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Research Article

Knowledge and Reasons for Use of Analgesic Medications among Haramaya University College of Health and Medical Science Students, Harar Town, East Ethiopia

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Abstract

Background: Analgesics, NSAIDs and opioids, commonly known as painkillers, are substances which work in various ways to relieve different types of pain experienced in the body. Approximately 25% of the patients taking non-steroidal anti-inflammatory drugs face several adverse events even in case of prescribed drug and several cases of deaths are reported.

Objective: The aim of this study is to assess knowledge and reasons for use of analgesic medications at Haramaya University, College of Health and Medical Science students of Harar town, Eastern Ethiopia from March 1 2020 to February, 2021.

Method: Institution based cross sectional study was conduct from March 1, 2020 to February 30, 2021. Data was collected using self-administered structured questionnaire prepared in English. Stratified sampling and simple random sampling was used to select the study participants. A total sample size of 317 was taken. Then the collected data was coded, entered and analyzed by using statistical package for social science version 23. The result is presented using tables.

Results: The 90.5% of participants had used analgesic in their life time and the 63.8% them had used analgesic in the last six months. The analgesic usage prevalence in of the study is Ibuprofen (28.7%), Diclofenac (25.7%) and Paracetamol (21.7%). The 78.5% of the respondents reported that large dose of Paracetamol may cause liver. With regard to the use of alcohol with paracetamol, the 77.8% of the respondents replied that alcohols should be avoided when Paracetamol is being taken. The 60.7% of the respondents were aware of the daily maximum dose of Paracetamol. The 78.3% of respondents replied that long time use of codeine can cause addiction. In the current study the 32.4%, 13.2%, and 12.5 %, of the respondents took analgesics for the reason of headache, menstrual pain and fever pain management respectively. The 38.7% of the respondents chose the analgesics due to previous experience, the 19.9% by reading a publication and the 17.5% based on recommendations from others.

Conclusion: This study showed the majority of the participants used analgesics for different reasons mainly for management of headache, menstrual pain and fever. Significant proportions of the study participants lack the appropriate knowledge about analgesics usage of analgesics.

Keywords: analgesic medications; paracetamol; ibuprofen; diclofenac

Introduction

Analgesics, NSAIDs and opioids, commonly known as painkillers, are substances which work in various ways to relieve different types of pain experienced in the body. They are also drugs which reduce or relieve the sensation of pain without producing loss of consciousness or parallel depression of other senses [1].

Non-steroidal anti-inflammatory drugs (NSAIDs) and paracetamol (acetaminophen), are the most commonly used over the-counter (OTC) drugs in the world. Over-the-counter analgesics represent a convenient solution for self-care and are generally safe if used in appropriate dosage [2]. Opioids are often the next logical step following NSAIDs in the management of acute pain and cancer-related chronic pain. They also may be an effective treatment option in the management of chronic non-cancer pain [3].

Treatment with analgesic drugs for longer period and/or with a dose exceeding maximum recommended doses has been associated with cardiovascular (CV), renal, myocardial infarction and kidney disease, both acute and chronic kidney diseases and GI complications including bleeding gastric or duodenal ulcers and GI obstructions and perforations [4, 5].

In a retrospective analysis of a rheumatoid arthritis patient database done in Stanford university school of medicine in California, USA, showed OTC ibuprofen and naproxen users had a relative risk for serious GI complications of approximately 3.5 compared with NSAID nonusers and

it is estimated that 1%–2% of continuous NSAID users experience a clinically significant upper GI event per year [6].

Prevalence of analgesic drugs use related peptic ulcer has significantly increased and has been associated with increased morbidity and mortality [7, 8].

Significant proportion of NSAIDs users takes the drugs at a dosage exceeding the maximum dose, a warning or contraindication for the use of the drugs or concurrently with interacting medications [9].

In both developed and developing countries, there is a growing problem of OTC NSAIDs misuse has been reported especially among high school and university students due to the lack of knowledge regarding their proper use [10]. Studies conducted to assess students' knowledge on the use of NSAIDs have been conducted worldwide shows a lack of sufficient knowledge regarding correct use of NSAIDs among University students [11-13]. Lack of knowledge about proper use of NSAIDs lead to increased morbidity and mortality, increased risk of unwanted effects such as adverse drug reactions, unnecessary hospital admissions and visits and many other consequences.

Despite this fact, no study has been done that assess knowledge and reason about use NSAIDs Haramaya University, college of health and medical sciences students. Therefore, this study assessed knowledge and reasons for use of analgesics among CHMS students.

Methodology

Study area and Period

The study was conduct from February 1, 2020 to February, 2021 among College of Health Medical Science students in Harar town, Haramaya University, Eastern Ethiopia. Harar town is located at 525 kilometers east of the capital city, Addis Ababa. Currently a total of 1130 as regular students at Haramaya University CHMS.

Study design

Institution based cross sectional study design was conducted to assess knowledge and reasons for use of analgesic medications among Haramaya University College of Health and Medical Science.

Population

Source population

All students who were attending their education at Haramaya University College of Health and Medical Science

Study population

All selectee students who were attending their education at College of Health and Medical Science and willing to participate in the study.

Sample size determination

The required sample size is calculated by formula:

$$n = \frac{(Z\alpha/2)^2 P(1-P)}{d2} \quad n = \frac{(1.96)^2 \times 0.5(1-0.5)}{(0.05)2} = 384$$

Where:

Prevalence (p) use analgesic 50%, (Z) = standard normal distribution value at 95% confidence level of Z = 1.96 and margin of error (d) = 5%.

Since the total study population is less than 10,000, correction formula is used to determine the sample size.

Finite population correction (FPC) = $\frac{n}{1+\frac{n}{N}}$

Where n= 384

N=Total population of our study= 1130

FPC = $\frac{384}{1+\frac{384}{1130}} = 288$

To compensate for possible missing of information and errors, 10% of the size was add. Hence sample the final sample size = 288 + 28.8= 317

Sampling technique

The first sample was select using lottery methods. Using a proportionate allocation, a total sample size were divide to each regular program departments of CHMS.

- $n_i = \frac{N_i}{N} \times n$ where i = 1, 2, ..., k where, k is the number of strata and
  - ✓ n_i is sample size of the i^{th} stratum
  - ✓ Ni is population size of the i^{th} stratum
  - ✓ N is the total number of students in CHMS
  - ✓ n is the total sample size

Based on that, the required sample from each department;

Nurse = 89/1130 * 317 = 25

Midwifery =103 /1130*317 = 29

Clinical pharmacy =114/1130 *317 =32

Medical Laboratory Science =84/1130*317 =24

Environmental health =64/1130*317 =18

Psychiatry nurse =66/1130*317 =18

Public health =83/1130*317 = 25

Medicine =520/1130*317 = 146

Finally, simple random sampling was use to select the study participants for this study.

Department	No of students	Sample allocation
Nurse	89	25
Midwifery	103	29
Clinical Pharmacy	114	32
MLS	84	24
Environmental health	64	18
Psychiatry nurse	66	18
Public health	83	25
Medicine	520	146
Total	1130	317

Table 1: *Proportionate allocation of the samples at CHMS students March1, 2020.*

Data collection instrument and technique

Data was collect using self-administered structured questionnaire which is prepared in English. Participation was on voluntary basis and confidentiality was maintained.

Data quality control

To ensure data quality, the questionnaire was pretested on selected sample and subsequent correction and modification was done depending up on the finding. Finally, the collected data was reviewed and checked for completeness before the data analysis.

Data processing and analysis

The collected data was coded and analyzed by using SPSS version 24. The result was presented by tables, graphs and charts**.**

Ethical consideration

Before commencing data collection ethical clearance & approval letter was obtained from College of Health and Medical Sciences Haramaya University and was submitted to each department and then the permission letter was obtained from the respective deparments. The researcher has given full information on the purpose and objectives of the study to the study participants in order to empower the study participants to make informed decisions on whether to participate or not.

Operational definition

Analgesic: substances which work in various ways to relieve different types of pain experienced in the body**.**

Assessment: Evaluation and measurement of knowledge and practice about a particular matter.

Knowledge: Awareness or understanding about something overall information.

Reason: The motive or rationale for the use or application of particular subject.

Results

Socio demographic characteristics

In this study 317 respondents were included. The 169 (53.30%) and 148(46.7%) of the respondents were male and female respectively. The majority, 97.4% of the study participants were at age group of 21 to 27 years. The 288(90.9%) of them were single and the 29(9.1%) them were married. The 146(46.1%), 32(10.1%) and 29(9.1%) of the participants were from medicine, pharmacy and midwifery nurse departments respectively. The majority, 141(44.5%) and 83(26.2%) of the study participants were of fourth and fifth year students (**Table 2**).

Variables	Socio-demographic characteristics	Frequency	%
Age	Male	169	53.30
	Female	148	46.70
Age of Respondent	20-22	79	24.8
	23-25	188	59.3
	26-30	50	15.7
Marital Status	Single	288	90.9
	Married	29	9.1
Department	Medicine	146	46.1
	Clinical Pharmacy	32	10.1
	Midwifery Nurse	29	9.1
	Clinical Nurse	25	7.9
	HO*	25	7.9
	MLS*	24	7.6
	Psychiatry nurse	18	5.7
	Environmental	18	5.7
Academic year of study	First	6	1.9
	Second	2	0.6
	Third	47	14.8
	Fourth	141	44.5
	Fifth	83	26.2
	Sixth	38	12.0

HO*: Health officer; MLS*: Medical laboratory science; CHMS*: College of health and medical sciences

Table 2: *Socio-demographic characteristics of the study participants, CHMS*, Haramaya University, Harar, Eastern Ethiopia, Feb 2021.*

Prevalence of analgesics usage

The 288(90.8%) had used analgesics in their life time. And 201(63.8%) of the study participants had used an analgesic in the last six months.

From the participants who had used analgesics in the last six months, the 28.7%, 25.7%, 21.7% and 13.9% of the respondents used Ibuprofen, Diclofenac, Paracetamol and Tramadol respectively (**Table 3**).

Variables	Analgesic usage pattern	Frequency	%
Have you ever used analgesics	Yes	288	90.8
	No	24	7.6
	I don't Remember	5	1.6
Have you used analgesics in the last six month	Yes	223	70.3
	No	88	27.7
	I Don't Remember	6	1.9
If "Yes" which of the following drug do you used for analgesic effect?	Paracetamol	50	21.7
	Ibuprofen	66	28.7
	Diclofenac	59	25.7
	Aspirin	11	4.8
	Tramadol	32	13.9
	Codeine	4	1.7
	Others*	1	0.4

Other*: Meloxicam; CHMS*: College of health and medical sciences

Table 3: *Analgesics usage pattern of the study participants, CHMS*, Haramaya University, Harar, Eastern Ethiopia, Feb 2021.*

Knowledge towards analgesics usage

The 277(87.3%) of the respondents stated that Paracetamol, Ibuprofen, Diclofenac, and Aspirin can be used to relieve pain. The 164(51.7%) respondents replied that Paracetamol, Ibuprofen, Diclofenac, and Aspirin are equally effective for relieving pain associated with inflammation. The 78.5% of the respondents reported that large dose of Paracetamol causes liver damage.

With regard to the use of alcohol with paracetamol, the 77.8% of the respondents replied that alcohols should be avoided when Paracetamol is being taken to decrease the risk of liver damage. The 60.7% of the respondents were aware of the daily maximum dose of Paracetamol.

In the present study, the 77.8% of the participants reported that alcohol should be avoided to decrease the risk of gastric irritation while taking Ibuprofen, Diclofenac, and Aspirin. The majority, 66.5%, of the respondents in this study replied that aspirin should not be used for the treatment of pain in patients with asthma and peptic ulcer disease. With respect to the use of opioids, the 78.3% of the respondents stated long time use of codeine can cause addiction. The 64.2% of respondents replied that they read the leaflet before taking analgesic (**Table 4**).

Variables	Analgesic usage pattern	Frequency	%
Medications such as Paracetamol, Ibuprofen, Diclofenac, and Aspirin may be used to relieve pain	Yes	277	87.3
	No	21	6.6
	I Don't Remember	19	6.0
Paracetamol, Ibuprofen, Diclofenac, and Aspirin are equally effective for relieving pain associated with inflammation	Yes	164	51.7
	No	109	34.3
	I Don't Remember	44	14.0
A large dose of Paracetamol may cause liver damage	Yes	248	78.5
	No	29	9.2
	I Don't Remember	39	12.3
Large doses of Ibuprofen, Diclofenac, and Aspirin may cause gastric irritation/ulcer	Yes	257	81.3
	No	22	7.0
	I Don't Remember	36	11.4
When you take Paracetamol alcohol should be avoided to decrease the risk of liver damage	Yes	247	77.8
	No	24	7.6
	I Don't Remember	46	14.6
Do you know the maximum daily dose of Paracetamol?	Yes	193	60.8
	No	58	18.4
	I Don't Remember	66	20.9
When you take Ibuprofen, Diclofenac, and Aspirin alcohol should be avoided to decrease the risk of gastric irritation	Yes	247	77.8
	No	34	10.8
	I Don't Remember	36	11.4
Aspirin should not be used for the treatment of pain in patients with asthma and peptic ulcer disease	Yes	211	66.5
	No	35	11.1
	I Don't Remember	71	22.5
Long time use of codeine can cause addiction	Yes	248	78.3
	No	24	7.6

	I Don't Remember	45	14.1

Table 4: *Knowledge towards analgesics usage, CHMS, Haramaya University, Harar, Eastern Ethiopia, Feb 2021.*

Reason for analgesic use

In the current study the 32.4%, 13.2%, and 12.5 % of the respondents took analgesics for the reason of headache, menstrual pain and fever pain management respectively. The 38.7% of the respondents chose the analgesics due to previous experience, the 19.9% by reading a publication and the 17.5% based on recommendations from others. With respect to a drug selection for the pain management, the 29.1% and 26.8 % of the respondents in this study reported that Paracetamol and Ibuprofen as drugs that they prefer for a pain management (**Table 5**).

Variable	Reason for the analgesic use	Frequency	%
For what reason(s) you take analgesics?	Headache	93	32.4
	Menstrual symptoms (pains)	38	13.2
	Fever	36	12.5
	Dental pain	32	11.1
	Back pain	29	10.1
	Arthritis	19	6.6
	Sore throat	15	5.2
	Cold/Flu	13	4.5
	Muscle pain	12	4.1
Reason for the choice of analgesic??	Affordable	45	15.4
	Previous experience	113	38.7
	Advert on media	20	6.8
	Publish materials I read	58	19.9
	Recommended by friends/ family/ health professionals	51	17.5
	Others	4	1.4
Which analgesic would you prefer for pain management	Paracetamol	91	29.1
	Ibuprofen	74	23.6
	Diclofenac	84	26.8
	Aspirin	13	4.2
	Tramadol	49	15.7
	Codeine	1	0.3

Table 5: Reason for analgesic use, CHMS, Haramaya University, Harar, Eastern Ethiopia, Feb 2021.

Discussion

In this study 317 respondents were included from which 53.30% of them were males, while the remaining 46.70% were females. In the current study 90.9% of the respondents were single and the remains 9.1% were married. The 97.40% of the participants were under the age group of 21 to 27 years.

The 90.5% of the respondents had used analgesics. This result is relatively higher than a study conducted in Jeddah, Saudi Arabia, which showed that 84.4% of the participants used OTC analgesics [14]. In other study conducted in USA, the prevalence of analgesic self-medication was 49.7% which is lower than a prevalence of analgesic usage in this study [15]. The probable reason behind the lower percent usage of analgesic in the latter study might be due to the differences in sample size and educational status of the two countries.

In the current study the 63.8% of the respondents used analgesic in the last six months. The result is lower than the study conducted in Iranian University which showed that 76.6% of the respondents self-medicated with analgesics once or more than once in the 3 months of the study. This result is also lower than a study done in Saudi which revealed that 94.4% of participants used analgesics [16]. This irrational uses of medication leads to a development of toxicity and exposes to adverse effect if the medications when the drug is taken in an inaccurate dose or way.

In the present study the pattern of analgesic consumption is Ibuprofen (28.7%), Diclofenac (25.7%) and Paracetamol (21.7%). The analgesic consumption pattern of this study is different from a study conducted in Iranian University in which the 59.6% of the respondents used acetaminophen followed by acetaminophen-codeine (28.7%) and Ibuprofen (4.8%) [16]. The analgesics consumption pattern of the current study is also different from a study done in Saudi Arabia that revealed that majority the respondents used Paracetamol as OTC analgesic (73.4%) [17]. Similarly in other study conducted in Jeddah, Saudi Arabia, Acetaminophen (Paracetamol) was the most frequently used drug (86.1%), followed by ibuprofen (25.1%) and diclofenac (14.7%) [14]. The probable reason for the differences in the findings might be due to difference in study population area.

In the current study the most common reasons analgesics were used for management headache (31.8%), menstrual pain, (13.0%) and fever (12.3%). This is relatively similar to a study conducted in USA, in which the most common disease symptoms managed by analgesics were headache (48.4%), followed by a cough, cold, and fever (44.4%) and bone and joint pain (39.9%) [15]. On the other hand this is slightly different from to a result of a study conducted in Jeddah, in which headache(71.1%) was the major disease reason for usage of the analgesics followed by arthralgia (17.7%) and toothache (17.4%) [14]. This might shows that the difference for the reason of using analgesics could be raised because of

differences in the morbidity patterns. The 38.7% of respondents replied that for reason of choosing the analgesics were previous experience of the use of the analgesic. This is in agreement with a study done in Saudi Arabia which revealed that previous experience with the drug (35.1%) were the most common reason for choosing OTC analgesics use [14]. In this study the 29.1 % of the respondents replied that Paracetamol was a drug that they would prefer for pain management. Similarly, a study conducted in Iranian University students in 2012, reported that Acetaminophen (59.6%) was the most common self-medicated analgesic used by the respondents followed by acetaminophen-codeine (28.7%) and Iboprofen (4.8%) [16].

Significant proportion of the study participants had no adequate knowledge regarding side effects of analgesic drugs. With regard to this the 78.5% of the participants replied that large dose of Paracetamol may cause liver damage and the 81.3% the respondents were aware that large doses of Ibuprofen, Diclofenac, and Aspirin may cause gastric irritation/ulcer. This result is better than a study report of a study done in Jeddah, Saudi Arabia, in which 58.1% of the respondents had no knowledge about OTC analgesic side effects [17]. Also in a study conducted in Pakistan, only (25.0%) correctly answered for a knowledge base question [18]. The present study result on the other hand, is in line with the result of a study from Lusaka Apex Medical University, showed that a 78.5% of students did not know the side effects of Ibuprofen [19].The probable reason for the differences in the findings might be due to different study population area.

In this study 78.3%, the respondents stated that long time use of codeine can cause addiction This is analogous with a study conducted in Aston University which showed the average score of the 50 students for the knowledge based questions was 3.32 out of 7 (47.4%). The result of the current study is slightly higher when compared to a study conducted in Nigeria where only 38.7% had good knowledge of opioid use [20]. Long term use of opioids including codeine may leads to addiction and potential adverse effects. Dependence on opioids has become a social problem [21, 22]

Conclusion:

This study showed the majority of the participants used analgesics for different reasons mainly for management of headache, menstrual pain and fever. Significant proportions of the study participants lack the appropriate knowledge about analgesics usage of analgesics. The study also showed that the majority of the participants used analgesics without a health professional consultation. Paracetamol is the most preferred drug for pain management in this study. The major reason for the choice of analgesics is primary the previous experience with the drug. All stakeholders including the college, CHMS, researchers, governments and all concerned bodies should give a better attention to close the knowledge gap about analgesics use seen in this study.

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Declarations

Consent to publish: Not applicable

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Conflict of Interest: The authors declare no conflict of interest

Author's contribution

Author Lemlem Niguse involved in the conception and design of the study, participated in the literature searches, supervised data collection and analyzed data. Author Teshome Sosengo involved in the conception and design of the study, participated in the literature searches, analyzed data and wrote the manuscript. Both the authors approved the final manuscript.

Availability of data: All the data are available with the corresponding author, Lemlem Niguse.

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