



Self-Medication with Analgesics: Knowledge and Attitudes of Senior Medical Students and Interns at King Abdulaziz University, Jeddah, Saudi Arabia

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Authors' contributions

This work was carried out in collaboration between both authors. Author NKI designed the study, performed the statistical analysis, participated in literature searches, wrote the final paper and is the corresponding author of the manuscript. Author BMA conducted the data collection, participated in data analysis, managed the literature searches and wrote the first draft of the paper. Both authors read and approved the final manuscript.

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ABSTRACT

Aim: The study was conducted to assess the knowledge and attitudes of clinical years' medical students and interns towards self-medications with analgesics, King Abdulaziz University (KAU), Jeddah, Saudi Arabia.

Methodology: A cross-sectional study design was conducted among senior medical students (4th-6th year) and interns at the medical college of KAU. A multistage stratified random sampling technique was used. A confidential, validated, self-administered questionnaire was used. It inquired about personal and socio-demographic information. It contained 10 questions asked about their knowledge concerning self-medication with analgesics. The knowledge score was calculated, ranged from 0-10. It was categorized into: satisfactory score (≥ 7), fair score (5 - <7) and poor score (< 5). Their attitudes towards analgesic self-medication were determined through rating 10

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attitudes' statements on a 3-points Likert scale. Descriptive and inferential statistics were done.

Results: Only 48% of the participants obtained a satisfactory knowledge score about self-medication with analgesics. Males had a significantly lower level of knowledge compared to females ($X^2=11.41$, $P < 0.001$). After controlling confounding factors in logistic regression, the first predictor of having a satisfactory knowledge score about self-medication with analgesics was being in a higher educational grade (aOR; 2.35, 95% CI: 1.54 - 3.58), followed by female gender. Regarding attitude, 70.8% of respondents agreed that self-medication with analgesics can cause side effects.

Conclusion: Some lack of knowledge about self-medication with analgesics was found among our participants. However, the participants had sound attitudes towards some of its issues. Knowledge of medical students and interns about self-medications needs improvement through more educational and training programs.

Keywords: Analgesic; self-medication; knowledge; attitudes; Saudi Arabia.

1. INTRODUCTION

Self-medication is a prevalent global practice, which is considered a pattern of irrational use of medications [1,2]. Self-medication is "the use of drugs to treat self-diagnosed disorders or symptoms, or the intermittent or continued use of a prescribed drug for a chronic or recurrent disease or symptoms" [3]. It has been reported that irrational use of medication drugs and use of self-medications may lead to loss of resources, increase microbial resistance, the emergence of serious complications, increase suffering and drug dependence [4]. However, self-medication can aid in the treatment of mild illnesses that do not need medical consultation and provide an inexpensive alternative for the treatment of common ailments [5].

Increasing self-medication practice, from the community and health authorities, needs having good knowledge for avoiding the irrational drug use. All parties which elaborate self-medication need to know about the benefits and risks of its use [6]. Despite the presence of analgesics everywhere, there are many risks related to their use. Acetaminophen is the most common drug involved in self-poisoning [7-9] as high doses of this drug is very dangerous to the liver. Furthermore, Non-Steroidal Anti-Inflammatory Drugs (NSAIDs) as aspirin may precipitate inflammation and gastrointestinal ulceration [10].

It was reported that doctors' usage of self-medication starts during their medical education and training [11,12]. The use of self-medication among medical students is still high. Ibrahim, et al. reported that a high percentage of medical students and interns from Jeddah utilized self-medication and self-medication with analgesics [13]. A systematic review was done for twenty-seven studies between physicians and medical

students revealed that use of self-medication ranged from 12% to 99% [14]. A study from Pakistan reported that most of the university students from Karachi were aware of harmful effects of self-medication [15]. Another study done in Ethiopia found that more than one-half of the students agreed that they can use self-medication irrespective of the seriousness of the illness [16]. High educational level and the better working professional were notified to be predictive factors for using self-medication [17, 18].

All undergraduate medical students study pharmacology in their curriculum. However, knowledge about analgesics, the uses, and side effects may not be excellent, and may not reflect the extent of their using as self-medications. A study done in two Brazilian universities showed that only about half of dentistry and nursing students reported that the course of pharmacology provided them with satisfactory knowledge about self-medication. They were evaluated regarding their ability to administer self-medication without harm where 14.8% of them did not agree that they had the ability to proceed with self-medication, and about 40% thought that they did not yet have adequate information for giving such drugs [19]. So, teaching pharmacology for medical students in medical schools does not reflect the extent of their knowledge and attitudes towards self-medication with analgesics. Medical students are the future doctors.

The expectation of undergraduate students towards the use of self-medication was found to be high. The major cause of this attitude appears to be due to over self-confidence, because of their medical knowledge gained from the medical study. Attitudes usually develop during the medical schools and that will continue with them

throughout their lives [20]. Up to the best of our knowledge, there is a paucity of studies conducted to determine the knowledge of and attitudes towards self-medication with analgesics among medical students and interns in Saudi Arabia. So, identifying their knowledge and attitudes towards self-medication with analgesics is crucial.

The study was done to assess knowledge and attitudes of medical students and interns towards analgesic self-medication, King Abdulaziz University (KAU), Jeddah, Saudi Arabia.

2. MATERIALS AND METHODS

A cross-sectional study was conducted among clinical years' medical students (4th to 6th clinical years) & interns (advanced students or graduates from a medical field who are gaining supervised practical experience) at KAU, Jeddah. A self-administered questionnaire was conducted during 2015. A confidential, anonymous, validated, self-administered questionnaire was used. It consisted of three sections. It inquired about personal and socio-demographic data, their knowledge and attitude toward self-medication with analgesics. They were also asked about their use of self-medication during the 6 months preceding the study. The study was approved by the Institutional Review Board (IRB) of the Faculty of Medicine, King Abdulaziz University Hospital (KAUH) with the (Reference Number: 117-14). The research objectives were explained to each participant and upon acceptance, an informed consent was taken for each one.

A multi-stage stratified random sampling technique was utilized. Stratification was based on the sex and the educational level of the student. The Sample size was determined by the formulae [21]:

$$n = \frac{z^2 \times p \times q}{d^2}$$

Where "n"= the minimal calculated sample, z= 1.96 and p is the prevalence of good knowledge and it was presumed to be 40% based on the results of a previous study done in UAE (22), q = (1-p)=0.6 and "d" is the precision of ± 0.043, at 95% Confidence Interval (CI)". It was calculated to be 499 and increased to become 504 during the study; for the stratification purpose.

A self-administered, anonymous, validated questionnaire was used. It was constructed by

authors. Face and content validity were assessed by 2 experts and internal consistency reliability was determined by Cronbach's alpha and was found to be 80%. It asked about personal and socio-demographic data as age, gender.

Knowledge about self-medication was assessed through 10 Multiple Choice Questions (MCQs) asked about the definition of analgesics, the safest analgesic to treat a child with a viral infection, and the side effect of aspirin. They were also asked to identify a type of non-steroidal anti-inflammatory drugs (NSAIDs), the safest type of analgesics for using during pregnancy, an analgesic drug which can cause liver toxicity, and those which have an anticoagulant effect.

Student's attitudes towards self-medication with analgesics was determined through their responses to 10 statements asked on a three-point Likert scale (agree, neutral or disagree). These statements assessed, for example, their level of satisfaction with self-medication as a method of treatment, their opinions towards the ability of medical students to diagnose diseases and to treat themselves with self-medication, and if self-medication with analgesics may cause side effects.

The data were analyzed using SPSS 20 (IBM SPSS Statistics 20, IBM Corporation, Armonk, NY, USA, 2014) & Epi-Info programs.

The knowledge scores were determined by awarding "1" point for every correct answer and "0" point for an incorrect or unknown answer. The sum of the knowledge scores; ranging from 0 to 10; was classified as follows: Satisfactory score (≥7), Fair score (5 - <7) and Poor score (< 5).

Both descriptive and analytical statistics were conducted. Chi-square statistical analysis was used to test for significant association between the outcome variable (knowledge) and studied variables.

Stepwise logistic regression analysis was used to identify predictors of satisfactory knowledge score among the three tested variables (age, sex and educational year).

3. RESULTS

The study included 504 participants, with a male to female ratio of 1:1.08. The prevalence of use

self-medication during the 6 months preceding the study was 75.2%, while 55.4% of the participants used self-medication with analgesics during the same period.

Table 1 shows that 82% of the participants knew the definition of analgesic drugs. Similarly, 86.7% recognized that peptic ulcer is one of aspirin contraindication. However, only 36.0% identified that aspirin has anti-inflammatory, anti-pyretic and analgesic effects. A similar percentage correctly identified acetaminophen as a drug with a weak anti-inflammatory activity.

Results revealed that 48% of the participants obtained a satisfactory knowledge score about self-medication. On the other hand, only 29.6% and 22.4% of them had fair and poor scores, respectively.

Table 2 shows that participants aged more than 21 years obtained better knowledge score compared to the younger participants ($X^2=7.11$, $P<0.05$). Similarly, the level of knowledge was increased with the educational year. The fourth-year medical students had the lowest percentage of correct answers regarding self-medication with analgesics compared to other grades, with a highly statistically significant difference ($X^2= 27.6$, $P< 0.001$). Males scored lower with knowledge questions about self-medication with analgesic compared to females. They obtained a higher percentage of poor knowledge score (28.9%)

compared to females (16.4%), with a highly statistically significant difference ($X^2=11.4$, $P< 0.001$). Those who used self-medication during the 6 months preceding the study obtained a higher percentage of poor knowledge (50.6%) compared to others, but without statistical difference ($P > 0.05$).

Table 3 demonstrates the predictors of having satisfactory knowledge score about analgesic self-medication, after controlling for confounding factors. Students who enrolled in the fifth year or above had approximately two and half times more satisfactory knowledge about self-medication with analgesics, compared to others (OR=2.35; 95% CI: 1.54 -3.58). Female students had an increased likelihood of having more satisfactory knowledge score about the topic compared to males (OR=1.45, 95% CI: 1.02-2.08).

Table 4 illustrates the attitude of the target population towards self-medication with analgesics. It reveals that 36.1% of our participants agreed that medical students can treat themselves by self-medication. In addition, 59.1% and 70.8% of them agreed that self-medication with analgesics may have negative health impact and can cause side effects, respectively. More than 40% of the medical students and interns gave a neutral opinion regarding the ability of the students to diagnose and treat themselves.

Table 1. Percentage of the correct answers in response to knowledge questions about self-medication with analgesics, among senior medical students & interns at King Abdulaziz University

Variables	Correct answer %	Incorrect answer %
The correct definition of analgesic drugs	82.7	17.3
The best analgesic to treat a child who has a viral infection (Acetaminophen)	66.2	33.8
Contraindication and side effect of aspirin (peptic ulcer)	86.7	13.3
Analgesic drug which is not among the NSAIDs (Paracetamol)	62.6	37.4
Type of diclofenac drug (NSAIDs)	60.5	39.5
A drug that has anti-inflammatory, anti-pyretic and analgesic effects (Aspirin)	36.0	64.0
Analgesic drugs that produce an anticoagulant effect with a prolonged bleeding time (NSAIDs)	52.4	47.6
The safest analgesic during pregnancy (Paracetamol)	74.8	25.2
A drug which could cause liver toxicity in large doses (Acetaminophens)	72.7	27.3
Analgesic drug that has a weak anti-inflammatory activity (Acetaminophen)	36.6	63.4

Table 2. Relationship between the level of knowledge about analgesics and the study variables, among senior medical students & interns at King Abdulaziz University

Knowledge score Variables	Satisfactory		Fair		Poor		Total	X ²	P
	No.	%	No.	%	No.	%			
Age									
≤ 21 years	27	34.6	31	39.7	20	25.6	78	7.11	0.029
> 21 years	215	50.5	118	27.7	93	21.8	426		
Sex									
Male	105	43.4	67	27.7	70	28.9	242	11.41	0.003
Female	137	52.3	82	31.3	43	16.4	262		
Nationality									
Saudi	222	47.5	137	29.3	108	23.1	467	1.83	0.40
Non-Saudi	20	54.1	12	32.4	5	13.2	37		
Marital status:									
Single	214	47.8	130	29.0	105	23.4	449	2.33	0.31
Non-single	28	50.9	19	34.5	8	14.5	55		
Educational year:									
Fourth	42	32.8	44	34.4	42	32.8	128	17.87	0.000
Fifth year and above	200	53.2	105	27.9	71	18.9	376		
Residual status									
With family	194	47.2	127	30.9	90	21.9	411	1.92	0.38
In dormitory	48	51.6	22	23.7	23	24.7	93		
Father's education									
University and above	171	46.6	112	30.5	84	22.9	367	1.17	0.57
Less than university	71	51.8	37	27.0	29	21.2	137		
Mother's education									
University and above	143	46.3	89	28.8	77	24.9	309	3.27	0.19
Less than university	99	50.8	60	30.8	36	18.4	195		
Father occupation									
Professional	177	46.6	119	31.3	84	21.1	380	2.34	0.31
Non-professional	65	52.4	30	24.2	29	23.4	124		
Mother occupation									
Professional	116	46.0	70	27.8	66	26.2	252	4.15	0.13
Non-professional	126	50.0	79	31.3	47	18.7	252		
Health insurance									
Yes	95	49.5	47	24.5	50	26.0	192	4.15	0.09
No	147	47.1	102	37.7	63	20.2	312		
Income									
Sufficient	240	48.5	145	29.3	110	22.2	495	2.44 ^a	0.29
Non-sufficient	2	22.2	4	44.3	3	33.3	9		
Use of self-medication with analgesics (practice)									
Yes	142	50.6	80	28.7	57	20.4	279	2.35	0.30
No	100	44.4	69	30.7	56	24.9	225		

^a: Fisher's exact test**Table 3. Predictors of the satisfactory knowledge about self-medication with analgesics among senior medical students & interns at King Abdulaziz University**

Variable	B	P	OR	95% CI
Fifth academic year and above	0.853	0.000	2.35	1.54 – 3.58
Female	0.373	0.041	1.45	1.02 – 2.08
Constant	-0.308	0.024	0.74	

Table 4. Attitude of senior medical students and interns at King Abdulaziz University towards self-medication with analgesics

Attitude statement	Level	Agree		Neutral		Disagree	
		No.	%	No.	%	No.	%
I'm satisfied with self-medication as a method of treatment		174	34.6	175	34.8	154	30.6
I think that medical students can diagnose diseases		150	29.8	204	40.5	150	29.8
I think that medical students can treat themselves		182	36.1	214	42.5	108	21.4
I think that self-medication with analgesics may cause side effects		354	70.8	107	21.4	39	7.8
I think that self-medication with analgesics may cause interaction with other drugs		347	69.4	123	24.6	30	6
I think that I can use analgesics irrespective of the seriousness of the illness		250	49.9	152	30.3	99	19.8
I think that self-medications enhance the inappropriate use of analgesics		303	60.5	137	27.3	61	12.2
I think that I can share analgesics with relatives		176	35.1	148	29.5	178	35.5
I think that self-medication with analgesics saves time and money		123	24.4	187	37.1	194	38.5
I think that self-medication with analgesics may have negative impact		298	59.1	153	30.4	53	10.5

4. DISCUSSION

Results of the current study revealed that about 48% of the clinical years' medical students and interns obtained satisfactory knowledge score about self-medication with analgesics, which is considered low (among such population) and needs improvement. However, a study done among basic years' medical students from Ain Shams University, Cairo, Egypt, revealed that only 18.4% of their students had adequate knowledge about self-medication [12]. This discrepancy could be attributed to the influence of differences between the academic years of the students from both studies. The current study involved students from all grades and interns, while, the Egyptian study was done only among the basic years' students. Their students may not have adequate information about drugs as they didn't yet study pharmacology (at time of the study). The difference may be also because the current study asked about analgesics only, while the Cairo's study asked about all self-medications [12]. A study from Alexandria, Egypt, found that most of their adults who attended pharmacies had poor knowledge about self-medications [23]. This inconsistency of results between our study and this study may be because the study of Alexandria was conducted among the general adult population and not among senior medical students and interns (who have good information about pharmacology and the use of drugs), or it may be due to differences

between both study settings or the type of self-medication or the time of conduction.

In the current study, 82.7% of our participants recognized the correct definition of analgesics. However, only two-fifths of the expatriate adolescents from United Arabs of Emirates (UAE) knew such definition [22]. The reason for this discrepancy may be also to differences between the type of the two target populations.

A considerable proportion of our participants had good knowledge regarding the side effects of analgesics (about 86% and 73% of them recognized the side effects of aspirin and acetaminophens, respectively). On the other hand, an older study done among a convenience sample of 333 British students illustrated that they had lower awareness about the harmful effects of aspirin and acetaminophen; 4% and 12%, respectively (24). These discrepancies may be also due to differences between both populations, samples, or the time of conduction of both studies. Almalak, et al. conducted a study in Riyadh, Saudi Arabia, to determine their knowledge about paracetamol and Ibuprofen (NSAIDs). They found that 56.7% and 50.4% of them had good knowledge about both drugs, respectively [25].

In the current study, students from the higher educational year and interns, and those aged more than 21 years had significantly better knowledge scores about analgesics compared to

others. Similarly, studies from Bahrain [26] and India [27,28] revealed the presence of a statistical significant difference between the level of knowledge of both junior and senior medical students and interns towards self-medication. This may be due to the positive impact of studying pharmacology and clinical education. Our study also revealed the presence of a significant association between gender, the age of the participants and their knowledge about analgesic self-medication. Female students in our research had better knowledge about self-medication with analgesic, compared to males which similar to results from Ain Shams University [12].

Regarding attitudes, 36.1% of our participants agreed that medical students can treat themselves by self-medications. This rate coincides with the rate (39.1%) reported among Egyptian medical students from Ain-Shams University[12]. In our study, 29.8% of the participants agreed that medical students can diagnose diseases, which is higher than the rate (17.4%) reported by the students from Ain shams university[12]. This discrepancy may be due to differences between the educational levels. Results of the present study revealed that about half (49.9%) of the respondents agreed that they can use self-medication with analgesics, irrespective of the seriousness of the illness. Kumar, et al [2] showed that 31.8% of their medical students were ready to advise self-medication to friends. These responses from medical students and interns refer to the need to stress the issues and side effects related to using self-medication with analgesics in the various Pharmacology courses [29].

In the present study, 59.1% of the students and interns agreed that self-medication with analgesics may have a negative health impact. However, better rates were reported among Brazilian students; as 79.4% of dentistry and 91% of nursing students believed that self-medication may bring some harm to health [19]. The reason for these inconsistencies of results may be because we asked about analgesics only, while the Brazilian study they asked about self-medication in general; without specifying analgesics.

5. CONCLUSION

The study illustrated some lack of knowledge regarding self-medication by analgesics among senior medical students and interns from KAU.

However, a considerable proportion of them had good knowledge regarding the side effects of analgesics. Senior medical students and females had better knowledge than the juniors and males. The attitude towards self-medication was positive for some issues and negative for the others. Knowledge about self-medication needs improvement through educational strategies. Educational programs, training courses and workshops on self-medication with analgesics need to be done for students and interns in medical school, stressing on certain points especially the advantages and disadvantages. It is expected that participants who will receive such training during their university education will have a much better understanding about the topic, which can help to reduce the irrational use of self-medications in general and self-medications with analgesics. The current work needs to be extended to include other health professionals; for amplifying the looking on, and for reducing the problem of analgesic self-medications.

CONSENT

As per international standard or university standard, patient's written consent has been collected and preserved by the authors.

ETHICAL APPROVAL

It was taken from Institutional Review Board (IRB) of King Abdulaziz University Hospital.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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