



Practices, awareness and attitudes toward self-medication of analgesics among health sciences students in Riyadh, Saudi Arabia

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ABSTRACT

Background: Self-medication is a common practice among health sciences students in Saudi Arabia. It is known that inappropriate selfmedication may harm individuals due to increasing the risk of drug misuse or delaying a hospital visit by masking some symptoms. Thus, the aim of our study is to investigate and assess practices, awareness and attitudes toward analgesics self-medication among health science students in Riyadh, Saudi Arabia.

Methods: This is a cross-sectional study in a form of electronic survey that was conducted among health sciences students from different universities in Riyadh, Saudi Arabia in 2016. Two hundred and seventy-two students responded to the questionnaire. The electronic questionnaire survey covered demographics, self-medication practice and the analgesics consumption, attitude and awareness about the safety of self-medication practice of analgesics.

Results: Factors associated with high prevalence of self-medication were not significant except for age ($P = 0.04$). Health sciences students had adequate knowledge about the safety of analgesics consumption itself and simultaneous use of analgesics with other drugs, significantly different by college; 80% for Pharmacy, 71% for Medicine, 61% for Nursing and Dentistry, and 25% for Applied Medical Sciences and pre-professional students ($p = 0.037$).

Conclusion: The occurrence of self-medication practices is distressingly high among health sciences students. It is necessary to educate the students about the side effects and drawbacks of irresponsible selfmedication.

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1. Introduction

Self-medication is a common practice among health sciences students worldwide due to various factors (WHO, 2000). It is defined as “the selection and use of medicines/medicinal products, including herbal and traditional products by individuals, to treat

self-recognized illness or symptoms, or the intermittent or continued use of a medication prescribed by a physician for chronic or recurring diseases or symptoms” (WHO, 2000; Gyawali et al., 2015). If self-medication is practiced appropriately, such as conditions managed by over-the-counter (OTC) products, it may be beneficial for individuals who do not need medical attention or their illness is not severe enough to seek medical attention. For example, when student treat troublesome headache with over-the-counter paracetamol. However, inappropriate self-medication may cause harm to individuals because of delaying a hospital visit or increasing the risk of drug misuse/abuse (Mumtaz et al., 2011). Inappropriate self-medication practice doesn't seem to be a risk for health sciences students only, but it might be a possible risk for their future professionalism and medication use practice (Lukovic et al., 2014) might affect the quality of care as they may advise patients and relatives to practice self-medication without seeking medical attention (Montgomery, 2011). Therefore, making

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students aware of the dangers of analgesics consumption should be ensured for student well-being and future achievements. So, more educational and governmental interventions are needed to increase the awareness among university students.

In general, previous studies revealed that the prevalence of self-medication practice seems to be high worldwide among health sciences students. In Serbia- University of Belgrade, 79.9% of health sciences students practice self-medication (Lukovic et al., 2014; Da Silva et al., 2012; Zardosht et al., 2016). In addition, in Jeddah, Saudi Arabia, it has been reported that the prevalence of self-medication by medical students and interns is (75.2%) in King Abdulaziz University. This percentage appears to be high which indicate that self-medication is a common practice throughout Saudi Arabia (Ibrahim et al., 2015).

One of the most common groups of medications that health science students are using during their practices of self-medication are analgesic agents. "Analgesic" is a term that refers to any medication that provides pain relief, and it is also known as painkiller (Abahussain et al., 2005). Acetaminophen, Nonsteroidal anti-inflammatory drugs (NSAIDs), and opioids are groups of medications that are capable of providing analgesia and are commonly used worldwide to manage pain. Among all painkiller agents, acetaminophen is the most common medication used by health science students to manage different types of pain (Da Silva et al., 2012). In average, 3.45 medications are used per student, 20% of the students are consuming paracetamol formulations. Moreover, the frequent use of self-medication practice in students is based on their own knowledge (80%). However, student's knowledge about potential drug interactions, adverse effects and complications may be questionable and may lead to unsatisfactory outcomes because of the lack of experience at this stage of students' lives (Zardosht et al., 2016).

There are many indications that motivate students to consume analgesics. Headache is the most common indication for analgesic consumption among college students. The prevalence of lifetime tension type headaches and migraine headaches were 66.8% and 13.06% respectively among health science students, which drive them to self medicate more analgesics (Birru et al., 2016). Obviously, uncontrolled pain is associated with impaired social and academic functioning, which might affect students negatively. However, as health science students are more prone to use self-medication with analgesics, they might be at risk of analgesics overuse (Zardosht et al., 2016). There are different potential risks of self-medications such as incorrect self-diagnosis, administration or dosing. Another risk like failure to recognize self-contraindications/ percussions or drug-drug interactions (WHO, 2000).

Looking at the various factors that may contribute to self-medication therapy among health science students in previous studies, family's level of education, tendencies away from physical activity, female gender and being of older age are the most common factors for such practice (Lukovic et al., 2014). Moreover, academic level is an important predictor of practicing self-medication as shown in the study conducted by Klemenc-Ketis et al. which stated that senior health science students were found to be more likely consumers of analgesics, compared to junior students (Klemenc-Ketis et al., 2010). Having adequate knowledge about medications is also a possible risk factor for self-medication among health sciences students (Da Silva et al., 2012; Zardosht et al., 2016). According to the study conducted by Zardosht et al., it was illustrated that the most common reason of using self-medication is student knowledge of diseases and medications (Zardosht et al., 2016).

In fact, it is important to raise awareness of the dangers of self-medication to students since the safety background of self-medication might be different between students from different

specialties and different ages. A published study in 2015 in Bangladesh reported that pharmacy students are more aware than medical students of the dangers of the self-treatment taking into account side effects and possible toxicity (Alam et al., 2015).

To the best of our knowledge, it can be concluded that there have been few studies conducted in Saudi Arabia that addressed this issue well among students from different health science specialties. While the other studies have focused on attitudes and practices of self-medication among students, this study takes important steps toward a better understanding of these practices among variety of health sciences students. Thus, the aim of our study is to investigate and assess practices, awareness and attitudes toward self-medication of analgesics among health sciences students in Riyadh, Saudi Arabia from different universities and specialties.

2. Material and methods

This is a cross-sectional study in a form of electronic survey that was conducted among health sciences students from different universities in Riyadh, Saudi Arabia during the research summer school in 2016. It involved medical, pharmacy, dental, nursing, and applied medical sciences students. The survey that has been used was adapted from a previous study (Klemenc-Ketis et al., 2010). The survey was composed of 32 items covering three parts. The first part of the questionnaire included demographics and clinical data of the participants (e.g. age, gender, specialty, exercise). While the second part of the questionnaire focused on the self-medication practice and the analgesics consumption (eg. Indications, reason for self-medication with analgesics, type of analgesia). The third part was mainly focused on the awareness and knowledge about the safety of self-medication practice in a form of likert-type scale. The questionnaire asked for participants' consent at the time of registration and assured them about the confidentiality and anonymity of their answers. This questionnaire got the approval from King Abdullah International Medical Research Center, Riyadh.

Based on Raosoft online sample size calculator with 5% margin of error and 95% confidence interval, the calculated sample size was 237 students, considering the estimated number of health sciences students in Riyadh during the research summer school in 2016 which is about 600–650 students.

Descriptive statistical analyses were performed on the data for the study participants. Continuous variables were summarized using mean and standard deviation (SD), and proportions were used for categorical variables. Self-medication and safety of analgesics use were analyzed and compared by age, gender, smoking, exercise and college. Comparisons were made using the chi-square test. Statistical significance was considered at $p < 0.05$. All statistical analyses were performed using IBM SPSS 21.0 (Armonk, NY: IBM Corp).

3. Results

An 80% response rate was initially anticipated, and therefore, the questionnaire was administered electronically to 300 students. A total of 272 students completed it, representing a higher than anticipated response rate of 91%. The results were categorized to three main groups: Demographics, Disease, Awareness. Descriptive statistics of the respondents are displayed in Table 1. Seventy one percent of the respondents were females. The distribution of age was as follows: below 20 years 11%, 20–22 years 65% and above 22 years 24%. The vast majority of respondents were single (97%) and have a Saudi nationality (96%). The distribution of college enrollment was as follows: Medicine 29%, Applied Medical

Table 1
Profile of respondents - demographics. N = 272.

Factor	
Gender n (%)	
Female	194 (71.3%)
Male	78 (28.7%)
Age group (years)	
Below 20	29 (10.7%)
20–22	178 (65.4%)
Above 22	65 (23.9%)
Marital Status n (%)	
Single	264 (97.1%)
Married	8 (2.9%)
Nationality n (%)	
Saudi	262 (96.3%)
Non-Saudi	10 (3.7%)
Occasional Exercise n (%)	
Yes	142 (52.2%)
No	130 (47.8%)
Smoking n (%)	
Yes	25 (9.2%)
No	247 (90.8%)
Type of Smoking n (%)	
Cigarettes	12 (48.0%)
Shisha	16 (64.0%)
Other	2 (8.0%)
College n (%)	
Pharmacy	54 (19.9%)
Medicine	79 (29.0%)
Nursing	17 (6.3%)
Applied Medical Sciences	51 (18.8%)
Dentistry	63 (23.2%)
Pre-professional	4 (1.5%)
Other	4 (1.5%)
Year of Study n (%)	
First	12 (4.4%)
Second	33 (12.1%)
Third	75 (27.6%)
Fourth	73 (26.8%)
Fifth	29 (10.7%)
Sixth	24 (8.8%)
Intern	26 (9.6%)

Sciences 19%, Nursing 6%, Dentistry 23% and Pharmacy 20%. About 54% of respondents were in their third or fourth year of study and 30% were in years 5–6 or in the internship program. Forty eight percent of respondents did not exercise even occasionally while the vast majority was non-smokers (91%).

Descriptive data which focus in disease are displayed in Table 2. Seventy two percent of the respondents reported that their average sleeping time is more than 7 h and half of them said that their daily study time ranges from 1 to 3 h. Most respondents visit a doctor 1–3 times a year and about half of them reported that they have some diseases. About 70% reported that their medications were not prescribed by a physician and 21% reported that reported that self-medication was their first method of treatment for all problems.

Results in Table 3 showed that about 47% of respondents indicated that they want to play an active role regarding their health and only 34% have adequate knowledge of medication and disease. Eighty three percent of respondents reported that they used analgesics in the past year and 78% were satisfied with it. The vast majority of respondents (92%) were aware that analgesics have side effects (Table 4).

Most respondents agreed that simultaneous use of analgesics with other drugs and increasing doses of these medications can be dangerous; 70% and 88%, respectively (Table 5). Results in Table 6 showed that overall, 58 respondents (21.3%) reported that they use analgesics as their first method of treatment for all problems (self-medication). Moreover, younger students (aged < 20 years) were significantly more likely to use self-medication (74%) vs. (18–23%) for older ages. Female students use to self medicate (24.2%) as compared to male (14.1%) and among different colleges, College of

Table 2
Focus in the disease. N = 272.

Factor	
Average Sleeping Time (hours) n (%)	
<7	77 (28.3%)
7–9	165 (60.7%)
More than 9	30 (11.0%)
Daily Study Time (hours) n (%)	
1–3	135 (49.6%)
4–6	102 (37.5%)
7–10	30 (11%)
More then 10	5 (1.8%)
Visits to Doctor (Previous Year) n (%)	
1–3	195 (71.7%)
4–6	46 (16.9%)
More then 6	31 (11.4%)
Any Diseases n (%)	
Yes	145 (53.3%)
No	103 (46.7%)
Type of Disease	
Diabetes	3 (2.1%)
Hypertension	7 (4.8%)
Asthma	20 (13.8%)
Skin disease	21 (14.5%)
Kidney disease	2 (1.4%)
Epilepsy	2 (1.4%)
Depression	19 (13.1%)
Anxiety	17 (11.7%)
Psychiatric disorders	5 (3.4%)
Rhinitis	9 (6.2%)
Other allergies	11 (7.6%)
Cancer	8 (5.5%)
Other	21 (14.5%)
Medication Prescribed by Physician n (%)	
Yes	83 (30.5%)
No	189 (69.5%)
Headache n (%)	
Yes	116 (42.6%)
No	156 (57.4%)
Type of Headache n (%)	
Migraine	19 (7.0%)
Tension-related	40 (14.7%)
Sinus-related	6 (2.2%)
Chronic	10 (3.7%)
Other	10 (3.7%)
Missing	31 (11.4%)
Self-medication n (%)	
Always unjust, if not examined by doctor	45 (16.5%)
OK only after receiving advice from doctor/pharmacist	98 (36.0%)
OK for some problems without consulting doctor/pharmacist	71 (26.1%)
First method of treatment for all problems	58 (21.3%)
Practiced Self-medication in Past Year n (%)	
Yes	199 (73.2%)
No	73 (26.8%)

Table 3
Reasons for self-medication (likert items).^a

Item	Median	Range (min:max)	%Agree/Strongly Agree
Have adequate knowledge of medication and disease	3.00	4(1:5)	34.2%
Does not want to burden physician – illness is not severe	3.00	4(1:5)	26.1%
Want to play an active role regarding my health	3.00	4(1:5)	47.4%
Does not want to visit physician – long waiting time	3.00	4(1:5)	39.0%

^a Coding: 5 = strongly agree, 4 = agree, 3 = not sure, 2 = agree, 1 = strongly disagree.

Nursing were more likely to use self-medication (41.2%); however, these results were not statistically significant ($p > 0.05$). Lastly, students in year 6 or interns tended to use self-medication more than those in earlier years (12.0% vs. 23.4%; $p = 0.075$).

Table 4
Analgesics consumption, N = 272.

Factor	
Used Analgesics in the Past Year n (%)	
Yes	226 (83.1%)
No	46 (16.9%)
Type of Analgesics Used n (%)	
Paracetamol	218 (96.5%)
NSAIDs	111 (49.1%)
Opioids	17 (7.5%)
Other	1 (0.4%)
Indication for Analgesics Consumption n (%)	
Headache	208 (92.0%)
Fever	118 (52.2%)
Cold	88 (38.9%)
Muscle Pain	63 (27.9%)
Stomach Pain	53 (23.5%)
Menstrual Cramps	99 (43.8%)
Allergy	22 (9.7%)
Other	16 (7.1%)
Frequency of Analgesics Use n (%)	
Almost Daily	24 (8.8%)
Monthly	163 (59.9%)
Yearly	71 (26.1%)
Other	14 (5.1%)
Satisfied with Analgesics Use n (%)	
Yes	212 (77.9%)
No	60 (22.1%)
Experienced Side Effects from Analgesics Use n (%)	
Yes	35 (12.9%)
No	237 (87.1%)
Aware that Analgesics Have Side Effects n (%)	
Yes	249 (91.5%)
No	23 (8.5%)

Table 5
Safety of analgesics consumption (likert items).^a

Item	Mean	SD	%Agree/ Strongly Agree
Simultaneous use of Analgesics with other drugs can be dangerous	3.99	0.96	69.9%
Increasing doses of Analgesic drugs can be dangerous	4.49	0.85	88.2%

^a Coding: 5 = strongly agree, 4 = agree, 3 = not sure, 2 = disagree, 1 = strongly disagree.

Table 6
Self-Medication^a by Respondents' Characteristics.

	N	Number	%	P ^b
All respondents	272	58	21.3%	
Age group				0.048
Below 20	29	11	73.9%	
20–22	178	32	18.0%	
Above 22	65	15	23.1%	
Gender				0.065
Female	194	47	24.2%	
Male	78	11	14.1%	
College				0.20
Pharmacy	54	13	24.1%	
Medicine	79	11	13.9%	
Nursing	17	7	41.2%	
Applied Medical Sciences	51	12	23.5%	
Dentistry	63	14	22.2%	
Pre-professional/Other	8	1	12.5%	
Year of Study				0.075
1–5	222	52	23.4%	
6+	50	6	12.0%	

^a Indicated by first method of treatment for all problems.

^b Based on the chi-square test.

Results from additional analyses showed that safety of analgesics consumption indicated by reporting that simultaneous use of analgesics with other drugs as well as their increasing doses can be dangerous was significantly different by college; 80% for Pharmacy, 71% for Medicine, Nursing and Dentistry vs. 61% and 25% for Applied Medical Sciences and pre-professional students ($p = 0.037$).

4. Discussion

In this study we evaluated the practice of self-medication of analgesics among Health Sciences Students in Riyadh, Saudi Arabia. The prevalence of self-medication among university students is 73.2%. This study supports earlier reported study with similar results of 76% (Mumtaz et al., 2011). Conversely, the incidence of self-medication in other countries as turkey is 45% and in Hong Kong is 94% (James et al., 2006).

In the present study, the main reasons of self-medication were long waiting time (39%) to see physician, do not burden the physician for minor illness (26%) and want to play an active role regarding their health (47.4%). These results endorsed with other studies which also mentioned the factors such as time saving by not visit the physician (Klemenc-Ketis et al., 2010; Aljinović-Vucić et al., 2005; Amani et al., 2011; Sharifirad et al., 2012). About 34.2% of the respondents in the present study perceived that they have adequate knowledge of medications and diseases. This result is consistent with another study conducted in kerman by Zardosht et al indicated that students' knowledge about diseases and their treatment can persuade the use of self-medication (Zardosht et al., 2016).

In addition, the present study was conducted among different age groups, the distribution of age was as following: below 20 years (11%), 20–22 years (65%) and above 22 years (24%). Specifically, We found that most students whom are using analgesics were aged between 20 and 25 years (65.4%). Similar results were found by Ibrahim et al. (2015). The reason for this result might be because senior students are more confident to select medication for minor illness.

In this study, the majority of the survey respondents were from medical, pharmacy and dentistry colleges and showed positive attitudes towards self-medication as compared to applied health sciences and nursing students. This finding demonstrated that self-medication is significant among medical, pharmacy and dental students as previously reported by Alam et al. (2015). This study also revealed that approximately 36% of the students would like to consult with doctor or pharmacist for medical advice. Similar findings were observed in earlier studies by Klemenc-Ketis et al and Alam et al where they reported that healthcare students inquire about the recommendation of a physician or pharmacist for different types of Over-the-Counter drugs (Klemenc-Ketis et al., 2010; Alam et al., 2015).

Majority of the respondents in the present study mentioned that they practice self-medication for minor illness, such as headache, fever, or menstrual cramps 92.0%, 52.2%, 43.8% respectively for which they believed that no medical intervention is required. A similar finding was reported by Mumtaz et al and Henry et al where fever, headache, flu and body ache were the most common complaints for self-medication (Mumtaz et al., 2011; Montgomery, 2011; Lukovic et al., 2014; Da Silva et al., 2012; Zardosht et al., 2016; Ibrahim et al., 2015; Abahussain et al., 2005; Birru et al., 2016; Klemenc-Ketis et al., 2010; Alam et al., 2015; Badiger et al., 2012; James et al., 2006). It is important to mention that self-medication of minor illness gives patients the chance to take

responsibility and develop confidence to deal with their own health (Awad and Eltayeb, 2007; Al-Bakri et al., 2005).

Our results illustrated that 53% of the students visited the physician one to three times during the previous year to consult their medical problem with their physician, while 46% did not consult a physician because they have enough knowledge to deal with minor diseases. Similar pattern was reported by Mumtaz et al which showed that a large number of participants did not consult their physician due to the students' knowledge regarding self-medication (Mumtaz et al., 2011).

Furthermore, our study indicated that final year students and interns are practicing self-medication more as compared to first-year to fifth-year students. These findings can be compared with other studies by Banerjee et al, that showed significant difference ($p < 0.001$) in practicing self-medication among first-year students 41.67% and final-year students 79.31% (Al-Bakri et al., 2005).

In addition, our findings showed that 87% of the students did not have side effects when they used analgesic for minor illness, while 13% suffered from side effects. It is worth noting that approximately 92% of the students were aware about the nature of side effects related to the use of analgesics, while about 8% were unaware of side effects. These findings are supported by other studies by Badiger et al. (2012), Zafar et al. (2008).

Our findings also revealed that the most common used analgesics were acetaminophen (96.5%) and NSAIDs (49.1%). This finding is consistent with a study conducted by Correa da Silva where acetaminophen (20.3%) and aspirin (6.2%) are the most common agents (Zardosht et al., 2016). On the other hand, Barea et al contradict our results, where aspirin is more commonly used than acetaminophen to treat headache (Barae et al., 1997).

Finally, as expected, the prevalence of self-medication among university health sciences students in this study (73.2%) was substantially higher than that reported in the general Saudi population (19%) (Kasulkar and Gupta, 2015).

4.1. Limitations and strengths

The strength of the study was the good sample size. Out of 300 participants, the response rate was 91% which is quite enough. There are some limitations to this study. First, as cross-sectional design could only study the opioids and report behaviors at particular point in time, so the significant associations may not be that strong. For more stronger conclusion, we suggest further research to observe actual behavior with a study type that can follow-up with students and study their consumption behaviors.

Second, the electronic survey tool has some disadvantages despite online anonymous survey such as reporting bias in selecting the form of drugs that have been used for self-medication. As the questionnaire was self-reported, it might lead to under or over depiction of the self-medication utilization.

5. Conclusion

This study shows high prevalence of self-medication of analgesics among Health Sciences Students in Riyadh, Saudi Arabia. It is necessary to educate the students about the side effects and drawbacks of irresponsible self-medication. Acetaminophen and NSAIDs were the most frequently used medications, particularly to treat headaches, colds, cramps, and fever. There is an imperative need to develop policies and legislations to purchase drugs from community pharmacies without prescription apart from those

medications which are safe to use in general population. More studies are required to estimate the prevalence of self-medication among health sciences students in other cities and to explore the various factors affecting self-medication such as awareness and knowledge about of advantages and disadvantages of self-medication among health sciences students.

Declarations of interest

None.

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