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Original Research Article

Drug used pattern by self-medication among the RT-PCR positive health workers in Dhaka city

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ABSTRACT

Background: To date there is no effective treatment against COVID-19. Self-medication played one of the major modes of treatment among general population as well as the health workers during this pandemic. Studying the pattern of self-medication among the health care workers (HCWs) may indicate their knowledge and skills towards rational use of medicines. The aim of the study was to assess the pattern self-medication among the COVID-19 affected HCWs.

Methods: This cross-sectional survey assessed the pattern of drug used by self-medication among the health workers who were RT-PCR positive in context to Bangladesh.

Results: A total of 267 HCWs data were collected. Most of the HCWs were in middle age group between 31-40 years with the mean age of 32.2±5.2. Doctors (83.9%) enrolled five times more than the nurses (16.1%). Most of the HCWs (60.3%) commenced medications just after appearance of symptoms and 27.0% went for the RT-PCR testing. Only 3.7% went to health care facilities for treatment. More than sixty percent of the respondents took medication by themselves just after start the symptoms, 19 (33.7%) took advised from the specialists and attended at health facilities 2.6%. Most of the patients (42.7%) used azithromycin as antimicrobial agent. Paracetamol was the most used drug among the participants (78.65%) followed by antihistamines (67.79%). Average number of drugs used by patients 3.1% and percentage of antibiotics per patients 42.6%.

Conclusions: The prescribing practice of antibiotics shows deviation from the standard recommendation. Awareness regarding essentials drug list should be needed.

Keywords: Self-medication, Health workers, Self-treatment, Drugs pattern

INTRODUCTION

Drugs are the main intervention mechanisms used for the treatment, diagnosis, mitigation and prevention of diseases.¹ Therefore, rational way of drug use needs to be always in the forefront practice contrast to this, the use of drugs when no drug therapy is indicated, the use of the wrong drug for a specific condition requiring drug therapy, the use of drugs with doubtful or unproven efficacy, the

use of drugs of uncertain safety status, failure to provide available, safe, and effective drugs, the use of correct drugs with incorrect administration, dosages, and duration, the use of unnecessarily expensive drugs is deemed as irrational use of drugs.

The act of self-prescription is common in many pieces of Bangladesh despite financial status and level of instruction. While this is undeniable, the frequency of

self-drug is might be higher in the low or centre pay nations without talking with qualified wellbeing professionals.¹ Although the WHO stressed that rational self-medication practice helps in the prevention and treatment of some minor pathological conditions at affordable cost, but otherwise, it may cause wastage of resources, resistance to pathogens and serious health hazards with adverse drug reactions and prolonged morbidity.^{2,3} In a developing country like Bangladesh, the practice of self-medication may provide an alternative for people as low-cost to avoid high cost of clinical services and many drugs dispensed over the counter (OTC) without prescription.⁴

Currently, the world is struggling with COVID-19 pandemic, which has been declared a global public health emergency (WHO, 2020).⁵ The focus has shifted to combating the pandemic; thereby curtailing the strides made in other healthcare indicators. The current situation has been exacerbated by inadequacies in healthcare infrastructure, essential medical equipment in health facilities and inadequate health workforce. The combat against COVID-19 is still continuing in Bangladesh, with the highest incidence rate in Dhaka city. The available data by WHO revealed that the highest AR was observed to continue in the Dhaka (2321.7/1,000,000) and was highest (9422.1/1,000,000) during April to June 2020.⁶⁻¹¹ As, there is no approved cure for COVID-19 the aim of treatment was focused to manage and reduce symptoms until clinical recovery. Most people (around 80%) are asymptomatic or mild infection that can be treated at home. As stated in the National Guideline on Case Management of COVID-19 in Bangladesh, there is no precise effective treatment for COVID-19, the mainstay of management is early diagnosis and supportive care of symptoms and optimum support for organ function in severe illness. No drug is yet recommended as chemoprophylaxis as there is no quality evidence of efficacy and safety in COVID-19. Hence, this study was planned to assess the drug use pattern which includes parameters such as the number of drugs prescribed per encounter which measures the degree of polypharmacy, to measure the level of two important but commonly overused antibiotics and to measure the degree to which practices confirm an implement of national drug policy.

METHODS

Study design

This cross-sectional prospective study was conducted among a total no of 267 health workers working in different hospitals in Dhaka city, from July 2020 to December 2020, Bangladesh who were RT-PCR positive. The positive result of RT-PCR was collected from the different health care facilities. A data collection questionnaire form was developed and collect the data by interviewing with the participant. The face to face interview was waived as because of pandemic situation. Data was collected over phone, email and google docs

form from the participants. Study participants were selected using purposive sampling technique. All data in the ordinary prescribing indicator recording form were first analyzed manually and then using Microsoft excel 2007. In the statistical analysis, frequencies, averages/means, standard deviations and percentages were obtained.

Selection criteria

Inclusion criteria

Healthcare workers with following criterias were included- (a) RT-PCR positive for COVID-19 (doctors and nurse); (b) age- above 18 years; (c) sex both male and female HCWs; (d) HCWs who did not admit in hospital for COVID-19 treatment; and (e) given informed oral consent

Exclusion criteria

Unwilling to participate in the study were excluded.

Prescribing indicators

The WHO prescribing indicators were used in this study. The indicators were pretested, and slight modification was made because the drug was self-prescribed so that they could be used easily to provide accurate data. The final versions of the pretested indicators are described below.

The prescribing indicators that were measured included: (a) the average number of drugs prescribed per encounter was calculated to measure the degree of polypharmacy. It was calculated by dividing the total number of different drug products prescribed by the number of encounters surveyed. Combinations of drugs prescribed for one health problem were counted as one; (b) percentage of drugs prescribed by generic name is calculated to measure the tendency of prescribing by generic name. It was calculated by dividing the number of drugs prescribed by generic name by total number of drugs prescribed, multiplied by 100; (c) percentage of encounters in which an antibiotic was prescribed was calculated to measure the overall use of commonly overused and costly forms of drug therapy. It was calculated by dividing the number of patient encounters in which an antibiotic was prescribed by the total number of encounters surveyed, multiplied by 100; (d) percentage of encounters with an injection prescribed was calculated to measure the overall level use of commonly overused and costly forms of drug therapy. It was calculated by dividing the number of patient encounters in which an injection was prescribed by the total number of encounters surveyed, multiplied by 100; and (e) percentage of drugs prescribed from an essential drug list (EDL) was calculated to measure the degree to which practices conform to a national drug policy as indicated in the national drug list of Bangladesh. Percentage was calculated by dividing number of products

prescribed which are in essential drug list by the total number of drugs prescribed, multiplied by 100.

Statistical methods

Descriptive statistical analysis has been carried out in the present study. The statistical data analysis was done using SPSS software version 23.0 for Windows.

Data collection

Data was collected over phone, email and google docs form from the participants. A semi-structured open-ended questionnaire was developed according to our context and was used as a data collection tool to interview the selected patients and interview was taken by required interviewer by direct face-to-face or telephone interviews. The time duration of each interview will take 10-15 min face-to-face and 15-20 min over telephone. A recorder was used with the permission of the patients during the interview. The recorded interview was discarded after data analysis. Collected data was recorded into separate case record forms and was processed and analyzed.

RESULTS

Figure 1 shows the distribution of HCWs according to age. A total of 267 COVID-19 positive HCWs records were collected. Most of the HCWs were in middle age group between 31-40 years with the mean age of 32.2±5.2 and age ranged from 21 to 60 years.

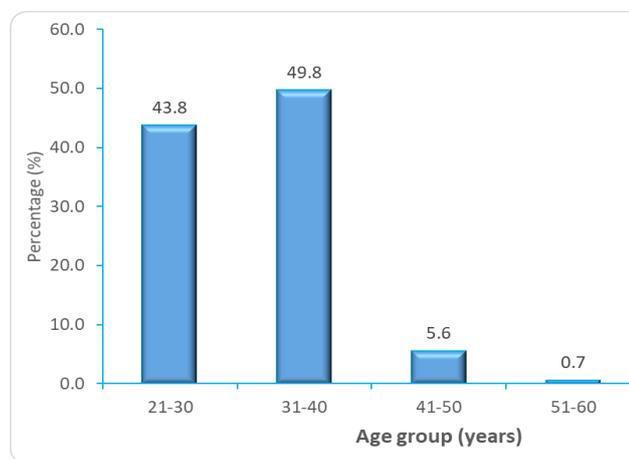


Figure 1: Distribution of the study participants according to age (n=267).

Figure 2 depicts the distribution of HCWs according to gender. In this series, male HCWs (62.2%) were affected more than the females (37.8%) and the male and female ratio 2.3:1. Blue pie denotes male and yellow pie denotes female.

Table 1 shows the distribution of the respondent according to their occupation. Out of 267 HCWs, doctors (83.9%) enrolled five times more than the nurses (16.1%).

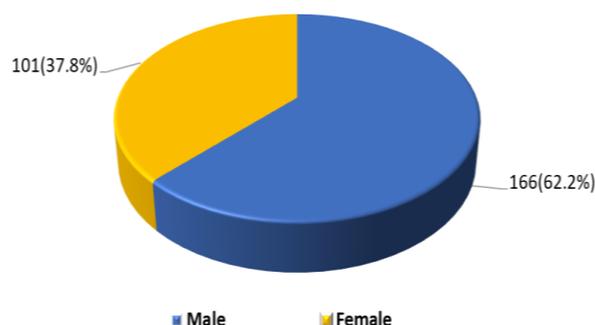


Figure 2: Distribution of the study participants according to gender (n=267).

Table 1: Distribution of patients according to occupation (n=267).

Occupations	Frequency	Percentage (%)
Doctor	224	83.9
Nurse	43	16.1

Table 2 shows that most of the HCWs (60.3%) commenced medications just after appearance of symptoms and 27.0% went for the RT-PCR testing. Only 3.7% went to health care facilities for treatment. Most of the patients were doctors and they could prescribe by themselves, and they had knowledge about treatment and drugs.

Table 2: Activities of the participants following appearance of the symptoms (n=267).

Activities following symptoms appearance	Frequency	Percentage (%)
Started drugs	161	60.3
Started non-pharmacological agents	24	9.0
Went to health care facilities	10	3.7
Went for RT-PCR testing	72	27.0

Table 3 shows that more than sixty percent of the respondents took medication by themselves. Others took advised from the specialists (33.7%) or attended at health facilities (2.6%).

Table 3: Distribution of patients according to the mode of seeking of drug treatment (n=267).

Medications	Frequency	Percentage (%)
Self-medication	169	63.3
Advised by specialist	90	33.7
Advised by Hospital or clinic	07	2.6
Others	01	0.4

Table 4 shows that more than ninety percent participants follow the national or international treatment guidelines. Most of the patients were doctors and they were aware the different treatment guidelines of COVID-19.

Table 4: Distribution of participants according to adherence of COVID-19 treatment guideline (n=267).

Medications	Frequency	Percentage (%)
Yes	253	94.8
No	14	5.2

Table 5 shows the pattern of pharmacological treatment. As antimicrobial agent, most of the patients (42.7%) used azithromycin. In addition, ivermectin (23.60%) and doxycycline were also used by the respondents. However, only 4 percent of respondents had used antiviral agents such as remdesivir and favipiravir. Paracetamol was the most used drug among the participants (78.65%) followed by antihistamines (67.79%). About half of the patients used vitamin D and zinc. As azithromycin was available drug and it has both antibacterial as well as antiviral activity and most of the patients were doctors and they had the knowledge regarding any drug.

Table 6 shows that the mean duration of pharmacological agent matched with standard treatment protocol. Mean±duration of azithromycin was 5.5±1.8 and vitamin and minerals were 11.9±10.4. Three fourth of the patients took antimicrobials and antipyretics. Two third of the patients took antihistamine and vitamin and minerals.

Table 7 shows that most of the patients 46.4 % used 3 to 4 drugs. Approximately 34.1% of patients took more than 4 drugs. The mean±SD number of drugs per person was 4.14±1.67. Table 8 shows average number of drugs

prescribed or used per patients 3.1% and percentage of antibiotics per patients were 42.6%.

Table 9 shows a total of 852 drug products were used by self-medication. Thus, the average number of drugs per prescription or mean was 3.1 (SD=0.31) with a range between 1 and 4. The total number of drugs used by generic name was 10 (3.7%). An antibiotic was used in 114 by self-medication (42.6%), and an injection was prescribed after hospital admission in 118 encounters (44%). Almost no drugs prescribed were on the essential drug list of Bangladesh.

Table 5: Distribution of the study participants by drug use pattern (n=267).

Pharmacological treatment	Frequency	Percentage (%)
Azithromycin	114	42.70
Doxycycline	42	15.73
Hydroxychloroquine	08	03.00
Ivermectin	63	23.60
Oseltamivir	01	0.37
Remdesivir	03	1.12
Favipiravir	07	2.62
Angiotensin receptor blockers	02	0.75
Corticosteroids	04	1.50
Dexamethasone	09	3.37
Methyl prednisolone	03	1.12
Paracetamol	210	78.65
Anti-coagulant	40	14.98
Anti-histamine	181	67.79
Cough expectorant	28	10.49
O ₂ therapy	02	0.75
Others (vitamin D, zinc)	135	50.56

Table 6: Distribution of the study participants by duration of drug use pattern (n=267).

Pharmacological treatment	Frequency	Percentage (%)	Duration (days±SD)
Azithromycin	114	42.70	5.5±1.8
Doxycycline	42	15.73	7.56±2.43
Hydroxychloroquine	63	23.60	2.08±1.52
Ivermectin	01	0.37	2.0
Oseltamivir	03	1.12	5.7±1.15
Remdesivir	07	2.62	8.50±3.72
Favipiravir	40	14.98	11.8±4.5
Angiotensin receptor blockers	4	1.50	5.0±1.2
Corticosteroids	03	1.12	8.75±3.5
Dexamethasone	210	78.65	3.4±1.69
Methyl prednisolone	181	67.79	7.8±8.86
Paracetamol	28	10.49	5.86±2.81
Anti-coagulant	02	0.75	6.0±1.14
Anti-histamine	135	50.56	11.9±10.4
Cough expectorant	114	42.70	5.5±1.8
O ₂ therapy	42	15.73	7.56±2.43
Others (vitamin D, zinc)	63	23.60	2.08±1.52

Table 7: distribution of participant according to number of drugs (n=267).

Number of drugs	Number of patients	Percentage	Mean±SD
One to two	37	13.9	4.14±1.67
Three to four	124	46.4	
Five to six	91	34.1	
Seven and above	15	5.6	

Table 8: Average number of drugs used by self-medication and percentage of antibiotics used per patients.

Variables	Total drugs	Percentage (%)
Average number of drugs used by self-medication	852	3.1
Percentage of antibiotics used per patients	114	42.6

Table 9: Assessment of prescribing indicators.

Prescribing indicators assessed	Total drugs/encounters	Average/percent	Standard derived or ideal
Average number of drugs per encounter	852	3.1	(1.0-1.8)
Percentage of encounter with antibiotics	114	42.6%	(20.0-22.8%)
Percentage of encounters with injection	118	44%	(22%-24.1%)
Percentage of drugs prescribed by generic	10	3.7%	1.8-2%
Percentage of drugs from essential drug list	00	00%	00%

DISCUSSION

To the best of our knowledge, this is the first study in Dhaka city evaluating the pattern of drug use in self-medication practice among the health workers of prescription-only drugs in COVID-19 outbreak (April to June 2020) in Bangladesh¹². As the survey population was doctors and nurses. In this series, Male HCWs (62.2%) were affected more than the females (37.8%) and the male and female ratio 2.3:1, belonged to the age group of 21-60 years living in Dhaka city at the time of COVID-19 pandemic. As most of the patients were doctors and they could prescribe by themselves, and they had knowledge about treatment and drugs so most of them (60.3%) commenced medications just after appearance of symptoms.

And 27.0% went for the RT-PCR testing. Only 3.7% went to health care facilities for treatment. Having self-medication without detecting COVID-19 among a large number of respondents could also be due to feeling of insecurity influenced by availability of local medical resources, efficiency of public health system, and prevention and control measures taken in pandemic situation.¹³⁻¹⁵ The rate of self-medication of antimicrobial agents like azithromycin (54.15%), doxycycline (40.25%) were found much higher during the outbreak of COVID-19 comparing to 21% and 25% for azithromycin and doxycycline before the pandemic as reported by Chowdhury et al.¹⁶ Azithromycin was the first highest

percentage of people with self-medication throughout the previous years, whereas it became most common antibiotic during the present pandemic.

On the other hand, ivermectin being the anti-parasitic agent was self-medicated by 23.60% of the patients. This might be due to the nationwide broadcast of an experience by a team of Bangladeshi physicians and Bangladesh Medical College Hospital (BMCH) claimed as 'outstanding results' in 60 patients with COVID-19 patients all of whom recovered in combination of ivermectin and doxycycline.¹⁷ Though the drugs like chloroquine, hydroxychloroquine and azithromycin, was recommended in the treatment protocol of COVID-19 patients in Bangladesh, according to the 'National Guidelines on Clinical Management of Coronavirus Disease-2019' published in the health directorate's website, hydroxychloroquine was used much less (20.44%) than any other antimicrobials without prescription.^{18,19} This could be due to mass publicity and sharing of news in national and international news and social media as the drug can cause hazardous abnormalities in cardiac rhythm in COVID-19 patients, and should be limited only in clinical trials or hospitals with adequate facilities to monitor any cardiac complications, warned by FDA in a safety communication briefing globally.¹⁷

The overall the prevalence and dominance of self-medication of antimicrobials in low- and middle-income

countries were reported around 39% in previous studies before COVID-19 pandemic; but was outrageously higher (88.33%) in Dhaka city during the pandemic.^{20,21} Considering the knowledge and sources for medication more than sixty percent of the COVID positive health workers took medication by themselves. Others took advised from the specialists (33.7%) or attended at health facilities (2.6%). This finding was very much similar to the previous studies that reported the high prevalence of self-medication (including antimicrobials) since people could obtain any drugs from the pharmacies without prescription even in the distant areas of the country.²²

Having inappropriate antimicrobials and supplementary medications (zinc, calcium, vitamin D) without prescription is associated with the risk of drug interactions, masking symptoms of underlying diseases and most importantly, the development of antimicrobial resistance.^{23,24} A total of 852 drug products were used by self-medication. Thus, the average number of drugs per prescription or mean was 3.1 (SD=0.31) with a range between 1 and 4. The total number of drugs used by generic name was 10 (3.7%). An antibiotic was used in 114 by self-medication (58%), and an injection was prescribed after hospital admission in 118 encounters (44%). Almost no drugs prescribed were on the essential drug list of Bangladesh. This was not matched with any study because almost every study showed use of drugs from essential drug list.²⁵ Although there is no specific treatment for COVID-19, the drug administration in Bangladesh started working in advance to increase the production of some supportive medicines.²⁶

As far this was the first study among the healthcare professional who were COVID-19 positive in relation to self-medication in this pandemic situation. The limitation of this study was that it was a convenience sample which is inferior to probability sampling in its representativeness.

CONCLUSION

Most of the patients were doctors and they were aware the different treatment guidelines of COVID-19. Paracetamol was the most used drug among the participants and followed by antihistamines. As azithromycin was available drug and it has both antibacterial as well as antiviral activity. Most of the HCWs were not use drugs from essential drug list. Awareness regarding essential drug list and use will be needed.

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Ethical approval: The study was approved by the Institutional Ethics Committee

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