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PATIENT CARE INDICATORS RELATED TO DRUG DISPENSING AT PUBLIC AND PRIVATE PHARMACIES IN THATTA SINDH, PAKISTAN: A CROSS SECTIONAL STUDY

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ABSTRACT

Introduction: Optimal dispensing practices improvise significant role in rational use of medicines ensuring that patient received prescribed medicines with proper labeling, counseling and appropriate directions. World Health Organization identifies Patient care indicator to estimate the quality of dispensing practices. In evolving countries particularly in Pakistan, these indicators are suboptimal. Current study assists Patient Care indicators in Public and Private Pharmacies of District Thatta.

Methodology: A cross sectional study was conducted. Convenient sampling technique was utilized with selection of four public and four private pharmacies. Total sample size was (n=240). To assess the pharmaceutical practices, structured World Health Organization questionnaire was utilized and thirty respondents from said facility were questioned. Data was analyzed in SPSS 16.0.

Results: Patient care indicator assessment reflected average dispensing time in public pharmacies was 15.1 seconds and in private pharmacies it was 35.1 seconds. 32.2% and 38.8% medicines adequately were labeled in public pharmacies and private pharmacies respectively. 38.3 % of people had knowledge of taking medicines in public pharmacies and 56.7 % in private pharmacies. Number of medicines prescribed per prescription was 3.1% in public pharmacies and percentage of medicines actually dispensed in public pharmacies was 80.1%.

Conclusion: The patient care indicators were assessed and the pharmaceutical practices at dispensing counters of the pharmacies were evaluated. Each indicator was found to be suboptimal in Sindh reflecting that practices were not according to World Health Organization standards. Laws exist but due to lack of governance and hiring of untrained personnel, its implications were deprived. The hiring and training of pharmacist with strict implications of policies are in utmost

need in collaboration with patient counseling which increase the treatment adherence and promote the rational use of medicines. Strict improvisation of essential drug list, hospital formulary and standard treatment guidelines is needed at health facilities and private pharmacies to reduce irrational use of medicines.

Keywords: Patient Care, Drug Dispensing, Pharmacies

INTRODUCTION

Pharmacies in health care system are accountable for rational use of medicines including dispensing and counseling of medicines to ensure that patient receives the correct information regarding the correct use of their medication with proper accessibility and affordability [1,2]. According to WHO, Essential Medicines are healthcare essentials and should be available all the time [3, 4]. Among eight elements for optimal primary health care service, provision of essential medicines are vital most [5]. Medicines provide preventive, curative and rehabilitative care and its demand is increasing gradually with limited financial resources [5]. In developing countries, irrational drug use and indecorous dispensing practices are the chief problem. The medicines expenditure is intensifying in numerous countries with 50% medicine budget wastage via irrational prescribing, dispensing and incorrect patients usage [6]. The inadequate prescription, counseling and reduce dispensing time is worsening the situation [7]. Worldwide, one third of population lack admittance to essential medicines, 50% of patients fail to take them appropriately, and more than 50% of all medicines are prescribed, dispensed, or sold inaccurately [8]. The key dispensing errors lie in the inadequate medicine patient's compliance. Patients should be encouraged and offered proper time at dispensing the prescribed medicines to increase the treatment adherence [9, 10] . Also patients' knowledge regarding medicine name, dosage, and proper timing of medicines intake and treatment adherence is directly associated[11]. In order to monitor and evaluate the pharmaceutical practices, WHO specified the core drug indicators. These indicators measure the health care practices according to standard guidelines at facilities as well as identifies rational use of medicines. The core drug indicators includes Patient Care Indicators (percentage of medicines actually dispensed, percentage of adequately labeled medicines, average dispensing time, percentage of patients knowing how to take medicines , and average consultation time) , Prescription Indicators (the average number of drugs prescribed, percentage of drugs prescribed by generic name, percentage of encounters in which an antibiotic was prescribed, percentage of encounters with prescribed injection , and percentage of drugs prescribed from an essential drug list) , and Health Care Facility Indicators (availability of a copy of essential medicines list or formulary and availability of standard treatment guideline).The patient care indicators explain what patients experience and deal with medicines prescribed and dispensed at health care facilities. In order to sustain adherence to treatment of patient, the prescribing and dispensing time should be sufficient. Properly labeled prescribed medicines with proper name, dosage and duration of treatment could avoid medicines interactions. Understanding of the medicines consumption and patient and dispenser communication signifies patient satisfaction. Number of medicines prescribed and dispensed are also include in Patient care indicators [12] .The difference between prescribed and dispensed medicines assess availability of the medicines stock and measure provision of services quality at the health care facility[11, 12]. This study assisted Patient Care indicators related to dispensing practices in outpatients visiting in public and private drug Pharmacies of District Thatta.

METHODOLOGY:

Study design, setting, and Participants

A cross sectional study was conducted from August 2018 to December 2018 in Thatta, located in southern area of Sindh Province locally known as Laar. The capital is Thatta and having five tehsil (Talukas) [13]. The survey was conducted at four pharmacies of public sector including Civil Hospital, Tehsil Headquarter, Rural Health Center, Basic Health Unit and private pharmacies in the

near vicinity of said hospitals were also included. The study population was outpatients visited to the said public and private pharmacies. Sample size was (n=240) [14].

Inclusion and Exclusion criteria

To measure the patient care indicator, outpatient with age limit between 16 to 70 years with general illness, representing a mix of health problems were selected and patient with chronic diseases , using same medicines for longer period of time, and patient came for antenatal and postnatal care, vaccination were excluded.

Data collection

Prospective sampling with WHO validated structured questionnaire from WHO Operational package for Pharmaceutical sector assessment was used. Patients were provided with questionnaire after taking the permission from higher authorities. In order to visit the private pharmacies, a schedule was prepared with the consent of in-charge.

Eight pharmacies were assessed. After obtaining verbal and written consent from patients, questions were asked. 30 patients were interview when leaving the dispensing pharmacy area and / or leaving the facility after they have received medicines to evaluate how many of prescribed medicines were dispensed. During the visits, Data collector with the principal investigator was present. Between 9am to 1pm from Monday to Saturday, data was collected. Medicines prescribed with and without prescriptions in private pharmacies were recorded [15].

Data Analysis

Data were collected and organized into Microsoft Excel (2013) and data entered and analyzed in SPSS 16.0.

RESULTS

Patient care indicators data from health care facilities involved average number of medicines prescribed, percentage of medicines dispensed, percentage of adequately labeled medicines, average dispensing time, and percentage of patients knowing how to take medicines. These outcomes were measured according to guidelines provided by WHO. Table- 1 showed the descriptive statistical data of the respondents and the patient care indicators at public and private pharmacies.

Table 1 Basic Characteristics And Patient Care Indicators According To Public And Private Pharmacies. (N=240)

Characteristics	**Public Health Facility**	**Private Pharmacy**
Patient Age (%)		
16-30 years	49 (40.8)	44 (36.7)
31-45 years	51 (21.2)	56 (46.7)
46-60 years	14 (11.7)	20 (16.7)
60-70 years	6 (5.0)	-
Patient Sex (%)		
Male	55 (45.8)	89 (74.2)
Female	65 (54.2)	31 (25.8)
Number of medicines prescribed (mean±SD)	3.1±0.99	-
Number of medicines dispensed or administered(mean±SD)	2.48±0.75	-
Number of medicines adequately labeled (mean ± SD)	0.80 ±0.74	0.88±0.73
Patient knows how to take medicines (%)		
Yes	46 (38.3)	68 (56.7)
No	74 (61.7)	52 (43.3)

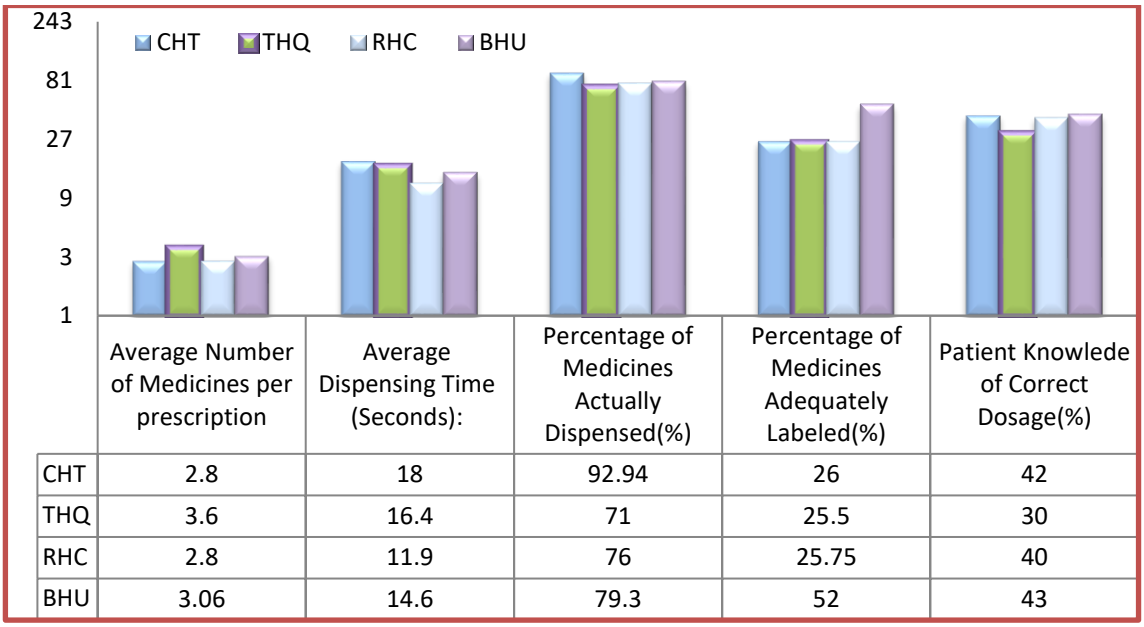
Average Dispensing time(mean ± SD)	15.2 ±5.61	35.14±21.10
Time taken to go to the health facility today (%)		
<30min	81 (67.5)	106 (88.3)
31min-1h	31 (25.8)	12 (10.0)
> 1h	8 (6.7)	2 (1.7)
How much did he/she spent to come here(mean ± SD)	50.47 ±32.55 n= 73	68.15 ±68.82 n=46
Number of medicines purchased(mean ± SD)	-	2.29 ±1.22
Number of prescription medicines purchased(mean ± SD)	-	1.72 ±1.54
Number of prescription medicines purchased without prescription(mean ± SD)	-	0.55 ±0.79

Patient Care Indicators:

Table 1 showed public health facility results and is graphically presented in Graph-1a. Private health facility results and its graphical comparison is presented in Table-2b and Graph-1b respectively.

Table 2 Patient Care Indicators at Public Pharmacies

Patient Care Indicator	Health Facility/Pharmacy	Value
Average number of medicines per prescription	CHT	2.8
	THQ	3.6
	RHC	2.8
	BHU	3.06
Percentage of Medicines dispensed (%)	CHT	92.94
	THQ	71
	RHC	76
	BHU	79.39
Average dispensing time (sec)	CHT	18
	THQ	16.4
	RHC	11.9
	BHU	14.6
Percentage of Medicines Adequately Labeled (%)	CHT	26
	THQ	25.25
	RHC	25.75
	BHU	52
Patient Knowledge of Correct Dosage (%)	CHT	42
	THQ	30
	RHC	40
	BHU	43

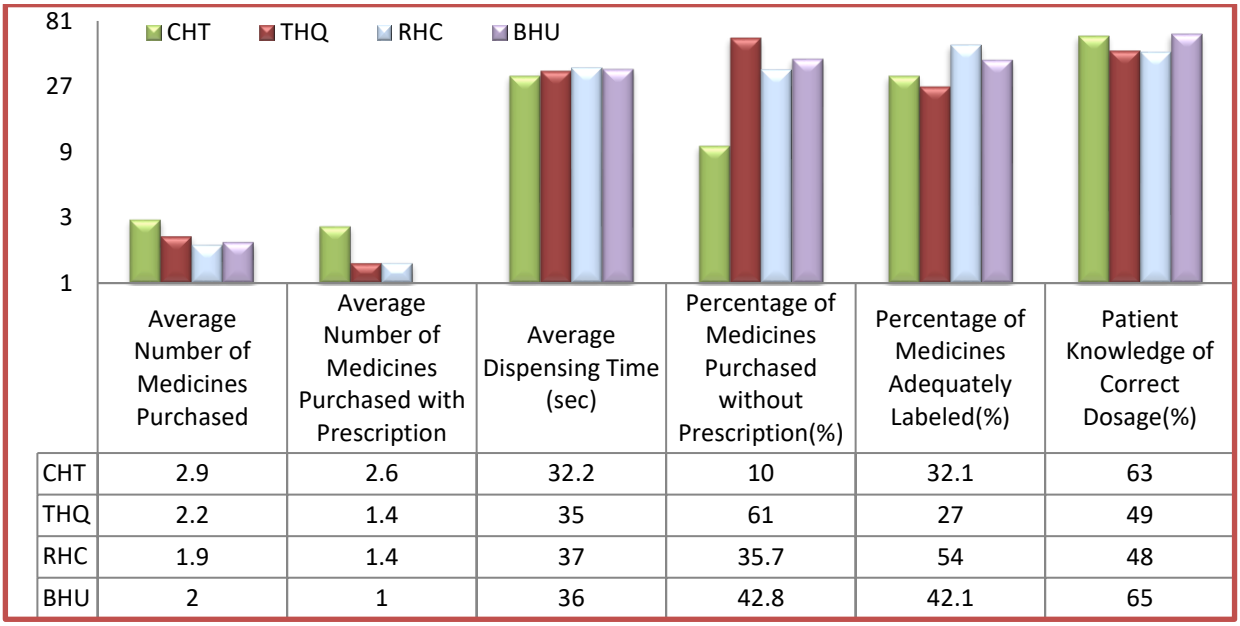


	Average Number of Medicines per prescription	Average Dispensing Time (Seconds):	Percentage of Medicines Actually Dispensed(%)	Percentage of Medicines Adequately Labeled(%)	Patient Knowlede of Correct Dosage(%)
CHT	2.8	18	92.94	26	42
THQ	3.6	16.4	71	25.5	30
RHC	2.8	11.9	76	25.75	40
BHU	3.06	14.6	79.3	52	43

Figure 1 Patient Care Indicators in each Public Pharmacy

Table 3 Patient Care Indicators at Private Pharmacies

Patient Care Indicator	**Health Facility/Private**	**Value**
Average number of medicines purchased	CHP THQP RHCP BHUP	2.9 2.2 1.9 2
Average number of medicines purchased with prescription	CHP THQP RHCP BHUP	2.6 1.4 1.4 1
Percentage of medicines purchased without prescription	CHP THQP RHCP BHUP	10 61 35.7 42.8
Average dispensing time (sec)	CHP THQP RHCP BHUP	32.2 35 37 36
Percentage of Medicines Adequately Labeled (%)	CHP THQP RHCP BHUP	32.1 27 54 42.1
Patient Knowledge of Correct Dosage (%)	CHP THQP RHCP BHUP	63 49 48 65



	Average Number of Medicines Purchased	Average Number of Medicines Purchased with Prescription	Average Dispensing Time (sec)	Percentage of Medicines Purchased without Prescription(%)	Percentage of Medicines Adequately Labeled(%)	Patient Knowledge of Correct Dosage(%)
CHT	2.9	2.6	32.2	10	32.1	63
THQ	2.2	1.4	35	61	27	49
RHC	1.9	1.4	37	35.7	54	48
BHU	2	1	36	42.8	42.1	65

Figure 2 Patient Care Indicators in Private Pharmacies

Comparative analysis between Public and Private Pharmacies

There is significance difference between indicators of public and private health facilities pharmacies at p-value <0.001. In Public pharmacy, the average number of Medicines prescribed at 95% Confidence Interval (2.92-3.28) was 3.1. The percentage of medicines dispensed in public pharmacy at 95% confidence intervals (72.9-87.2) was 80.1%. In public pharmacy, the percentage of medicines adequately labeled was found to be 32.2% at 95%confidence intervals (23.8-40.5) and in private pharmacy it was found to be 38.8% at 95% confidence interval (29.3-46.6). In public pharmacy, average dispensing time at 95%confidence interval (14.1-16.2) was 15.2 seconds and in private pharmacy it was found to be 35.1 seconds at 95% confidence interval (31.3-38.9). In public pharmacy, percentage of patient knowledge regarding dosage form was 38.3% at 95% confidence interval (29.3-46.6) and it was found to be 56.7% at 95% confidence interval (47.1-64.8) in private pharmacy. Results are shown in Table 4.

Table 4 Comparison between Public and Private Health facilities' pharmacies patient care indicators with the WHO standard

Indicators	**WHO Standard Values**	**Study findings at Public Health Facilities**	**Study findings at Private Health Facilities**	**p-value***
		(95% Confidence Intervals)	(95% Confidence Intervals)	
Average number of Medicines prescribed	1.6 - 1.8	3.1 (2.92 - 3.28)	-	-
Percentage of medicines dispensed or administered	100	80.1 (72.9 - 87.2)	-	-
Percentage of medicines adequately labeled	100	32.2 (23.8 - 40.5)	38.8 (29.3 - 46.6)	0.395
Average Dispensing time (seconds)	180	15.2 (14.1 - 16.2)	35.1 (31.3 - 38.9)	< 0.01
Percentage current patient knowledge of dosage	100	38.3 (29.3 - 46.6)	56.7 (47.1 - 64.8)	< 0.01
*p-value <0.001 showed significance between the indicators of public and private health facilities				

DISCUSSION

The results of our study revealed that in public health facilities, the average number of medicines per prescription was 3.1 which was higher than the WHO recommended standard value i.e. 1.8. This value was found to be 2.7 in another study conducted in other provinces of Pakistan[16]. In

another study conducted in Nepal, it was found to be 2.5 [17] and in India[6], it was 2.8. Moreover, in current study, in BHU, the highest average number of medicines prescribed found that was 3.8**.** This indicated that prescriber are prescribing more from standard treatment guidelines. The reason might be irrational prescribing trend of various medications including analgesics, antibiotics, and multivitamins. In the other studies of Pakistan, Nepal and Indonesia, this trend was also demonstrated[18, 19]. Another reason of this over prescription is low literacy rate in the province Sindh and people thought injections are more effective. In Sindh, another study conducted reflected that 4.5 medicines per prescription was prescribed by private practitioners[20]. Another study revealed that in primary health centers there were over prescriptions with injections being the highest percentage, health seeking behaviors effect the treatment adherence and illiteracy prolong the situation[19]. Another study in Kuwait revealed that people demanded for more medicines as they presumed that more medicines cure more[21]. In current study, it is revealed that major problem lies in the irrational use of medicines especially in rural areas.[22] It was also observed in THQ that average number of medicines prescribed was high i.e. 3.6 and the same was found least in Civil and rural health center. It was also found that on prescription, more antibiotics were prescribed as reported by Hafeez et.al [16]. Especially in Pakistan, the situation is still alarming that lead to treatment failure and increasing prevalence of resistance against antibiotic, adverse reaction and ultimately economic burden on patient.

Antimicrobial resistance is one of the frightening problem in public health as per world health organization due to unnecessary use of medicines that may contribute resistance up to 70 to 90 %[23]. At health care facilities, the availability of medicines is measured by total percentage of medicines actually dispensed. In current study, at public health facilities, it was 80.1% while in earlier study conducted in rest of three provinces of Pakistan excluding Sindh, it was 59.20%[16]. The increase showed good pharmaceutical supply chain system but it is still challenging as according to WHO criteria it should be 100%. In this study, the increase in percentage might be prescribing medicines from available stock of medicines due to the unavailability. The other reason could be the patient psychology and stipulation for the unwanted medicines. In this regard, countries like Srilanka (91.20%) [24], Nepal (92.20%) [17], Saudi Arabia (99.60%) [25] and Ethiopia (90%)[25] showing invariable results to our study.

In current study, in civil hospital Thatta, the number of medicines dispensed was high i.e. 92.94 % with reference to other three public health facilities. The reason behind increase percentile was prescription of the medicines to outpatient department as per available stock and reduce percentage were prescribed to purchase from private pharmacies.

Average dispensing time is used in this study to assess the dispensing practices. In present study, in public health facility pharmacies, the average dispensing time was calculated to be 15.1 seconds and 35.1 seconds in private pharmacies which deviated with WHO standards i.e. 3 mints (180 seconds). However, our study signified that in both public and private pharmacies, the average dispensing time was short and one of the chief causes for dispensing errors is short dispensing time. This might resulted due to untrained staff and absence of qualified pharmacist at dispensing area. The reason may also be lacking of proper patient counseling at the time of dispensing [26].

In public health pharmacies, there is deviation in dispensing time as compared to three provinces of Pakistan that was 38 seconds [16].However, studies conducted revealed average dispensing time in Srilanka was 48.1 second [24], in Nepal 52 seconds[17] , in Saudi Arabia 60.2 seconds [27] , and in Bangladesh , it was 30 seconds[28]. Our study revealed that the average dispensing time was contrary with other countries. In spite of improved dispensed time in these countries, they are still suboptimal with WHO standard. In current study, at private pharmacies, the average dispensing time was 35.1 seconds that is inconsistent with Ethiopia (17.5 seconds) [29], and in Yugoslavia (48.2 seconds) [30]. Current study revealed that at Civil hospital Thatta there was more dispensing time offered to the patient by dispenser that was 18 seconds and it was least in Basic health Unit i.e.14.6 seconds. The reason is absence of qualified pharmacist in those public health pharmacies. However

in public and private pharmacies, high ratio of patient in outpatient department, more work load, and lacking of qualified personnel may contribute the least dispensing time [31].

In current study, in public health facilities, the average number of medicines adequately labeled was 32.2% and 38.84% in private pharmacies which is suboptimal as per standard set by WHO (100%). The apparent reason of this low percentage is extensive burden on health care providers and health care facilities. This result also correlates with the low average dispensing time provided to the patient. In another study, the adequate labeling practices in Pakistan was found to be 57.4%[16]. In Srilanka, it was 13.7%[24,] in Nepal 1.4% [32,] Brazil 30.6% [32], Yugoslavia and Bangladesh 0% [28,30] Current study revealed that among public health pharmacies, percentage of medicines adequately labeled was high i.e. 52.05% in Basic Health Unit that was as compared to Civil hospital Thatta. The reason might be that Basic Health Unit, Sindh, is under management of Peoples Primary Health Care Initiatives (PPHI) which provide continuous medical education and organized trainings on regular basis for their medics and paramedics.

According to WHO recommendations, patient should have complete knowledge of the medicine and its dosage form usage. Poor treatment adherence and resources wastage is the consequence of short dispensing time and inadequate labeling practices that also leads to the poor collaboration between patient and dispenser. In previous study, the percentage of knowledge of patient regarding correct dosage in three provinces of Pakistan except Sindh was calculated to be 58.50 % in public pharmacies[16] and in this study it was found to be 38.3 %. This revealed that patient knowledge in Sindh regarding correct dosage was less than other provinces of Pakistan. This reason might be short dispensing time and hiring of untrained dispenser and absence of pharmacist in public pharmacies. Furthermore, there is low literacy rate in Sindh and people are unaware of proper use of prescribed medicines. Patient counseling was also inappropriate and medicines were dispensed from loose bottles which may also contribute poor adherence to treatment. Present study also demonstrated inadequacy with other studies conducted in Nepal 81 % [17,] Srilanka 50 % [24], Saudi Arabia 79.30 % [27]. This indicator was good in Bangladesh 37.30 % [28] and from Ethiopia it was 7.60 %. [25]

In current study, patient knowledge about dosage form, coming to private pharmacies, was found to be 56.7 %. As compared to public health pharmacies, the patient knowledge about dosage form is more in private pharmacies. The reason might be proper patient counseling as dispensers at private pharmacies spent more time with patient. Other contributing factor is dispensing of medicines in a standard blister packing so the patient identify the medicines and take them correctly. Current study demonstrated consistency with Yugoslavia studies i.e. 70%, and inconsistent with Ethiopia studies i.e. 92.7 % [29]. In order to improve dispensing time to patient, the base line knowledge of the patients to take the prescribed medicines, prescription practices, and the medicines labeling, patient care indicators should be evaluated on regular basis. The rational uses of medicines increase the efficacy of the medicine and adherence to treatment.

CONCLUSION

The patient care indicators were assessed and the pharmaceutical practices at dispensing counters of the pharmacies were evaluated. Each indicator was found to be suboptimal in Sindh reflecting that practices were not according to World Health Organization standards. Laws exists but due to lack of governance and hiring of untrained personnel, its implications were deprived. The hiring and training of pharmacist with strict implications of policies are in utmost need in collaboration with patient counseling which increase the treatment adherence and promote the rational use of medicines. Strict improvisation of essential drug list, hospital formulary and standard treatment guidelines at health facilities and private pharmacies to reduce irrational use of medicines. The medicines leaflets should be printed in the regional languages with promotion of the use of essential medicines list. At public and private pharmacies, there is need to develop and enforce the guidelines on the dispensing practices. There is also need of regular audits and effective intervention, continuous medical education for community and health care professionals, updated drug

information sources, and drug information centers by the governing bodies and pharmaceutical industry for the positive outcomes.

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