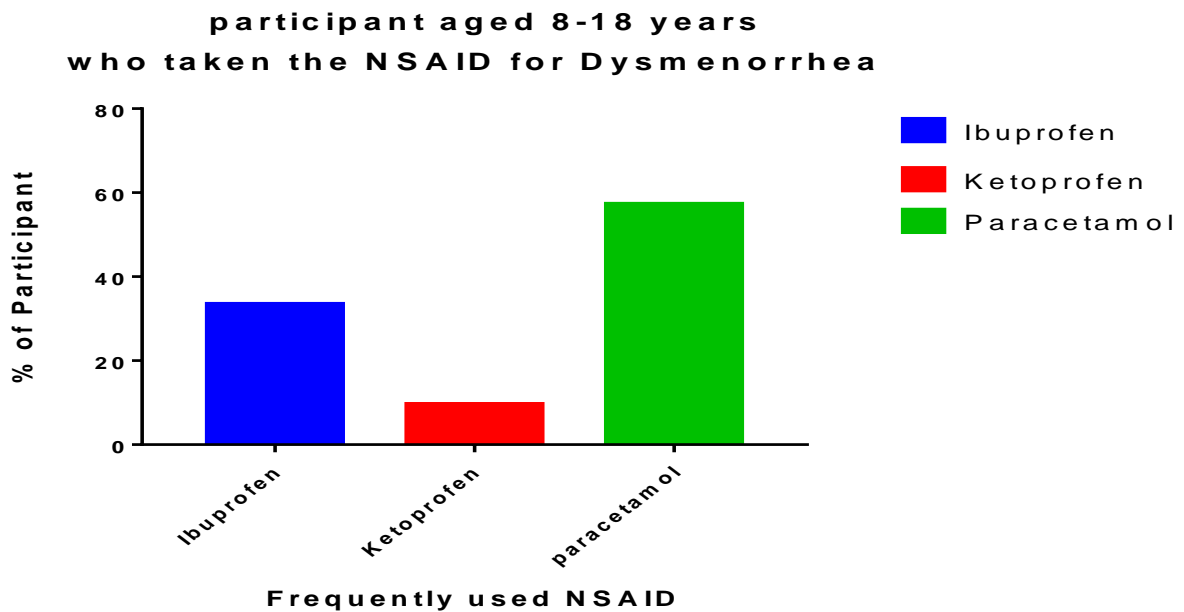


Fig. (9). This figure reveals dysmenorrhea case aged 8-18 years who taken non-steroidal anti-inflammatory drugs.

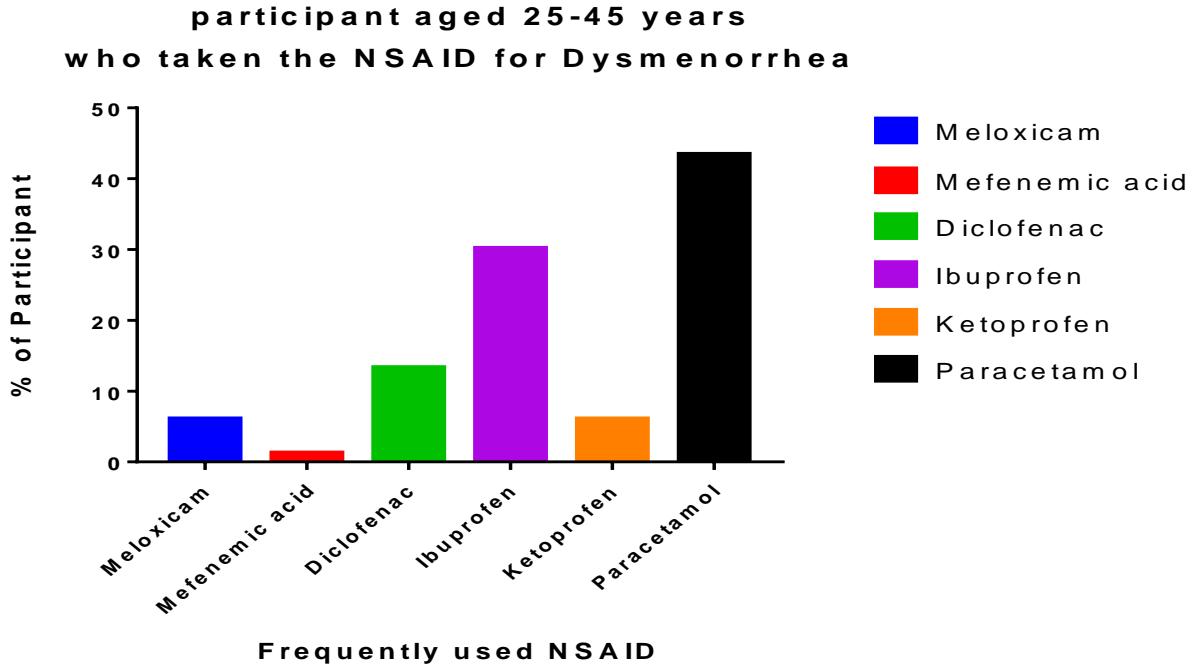


Fig. (10). this figure reveals dysmenorrhea case aged 25-45 years who taken non-steroidal anti-inflammatory drugs.

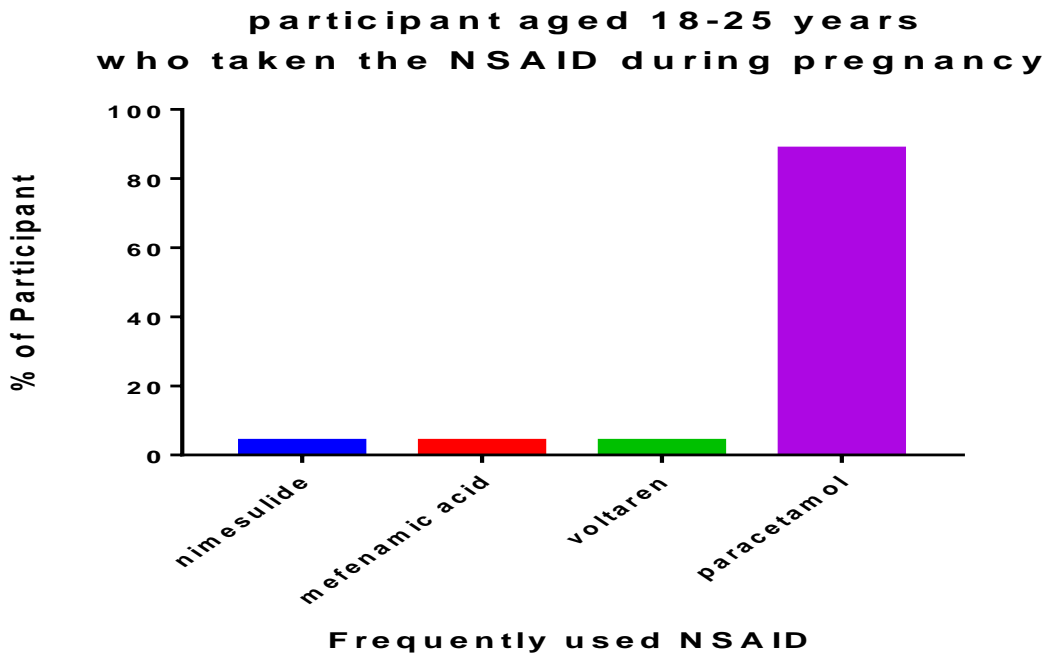


Fig. (11). This chart shows cases of pregnant women of participant aged 18-25, against frequently used of non-steroidal anti-inflammatory drugs.

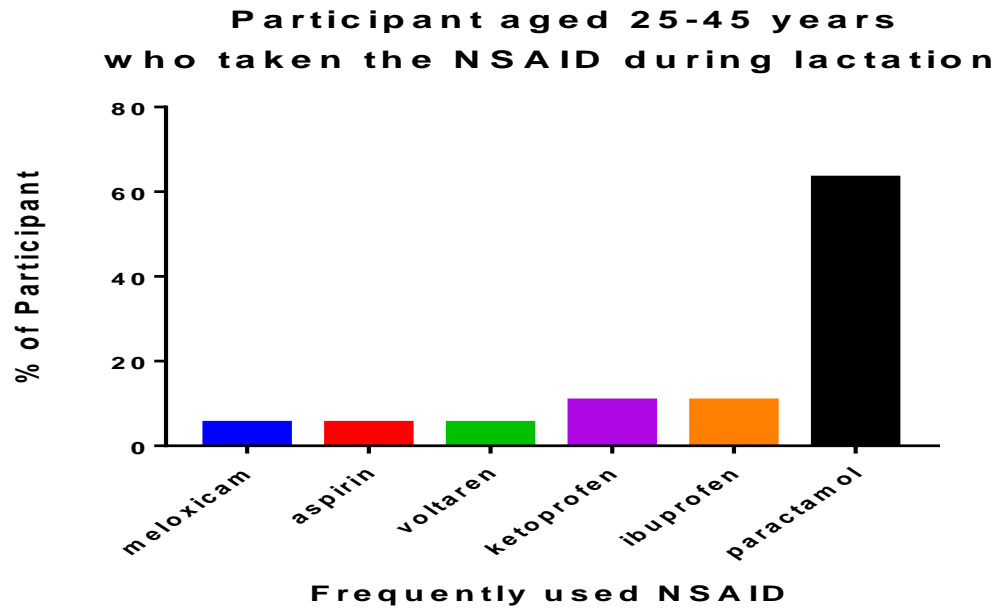


Fig. (12). this chart participant aged 25-45 years who taken the non-steroidal anti-inflammatory drugs during lactation.

Discussion

In this study, the most respondents were aged between 18 to less than 25 years old were 55.9% responses, then people aged from 25 to less than 45 years old were 33.6% as it shown in figure 1.1. This is due to that younger people has more access to the internet and has more interest to the social media. However, to overcome this limitation, the questioner has also conducted in RasAltoba hospital in Misurata for elderly people who suffer from chronic diseases. Although, the responses from the internet were way more than the responses which collected from the hospital.

Regarding the instruction leaflet reading before using of analgesics, people who are not reading were 36.5% which is quit high percentage. All individuals who are aged more than 60 do not read the instruction leaflets. Yet, they often consult their doctor or pharmacist before taking the analgesics. Where younger people do not consult their doctor or pharmacists which give 34.6% from respondents.

There was 46% of people aged over 60 years who are using Paracetamol and 32% using of Diclofenac potassium. This means that most of people in this category of age are taken their analgesics carefully and under supervision of health care professionals. However, there are 8% and 7% and 8% who are taking Ibuprofen, Ketoprofen and Diclofenac sodium, respectively. This can cause increase in blood sugar level for diabetics because of sugar coated Ibuprofen which are available in the pharmacies. Furthermore, all of the last three drugs can worsen the peptic ulcer or asthmatic patients as it has been seen in the responses sheet.

The people who are aged between 45 to 60 years old are less prone to the side effects of the analgesics. Because they have way less chronic diseases, even though, participants who have diabetes should not take sugar coated tablets, as it has been found in figure 1.4.

Furthermore, asthmatic patients should not take NSAID, this is due to its inhibition effect on COX enzyme which leads to LOX pathway, the disorder is thought to be caused by an anomaly in the arachidonic acid metabolizing cascade that leads to increased production of pro-inflammatory cysteinyl leukotriene (6). In this study there were many asthmatic participants who are taken diclofenac and

Ibuprofen approximately 50% and 25 % respectively. Thus, they will be susceptible to asthmatic attack. Therefore, awareness rise for asthmatic patients for the risk of NSAID use are highly recommended.

Regarding dysmenorrhoeal pain, the most used Pain killer is paracetamol that was 55%, 50% and 45 % for participants who are aged 8 to less than 18, 18 to less than 25 and 25 to less 45 years old respectively. However, Diclofenac, Ibuprofen, Ketoprofen, Meclofenamate, Mefenamic acid, and Naproxen are the NSAID specifically approved by the US by FDA. Here in, they are not following the FDA protocol. Therefore, the following of FDA protocol is advised to get the maximum pharmacological effect.

Taking higher doses of aspirin during the third trimester increase the risk of the premature closure of a vessel in the foetus's heart. If the use of Aspirin is need during the third trimester of pregnancy, the healthcare provider will likely closely monitor the statues of the foetus. Inhibition of prostaglandin synthesis constricts the duct arteriosus in foetus. Therefore, the Aspirin and indomethacin can be used for these statues. It has been found that 85% of pregnant are using paracetamol as analgesic. While Diclofenac, Mefenamic acid and Nimesulide usage is 5% each.

The Lactating mother was less careful in taking the NSAID analgesics. Since the use of paracetamol was 65%, while the use of ketoprofen and Ibuprofen were 10% each. Whereas, the use of Aspirin and Meloxicam and Diclofenac was 7% percent each. Risk of Reye's syndrome is associated with aspirin admiration with infant with viral infection but the risk of Reye's syndrome is unknown however it should be avoided. As example, hepatic glucoronidation activity in children aged 13-24 months was found to be lower than in adult for Ibuprofen 24 folds. There the dose of NSAID should be adjusted.

Summary and Conclusion

In this study, it was concluded that People who are aged more than 45 years were consulting their healthcare professional. Whereas, the younger participants were relying on the reading of the leaflet by their own selves. It has been found that there is diabetic patient who are taking Sugar coated NSAID such as Ibuprofen. Which may lead to increase in their blood sugar level. Furthermore, there were some hypertension patient who were used sodium salt of drugs such as diclofenac sodium which may leads to increase of their blood pressure. Therefore, they should be given a substitution that does not have sodium. There also has been found that asthmatic participants taking NSAID and that may lead to increase the asthmatics attacks. Thus, it should be given with caution. Peptic ulcer is another common problem associated with NSAID usage.

REFERENCES

- Aches, N. and Pains, F. (2006).** Physicians' Desk Reference for Nonprescription Drugs, Dietary Supplements, and Herbs. Montvale, NJ, Thomson PDR, 194-216.
- Alcock, M.M. (2017).** Defining pain: past, present, and future. *Pain.* Apr;158(4):761-762. [[PubMed](#)]
- Aydede, M. (2019).** Does the IASP definition of pain need updating? *Pain Rep.* Sep-Oct;4(5): e777. [[PMC free article](#)] [[PubMed](#)]
- Awtry, E.H. and Loscalzo, J. (2000).** Aspirin. *Circulation.* 2000, 101: 1206-1218.
- Cohen, M.; Quintner, J. and van Rysewyk, S. (2018).** Reconsidering the International Association for the Study of Pain definition of pain. *Pain Rep.* 2018 Mar;3(2): e634. [[PMC free article](#)] [[PubMed](#)]
- Dale, O.; Borchgrevink, P. C.; Fredheim, O. M. S.; Mahic, M.; Romundstad, P. and andSkurtveit, S. (2005).** Prevalence of use of non-prescription analgesics in the Norwegian HUNT3 population: Impact of gender, age, exercise and prescription of opioids. *BMC Public Health,* 15(1), 1-9.
- Graham, G.G. and Scott, K.F. (2005).** Mechanism of action of paracetamol. *Am. J. Ther.,* 12: 46-55.
- Hoftiezer, J.W.; O'Laughlin, J.C. and Ivey, K.J. (1982).** Effects of 24 hours of ASA, Bufferin,

paracetamol and placebo on normal human gastroduodenal mucosa. *Gut*, 23:692-697.

Kaufman, D.W.; Kelly, J.P.; Rosenberg, L.; Anderson, T.E. and Mitchell, A.A. (2002). Recent patterns of medication use in the ambulatory adult population of the United States: The Slone survey. *JAMA*, 287(3): 337-344.

Kim, C. and Beckles, G.L. (2004). Cardiovascular disease risk reduction in the behavioural risk factor surveillance system. *Am. J. Prev. Med.*, 27: 1-7.

Mark, A. F.; Deborah, E. P. and Grace, E. J. (2008). OTC analgesics and drug interactions: clinical implications. *J. Osteopath Med. Prim. Care*, 2 (2): 1-7.

Pain Control (2013). Using Nonprescription Analgesics [http://www. Pharmacytimes com. publications/otc/2013/otcguide-2013/Pain-Control-Using-Nonprescription-Analgesics](http://www.Pharmacytimes.com/publications/otc/2013/otcguide-2013/Pain-Control-Using-Nonprescription-Analgesics)

Patrono, C.T. (1994). Aspirin as an antiplatelet drug. *N Engl J Med.*, 330: 1287-1294.

Silagy, C.A.; McNeil, J.J.; Donnan, G.A.; Tonkin, A.M.; Worsam, B. and Champion, K. (1993). Adverse effect of low-dose aspirin in a healthy elderly population. *CliniPharinacolTlier*; 54:84-9.

Turunen, J. H.; Mäntyselkä, P. T.; Kumpusalo, E. A. and Ahonen, R. S. (2005). Frequent analgesic use at population level: prevalence and patterns of use. *Pain*, 115(3): 374-381.

Fendrick, A.M. (2005). Assessing the gastrointestinal complications of over-the-counter analgesics. *Family Practice Recertification*, 27: 9-15.

Wazaify, M.; Kennedy, S.; Hughes, C.M. and McElnay, J.C. (2005). Prevalence of over-the-counter drug-related overdoses at Accident and Emergency departments in Northern Ireland: retrospective evaluation. *J. Clin. Pharm. Ther.*, 30: 39-44.