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Survey on the availability, price and affordability of selected essential medicines for non-communicable diseases in community pharmacies of Kathmandu valley

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Abstract

Background: The access to essential medicines for non-communicable disease treatment is unacceptably low worldwide. The fundamental right to health cannot be fulfilled without equitable access to essential medicines.

Methodology: A cross-sectional study was carried out in 94 community pharmacies of Kathmandu valley. Non-probability quota sampling method was adopted for the purpose. Village Development Committees with more than 5000 populations were included in the study. The availability of the selected essential medicines, their price and producer identity were observed. Data entry and analysis were carried out in Microsoft Excel and Statistical package for social science.

Result: The availability of the essential medicines was not 100% in Kathmandu valley. High competition and high price variation were seen in metformin 500 mg (254.6%) and atorvastatin 10 mg (327.6%). The study showed that maximum (54.7%) brands were manufactured in Nepal. Furthermore, atorvastatin 10 mg (0.6 day wage) was found to be quite expensive, and glibenclamide 5 mg (0.1 day wage) was the cheapest one for diabetes mellitus treatment for 1 month of treatment period compared to daily wages of other essential medicines.

Conclusion: The availability of the selected essential medicines was found to be ununiform and insufficient in the entire region. High competition was observed in the products with high price variation, and the access to cost-effective brand was poor. Furthermore, it was found that government salary is affordable to treat non-communicable disease with the help of the essential medicines.

Keywords

Affordability, availability, community pharmacy, essential medicine, Nepal, non-communicable disease, price variation

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Introduction

Access to essential medicines (EMs) is one of the United Nations Millennium Development Goals (MDGs).[1] One of the objectives of National health policy 2071 is to establish effective and accountable health services equipped with 'essential drugs'.[2] Non-communicable diseases (NCDs), like heart disease, stroke, cancer, diabetes and chronic lung disease, are collectively responsible for almost 70% of all deaths worldwide,[3] 82% of which is occurred in low- and middle-income countries.[4] The probability of premature mortality from NCDs was estimated to be 22% in Nepal.[5]

The access to EMs for NCDs treatment is unacceptably low worldwide. There is a large disparity between high-, middle- and low-income countries in access to medicines for NCDs.[6] The fundamental right to health cannot be fulfilled without equitable access to EMs for priority diseases.[1] The study is aimed to analyse the status of EMs for NCDs in

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Table 1. Distribution of sample.

District	VDC	MU	SMC	MC	Total
Kathmandu	34	2	0	20	56
Lalitpur	15	0	5	0	20
Bhaktapur	8	10	0	0	18
Total sample	57	12	5	20	94

VDC: Village Development Committee; MU: municipality, SMC: sub-metropolitan city, MC: metropolitan city.

different community pharmacies of Kathmandu valley by determining the availability, price and affordability of the selected EMs. The study findings will help to understand the dispersion of EMs for NCDs and know its affordability with reference to minimum government salary scale. Additionally, it will help to analyse the current status of EMs for NCDs in community as well as in the Government level.

Methods and methodology

A cross-sectional study was carried out in total 94 community pharmacies of Kathmandu valley (Kathmandu, Lalitpur and Bhaktapur district). The actual number of pharmacy was not identified thus non-probability quota sampling method was adopted. The possibility of pharmacy availability was found to be low: below 5000 population in Village Development Committee (VDC) area during pre-study. Therefore, VDCs with more than 5000 population were included in the study whereas wholesale pharmacies, hospital pharmacies and government-run free drug distribution centres were excluded. Ethical approval was taken from Nepal Health Research Council before conducting the research. Both verbal and written consents were taken from the participants.

As the population variation was high, sample number was chosen proportionately: one community pharmacy from VDC population below 50,000; two from population 50,000 to 100,000; three from population 100,000 to 150,000 and so on in an increasing order. Community pharmacy was selected conveniently among the community pharmacies of each VDC or municipality (MU) or sub-metropolitan city (SMC) or metropolitan city (MC) (Table 1). In this way, the total number of sampled pharmacy was 94. The information of district-wise population was collected from Central Bureau of Statistic Nepal.[7]

The EMs and their dosage forms for NCDs, that is, diabetes mellitus (DM) (glibenclamide 5 mg, metformin 500 mg), cardiovascular diseases (atenolol 50 mg, enalapril 5 mg, atorvastatin 10 mg, hydrochlorothiazide (HZT) 25 mg) and respiratory diseases (salbutamol aerosol 0.1 mg, beclomethasone aerosol 0.05 mg) were selected on the basis of EMs list of Nepal 2011 and core list of medicines required for implementing NCDs interventions in primary care.[8] The EMs regimen was assumed with reference to package of essential NCD, World Health Organization (WHO) and Nepalese National Formulary 2010.[9]

The availability of the selected EMs, their price and producer identity were observed. A predesigned form was filled up from the selected community pharmacies. Required information was filled on the basis of a survey carried out with community pharmacy representatives.

Data entry and analysis were carried out in Microsoft Excel and Statistical Package for the Social Sciences, version 22. The availability and price variation of multiple substitutions of the selected medicines were analysed, and the affordability was mathematically calculated from the minimum salary scale of Nepal government.[10]

Results

The availability of the selected EMs for NCDs was found to be greater than 50% in all three districts. Among all the districts, metformin 500 mg (97.9%, n = 92) had the highest availability, followed by salbutamol 0.1 mg aerosol (84.1%, n = 79), atorvastatin 10 mg (88.3%, n = 83), enalapril 5 mg (82.9%, n = 78), atenolol 50 mg (74.5%, n = 70), HZT 25 mg (63.8%, n = 60), glipalamide 5 mg (11.7%, n = 11) and beclomethasone 0.05-mg aerosol (0%) (Table 2).

The availability of all the EMs was found to be greater in MU/SMC/MC area comparing to VDC. The EMs were available above 50% in both areas except glibenclamide which was only 5.3% in VDC and 21.6% in MU/SMC/MC. Furthermore, except glibenclamide, the lowest margin of all the EMs in MU/SMC/MC and VDC was 75.7% and 56.1%, respectively. Metformin, atorvastatin and salbutamol were widely available EMs, whereas glibenclamide along with HZT were poorly available in both areas (Table 2).

The available brands of glibenclamide and metformin with their respective price distribution have been shown in Table 3. Glibenclamide was found to have only one brand Daonil (maximum retail price (MRP) 1.7 NC; Nepali currency) with no other competitors in the market which was manufactured in India. The mean and median price was same (1.7 NC) (Table 7).

Metformin had 18 brands in the market, the most prominent brand being Metfor 97.8% (n = 90) followed by Formin 63.1% (n = 58). Most of the other brands including Carbomet, Zomet, T-for, Memin, Melmet, Metaday, Glucut, Formet, V-met and Bigomet were found to be below 10% in the market. The MRP of metformin was in the range of 1.1–3.9 NC. The availability of the cheapest Zomet (1.1 NC) was 1.1% (n = 1) and the most expensive Melmet (3.9 NC) was 9.8% (n = 9) in the market. The highly available brand Metfor had a retail price of 2 NC (Table 3).

Metformin had a mean price of 2.1 NC, median price of 2 NC and price variation of 254.6%. Moreover, looking at the manufacturer characteristics, the lowest priced Zomet and the highest priced Melmet were both found to be manufactured from India (Table 7).

Table 2. Total availability of the selected EMs for NCDs.

EMs	Districts wise, n (%)				Structure wise, n (%)		
	Ktm	Lat	Bhk	Total	VDC	Other[a]	Total
Salbutamol	49 (87.5)	15 (75)	15 (83.3)	79 (84.1)	47 (82.5)	32 (86.5)	79 (84.1)
Beclomethasone	0	0	0	0	0	0	0
Glibenclamide	9 (16.1)	1 (5)	1 (5.6)	11 (11.7)	3 (5.3)	8 (21.6)	11 (11.7)
Metformin	59 (100)	19 (95)	17 (94.4)	92 (97.9)	55 (96.5)	37 (100)	92 (97.9)
Atenolol	43 (76.8)	15 (75)	12 (66.7)	70 (74.5)	37 (67.9)	33 (89.2)	70 (74.5)
Enalapril	51 (91.1)	17 (85)	10 (55.6)	78 (82.9)	47 (82.5)	31 (83.8)	78 (82.9)
Atorvastatin	52 (92.9)	19 (95)	12 (66.7)	83 (88.3)	50 (87.7)	33 (89.2)	83 (88.3)
HZT	40 (71.4)	10 (50)	10 (55.6)	60 (63.8)	32 (56.1)	28 (75.7)	60 (63.8)
Total	56	20	18	94	57	37	94

NCD: Non-communicable disease; EM: essential medicine; Ktm: Kathmandu; Lat: Lalitpur; Bhk: Bhaktapur; VDC: Village Development Committee; HZT: hydrochlorothiazide.
[a]MU: municipality; SMC: sub-metropolitan city; MC: metropolitan city.

Table 3. Availability of different brands of the selected anti-diabetics EMs and their price distribution.

EMs	Brands	Price (NC)	Availability, n (%)
Glibenclamide	Daonil	1.7	11 (100.0%)
Metformin	Metfor	2	90 (97.8%)
	Glycomet	2	51 (55.4%)
	Glyciphage	2.3	38 (41.3%)
	Meta-H	2	11 (11.9%)
	Effimet	2	23 (25%)
	Formin	2	58 (63.1%)
	Metlong	3	15 (16.3%)
	Obicheck	2	14 (15.2%)
	Carbomet	2	5 (5.4%)
	Zomet	1.1	1 (1.1%)
	T-for	1.8	1 (1.1%)
	Memin	1.9	1 (1.1%)
	Melmet	3.9	9 (9.8%)
	Metaday	2.9	2 (2.2%)
	Glucut	2	2 (2.2%)
	Formet	2	6 (6.5%)
	V-met	2	8 (8.7%)
	Bigomet	1.6	4 (4.4%)
Total		–	92

EM: essential medicine; NC: Nepali currency.

Similarly, the most prominent brand among all the available brands of atenolol was Atenol (84.3%, n=59) followed by Atecard (42.9%, n=30), Tenolol (18.6%, n=13), Beten (8.6%, n=6), Cardinol (4.3%, n=3), Atcardil (1.4%, n=1), Tenormin 1.4% (n=1) and Betanol (1.4%, n=1). The MRP of these available brands were in the range of 3.2–4.4 NC. The most prominent brand available in the market, Atenol had MRP of 4 NC. Both the cheapest Tenormin (3.2 NC) and the expensive Atcardil (4.4 NC) had availability of only 1.4% in the market (Table 4). The price variation of atenolol was 25% (mean price 3.9 NC, median price 4 NC). The minimum priced Tenormin and maximum priced Atcardil, both were manufactured from India (Table 7).

The highly available brands of enalapril were Enpil (66.7%, n=52) and Qpil (60.3%, n=47) followed by Enil (29.5%, n=23), Enapril (29.5%, n=23), and the remaining three brands Enapril, Acepril and E-card were below 10% in the market. The MRP range of enalapril was from 4 to 5 NC. Enil was the most expensive brand with MRP of 5 NC. Both the most available brand Enpil and least available brand Acepril had same MRP of 4 NC (Table 3). Enalapril had a price variation of 25% (mean price of 4.2 NC, median price 4 NC). The minimum priced Acepril, Enapril and Enpil were manufactured in Nepal, India and Nepal, respectively. The maximum priced Enil was manufactured in Nepal (Table 7).

There were 18 brands available for atorvastatin. The most prominent brand among all was Ator (71.1%, n=59) followed by Aztor (57.8%, n=48) and Astat (56.6%, n=47). Another large number of substitute brands were below 20% in the market, that is, Hypolip 8.4% (n=7), Liplow 13.3% (n=11), Atorlip 12.1% (n=10), Atchol 8.4% (n=7), Statin 8.4% (n=7), Lipicure 12.1% (n=10), Tonact 6.0% (n=5), Ozovas 6.0% (n=5), Vastatin 10.8% (n=9), Atorvast 12.1% (n=10), Avas 9.6% (n=8), Normachol 1.2% (n=1), Liponorm 4.8% (n=4), Atorin 2.4% (n=2) (Table 3). The MRP range of atorvastatin was from 3.1 to 13 NC, Ozovas (3.1 NC) being the cheapest and Hypolip (13 NC), the expensive brand in the market. Most of the brands had MRP above 10 NC except Avas (8.6 NC), Liponorm (5.3 NC), Atchol (3.4 NC) and Ozovas (3.1 NC). Moreover, the availability of atorvastatin with MRP less than 10 was below 10% in the market. The most prominent three brands Ator, Aztor and Astat had MRP of 10.8 NC (Table 4). Atorvastatin had a mean price of 9.7 NC, median price of 10.7 NC and price variation 327.6%. The minimum priced Ozovas was manufactured in India, and the maximum priced Hypolip was manufactured in Nepal (Table 7).

Furthermore, there were total eight available brands for HZT. The most commonly available two brands were Hytide

Table 4. Availability of different brands of the selected cardiovascular EMs and their price distribution.

EMs	Brands	Price (NC)	Availability, n (%)
Atenolol	Atenol	4	59 (84.3%)
	Cardinol	4	3 (4.3%)
	Beten	4.3	6 (8.6%)
	Atecard	3.9	30 (42.9%)
	Atcardil	4.4	1 (1.4%)
	Tenormin	3.2	1 (1.4%)
	Betanol	4	1 (1.4%)
	Tenolol	3.7	13 (18.6%)
Total		–	70
Enalapril	Enil	5	23 (29.5%)
	Enpil	4	52 (66.7%)
	Qpil	4.3	47 (60.3%)
	Enapril	4	5 (6.4%)
	Envas	4.03	23 (29.5%)
	Acepril	4	2 (2.6%)
	E-card	4	4 (5.1%)
Total		–	78
Atorvastatin	Astat	10.8	47 (56.6%)
	Ator	10.8	59 (71.1%)
	Atorin	10.7	2 (2.4%)
	Atortin	10.7	27 (32.5%)
	Hypolip	13	7 (8.4%)
	Liplow	10.7	11 (13.3%)
	Atorlip	10.9	10 (12.1%)
	Aztor	10.8	48 (57.8%)
	Atchol	3.4	7 (8.4%)
	Statin	10.8	7 (8.4%)
	Lipicure	10.8	10 (12.1%)
	Tonact	10.7	5 (6.0%)
	Ozovas	3.1	5 (6.0%)
	Vastatin	10.7	9 (10.8%)
	Atorvast	11	10 (12.1%)
	Avas	8.6	8 (9.6%)
	Normachol	12	1 (1.2%)
	Liponorm	5.3	4 (4.8%)
Total		–	83
HZT	Hytide	3.2	53 (88.3%)
	Esizide	2.6	1 (1.7%)
	Diazide	2.8	1 (1.7%)
	Hyzide	3	3 (5%)
	Uretik	1.9	2 (3.3%)
	Maxzide	4.8	1 (1.7%)
	Hydrozide	3.2	1 (1.7%)
	Aquazide	3.1	34 (56.7%)
Total		–	60

EM: essential medicine; NC: Nepali currency.

88.3% (n=53) and Aquazide 56.7% (n=34). Other six brands (Esizide, Diazide, Hyzide, Uretic, Maxzide, and Hydrozide) were only available below 5% in the market. The price range was from 1.9 to 4.8 NC in HZT. The highest priced Maxzide (4.8 NC) was 1.7% (n=1). However, the cheapest Uretik (1.9 NC) was 3.3% (n=2) available in the market. The highly available brand Hytide and Aquazide had MRP of 3.2 NC and 3.1 NC, respectively (Table 4). Similarly, HZT had a price variation of 151.3% (both mean and median price of 3.1 NC). The minimum priced Uretik and maximum priced Maxzide both were manufactured from Nepal (Table 7).

Table 5. Availability of different brands of the selected respiratory EMs and their price distribution.

EMs	Brands	Price (NC)	Availability, n (%)
Salbutamol	Asthalin	203.4	76 (96.2%)
	Azmasol	195.0	6 (7.6%)
Total		–	79
Beclomethasone	Nil	Nil	Nil

EM: essential medicine; NC: Nepali currency.

Table 6. Characteristics of the manufacturer of the selected EMs.

EMs	Manufacturing country		
	Nepal	India	Bangladesh
Salbutamol	0	1 (50%)	1 (50%)
Beclomethasone	0	0	0
Glibenclamide	0	1	0
Metformin	11 (61.1%)	7 (38.9%)	0
Atenolol 50 mg	4 (50%)	4 (50%)	0
Enalapril	5 (71.4%)	2 (28.6%)	0
Atorvastatin	9 (50%)	9 (50%)	0
HZT	6 (75%)	2 (25%)	0
Total	35 (54.7%)	26 (42.2%)	1 (3.1%)

NCD: Non-communicable disease; EM: essential medicine; HZT: hydrochlorothiazide.

Two brands Asthalin and Azmasol were available for salbutamol aerosol. In total available brands, Asthalin (203.4 NC) was 96.2% and Azmasol (195.0 NC) 7.6% (Table 5). Salbutamol had both mean and median price of 199.2 NC and price variation of 4.3%. The minimum priced Azmasol was manufactured from Bangladesh, and the maximum priced Asthalin was manufactured from India (Table 7).

Looking at the overall manufacturer and the supplier of the selected EMs, maximum were found to be manufactured from Nepal (n=35, 54.7%) followed by India (n=26, 42.2%) and Bangladesh (n=1, 3.1%) (Table 6). The manufacturing details of each EMs are presented in Table 7.

Finally, the affordability of the selected EMs for 1 month was calculated by determining per day salary scale of the lowest paid government employees. The study showed that glibenclamide 5 mg used for DM treatment for 1 month had 0.1 day wages whereas metformin 500 mg consumed 0.2 day wages. The treatment of cardiovascular disease condition like hypertension (HTN) condition for 1 month took 0.2, 0.2, 0.6, and 0.2 day wages for atenolol 50 mg, enalapril 5 mg, atorvastatin 10 mg and HZT 25 mg, respectively. Salbutamol 0.1 mg

Table 7. Price and manufacturer characteristics of the selected EMs.

EMs	Price variation				
	Min.	Max.	Mean	Median	% variation
Anti-diabetic EMs					
Glibenclamide	1.7	1.7	1.7	1.7	
Brand	Daonil (I)	Daonil (I)			
Metformin	1.1	3.9	2.1	2	254.6
Brand	Zomet (I)	Melmet (I)			
Cardiovascular EMs					
Atenolol	3.2	4.4	3.9	4	25
Brand	Tenormin (I)	Atcardil (I)			
Enalapril	4	5	4.2	4	25
Brand	Acepril (N) Enapril (I) Enpil (N)	Enil (N)			
Atorvastatin	3.04	13.0	9.7	10.7	327.6
Brand	Ozovas (I)	Hypolip (N)			
HZT	1.9	4.8	3.1	3.04	151.3
Brand	Uretik (N)	Maxide (N)			
Respiratory EMs					
Salbutamol	195.0	203.4	199.2	199.2	4.3
Brand	Azmasol (B)	Asthalin (I)			

EM: essential medicine; HZT: hydrochlorothiazide; N: Nepal; I: India; B: Bangladesh.

Table 8. Treatment affordability of the selected EMs for 1-month treatment.

EMs	Median price (NC/unit)	Disease condition	Treatment regimen (month)	Treatment period (days)
Glibenclamide	1.7	DM	30 tab	0.1
Metformin	2	DM	60 tab	0.2
Atenolol	4	HTN	30 tab	0.2
Enalapril	4	HTN	30 tab	0.2
Atorvastatin	10.7	HTN	30 tab	0.6
HZT	3.03	HTN	30 tab	0.2
Salbutamol	199.2	Asthma/COPD	1 inhaler/200 doses	0.4

NC: Nepali currency; DM: diabetic mellitus, HTN: hypertension; HZT: hydrochlorothiazide; COPD: chronic obstructive pulmonary disease.

aerosol for the treatment of respiratory conditions like asthma and chronic obstructive pulmonary disease (COPD) took 0.4 day wages (Table 8).

Discussion

The study shows that availability of the selected EMs was very poor in VDC region as compared to other developed regions (MU/SMC/MC). Although the objective of National Drug Policy 1995 was to evolve a suitable mechanism to ensure the availability of safe, effective and quality medicine at reasonable price throughout the country, the availability of medicines were not uniform even in the central districts, that is, Kathmandu, Bhaktapur and Lalitpur of Nepal. The probable reason behind this might be due to inefficient performance of healthcare systems in ensuring availability of EMs in the community pharmacies of all regions. It is required to mobilize all the resources and equally distribute EMs to all parts of the country. However, it seems that inefficient management is causing difficulty in the access of EMs in all parts of the country.

This study determines that the availability of EMs for NCDs was not 100% in all area of Kathmandu valley. The availability of metformin was found to be almost 100%, whereas beclomethasone 0.05-mg aerosol was nil. However, other doses of beclomethasone were present. According to Nepalese National formulary and Package of Essential Noncommunicable (PEN) disease, the dose for management of asthma is 0.2–0.4 mg daily for adult and the use of 0.5 mg takes longer time.[8,9] But still, beclomethasone 0.05-mg aerosol is present in the National List of EMs 2011.[11] This signifies the immediate need of amendment of National EMs list.

Looking at different brands of the selected EMs, the study revealed that there was very less competitor brand (only two) in salbutamol, Asthalin being the biggest brand available with a higher price than Azmasol. These kinds of monopoly market compel patients to choose same brand with higher cost.

In the study of cardiovascular EMs, atorvastatin had high brand availability with higher MRP comparing to other cardiovascular medicines. Although there were several substitutes, there were few brands which cover high market availability. For instance, Atenol and Atecard of atenolol, Enpil and Qpil of enalapril, Ator, Aztor and Astat of atorvastatin and Hytide and Aquazide of HZT were highly available in community pharmacy. There was a huge difference in the availability of atenol as compared to other brands.

In a similar study carried out by WHO in 2007, the availability of HZT and enalapril was found to be lower than that of our study.[12] Similarly, a survey conducted in Srilanka, in 2014 shows similar kinds of results for the availability of HZT (67%), atorvastatin (87%) and atenolol (70%), whereas it was 100% for enalapril.[13] The number of manufacturers and the variation in prices was found to be high in case of atorvastatin. Whereas, the availability of cost-effective medicines was found to be comparatively lower. Since, the average cost of atorvastatin is higher as compared to other cardiovascular medicines, the competition is also high. The probable reason for its high price is that it is safe and efficacious in reducing the risk of first cardiovascular disease events including stroke in patients with type 2 DM.[14,15]

In our study, only a single brand of glibenclamide was present. Thus, there was no competition, and patients were compelled to receive that particular medicine. Metformin was the most available brand in market, providing multiple choices to the patients. There was high manufacturer participation in its manufacturing because of the need of that particular generic medicine due to increment in the burden of type 2 DM.[16] A research conducted in 2007 in tertiary care teaching hospital of Nepal reveals that the use of biguanides, like metformin was higher than the sulfonylureas like glibenclamide.[17] The prevalence of NCDs including type 2 DM is expected to increase rapidly in near future.[16] Therefore, it is supposed that metformin will be highly available in contrast to glibenclamide.

The price variation of salbutamol was 4.3%, metformin 254.6%, atenolol 25%, enalapril 25%, atorvastatin 327.6% and HZT 151.3%. The study showed that there was high competition along with higher price variation in metformin and atorvastatin comparing to other medicines. Whereas, other EMs have less-available brands in market and thus particular brand dominancy was seen. The higher price variation and insufficient availability of all the competing medicine equally reduce the access of cost-effective medicine to general public. This somehow promotes unethical practice among the prescriber and dispenser to push expensive ones and enhance public expenses. The EMs must be affordable and available in adequate quantity with low price variation.

The study determines that among total available different brands, the manufacturer was highest from Nepal followed by India and Bangladesh; Bangladesh was seen participated in the availability of salbutamol only. Nepal is self-reliant in manufacturing of all the selected cardiovascular medicines but not in respirator aerosols and glibenclamide, an anti-diabetic medicine. There was an equal brand of atorvastatin and atenolol manufactured by India and Nepal. It was found that India has significantly involved in manufacturing of all the selected EMs except beclomethasone. One of the aims of National Drug Policy (NDP) 1995 is to make nation self-reliant in EMs manufacturing and be able to produce 80% of the EMs formulations in the next 10 years.[2] Therefore, the government has to encourage and promote domestic company to manufacture the required EMs.

Finally, the affordability of the EMs was calculated by the regimen assumed. All of the selected EMs can be consumed for 1 month under 1 day of wages of lowest scale of government employee. Therefore, the promotion of use of EMs can highly reduce the financial aspect of general public in treatment of NCDs.

The findings of this study can be useful as a reference to check the status of EMs in Kathmandu valley and help to provide basis in preparation of regulation in case of access of EMs for NCDs.

Conclusion

The availability of the selected EMs was not uniform and was insufficient in the entire region. The EMs list was not revised according to the status of disease and pattern of drug utilization in particular disease. There was high competition in the product with high price variation, and the access to the cost-effective brand was poor. The country does not seem to be self-reliant in producing all the EMs. Furthermore, while considering the median price of the available brands, it was found that the government salary is affordable to treat NCDs by the help of the EMs.

Limitation of the study

Generalization of the study became difficult because of non-probability type of sampling method and less study period.

Recommendation

- Periodic revision of EMs list is required to meet the need of the patients;
- There is a need to prepare stringent policy regarding price control of EMs for NCDs and ensure its full-phase implementation;
- For the sufficient availability of EMs in small city/VDC area, effective mechanism has to be implemented in co-operation with private sector;

- The Government has to promote domestic entrepreneur to produce EMs required by the nation.

Declaration of conflicting interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship and/or publication of this article.

Ethical approval

Ethical approval was granted by the Ethical Review Board of Nepal Health Research Council to conduct the study. Nepal Health Research Council ethical approval number: 626.

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Informed consent

Informed verbal consent as well as written consent was taken with the participants before starting the research.

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