

# Antibiotic Dispensing Practices at Community Pharmacies in Kathmandu and Lalitpur Districts of Nepal

Nisha Jha<sup>1,\*</sup>, Sunil Shrestha<sup>2</sup>, Pathiyil Ravi Shankar<sup>3</sup>, Anil Khadka<sup>4</sup>, Mukhtar Ansari<sup>5</sup>, Binaya Sapkota<sup>6</sup>

<sup>1</sup>Department of Clinical Pharmacology and Therapeutics, KIST Medical College, Lalitpur, NEPAL.

<sup>2</sup>Department of Pharmaceutical and Health Service Research, Nepal Health Research and Innovation Foundation, Lalitpur, NEPAL.

<sup>3</sup>IMU Centre for Education, International Medical University, Kuala Lumpur, MALAYSIA.

<sup>4</sup>Department of Public Health, Nobel College of Health Sciences, Sinamangal, Kathmandu, NEPAL.

<sup>5</sup>Department of Clinical Pharmacy, University of Hail, Hail, SAUDI ARABIA.

<sup>6</sup>Department of Pharmaceutical Sciences, Nobel College, Sinamangal, Kathmandu, NEPAL.

## ABSTRACT

**Objectives:** Antibiotics are often dispensed irrationally especially in community pharmacies. The present study was conducted to evaluate antibiotic dispensing practices among community pharmacies. **Methods:** A cross-sectional study was conducted in Kathmandu and Lalitpur districts, Nepal from October to November 2018 among the community pharmacies listed in different directories. Systematic random sampling was used to sample 78 community pharmacies based on a 5% margin of error and a 95% confidence level. Data was collected using a structured questionnaire and analyzed using SPSS version 21 for Windows. **Results:** Out of 78 pharmacies, 54 (69.2%) were in Kathmandu district. Antibiotics were dispensed without a prescription by 67 (85.9%) pharmacies. Brand substitution was seen in 43 pharmacies (55.1%). Antibiotics per prescription were three in 51 cases (65.4), followed by two antibiotics in 27 (34.6%). Advice regarding completing the course of antibiotics was provided by 59 (75.6%) pharmacies and an insufficient course of antibiotics was dispensed in 23 (29.5%) pharmacies. Nine pharmacists (11.5%) replaced prescribed antibiotics with cheaper brands. Azithromycin [69 (22.2%)] was the most dispensed antibiotic followed closely by Amoxycillin [68 (21.9%)]. **Conclusion:** Dispensing antibiotics without a prescription was seen in most pharmacies which can adversely impact the rational use of antibiotics. The findings of this study may necessitate strengthening the implementation of the framed guidelines for ensuring the safe and rational use of antibiotics.

**Key words:** Antibiotics, Community pharmacy, Dispensing, Kathmandu, Lalitpur, Pharmacists.

## INTRODUCTION

In Nepal, the use of antibiotics as an over the counter medicine is common.<sup>1</sup> In a developing country such as Nepal, the implementation of the existing antibiotic use guidelines is very difficult.<sup>2</sup> As per the Drug Act 2035, clause 17 and 27 of Nepal, antibiotics should be only prescribed by medical doctors and should only be dispensed or sold by a pharmacy professional.<sup>3</sup>

Various factors contribute to the irrational use of antibiotics including self-medication, irrational prescribing and dispensing.<sup>4,5</sup> Pharmacists working in community settings are important stakeholders towards

promoting safe and rational use of medicines as they are often the first contact point for individuals seeking healthcare.<sup>6</sup> A major factor promoting misuse is self-medication in developing countries and community pharmacies may be responsible in many low- and middle-income countries (LMICs).<sup>7</sup> Evidence suggests a linkage of antibiotic self-medication with the lack of legislation and health insurance.<sup>8</sup> Therefore, the objectives of the present study were to evaluate the antibiotic dispensing practices, the status of community pharmacies, their staffs and practices toward dispensing antibiotics in two districts of Nepal.

DOI: 10.5530/ijopp.13.4.57

Address for correspondence:

Dr. Nisha Jha

Associate Professor, Department of Clinical Pharmacology, KIST Medical College, Lalitpur, NEPAL.

Phone no: +9779841602808

Email Id: nishajha32@gmail.com



www.ijopp.org

## METHODS

### Study design

A cross-sectional prospective study was conducted in selected community pharmacies of Kathmandu and Lalitpur districts of Nepal from 1<sup>st</sup> October to 30<sup>th</sup> November 2018.

### Study site

The community pharmacies were selected from the list of pharmacies provided by the Department of Drug Administration (DDA) and Nepal Chemists and Druggists Association (NCDA).

### Sample size

The sample size of 78 was calculated using the Rao soft sample size calculator.<sup>9</sup> Systematic random sampling was used.

### Inclusion and exclusion criteria

The community pharmacies registered with Department of Drug Administration (DDA) were included and the community pharmacies not having registration numbers were excluded from the study.

### Data collection procedure

A structured questionnaire was used as a data collection tool. The questionnaire was developed in English and translated into Nepali for better understanding. The questionnaire was developed based on the objectives of the study and the existing literature. Informed written consent was obtained from all participants. Both face and content validity were tested by consulting content experts from the field of pharmacy, pharmacology and biostatistics.

### Data analysis

The data were tabulated and statistical analyses done using IBM SPSS Statistics, Version 21 (SPSS Inc., Chicago, IL, USA).

### Ethical considerations

Ethical approval was obtained prior to conduct of this study with a reference number of EPYIRC163/2018. Written informed consent was obtained from all participants.

## RESULTS

Among the 78 community pharmacies surveyed, 54 (69.2%) were in Kathmandu district and 24 (30.8%) in Lalitpur district.

Table 1 shows the socio-demographic characteristics of individuals working at community pharmacies, where most participants (52.6%) were from the age group 22-31 years with a mean age of 30.42 (Mean  $\pm$  SD: 30.42  $\pm$  5.516). Fifty percent (39) of respondents had work experience of 5-10 years. Majority of participants were males (51.3%).

The number of antibiotics dispensed daily by the community pharmacies is shown in Table 2 where 11-20 antibiotics were dispensed daily by 45 (57.7 %) community pharmacy staff.

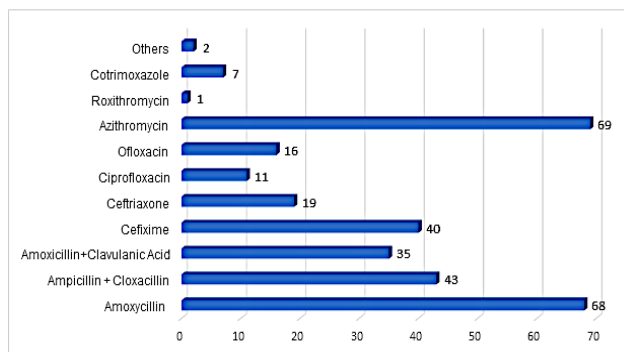
Half of the dispensing staff [39 (50%)] had an experience of 5-10 years. Pharmacists having bachelor's degree were found to dispense antibiotics only with a prescription, whereas, others like community medical assistants (CMA) and diploma staff dispensed antibiotics even without a prescription. Pharmacists having bachelor's degree were found to advise patients to complete the full course of antibiotics. CMAs are paramedical professionals who undergo basic medical training for eighteen months. They are capable of diagnosing and treating minor illnesses and can also refer the patients for specialized services if needed and they do not have any legal authority to dispense medicines unless they have completed the DDA orientation training course which used to be conducted in the past.

**Table 1: Demographic characteristics of pharmacy staff (n = 78).**

Socio-demographic characteristics	Frequency (n)	Percent (%)
<b>Gender</b>		
Male	40	51.3
Female	38	48.7
<b>Age of the respondents (years)</b>		
21	4	5.1
22 – 31	41	52.6
32 – 41	31	39.7
>=42	2	2.6
<b>Work Experience of respondents (years)</b>		
Less than 5 years	30	38.5
5-10 years	39	50.0
More than 10 years	9	11.5
<b>Qualification of the respondents</b>		
Primary	3	3.8
Secondary	1	1.3
Higher Secondary	3	3.8
Diploma in Pharmacy	21	26.9
Bachelor's in pharmacy	28	35.9
Community Medical Assistant (CMA)	22	28.2

**Table 2: Number of antibiotics dispensed daily.**

No of antibiotics dispensed	Number (n = 78)	Percentage
1-10	4	5.1
11-20	45	57.7
21-30	22	28.2
31-40	7	9.0

**Figure 1: Common antibiotics dispensed by the community pharmacists.**

Deals with common antibiotics dispensed by the community pharmacists. Most common antibiotic was azithromycin followed by amoxicillin.

CMA and diploma staffs were more likely to replace the prescribed antibiotics with a cheaper brand as compared to the graduate pharmacy staff. Ten (12.8%) dispensing staff had not consulted any sources of information for remaining updated about the medicines they dispense. Fifty-five (70.5%) pharmacy staff obtained information from multiple resources like the Current Index of Medical Specialities (CIMS), Monthly Index of Medical Specialties (MIMS) and Medicine Index (MI). Only a few staff (7.7%) were using a single resource such as CIMS, MIMS and MI, whereas 9% were dependent on information provided by medical representatives from various pharmaceutical companies.

Sixty-three (80.8%) dispensing staff working at registered community pharmacies were obtaining feedback from patients with regards to use of antibiotics. Dispensing antibiotics without a prescription was seen among 85% of staff. The pattern of antibiotics dispensed by the community pharmacists is shown in Figure 1.

## DISCUSSION

Globally, antibiotic resistance has drawn the attention of several stakeholders due to its extensive economic significance and possible health hazards. The main reason for the increase in antibiotic resistance is the unselective, inappropriate and insufficient use of antibiotics.<sup>10,11</sup> This study shows irrational dispensing practices for antibiotics in the community pharmacies.

Majority of staff working in community pharmacies have a diploma in pharmacy.<sup>12,13</sup> The educational qualification of the staff who dispense medicine is important. Dispensing personnel like CMA and diploma pharmacists have only basic information about drugs. Due to the scarcity of medical doctors and pharmacists having bachelor's degrees, other healthcare professionals like CMAs, nurses and other paramedics are commonly engaged in providing healthcare services in many parts of Nepal.<sup>14</sup> Community pharmacies serve as the first point of contact for many people for their healthcare needs due to convenience and lesser fees compared to seeing a doctor.<sup>4,15</sup> Dispensing staff having a diploma in pharmacy and CMA qualification were found to be more likely to dispense antibiotics without a prescription compared to those having a bachelor's degree. Also, the bachelor's degree pharmacists were more likely to advise patients to complete the full course of antibiotics. This was in accordance with a similar study done in Nepal.<sup>1</sup> CMAs and diploma pharmacists were more likely to replace the prescribed antibiotic with a cheaper brand or provide an incomplete course compared to those having a graduate degree. Educational qualification influences knowledge and promotes the responsible and safe use of medicines. Nepal developed a guideline for the safe use of antibiotics in 2014, but unfortunately, it has not been followed in many areas.<sup>16</sup>

The drug regulatory authority of Nepal, DDA started a short training module of 45 hours in 1981 for capacity building as a basic requirement for registering community pharmacies. At that time, there were very few pharmacists in the country and the training program was considered as a means of creating individuals to work in community pharmacies.<sup>17,18</sup> Later on, three months of training was conducted as an orientation training for individuals with basic qualifications like School leaving certificate (SLC) and these people were eligible to register their community pharmacies. This practice was discontinued following the increase in the number of pharmacy graduates.<sup>18</sup>

This study showed an exceptionally low (2.6%) number of community pharmacies being operated by persons who had completed an orientation program. And this finding can be taken as indicating an improvement in the number of available pharmacists to operate community pharmacies, especially in urban and more accessible parts of the country. Pharmacists should be available to operate the pharmacies as they are the certified healthcare professionals for delivering medicine-related services to the patients.<sup>19</sup>

About 15% of the staff was not obtaining feedback from the patients about their understanding of the use

of antibiotics. Brand substitution with a cheaper brand was seen for 55% of prescribed antibiotics and also dispensing of antibiotics for a reduced duration in 29% of patients. This may be due to a lack of adequate knowledge about good dispensing practices. Also replacing the prescribed antibiotics with cheaper brands of antibiotics may be due to the poor practices for dispensing antibiotics which can be commonly seen in low and middle-income countries (LMICs) and also due to the lack of knowledge and adherence to the existing laws and guidelines on antibiotic dispensing.<sup>20,21</sup> Studies have shown these issues were related to the irrational use of medicines in many countries.<sup>22</sup> Patients may lack financial resources to buy a complete course of antibiotics. This can lead to inappropriate use of antibiotics and the development of antibiotic resistance. In a developing country like Nepal, patients have to pay out of pocket for their healthcare which can influence their ability to complete the course of antibiotic treatment.<sup>23-25</sup>

Pharmacists should be responsible for the safe and rational use of medicines and should deliver proper pharmaceutical care services. They are also responsible for educating and creating awareness among consumers regarding the proper use of antibiotics.<sup>3,20,26</sup> The findings of this study showed that about 85% of staff dispensed antibiotics without a prescription. In 2014, antibiotic treatment guidelines were framed however they are not strictly implemented.<sup>10</sup> The reason for this may also be the presence of unqualified staff (other than pharmacists) operating community pharmacies as seen in many other countries like Vietnam and Egypt.<sup>27,28</sup>

There were two antibiotics per prescription in about 34.6% of prescriptions in our study, which is double in number as compared to a study that reported about 17% of prescriptions with two or more antibiotics.<sup>27</sup> Also, 85% of pharmacy staff were found to dispense antibiotics without a prescription in our study, which is similar to a study that reported about 88% of antibiotic use without a prescription.<sup>29</sup> Similarly, another study by Belkina *et al.* conducted in large cities of Yemen, Saudi Arabia and Uzbekistan showed about 78% use of antibiotics without a prescription which is similar to our findings.<sup>27</sup> A study from Sri Lanka also suggests widespread illegal dispensing (61%) of antibiotics in community pharmacies, despite the law prohibiting dispensing antibiotics without a prescription.<sup>28</sup>

Dispensing staff were using resources like MIMS and CIMS and also obtained information from medical representatives. The maximum percentage of dispensed antibiotics was from the macrolide and penicillin group

which is similar to that noted in another study from Nepal.<sup>30</sup>

### Limitations

This study has been done only in two districts with a limited sample size of seventy-eight pharmacies.

### CONCLUSION

Inappropriate and irrational use of antibiotics is a worldwide issue and Nepal is also facing a similar challenge. There should be strict adherence to the antibiotic use guidelines for better use of antibiotics at the community level. The role of pharmacists and the healthcare services provided by them was critically appraised. Many pharmacists working at community pharmacies were dispensing antibiotics without prescription. This should be taken seriously by the drug regulatory authority.

### ACKNOWLEDGEMENT

The author would like to thank DDA and NCDA for providing the list of community pharmacies. The authors would like to thank all the participants from different pharmacies in this study. The author(s) would like to thank Mrs. Nita Shrestha, Nepal Health Research and Innovation Foundation for her assistance in data collection.

### CONFLICT OF INTEREST

The authors declare that they have no competing interests.

### ABBREVIATIONS

**LMICs:** Low- and middle-income countries; **DDA:** Department of Drug Administration; **NCDA:** Nepal Chemists and Druggists Association; **SPSS:** Statistical Package for Social Sciences; **CMA:** Community Medical Assistant; **CIMS:** Current Index of Medical Specialities; **MIMS:** Monthly Index of Medical Specialties; **MI:** Medicine Index; **SLC:** School leaving certificate.

### Recommendations

The syllabus of diploma pharmacy and Bachelor of Pharmacy should comprise modules on antimicrobial resistance. Curricula and treatment guidelines should be frequently reviewed. Drug authority or concerned stakeholders should regularly monitor the pharmacies of Nepal. There is a need of multi-center studies in various districts of the country for generating evidence from rural and other parts of Nepal regarding the use of antibiotics.



## REFERENCES

1. Ansari M. Evaluation of community pharmacies regarding dispensing practices of antibiotics in two districts of central Nepal. *PLoS One*. 2017;12(9):e0183907.
2. National Antibiotic Treatment Guidelines. Ministry of Health and Population, Government of Nepal, Kathmandu, Nepal. 2014. Available from: [http://www.mohp.gov.np/images/pdf/guideline/National\\_Antibiotic\\_Treatment\\_Guidelines.pdf](http://www.mohp.gov.np/images/pdf/guideline/National_Antibiotic_Treatment_Guidelines.pdf)
3. Drugs Act. 2035 [statute] Kathmandu (Nepal): Government of Nepal. 1978. [cited 2020 Apr 12]. Available from: [www.lawcommission.gov.np/en/documents/2015/08/drugs-act-2035-1978.pdf](http://www.lawcommission.gov.np/en/documents/2015/08/drugs-act-2035-1978.pdf).
4. Shankar PR, Partha P, Shenoy N. Self-medication and nondoctor prescription practices in Pokhara valley, Western Nepal: A questionnaire-based study. *BMC Fam Pract*. 2002;3(1):1-7.
5. Kafle KK, Shrestha N, Karkee SB, Prasad RR, Bhuju GB, Das PL. Intervention studies on rational use of drugs in public and private sector in Nepal. *Nepal Med Coll J*. 2005;7(1):47-50.
6. Palaian S, Ibrahim MIM, Mishra P. Pattern of adverse drug reactions reported by the community pharmacists in Nepal. *Pharm Pract*. 2010;8(3):201-7.
7. Goossens H, Ferech M, Vander SR, Elseviers M. ESAC Project Group. Outpatient antibiotic use in Europe and association with resistance: A cross-national database study. *Lancet*. 2005;365(9459):579-87.
8. Ministry of Health and Population, World Health Organization. Nepal pharmaceutical country profile. Kathmandu. 2011. Available from: <http://un.info.np/Net/NeoDocs/View/4794>.
9. Sample size calculator. Available from: <http://www.raosoft.com/samplesize.html>.
10. Gyawali S, Rathore DS, Adhikari K, Shankar PR, Vikash KC, Basnet S. Pharmacy practice and injection use in community pharmacies in Pokhara city, Western Nepal. *BMC Health Serv Res*. 2014;13:3.
11. Zawahir S, Lekamwasam S, Aslani P. A cross-sectional national survey of community pharmacy staff: Knowledge and antibiotic provision. *PLoS One*. 2019;14(4):e0215484.
12. Poudel A, Khanal S, Alam K, Palaian S. Perception of Nepalese community pharmacists towards patient counseling and continuing pharmacy education program: A multicentric study. *J Clin Diagn Res*. 2009;3(2):1408-13.
13. Bhuvan KC, Alrasheedy AA, Ibrahim MIM. Do community pharmacists in Nepal have a role in adverse drug reaction reporting systems?. *Australas Med J*. 2013;6(2):100-3.
14. Ranjit E. Pharmacy Practice in Nepal. *Can J Hosp Pharm*. 2016;69(6):493-500.
15. Jha N, Shankar PR, Marasini A. Effect of an Educational Intervention on Knowledge and Perception Regarding Rational Medicine Use and Self-medication. *J Nepal Health Res Counc*. 2018;16(3):313-20.
16. WHO Report on Surveillance of Antibiotic Consumption: 2016–2018 Early Implementation; World Health Organization: Geneva, Switzerland. 2018. Available from: [https://www.who.int/medicines/areas/rational\\_use/oms-amr-amc-report-2016-2018/en/](https://www.who.int/medicines/areas/rational_use/oms-amr-amc-report-2016-2018/en/)
17. Kafle KK, Gartoulla RP, Pradhan YM, Karkee SB, Quick JD. Drug retailer training: Experiences from Nepal. *Soc Sci Med*. 1992;35(8):1015-25.
18. World Health Organization. World health statistics. Available from: [https://www.who.int/whosis/whostat/EN\\_WHS2011\\_Full.pdf](https://www.who.int/whosis/whostat/EN_WHS2011_Full.pdf)
19. Toklu HZ. Promoting evidence-based practice in pharmacies. *Integr Pharm Res Pract*. 2015;4:127-31.
20. Zawahir S, Lekamwasam S, Aslani P. Antibiotic dispensing practice in Sri Lankan community pharmacies: A simulated client study. *Res Soc Adm Pharm*. 2019;15(5):584-90.
21. Barker AK, Brown K, Ahsan M, Sengupta S, Safdar N. What drives inappropriate antibiotic dispensing? A mixed-methods study of pharmacy employee perspectives in Haryana, India. *BMJ Open*. 2017;7(3):1-8.
22. Miller R, Goodman C. Performance of retail pharmacies in low- and middle-income Asian settings: A systematic review. *Health Policy Plan*. 2016;31(7):940-53.
23. Vu DH, Rein NV, Cobelens FG, Nguyen TT, Le VH, Brouwers JR. Suspected tuberculosis case detection and referral in private pharmacies in Vietnam. *Int J Tuberc Lung Dis*. 2012;16(12):1625-9.
24. Jha N, Rathore DS, Shankar PR, Bhandary S, Alshakka M, Gyawali S. Knowledge, Attitude and Practice Regarding Pharmacovigilance and consumer Pharmacovigilance among Consumers at Lalitpur District, Nepal. *J Nepal Health Res Counc*. 2017;15(1):31-7.
25. Roche C, Kelliher F. Giving "Best Advice": Proposing a framework of community pharmacist professional judgment formation. *Pharmacy*. 2014;2(1):74-85.
26. Shrestha S, Shrestha S, Palaian S. Can clinical pharmacists bridge a gap between medical oncologists and patients in resource-limited oncology settings? An Experience in Nepal. *J Oncol Pharm Pract*. 2019;25(3):765-8.
27. Belkina T, AlWarafi A, Hussein EE, Tadjieva N, Kubena A, Vleck J. Antibiotic use and knowledge in the community of Yemen, Saudi Arabia and Uzbekistan. *J Infect Dev Ctries*. 2014;8(04):424-9.
28. Zawahir S, Lekamwasam S, Aslani P. A cross-sectional national survey of community pharmacy staff: Knowledge and antibiotic provision. *PLoS One*. 2019;14(4):e0215484.
29. Nga DTT, Chuc NT, Hoa NP, Hoa NQ, Nguyen NT, Loan HT, et al. Antibiotic sales in rural and urban pharmacies in northern Vietnam: An observational study. *BMC Pharmacol Toxicol*. 2014;15(1):6.
30. Ansari M. Evaluation of the most commonly dispensed antibiotics among the pharmacies located in and around National Medical College Teaching Hospital, Birgunj, Nepal. *Indian J Pharm Pract*. 2013;6(3):62-4.