Original Article

Knowledge and Awareness Level about the Association between Non-Steroidal Anti-inflammatory Drugs Intake and Having Peptic Ulcers

Faisal Holil Alanazi[1], Mohammed Jawad Alobaid[2], Futoon Faisal Afandy[3], Lina Khalid Alhomaiani[4], Aljohara Bander Alruwaitea[5], Ghadah Yousef Aljohani[6], Meshari Ali Almeshari[7], Mohammed Alshabanat[8], Moayed Mashari Alrakathi[9], Khames Alzahrani[10*]

[1]Majmaah University, Majmaah, Saudi Arabia. [2]College of Medicine, King Faisal University, Al Ahsa, Saudi Arabia. [3]Batterjee Medical College for Health Sciences and Technology, Jeddah, Saudi Arabia. [4]Ibn Sina Medical College, Jeddah, Saudi Arabia. [5]Imam Mohammed bin Saud Islamic University, Riyadh, Saudi Arabia. [6]Al-Rayan Colleges, Madinah, Saudi Arabia. [7]College of Medicine, King Faisal University, Al Ahsa, Saudi Arabia. [8]General Practitioner, Ministry of National Guard Health Affairs, Riyadh, Saudi Arabia. [9]Qassim University, Qassim Region, Saudi Arabia. [10]King Faisal Specialist Hospital & Research Centre, Riyadh, Saudi Arabia.

Abstract

NSAIDs, classified as non-opioid analgesics, are commonly prescribed medications known for their anti-inflammatory, antipyretic, and pain-relieving properties. They are primarily used to alleviate fever and headaches. Studies have proven that the chronic and excessive use of NSAIDs is an important reason for gastrointestinal (GI) morbidity and mortality. To assess the level of knowledge and awareness of NSAID side effects and their association with peptic ulcers in the general population in Saudi Arabia. This is a cross-sectional study. The required sample size is 385 participants from different regions in Saudi Arabia. The study was conducted using a self-administered questionnaire that was distributed among different social media platforms. The study included 230 participants, half of them males and half females. Most respondents, comprising 64.8%, fall within the 20-30 age bracket, followed by 14.3% in the 31-40 age group. A significant portion (37.0%) of the respondents have used NSAIDs before, with the majority reporting prior usage. 13.5% of the population surveyed have been diagnosed with PUD. Only 4.3% of participants had good knowledge scores of NSAIDs, 49.6% had poor knowledge, and 46.1% had moderate knowledge. As for PUD, only 9.1% of participants had good knowledge scores of peptic ulcer disease, 64.8% had moderate knowledge, and 26.1% had poor knowledge. There is a significant lack of knowledge and awareness about the association between NSAID intake and peptic ulcers among the general population of Saudi Arabia.

Keywords: NSAIDs, Side effects, Saudi Arabia, Peptic ulcers

Introduction

The discovery of acetylsalicylic acid (ASA) by Felix Hoffman in 1897 marked a significant milestone as the first non-steroidal anti-inflammatory medicine (NSAID) [1]. NSAIDs, classified as non-opioid analgesics, are commonly prescribed medications known for their anti-inflammatory, antipyretic, and pain-relieving properties [2]. They are primarily used to alleviate fever and headaches [3]. However, the use of NSAIDs has been strongly associated with various gastrointestinal conditions [4]. One notable adverse effect is the development of peptic ulcers, characterized by damage to the mucosal lining caused by the release of pepsin and stomach acid [5].

NSAIDs, often known as non-steroidal anti-inflammatory drugs, are among the most widely used over-the-counter (OTC) medications worldwide [6].

According to a study done in Arar, Northern Saudi Arabia, the overall prevalence of peptic ulcers was 21.9% among the respondents, and in 33.3% of those cases, it was linked to long-term NSAID use [7].

Numerous research conducted in Saudi Arabia came to the conclusion that there is a high incidence of NSAID usage along with a lack of awareness and knowledge of (NSAIDs) and the risks associated with them [8].

Address for correspondence: Khames Alzahrani, Saudi Board of Endodontic SR, King Faisal Specialist Hospital & Research Centre, Riyadh, Saudi Arabia.
Dr.khames.Alzahrani@gmail.com

How to cite this article: Alanazi FH, Alobaid MJ, Afandy FF, Alhomaiani LK, Alruwaitea AB, Aljohani GY, et al. Knowledge and Awareness Level about the Association between Non-Steroidal Anti-inflammatory Drugs Intake and Having Peptic Ulcers. Arch Pharm Pract. 2023;14(S):A06231524.

Studies have proven that the chronic and excessive use of NSAIDs is an important reason for gastrointestinal (GI) morbidity and mortality; human beings are conscious that NSAIDs are a risk factor for gastric irritation and gastric ulcers [9].

NSAIDs induce various types of mucosal damage, including red spots, erosions, and round, oval-shaped, irregular, circular, and longitudinal ulcers and diaphragm-like stricture in the small intestine [10].

The prevalence of peptic ulcers within the general population is 5–10%, being an important source of morbidity and mortality worldwide. (NSAIDs), Helicobacter pylori (HP) infection and smoking were identified as major threat factors for peptic ulcers in the general population [11].

Worldwide studies on students' awareness of NSAID usage have revealed a lack of sufficient knowledge regarding correct NSAID use among university students. Adolescents and young adult students have a low-risk perception and better information about the medicines and their use, which keeps them from seeking help from physicians or pharmacists for their difficulties and leads them to self-medicate [12].

Moreover, 27 million people live in Saudi Arabia, a developing nation, including 8.4 million foreign citizens. The frequency of H. pylori infections and the ensuing PUD differs in various reports across the nation because of the multifaceted characteristics, including geographical, ethnic, and socioeconomic considerations [13].

NSAIDs are widely used medications for anti-inflammatory and analgesic purposes. Common side effects include gastrointestinal issues, potentially causing upper GIT hemorrhage. In the US, one in every 175 users may be hospitalized for NSAID-related GIT injury [14].

Improper using of analgesics can lead to increased morbidity, mortality rates, and deterioration in quality of life. This can result in misusing healthcare resources and increasing healthcare costs. There has been little research on analgesic awareness in the Middle East and Saudi Arabia [8]. This study aimed to assess the knowledge and awareness level of the association between NSAlD taking and peptic ulcer among the general population in KSA.

Objectives

Our study was designed to assess the level of knowledge and awareness of NSAIDs association with peptic ulcers in the general population in Saudi Arabia.

Materials and Methods

Study Design

This was a cross-sectional study carried out in Saudi Arabia. Using a self-administered questionnaire distributed over multiple online platforms.

Study Setting: Participants, Recruitment, and Sampling Procedure

The study required individuals to be at least 18 years old, and their gender or race was not a factor in the selection process. Inclusion criteria were met by those who provided informed consent and could independently complete the survey. The survey was not available to individuals who could not read or speak Arabic or needed assistance.

Inclusion and Exclusion Criteria

Population must be at least 18 years of age, and those who provided informed consent could independently complete the survey. (inclusion criteria). People under the age of 18 were excluded (exclusion criteria).

Sample Size

In this cross-sectional survey, a sample size calculation was done by (the Raosoft sample size calculator program)—the marginal error setting at the most common value of 10%. The selection of response distribution of the population at the calculating formula was selected to be 50%. The confidence level settings were chosen to be at 90%—the result of the calculation with a minimum of 68 population size.

Method for Data Collection and Instrument (Data Collection Technique and Tools)

A cross-sectional survey study was conducted among the population in Saudi Arabia using an electronic questionnaire. Toward the awareness of the general population in Saudi Arabia about NSAIDs taking and having PUD. The total enumeration method was used to include all the adult males and females who agreed to answer the questionnaire in this study. Adult individuals in the age group of 18–65 years were included in this study. Children and geriatric patients above 65 years were excluded from participation. The survey consisted of demographic data, age, education, socioeconomic status, weight, history of chronic disease, history of pain, frequency, type and dosage of NSAIDs, and indication for the use of NSAIDs. The survey web link was distributed via social media. Data were analyzed by using SPSS version 21.

Scoring System

Overall, 21 questions were used to assess the level of knowledge about the association between NSAIDs and peptic ulcers. 9 questions will assess the knowledge about NSAIDs. One point was given for correct answers, and zero points for incorrect answers or I don't know. The scoring system was divided into 3 groups: less than 5 out of 9 was considered as a poor level of knowledge, 5-7 out of 9 would be considered a moderate level of knowledge, and more than 7 would be considered an excellent level of knowledge.

Knowledge level about peptic ulcer:
13 questions were used to assess the level of knowledge of peptic ulcer. One point was given for correct answers, and zero points were given for incorrect answers, or I don't know. The scoring system was divided into 3 groups: less than 7 out of 13 was considered a poor level of knowledge, 7 – 10 was considered a moderate level of knowledge, and more than 10 was considered an excellent level of knowledge.

Analyzes and Entry Method

The "Microsoft Office Excel Software" application (2016) for Windows was used to input data on the computer. Then, for statistical analysis, the data was transmitted to the SPSS application, version 20 (IBM SPSS Statistics for Windows, Version 20.0; Armonk, NY: IBM Corp.).

Results and Discussion

As illustrated in **Table 1**, the majority of respondents, comprising 64.8%, fall within the 20-30 age bracket, followed by 14.3% in the 31-40 age group. The data also indicates a relatively younger demographic, with 12.6% of respondents being less than 20 years old. In terms of gender distribution, there is a nearly equal split, with 49.6% male and 50.4% female respondents. The nationality breakdown shows that the overwhelming majority, at 96.1%, are Saudi nationals, while the remaining 3.9% are non-Saudi. Moving on to location, the data is distributed across various regions, with the highest representation in the Eastern region at 30.4%, followed by Riyadh at 26.5%. Education levels vary among the respondents, with the highest percentage, at 59.6%, holding a bachelor's degree. This is followed by 26.5% with a secondary education and 7.8% with a diploma. Regarding occupation, the largest segment, at 47.8%, consists of students, followed by 33% employed as workers. Finally, the marital status distribution shows that most respondents, at 71.7%, are single, while 26.1% are married.

Table 1. Sociodemographic characteristics of participants (n=230)

Parameter		No.	%
Age	less than 20	29	12.6
	20_30	149	64.8
	31_40	33	14.3
	41_50	9	3.9
	51_60	10	4.3
Gender	Male	114	49.6
	Female	116	50.4
Nationality	Saudi	221	96.1
	Non-Saudi	9	3.9
Location	Al-Baha	1	.4
	Hollow	3	1.3
	Northern borders	2	.9
	Riyadh	61	26.5
	Eastern	70	30.4
	Al-Qassim	46	20.0
	AL Madinah AL Munawwarah	16	7.0
	Tabuk	3	1.3
	Hail	3	1.3
	difficult	2	.9
	Makkah	20	8.7
	Najran	3	1.3
	Uneducated	2	.9
	middle	3	1.3
Education Level	secondary	61	26.5
	Bachelor's	137	59.6
	diploma	18	7.8
	Master/PhD	9	3.9
Occupation	student	110	47.8
	private job	6	2.6
	retired	6	2.6
	employee	76	33.0
	Without work	30	13.0
	Other	2	.9
Marital Status	Married	60	26.1
	Single	165	71.7
	Divorced	4	1.7
	Widowed	1	.4

According to **Table 2**, a significant portion (37.0%) of the respondents have used NSAIDs before, with the majority reporting prior usage. Among the types of NSAIDs used, ibuprofen emerges as the most commonly utilized (60.0%), followed by aspirin (16.5%). The reasons for NSAID usage vary, with dental pain (47.1%) and menstrual pain (31.8%) being the most prevalent. Notably, a considerable proportion of respondents (56.5%) reported using NSAIDs without a prescription. In terms of experiences with discomfort or problems due to NSAID use, heartburn, and collywobbles were reported by 20.0% of respondents each, while 47.1% indicated no discomfort occurred. The timing of NSAID intake in relation to meals also varied, with a majority (56.5%) reporting taking NSAIDs after meals. Furthermore, the data indicates a lack of consensus regarding the mechanism of action of different types of NSAIDs, as a significant portion (39.1%) expressed uncertainty in this regard. Perceptions about the potential of NSAIDs to cause diseases were varied, with 47.0% expressing concern, 22.2% denying this possibility, and 30.9% being unsure. Additionally, a substantial number of respondents (48.3%) reported heartburn as a side effect of NSAID usage, while 43.0% experienced digestive disorders. Concerns about NSAID-related health risks were evident, as 48.7% believed that NSAIDs cause stomach ulcer disease and bleeding, and 37.0% thought that stomach ulcers could lead to cancer. Furthermore, the data revealed diverse beliefs regarding the potential impact of NSAIDs on swallowing ability, with 46.1% expressing uncertainty in this regard. A majority of respondents (60.4%) recognized the existence of limits to the amount of NSAIDs that can be safely taken. Additionally,

46.5% believed that a prescription is necessary for obtaining NSAIDs.

Table 2. Knowledge of participants of NSAIDs (n=230).

Parameter		No.	Percent
Used NSAID before	Yes	85	37.0
	no	145	63.0
Type of NSAIDs used	aspirin	14	16.5
	Ibuprofen	51	60.0
	Ibuprofen and diclofenac	1	1.2
	Diclofenac	6	7.1
	Celecoxib	2	2.4
	I don't know the painkiller	1	1.2
	Meloxicam	1	1.2
	Naproxen	4	4.7
	Other	5	5.9
Reason behind using it (Bias risk)	practical	1	1.2
	Back pain	13	15.3
	Fever	22	25.9
	Menstrual pain	27	31.8
	Dental pain	40	47.1
	Severe headache	28	32.9
	Sports injuries	5	5.9
	arthritis	13	15.3
Used NSAIDs without a prescription	Yes	48	56.5
	no	37	43.5
Experienced discomfort or problem due to the use of NSAIDs (Bias risk)	heartburn	17	20.0
	Collywobbles	17	20.0
	No discomfort occurred	40	47.1
	Diarrhea or constipation	10	11.8
	Peptic ulcer disease (PUD)	12	14.1
	Digestive disorder	8	9.4
	Lack of appetite	10	11.8
	Nausea and vomiting	9	10.6
	Headache, dizziness, and increased desire to sleep	4	4.7
	Idleness	1	1.2
NSAIDs taken before or after meals	after meals	130	56.5
	before meals	25	10.9
	There is no difference	21	9.1
	I don't know	54	23.5
All types of NSAIDs have the same mechanism of action	Yes	40	17.4
	no	100	43.5
	I don't know	90	39.1
Think NSAIDs may cause any disease	Yes	108	47.0
	no	51	22.2
	I don't know	71	30.9
Side effect of NSAIDs (Bias risk)	heartburn	111	48.3
	headache	75	32.6
	Feeling bloated	45	19.6
	Allergic reaction	78	33.9
	Digestive disorder	99	43.0
	None of it	30	13.0
NSAIDs cause stomach ulcer disease - bleeding	Yes	112	48.7
	no	47	20.4
	I don't know	71	30.9
Stomach ulcers cause cancer	Yes	85	37.0
	no	67	29.1
	I don't know	78	33.9
NSAIDs cause difficulty swallowing	Yes	60	26.1
	no	64	27.8
	I don't know	106	46.1
There is a limit to the amount of NSAIDs taken.	Yes	139	60.4
	no	43	18.7
	I don't know	48	20.9
Need a prescription for NSAIDs	Yes	107	46.5
	no	74	32.2
	I don't know	49	21.3

Table 3 shows that 13.5% of the population surveyed have been diagnosed with PUD, with a majority (86.5%) reporting no diagnosis. Among those diagnosed, the locations of peptic ulcers were predominantly found in the stomach (75.7%), followed by the small intestine (37.0%), colon (32.2%), pancreas (11.7%), liver (14.8%), and throat, (0.4%) When it comes to the types of peptic ulcers known to the respondents, the data shows a varied understanding, with 24.8% identifying one type, 39.1% recognizing two types, 11.7% aware of six types, and 0.9% acknowledging ten types. Additionally, 23.5% of participants admitted to not knowing the specific type of peptic ulcer they were diagnosed with. The survey also sheds light on the danger signs associated with peptic ulcers, with abdominal/back pain being the most commonly recognized symptom (53.9%), followed by nausea (25.7%) and constipation (9.1%). Notably, 11.3% of respondents indicated that they did not know the danger signs of peptic ulcers. Regarding the differentiation of symptoms between stomach ulcers and duodenal ulcers, the data reveals that 33.0% of participants believe that these ulcers have distinct symptoms, while 26.1% disagree and 40.9% are unsure. Furthermore, 40.0% of respondents acknowledge that peptic ulcers can be asymptomatic, while 24.3% believe they cannot, and 35.7% are uncertain about this aspect. The survey also delves into the role of smoking in peptic ulcers, with 60.0% of participants recognizing its potential influence, 20.0% denying its role, and an additional 20.0% expressing uncertainty. Additionally, the most important cause or risk factor for peptic ulcers was identified as both prolonged use of NSAIDs and H. pylori infection by 37.0% of respondents, while 14.8% attributed it solely to the prolonged use of NSAIDs and 23.0% to H. pylori infection. Only 1.7% of

respondents believed that neither of these factors played a significant role. When it comes to the common complications of peptic ulcers, 29.1% of participants recognized all listed complications, including the formation of perforation, bleeding, and stomach obstruction, while 15.2% identified the formation of perforation, 25.2% recognized bleeding, and 7.8% acknowledged stomach obstruction. Moreover, 20.0% of respondents admitted to not knowing the common complications of peptic ulcers. Regarding the possible treatments for peptic ulcers, 38.7% of participants identified both antibiotic therapy and reducing stomach acidity as potential treatments, 15.2% recognized antibiotics alone, and 19.6% acknowledged reducing stomach acidity. Additionally, 20.0% of respondents expressed uncertainty regarding the possible treatments. In terms of diagnosis, the data indicates that 30.9% of participants recognize gastroscopy as the final diagnostic test for peptic ulcers, 12.6% identified the H. pylori test, and 11.7% acknowledged anemia screening. Furthermore, 28.7% of respondents recognized all three methods, while 16.1% recognized none of the listed diagnostic methods. Lastly, the survey addresses the age at which gastroscopy is recommended, with 43.5% of respondents indicating that it should be conducted before the age of 55 and 56.5% suggesting it should be performed after the age of 55.

Table 3. Knowledge of participants of PUD (n=230).

Parameter		No.	%
Diagnosed with peptic ulcer disease (PUD)	Yes	31	13.5
	no	199	86.5
Locations of peptic ulcers (Bias risk)	Stomach	174	75.7
	Pancreas	27	11.7
	Colon	74	32.2
	Small intestine	85	37.0
	Liver	34	14.8
	Throat	1	0.4
Types of peptic ulcers do you know	One type	57	24.8
	Two types	90	39.1
	Six types	27	11.7
	Ten types	2	.9
	I don't know what kind	54	23.5
Danger signs that indicate the presence of peptic ulcers	Abdominal/back pain	124	53.9
	Constipation	21	9.1
	nausea	59	25.7
	I don't know	26	11.3
Stomach ulcers and duodenal ulcers have distinct symptoms that clearly differentiate them	Yes	76	33.0
	no	60	26.1
	I don't know	94	40.9
Peptic ulcer can be asymptomatic	Yes	92	40.0
	no	56	24.3
	I don't know	82	35.7
Do you think smoking has a role in peptic ulcers?	Yes	138	60.0
	no	46	20.0
	I don't know	46	20.0
Which of the following is the most important cause or risk factor for peptic ulcers?	Prolonged use of NSAIDs	34	14.8
	H. pylori infection	53	23.0
	both of them	85	37.0
	None of that	4	1.7
What are the common complications of peptic ulcers?	Perforation	35	15.2
	Bleeding	58	25.2
	Stomach obstruction	18	7.8
	all of which	67	29.1
	None of that	6	2.6
	I don't know	46	20.0
What is the possible treatment for peptic ulcers?	Antibiotics	35	15.2
	Reducing stomach acidity	45	19.6
	both of them	89	38.7
	None of that	15	6.5
	I don't know	46	20.0
How can peptic ulcers be diagnosed?	H pylori test	29	12.6
	Anemia screening	27	11.7
	Gastroscopy (final test)	71	30.9
	all of which	66	28.7
	None of that	37	16.1
At what age is gastroscopy recommended?	Before the age of 55	100	43.5
	After the age of 55	130	56.5

As illustrated in **Figure 1**, only 4.3% of participants had good knowledge scores of NSAIDs, 49.6% had poor knowledge, and 46.1% had moderate knowledge.

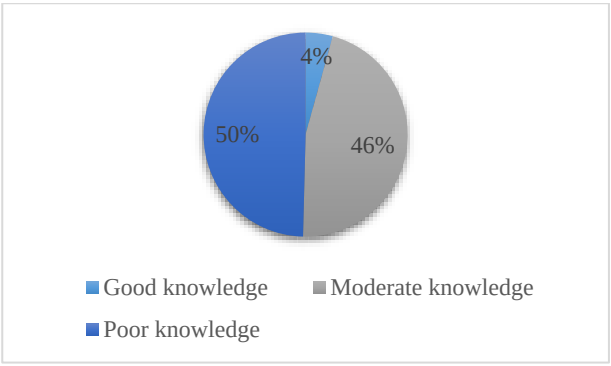

Figure 1. Participants' knowledge scores of NSAIDs

Figure 2 shows that only 9.1% of participants had good knowledge scores of peptic ulcer disease, 64.8% had moderate knowledge, and 26.1% had poor knowledge.

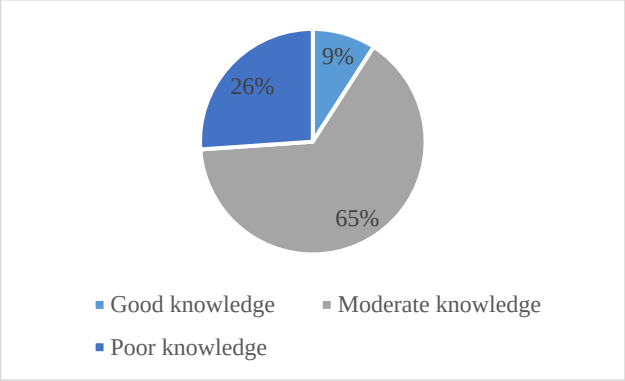

Figure 2. Participants' knowledge scores of PUD

As in **Table 4**, age appears to be a factor influencing NSAID knowledge, with the distribution of knowledge levels varying across different age groups. For instance, individuals aged 20-30 seem to have the highest proportion of good knowledge (64.8%), while those aged 41-50 have the lowest (3.9%). However, the P value of 0.170 indicates that the differences in knowledge levels across age groups are not statistically significant. Marital status also shows some variation in NSAID knowledge levels, but the P value of 0.806 suggests that these differences may not be statistically significant. Similarly, gender exhibits some variation in knowledge levels, with males having a higher proportion of good knowledge (49.6%) compared to females (50.4%). The P value of 0.037 indicates that there may be a statistically significant difference in NSAID knowledge between genders. Nationality, location, education level, and occupation also demonstrate varying levels of NSAID knowledge among the participants. For example, the data shows that individuals from the Eastern region have the highest proportion of good knowledge (30.4%), while those from Al Baha have the lowest (0.4%). The P values associated with these variables provide insights into the statistical significance of the observed differences in knowledge levels.

Table 4. Knowledge of participants of NSAIDs in association with their sociodemographic characters (n=230).

		Knowledge of NSAID			Total (N=230)	P value
		Poor knowledge	Moderate knowledge	Good knowledge		
Age	less than 20	17 7.4%	9 3.9%	3 1.3%	29 12.6%	0.170
	20_30	66 28.7%	77 33.5%	6 2.6%	149 64.8%	
	31_40	20 8.7%	13 5.7%	0 0.0%	33 14.3%	
	41_50	4 1.7%	4 1.7%	1 0.4%	9 3.9%	
	51_60	7 3.0%	3 1.3%	0 0.0%	10 4.3%	
Marital status	Single	77 33.5%	80 34.8%	8 3.5%	165 71.7%	0.806
	Married	34 14.8%	24 10.4%	2 0.9%	60 26.1%	
	Divorced	2 0.9%	2 0.9%	0 0.0%	4 1.7%	
	widow	1 0.4%	0 0.0%	0 0.0%	1 0.4%	
Gender	Male	66 28.7%	43 18.7%	5 2.2%	114 49.6%	0.037
	Female	48 20.9%	63 27.4%	5 2.2%	116 50.4%	
Nationality	Saudi	107 46.5%	104 45.2%	10 4.3%	221 96.1%	0.216
	Non-Saudi	7 3.0%	2 0.9%	0 0.0%	9 3.9%	
Location	Al Baha	1 0.4%	0 0.0%	0 0.0%	1 0.4%	0.395
	Jouf	1	2	0	3	

		0.4%	0.9%	0.0%	1.3%	
	Northern border	0	2	0	2	
		0.0%	0.9%	0.0%	0.9%	
	Riyadh	24	35	2	61	
		10.4%	15.2%	0.9%	26.5%	
	Eastern Region	31	36	3	70	
		13.5%	15.7%	1.3%	30.4%	
	Qaseem	28	15	3	46	
		12.2%	6.5%	1.3%	20.0%	
	Al Madina	13	3	0	16	
		5.7%	1.3%	0.0%	7.0%	
	Tabuk	2	1	0	3	
		0.9%	0.4%	0.0%	1.3%	
	Hail	2	1	0	3	
		0.9%	0.4%	0.0%	1.3%	
	Aseer	0	2	0	2	
		0.0%	0.9%	0.0%	0.9%	
	Makkah	10	8	2	20	
		4.3%	3.5%	0.9%	8.7%	
	Najran	2	1	0	3	
		0.9%	0.4%	0.0%	1.3%	
	Illiterate	0	2	0	2	
		0.0%	0.9%	0.0%	0.9%	
	Preparatory	1	2	0	3	
		0.4%	0.9%	0.0%	1.3%	
Education Level	Secondary	30	27	4	61	
		13.0%	11.7%	1.7%	26.5%	0.023
	Bachelor	66	66	5	137	
		28.7%	28.7%	2.2%	59.6%	
	Diploma	16	2	0	18	
		7.0%	0.9%	0.0%	7.8%	
	Master	1	7	1	9	
		0.4%	3.0%	0.4%	3.9%	
	Student	42	61	7	110	
		18.3%	26.5%	3.0%	47.8%	
	Private work	6	0	0	6	
Occupation		2.6%	0.0%	0.0%	2.6%	
	Retired	5	1	0	6	
		2.2%	0.4%	0.0%	2.6%	
	Employee	49	24	3	76	0.002
		21.3%	10.4%	1.3%	33.0%	
	No work	12	18	0	30	
		5.2%	7.8%	0.0%	13.0%	
	Other	0	2	0	2	
		0.0%	0.9%	0.0%	0.9%	

Table 5 shows that the majority of individuals with good knowledge of peptic ulcers fall within the age group of 20-30, comprising 64.8% of the total. Conversely, those aged less than 20 years and those aged 51-60 exhibit the lowest percentages of good knowledge, standing at 12.6% and 4.3%, respectively. The differences in knowledge levels across age groups are statistically significant, as indicated by the P value of 0.628. In terms of marital status, the data shows that the highest proportion of individuals with good knowledge of peptic ulcers are those who are single, constituting 71.7% of the total. On the other hand, divorced and widowed individuals demonstrate the lowest levels of good knowledge, both at 0.0%. The P value of 0.551 suggests that there is no statistically significant difference in knowledge levels across marital status categories. Looking at gender, the data reveals that 49.6% of males and 50.4% of females possess good knowledge of peptic ulcers, with a P value of 0.253, indicating no significant difference in knowledge levels between the two genders. 96.1% of Saudi individuals have good knowledge of peptic ulcers, while only 3.9% of non-Saudi individuals fall into this category. The P value of 0.562

suggests that there is no statistically significant difference in knowledge levels between the two nationalities.

Table 5. Knowledge of participants of PUD in association with their sociodemographic characters (n=230).

		Knowledge of peptic ulcer			Total (N=230)	P value
		Poor knowledge	Moderate knowledge	Good knowledge		
Age	less than 20	11	17	1	29	0.628
		4.8%	7.4%	0.4%	12.6%	
	20_30	37	95	17	149	
		16.1%	41.3%	7.4%	64.8%	
	31_40	7	25	1	33	
		3.0%	10.9%	0.4%	14.3%	
	41_50	2	6	1	9	
		0.9%	2.6%	0.4%	3.9%	
	51_60	3	6	1	10	
		1.3%	2.6%	0.4%	4.3%	
marital status	Single	47	101	17	165	0.551
		20.4%	43.9%	7.4%	71.7%	
	Married	13	43	4	60	
		5.7%	18.7%	1.7%	26.1%	
	Divorced	0	4	0	4	
		0.0%	1.7%	0.0%	1.7%	
	widow	0	1	0	1	
		0.0%	0.4%	0.0%	0.4%	
Gender	Male	28	72	14	114	0.253
		12.2%	31.3%	6.1%	49.6%	
	Female	32	77	7	116	
		13.9%	33.5%	3.0%	50.4%	
Nationality	Saudi	58	142	21	221	0.562
		25.2%	61.7%	9.1%	96.1%	
	Non-Saudi	2	7	0	9	
		0.9%	3.0%	0.0%	3.9%	
Location	Al Baha	0	1	0	1	0.164
		0.0%	0.4%	0.0%	0.4%	
	Jouf	0	2	1	3	
		0.0%	0.9%	0.4%	1.3%	
	Northern border	0	2	0	2	
		0.0%	0.9%	0.0%	0.9%	
	Riyadh	21	38	2	61	
		9.1%	16.5%	0.9%	26.5%	
	Eastern Region	21	38	11	70	
		9.1%	16.5%	4.8%	30.4%	
	Qaseem	6	38	2	46	
		2.6%	16.5%	0.9%	20.0%	
	Al Madina	6	9	1	16	
		2.6%	3.9%	0.4%	7.0%	
	Tabuk	0	3	0	3	
		0.0%	1.3%	0.0%	1.3%	
	Hail	1	2	0	3	
		0.4%	0.9%	0.0%	1.3%	
	Aseer	0	2	0	2	
		0.0%	0.9%	0.0%	0.9%	
	Makkah	5	11	4	20	

		2.2%	4.8%	1.7%	8.7%	
	Najran	0	3	0	3	
		0.0%	1.3%	0.0%	1.3%	
	Illiterate	0	1	1	2	
		0.0%	0.4%	0.4%	0.9%	
	Preparatory	1	2	0	3	
		0.4%	0.9%	0.0%	1.3%	
Education Level	Secondary	17	40	4	61	
		7.4%	17.4%	1.7%	26.5%	0.260
	Bachelor	35	88	14	137	
		15.2%	38.3%	6.1%	59.6%	
	Diploma	7	11	0	18	
		3.0%	4.8%	0.0%	7.8%	
	Master	0	7	2	9	
		0.0%	3.0%	0.9%	3.9%	
	Student	29	66	15	110	
		12.6%	28.7%	6.5%	47.8%	
	Private work	2	4	0	6	
Occupation		0.9%	1.7%	0.0%	2.6%	
	Retired	1	5	0	6	
		0.4%	2.2%	0.0%	2.6%	
	Employee	22	50	4	76	0.567
		9.6%	21.7%	1.7%	33.0%	
	No work	5	23	2	30	
		2.2%	10.0%	0.9%	13.0%	
	Other	1	1	0	2	
		0.4%	**0.4%**	**0.0%**	**0.9%**	

NSAID side effects are serious and frequently occur in a frightening manner. It is well-recognized that these substances can be harmful to the gastrointestinal tract and result in peptic ulcers. Users of NSAIDs should be aware of these side effects, particularly those with a history of peptic ulcers. Peptic ulcers are painful sores that can develop in the lining of the stomach or small intestine, and they can cause serious health problems if left untreated [3, 6].

In our study, a significant portion (37.0%) of the respondents had used NSAIDs before, with the majority reporting prior usage (56.5%) reported using NSAIDs without a prescription. This was less than that of a prior survey, which indicated that a sizable percentage of participants used NSAIDs without a prescription, suggesting a somewhat lax attitude toward their usage. Additionally, 39.3% of participants thought that NSAIDs were readily available without a prescription. Remarkably, this result is consistent with the views of about one-third of the participants, who felt that these drugs ought to be freely accessible [15]. Similarly, in Karachi, Pakistan, 84.7% of non-medical students and 83.7% of medical students took NSAIDs without a prescription [16].

Our study shows that only 4.3% of participants had good knowledge scores of NSAIDs, 49.6% had poor knowledge, and 46.1% had moderate knowledge. This was consistent with earlier research findings that indicated the majority of NSAID knowledge components were insufficient. The fundamentals of the drugs used by responders who took NSAIDs with or without food were the first knowledge factor examined. By providing this information, healthcare providers may be able to prevent gastrointestinal adverse effects, ensure appropriate treatment, and save a significant financial burden on healthcare. In addition, half of the respondents were ignorant about the negative consequences of NSAIDs [17].

Gender and occupation were statistically significant with knowledge of NSAIDs. An earlier investigation revealed a strong relationship between age group and NSAID awareness. Furthermore, there is a direct correlation between educational attainment and understanding of appropriate dosing of NSAIDs and other medicines for acute pain [17]. Similar noteworthy results were obtained from another study that examined the connection between medical knowledge and age. They discovered that respondents' awareness of appropriate medicine use increased with their age. All of the earlier research in the literature generally covered abuse, side effects, and safety regulations to be adhered to without providing any information regarding the respondents' backgrounds. Nonetheless, this research revealed a strong correlation between educational attainment and appropriate NSAID use [18].

In our study, only 9.1% of participants had good knowledge scores of peptic ulcer disease, 64.8% had moderate

knowledge, and 26.1% had poor knowledge. Approximately 38.4% of the participants in a prior study who had their level of PUD awareness evaluated were found to have good awareness. Increased levels of awareness among nursing students completing their final year of physician assistantship [18]. Lower awareness was noted by Shamseya *et al*. [19], who reported that 81.3 percent of the subjects had low total knowledge scores.

When it comes to the common complications of peptic ulcers, 29.1% of participants recognized all listed complications, including the formation of perforation, bleeding, and stomach obstruction, while 15.2% identified the formation of perforation, 25.2% recognized bleeding, and 7.8% acknowledged stomach obstruction. Consistent with earlier research findings, participants reported bleeding (9.8%), perforation (14.8%), stomach blockage (3.2%), and a combination of these problems (40.2%) [18]. Higher participant knowledge of PUD consequences was observed in a study by Jaras *et al*. [20], wherein almost 95% of participants were aware that PUD is associated with bleeding (97.8%) and perforation (95.7%).

According to our study results, age, educational level, and occupation were not associated with knowledge level of PUD. In contrast to the findings of the study by Shamseya *et al*. [19], which reported that a statistically significant difference was found between the patient's level of knowledge score and occupation, favoring students and office workers ($p = 0.000$), a study on the subject found that there were no significant differences between occupation and level of awareness ($p = 0.369$) [18]. Age and educational attainment both showed significant variations in awareness, with p-values of 0.002 and 0.010, respectively, for these characteristics. Compared to other groups, participants in the 25–34 age range with a university education exhibited a considerably higher level of awareness [18]. This is consistent with the findings previously published by Shamseya *et al*. [19], which reported that a statistically significant difference was found between the patient's level of knowledge score and age, with patients falling between the ages of 20 and 30 years old, and education level, with patients having a high or secondary education, favoring those with these characteristics.

It is important for people to understand the risks associated with NSAIDs and to take steps to protect themselves from developing peptic ulcers. This includes avoiding the overuse of NSAIDs, taking them only as directed by a healthcare professional, and seeking medical attention if symptoms of peptic ulcers develop. Additionally, people should be aware of the warning signs of peptic ulcers, which include abdominal pain, bloating, nausea, vomiting, and bloody or black stools.

Healthcare professionals in Saudi Arabia play a critical role in educating the public about the risks associated with NSAIDs and peptic ulcers. They can provide information about the proper use of NSAIDs and the warning signs of peptic ulcers, as well as offer guidance on how to prevent and treat these conditions. It is also important for healthcare professionals to stay up-to-date on the latest research and guidelines related to NSAIDs and peptic ulcers so that they can provide the best possible care to their patients.

The study provides valuable insights into the awareness levels of the general population regarding the association between non-steroidal anti-inflammatory drug (NSAID) intake and peptic ulcers. However, it is important to acknowledge certain limitations of the study. Firstly, the study may be limited by its sample size and the representativeness of the general population of Saudi Arabia. Additionally, the study may be limited by the potential biases inherent in survey-based research, such as response bias and recall bias. Furthermore, the reliance on self-reported data may also limit the study, which may introduce inaccuracies. Despite these limitations, the study offers important implications for public health interventions and future research in this area.

The findings of this study could have important future implications for public health policies and healthcare practices in the region. It may lead to the development of targeted educational campaigns aimed at increasing awareness about the potential risks associated with NSAID use and the importance of seeking medical advice before their consumption. Additionally, the study could also prompt further research into the factors influencing NSAID intake and peptic ulcer development, ultimately leading to the implementation of preventive measures to reduce the burden of this condition in the Saudi Arabian population. Overall, this study can potentially drive positive change in healthcare practices and improve the well-being of the general population in Saudi Arabia.

Conclusion

There is a significant lack of knowledge and awareness about the association between NSAID intake and peptic ulcers among the general population of Saudi Arabia. Many people are unaware of the risks associated with taking NSAIDs, and they may not realize that they are at risk for developing peptic ulcers. This lack of knowledge and awareness can lead to a higher incidence of peptic ulcers and other related health problems.

It is important for people to understand the risks associated with NSAIDs and to take steps to protect themselves from developing peptic ulcers. Healthcare professionals play a critical role in educating the public about these risks and providing guidance on preventing and treating these conditions. By working together, we can help reduce the incidence of peptic ulcers and improve the overall health of the population in Saudi Arabia.

ACKNOWLEDGMENTS: We thank the participants who all contributed samples to the study.
CONFLICT OF INTEREST: None
FINANCIAL SUPPORT: None
ETHICS STATEMENT: Informed consent was obtained from each participant after the study was explained in full and clarification that participation was voluntary. Data collected were securely saved and used for research purposes only. Written informed consent was obtained from all individual participants included in the study.

REFERENCES

1. Arain A, Rasheed M, Sallam N, Sarwar Z, Khan M. Patient's Knowledge and Use of Oral Non-Steroidal Anti-Inflammatory Drugs in a Rheumatology Clinic. Kans J Med. 2019;12(4):132-5.
2. Salih S, Madkhali AA, Al-hazmi WM, Al-khaldy AY, Moafa TA, Al-gahtani EZ, et al. Knowledge, attitude, and practices on over-the-counter oral analgesics among female students of Jazan University. Int J Med Dev Ctries. 2019;3(4):311–5.
3. Bahdailah AA. Pattern use of Non-steroidal Anti-inflammatory Drugs among Saudi Community: Patients' Perspective. Pharmacol Toxicol Biomed Reports. 2019;5(2).
4. Almerstani YM, Aljuhani A, Alsaad SA, Alalwani BM, Alsahlawi AM, Alyamy TM, et al. NSAID is associated with an increased risk of peptic ulcer among patients with arthritis. Int J Med Dev Ctries. 2019;3(7):597–600.
5. Ushanthika T, Mohanraj KG. Knowledge and awareness of the risk factors of peptic ulcer among college students. Drug Invent Today. 2019;12(10):2189–92.
6. Babakor SD, Al Ghamdi MM. Prevalence and determinants of over-the-counter analgesics usage among patients attending primary health care centers in Jeddah, Saudi Arabia. J Young Pharm. 2018;10(1):91–7.
7. Badi Albaqawi AS, Abo el-Fetoh NM, Abdullah Alanazi RF, Farhan Alanazi NS, Emad Alrayya S, Nughaymish Mulfi Alanazi A, et al. Profile of peptic ulcer disease and its risk factors in Arar, Northern Saudi Arabia. Electron Physician. 2017;9(11):5740–5.
8. Karami N, Altebainawi A, Alfarki S, Aldossari N, Asiri A, Aldahan M, et al. Knowledge and attitude of analgesics use among Saudi population: A cross-sectional study. Int J Med Sci Public Health. 2018;7(2):137-42.
9. Asiri OA, Alzahrani AA, Alshehri KM, Althomal OW, Alameen AA, Serwah MA. Prevalence of non-steroidal anti-inflammatory drugs usage and assessment of knowledge related to its complications among Saudi population; a cross-sectional study. Headache. 2020;68:19.
10. Watanabe T. Current knowledge on non-steroidal anti-inflammatory drug-induced small-bowel damage : a comprehensive review. J Gastroenterol. 2020;55(5):481–95. doi:10.1007/s00535-019-01657-8
11. Wang C, Guo X, An Y, Xu S, Zhang D, Qin Y, et al. Risk Factors of Peptic Ulcer in Military Personnel: A Systematic Review of the Literature. Explor Res Hypothesis Med. 2020;5(3):103-9.
12. Ravalia A, Pierre YY, Dilmohamed A. Assessing students knowledge on the use of NSAID, s at Lusaka apex medical university. IOSR J Pharm. 2018;8(8):36-45. Available from: www.iosrphr.org
13. Dafalla S, Alghamdi H, Alsaedi A, Alzain M, Alsaedi O, Abdullah Khormi M, et al. Awareness of peptic ulcer disease among the general population in Jeddah. Int J Med Dev Ctries. 2021;5(January):656–62.
14. Padayachee V. Awareness Regarding Non-Steroidal Anti-Inflammatory Drug-Related Side Effects in Johannesburg, South Africa. 2021;(February).
15. Altahini AT, Aburas W, Aljarwan SF, Alsuwayagh SA, Alqahtani NF, Alquwaiay S, et al. Charting the Knowledge and Patterns of Non-Steroidal Anti-Inflammatory Drugs Usage in Hail Population, Saudi Arabia: Insights into the Adverse Effect Profile. Pharmacy. 2024;12(1):9.
16. Suleman Mehboob AA, Kamran M, Ashraf H, Subata Siddiqui UN, Siddiqui AH. Knowledge of Non-Steroidal Anti-Inflammatory Drugs (NSAIDs) and their Adverse Effects among Medical and NonMedical Students. Pak J Med Dent. 2022;11:94-9.
17. Bahdailah AA. Basic knowledge of non-steroidal anti-inflammatory drugs among saudi community. Pharmacol Toxicol Biomed Rep. 2019;5(2).
18. Abahussain NA, Taha AZ. Knowledge and attitudes of female school students on medications in eastern Saudi Arabia. Saudi Med J. 2007;28(11):1723-7.
19. Shamseya AM, Shamseya MM, Salem MA, Ahmed AS, Abdelfatah DA. Assessment of some health-related practices and knowledge among a Group of Egyptian Patients with peptic ulcer disease. J Med Sci Clin Res. 2015;3(11):8186–92. doi:10.18535/jmscr/ v3i11.12
20. Jaras M, Glumbakaitė E, Jievaltaitė V. Population knowledge about peptic ulcer disease and outcomes. Riga, Latvia: Riga Stradins University; 2018. pp 37.