

A Cross-Sectional Survey on the Dispensing Practice and its Determinants from the Retailers' Perspective in Rural Areas of Gazipur

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ABSTRACT: Being the de facto primary healthcare contacts in rural Bangladesh, retail pharmacy shops (RPSs) influence the medication usage by the people. Therefore, identifying dispensing activities of RPSs can be a key indicator of medicine use. The aim of the current study is to explore the drug dispensing practice of retail pharmacists in the rural areas of Gazipur district. A cross-sectional study was designed to find out drug dispensing practice of analgesic, antipyretic, Gastro Esophageal Reflux Disease (GERD), sedative & hypnotic, ED and multivitamin drugs, assess determinants impacting the practice, and acceptance level of retailers' suggestions. Forty seven RPSs were selected by random sampling out of 92 in rural areas of Gazipur Sadar from the list of registered allopathic RPSs by the Directorate General Drug Administration (DGDA). Dispensers were interviewed with structured validated questionnaire and data was analyzed using 'Microsoft Office Excel 2016'. Diclofen, Napa extra, Rivotril, Seclo, Niagra and Filwel Gold were reported to be as the highest dispensed brands at that time. The lowest dispensed brands were found to be Apeclo, Zerine, Relaxen, Procap, Adegra and Biovit Gold. Among determinants impacting dispensing practice, 'prescriber's choice' dominated most in Multivitamin (94%), Sedative & Hypnotic (87%), and Analgesic (77%) groups. 'Dispenser's choice' emerged as a primary determinant in the ED drug group (62%) which is alarming. Moreover, an unlicensed foreign brand, Senegra was found to be dispensed in many drugstores. Buyer's choice (self-medication) was more remarkable in Antipyretic (38%) and GERD drugs (21%). Although only a few of the reported drugs were over-the-counter (OTC), almost all drugs were being dispensed without prescriptions. As per retailers' perception, buyers did not seem to be much affected by medicine price (72%) indicating that studied drugs' price is affordable. A total of 66% dispensers were found to suggest an alternative brand in the absence of a sought brand (brand-substitution) implying to the fact that untrained dispensers may potentially influence drug choice and 77% claimed that buyers usually accept their suggestions which is of no surprise considering the reality of our medication buy-sale practice. Retailers' perspective might be a great tool to understand drug usage scenario on the ground. Effective regulatory and social initiatives can be devised accordingly to strengthen the rational dispensing and use of medicine.

Key words: Retail pharmacy shop, dispensing practice, self-medication, brand-substitution, ED drug, retailers' perspective, rational use of medicine, primary healthcare.

INTRODUCTION

Well-established drug stores or retail pharmacy shops/stores (RPSs) with any registered pharmacist available to dispense are still in scarce, especially in rural Bangladesh.¹ Yet retail stores play a major role in healthcare of the country often being the first contact

points or 'de facto primary healthcare providers' for population who seek for medical attention, mostly bypassing a registered medical practitioner or a health care facility.^{1,2} Irrational use of medicine is a global concern, particularly in a country like ours, and the issue encompasses a wide array of malpractice including but not limited to unjustified polypharmacy, prescribing drugs that are unnecessary and expensive, dispensing drugs without prescription,

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self-medication by patients, and overuse of antibiotics and injections etc.³⁻⁵ Drug purchasing behavior of mass people is dependent on the current structure and pharmacy practice at the RPSs and vice versa. RPSs deficient with qualified pharmacists evidently aggravate irrational drug use, particularly self-medication and overuse or unnecessary use of prescription medicines. Eventually, these contribute to unwanted health hazards and unfair out-of-pocket expenditure.⁶ Despite many initiatives by the Directorate General Drug Administration (DGDA), buying medicines without prescriptions is still in commonplace in Bangladesh unfortunately for both over-the-counter (OTC) and prescription only (non-OTC) drugs. It is unethical and may gradually reduce the efficacy of the treatment, especially in case of antibiotics.^{6,7}

Many times, dispensers in the RPSs are seen to suggest medicines in the absence of the prescribed drugs due to current business model of private drug-selling, which can potentially deteriorate the health of a patient⁸. As the suggestions are for free, patients usually accept and purchase the medicines. Even patients or buyers are often observed to demand and expect suggestions or advice from the informal dispensers/retailers of the RPSs. Dispenser's choice may have influence over buying pattern more in villages as people in rural areas have limited access to healthcare providers and are usually associated with poor health literacy.⁹ Another major problem contributing to irrational drug dispensing may occur when the dispenser negligently supplies the incorrect drug as an alternative to the prescribed drug leading to contraindication, or drug-interaction. Moreover, as the drug selling is not properly controlled and regulated by the authority, selling of unregistered or counterfeit drugs for extra commission is also a possible threat in Bangladesh. Sometimes, the cost of a drug may have an influence too, especially when the drug is not prescribed by a doctor.^{10,17} Furthermore, vendors of RPSs may keep drugs which have higher demand (to both patients and prescribers) in a particular area and this might impact the subsequent drug purchase behavior of that community. Therefore, for identifying the barriers of

rational medicine usage it should be beneficial to understand the factors influencing the dispensing pattern and peoples' drug purchase decisions in the RPSs.¹¹

This study aims to understand the RPS retailers' perspectives regarding the highest and lowest dispensed brands of drugs and what motivates the purchase pattern of the consumers. From normative observation in the targeted village areas, the therapeutic groups which were found to be sold by local RPSs more frequently were - i) analgesic, ii) antipyretic, iii) GERD (gastroesophageal reflux disease), iv) sedative & hypnotic, v) ED (erectile dysfunction) drugs and vi) multivitamins etc. Therefore, these groups were selected to find out which brands were dispensed the most and the least frequently. Based on current practice and normative behavior of people, authors have divided the determinants that motivate purchasing decision of a drug into the following three broad choices:

- a) prescriber's choice (having a prescription from a registered physician),
- b) dispenser's choice (seeking and accepting advice/ suggestions from RPS retailers) and
- c) buyer's choice (self-medication including advice from friends/ family/ old prescriptions etc.)

The retailers were asked to identify which of the determinants dominate purchasing decision along with price of the medicines. As retailers possess the potential to not only directly influence consumers' purchasing behavior but also often assess the motivation behind the consumer's decisions, understanding retailers' perspective in terms of drug purchase determinants deemed important. Besides the above-stated objectives, authors also looked for availability of any unregistered drug, if found during the survey.

METHODOLOGY

The study was designed as a cross-sectional survey to take in-person interview of drug dispensers of the selected RPSs with structured questionnaire (Table 1), designed and validated based on the study purpose and translated into Bengali for ease of

communication. The study purpose was communicated to the respondents in lay language and the questionnaire was then administered upon their consent.

The “RPS” was defined as retail pharmacy shops or drug stores which are enjoinable for mandatory approval and registration from the DGDA under the Ministry of Health and Family Welfare of the Government of Bangladesh (MOHFW, GOB),

excluding the shops that sell only Ayurvedic, Homeopathic and/or Unani medications.

Since buying patterns in pharmacy shops adjacent to medical colleges, hospitals and clinics might be different from that of distant shops, and inclusion of altogether might hinder the generalization of the study findings, authors included only rural RPSs which are far from large government or non-government health facilities.¹¹

Table 1. Questionnaire for the data collection

Questionnaire in English for data collection: Questions for communicating with the local pharmacists/ vendors/ retailers/ sellers/ pharmacy technicians present at the selected RPSs:							
No.	Questions						
1.	Which brands of the following therapeutic drug groups are sold the highest in your pharmacy shop?						
	RPSs	Analgesic drugs	Antipyretic drugs	Sedative and Hypnotic drugs	GERD drugs	ED drugs	Multi-vitamins
2.	Which brands are sold the lowest in the similar therapeutic groups in your shop?						
	RPSs	Analgesic drugs	Antipyretic drugs	Sedative and Hypnotic drugs	GERD drugs	ED drugs	Multi-vitamins
3.	What are the usual reasons behind the sale of each therapeutic class of drugs?						
	Reasons/ Motivations	Analgesic drugs	Antipyretic drugs	Sedative and Hypnotic drugs	GERD drugs	ED drugs	Multi-vitamins
	1. Prescriber's choice						
	2. Pharmacist's choice						
	3. Patient's choice						
4.	In your opinion, does price have an influence over the consumers' choice while buying drugs?						
	Yes/ No						
5.	In case of not having a drug of the prescriber's choice, do you give a drug of your own choice?						
	Yes/ No						
6.	Do they accept the alternately suggested brand or not?						
	Yes/ No						

Among 793 licensed pharmacies in Gazipur Sadar according to DGDA's allopathic retail pharmacy list¹², 92 rural pharmacy stores were identified based on their location and proximity to any eminent medical college hospital or private clinic facilities. Finally, within those identified RPSs 47 pharmacies were selected (Figure 1) through simple random sampling by using the below-mentioned formula where, the total number of rural pharmacy stores in

Gazipur Sadar, N=92 and at 5% level of significance $z_{\alpha/2} = 1.96$, $p = q = 0.5$, and $d = 0.1$ ¹³:

$$\text{sample size, } n = \frac{\frac{z_{\alpha/2}^2 pq}{d^2}}{1 + \frac{1}{N} \left(\frac{z_{\alpha/2}^2 pq}{d^2} - 1 \right)}$$

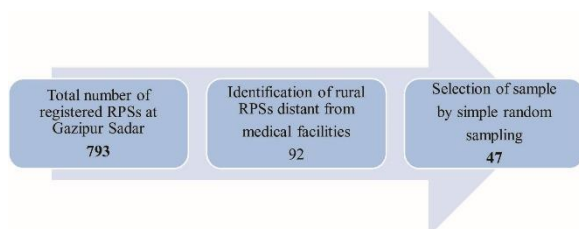


Figure 1. Sampling process for data collection.

The study was conducted from July to September 2019. The findings of the study were analyzed using Microsoft Office Excel 2016. The study steps can be easily explained by using the following flow chart in Figure 2:

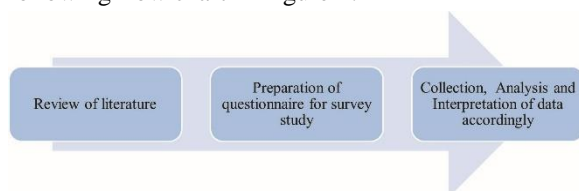


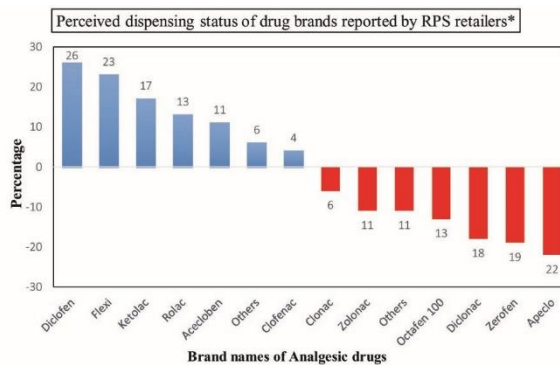
Figure 2. Study flow chart

RESULTS AND DISCUSSION

Perceived dispensing practice of drug brands reported by RPS retailers:

Analgesic. In the category of analgesic drugs, almost 20 brands were found in total being sold in the selected RPSs, among them 9 brands were reported as high and 11 brands were reported as low dispensing drug by the retailers (Figure 3). Diclofenac (26%) was reported as the most dispensed and Flexi (23%) was the second highest. Their selling status was close while the generics were different (Diclofenac sodium and Aceclofenac, respectively). Other high selling brands of analgesics were Ketolac (17%), Rolac (13%), Acecloben (11%) and Clofenac (4%). Others constituted only 6%.

The analgesic brand that was mentioned the most as ‘low dispensing’ was Apeclo (22%), and the next low dispensed products were Zerofen (19%), Diclonac (18%), Octafen 100 (13%) etc. Zolonac and Clonac were perceived by 11% and 6% RPSs having low sale. Here, ‘others’ constituted 11%. In terms of generics, the drugs were Diclofenac sodium, Aceclofenac, Ketorolac tromethamine and Ketoprofen.



*In the chart, blue colored bars are representing high frequency of dispensing and the red colored bars are showing low frequency of dispensing, hence displayed in the opposite direction. They are in order as per the dispensing frequency from most dispensed (left) to least dispensed (right) brands perceived by retailers in the RPSs.

Figure 3. Perceived dispensing status (%) of analgesic brands.

Antipyretic. For antipyretic drugs, a total of 9 brands were reported; 4 being high and 5 low dispensing drugs informed by the retailers (Figure 4) and all of them were from the same generic, Paracetamol. Napa extra and Napa held the most selling status of 49% and 34%, respectively totaling in 83% as they are from the same manufacturer. The other two brands Ace and Reset constituted the remaining 17% among the high dispensed group of antipyretics.

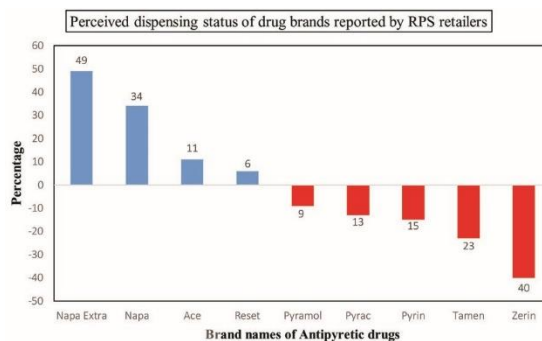


Figure 4. Perceived dispensing status (%) of antipyretic brands.

The antipyretic brands that were reported as the ‘least dispensed’ were Zerin (40%), followed by Tamen (23%), Pyrin (15%), Pyrac (13%) and Pyramol (9%). All the brands were of one generic, Paracetamol.

Gastroesophageal reflux disease (GERD) drugs. Among the drugs for GERD, a total of 11 brands were reported (5 high and 6 low frequency of

dispensing) in the survey (Figure 5). Seclo (38%) held the position for highest dispensed drug while Maxpro (21%) had the second selling status. They come from different generics namely Omeprazole and Esomeprazole. The third more frequently dispensed agent was again Omeprazole, brand name Losectil (17%), followed by Esomeprazole MT; i.e., Sergel (13%) and Esonix (11%).

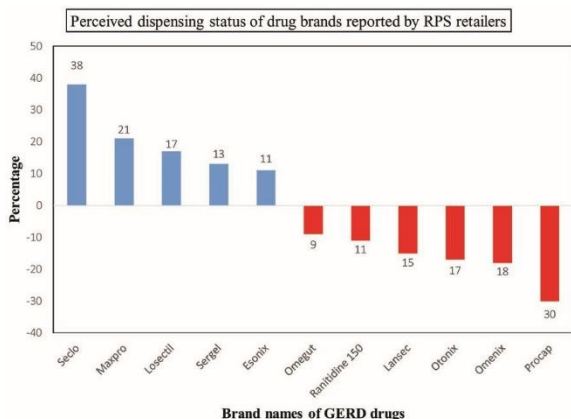


Figure 5. Perceived dispensing status (%) of GERD brands.

Procap was reported as the lowest dispensed (30%) in the GERD group. Other less frequently dispensed brands were Omeget (9%), Ranitidine 150 (11%), Lansac (15%), Otonix (17%) and Omenix (18%). The generics are Omeprazole, Lansoprazole, Pantoprazole, and Ranitidine, respectively.

Sedative and Hypnotic. For sedative and hypnotic drugs, 12 brands were reported to be sold among which 4 were identified as high and 8 as low dispensing drug by RPS retailers (Figure 6). All belonged to two generics namely Clonazepam and Diazepam. Rivotril (46%) was the highest selling drug claimed by almost half of the RPSs from the generic Clonazepam. The second highest reported was Sedil (27%).

Relaxen (Diazepam) was reported as the least dispensed, whereas 24% claimed Lonapam (Clonazepam) to be lowest dispensed.

Erectile dysfunction (ED) drugs. Total 10 brands (6 high and 4 low dispensing) of ED drugs were reported by the RPS retailers (Figure 7). Among them Niagra (34%) was dispensed highest and Senegra was the second highest (17%) constituting as

half of Niagra. However, Senegra is a foreign brand did not have import permission at the time of the study¹⁴. All the six high selling ED brands were from Sildenafil.

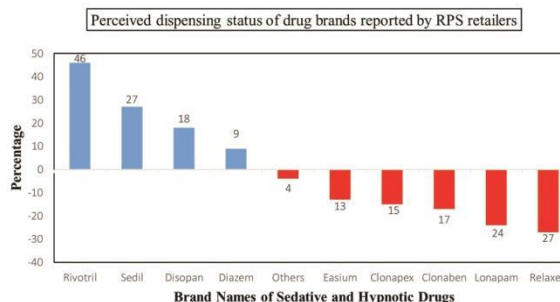


Figure 6. Perceived dispensing status (%) of sedative and hypnotic brands.

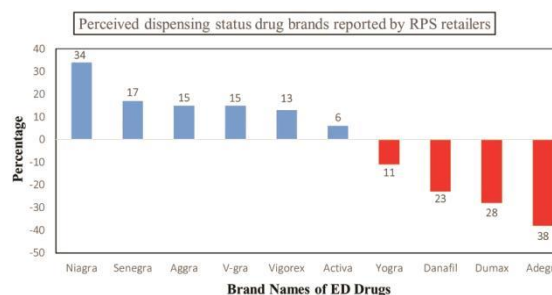


Figure 7. Perceived dispensing status (%) of ED drugs.

The lowest-selling ED drug was reported as Adegra (38%). Among the four brands reported as low selling Dumax (28%) was of a different generic, Dapoxetine, whereas others were Sildenafil.

Multivitamins. In total, 12 brands (5 high and 7 low dispensing) of multivitamins were reported (Figure 8). Among them Filwel (30%) and Filwel gold (23%) were perceived frequently as high dispensing by the RPS retailers, and they are from the same manufacturer. The other 3 brands constituted the remaining 47%.

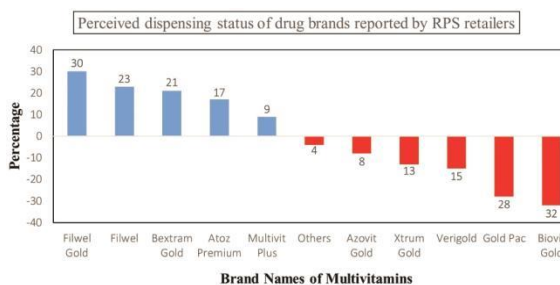


Figure 8. Perceived dispensing status (%) of multivitamin brands.

Biovit gold (32%) was found as the lowest selling drug and the second low selling was Gold pac (28%). All the reported drugs were multivitamin and multiminerall combinations.

Perceived determinants behind drug dispensing practice:

Among analgesics (Figure 9) 77% RPS retailers identified prescriber's choice as the dominant

determinant indicating to the fact that people in that area do rely on prescriptions for pain-killer which is a good sign for rational usage of medicine. In 14% dispensing of analgesics, people sought for retailer's guidance. Consumers themselves were identified determining the purchase in 9% of cases which is self-medication and potentially an irrational medicine use. However, Diclofenac gel among the analgesics is permitted for OTC use in Bangladesh.

Table 2. Determinants behind the drug dispensing practice perceived by RPS retailers.

Determinants of drug purchasing	Analgesic	Antipyretic	GERD	Sedative & Hypnotic	ED	Multivitamins
Prescriber's choice	77%	45%	60%	87%	30%	94%
Dispenser's choice	14%	17%	19%	9%	62%	4%
Buyer's choice	9%	38%	21%	4%	8%	2%

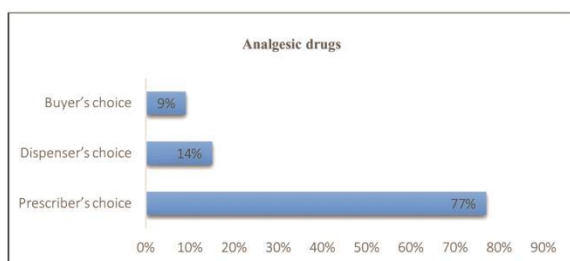


Figure 9. Percentage of perceived determinants of analgesic drug dispensing.

In the antipyretic group (Figure 10), buying medicine along with prescription was reported much less (45%) than analgesics which was not surprising as the analgesic identified (Paracetamol) in the study is an enlisted OTC drug. Dispensers reportedly suggest the products at 17% cases where buyers make own decisions while purchasing at almost twice of the cases (38%).

Among the GERD drug group (Figure 11), prescriber's choice dominated (60%) the buying decisions as reported by the RPS retailers where their suggestions influenced 19% of the choices. And buyer's choice secured 21%. Therefore, it can be said that around 40% (combining dispensers' and buyers' choice) of the GERD drug dispensing is done without any prescription. Omeprazole is designated as OTC while Esomeprazole along with other PPI drugs are not included in the OTC drug list of Bangladesh

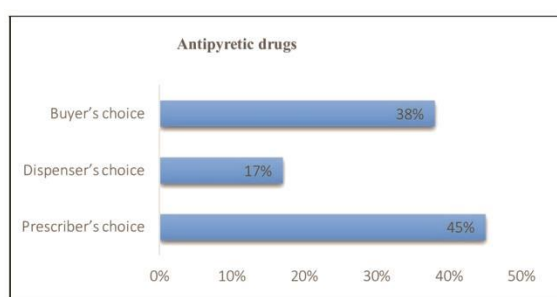


Figure 10. Percentage of perceived determinants of Antipyretic drug dispensing.

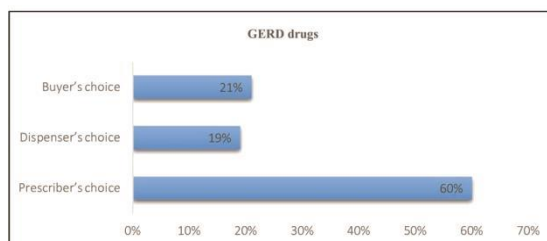


Figure 11. Percentage of perceived determinants of GERD drug dispensing.

approved by drug administration authority, DGDA. Although, in global market Esomeprazole is bought over the counter without prescription in many countries. Nevertheless, developed health systems have pharmacists playing their role in retail and community pharmacy ensuring drug safety while the practice is almost non-existent in our country. Moreover, inappropriate and unnecessary use of

proton pump inhibitors, commonly known as ‘gastric medicines’ in lay language among general people pose many risks including osteoporosis and other long-term health hazards.¹⁵

In case of sedative and hypnotic drugs (Figure 12), most of the dispensing was done due to prescribers’ choice (87%) and it is a good sign as these are all prescription (non-OTC) drugs. However, even low, the rest of the drug purchase (either on buyers’ own choice, 4% or dispenser’s advice, 9%) and it is of great concern and should be controlled.

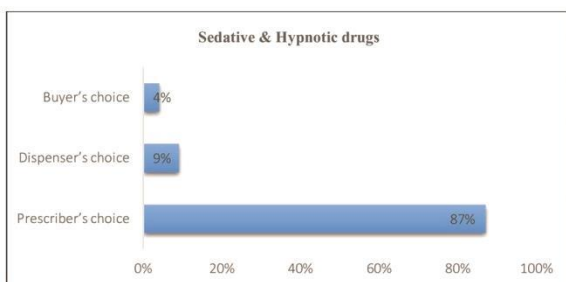


Figure 12. Percentage of perceived determinants of sedative and hypnotic drug dispensing.

Despite being non-OTC, ED drugs (Figure 13) are reported to be dispensed according to a prescription in only 30% of cases. As per RPS retailers’ perception, consumer or buyer’s own decisions made up 8% while dispensers suggest or advise alternative brands as per buyer’s demand on 62% occasions.

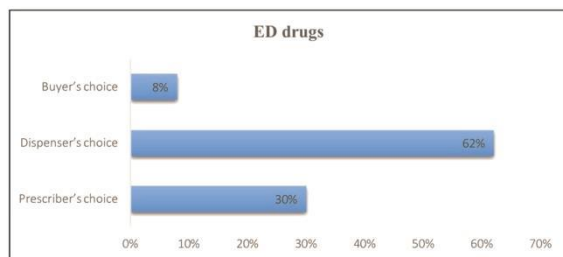


Figure 13. Percentage of perceived determinants of ED drug dispensing.

Multivitamins (Figure 14) in the study area were found to be dispensed mainly due to doctors’ prescriptions (94%). Only 6 out of 100 dispensing occasions, they are bought by consumers without prescriptions where dispensers choice impacted in

4% cases. As vitamins and minerals are usually often preventive or maintenance medicine, people in rural Gazipur tend to buy it more when prescribed rather than self-medication.

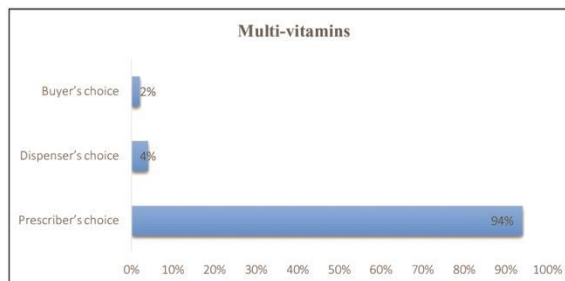


Figure 14. Percentage of perceived determinants of multivitamins drug dispensing.

Effect of price over buyer’s choice. RPS retailers were asked whether the drug price affected buying decision of consumers. Opinions were taken as Yes or No, and the responses were then expressed in percentage. 28% RPS retailers perceived price as a factor to influence over consumer choice while buying a drug. In 72% cases, price was thought to have no influence over drug’s choice (Figure 15).

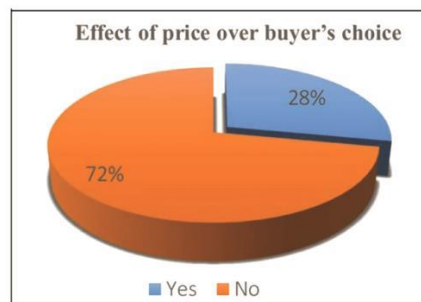


Figure 15. Effect of price over consumer’s choice.

Alternative suggestion of brands by RPS retailers (brand substitution). Answers to the question whether retailers usually suggest an alternative brand if the sought brand by the consumer is not present in the RPS were taken as Yes or No. The responses were then expressed in percentage.

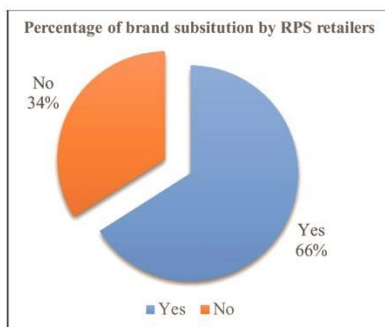


Figure 16. Brand substitution suggested by RPS retailers.

A total of 66% retail pharmacists suggested alternative brands in case of not having the prescriber's chosen brands and 34% reported not to suggest anything (Figure 16). This high rate of brand substitution is of no surprise considering the overall medicine business and dispensing system of Bangladesh.

Buyer's acceptance of alternative brands.

When asked to the RPS retailers, whether buyers/consumers accepted the alternative suggestions of drug brands, 77% reported that buyers usually accept the alternative brands suggested, while 23% retailers reported the opposite (Figure17).

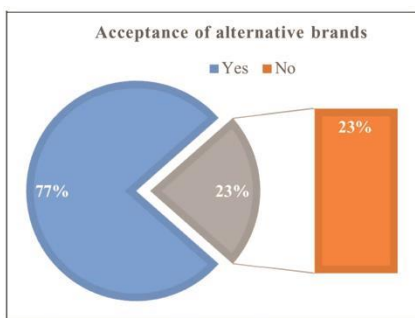


Figure 17. Buyer's acceptance of alternative suggestions of brands from RPS retailers.

Given the trustworthiness and popularity RPSs possess in the community, from both normative observation and evidenced literature, this high percentage of acceptance is as expected. However, due to the current business model of drugs, low-quality or unlicensed manufacturers can exploit this acceptance to sell their counterfeit products which often can lead to health hazards not uncommon in a country like Bangladesh.

From the discussion so far, it is clearly visible that drugs from all therapeutic groups are being purchased without doctor's consultation. The drugs that have been found to be bought in high percentage without prescription are mainly of antipyretic (55%), GERD (40%) and ED (70%) groups. According to the updated 'List of Over-the-Counter (OTC) Drugs (Allopathic)' by Bangladesh Gazette at the time of study,¹⁶ among the reported drugs Paracetamol, Omeprazole capsule, Ranitidine, Diclofenac gel and Multivitamins were OTC and therefore, could be bought without prescriptions. Dispensing or sale of the rest of the drugs should be done only in the presence of a registered physician's advice. Particularly, the extreme high rate of ED drugs dispensing without consulting doctors (70% in total combining dispensers' and buyers' choices) is alarming. Sedative and hypnotic drugs, although less in percentage (13%), should not be bought without prescription at all. On the other hand, high purchase of multivitamins is backed by prescriptions at most of the times (94%) despite being OTC.

Most of the highest selling drugs were from renowned and licensed pharmaceutical companies except Senegra, an ED drug brand without import permission.¹⁵ In majority of the cases price of the drug does not restrain anyone from buying. Alternative suggestion by sales persons in case of not having the sought brand is a common phenomenon in these retail pharmacies which can be a matter of concern. The acceptance level of the buyer of substituted brand is also high. This leads to a question if the patients are receiving or getting the proper medication in these rural areas as salespersons or pharmacists (RPS retailers) are the bridge between people and their medication. It would not be a grave issue if RPSs in our country could have employed registered graduate pharmacists (A-grade) mandatorily as per the rules in the dispensing and counseling. But this is not the reality in our health care system and it imposes a threat for ensuring rational drug use as unregistered or untrained retailers may dispense drugs without proper diagnosis and necessary patient counseling.

While this study displays the current scenario of drug dispensing pattern and associated factors or determinants, one limitation of the study can be that it does not include unlicensed pharmacy stores who may also influence people's medicine buying behavior in the rural areas. Future study efforts should concentrate on finding sustainable solutions to minimize irrational dispensing. The data would facilitate the regulatory authorities and others concerned in optimizing appropriate monitoring of retail drug sale.

CONCLUSION

Given the importance of the role and influence of RPS retailers in the community, improved regulation of retail drug sector is crucial for promoting rational drug dispensing. Implementing planned regulations with proper policies in place should offer vital opportunity to promote overall rational use of medicine. This study warrants the need for more such studies to understand the social implications and wider health outcomes of drug dispensing pattern in local pharmacies. Such findings will be helpful in creating solutions to tackle the extant shortcomings and minimize potential health hazards due to irrational drug dispensing, especially to ensure people's wellbeing in rural areas.

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