Differential perception on the role of irrational use of antibiotics in emergence of antimicrobial resistance among the trained and untrained pharmacists: a qualitative enquiry in Bangladesh

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ABSTRACT:

Antimicrobial resistance and irrational use of antibiotics are two concerning issues in the present world especially in lower-and-middle income countries. Bangladesh is one of the worst-case scenarios where a large number of untrained drug store salespersons are involves with dispensing drug. This aimed to understand the differential perception of trained and untrained pharmacists on role of irrational antibiotics use in emergence of antimicrobial resistance. A qualitative study was designed with in-depth interviews conducted among the retail pharmacists based in Dhaka. The participants demonstrated a significant difference in knowledge, awareness, attitude and practice regarding antimicrobial resistance and dispensing practice of antibiotics along with difference in level of education and professional training. Grade C and untrained pharmacists working in the local small drug shops were found reluctant and unaware about antimicrobial resistance and rational use of antibiotics influenced by various factors like workplace environment, client demands, marketing by pharmaceutical companies and ignorance about the existing. However, grade A and B pharmacists were found working in bigger corporate and hospital pharmacies confined to managing and dispensing drugs with limited decision-making power on proper use of antibiotics. A multi-sectoral multidisciplinary approach with a strong regulatory body is required to control the situation in Bangladesh.

KEYWORDS: Antimicrobial resistance, antibiotic resistance, irrational antibiotic use, pharmacists' perception

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INTRODUCTION:

Antimicrobial resistance (AMR) is a major global health issue causing 7000,000 deaths annually and controlling it has been recognized by World Health Organization (WHO) as one of the top priorities.[1] Antimicrobial resistance is a natural process but there are various factors from individual to environmental factors contributing significantly to its development.[2-4] Rampant irrational use of antimicrobials is causing loss of efficacy of the first line of drugs with an increasing need for second and third line of drugs which are much more expensive.[5] Further AMR is causing serious impact on the global economy by decreasing productivity of people through chronic illness.[6] By 2050, it is estimated there will be a loss of 100 trillion USD worldwide pushing 28 million people towards poverty and people living in lower-middle-income countries (LMICs) will be hit hardest.[6]

Resistance against commonly used antimicrobial drugs is remarkably high in countries where those are not restricted for use.[7] WHO reports that in LMIC, prescribers have a lack of knowledge on the proper use of antimicrobial and around 80% of medicines are used for out-patients rather than in hospitals.[1] Southeast Asia is the most vulnerable to this situation and poor implementation of regulations, lack of qualified healthcare staffs, insufficient health education, self-medication and inappropriate prescribing contributing to the rise and spared of AMR in this region.[1,4] Bangladesh is one of the worst-case scenarios with high levels of self-medication and unregulated drug selling.[8] Studies conducted in Bangladesh have found that majority antimicrobial agents prescribed in the capital were having less efficacy and about 80% gut bacteria were found resistant against the common antimicrobial agents.[9,10]

Bangladesh health system faces a crisis of workforce with inequity in distribution and proportion of doctor-nurse-other staffs.[11] A large portion of Bangladeshi population is still living in unplanned urban areas and hard to reach rural areas, devoid of primary healthcare facilities and depends on informal untrained or semi-trained village doctors and pharmacists.[12,13] Very often people prefer to take healthcare from retail pharmacists to avoid doctors' fee, save money and convenient distance.[14] However, 58.7% of pharmacies don't have a valid license; 54% of medicine sellers are without a proper formal education and 61.9% among them never had any kind of training before they join the profession.[8] It has been reported that the untrained drug shop salespeople without proper knowledge are easy prey to the aggressive marketing strategies of the pharmaceutical companies and involved with irrational use of drugs i.e., overprescribing, multi-drug prescribing, unnecessary expensive drugs and selling without prescriptions.[15] The Pharmacy Council of Bangladesh grades the professional pharmacists as: 'A' grade certification having university bachelor degree, 'B' grade certification having 2 years diploma training and 'C' grade certification having 3 months of relevant institutional training. However, majority people involved with the profession have no formal training or education in the subject matter. This study tried to understand how trained and untrained pharmacists of Bangladesh perceive the role of irrational antibiotics use on the emergence antimicrobial resistance.

METHODS:

A qualitative research method was adopted consisting of in-depth interviews (IDIs) to get insight into how the trained and untrained pharmacist of Bangladesh working on retail drug stores perceive the irrational use of antibiotics and its consequence on emergence of antimicrobial resistance. The study was conducted in the capital city of Dhaka with high population density, and numerous small and corporate drug stores scattered around the city.

Twenty-four IDIs were conducted among retail pharmacists of Dhaka city consisting of 5 grade A pharmacist, 4 grade B pharmacist, 6 grade C pharmacist and 9 untrained retail pharmacists (drug store salespersons). All of the participants were male, although there were no specific exclusion criteria for female. A snowball technique was followed for recruitment process considering including participants from different pharmacist category, education, experience level and location. No female pharmacist was found because of their scarce involvement in retail drug stores. The IDI was taken after signing an informed consent form from the participants. Interviews were recorded, later

transcribed within next 24 hours and further translated into English before analysis.

Content analysis was done for the qualitative analysis of the study. Transcribed interviews were printed as hard copies, and then read and re-read to get a general understanding. Then the condensed meaning units were underlined and marked with different meaning units. The meaning units were then labeled with codes and subsequently categorized and re-categorized to get emerging themes. Emerged themes were then discussed, and final themes were reached after further review of data and categorization of earlier themes.

RESULTS:

Background information

The grade A pharmacists were university graduates with a minimum Bachelor of Pharmacology (B.Pharm) degree. The grade B and C pharmacists had completed secondary education before going for the 3-year diploma or 3-months certificate course respectively. The majority untrained pharmacists had less than ten years of schooling. Being the pharmacist was sole profession for the grade A and B pharmacists. Rests were also involved with other professions like student, business, driving Pathao/Uber (ride sharing and delivery jobs). Most of the grade C and untrained pharmacists were owner of the local drug stores who inherited the profession. One of the untrained pharmacists said:

"We are having this family business for more than 15 years. I am working here since my childhood. I've learned all these things from my experience."

Awareness on antibiotics and antimicrobial resistance

All of the pharmacists were aware of the use antibiotics against bacterial infection. All of them were aware of specific dose, time, route and indications for taking antibiotics. Antimicrobial resistance (AMR) was quite familiar to all the trained pharmacists, whereas majority untrained pharmacists were not aware of the phenomenon. All of them related AMR with irrational use of antibiotics and the extra doses of antibiotics needed for treatment nowadays. Some of them also claimed low quality drugs could also be blamed for this. Sources of knowledge and information mentioned by the trained pharmacists were educational institutes, research articles, seminars and colleagues, and the untrained pharmacists solely learned about the profession from their experience. Medical representatives from pharmaceutical companies were major source of new information and knowledge in this field for majority of the pharmacists. One of untrained pharmacist said:

"Although I have no formal education in this field, I learned the things from my long experience and observing the prescriptions of the doctors while selling the medicines. Moreover, medical representatives visit us every day to sell their new drugs and teaching us about the usage."

Workplace practice, environment and ethics

Grade A and B pharmacists worked in corporate or hospital pharmacies where their work was limited to managing the drug store and dispensing the drugs. In these pharmacies within the corporate hospitals or diagnostic centers, patients mostly come with prescriptions from the doctors. Although the concept of 'model pharmacy' was followed in these big pharmacies, where they defied selling antibiotics, cough syrups and sleeping pills without prescriptions; some of the pharmacists criticized about the prescription pattern of the physicians. One of the grade A pharmacists complained:

"We just provide the medications as per the prescriptions and people think we are just shopkeepers. However, in most cases doctors prescribe multiple antibiotics to the patients, even 2nd and 3rd generation cephalosporin is given to the children frequently. A comprehensive policy should be taken to combat this antimicrobial resistance."

The grade C and untrained pharmacists were found to be working in the local small drug stores or the drug shop owners. Along with selling drugs, various other services were provided in these drug shops i.e.., pushing injections, vaccination (Tetanus toxoid, Rabies vaccine), examinations (blood pressure, blood sugar) and dressing of burn/wounds. In few of the local pharmacies there were doctors available for consultation. They reported that majority clients came to them are without prescriptions (self-referral)

and very often they suggest medications on request. Many of the clients bring prescriptions from quacks (village doctors). Suggesting multiple drugs and new generation drugs was common to them and the untrained pharmacists stated:

"New generation antibiotics work better and fast. Patients become happier with the fast-working drugs."

"Prescribing multiple antibiotics is very common in our country otherwise it won't work properly. In our country drugs are not of good quality. The village doctors prescribe more drugs than the usual doctors and the patients are happy with them."

The trained pharmacists were aware of the side effects of an incomplete course of antibiotic and they motivated clients buying the full course of antibiotics at a time. Antimicrobial resistance and recurrence of the infection was commonly mentioned by them as the side effects. However, all the untrained pharmacists were found reluctant about missed doses and incomplete course of antibiotics. One of the untrained pharmacists, owner of a local drug shop said:

".... whenever someone come to me with stomach infection, I give them ciprofloxacin twice daily and metronidazol thrice daily for 2-3 days. Usually within a day they become totally recovered."

Aggressive marketing by pharmaceutical companies

Influence of pharmaceutical companies on selling frequent was clear from the statements of the pharmacists. Gifts and remunerations were given to the pharmacists for their drugs in the form of profit share, cash, seminar invitations and various daily life utensils. Special emphasis was given to selling antibiotics by giving greater profit margins and periodic targets. The scenario was more serious in the small local drug shops. One of the grade A pharmacists said:

"Not only are the systems, but these capitalist drug companies also are behind this scenario. They are openly bribing the doctors and the local drugstore shopkeepers to sell their drugs more and more. The drugstore shopkeepers sell the poor-quality drugs for higher profit margins. Even they sponsor foreign trips to the doctors and hand cash to the local drugstore shopkeepers as remunerations."

The grade C and untrained pharmacists believed the marketing policy of the pharmaceutical companies was ethical and compared it with the marketing of other companies. One of the grade C pharmacists, owner of a local drug store said:

"No one can make business without marketing. There are companies like PRAN who give money to the shopkeepers for keeping their grocery items in the stores...why not the drug companies? If they don't come to us how would we know, a new better drug has come to the market?"

DISCUSSION:

This study found significant difference in knowledge, attitude, practice and perception regarding relation of antimicrobial resistance (AMR) antibiotics misuse. The trained pharmacists were found apparently more knowledgeable and concerned about the effect of irrational use of antibiotics on emergence of AMR. The background information about the pharmacists like educational status and level of training on the professional quite well explained the reason behind the gap.

This study revealed the common phenomenon of irrational antibiotics use in Bangladesh through self-medication and prescriptions from various agents. Even medical doctors were involved with aggressive marketing of pharmaceutical companies. This is supported by various studies.[3,16] This further reflects the little importance given to the core public healthcare system in Bangladesh.[17] However, this study found a significant population still uses the retail local drug shops even for many health services in Bangladesh. Providing proper training the retail salespersons and establishing strong regulatory body, government can utilize these centers to strengthen its primary healthcare system. Studies conducted in more developed regions found local pharmacies were under-utilized.[18, 19]

Retails pharmacists are considered as the gatekeepers of medicine.[20] However, this study revealed the cramped role of the professional and trained

pharmacists in the context of Bangladesh. On the other hand, untrained retail drugstore salespersons were practicing greater decision-making power dispensing drugs and providing medical services who had minimum knowledge on the subject and professional ethics. The government should set a minimum mandatory educational requirement for the pharmacists for working in the retails drug stores.[17, 21]

Role of pharmaceutical companies were evident in this study. They played decisive role in emergence of AMR and irrational use of antibiotics in Bangladesh. Although promotion of medicine in mass media is strictly prohibited in Bangladesh,[22, 23] pharmaceutical companies were not in any way lagging behind in promotion of their products than other companies. This brings the ethical issues and pulling one thread might reveal a whole network. Similar findings have also been discussed in many countries.[24]

The current study primarily aimed to understand the differential perception of the trained and untrained pharmacists on role of irrational antibiotics use in emergence of AMR through the qualitative key informant interviews. The interviews were taken in the local language and the place where they felt comfortable. However, as the study was conducted in Dhaka, it doesn't represent the overall scenario of Bangladesh. It is purely descriptive in nature and no causal relation can be drawn. Moreover, only male pharmacists were included in this study which further limits the generalizability of the study.

CONCLUSION:

To conclude, this study revealed confined role of trained professional pharmacists in Bangladesh health system. The untrained pharmacists control the major portion of the drug dispensing practice in the country with inferior knowledge, perception and practice regarding the profession. The untrained pharmacist had poor perception about the role of irrational antibiotic use in emergence of AMR which was reflected also in their practice. Although Bangladesh has recently taken some initiative to establish 'Model Pharmacies', it is still a long way to go. Government should take a multi-sectoral multidisciplinary approach with a strong regulatory body to control the situation of AMR with irrational antibiotic use.

REFERENCES:

1. WHO, 2014 Antimicrobial resistance: global report on surveillance, World Health Organization.
2. Bax, R, Bywater, R., Cornaglia, G., Goossens, H., Hunter, P., Isham, V., et al. 2001Surveillance of antimicrobial resistance — what, how and whither? Clin Microbiol Infect. 7(6):316-25.
3. Joshi, J. 2018 Antibiotic Use and Resistance in Bangladesh: Situation Analysis and Recommendations. Dhaka, Bangladesh: The Center for Disease Dynamics, Economics & Policy.
4. Haque, M. 2017 Antimicrobial Use, Prescribing, and Resistance in Selected Ten Selected Developing Countries: A Brief Overview. Asian Journal of Pharmaceutical and Clinical Research. 10(8).
5. Jonas, O., Marquez P., Bank Group Team, W. 2013Drug-Resistant Infections: A Threat to Our Economic Future. World Bank, Washington, DC: The World Bank Group; 2017
6. Laura P. The Dangers of Hubris on Human Health. World Economic Forum: World Economic Forum.
7. Uddin, M., Rahman, M., Hasan, M., Islam, M., Sarkar, M., Hasan, M., et al. 2017 Survey on Antimicrobial Resistance: Reason behind the Misuse of Antibiotics in Bangladesh. Journal of Pharmaceutical Research International. 18(6):1-8.
8. Saha, S., Hossain, MT. 2017 Evaluation of medicines dispensing pattern of private pharmacies in Rajshahi, Bangladesh. BMC Health Serv Res. 17(1):136
9. UNB, Desk. 2016. 56 percent antibiotics not working in Dhaka. Prothom Alo.
10. Monira, S., Shabnam, SA., Ali, SI., Sadique, A., Johura, FT., Rahman, KZ., et al. 2017 Multi-drug resistant pathogenic bacteria in the gut of young children in Bangladesh. Gut Pathog. 9:19.
11. WHO. Primary health care systems (PRIMASYS): case study from Bangladesh, abridged version. 2017. Licence: CC BY-NC-SA 3.0 IGO
12. Ahmed, SM., Hossain, MA. 2007 Knowledge and practice of unqualified and semi-qualified allopathic providers in rural Bangladesh: implications for the HRH problem. Health Policy. 84(2-3):332-43.
13. Ahmed, SM., Hossain, MA., Chowdhury, MR. 2009 Informal sector providers in

Bangladesh: how equipped are they to provide rational health care? Health Policy Plan. 24(6):467-78.
14. Rabbani, F., Cheema, FH., Talati, N., Siddiqui, S., Syed, S., Bashir, S., et al. 2001 Behind the counter: pharmacies and dispensing patterns of pharmacy attendants in Karachi. J. Pak Med Assoc. 51(4):149-53.
15. SIAPS. 2015. Baseline Study of Private Drug Shops in Bangladesh: Findings and Recommendations. Submitted to the US Agency for International Development by the Systems for Improved Access to Pharmaceuticals and Services (SIAPS) Program. Arlington, VA: Management Sciences for Health.
16. Ahmed, I., Rabbi, MB., Sultana, S. 2019 Antibiotic resistance in Bangladesh: A systematic review. Int. J. Infect Dis. 80:54-61.
17. Alam, GM., Shahjamal, MM., Al-Amin, AQ., Azam, MN. 2013 State of Pharmacy Education in Bangladesh. Tropical Journal of Pharmaceutical Research. 12(6):1107-12.
18. Sakeena, MHF., Bennett, AA., McLachlan, AJ. 2018 Enhancing pharmacists' role in developing countries to overcome the challenge of antimicrobial resistance: a narrative review. Antimicrob Resist Infect Control. 7:63.
19. Molstad, S., Lofmark, S., Carlin, K., et al. 2017 Lessons learnt during 20 years of the Swedish strategic programme against antibiotic resistance. Bull World Health Organ. 95:764–773.
20. Miller, R., Goodman, C. 2016 Performance of retail pharmacies in low- and middle-income Asian settings: a systematic review. Health Policy Plan. 31(7):940-53.
21. Molla, AA., Chi, C. 2017 Who pays for healthcare in Bangladesh? An analysis of progressivity in health systems financing. Int. J. Equity Health. 16(1):167.
22. Islam, MS., Farah, SS. 2007 Misleading promotion of drugs in Bangladesh: evidence from drug promotional brochures distributed to general practitioners by the pharmaceutical companies. J. Public Health (Oxf). 29(2):212-3.
23. Babu, MM. 2008 Factors contributing to the purchase of over the counter (OTC) drugs in Bangladesh: an empirical study. The Internet Journal of Third World Medicine. 6(2):9-24.
24. Hermsen, ED., Sibbel, RL., Holland, S. 2020 The Role of Pharmaceutical Companies in Antimicrobial Stewardship: A Case Study. Clinical Infectious Diseases. 71(3):677–681, https://doi.org/10.1093/cid/ciaa053

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