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Awareness of analgesics complications in Saudi Arabia: a cross-sectional study

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Abstract

Background: All over the world, analgesics are considered one of the most widely used and abused medications. Painkillers such as paracetamol (acetaminophen), non-steroidal anti-inflammatory drugs (NSAIDs), and aspirin currently represent the principal means of pain management. Unfortunately, paracetamol and NSAIDs have dangerous side effects primarily when they are used improperly and without respect to safety rules. This study aims to assess the awareness of the indications, complications, and contraindications of commonly used analgesics.

Results: A total of 1554 participants responded to the survey, and the findings indicated that the main analgesic used is paracetamol. A proportion of 68.1% of the total number of respondents received their information about analgesic medications from a physician or pharmacist; 95.7% used analgesics when needed, and 70.9% mentioned that they would consult a physician or pharmacist if the pain was not relieved after the use of over-the-counter medications. Nearly 29% were not aware of the possibility of adverse effects of analgesic use.

Conclusion: The most commonly used analgesic is paracetamol, and most of the participants had a poor level of awareness regarding the complications and side effects of analgesics in general. Our recommendation is to conduct a continuous health education campaign about the use of analgesics.

Keywords: Awareness, Analgesic complications, Paracetamol

Background

Painkillers are considered globally as one of the most abused medications. Pain is defined as an actual or potential tissue damage associated with an unpleasant emotional and sensory experience. Analgesics such as acetaminophen, non-steroidal anti-inflammatory drugs (NSAIDs), and aspirin currently represent the principal means of pain management [1].

NSAIDs are medications with anti-inflammatory, analgesic, and antipyretic actions, and some inhibit the platelet aggregation [2, 3], while paracetamol has antipyretic and analgesic effects [4]. Inflammatory conditions comprise the most prevalent indications for NSAID use. However, for fever and pain disorders, paracetamol and NSAIDs are considered as the first-line treatment [5].

Unfortunately, paracetamol and NSAIDs have dangerous side effects, especially when they are used with no respect to safety rules and in improper ways, such as

without consulting a physician or pharmacist or being taken repeatedly without a prescription. They are not only associated with gastrointestinal tract, liver, nervous system, hematological, and kidney complications, but they can have adverse effects on almost every organ [6–9]. A cohort survey analysis conducted among people who are NSAID abusers showed a higher risk of ulcers compared to non-users of NSAIDs. Hence, the increased use of NSAIDs increases the risk of ulcers and, therefore, of bleeding, which can threaten the patient's life [10–13].

NSAIDs are contraindicated in patients who have an allergy to NSAIDs, severe kidney and liver insufficiency, an active peptic ulcer, and hemorrhagic diathesis, as well as those who are pregnant or breastfeeding [14]. Moreover, paracetamol is contraindicated in patients with severe renal or hepatic failure, methemoglobin reductase, or glucose-6-phosphate dehydrogenase deficiencies and in patients with allergies to any ingredients of the drug formula [15].

An assessment through a survey study of Taif University students' knowledge, attitudes, and practices regarding medication use is essential for identifying gaps in these

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domains. The gaps can be the starting point of future educational programs to raise public awareness around the identified misconceptions. Therefore, this study was designed to identify the most common analgesics used by Taif University students. It was conducted mainly to assess the knowledge and awareness of Taif University students regarding the indications, complications, and contraindications of the most frequently used analgesics.

Methods

A cross-sectional study was designed using an electronic questionnaire that was distributed to students at Taif University to assess their knowledge, attitude, and practice regarding analgesic use and their awareness about analgesic complications. The questionnaire was distributed over 6 months starting in January 2018. In this study, we included male and female students from Taif University, regardless of their colleges or departments, as a randomized sample.

Questionnaire design

We designed the questionnaire based on many previous studies [16, 17]. We then tested its validation by distributing it to a small sample of the target group to ensure they understood the questionnaire. They understood all the questions, indicating that the questionnaire was clear and understandable. The questionnaire was divided into five sections: (I) the participants' demographic data, which included age, gender, residence, and university level; (II) the participants' knowledge, attitude, and practice regarding analgesics; (III) the participants' knowledge and awareness about paracetamol; (IV) the participants' knowledge and awareness about aspirin; and (V) the participants' knowledge and awareness about ibuprofen.

Statistical analysis

The data were analyzed using the Statistical Package for the Social Sciences software (SPSS version 25). Descriptive data were presented in frequencies and percentages.

Results

Demographic characteristics of respondents

The number of participants in this study was 1554 students from various university faculties. The age of most participants was between 19 and 22 years (53.47%). The percentage of female participants was 58.9% while that of male participants was 41.1%. A majority of 91.8% of the respondents lived in cities, while only 8.17% lived in villages. Third year university students were the main contributors to this study (20.3%), whereas only 8.9% of the participants were postgraduate students (see Table 1).

Table 1 Background characteristic ($n = 1554$)

Variables		Number	Percent
Age groups (years)	Less than 19	89	5.74
	19–22	831	53.47
	23–25	502	32.3
	More than 25	132	8.49
Gender	Female	915	58.9
	Male	639	41.1
Residency	City	1427	91.8
	Village	127	8.17
Academic year	First	159	10.2
	Second	220	14.2
	Third	315	20.3
	Forth	295	19
	Fifth	241	15.5
	Sixth	186	12
	Postgraduate	138	8.9

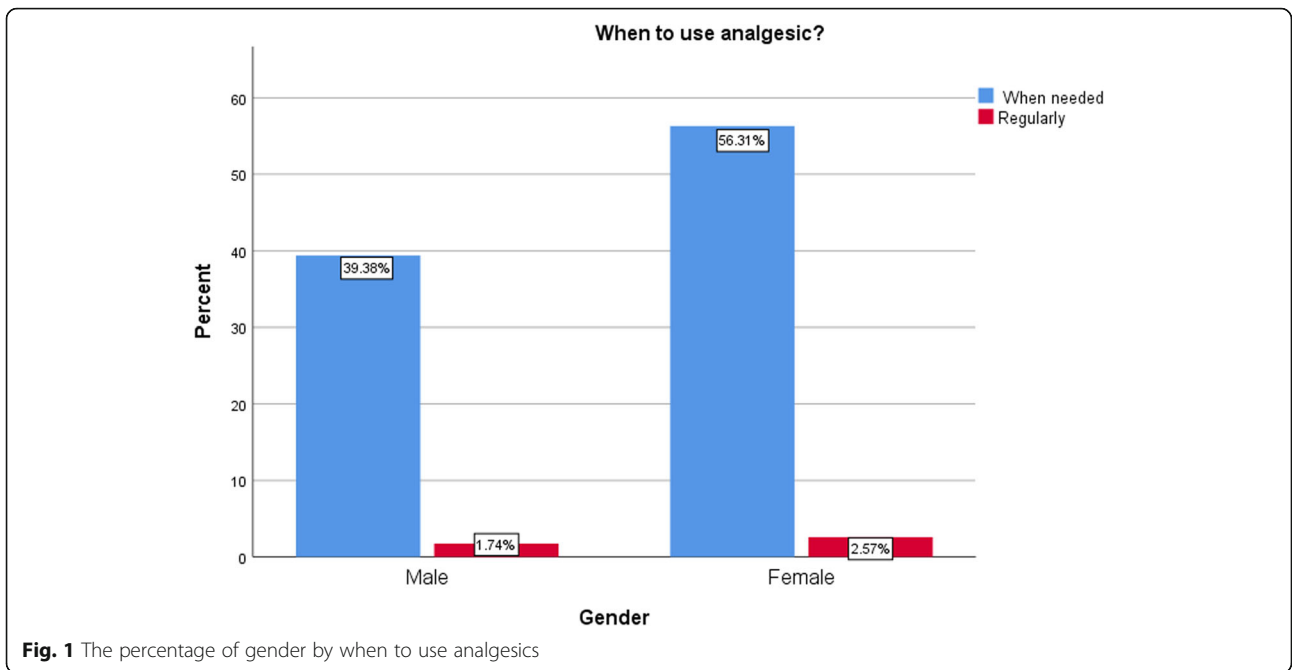
Participants' knowledge, attitude, and practice regarding analgesics

The most commonly used drug was paracetamol, used by 77.3% of the study participants. 95.7% of the participants mentioned that they use it only when necessary, while 4.3% use it regularly (Fig. 1). 70.9% of the students said if it did not subside after taking one dose of an analgesic, he will ask a physician or pharmacist, while a few mentioned increasing the dose or using another analgesic if their pain was not relieved (8.5% and 20.5%, respectively) (Fig. 2). A small percentage of participants (8.6%) thought that increasing the dose of the analgesic would have no side effects (Table 2).

In terms of knowledge about the use of paracetamol, a small proportion (2.3%) of the students answered that they believed they could use more than eight tablets within 24 h. Seventy-two percent realized that paracetamol could cause liver failure, whereas 28% did not. A significant proportion of those who participated lacked knowledge about the side effects and contraindications of paracetamol (52.8% and 34.9%, respectively) (Table 3).

Regarding the knowledge about and attitudes towards aspirin, 3.2% of the participants used more than six tablets of aspirin per day, while a majority of 89.2% did not use it. There was a significant deficiency in the participants' knowledge about the side effects of aspirin. 56.7% of the participants did not know the possible side effects of aspirin, and 42.9% did not know that it can cause bleeding. Also, there was a considerable lack of knowledge about aspirin's contraindications, with 38.8% of the participants unaware of them (Table 4).

We also noted a lack of awareness about the side effects and complications of ibuprofen, with 58.3% and



53.9% of participants unaware of the side effects and contraindications, respectively. A significant percentage of the respondents did not use ibuprofen, but among those who did, 1.3% used more than four tablets per day. Note that the researchers depended on the National Health Service (NHS) guidelines about safe doses [18] (Table 5).

Discussion

In this study, we identified paracetamol as the most common analgesic used. Most of the participants in

this study were between 19 and 25 years old. It is crucial that this age group has adequate knowledge and awareness about medications because they are the most important link between those under the age of 18 and over 25. According to this ratio, these results are consistent with studies conducted in Saudi Arabia and Norway [16, 19] and are not consistent with others in the USA [20].

The most commonly used type of analgesic in Saudi Arabia is paracetamol, which is consistent with the results of previous studies [16, 19, 21]. There is a

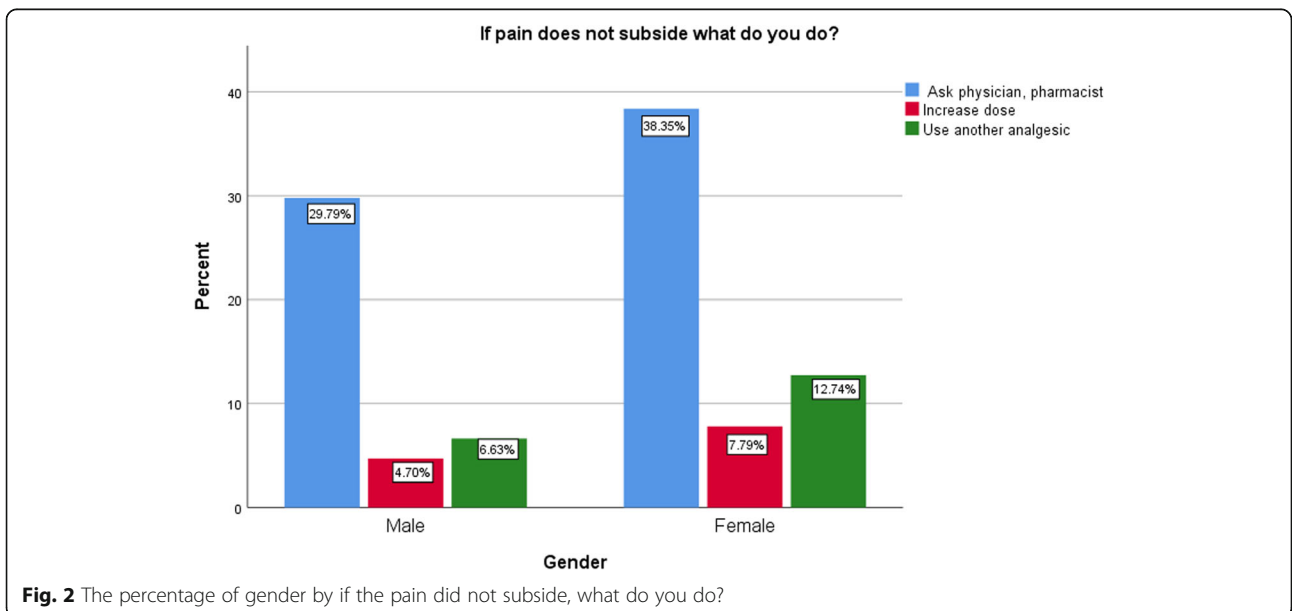


Table 2 Knowledge and awareness of participant about analgesics ($n = 1554$)

Variables		Number	Percent
Most commonly used analgesic	Paracetamol or acetaminophen	1202	77.3
	Ibuprofen	275	17.7
	Aspirin	28	1.8
	Other analgesic	49	3.2
When do you use analgesics?	When needed	1487	95.7
	Regularly	67	4.3
If the pain did not subside, what do you do?	Ask physician, pharmacist	1102	70.9
	Increase dose	133	8.5
	Use another analgesic	319	20.5
When you buy pain relief medication without a prescription, what is your source of information about it?	Pharmacist, physician	1059	68.1
	I have heard about it through television, radio, social media	194	12.6
	Parents and friends	301	19.3
Do you think that increasing the analgesic dose has side effects?	Yes	1102	70.9
	No	133	8.6
	I do not know	319	20.5

prevalent idea among the population in Saudi Arabia that paracetamol is completely safe. However, the National Prescribing Service MedicineWise (NPS MedicineWise) [22] indicates that this information is wrong.

In terms of students' knowledge, attitude, and practice regarding the use of analgesics, we found that most participants committed to a safe dose of analgesics, whereas a few took higher than the recommended daily dosage. It is important to note that the degree of knowledge in this study respect is high, as all of the study's participants are students at the university and have good knowledge and awareness in this aspect. This is consistent with the results of a similar study conducted by Karami et al. in Saudi

Arabia in 2018 [16]. We have observed from the results of our study that there is an adequate awareness about the maximum safe dose of analgesics among the university student population. This is compatible with the results of the study conducted by Fendrick et al. in 2008 [23].

The usual number of paracetamol tablets used daily by most of the respondents is one to two every 4 to 6 h. This dose is safe according to the NHS recommendations. The same is true for the aspirin and ibuprofen daily doses taken by participants. This indicates the participants' adequate knowledge and awareness about analgesic doses.

Table 3 Knowledge and awareness of participant about paracetamol or acetaminophen ($n = 1554$)

Variables		Number	Percent
How may paracetamol tables do you use daily?	Once to twice for every 4–6 h	777	50
	More than 8 tablets within 24 h	36	2.3
	I do not use it	741	47.7
	Do you think that paracetamol can lead to liver failure?	Yes	1119
	No	435	28.0
Do you know what the side effects of paracetamol are?	Yes	734	47.2
	No	820	52.8
Do you have an idea about the contraindications of Panadol?	Yes	1011	65.1
	No	543	34.9

Table 4 Knowledge and awareness of participant about aspirin ($n = 1554$)

Variables		Number	Percent
How may aspirin tables do you use daily?	More than 6 tablets per day	49	3.2
	6 tablets per day	24	1.5
	Less than 6 tablets per day	95	6.1
	I do not use it	1386	89.2
Do you have an idea about aspirin side effects?	Yes	673	43.3
	No	881	56.7
Do you think aspirin can lead to bleeding?	Yes	888	57.1
	No	131	8.4
	I do not know	535	34.4
Do you know the conditions in which aspirin should not be used?	Yes	951	61.2
	No	603	38.8

Table 5 Knowledge and awareness of participant about ibuprofen ($n = 1554$)

Variables		Number	Percent
How may ibuprofen tables do you use daily?	Less than 4 tablets per day	310	19.9
	Once to twice for every 4–6 h	105	6.8
	More than 4 tablets per day	20	1.3
	I do not use it	1119	72
Do you have an idea about the side effects of ibuprofen?	Yes	648	41.7
	No	906	58.3
Do you think that ibuprofen is associated with stomach ulcers?	Yes	990	63.7
	No	564	36.3
Do you know what the contraindications of ibuprofen are?	Yes	716	46.1
	No	838	53.9

Unfortunately, we found that there was poor awareness of the side effects of analgesics. This gives us an indication of the poor education about medicines in society, as we were expecting that the sample group should be the class with the highest level of knowledge in the community and could pass it on to the rest of the population.

Limitations

The present study dealt only with students' knowledge and awareness about the use of analgesics. Future studies should address the same problem with a more diverse sample of multiple populations and more analgesic medication. In addition, we conducted this study in one educational facility. Future research should focus on all university education facilities in Saudi Arabia.

Conclusion

The most commonly used analgesic among Taif University students is paracetamol, and the majority of Taif University students use over-the-counter analgesic medications without being aware of their contraindications and side effects. Our recommendation is to conduct a health education campaign about the use of analgesics.

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Authors' contributions

AS is the main author; she supervised and reviewed all the steps. AQ analyzed the data and wrote or rewrote the manuscript. MT participated in writing the proposal and the results in the manuscript. SB participated in writing the proposal and the conclusion in the manuscript. ASH participated in writing the proposal and the introduction/background in the manuscript. AT participated in writing the proposal and the methods in the manuscript. All authors have read and approved the final manuscript.

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Ethics approval and consent to participate

The ethics approval was obtained from the Human Research Ethics Committee, Taif University, Taif, Saudi Arabia. The consent of the participants was written.

Consent for publication

Not applicable

Competing interests

The authors declare that they have no competing interests.

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