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# Antibiotic Prescribing Patterns among Post-operative Patients of Surgery Department at a Tertiary Care Hospital in Bangladesh: A Cross-sectional study

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## Abstract

**Background:** Antibiotics are one of the most important drugs in post-operative patients. After any successful surgery, patient outcome greatly depends on the use of appropriate antibiotics. Postoperative wound infections are the third most common cause of nosocomial infection in surgical patients, and it is higher in developing countries. It is associated with significant morbidity and mortality and increases costs in health care. It also significantly increases the postoperative length of hospital stay, hospital charges, and risk of death. But the irrational use of antibiotics promotes the emergence of resistance, which is a global concern nowadays. **Objectives:** This study aimed to assess the commonly used antibiotics among the post-operative patients in the Surgery department of a tertiary care hospital in Dhaka. **Methods:** This cross-sectional descriptive study was conducted in the Department of Pharmacology & Therapeutics, Sir Salimullah Medical College, Dhaka, in collaboration with the Surgery Department of Sir Salimullah Medical College, Dhaka, from July 2023 to June 2024. A total of 216 patients were enrolled in this study after meeting the selection criteria. **Results:** In this study, the most commonly prescribed antibiotic group was cephalosporin, which was 39.3%, followed by the Nitroimidazole group at 34.3% and the penicillin group 10.3%. Among the cephalosporin group, ceftriaxone was the most prescribed drug in our study, which was 48.5% then Metronidazole 137(34.3%). **Conclusion:** Ceftriaxone and metronidazole are the most commonly used antibiotics in post-operative patients.

**Keywords:** Prescribing pattern, Post-operative patients, Antibiotics.

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## Introduction

The skin and mucosal membrane provide an important barrier to bacterial colonization of the underlying tissue. Surgery is the procedure or intervention where the barriers are penetrated. So, there is a risk of developing a bacterial infection. Surgical site infections are infections that occur due to surgical procedures adjacent to the wounds that are exposed during the operation.[1] Surgical site infection is one of the most common infections in hospital-stay patients throughout the world, especially in developing countries like Bangladesh. Among the hospital-acquired infections, surgical site infections account for 14-16%.[2] It not only increases morbidity and mortality but also increases the burden on the patient by increasing hospital stays and financial loss, which has a huge economic impact. Antibiotics are the most commonly prescribed drugs throughout the world.[3] Surgical antibiotic prophylaxis means the use of preoperative and intraoperative antimicrobials, whereas postoperative antimicrobials are for a therapeutic purpose. The main cause of using antibiotics in surgical patients is to prevent surgical site infection. In low- and middle-income countries, surgical site infections are very common.[4] The recovery from surgery involves the return to normal physiological processes. Antimicrobials are used to eradicate or reduce the growth of microorganisms. Antibiotics are used in surgery to treat pre-existing infections and prevent infections after surgery.[5] The resistance pattern of pathogens is changing drastically worldwide, especially in developing countries like Bangladesh, due to overuse and uncontrolled use of antibiotics, where most of the antibiotics are given empirically before laboratory tests. So, their antimicrobial resistance pattern is changing in both communities and hospitals.[6] To improve overall drug use, international agencies like the World Health Organization (WHO) and the International Network for the Rational Use of Drugs (INRUD) are working to ensure standard drug use indicators.[7] The WHO core indicators help to improve prescribing patterns and to promote the practical use of pharmaceuticals in healthcare settings. The ability of clinicians to prescribe rationally must be assessed, and this can be done by conducting frequent prescription audits. As a result, this study aimed to use WHO prescribing indicators, such as antibiotics prescribed per prescription and antibiotics prescribed by generic or brand name, to evaluate antibiotic prescribing patterns.[8,9] The importance of antibiotics is increasing day by day because of their wide range of usage. So, the appropriate use of antibiotics is an important health issue all over the world. Overuse or misuse of antibiotics, self-medication, multiple uses of broad-spectrum antibiotics, random selling by pharmacists in patients' demands, and not completing the antibiotic course are the main causes for the emergence of resistance in our country.[10] One of the most important therapeutic exchanges between a doctor and a patient is a prescription. The study of the prescribing pattern of antibiotics is important for monitoring, evaluating, and suggesting modifications in practitioners' prescriptions. It is also necessary to take a constructive approach to solve the problem that arises from the use of multiple antibiotics. Every medical institution or hospital must have an antibiotic policy that should be followed strictly. This study was done to find out the extent of antibiotic use as well as to indicate the prevalence of the most commonly used antibiotics in postoperative patients in the Department of Surgery in Sir Salimullah Medical College, Dhaka.

## Materials and methods

The study was a cross-sectional observational study. This study was conducted at the Department of Pharmacology, Sir Salimullah Medical College, Dhaka, in collaboration with the Surgery Department of Sir Salimullah Medical College, Dhaka. The study was conducted from July 2023 to June 2024. Before the beginning of the study, ethical clearance was obtained from the Ethical Review Committee of Sir Salimullah Medical College, Dhaka. A total of 216 post-operative patients admitted to the Surgery Department of Sir Salimullah Medical College Hospital, Dhaka, were enrolled in this study. The purposive sampling technique was applied to take the study population.

**Inclusion criteria:**

- Age ≥ 18 years.
- Both male and female patients.
- Post-operative patients taking antibiotics who were admitted to the Surgery Department of Sir Salimullah Medical College.

**Exclusion criteria:**

- Pre-operative patients.
- Pregnant patients.

A total of 216 patients were enrolled in SSMCH following the inclusion and exclusion criteria. Informed written consent was taken from every subject. The following variables, such as age, sex, personal history, and drug history, were analyzed by observing the prescription, and this information was entered into data

collection sheets. Pharmacotherapy investigation data were taken from the documents of patients. Data was analyzed using descriptive statistics. Continuous data was expressed as mean ± SD (Standard deviation), and nominal data was expressed as percentages. Analysis of data was carried out by using the Statistical Package for Social Sciences (SPSS) version 26.

## Results

The mean age of the patients was 39.87 ± 13.94 years. Here, 66 (30.6%) of the patients were in the age group of 21-30 years, which was the highest. Male participants were predominant in number, which was 126 (58.3%), and 90 (41.7%) participants were female. Table 01 shows the age and sex distribution of study patients.

**Table 01: Age and sex distribution of study patients (n = 216)**

| Age group in years | Frequency | Percentage (%) |
|---|---|---|
| ≤ 20 | 8 | 3.7 |
| 21-30 | 66 | 30.6 |
| 31-40 | 53 | 24.5 |
| 41-50 | 35 | 16.2 |
| 51-60 | 41 | 19.0 |
| 61-70 | 10 | 4.6 |
| 71-80 | 2 | 0.9 |
| >80 | 1 | 0.5 |
| Male | 126 | 58.3% |
| Female | 90 | 41.7% |

Out of the 216 patients that were included for the study, patients had appendicitis 36 (16.7%), followed by cholecystitis 31 (14.3%), then inguinal hernia 21 (9.7%), perianal abscess and breast abscess were 16 (7.5%).

**Table 02: Frequency distribution of disease condition. (n =216)**

| Name of disease condition | Frequency | Percentage (%) |
|---|---|---|
| Anal fissure | 1 | 0.4 |
| Anal fistula | 14 | 6.5 |
| Appendicitis | 36 | 16.7 |
| Axillary abscess | 5 | 2.4 |
| Breast abscess | 16 | 7.5 |
| Carcinoma of the breast | 10 | 4.7 |
| Carcinoma of the colon | 7 | 3.2 |
| Carcinoma of the stomach | 4 | 1.8 |
| Cholecystitis | 31 | 14.3 |
| Diabetic foot | 7 | 3.2 |
| Gluteal abscess | 6 | 2.7 |
| Hemorrhoids | 3 | 1.3 |
| Hydrocele | 2 | 0.9 |
| Incisional hernia | 6 | 2.7 |
| Inguinal hernia | 21 | 9.7 |
| Intestinal obstruction | 7 | 3.2 |
| Lipoma | 4 | 1.8 |
| Perforation | 5 | 2.3 |
| Perianal abscess | 16 | 7.4 |
| Peritoneal abscess | 5 | 2.3 |
| Wound infection | 10 | 4.6 |

In this study, cephalosporin 157 (39.3%) was the most commonly prescribed, followed by the second most used antibiotic group, Nitroimidazole, which was 137 (34.3%), then penicillin 41 (10.3%), carbapenems 33 (8.2%), fluoroquinolone 15 (3.8%), aminoglycosides 12 (3%), and oxazolidinone 4 (1%).

**Table 03: Distribution of prescribed antibiotic groups among the study patients.**

| Antibiotic group | Number of antibiotics | Percentage (%) |
|---|---|---|
| Cephalosporin | 157 | 39.3 |
| Penicillin | 41 | 10.3 |
| Fluoroquinolone | 15 | 3.8 |
| Aminoglycosides | 12 | 3.0 |
| Macrolides | 0 | 0.0 |
| Carbapenems | 33 | 8.2 |
| Nitroimidazole | 137 | 34.3 |
| Sulfonamide | 0 | 0 |
| Clindamycin | 0 | 0 |
| Oxazolidinone | 4 | 1.0 |
| Total antibiotics | 399 | 100 |

In Table 04, shown that Ceftriaxone 154 (38.5%) was the most commonly prescribed antibiotic, followed by Metronidazole 137 (34.3%), then flucloxacillin 37 (9.2%), meropenem 33 (8.2%), ciprofloxacin 15 (3.8%), amikacin 12 (3%), co-amoxiclav 4 (1%), and cefixime 3 (0.8%).

**Table 04: Distribution of prescribed antibiotics among the study patients.**

| Antibiotic name | Number of antibiotics | Percentage (%) |
|---|---|---|
| Cefixime | 3 | 0.8 |
| Ceftriaxone | 154 | 38.5 |
| Ciprofloxacin | 15 | 3.8 |
| Co-amoxiclav | 4 | 1.0 |
| Flucloxacillin | 37 | 9.2 |
| Meropenem | 33 | 8.2 |
| Metronidazole | 137 | 34.3 |
| Amikacin | 12 | 3.0 |
| Linezolid | 4 | 1.0 |
| Total antibiotics | 399 | 100 |

In this study, single antibiotics were prescribed among 38 (17.6%) patients, double antibiotics were prescribed mostly, and that was 178 (82.4%), and triple antibiotics were prescribed 5 (2.3%). The average number of antibiotics per prescription was (399/216) = 1.85

**Table 05: Distribution of the number of antibiotics per prescription (n = 216)**

| Number of antibiotics | Frequency | Percentage (%) | Total |
|---|---|---|---|
| One | 38 | 17.6 | 38 × 1 = 38 |
| Two | 173 | 80.1 | 178 × 2 = 346 |
| Three | 5 | 2.3 | 5×3 = 15 |
| Total | 216 | 100.0 | 399 |

Table 06 shows that 188 (87.0%) antibiotics were prescribed by generic name, 8 (3.7%) antibiotics were prescribed by trade name, and 20 (9.3%) antibiotic's some were prescribed by generic and some were prescribed by trade name.

**Table 06: Distribution of prescribed antibiotics according to nomenclature (n = 216)**

| Nomenclature | Number of prescriptions | Percentage (%) |
|---|---|---|
| Generic name | 188 | 87.0 |
| Trade name | 8 | 3.7 |
| Both (Generic+ Trade) | 20 | 9.3 |
| Total | 216 | 100.0 |

In our study, 213 (98.6%) antibiotics were prescribed by the parenteral route, and 3 (1.4%) prescriptions some antibiotics were prescribed by the oral route.

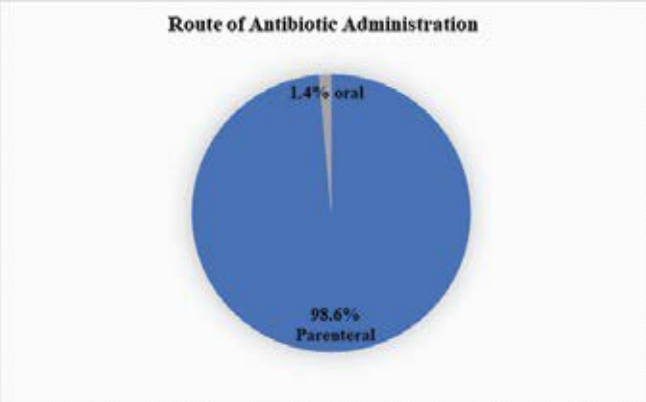


**Figure 01: Distribution of route of antibiotics administration per prescription.**

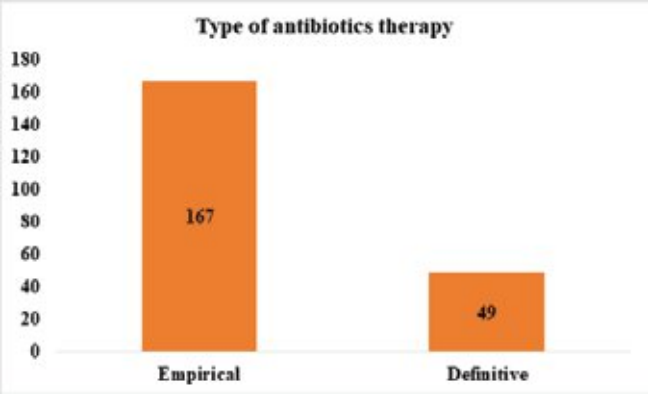


**Figure 02: Bar diagram for types of antibiotic therapy.**

Table 07 shows culture and sensitivity report was done in 54 (25%) and the culture and sensitivity were not done in 162 (75%) of the patients.

**Table 07: Lab evidence of culture and sensitivity of study patients.**

| Culture done | Frequency | Percentage (%) |
|---|---|---|
| Yes | 54 | 25.0 |
| No | 162 | 75.0 |
| Total | 216 | 100.0 |

Table 08 shows that 90 (41.7%) antibiotics were prescribed for 1 to 3days, 120 (55.6%) antibiotics were prescribed for 4 to 7 days, and 6 (2.7%) antibiotics were prescribed for 8 to 12 days.

**Table 08: Distribution of study patients according to duration of antibiotic therapy (n =216)**

| Duration (Days) | Antibiotic Therapy | |
|---|---|---|
| | Frequency | Percentage (%) |
| **1 to 3 days** | 90 | 41.7 |
| **4 to 7 days** | 120 | 55.6 |
| **≥ 8 days** | 6 | 2.7 |
| **Total** | 216 | 100.0 |

Among antibiotic usage in patients supported by empirical therapy, 167 (77.3%) and definitive therapy, 49 (22.7%).

**WHO Prescribing Indicator**

In this study, the prescribing pattern of antibiotics was analyzed using WHO prescribing indicators. A total of 399 antibiotics were prescribed for 216 patients. The number of antibiotics prescribed per patient was 1.8. Furthermore, 51.37% of antibiotics were prescribed using their generic names. Culture and sensitivity testing of antibiotics was done 25% of the patients. Here, 98.6% antibiotics were given in an injectable form. Among 390 drugs, 205 drugs were prescribed from the essential medicine list, which was 51.37%.

**Table 09: WHO Prescribing Indicator in comparison to our study.**

| Indicator | Observed value (mean/frequency) | Proportion (%) | Optimal value |
|---|---|---|---|
| Average number of drugs per prescription | 1.8 | | 1.6–1.8 |
| Antibiotics prescribed in generic names | 188 | 87% | 100% |

| | | | |
|---|---|---|---|
| Prescriptions after culture and sensitivity | 54 | 25% | 20.0%–26.8% |
| Antibiotics prescribed from the Essential Medicine List | 205 | 51.37% | 100% |
| Injectable antibiotic | 213 98.6% | 13.4%-24.1% | |

## Discussion

In this study, the age range of participants was 18-81 years. The majority of the participants were in the age group 21-30, which was very similar to the study of Panday, D. R. et al., and Khyati M. Patel et al., where the majority of the participants in the age group were 20-39 years.[10] In this study, the demographic profile showed a slight male predominance among the participants. It was observed that in this study, 58.3% (126) of participants were male and 41.7% (90) participants were female. This data coincides with the study of Khyati M et al., where 60.60% were male participants and 39.40% were female participants.[11]

The most common disease in this study for which antibiotics were prescribed in the post-operative ward of surgery department was Appendicitis 36 (16.7%) followed by Cholecystitis 31 (14.3%), then inguinal hernia 21 (9.7%), breast abscess 16 (7.5%), anal fistula 14 (6.%%), which was almost similar to a study done in Gujarat India by Khyati M Pate et al. where most common disease condition was appendicitis (14.9%) and inguinal hernia (10.6%).[12]

In this study, the most commonly prescribed antibiotic group was cephalosporin, which was 157(39.3%), followed by the Nitroimidazole group 137 (34.3%), penicillin group 41 (10.3%). Carbapenems 33 (8.3%), Fluoroquinolone 15 (3.8%), Aminoglycosides 12 (3 %), Oxazolidinone 4 (1%). A study by Asawari et al. showed that 28.23% were prescribed antibiotics from the cephalosporin group, 23.56% from the penicillin group, and 19.95 % from the nitroimidazole group.[13] Among the cephalosporin group, ceftriaxone was the most prescribed drug in our study which was 154(48.5%), Metronidazole 137 (34.3%), Flucloxacillin 37 (9.2%), Meropenem 33 (8.2%), Ciprofloxacin 15 (3.8%), Amikacin 12 (3%), Linezolid 4 (1%), Co-amoxiclav 4 (1%), Cefixime 3 (0.8%). A study by Fatema Johora et al. showed that ceftriaxone was the most commonly used antibiotic when it was used as monotherapy, which was (65.1%).[14]

In this study, most antibiotics were given by the parental route. Because all the participants were post-operative hospital-admitted patients, 213 (98.6%) received antibiotics by the parental route, and 3 (1.4 %) received antibiotics by both the parental and oral routes. In the study of Joshi et al. showed, 90% of antibiotics were given intravenously, and 10 % were given in oral route.[15] The average number of antibiotics per prescription is an important parameter of a prescription. To minimize the risk of drug interactions, development of bacterial resistance, and hospital costs, it is preferable to keep the number of drugs per prescription as low as possible.

The average number of antibiotics per prescription was 1.85, which was closely similar to Machowsks, A. et al. which showed the number of antibiotics per prescription was 1.61.[16] In this study two antibiotics were prescribed mostly (80.1%), then single antibiotics were given to 17.6 %, and triple antibiotics were given to only 2.3% of patients. A study by Prasad Honey et al showed that two antibiotics were prescribed to 46%, then single antibiotics were given to 25.33%, and triple antibiotics were given to 26% of patients.[17]

Whether the antibiotic therapy was definitive or empirical is an important indicator for treatment. It is also important to know which type of organism is most common in hospital-admitted patients. In this study, most of the patients received empirical therapy. It was 77.3% (167). %. Culture and sensitivity were done in only 25% of the patients. A study by Datta et al. showed empirical thera-py was 61.6%.[18,19]

## Conclusion

A prescription-based survey is one of the most effective methods to assess appropriate drug utilization. Good prescribing practice and proper use of antibiotics can minimize or delay the possibility of the emergence of

resistance to various pathogens. In this study, the antibiotic prescribing pattern deviated from the WHO-recommended standard. This necessitates the Implementation of ongoing interventional techniques, as well as periodic audits at all levels of health care, to avoid the harmful and incorrect antibiotic prescribing. More than half of the patients in this study were taking at least two antibiotics. In this study, it was found that third-generation cephalosporin-ceftriaxone was the most prescribed drug for post-operative patients in the surgery department then followed by penicillin. Most of the patients were prescribed antibiotics per prescription, and most of the antibiotics were given by the parenteral route. However, in most of the cases, antibiotics were given without a culture or sensitivity test. Establishing an antibiotic stewardship program, introducing antibiotic use based on culture and sensitivity tests, and developing institutional guidelines could all help to alleviate this problem. It will also help to prevent drug resistance and ensure rational therapy.

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## References

01. Rayamajhi, B.B., Basukala, S., Khadka, A., Thapa, N. and Ayer, D.B., 2021. An assessment of antimicrobial prescription pattern among surgical patients: a hospital based cross sectional descriptive study. Journal of Society of Surgeons of Nepal, 24(1), pp.23-27.
02. Ramalingam, V. and Pandian, J.J., 2021. Prescribing Pattern of Antimicrobial Agents in the Post-operative General Surgery Ward of a Tertiary Care Teaching Hospital: A Prospective Observational Study. Technological Innovation in Pharmaceutical Research Vol. 8, 9(10), pp. 144–156.
03. Khatun, S.A. and Shaha, S., 2020. Prescribing pattern of antimicrobials in urinary tract infection at outpatient department in a tertiary care hospital in Dhaka. Journal of Enam Medical College, 10(1), pp.23-26.
04. Chowdhury, M.K., Siddique, A.A., Sarkar, P.K., Haque, M.M., Biswas, P.K., Biswas, S. and Ahasan, H.N., 2015. Pattern of antibiotic use in different departments of Dhaka medical college hospital. Journal of Medicine, 16(1), pp.35-38.
05. Choudhury, A.U., Biswas, M., Haque, M.U., Arman, M.S.I., Uddin, N., Kona, N., Akter, R. and Haque, A., 2018. Cephalosporin-3G, highly prescribed antibiotic to outpatients in Rajshahi, Bangladesh: prescription errors, carelessness, irrational uses are the triggering causes of antibiotic resistance. Journal of Applied Pharmaceutical Science, 8(6), pp.105-112.
06. Gani, D. M. A., Pareen, F., Saha, S.K., Ahmed, A.U., Uddin, M.M., Afrose, R., Sultana, S. And Siddique, A.S.R., 2021. Antibiotic Uses in the Outpatient Department: Study in a Teaching Hospital. Scholars Academic Journal of Pharmacy, 10(6), pp. 107–110.
07. Honey, P., Shruthy, K.B., Soumya, T., Upendra, N. and Chaithan Yakumar, T., 2018. A Study on Prescribing Pattern and Rationality of Antibiotics in the Post Operative Patients in a Tertiary Care Hospital. Indo American Journal of Pharmaceutical Research, 8(02), p. 8.
08. Tesfaye Yimer Tadesse, Mulugeta Molla, Yohannis Shumet Yimer, Benyas Shishigie Tarekegn and Belal. Evaluation of antibiotic prescribing patterns among inpatients using World Health Organization indicators: A cross-sectional study. SAGE Open Medicine Volume10:1–10©TheAuthor(s)2022.
09. Asha Pathak, Vinay Kumar Gupta, Arvind Maurya, Alok Kumar, Amit Singh. Assessment of drug prescribing pattern using WHO indicators in hospitalized patients at a tertiary care teaching hospital in rural area of India. DOI: http://dx.-doi.org/10.18203/2319-2003.ijbcp20160983.
10. Mani, S. and Hariharan, T.S., 2017. A prospective study on the pattern of antibiotic use in a tertiary care hospital. Int J Basic Clin Pharmacol, 6(9), pp.2237-43.
11. Panday, D.R., Rauniar, G.P., Rai, D., Shah, R. and Pandey, K.R., 2023. Drug Prescribing Pattern Among the Inpatients in the Surgery Department of Tertiary Hospital of Eastern Nepal. Journal of BP Koirala Institute of Health Sciences, 6(1), pp.8-13.
12. Patel, K.M., Jadav, S.D., Parmar, S.P. and Trivedi, H., 2018. Drug prescribing pattern in surgical wards of a tertiary care hospital in Western part of India. Int J Basic Clin Pharmacol, 7(8), pp.1587-92.
13. Raut, A.S.A.W.A.R.I., Cherian, T.I.R.Z.A.H., Chauhan, S.H.R.E.E.P.A. and Pawar, A.T.M.A.R.A.M., 2017. Antibiotic utilization pattern at the surgery department of a tertiary care hospital. Asian J Pharm Clin Res, 10(6), pp.131-4.
14. Fatema Johora et al. (2019) 'Pattern of surgical

antibiotic prophylaxis in a tertiary care teaching hospital in Bangladesh', International Journal of Infection Control, 6(2), pp. 37–40. doi: 10.3396/ijic.v6i2.014.10.

15. Joshi, D.K., Mohd, R., Kothiyal, P. and Joshi, Y., 2017. Evaluation of prescription pattern of antibiotics for surgical prophylaxis in secondary care hospital. Int J Basic Clin Pharmacol, 6(8), pp.1969-1976.
16. Machowska, A., Sparrentoft, J., Dhakaita, S.K., Stålsby Lundborg, C. and Sharma, M., 2019. Perioperative antibiotic prescribing in surgery departments of two private sector hospitals in Madhya Pradesh, India. Perioperative Medicine, 8, pp.1-12.
17. Honey, P., Shruthy, K.B., Soumya, T., Upendra, N. and Chaithanya Kumar, T., 2018. A Study on Prescribing Pattern and Rationality of Antibiotics in the Post Operative Patients in a Tertiary Care Hospital. Indo American Journal of Pharmaceutical Research, 8(02), p. 8.
18. Datta, S.K., Paul, T.R., Monwar, M.O.N.A.L.I.S.A., Khatun, A.M.B.I.A., Islam, M.R., Ali, M.A., Barman, R.K., Rahman, B.M. and Wahed, M.I.I., 2016. Patterns of prescription and antibiotic use among outpatients in a tertiary care teaching hospital of Bangladesh. International Journal of Pharmacy and Pharmaceutical Sciences, 8(11), pp. 60–63.
19. Udith K. Costantine, George M. Bwire, David T. Myemba, Godfrey Sambayi, Belinda J. Njiro, Amosi Kilipamwambu, Novatus Ching'oro1, Rehema S. Shungu, Mathew Mganga and Mtebe V. Majigo. WHO/INRUD prescribing indicators among tertiary regional referral hospitals in Dar es Salaam, Tanzania: a call to strengthen antibiotic stewardship programmes. JAC Antimicrob Resist https://-doi.org/10.1093/jacamr/dlad093.