



Status of over the counter buying and selling of antibiotics in Kathmandu Valley

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ABSTRACT

Self-medication and irrational antibiotic prescribing are major factors in emergence of antibiotic resistance. This study finds incidences of self-mediations in Kathmandu city. This descriptive, cross-sectional study was conducted within duration of October to November 2012. First the checklist was prepared and information was collected from 25 pharmacies. Amoxicillin was found to be mostly used antibiotics. The study found that there is price differences among the antibiotics produced by National and Multinational Pharmaceuticals. These differences in the cost were not noticed by the public as well as the authorized levels. It showed that 56% of patients used antibiotics without prescription. The cost of medical consultation and low satisfaction with medical practitioners are related to self-medication. Though 92% of the respondents have bought full dose of antibiotics, 36% of the respondents have withdrawn to use antibiotics before the expected duration. People think that if the illness is recovered sooner than there is no need to continue medicine. The importance of completing the full course of antibiotics and taking the correct dose at the stated times, must be emphasized by the doctor prescribing the antibiotics and the pharmacist who dispenses them. Thus, unnecessary self-medication with antibiotics seems to be common in Kathmandu.

Keywords: Self-medication, Antibiotics, Cost



INTRODUCTION

Antibiotic misuse, sometimes called antibiotic abuse or antibiotic overuse, refers to the misuse or overuse of antibiotics, with potentially serious effects on health. It is a contributing factor to the creation of multidrug-resistant bacteria, informally called "super bugs": relatively harmless bacteria can develop resistance to multiple antibiotics and cause life-threatening infections. Antibiotics were once considered "wonder drugs." These drugs have been used for decades to effectively treat a variety of bacterial infections. If left untreated many of these bacterial infections would have been deadly. Unfortunately, because of worldwide overuse and misuse of antibiotics, common bacteria are becoming resistant to treatment with these drugs. This misuse is a major cause for alarm as it is reason for the emergence of drug resistance. Thus, antimicrobial resistance is a current problem worldwide particularly in developing countries, where

antibiotics are often available without a prescription [1].

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 chronic or recurrent disease or symptoms. The buyer diagnoses his own illness and buys a specific drug to treat it. A large number of people, when they fall sick, do not consult the physician. They either consult a drug store and obtain a medicine from the shelf, or consult a neighbor who may be having some tablets left over from his previous illness, and readily spares them. If you have a fever, cold, cough, constipation or indigestion, your friends or even total strangers volunteer advice on medicines to take like expert physicians. Almost everyone you meet has an excellent remedy for whatever ails you. In short, this is what is meant by self-medication [2]. Self-medication can take place through the consumption of industrialized or manipulated medicines, or the use of home

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remedies (teas, herbs, etc.) and includes various types of activities: acquiring medicines without a prescription, resubmitting old prescriptions to purchase medicines, sharing medicines with relatives or members of one's social circle, using leftover medicines stored at home, or failing to comply with the professional prescription, either by prolonging it or interrupting it too early or decreasing or increasing the originally prescribed dosage [3].

Antibiotics help get rid of bacteria. Some are targeted toward most kinds of bacteria while others only attack one particular variety. Most of these "friendly" bacteria aid in the digestion of food and even produce certain vitamins. Along with the immune system, these "friendly" bacteria keep bad bacteria, called pathogens, from spreading out of control. This natural harmony is severely thrown out of balance by antibiotics. With the friendly bacteria out of the way, the bad species can colonize. Because so much damage can be done by antibiotics, they should only be used under the supervision of a qualified physician.

Patients who self-medicated were more likely to use an inadequate drug or dose. A qualitative study on self-medication in Latin America points out, that patients believe that visit to physician for a diagnosis and prescription were unnecessary when the patient was familiar with the symptoms and it had previously responded to antibiotic treatment. In Trinidad and Tobago, inappropriate use of antimicrobials resulted from self-medication, over the counter availability at the community pharmacy, prescribing on demands, and lack of regulatory control [4].

In Nepal, antibiotic resistance is becoming a challenging health issue. Antibiotic resistance is a public health problem of increasing magnitude. Many infectious diseases are increasingly difficult to treat because of the burden of antimicrobial resistant organisms, including HIV infection, tuberculosis, malaria, influenza, staphylococcal infections etc. Antibiotic resistance is becoming the major problem in Nepal because the resistant bacteria can spread from one person to another and can affect the entire community with illness that are expensive and difficult to treat. Antibiotic resistance makes it harder to eliminate infections from the body as a result of a bacteria's ability to survive in the presence of antibiotics. Therefore, it is difficult to diagnose and treat the diseases with antibiotic resistance. People infected with antibiotic resistant organism are more likely to have longer hospital stays and may require complicated treatment and some infection are deadly too. Similarly, self-medication using antibiotics is

very much popular in urban areas like Kathmandu. People living in urban area are especially exposed to the media and the increased advertising of pharmaceuticals poses a larger threat to the urban population. This raises concerns of incorrect self-diagnosis, drug interaction, and use other than for the original indication. Thus, self-medication with antibiotics is an important factor contributing to the development of bacterial antibiotic resistance. [5].

MATERIALS AND METHODS

Setting: The study was conducted in 25 pharmacies of Kathmandu valley and the duration of the field was from October 2012 to November 2012. Kathmandu valley was selected for the study because Kathmandu Valley is a densely populated urban area where majority of the pharmacies of the country situated.

Study Design: The study was both qualitative and quantitative also purposive and descriptive. The study was conducted after obtaining consent from the respondents and the pharmacist of respective pharmacists.

Sample Size: Pharmacists, those who were selling the medicines in the medicine shop and the Customers came in the pharmacy to buy antibiotics were taken under this study and both the gender (12 male and 13 female) were included in the study. A total of 25 pharmacist and 25 customers, who fulfill all inclusion and exclusion criteria, were selected for the study. After interviewing 25 customers and 25 pharmacists the data were almost saturated, so the sample size was 25 pharmacist and 25 customers came to buy antibiotics.

Data Collection and Analysis: The objectives of this study were to find out top ten antibiotics used in Kathmandu Valley and to find out the prices differences among the same antibiotics of different brands. Thus, all the list of antibiotics registered in the essential drug list of DDA were jotted down. The pharmacists were asked about the mostly used antibiotics in Kathmandu. Then, the list of 15 mostly used antibiotics were listed. Ranking of those antibiotics was requested to do by the pharmacist of 25 pharmacies of Kathmandu valley. From the procedure top ten antibiotics were listed. The price rate of the antibiotics according to the brand name and company was asked to a pharmacist and the reason for the difference was also asked to few pharmacists from among those 25 samples taken. The data was transcribed and analyzed using SPSS 16.0.

Ethical Consideration: Ethical approval was taken from Department of Anthropology and Sociology

for the conduction of the study and the consent from the respondents and the respective pharmacy owner was taken before the execution of the study. The dignity of the individual was respected i.e. human rights of the individual was considered, practices contrary to human dignity were prohibited. Any individual wanting to withdraw from the study was not forced to continue. The research participants were given sufficient information of the research including the purposes, research procedures, risks and discomforts and its beneficence to the participants. Verbal statement offering the participant the opportunity to ask questions was involved in the research study. Confidentiality of the study was maintained.

Limitations of the Study: This study was carried out only in 25 Pharmacies of Kathmandu. The sample population was limited, thus, the findings may not include the whole people of the country. Due to the budgetary and time constraints, this study only covered a small area of Kathmandu. So, the result could not cover other areas of the country. This study was also carried out as the partial fulfillment of the requirements for the master degree of arts in Sociology, so that it did not cover large area of subject matter for study.

RESULTS AND DISCUSSION

All the list of antibiotics registered in the essential drug list of DDA was jotted down. One of the pharmacists was asked about the mostly used antibiotics in Kathmandu. Then from his information the list of 15 mostly used antibiotics were listed. Then after, top ten antibiotics were found.

Top Antibiotics used in Kathmandu Valley: The lists of fifteen antibiotics were taken from among the list of essential drugs from the website of DDA. Then twenty five pharmacists of twenty five pharmacies around the Kathmandu Valley were asked to rank the list of antibiotics. After ranking of the antibiotics by the pharmacists, tally was done and then top ten antibiotics were jotted down from that ranking. From the above process top ten antibiotics used in Kathmandu Valley were found and presented in Table 1. Top ten antibiotics were Azithromycin, Amoxicillin, Cephalexin, Ciprofloxacin, Amoxicillin-Clavulanate, Norfloxacin, Cefadroxil, Cefpodoxime, Ampicloxacin. From the study it was found that amoxicillin (16%) was the mostly used antibiotics by the respondents, following Azithromycin (12%) and cefadrox (12%) in the second number, ciprofloxacin (8%) and cephalaxin (8%) on third number. However, other antibiotics such cefixime, levofloxacin, cefadrox, nitrofurantoin, were also

found to be used. Market forces, rather than government regulatory processes, would set pharmaceutical prices in the absence of price controls. It is not feasible to find out the prices of all the antibiotics and analyze them because of time limitation. Thus after finding the top ten antibiotics, the prices differences of those top ten antibiotics among the same generic produced by different companies are figured out in the following section:

Differences in the Prices of Antibiotics of Different Companies with Same Generic: One of the objectives of this study was to find out the price variation of the same generic medicine of same dose according to the differences in the companies that produce them. Access to essential medicines is part of the fulfillment of the right to the highest attainable standard of health (in short: the right to health). Millions of people across the globe go without the treatments they need. The reason behind this is the price and availability of medicines to those who need them. Prices for poor people are simply too high and there are differences in the prices of the same generic medicines with the differences in the companies and thus there is unavailability of the essential medicines due to the differences in the prices.

It was found in Table 2 that the price of Amoxicillin Capsule 500 mg produced by Dingla pharmaceuticals LTD, Nepal (Amoxydin) and Aristo Pharmaceuticals LTD, India is Rs. 10 and that of Amoxicillin Capsule (Aminox) produced by Amie Pharmaceuticals (P) LTD, Nepal is Rs. 8.80. Price of Amoxycillin capsule 250mg produced by Dingla pharmaceuticals (P) LTD Nepal is Rs. 6.00 and Lark Laboratories Ltd., India was Rs. 3.37. The second mostly used antibiotic was Azithromycin. The difference between the highest and lowest prices for same generic Azithromycin was found to be more than double i.e. price of azithromycin (Aziwork) manufactured by Laboratories Serono S.A, a multinational company is Rs 53.12 and that (Aziwok) manufactured by Wochhardt Limited, India is Rs 24.56, as shown in Table 3.

Thus, the prices difference of the same antibiotics is different according to the differences in the companies that produce them. It shows that there is a great price differences among the Medicines produced by National and multinational Pharmaceuticals. The reasons behind these price differences are not transparent.

Reasons for Differences in the Price of the Antibiotics of Same Generic: A great difference was found in the prices of antibiotics of same generic with differences in the companies that produce them. Different pharmacists have given

their views on this subject matter. Some have told that the differences in the price is because of the quality raw materials the company had used for preparing the medicine, few told because of competent human resources that the company had, some told because of the advanced equipment and machineries. All of perceptions of the pharmacists are described in detail as follows:

Quality Control and the use of Advanced Equipment:

National companies have low quality control and the technical manpower and machineries are also not maintained properly in some companies thus the medicine produced by such companies are of low quality and the price are also low. On the other hand multinational companies have good quality control. Different machineries and equipment are used in such companies. There are no chances of contamination in the drug because contamination controlling mechanisms are maintained in such companies. For the quality control they have hired highly qualified technical manpower and the investment in such companies are also high. So the medicines produced by such companies are of high price and the medicines are qualitative too. Similarly on this the same reason was described by the other pharmacist also. He told that, the machineries and equipment are good in some companies and in some there may be lack of well-maintained machines and equipment. Thus the companies which have not maintained their equipment and machines are obliged to sell their medicines in fewer prices.

Competent Technical Human Resources: More than 50 percent of the pharmacist told that, "The price is different because in Multinational Companies the facilities are more and there is more manpower in those companies". The owners of multinational companies have invested more money to make their companies better and there quality medicines are available. Thus there is price difference. One of the pharmacists told that there is availability of MR in big companies, thus the price is difference. Similarly the other pharmacist told that the multinational companies have hired technical manpower for whom they have to spend more money and facilities, so the prices are different.

Quality of the Chemical Used: Majority of the pharmacists told that the compositions of the medicines are qualitative and they use good materials for producing them so there is price difference.

From above all the responses it was found that the reason for differences in the price of the antibiotics

is the use of different technical manpower and the machineries and equipment by the multinational companies which are lacking in the national companies.

Providing accurate international drug price comparisons is not straightforward, because each country's pharmaceutical market basket is different. Products that are identical across countries in presentation form, strength, and pack size may not be similar in prices. Pharmaceutical market structure differs greatly across countries, in range of compounds, presentations, use, generic shares, and number and type of manufacturers. This diversity implies that no single perfect price comparison is feasible.

Although a full analysis of factors leading to price differentials for drugs and other medical services is not possible here but the factors related with the price differences should be reasonable and transparent to the general people. Such price differentials would be inappropriate for products that are perfectly competitively supplied and are subject to free trade, for which prices should approximate marginal cost. In practice, of course, systems of drug price regulation, reimbursement, and competition contribute to international price differences and these price differences should be minimized. When a successful formulation of a medication comes into the market, other companies usually try to cash in on it by producing a 'me-too' product to have a market share. That is why in India alone the drug market has 70,000 preparations compared to WHO's list of 250 essential drugs. This phenomenon is also shown clearly in the case of antibiotics. In the WHO Essential Drug List 2012, there are only 20 antibiotics but there are over 200 antibiotic preparations sold in Malaysia, for example. This baffling array can only generate confusion among the prescribers and the medicine users.

Common Problems Reported for Antibiotics use

Drug utilization studies have been done ever since the existence of pharmacy profession. Pharmacy education always stresses the following '3Rs' i.e. right drug, right dose and right time and promise to reduce the preventable drug related morbidity.

In the study it was found that mostly people uses antibiotics for diseases like wound, chest pain, sinusitis, pneumonia, pharyngitis, nodules in eyelid, throat swelling, tonsillitis, bloody stool, stomach ache, previous episode of tuberculosis, diarrhea etc. (Table 4). The mostly occurred disease in the respondent was UTI (16%). It was found that the respondents used antibiotics in illness like fever, cough, common cold etc.

Antibacterials do not have any beneficial effects in cases of illnesses due to non-bacterial causes. Self-limiting viral infections are the commonest infectious causes for fever, cough, common cold and antibacterials have no role to play in their management, neither do they shorten the duration of the illness nor do they "prevent secondary infections". Premature, presumptive and indiscriminate use of antibacterials in all cases of illnesses adds to the cost of therapy, adverse effects, development of drug resistance and may mask the signs of bacterial infection, making a proper diagnosis difficult. Therefore, the urge to use antibacterials in all cases of illness should be curbed. All attempts should be made to localize the site and type of the infection. High grades of 'fever' may be managed with antipyretics like paracetamol or mefenamic acid and it should never be forgotten that antimicrobials are not antipyretics. Thus using antibiotics in any form of illnesses should be avoided.

Diarrhea is another condition where anti-bacterials are often over-prescribed and over-used. While there are many causes for diarrhea, infective and non-infective, the fact remains that most of them are self-limiting and require only adequate rehydration. Thus proper checking of stool should be done and the consultation of the doctor should be before using any antibiotics. Different antibacterials have different nature and thus should be utilized according to the disease pattern. The antibiotics should be used according to the life cycle of the bacteria, pattern of harm it has caused etc. This can be known after lab examination and the consultant of the physician. Thus antibiotics could not be used in self-medication.

Status of over-the-counter dispensing of antibiotics with/without prescription: The study found that 56 percent of the respondents used antibiotics without prescription, as shown in Fig 1. Self-medication using antibiotics is high in Kathmandu valley. The percentage of drugs prescribed in our study was 56 % which is lower compared to that of the study conducted in Ghana (93.2%) and in North India (75-95%). Antibiotics are the most important weapons in our hands. Each one of them has been invented after spending considerable amount of time, energy and money. Therefore, we cannot afford to lose them. We must exercise considerable restraint in prescribing antibacterials and restrict the use of antibacterials without prescription.

Major Sources of Information for using antibiotics: The major source of information for using antibiotics were from the dispenser present in the pharmacy i.e. without prescription (40%),

advice of doctor (40%) followed by leftover medications at home (12%), friends and relatives (4%) and newspapers (4%).

A few pharmacists stated that people force them to sell the antibiotics. They told that in the situation when people cannot afford the doctor's fee, they should use the best of their clinical judgment and supply patients with the suitable antibiotics if antibiotic treatment is required. Drug retail shops frequently serve as the public's first point of contact with the healthcare system. Out-of-pocket purchases of medicines can cause severe financial hardship to individuals and their families. If medicines are not prescribed and used properly, billions of dollars of public and personal funds are wasted. Pharmaceutical expenditures are one of the most identifiable components of health expenditure. Governments therefore should implement a variety of regulatory measures targeting pharmaceutical expenditures for the purpose of controlling overall health care costs.

Causes of Buying Antibiotics Directly from the Pharmacy without prescription:

Previous Success with the Antibiotics: In the study it was found that 40% of the respondents have previous experiences of using the antibiotics for treating the same disease which has occurred in previous time also and the disease was cured last time also so the same antibiotics was preferred to use. Thus it was found that the reason for self-medication using antibiotics is the previous success with antibiotics. When they get symptoms that they have experienced before, they seek the treatment that seemed successful during prior episodes of those symptoms. They felt comfortable with a self-diagnosis if they had a subsequent episode with a similar symptom illness. Thus, self-medication seems appropriate because they are relying on previous experience with similar symptoms to identify the condition.

High Doctor Charge: One respondent told that, "Doctor Charge is high and in the previous case also, same antibiotic has worked". Similarly one woman told that she has become unable to pay the charge of the doctor because she lived alone and her husband has gone for abroad for money making but the money provided by her husband is not enough so that she cannot spend it to pay the charge of the doctor. The respondents thought that, "The money used to charge for the doctor can be utilized to buy lots of medicine". One of the respondents replied that he had to bear more cost for doctors and the doctor come and say few words and write something about his illness and give medicines. In spite, the pharmacist can provide the same medicine without charge.

It showed that the cost of medical consultation and low satisfaction with medical practitioners are related to self-medication with antibiotics. Patients hardly get three minutes of a doctor's time at government hospitals as well as private hospitals after waiting hours in long queues. After visiting the doctors they also prescribe antibiotics.

Faith upon the Medicine Seller: It was found that people have blind faith on the medicine seller. They easily believe on them and follow their suggestion. The response of one of the respondent as, "No need to go to the doctor because the pharmacist has enough knowledge about the disease and what medicine should be used for the illness" shows that people easily follow the suggestion of the medicine seller. It is also pertinent to note that at the moment, there are no restrictions to how and where antibiotics can be sold in Nepal hence the easy accessibility; most of the respondents got their supply from community pharmacies reinforcing the earlier mentioned problem. This is because of lack of proper regulation.

Lack of regulations or enforcement of existing regulations, lack of professionalism and/or knowledge among pharmacists and pharmacy staff have been suggested as some of the reasons for this malpractice, especially in developing countries. Customer demand or expectation, business orientation and competitiveness within community pharmacies, standards and practice of fellow pharmacists, ethics and professionalism, legislation, enforcement of the legislation, and apprehension of the consequences of such practice were hypothesized to have an effect on antibiotic use or supply without prescription by pharmacists [7].

Status of full-dose Antibiotics Purchase: Since the study was conducted in limited pharmacies of Kathmandu valley, it was found that only 8% of the respondents did not buy full dose of antibiotics. Remaining 92% of the respondents were found to buy full dose of antibiotics (n=25).

Causes of not Buying Full Dose

Among those 8% the reason for not buying full dose of antibiotics was found as below:

The money was insufficient, so bought 10 capsules only. She was prescribed antibiotics twice a day for 7 days. In other case also because of lack of money antibiotic was bought for 5 days which should be for 7 days.

Drug retailers prescribe and sell medicines over-the-counter. The more they sell the more income they generate, leading to overuse of medicines,

particularly the more expensive medicines. When medicines are unaffordable, people may not purchase a full course of treatment or may not purchase the medicines at all. Cost is a very important factor in developing countries like Nepal as it can be a major cause for non-adherence.

Status of Completion of Duration of Antibiotics:

Though 92 percent of the respondents have bought full dose of antibiotics, the study revealed that 36 percent of the respondents have withdrawn to use antibiotics before the expected duration (Fig 2). People think that if the illness is recovered sooner than there is no need to continue to use the medicine. Most of the respondents told that the discontinuity of the medication was early recovery. From the study it was found that 12 percent of the respondents have encountered side effects like indigestion, diarrhea, vomiting and appetite lost. So they withdraw to use antibiotics. One of the respondent was found to use overdose, in the false belief that by taking more of the drug he will get better faster. Similarly the false belief that the antibiotics will accumulate in our body and later it will form stone inside our body was also told by one of the respondents. It shows that people still have misbeliefs on antibiotics which should be removed by proper education and awareness. The importance of completing the full course of antibiotics and taking the correct dose at the stated times, must be emphasized by the doctor prescribing the antibiotics and the pharmacist who dispenses them.

The five important criteria for rational drug use are accurate diagnosis, proper prescribing, correct dispensing, suitable packing and patient adherence. The prescribers should make an accurate diagnosis and prescribe rationally and the pharmacist should ensure that effective form of the drug reaches the right patient in prescribed dosage and quantity, with clear instructions on its appropriate use. These things were found lacking in the pharmacies that were under study. Competent and qualified pharmacists should be trained for dispensing and for giving clear/proper instructions to the patient on safe and effective use of drugs. The pharmacists should have an easy access to complete and unbiased information on the drugs used and should undergo prerequisite training programs. The Omnibus Budget Reconciliation Act-1990 (OBRA-90) and Society of Hospital Pharmacists of Australia (SHPA) have established the minimum standards for information to be given to the patients by the dispensing pharmacists. But in our study it was found that the pharmacists who were selling medicine to the patients had not provided appropriate information to the patients. Appropriate uses of antibiotics also ensure the therapeutic

efficacy of drugs and reduce toxicity and reduce resistance of antibiotics. Thus patient counseling is essential for patients taking antibiotics properly.

CONCLUSION

It was found that people of Kathmandu Valley are ignorant about the effect of using antibiotics in self-medication in their health because approximately 40% of the people were buying antibiotics without the consultation of the physicians. The misuse of antibiotics had become integrated into the local culture. Most of the peoples, about 36% of the respondents have withdrawn antibiotics before time. People think that if the illness is recovered sooner than there is no need to continue to use the medicine. Most of the respondents told that the discontinuity of the medication was early recovery. They are unaware of the adverse effect caused by the incomplete withdrawal of the antibiotics. In our study, few have experienced the side effects like vomiting, loss of appetite and diarrhea because of which they become afraid of taking full dose of antibiotics. Such antibiotic-taking behavior can result in insufficient antibiotic exposure for eradicating infectious bacteria and potentially create an environment that promotes antibiotic resistance. Misuse of antibiotic therapy has ramifications on healthcare costs, antibiotic resistance, treatment failure, hospitalization time, wasted medication and increased return visits to the physician.

Dispensing is the end point of contact between pharmacist and patient or the patient's attendant. At this point it is the duty and responsibility of pharmacist to provide adequate information on proper use of drug which is lacking in our country. The dispensing time is very low because a pharmacist can hardly explain about the dosage regimen, any side effect of drug therapy and precautions to be taken along with appropriate labeling of envelope in such a short period of time. Also, as per the WHO recommendation the pharmacist should spend at least 3 minutes in orienting each patient which was found to be lacking in our study. Since antibiotics are legally grouped as prescription-only medicines, information about such medicines is, unfortunately, not readily available to the general public, but only to health practitioners. It is different with the over-the-counter (OTC) medicines or general sales, where information about the product can be easily accessed through the packed inserts and mass media advertisements. Different methods can be used to carry out public education on drug use. These include: workshops/training; printed materials such as booklets, leaflets, posters, pamphlets and flipcharts; mass media such as newspaper, radio, and television; puppet shows and

street theaters; telephone question-answer services; community meetings; health center talks; and educational programs at schools. This was found to be done by few community pharmacies only, which were run by pharmacist. Although legislation in Nepal mandates a medical prescription for purchase of antibiotics, unauthorized dispensing is clearly problematic. Risks of such indiscretion include harm to individual patients as well as spread of antimicrobial resistance [8]. There is a much scope for improvement consequent to this study. Prescribing of right drug to the right patient, in the right dose, at right time intervals and for right duration is very important duty of a Pharmacist. The results of this study indicate that antibiotics can be very easily bought in Nepalese pharmacies without prescription. In Nepal, there is a need to educate patients regarding antibiotic use and the consequences of misuse: what diseases actually require antibiotics, why full daily doses must be respected, and need of a prescription for getting antibiotics from the pharmacist. Although the prescribing was rational, it was felt that an inclination towards branded products and an over-use of antibiotics were prevalent. The need of an educational intervention, subsidizing cost of certain antibiotics, as well as a strict antibiotic policy was felt. Developing and maintaining an electronic documentation of the patients medical records may serve as a valuable tool for auditing the prescriptions frequently and for implementing the antibiotic policy. Polypharmacy, non-adherence to national formulary, inclination for branded products and overuse of antibiotics are different problems that needs attention by prescribers [17].

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Table 1- Top Ten Antibiotics Used in Kathmandu Valley

S.N	Name of Antibiotics
1	Amoxicillin
2	Azithromycin
3	Amoxicillin-Clavulanate
4	Cloxacillin
5	Ampi-Cloxacillin
6	Ciprofloxacin
7	Cefpodoxime
8	Cefixime
9	Cefadroxil
10	Norfloxacin

Table 2- Prices Differences among the Same Generic Amoxicillin Produced by Different Companies

S.N	Brand Name	Company	Strength	Doses Form	Rate in NRs
1	Perimox	Deurali Janata Pharmaceuticals PVT LTD, Nepal	500mg	Capsule	9.00
2	Amoxydin	Dingla pharmaceuticals (P) LTD Nepal	500mg	Capsule	10.00
3	Amimox	Amie Pharmaceuticals PVT LTD Nepal	500mg	Capsule	8.80
4	Aritomox	Aristo Pharmaceutical LTD, India	500mg	Capsule	10.00
6	Amoxydin	Dingla pharmaceuticals (P) LTD Nepal	250mg	Capsule	6.00
7	Amoxa	Florid Laboratories PVT LTD Nepal	250mg	Capsule	5.00
8.	Amimox	Amie Pharmaceuticals PVT LTD Nepal	250mg	Capsule	4.55
9.	Amoxicillin	Lark Laboratories Limited, India	250mg	Capsule	3.37

Table 3- Prices Differences among the Same Generic Azithromycin Produced by Different Companies

S.N	Brand Name	Company	Strength	Doses Form	Rate in NRs
1	Azimed	Quest Pharmaceuticals PVT LTD, Nepal	500mg	Tablet	40.00
2	Azitop	CTL Pharmaceuticals PVT LTD Nepal	500mg	Tablet	35.00
3	Zulid	Deurali Janata Pharmaceuticals PVT LTD, Nepal	500mg	Tablet	40.00
4	Azithro	National Health Care PVT LTD, Nepal	250mg	Tablet	20.00
5	Azilide	Brown & Bruk Pharmaceuticles PVT LTD, India	500mg	Tablet	39.24
6	Aziwork	Laboratories Serono S.A, Switzerland	500mg	Tablet	53.12
7	Aziwok	Wockhardt Limited, India	500mg	Tablet	24.56
8	Ortiza	Medo Pharm, India	500mg	Tablet	37.22

Table 4- Common Problems and Used Antibiotics

S.N	Illness	No. of people suffering	Name of Antibiotics
1	Wound (pillo)	2	Cefadrox 500mg
2	UTI	5	Nitrofurantion 100mg, Cefalexin 500mg, Cefadroxil 500mg, Ofloxacin 400mg
3	Cough/ Chest Pain	4	Amoxicillin 500mg,
4	Sinusitis	1	Cefpodoxime 500mg
5	Pneumonia	1	Cefixime 400mg
6	Pharyngitis	1	Amoxicillin 500mg
7	Eye infection/ nodules in eyelid, red and swollen eye	2	Cephalaxin 500mg
8	Tonsilitis	3	Azithromycin 250mg
9	Ear infection	1	Amoxicillin 500mg
10	Injury/ Wound in leg	1	Necilox 40ml (Ampicillin+Cloxacillin)
11	Diarrhoea	2	Ciprofloxacin 500mg
12	Common Cold	1	Levofloxacon 500mg

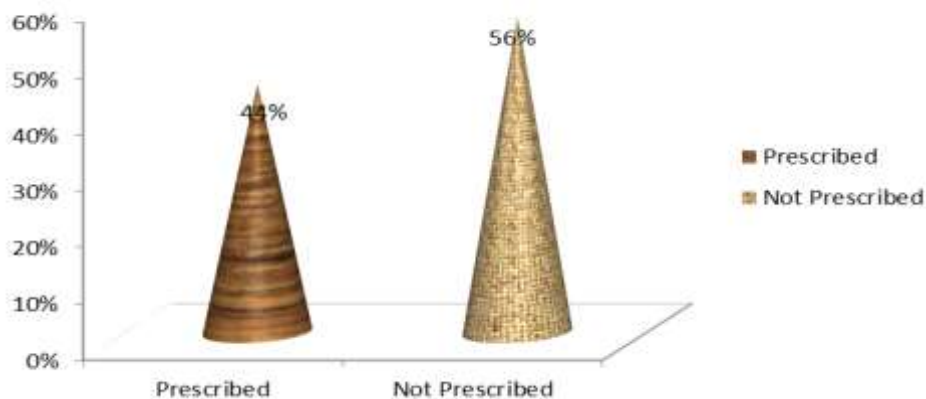


Figure 1 - Status of Antibiotics Prescription (n=25)

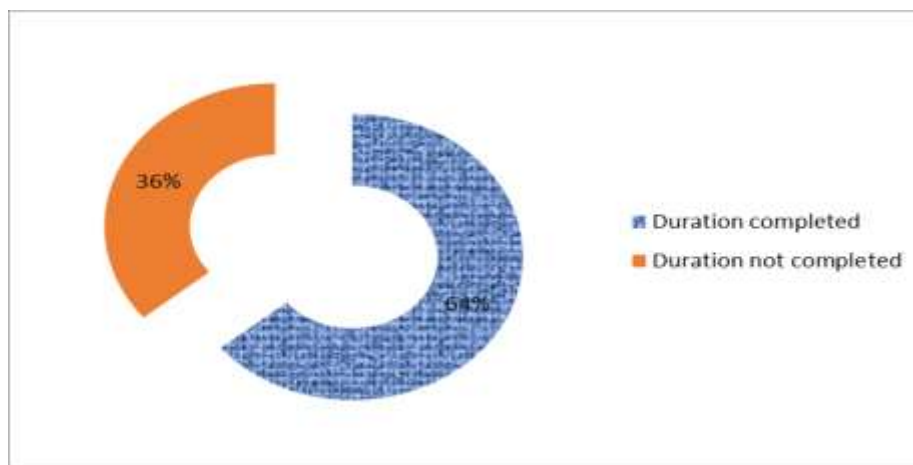


Figure 2 - Status of completion of Duration of Antibiotic Taken (n=25)

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