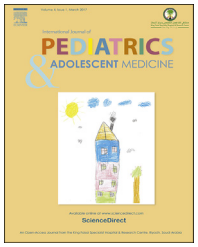
International Journal of Pediatrics and Adolescent Medicine (2017) 4, 19–25

HOSTED BY

Available online at www.sciencedirect.com

ScienceDirect

journal homepage: http://www.elsevier.com/locate/ijpam



Original Research Article

The self medication use among adolescents aged between 13–18 years old; Prevalence and behavior, Riyadh – Kingdom of Saudi Arabia, from 2014–2015

Turki Homod Albatti [a,*], Shahd Alawwad [b], Roqaih Aldueb [b], Razan Alhoqail [b], Rawan Almutairi [b]

[a] *Child and Adolescents Psychiatry Department, King Khalid University Hospital, Saudi Arabia*
[b] *College of Medicine, King Saud University, Saudi Arabia*

Received 25 November 2015; received in revised form 21 March 2016; accepted 23 May 2016
Available online 13 July 2016

KEYWORDS
Self-medication;
Adolescents;
Riyadh-Saudi Arabia;
Prevalence;
Behavior

Abstract *Background and objectives:* In Saudi Arabia, people have easy access to medication and can purchase prescribed medications, such as anti-acne medications and antibiotics, over the counter without the need for a prescription from a physician.

Our research is focused on estimating the prevalence of self-medication and understanding the reason for self-medication because previous studies have shown an increase in the practice of self-medication globally and locally.

The aim of this study is to estimate the prevalence of self-medication among adolescents aged 13–18 years of both genders in Riyadh, Saudi Arabia. In addition, we aim to identify the indications and external and internal factors behind self-medication, including the effects of gender, peer influence and parental supervision on the decision of adolescents to self-medicate.

Patients and Methods: An observational and cross-sectional adolescent-based study was performed to estimate the degree of self-medication among 400 intermediate and high school students in private and governmental schools living in Riyadh between 2014 and 2015 using a multistage random sampling technique. A validated self-administered questionnaire was used for data collection, and data were tabulated and analyzed with the SPSS version 21 computer program.

Results: We found that the rate of self-medication among adolescents was high (94.5%). Analgesics were the most common medication used (87.3%), and the least common medication used was hormones (5%). A majority of the students reported that headache was the reason for using analgesics. The sources of the medications included the pharmacy (51.64%),

* Corresponding author. King Khalid University Hospital, College of Medicine, King Saud University, Riyadh, Saudi Arabia. Tel.: +966 114671717.
E-mail address: talbatti@ksu.edu.sa (T.H. Albatti).
Peer review under responsibility of King Faisal Specialist Hospital & Research Centre (General Organization), Saudi Arabia.

http://dx.doi.org/10.1016/j.ijpam.2016.05.001
2352-6467/Copyright © 2016 Publishing services provided by Elsevier B.V. on behalf of King Faisal Specialist Hospital & Research Centre (General Organization), Saudi Arabia. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/).

followed by parents (34.33%). The results showed that self-medication was significantly associated with the type of school that the adolescents attended ($P < 0.011$) and the health status of the adolescents (P -value <0.035).
Conclusion: Self-medication is highly prevalent in Riyadh, particularly among adolescents. Easy access to pharmacies was found to be the leading cause for self-medication. The use of these drugs was associated with inappropriate drug use and the deterioration of health status. Self-medication should be closely monitored and awareness should be increased with educational programs among students.
Copyright © 2016 Publishing services provided by Elsevier B.V. on behalf of King Faisal Specialist Hospital & Research Centre (General Organization), Saudi Arabia. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/).

1. Introduction

The term self-medication refers to the use of nonprescription medicines, usually over-the-counter (OTC) drugs, to treat certain minor ailments without consulting a medical practitioner and without medical supervision [1]. Self-medication can present in different forms, including acquiring medication without a prescription, sharing medications with others, or utilizing a medication that is already available in the residence [1]. In Saudi Arabia, people have easy access to medication and can purchase prescribed medications, such as anti-acne medications and antibiotics, over the counter without the need for a prescription from a physician.

Our research is focused on the estimation of the prevalence of self-medication and understanding the reasons for self-medication. Previous studies have reported an increase in self-medication globally and locally. The prevalence of self-medication has been estimated to be between 10.3% and 87.0% worldwide, varying according to the population studied and methods used [2–5]. Among the Gulf Cooperation Council, the United Arab Emirates showed a high prevalence of self-medication (89.2%) [6]. Locally, in the Al Qaseem region of Saudi Arabia, researchers found that the majority of adolescents were self-medicating (86.2%) [7]. Studies assessing self-medication in adolescents are rare [1,8,9]. Studies have found that improper self-medication leads to a delay in seeking medical advice when needed, a deterioration in health status, the masking of the presence of severe disease, drug interactions, possible development of antibiotic resistance among pathogens, adverse drug reactions, monetary attrition and a risk of dependence and abuse [4,10–13].

Self-medication is not restricted to adolescents, but can also occur in any age group. The WHO has identified adolescence as the period in human growth and development that occurs after childhood and before adulthood, from ages 10 to 19. It represents one of the critical transitions in the life cycle of humans. The biological determinants of adolescence are fairly universal; however, the duration and defining characteristics of this period may vary across time, cultures, and socioeconomic situations. Adolescents are different from both young children and adults. Specifically, adolescents are trying to develop their own identity, and they are not fully capable of understanding complex concepts, the relationship between behavior and consequences, or the degree of control that they have or can have in making health-related decisions. As a result, during this process, adults have unique opportunities to influence young people [14].

We focused on this age group for many reasons: early adolescence is characterized by the transition from a family-centered environment to a broader environment that is open to more influences [15], and it is not only a blend of childhood and adulthood. Adolescence is a distinct stage with unique biological and social characteristics that combine both normal and abnormal behaviors [16]. Adolescence is a key period in which an individual takes their first steps towards self-care and self-medication, and the health care habits adopted during adolescence may be carried over into adulthood. This age is also a time for self-exploration. Most teens develop more autonomy than they had as children, and they are curious to try new things, such as medications [17]. The population of the Kingdom of Saudi Arabia includes a much higher percentage of children and adolescents than elderly, approximately 60% based on a census study in 2009 [18]. To the best of our knowledge, there is no study showing the prevalence of self-medication among adolescents of both genders in Riyadh, Saudi Arabia.

2. Patients and Methods

A cross sectional observational study was performed to estimate the prevalence of self-medication among adolescents in Riyadh from 2014 until 2015 after obtaining Institutional Review Board approval.

The target population included all adolescents of both genders aged 13–18 years old from intermediate schools, high schools, and private and governmental schools, living in Riyadh (the capital city of the Kingdom of Saudi Arabia). Questionnaires written in Arabic were distributed to students in the schools during official working hours while the students were in attendance. The response rate was 100%.

We distributed the questionnaire equally among students in each location: the North, East, South, West and Central regions of Riyadh. The questionnaire was also equally distributed with regards to gender.

Our sample size was calculated by using the formula:

$n = N/(1 + N \times e2) = 400$

n = Sample size = 400

N = population size = 2,000,000 [18]

e = margin of error = 5%.

Prevalence of Adolescents is 2,000,000, Sample size = 400

2.1. Inclusion criteria

Saudi and/or non-Saudi adolescents of both genders aged 13—18 years old who attended the school.

2.2. Exclusion criteria

Subjects younger than 13 or older than 18 years old, students who were prescribed medication by a doctor, and students who were treated by medical personnel — their parents or a physician.

3. Randomization technique

The technique that was used (Multistage Random Sampling) was performed in stages to identify the target population: "all adolescents of both genders aged 13—18 from intermediate and high schools and private and governmental schools, living in Riyadh (the capital city of the Kingdom of Saudi Arabia)".

We started by dividing Riyadh into sections: North, South, East, West and Center.

We then randomly selected 8 schools from each section (4 schools with female students and 4 schools with male students).

These 4 schools from each gender consisted of 1 governmental high school, 1 governmental intermediate school, 1 private high school and 1 private intermediate school.

We enlisted 10 students from each school, and each student was provided a questionnaire with instructions to consult the instructor to clarify any question when needed.

The time spent with each student was between 5 and 7 min.

4. Study questionnaire & validation procedure

The researchers developed the questionnaire, and a pilot study was conducted before the study officially proceeded.

The pilot study was performed on 15 students aged 13—18; 7 males and 8 females were randomly chosen from different schools, and the researcher was available to address any questions from the students.

We redistributed the questionnaire after 14 days to the same students, and there were no differences in the results and no ambiguities or difficulties when the students completed the questionnaire twice.

Data were collected from a self-administered questionnaire. The questionnaire consisted of 33 questions in Arabic. The questionnaire was divided into 2 sections:

1 Sixteen questions were regarding personal data; we collected data on: age; gender; parental supervision; socioeconomic status; presence of any chronic diseases; health related behaviors, such as smoking or regular physical activity; education level of the parents; and whether the subject received any medicine under medical supervision along with the name of the medication.

2 Seventeen questions were regarding self-medication, addressing different types of medications used without physician supervision. These medications included: eye drops, nasal drops, acne treatment, pain killers, antibiotics (creams or oral pills), vitamins, proteins, hormones, anti-allergy medications, antiemetic drugs, anti-diarrheal medications, laxatives, skin creams, anti-flu medication, antitussives, antacids and any other drugs. We also evaluated indications and the source of the medication (pharmacy workers, parents, relatives, friends and social media acquaintances).

5. Statistical analysis

Data were extracted from questionnaires into SPSS software version 21. Data were audited, standardized and analyzed. Categorical variables were expressed as percentages, and the chi square test ($\chi 2$) was used. A 95% confidence interval (CI) was used to assess different risk factors. A *P* value of less than 0.05 was used as the level of significance. The statistical outlier method was used to detect entry errors.

6. Ethical considerations

After receiving permission from the Ministry of Education to conduct the study in the schools, the implementation of the study was as follows: we developed consent forms explaining the research and rationale of the research and clearly described the informed consent. We indicated the purpose of the study, why the participants had been chosen, all of the potential risks and benefits and the right of the participants to withdraw at any time without penalty or loss of benefit. We then visited the schools, identified the students who wanted to participate after applying randomization, completed the questionnaire and asked the instructors if there were any misunderstandings.

We secured the data that we obtained from our participants, and at the end of the study, we will conduct awareness sessions about the high prevalence of self-medication among adolescents and the risks of self-medicating in this critical age group.

There was no funding required for this study.

7. Results

A total of 201 females and 199 males completed the questionnaire; 81.5% of participants were Saudis and 18.5% were non-Saudis, and 83.3% of participants did not report any diseases, while 16.7% of participants reported having a chronic disease.

We found that 93.49% of participants had at least one parent who had been educated, and 7.3% of participants had at least one parent who was a physician or a member of the medical profession.

Fig. 1 reveals that the most common source of medications was the pharmacy (51.64%), followed by a parent (34.33%), and the least common source was through an

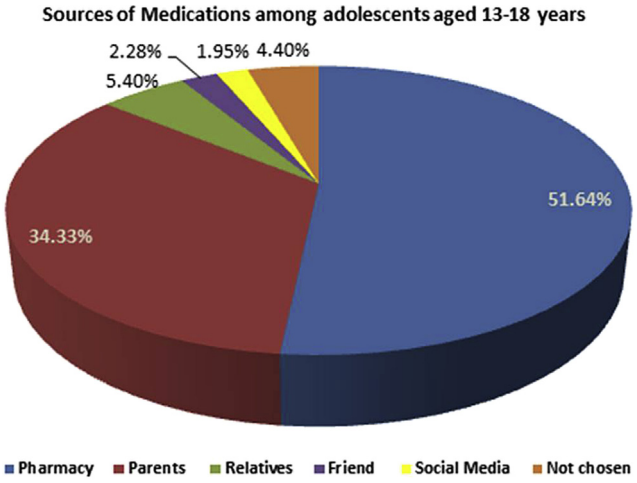


Figure 1 Sources of Medications among adolescents aged 13–18 years.

acquaintance on social media (1.95%). These sources of medications were significantly different ($P < 0.0001$).

Tables 1 and 2 show the different factors that influenced the study subjects to self-medicate. These factors were divided into internal and external factors.

Table 1 outlines the external factors and reveals that only the school type was a statistically significant external factor that affected self-medication among this age group (*P*-value was 0.011).

Table 2 shows the internal factors; health status was the only statistically significant risk factor affecting self-medication (*P* value was 0.035). The same table also shows that the gender did not have a strong effect; females and males were 95% and 93.97%, respectively.

The overall prevalence of self-medication was 94.5%, as shown in Table 3, and the use of multiple drugs was statistically significant ($P < 0.0001$).

Fig. 2 shows that among both genders, the most common type of medication used was analgesics (87.3%) and the least common type of medication used was hormones (5%). Regarding medication use based on gender, the most common type of drug used among males was analgesics (93.6%), followed by cold and flu treatments (56.7,%), and the least used type of drug was hormones (6.4%)

In females, the most common type of drug used was analgesics (91.1%), but the second most common was creams (54.5%); the least often used drug was for treatment of constipation (6.3%).

The indications for self-medication included: eye drops to treat allergies, nose drops for nasal congestion, creams for muscle pain, and vitamins (vitamin C; vitamin B12 and folic acid were reported as never used). For anti-allergy medication, skin allergies were the most common indication and analgesics to treat headache were also reported.

8. Discussion

Self-medication use among adolescents aged 13–18 years in Riyadh was high (94.5%). A previous study in Al Qaseem, Saudi Arabia, found that 86.2% of male university students [7] self-medicated. In addition, the Gulf States exhibited a higher prevalence of self-medication among adolescents than Brazil or Germany [1–5]. The prevalence of self-medication in the United Arab Emirates was 89.2% and

Table 1 External factors.

	n = 400	No OTC use No.(%)	1 OTC used No.(%)	2 OTC used No.(%)	More than 3 OTC used No.(%)	X^2	*P* value
School							
Government	192	6(3.13)	31(16.14)	37(19.27)	118(61.46)	11.22	**0.011**
Private	208	16(7.69)	15(7.21)	38(18.27)	139(66.83)		
Areas of Riyadh							
North	80	6(7.5)	8(10)	12(15)	54(67.5)	12.5	0.40
South	80	6(7.5)	12(15)	11(13.75)	51(63.75)		
West	80	0	12(15)	17(21.25)	51(63.75)		
East	80	6(7.5)	8(10)	18(22.5)	48(60)		
Center	80	4(5)	6(7.5)	17(21.25)	53(66.25)		
Nationality							
Saudi	326	18(5.52)	35(10.74)	61(18.71)	212(65.03)	1.19	0.75
Non-Saudi	73	4(5.48)	11(15.07)	14(19.18)	44(60.27)		
Mother's education level							
Academic degree	209	15(7.18)	18(8.61)	37(17.70)	139(66.51)	6.13	0.10
Non academic degree	185	7(3.78)	28(15.14)	36(19.46)	114(61.62)		
Father's education level							
Academic degree	267	16(5.99)	27(10.11)	54(20.22)	170(63.67)	2.96	0.39
Non academic degree	129	6(4.65)	18(13.95)	19(14.73)	86(66.67)		
Income							
Less than 5000	25	–	2(8)	3(12)	20(80)	11.05	0.27
5000–10,000	82	4(4.89)	11(13.41)	12(14.63)	55(67.07)		
10,000–20,0000	119	7(5.88)	18(15.13)	26(21.85)	68(57.14)		
More than 20,000	152	9(5.92)	10(6.58)	30(19.74)	103(67.76)		

Table 2 Internal factors.

	n = 400	No OTC use No.(%)	1 OTC used No.(%)	2 OTC used No.(%)	More than 3 OTC used No.(%)	X^2	*P* value
Age (years)							
13	39	2(5.13)	6(15.38)	12(30.77)	19(48.72)	15.2	0.43
14	64	6(9.38)	4(6.25)	11(17.19)	43(67.19)		
15	96	2(2.08)	11(11.46)	20(20.83)	63(65.63)		
16	84	7(8.33)	10(11.90)	15(17.86)	52(61.90)		
17	64	4(6.25)	7(10.94)	9(14.06)	44(68.75)		
18	50	1(2)	8(16)	8(16)	33(66)		
Gender							
Male	199	12(6.03)	19(9.55)	33(16.58)	135(67.84)	3.3	0.35
Female	201	10(4.97)	27(13.43)	42(20.90)	122(60.70)		
Health status							
Healthy	334	21(6.29)	39(11.68)	69(20.66)	204(61.08)	8.6	**0.035**
Chronic disease	66	2(3.03)	7(10.61)	6(9.09)	51(77.27)		

Table 3 Pattern of drug use.

	No.(%) (n = 400)	X^2-value	*P* value
Multi drug	253(63.25)	327.26	<0.0001
2 drugs	77(19.25)		
1 drug	48(12)		
No drug	22(5.5)		

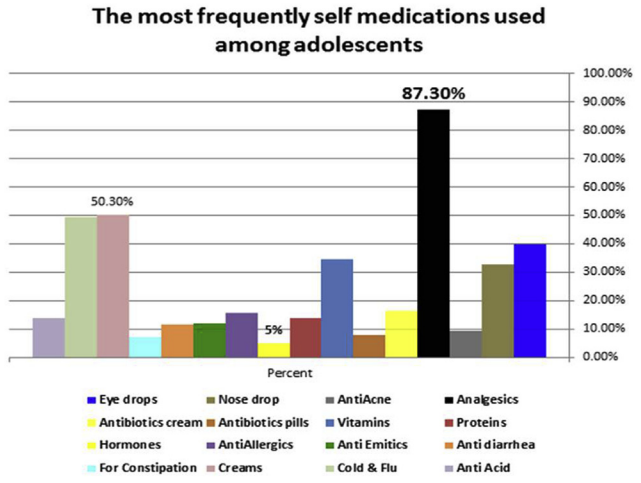


Figure 2 The most frequently self-medications used among adolescents.

92% in Kuwait [6,7,19] The prevalence of self-medication was 65% in Brazil and 25.2% in Germany [1,5].

The high prevalence of self-medication found in our study could be explained by the easy access to OTC products in the convenience store.

Our study revealed that the most commonly used type of medication was analgesics (87.3%) and the least common was hormones (5%), which is comparable to the findings of several studies carried out in different countries [4,10,12]. A previous study in KSA reported that the most frequent drugs used were: paracetamol, antibiotics and NSAIDs [7]. However, a study in Germany revealed that drugs acting on the respiratory system were used most often (32.1%), accounting for one-third of all self-medications [1].

Overall, we found many indications or factors for self-medicating. The most common indication for analgesics was headache, which is similar to a study in the UAE [6].

This previous study showed that 8% of participants were using antibiotics (pills, creams), which may indicate an understanding of the misuse of antibiotics and antibiotic resistance among pathogens. In addition, antibiotic use requires compliance. Adolescents may value immediate relief and would prefer to use analgesics instead of antibiotics.

In our study, we focused on understanding the factors that may influence self-medication in adolescents. Interestingly, we uncovered two statistically significant factors: health status and the type of school (*P* values were 0.035 and 0.011, respectively).

As expected, the prevalence of self-medication was high among adolescents who reported having chronic illnesses (96.97%), and the prevalence of self-medication in adolescents who did not report any chronic illnesses was 93.41%.

The type of school was statistically significant ($P = 0.011$); 96.88% of adolescents studying in governmental schools are self-medicated, while 92.31% of adolescents studying in private schools are self-medicated. We propose that private schools may educate students on awareness and offer more science subjects related to health than governmental schools. These observations require further study.

Our findings generally revealed no significant differences in self-medication between male and female adolescents (the prevalence was 93.97% among males and 95.02% among females). However, most of the previous studies in Germany, America and Brazil, showed variability in the prevalence of self-medication among males and females, with the exception of the UAE, in which no differences were detected [1,6,10,20]. This finding in our study might be due to the fact that the data were collected during the winter season because analgesics were the most common medications used. Our results also show that neither the socioeconomic status nor parental education level were significant. This result indicates that adolescents may have insufficient knowledge regarding self-medication, which demonstrates the need for health education sessions at

schools. Adolescents represent a large percentage of the Saudi population, and the development of multimedia programs or animations may be helpful in improving the knowledge of the entire community concerning the potential side effects of self-medication.

We found that the most commonly used medications were obtained from the pharmacy (51.64%). Free consultations on the use of OTC products is provided by community pharmacists in Saudi Arabia [7], which might be a strong factor in obtaining medications from a pharmacy. Parents were the second most common source of medications (34.33%). This finding may be due to cultural ties, a close community and the strong relationship between parents and their adolescents, which may impact the choice to self-medicate.

The least utilized source was social media (1.95%), in which participants can share information and materials on self-medication and recommend medications online, indicating that social media does not play a major role in self-medication in our study.

In our study, peer pressure was not high (2.28%), which could be explained by the fact that adolescents think it is time for them to develop their own decisions without the influence of their friends.

Limitations: Our data collection took place between February and March of 2015 (the winter season), which may affect the overall prevalence and categories of medication used. The study design included a self-reported questionnaire, which is sensitive to recall bias.

Strengths: In general, studies regarding self-medication in adolescents are rare [1,8,9] and to the best of our best knowledge, this study was the first to examine the prevalence of self-medication among adolescents of both genders aged 13—18 in Riyadh, Saudi Arabia. In this study, we administered questionnaires directly to the targeted sample subjects and achieved a good response rate (100%). In addition, although this was a self-reported questionnaire, there was an instructor present to answer any questions from the students in an attempt to decrease information bias in this study.

9. Recommendations

We recommend to repeat the study in the summer season to determine if the use of analgesics is the same or different. We also recommend that pharmacies not provide some medications without a prescription.

The awareness of self-medication must be increased in society; the second most common source of medications was parents, despite the educational level of parents, which was not a protective factor as in other studies. The number of programs and projects in schools should be increased to increase awareness among students and school counselors. Lastly, each school should have a small clinic with a qualified specialist to prescribe medications to students and employees when needed.

10. Conclusion

Our study revealed that 94.5% of adolescents took over the counter drugs, and the percentage of adolescents who were not taking OTC was (5.5%). The most common source of medications was the pharmacy, and the least common source was social media; the most common type of medication used was analgesics (87.3%), and the least common medication used was hormones (5%).

An analysis of influencing factors revealed that the external factor school type was statistically significant in affecting self-medication in this age group, whereas an analysis of the internal factors showed that health status was a statistically significant risk factor affecting self-medication.

Conflict of interest

The authors declare no conflicts of interest.

Acknowledgments

Dr. Najlaa abdel Hafeez. (Provided language assistance).
Dr. Shaffi Ahmed. (Data analysis).

References

[1] Du Y, Knopf H. Self-medication among children and adolescents in Germany: results of the National Health Survey for Children and Adolescents (KiGGS). Br J Clin Pharmacol 2009 Oct;68(4):599—608.
[2] Fuentes Albarrán K, Villa Zapata L. Analysis and quantification of self-medication patterns of customers in community pharmacies in southern Chile. Pharm World Sci PWS 2008 Dec; 30(6):863—8.
[3] Yousef A-MM, Al-Bakri AG, Bustanji Y, Wazaify M. Self-medication patterns in Amman, Jordan. Pharm World Sci PWS 2008 Jan;30(1):24—30.
[4] Ruiz ME. Risks of self-medication practices. Curr Drug Saf 2010 Oct;5(4):315—23.
[5] Bertoldi AD, Camargo AL, Silveira MPT, Menezes AMB, Assuncao MCF, Goncalves H, et al. Self-medication among adolescents aged 18 years: the 1993 Pelotas (Brazil) birth cohort study. J Adolesc Health 2014 Aug;55(2):175—81.
[6] Shehnaz SI, Khan N, Sreedharan J, Issa KJ, Arifulla M. Self-medication and related health complaints among expatriate high school students in the United Arab Emirates. Pharm Pract 2013;11(4):211—8.
[7] Al-Worafi YA, Long C, Saeed M, Alkhoshaiban A. Perception of self-medication among university students in Saudi Arabia. Arch Pharm Pract 2014;5(4):149.
[8] De Moraes ACF, Delaporte TRM, Molena-Fernandes CA, Falcao MC. Factors associated with medicine use and self medication are different in adolescents. Clinics 2011 Jul; 66(7):1149—55.
[9] Pereira FSVT, Bucaretchi F, Stephan C, Cordeiro R. Self-medication in children and adolescents. J Pediatr (Rio J) 2007 Oct;83(5):453—8.
[10] Arrais PS, Coelho HL, Batista M do C, Carvalho ML, Righi RE, Arnau JM. Profile of self-medication in Brazil. Rev Saúde Pública 1997 Feb;31(1):71—7.
[11] Hughes CM, McElnay JC, Fleming GF. Benefits and risks of self medication. Drug Saf Int J Med Toxicol Drug Exp 2001;24(14): 1027—37.
[12] Vilarino JF, Soares IC, da Silveira CM, Rödel AP, Bortoli R, Lemos RR. Self-medication profile in a city of south Brazil. Rev Saúde Pública 1998 Feb;32(1):43—9.

[13] Ali SE, Ibrahim MI, Palaian S. Medication storage and self-medication behaviour amongst female students in Malaysia. Pharm Pract 2010 Dec 20;8(4):226—32.
[14] WHO | Adolescent development [Internet]. WHO. [cited 2014 Nov 6]. Available from: http://www.who.int/maternal_child_adolescent/topics/adolescence/dev/en/.
[15] Due P, Lynch J, Holstein B, Modvig J. Socioeconomic health inequalities among a nationally representative sample of Danish adolescents: the role of different types of social relations. J Epidemiol Community Health 2003 Sep;57(9):692—8.
[16] Rutter's child and adolescent psychiatry (textbook).
[17] 10 Reasons Teens Abuse Alcohol or Drugs [Internet]. Promises Addiction Treatment | Alcohol Drug Rehab Malibu. [cited 2014 Nov 7]. Available from: http://www.promises.com/articles/teens/10-reasons-teens-abuse-alcohol-or-drugs/.
[18] http://www.aleqt.com/2009/07/13/article_251569.html http://www.cdsi.gov.sa/2010-07-31-07-00-05/doc_download/1457—-—-—-2010—2025.
[19] 1457—-—-—-2010—2025.pdf [Internet]. [cited 2014 Nov 6]. Available from: http://www.cdsi.gov.sa/2010-07-31-07-00-05/doc_download/1457—-—-—-2010—2025.
[20] Wilcox CM, Cryer B, Triadafilopoulos G. Patterns of use and public perception of over-the-counter pain relievers: focus on nonsteroidal antiinflammatory drugs. J Rheumatol 2005 Nov 1;32(11):2218—24.