

Overconsumption of medicines: what are the factors?

The case of Algeria

Nadira BESSOUH*

Ecole Supérieure de
Management Tlemcen
(ESMT)-Algérie

bessouh_nadira@yahoo.fr

Ali IZNASNI

Ecole Supérieure de
Management Tlemcen
(ESMT) -Algérie

aiznasnali@hotmail.fr

Imane HANINE

Ecole Supérieure de
Management Tlemcen
(ESMT) –Algérie

hanineimane44@gmail.com

Abstract :

The main purpose of this study is to better understand the factors that lead to the excessive consumption of medicines. In order to determine the characteristics of the excessive consumption of drugs in Algeria, it was decided to conduct a quantitative study in a medical environment involving patients, pharmacists and doctors. It was found that the patient's health status and social security, which is granted to almost all Algerians, are particularly responsible for the high amount of drugs consumed.

Article info

Received

14/05/2021

Accepted

25/05/2021

Keywords:

- ✓ Drug overuse
- ✓ Medical prescription
- ✓ Health Insurance
- ✓ Algeria

1. Introduction

Medicines represent a growing economic burden for current health systems; they are a major concern for governments when managing these systems (Fainzang, 2001; Johanne, 2003; WHO, 2010; Wilbur et al, 2010; Snoussi, 2014; Snoussi, 2020). Despite the enormous efforts made, the costs continue to increase and absorb a growing share of the health care and social services budget year after year in terms of equitable accessibility to health care and optimal use of medicines (Normiche, 1986; Ankri & Le Désert, 1995; Ziani and Brahmia, 2016). Since 1997, the share of drugs in health expenditure in Algeria has been second after that of hospital services. In general, the price of a given drug stabilizes over time, but its use is perpetuated (Ziani, 2010). It is well known that the arrival of new, more expensive drugs, contributes to the increase in pharmaceutical spending. This increase in costs increases the share of the Government budget that is devoted to medicines (Brahmia, 2006, Mahfoud et al, 2017).

It must be recognized that the health situation of Algerians has markedly improved since independence thanks to the importance given to the national health system (Oufriha, 1990; Mahoud et al, 2017). In addition, health spending has been growing steadily due to the combination of several factors, including population growth and changes in the age pyramid, the aspiration for well-being and the rapid increase in modern diseases, etc. All these factors, combined with the significant social health protection system and the generalization of third-party payment, are responsible for this growth in health spending (Snoussi, 2014).

In addition, health expenditure has been growing steadily, especially for drugs. Indeed, drug demands in Algeria have practically increased sevenfold in the space of 14 years, i.e. between 1999 and 2013, from \$ 0.37 billion to \$ 2.5 billion. This will certainly continue to rise even more as the population grows and life expectancy at birth increases (Snoussi, 2014, Mahfoud et al, 2017). It is worth recalling that overconsumption plays a major role in the overexploitation of resources. Drug abuse and excessive use of medicines, without consulting a doctor or a pharmacist, can have serious consequences on the individual's health status, from a medical point of view. It is widely admitted that excessive consumption of drugs can lead to immunodeficiency and many diseases resulting from the side effects engendered by these drugs. In addition, from an economic point of view, health expenditure has a negative

impact on the country's cash flow, especially in the Algerian social security system with the reimbursement of medical expenses and pharmaceuticals (Snoussi, 2014)

In light of what has been put forward, the present research work aims to identify the factors that engender excessive consumption of drugs. To do this, it was decided to raise the following question: "***What are the factors that lead to excessive consumption of drugs in Algeria?***"

Three stages were followed to address this issue. The first step consisted in carrying out a review of the literature on the Algerian drug market for the purpose of identifying the factors that cause overconsumption of medicines and also defining the problematic of our research in an appropriate way. The second step concerns the description of the recommended research methodology, while focusing on the patients and health professionals. Finally, the results obtained are presented and discussed in the third step.

2. Literature review

2.1. The Algerian drug market

The Algerian drug market is the third largest pharmaceutical market on the African continent. It is characterized by a predominance of imported products as opposed to the very limited national production that is mainly oriented towards mass production of generic products (Mahfoud et al., 2017).

Algeria has large hydrocarbon reserves which generate annual sales of \$ 3 billion. Algeria is particularly attractive to international pharmaceutical companies. The ever-increasing demand for drugs in our country has witnessed double digit growth; this was encouraged by a multitude of factors.

Furthermore, the drug-related turnover increase is largely due to demographic developments in Algeria. This is a country of 39.5 million people. According to the UN, as significant increase has recently been reported in the number of young and old people as compared to the rest of the population. On the other hand, according to the World Bank, the demographic dependency ratio, which corresponds to the percentage of people aged less than 15 and more than 64 with respect to the working age population, was 52% last year (Snoussi, 2014).

Furthermore, as in many emerging economies, Algeria has recently experienced positive a significant *growth* in its *living standards that were* accompanied by epidemic and infectious diseases, as well as chronic diseases such as diabetes. These diseases are mainly linked to lifestyle and require more complex and expensive treatments (Mahfoud et al, 2017).

On the other hand, it should be acknowledged that the Algerian health, beside its free social insurance system, encourage the overconsumption of reimbursable drugs. Moreover, with the introduction of the Chifa Card in 2007, the holder of this card can benefit from the third-party payment system to acquire drugs in a network of more than 10,000 contributing pharmacies. For all these reasons, Algeria today suffers from excessive drug consumption, or as otherwise called drug overuse.

3. Overuse of drugs

Excessive consumption of pharmaceuticals, drug overuse, and over-medication, all suggest from the medical and social points of view that the individual and the community in general consume medical products excessively and unnecessarily (Adam & Herzlich, 1994). According to the WHO benchmarks, the excessive consumption of pharmaceuticals is mainly attributed to their improper use. The excessive consumption of medicines is generally attributed to the introduction of drugs such as antibiotics, antidepressants, psychotropic substances, and anxiolytics. In a 2010 report on global health and rational use of drugs, the World Health Organization (WHO) reported that 50% of drugs acquired by patients are not prescribed correctly.

The doctors who prescribe drugs and the pharmacists who dispense them are very important elements in ensuring the correct prescription and effective use of drugs. Doctors and pharmacists are expected to provide the necessary advice to patients.

Deprescribing is defined as the controlled process of deliberately halting a medicine or diminishing its dose for the purpose of ameliorating the health of the patient.

Drug deconsumption is viewed as the moderate demand and consumption of medicines.

It is worth indicating that the ease of acquisition of drugs and their excessive consumption negatively affects the health of people; this would also generate enormous financial losses to

the country's economy, since the Algerian government is the main financier of the health sector.

4. Health expenditure

The World Bank defines the total health expenditure as *“the sum of public and private health expenses which include the provision of health services (preventive and curative), family planning programs, activities relating to nutrition and emergency aid for health”* (Oufriha, 1983; Chabli et Miloudi, 2016).

However, the health expenditures, coming from the health accounts, cover different types of services such as the hospital care costs, outpatient care costs, drug expenses, optics, prostheses, and other small equipment, in addition to the costs of medical transportation (Chabli and Miloudi, 2016).

4.1. Drug expenditure in Algeria

Drug expenses have rapidly increased; they represent a growing share of total health expenditures (Mebtoul, 2005, Snoussi, 2020). The increase in drug consumption in recent years is mainly due to the aging population, the introduction and dissemination of new drugs, epidemiological and demographic changes, higher standards of living of people, development of new health infrastructures and the generalization of social security.

4.1.1. The evolution of the share of drug expenditure in national expenditure

Drug expenditure in dinars in general shows an upward trend, going from 2722 million dinars to 85157 million dinars, between 1991 and 2008. They were multiplied by 31.28 within 17 years. However, the trend in drug expenditure was significantly higher than that in constant dinars, especially in 1991, due to the explosion of inflation as a result of the economic crisis. Since the 2000s, drug expenditure in constant dinars has remained almost at the same level as the expenditure in current dinars after the measures taken to control the inflation rate through the country's budgetary policy and also to maintain the Algerian dinar against the dollar. As for the share of pharmaceutical costs in health expenditure, it increased steadily, from 8.1% in 1991 to 14.12% in 2013, which represents an increase of 6.02% in 22 years (Ziani, 2016).

4.2. The influence of patient behavior on drug overuse

The patient's behavior is considered as one of the major factors in drug overuse. With irrational behavior, the patient may indulge in uncontrolled drug use (Ankri et al, 1995; Mebtoul, 2005). On the other hand, purchasing a medicine and not consuming it represents a great loss to the health budget. For example, some patients buy a box of Paracetamol but only consume one tablet; if he needs the same medicine later, he buys another box. This is certainly due to its low price. It should be known that some drugs can be avoided and traditional medical treatments can be used instead. For example, a mild fever, cold, or sore throat can be treated with traditional medicines like honey and herbal infusions.

On the other hand, there are many patients who do not want to go to the doctor when they are ill, preferring to rely mainly on the advice and opinions of people. In this case, they buy drugs without a medical prescription. Then if they do not get well, they buy another drug, and so on. Such behavior can lead to negative consequences on the health of the patient; he may also become dependent on certain medications over time. Once the illness is diagnosed, recognized and assessed by the doctor or pharmacist, the medical costs are fixed by the institutions concerned, and then remains the payment. Once again, the patient does not pay much, because health is a public good and an individual right. In European countries, and even in Algeria, the state guarantees social justice by largely subsidizing the costs of people's health care, particularly through reimbursable medical products. In this case, the overconsumption of drugs is not due to the fact that the drugs are not too expensive but rather because the patient's health status requires it (Snoussi, 2014)

4.3. The influence of physician behavior on drug overuse

Some doctors prescribe a medical treatment before checking the patient's condition and prior to performing the necessary tests. Usually, if the prescribed treatment does give positive results within a certain period of time, the doctor gives other medicines. In this case, there is a double negative effect: first the patient's health deteriorates because he has taken a lot of drugs for the different treatments, and then the large quantity of drugs purchased represents huge financial losses for the state budget (Camacho, 2014). On the other hand, physicians can be influenced by sales representatives (marketing specialists) who work for pharmaceutical companies that are only looking to sell their products (Ding, 2014). These drug sellers come

at least once a month to present their products to the doctor, and sometimes they even offer him gifts in order to convince him to prescribe their products. For example, if the doctor prescribes the drug 10 times a week, for a period of three months, the pharmaceutical company offers him a trip with lots of gifts. The doctor is therefore tempted and ends up accepting to obtain the favors of the laboratory. Consequently, in light of the above, the following assumptions were made:

H1: The patient's health status has a great influence on the amount of drugs consumed.

H2: Pharmaceutical companies influence healthcare professionals to prescribe their medicines.

H3: The social protection mechanisms established by the Ministry of Health encourage the consumption of drugs.

5. Empirical study

In order to collect the information necessary to analyze the phenomenon of drug overuse in Algeria and identify the factors that cause this excessive consumption, it was decided to conduct a survey of patients, doctors and pharmacists.

5.1. Sampling plan and method

5.1.1. The sample

This study was carried out on the population of the Wilaya of Boumerdes (Algeria); it was conducted on a random sample. It should be noted that the number of inhabitants in this Wilaya exceeds 800 000 inhabitants. In order to carry out this study, 300 questionnaires were distributed, but only 200 of them were returned to us from 120 patients, 42 pharmacists, and 38 doctors. The doctors included general practitioners and specialists working in health establishments in the Wilaya of Boumerdes.

5.1.2. Survey presentation

In order to better understand the Algerian position with regard to the consumption of drugs, it was deemed important to include as many people as possible in our study. Our choice

therefore naturally fell on a quantitative study that was conducted in a medical environment, among patients, pharmacists and doctors who answered this questionnaire which was carefully prepared.

5.1.3. Method of administering the questionnaire

When designing the questionnaire, specific questions were developed for each of the previously mentioned factors. The purpose was to determine and understand the opinion of Algerians on drug consumption. For this, three types of questions were selected for physicians, pharmacists and patients in order to facilitate the conduct of the survey:

- Closed multiple choice questions with one single answer. These questions require precise answers.
- Open questions. In this case, the answers to this type of question are not very precise, but are difficult to go through and are very rich in information.
- Scale questions.

As for the method of administering the questionnaire, the face-to-face survey was chosen. Consequently, the questionnaires were distributed to the members of the sample (patients, doctors, and pharmacists).

5.2. Presentation and analysis of the survey results

Table N° 1: Sociodemographic structure of the sample

Gender	Frequency	Percentage
Woman	134	67%
Man	66	33%
Age		
Under 25	34	32%
Between 25 and 34 years old	73	36.5%
Between 35 and 44 years old	26	13%
Over 45	37	18.5%
Marital status		
Single	114	57%

Married	79	39.5%
Other	7	3.5%
Profession		
Employees	44	22%
Medicaldoctors	38	19%
Pharmacists	42	21%
Students	65	32.5%
Jobless	6	3%
Others	5	2.5%

Source: Survey results

Table 1 summarizes the composition of our target population. The surveyed population consists of patients and health professionals, women and men of different ages and different socioeconomic categories, in order to have a representative sample.

Table N°2: Percentage of people who are often sick relative to age

	Are you oftensick?		Total
	No	Yes	
Under 25	20%	12%	32%
Between 25 and 34 yearsold	32%	4.5%	36.5%
Between 35 and 44 years old	9.5%	3.5%	13%
Over 45	15.5%	3%	18.5%
Total	77%	23%	100%

Source: Survey results

The table above clearly indicates that 77% of the sample population do not get often sick, and 32% of them are between 25 and 34 years old. The rest, i.e. 23%, are often sick with 12% of them under the age of 20. This indicates that most members of our sample are healthy.

TableN° 3: The rate of people suffering from a chronic disease

	Do you have a chronic disease?		Total
	No	Yes	
Under 25	26.5%	5.5%	32%
Between 25 and 34 yearsold	32.5%	4%	36.5%
Between 35 and 44 years old	12.5%	0.5%	13%

Over 45	14.5%	4%	18.5%
Total	86%	14%	100%

Source: Survey results

This table clearly shows that 86% of the patients in the sample do not suffer from a chronic disease, while the rest (14%) present a chronic disease.

Table N° 4: Drug consumption by age

	How would you assess your drug consumption?			Total
	High	Average	Low	
Under 25	2%	18%	12%	32%
Between 25 and 34 yearsold	5.5%	14%	17%	36.5%
Between 35 and 44 years old	0.5%	8%	4.5%	13%
Over 45	1%	10%	7.5%	18.5%
Total	9%	50%	41%	100%

Source: Survey results

Table 4 shows the level of drug consumption by the patients in the sample according to their age. It is noticed that 50% of these patients have an average drug consumption, while 41% of them have a low medicine use level; the rest of these patients consume too many medications.

5.3. Empirical data reliability tests

5.3.1. Reliability of measurement scales

Before analyzing the factors that have an impact on drug consumption in Algeria, it was considered useful to first test the reliability of the scales that are intended to determine the factors that have an impact on the consumption of drugs and thus generate their overconsumption. This test by calculating Cronbach's alpha, This test is performed through the calculation of the Cronbach's alpha as shown in the table below:

Table N° 5: Cronbach's Alpha reliability statistics for all items

Cronbach's alpha	Number of items
0.814	34

Source: Prepared by the authors using SPSS software

The table above indicates that for all the items, numbering 34, the value of Cronbach's Alpha is 0.814. It is statistically significant, which means that the questionnaire is very reliable; it also presents a very strong homogeneity of all its items.

5.3.2. Analysis of the correlation between variables

The correlation coefficient reflects the nature of the relationship existing between two quantitative variables. This coefficient can confirm the existence of a link between independent and dependent variables. Correlation is a measure of the linear relationship between these variables. Correlation analysis is performed when both variables are metric. The coefficient R, which ranges from -1 to $+1$, gives an estimate of the linear relationship between these 2 variables. It should be remembered that the decision rule of the test using SPSS is based on a certain level of statistical significance, that is, if the significance (SIG) of p-value is less than 0.05, then the hypothesis is confirmed. It can then be concluded that a p-value less than 0.05 confirms the existence of a relationship between the two variables.

The following tables attempt to show the correlation between drug overuse and the factors that encourage it. These factors are the patient's behavior, the medical prescription, the influence of pharmaceutical companies and finally the impact of health insurance.

Table N°6: Correlation matrix for hypothesis 1

Correlations		Overconsumption of drugs	Patient's behavior
Overconsumption of drugs	Pearson correlation	1	0.165*
	Sig. (bilateral)		0.020
	N	200	200
Patient's behavior	Pearson correlation	0.165*	1
	Sig. (bilateral)	0.020	
	N	200	200
*The correlation is significant at 0.05 (bilateral).			

Source: Prepared by the authors using SPSS software

The above correlation matrix indicates that there is a relationship between the variables: Drug overuse and Patient's behavior (Sig. < 0.05); however, this relationship is very weak (correlation coefficient = 0.165). Therefore, it can be concluded that the first hypothesis (H1: *The patient's health status has a strong influence on the amount of drugs consumed*) is confirmed.

As for the second hypothesis (H2: *Pharmaceutical companies influence healthcare professionals when prescribing medicine*), it can be split into two sub-hypotheses:

H2.1: Drug overuse is influenced by medical prescription

H2.2: Drug consumption is influenced by pharmaceutical companies

Table N°7: Correlation matrix for sub-hypothesis 2.1

Correlations		Overconsumption of drugs	Medical prescription
Overconsumption of drugs	Pearson correlation	1	0.039
	Sig. (bilateral)		0.588
	N	200	200
Medical prescription	Pearson correlation	0.039	1
	Sig. (bilateral)	0.588	
	N	200	200

Source: Prepared by the authors using SPSS software

The correlation table above shows that the correlation between the variables: Drug overuse and Medical prescription is not significant (Sig. > 0.05). Therefore, there is no relationship between these two variables, which means that sub-hypothesis H 2.1 is invalidated.

Table N° 8: Correlation matrix for sub-hypothesis 2.2

Correlations		Overconsumption of drugs	Pharmaceutical companies
Overconsumption of drugs	Pearson correlation	1	0.075
	Sig. (bilateral)		0.293
	N	200	200
Pharmaceutical companies	Pearson correlation	0.075	1
	Sig. (bilateral)	0.293	
	N	200	200

Source: Prepared by the authors using SPSS software

The correlation table shows that the correlation between the variables: Drug overuse and Pharmaceutical companies is not significant (Sig. > 0.05), which means that there is no relationship between these two variables. Therefore, sub-hypothesis H2.2 is invalidated. This leads us to conclude that hypothesis (H2) is rejected.

Third hypothesis (H3): The social protection mechanisms established by the Ministry of Health encourages the consumption of drugs.

Table N° 9: Correlation matrix for hypothesis H3

Correlations		Overconsumption of drugs	Healthinsurance
Overconsumption of drugs	Pearson correlation	1	0.144*
	Sig. (bilateral)		0.042
	N	200	200
Healthinsurance	Pearson correlation	0.144*	1
	Sig. (bilateral)	0.042	
	N	200	200
*The correlation is significant at 0.05 (bilateral).			

Source: Prepared by the authors using SPSS software

The table above clearly shows that there is a correlation between the two variables (Sig. < 0.05). Note that the variable: Health insurance is relatively weakly correlated with the variable: Drug overuse (correlation coefficient = 0.144). Therefore, the third hypothesis (H3: *The social coverage mechanisms established by the Ministry of Health encourages the consumption of drugs*) is confirmed.

Table N°10: Summary of the results obtained

Hypotheses	Results
H1: The patient's health status has a greater influence on the amount of drugs taken	Accepted
H2: Pharmaceutical companies influence healthcare professionals when prescribing medicine	Rejected
H3: The social coverage mechanisms established by the Ministry of Health encourage the consumption of drugs	Accepted

Source: Survey results

6. Conclusion

In this work, an attempt was made to examine the problem of drug overuse in Algeria as well as the factors that have an impact on that phenomenon. To do this, through a questionnaire intended for patients, doctors and pharmacists, a quantitative analysis was carried out, and the results obtained allowed drawing the following conclusions:

Regarding the first hypothesis, it was found that the patient's health status has an impact on the amount of medicines consumed, which generally leads to excessive drug consumption. For the second hypothesis, it turned out that the influence of pharmaceutical laboratories and

drug producers, who think only of profit and use all possible methods to seduce drug prescribers, on health professionals (doctors and pharmacists) does not have a great impact on the overconsumption of drugs in Algeria. As for the third hypothesis, it was revealed that the fact that social security protection is provided to almost all citizens encourages the excessive consumption of drugs.

For this, the following recommendations are made to physicians and pharmacists in order to minimize drug consumption:

- * Limit drug consumption by requiring a medical prescription from the doctor
- * Inform patients about the side effects of medications and the dangers of self-medication.
- * Make patients aware of the dangers and risks of drug abuse. Try to advise them to take natural remedies and to eat a balanced diet.
- * Give the necessary care and support to the patient.
- * Urge medical staff to prescribe only essential drugs.
- * Educate patients to avoid taking drugs without medical prescription and advice.
- * Require pharmaceutical companies to use small boxes containing quantities of drugs that are frequently needed by patients.

Finally, the Algerian Government should play a more important role in the health system as it is the main funder. It is worth reminding that the vast majority of Algerians benefit from social security, i.e. health insurance, maternity insurance, disability insurance, mutual insurance, etc., and therefore a way must be found to limit or eliminate the factors that cause the excessive consumption of drugs, in consultation with health professionals, drug producers and others.

As future research perspectives, it would be desirable to conduct more research on larger samples since ours included only 200 individuals (patients, physicians, and pharmacists),

which is considered a small sample. In addition, this study focused only on individuals from the Wilaya of Boumerdes, so it would be more interesting to expand it to include the entire country.

7. References

- Adam P, Herzlich C. (1994). Sociologie de la maladie et de la médecine. Paris. Nathan.
- Ankri J, Le Disert D, Henrard JC (1995). Comportements individuels face aux médicaments, de l'observance thérapeutique à l'expérience de la maladie, analyse de la littérature. Santé publique: 4.427-441.
- Brahmia Brahim (2006). Le marché du médicament en Algérie et l'option du tarif de référence. Communication au 1er colloque international d'économie de la santé sur « Gestion et réformes hospitalières dans les pays en développement ou à revenu intermédiaires ». Université A. Mira de Béjaia, les 13, 14 et 15 Novembre 2006.
- Camacho, N. (2014). Patient Empowerment: Consequences for Pharmaceutical Marketing and for the Patient– Physician Relationship. In Ding, M., Eliasbergh, J., &Stremersch, S. (Eds.) Innovation and marketing in the pharmaceutical industry: emerging practice, research, and policies (pp. 425-456). Philadelphia: Springer.
- ChabliSafia et MiloudiKatia ; Essai d'analyse de l'évolution des dépenses de santé en Algérie ; Master en Sciences Economiques ; Université Mouloud Mammeri De Tizi-Ouzou Faculté Des Sciences Economiques, Commerciales et des Sciences de Gestion ; 30/11/2016.
- Ding, M. (2014). The Pharmaceutical Industry: Specificity. In Ding, M., Eliasbergh, J., &Stremersch, S. (Eds.) Innovation and marketing in the pharmaceutical industry: emerging practice, research, and policies (pp. 1-19). Philadelphia: Springer.
- Fainzang S (2001). Médicaments et société. Le patient, le médecin et l'ordonnance. Paris, PUF.
- Johanne C (2003). Médicaments et vieillesse : trois cas de figure, in : Anthropologie et société. Volume 27, N°2.P 119-138.
- Mahfoud Nacera ; BrahmiaBrahim et Yves Coppieters ; Consommation de Médicaments et Maîtrise des Dépenses de Santé en Algérie ; مجلة أداء المؤسسات الجزائرية N ° 11/2017. P. 41-54.
- Mebtoul M. (2005).Médecins et patients en Algérie. Edition Dar El Gharb.
- Mesouad O. Marché algérien du médicament (2007). Indicateurs et tendances. Chambre Française du Commerce. Revue Partenaires : Médicament : un marché attractif. 69(2).
- Molina N. (1988). L'automédication, Paris, PUF. « Collection les champs de la santé ».

- Normiche P (1986). Pratiques culturelles, profession et consommation médicale, in : Economie et Stratégie. N°189. P 39-50.
- Oufriha F.Z : Etude des déterminants de la consommation des produits pharmaceutiques à travers la deuxième enquête de consommation des ménages en Algérie. Les cahiers du CREAD n° 22, 2ème trimestre, 1990.
- SnoussiZoulikha. (2020). Le système de santé Algérien face à la problématique de l'accès aux médicaments. Revue nouvelle économie. Volume 11. N°2. P.227-246.
- Senoussi Zoulikha. L'accès aux médicaments en Algérie : une ambiguïté entre les brevets des multinationales et le marché du générique, thèse de doctorat en Sciences Economique, Université de chlef, Algérie, 2014.
- ZianiFarida &Brahmia Brahim (2016). La consommation de médicaments en Algérie entre croissance, financement et maîtrise. Les cahiers du MECAS. Volume 12, N° 2. Pages 191-209.
- ZianiFarida : Analyse de la consommation de médicaments en Algérie : cas de la wilaya de Sétif, mémoire de Magistère en sciences économiques, option : économie de la santé et développement durable, université de Bejaia, 2010.
- Wilbur K, Salam SE, Mohammadi E (2010). Patient perceptions of pharmacists in guiding self-medication of over-the-countertherapy in Qatar. *Patient PreferAdherence*. 4:87–93.
- General Information WHO Drug Information. [Last accessed on 2010 Sep 8];2000 14(N°1. Available from: <http://www.apps.who.int>.