Evaluation of medicines dispensing pattern of private pharmacies in Rajshahi, Bangladesh

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Background

Analysis of the contribution of drug sellers and charlatans to irrational drug use Medicines are the weapons to combat the disease process but they can also cause serious harm when used incorrectly and depending on the patient's physiological pathology and pharmacological properties of the drugs, this event can be as dangerous as death. The drug control system in developing countries is very weak and it is very easy to purchase any drug with or without prescription. This inappropriate method of dispensing drugs is one of the essential elements to encourage the irrational use of drugs. In doses that meet their individual requirements, for a sufficient period of time, and at reasonable prices. More than 50% of all medicines prescribed, distributed or sold around the world are somewhat Inappropriate and at the same time 50% of patients fail to take the medicines appropriately.

Background

Irrational use of drugs may occur in different forms, but self-medication an d medication change by pharmacist and charlatans are the most common forms. Antibiotic resistance increases the cost of treatment, and the poor o ften have to choose between not treating and spending big money on me dication. Bangladesh is the seventh most populous country in the world an d its population is expected to double by 2050. In Bangladesh, the ratio of physicians to population was 3600: 1 in 2011.

Methods

1-Survey site

RAJSHAHI is a metropolitan city in BANGLADESH located on the northern banks of the river Padma, near the BANGLADESH-INDIA border , It is a major urban and industrial centre of North Bengal. The city has 4 medical colleges and more than 80 clinics and 90 diagnostic centers Most of these clinics and three of the medical college hospitals are situated in LAKSHMIPUR area This area was selecte d as major health care institutions cluster in the area and also for convenience of the selling allopathic medicines and did not included hospital pharmacies and private dispensaries.

Methods

2-Study design and data collection:

This cross-sectional study was conducted during January 2016 - April, 2016 in 75 randomly selected private pharmacies including both licensed and unlicensed pharmacies of covering LAKSHMIPUR ,The study procedure was divided into two stages. Firstly three trained data collector (medical students of Rajshahi medical college) was assigned to a randomly selected pharmacy.(They interviewed the clients just after they get out from the pharmacy using a structured questionnaire, reviewed the prescription and examined the prescription packages, The client was briefly informed by a written paper prepared by the chief investigator and written consent was taken. The process was carried out in two shifts of 3 h in the morning (9 to 12 AM) and in the afternoon business hours (4 to 7 PM) of one working day At the end of first stage on the same working day chief investigator interviewed the pharmacist using a structured questionnaire. The chief investigator also tried to have a short discussion with the pharmacist to understand pharmacist-client relationship The pharmacist w. The research was carried out in 63 private pharmacies The incomplete dat a provided by the clients were also discarded.

Methods

In this study 'pharmacist' refers to the main drug seller or manager of a pharmacy.

The pharmacist interview questionnaire included:

- questions on the pharmacist's age,
- years of formal schooling with professional pharmacy qualification and work experience in a pharmacy
- questions on registration status of the pharmacy, history taking pattern of the pharmacist, NGO or Govt
- history for irrational drug selling and business hours of
- the pharmacy

Methods

3-Data analysis

In this paper

- the term 'hospital prescription (is used to include medication orders issued by the phy sician for patients in a hospital)
- The term 'private prescription' (refers to the broader category of medication orders is sued by private general and specialist practitioners) Hospital or private prescriptions which were more than 30 days old were categorized as 'old prescriptions'. Directorate of Drug Administration of Government of Bangladesh does not have any specific of OTC (Over The Counter) medicine list e purpose we used OTC Medicine list by (USFD A)'prescription medicines' was used to include medicines that can be sold/dispensed only with a prescription according to the USFDA The appropriate dosage is the dosag e regimen recommended by the latest Bangladesh National Formulary
- Medicines which may have more than one indication were included in the therapeutic category of most common use
- Combination medicines were analyzed by including them in different categories as appropriate
- Prescriptions containing radiographic or diagnostic products were excluded from the study

Results of the study were analyzed using Microsoft Office Excel 2007

Result:

This study primarily enrolled 75 pharmacies but 12 pharmacists did not agreed to participate in the study (response rate =84%). During the whole study process,

total 7944 clients visited the pharmacies under observation.

Among this population 6313 clients bought 19,107 medicines (77.30%) with a prescription and 1631 clients purchased 5610 medicines (22.70%) without a prescription

Table show Medicine dispensed at pharmacies

Type of dispensing		Number	Subtotal
With prescription	Private prescription	5811 (30.42%)	19,107 (77.30%) Prescription medicine-(13,311) OTC medicine-(5796)
	Hospital prescription	8979 (46.99%)	
	Old prescription	2085 (10.91%)	
	Prescription from quacks (without valid license to practice)	2232 (11.68%)	
Without prescription	Request by client (self medication)	3714 (66.2%)	5610 (22.70%) Prescription medicine-(4131) OTC medicine-(1479)
	Recommended by pharmacist	1896 (33.8%)	
Total			24,717 (100%)

Result:

A total of 24,717 medicines were dispensed by all pharmacies during the study period The average number of medicines dispensed from each of the pharmacies during the observation period was 392, varied pharmacy to pharmacy – ranging from 194 to 588. All therapeutic categories of drugs were sold by all four category of request. Sales of medicine according to therapeutic category reveal that lowest selling medicines were sedative and hypnotics and highest selling medicines were antimicrobials. The recommendation rate for antibiotics was highest for the quacks (26.48%)

Table show Medicine dispensed by therapeutic category

Category	Prescription		Requested by client		Recommended by pharmacist		Prescription from quacks		Total	
	n	%	*n*	%	*n*	%	*n*	%	*n*	%
Anti infectives	3039	18.01%	963	25.93%	489	25.79%	591	26.48%	5082	20.56%
Medicines for GIT	1741	10.32%	444	11.95%	201	10.60%	183	8.20%	2569	10.39%
Medicines for CVS	1531	9.07%	378	10.18%	144	7.59%	189	8.47%	2242	9.07%
Medicines for CNS	2056	12.18%	132	3.55%	84	4.43%	123	5.51%	2395	9.69%
Medicines for respiratory system	1846	10.94%	477	12.84%	249	13.13%	336	15.05%	2908	11.77%
Vitamins and nutritional suppliments	1159	6.87%	279	7.51%	162	8.54%	219	9.81%	1819	7.36%
Analgesics and antipyretics	1408	8.34%	468	12.60%	288	15.18%	201	9.01%	2365	9.57%
Anti-diabetics	1907	11.30%	246	6.62%	99	5.22%	96	4.30%	2348	9.50%
Sedative and hypnotics	1513	8.97%	159	4.28%	114	6.01%	168	7.53%	1954	7.91%
Miscellaneous	675	4.00%	168	4.52%	66	3.48%	126	5.65%	1035	4.19%
Total	16,875		3714		1896		2232		24,717	
Prescription medicine: 17,442						OTC medicine: 7275				

Result:

though the major amount of the antimicrobials (n = 3039, 65.83%) were dispensed on prescription Anti-infectives were found to be the most recommended medicines in all groups.

Table show Anti infective agents dispensed

Class	Prescription	Requested by client	Recommended by pharmacist	Prescription from quacks	Total (%)
Antibiotics	1554	636	201	309	2700 (53.13%)
Antifungals	369	39	36	93	537 (10.56%)
Antiamoebics	231	51	57	54	393 (7.73%)
Antihelminthics	198	108	69	36	411 (8.09%)
Topical antimicrobials	687	129	126	99	1041 (20.49%)
Total (%)	3039 (65.83%)	963 (16.11%)	489 (8.18%)	591 (9.88%)	5082 (100%)

Result:

Table shows antibiotic agents dispensing according to generic group. Macrolides, quinolones, metronidazoles and cephalosporins are most favourite drug of quacks, clients and pharmacists. Interestingly pharmacists and clients did not ask for any carbepenems at all but quacks and doctors did.

Table show Antibiotic agents dispensing according to generic group

Class	Prescription	Requested by client	Recommended by pharmacist	Prescription from quacks	Total
Penicillin	60	9	6	6	81
Cephalosporins	312	143	54	48	557
Carbapenems	31	0	0	9	40
Tetracyclin	147	9	9	24	189
Aminoglycosides	93	15	3	24	135
Quinolones	369	132	30	61	592
Metronidazole	129	76	24	21	250
Sulfonamide	30	39	3	15	87
Macrolides	390	193	69	93	745
Others	24	0	0	0	24
				Total	2700

Result:

Table shows dispensing pattern of antimicrobials. It shows that major portion of antimicrobials sales were inappropriate (client group, 95.06%; pharmacist group, 89.57%; quack group, 84.26%). Lots of client took one or two tablets/capsules as one or two day's supply.

Table Dispensing pattern of antimicrobials

Type of dispensing	Dosage	Number	Percentage
Prescription	Prescribed dose	1877	61.77%
	Inadequate dosage	1162	38.23%
	Total	3039	
Requested by client	Full dosage	39	4.04%
	Inadequate dosage	924	95.06%
	Total	963	
Recommended by pharmacist	Full dosage	51	10.43%
	Inadequate dosage	438	89.57%
	Total	489	
Prescription from quacks	Full dosage	93	15.74%
	Inadequate dosage	498	84.26%
	Total	591	
All four types	Full dosage	2060	40.53%
	Inadequate dosage	3022	59.46%
	Total	5082	

Result:

Table shows other service provided by pharmacists. Most of the pharmacists inject IV or IM drug to the pati ents, measure blood pressure and measure blood glucose
by portable machine.

Table show Other service provided by pharmacists

Screenings	Responses	
	Yes	No
Blood pressure measurement	37	26
Blood sugar measurement	34	29
Dressing	21	42
Nebulization	32	31
stitches with suture materials	39	24
Inject IV or IM injections to patients	56	7

Result:

Maximum findings presented In This Table are alarming. 58.74% pharmacy did not have valid and updated registration while 96.83% percent of the pharmacist recommended medicine taking inadequate history. 53.96 % of drug seller did not have any professional qualification in pharmacy and they mainly relied on combined knowledge pool of work experience, medical representatives, distributors and doctors.

Table show Basic characteristic distribution of the pharmacists

Variable	Frequency (%)
Mean Age in years (SD)	34 ± 7.5
Does this pharmacy valid registration	Yes (41.26%)
	No (58.74%)
Do you take history systematically before recommending medicine?	Yes (3.17%)
	No (96.83%)
Do you provide the patients necessary information regarding possible side effect of the drugs every time?	Yes (4.76%)
	No (95.24%)
Did you ever had any training on pharmacy maintenance from any govt. or NGO based organization?	Yes (38.09%)
	No (61.90%)
Did you ever participated in any health education program organized by any govt. or NGO based organization?	Yes (7.93%)
	No (92.06%)
Did you ever receive any punishment for irrational drug selling?	Yes (0%)
	No (100%)

Result:

Table show Basic characteristic distribution of the pharmacists

Professional qualification	
Basic training in pharmacy	23 Responses (36.50%)
Diploma in pharmacy	5 Responses (9.93%)
Bachelor of pharmacy	1 Response (1.58%)
No education on pharmacy	34 Responses (53.96%)
Mean year of schooling (SD)	10.9 ± 1.85
Mean work experience (SD)	10.53 ± 4.97
Source of current drug knowledge	
On the job experience	8 Responses (12.70%)
Medical representatives	6 Responses (9.52%)
Doctor	1 Response (1.58%)
Distributors	4 Responses (6.34%)
Combined	44 Responses (69.84%)
Mean opening hours of pharmacy	13.58 ± 4.72

Discussion

Modern Bangladesh emerged as an independent nation in,1971 when average life expectancy at birth was 47.05 years and now it is 71.6 according to World Bank data published in 2014. Continuous development in healthcare facilities improved the condition. Still healthcare sector in BANGLADESH has lots of things to develop. The current study assessed the scope for improvement in rational drug distribution policy. To our knowledge, this was the first formal st udy to address drug dispensing pattern of private pharmacies in BANGLADEH In BANGLADESH self-medication is a rising problem. Self-medication is becoming prominent as it saves time and money. Poor people may self-medic ate to save the costs for physician's consultancy and also save money by not taking a full course or by using less priced below standard products.

Drug selling profit is their main source of income, The rapid access to mobile phones and the internet is contributing to promotion of self-medication as dr ug information is now widely available.

Current study revealed that 22.7% of all medicines were sold without any Prescription, and In this study we found that antimicrobials are highest selling drug contributing 20.56% of all drugs.

Discussion

Though anti-infective recommendation rate is lowest in valid prescription group (18.01%) but almost every 48 valid prescriptions out of 100 had at least one antibiotic which is too high. Common people regard them as 'powerful' medicines which can treat lots of ailments. but 59.46% of all antimicrobials. Inadequate antimicrobial treatment is an important factor in the emergence of infections due to antibiotic-resistant bacteria and rise of antimicrobial resistance in a community increasing total healthcare expenditure.

In every country the pharmaceuticals industry is controlled by a regulatory authority. The Directorate of Drug Administration (DDA) under the Ministry of Health & Family Welfare, Government of the People's Republic of Bangladesh, is the drug regulatory authority of the country. Currently there are no over the counter (OTC) drug list approved by the authority. That means the pharmacies have legal right to sell registered drugs to anyone without any prescription even drugs for cardiovascular diseases and diabetes.

In BANGLADESH, quality control systems of drugs are weak and a great fraction of drugs are counterfeit or sub-standard.

The pharmacists also have important role in fostering self-medication. This study reveals that among 5610 medicines, which were sold without prescription, 33.8% were sold on recommendation by the pharmacist and 66.2% on the basis of client request. It appears that client request is the major contributor but pharmacists are also responsible.

Discussion

Moreover 58.74% of pharmacies are operating without valid and up-to-date license, on pharmacy maintenance from any govt. or NGO, 92.06% of them never participated in any health education program organized by any govt. and In received any punishment for irrational drug selling. Such investors often care for profit but not for the pharmacies public health impact. Sales competition among pharmacies is another notable factor in areas where pharmacies clustered together, especially beside large hospital and clinics. In these places competition between pharmacies is sometimes so intense that they hire 'agents' to persuade patients to buy medicines from a particular pharmacy by offering cash discount. This business venture viewpoint also explains why drug vendors are not interested in formal education or training in pharmacy. Nowadays every medicine comes in prepackaged bottles and strips with label containing company name, brand name and ingredients. Pharmacists just have to take the medicines out of shelves and give it to the client. They think experience is more important than formal education in pharmacy business. 95.24% of the druggists don't aware the patients regarding possible side effect of the drugs. During our study period in an average each pharmacy took approximately less than 4 min to serve a client. Time is very short to have detailed interaction with the client. For example they know streptomycin is for infection, losartan potassium is for blood pressure but they don't know streptomycin can cause ototoxicity.

Discussion

The study revealed that pharmacists are offering various clinical services like blood pressure measurement, capillary blood sugar measurement and even providing stitches with suture materials as an extra source of money. To minimize the bias we selected the pharmacies as random as possible. The study was based on a small urban area.

We believe that there can be an urban–rural variation in medicine dispensing pattern of pharmacies. So multi centered or national level study is necessary to draw final conclusions.

Conclusion :

In developing country like BANGLADESH, people depend more on pharmacies due to expediency, shorter waiting time, cost reduction, availability of credit and flexible opening ho urs . Methods That Survey site , Study design and data collection and Data analysis also talk ed about Results This study primarily enrolled 75 pharmacies but 12 pharmacists did not agreed to participate in the study (response rate =84% Discussion Modern Bangladesh emerged as an independent nation in 1971 when average life expectancy at birth was 47.05 years and now it is 71.6 according to World Bank data published in 2014 Continuous development in healthcare facilities improved the condition. In BANGLADESH self medication is a rising problem. Self-medication is becoming prominent as it saves time and money. Government need to take educational and regulatory interventions to improve knowledge and professional behavior of pharmacists, pharmacy assistants and drug sellers knowledge Health education is also essential for common people to prevent self-medication The results and discussion presented in this paper will be helpful to provide a baseline to redirect further studies in this area.

Reference

Saha, S. and Hossain, M. T. (2017) 'Evaluation of medicines dispensing pattern of private p harmacies in Rajshahi, Bangladesh', *BMC Health Services Research*, 17(1), pp. 1–8. doi: 10. 1186/s12913-017-2072-z.

Thanks!