2022. Antibiotic Prescribing Behavior Among Surgeon

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Background. A comparative study was conducted to evaluate prescribed antibiotic (AB) use in surgical patients with the Transtheoretical Model of Behavior (TTM) and Theory of Planned Behavior (TPB).

Methods. A survey was conducted at Thammasat University Hospital from January 1 to 31, 2019. We evaluated the appropriateness of AB uses in the surgical department reported per the hospital's Drug Use Evaluation (DUE) form. After review of the DUE, in-depth interviews were conducted to all prescribers to explore antibiotic prescribing behavior based on TTM vs. TPB, using a standardized data collection tool. Data collected included demographics, indications, appropriateness of AB uses, the individual prescriber's behavior based on TTM and TPB. The five TTM stages of change were categorized precontemplation, contemplation, preparation, action, and maintenance. In TPB assessment, we evaluated attitude toward AB uses, subjective norm to AB uses behavior, and perceived behavior control of AB uses behavior.

Results. There were 92 AB uses from 64 prescribers; 70 (70/92; 76%) used antibiotics appropriately. The majority of AB uses (62/92; 67%) were for treatment of infections. The most common reasons for inappropriate AB uses included inappropriate AB choices for treatment and prophylaxis of SSIs ($n = 11$, 50%) and inappropriate duration ($n = 8$, 36%). Physicians categorized in higher stages of TTM (action and maintenance) were strongly correlated with appropriate AB uses, while there was no correlation between the total TPB score and appropriateness of AB uses. By multivariate analysis, the TTM action and maintenance (aOR = 7.95; $P = 0.02$) and self-reported prescribers who considered patients as first priority (aOR = 4.02; $P = 0.04$) were associated with appropriate AB uses, while neurosurgical procedures (aOR = 0.13; $P = 0.003$) and antibiotic prescriptions for surgical prophylaxis (aOR = 0.15; $P = 0.04$) were associated with inappropriate AB uses.

Conclusion. Antibiotic prescribers categorized by TTM stages strongly correlated with appropriate AB uses. Additional studies to assess appropriate AB prescribing behavior, based on TTM stages of change, offer an opportunity to optimize surgical care.

Disclosures. All authors: No reported disclosures.

2023. Antimicrobial Resistance and Stewardship Knowledge and Perception among Medical and Pharmacy Students in Nigeria

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Background. Nigeria is the most populous country in Africa and has high rates of antimicrobial resistance (AMR). The practice of antimicrobial stewardship in Nigerian hospitals is very limited and the subject is rarely included in undergraduate medical and pharmacy curriculums. To further acceptance and implementation of antimicrobial stewardship programs (ASP) in Nigeria health system, baseline measurements of the knowledge and perceptions held by graduating medical and pharmacy students was deemed essential. This study evaluated the knowledge and perceptions of a cohort of Nigerian medical and pharmacy students in concepts of AMR and ASP.

Methods. This was a cross-sectional questionnaire-based study of final year medical and pharmacy students from the two largest schools in the southeastern region of Nigeria. A previously published 20-items questionnaire measuring knowledge and perceptions toward AMR and ASP was adopted for the study. Results were expressed as frequencies and percentages.

Results. Completed questionnaires were received from 79.3% (361 of 455 students), over half (60%) were male, and mostly between 22 and 25 years old (68.7%). More pharmacy students had formal training on ASP compared with medical students (41.3% vs. 27.5%, $P < 0.05$). Pharmacy students ($n = 84.3\%$ and 90.5%) were significantly more knowledgeable of factors that promote the spread of AMR and interventions to combat resistance than medical students ($n = 73.9\%$ and 82.3%), $P < 0.05$, respectively. Interestingly, 23.3% of medical students thought pharmacists should lead ASP teams, while 5.8% of pharmacy students thought doctors should lead ASP. However, both held poor perceptions of each other's roles in the ASP team.

Conclusion. Knowledge of AMR and ASP among medical and pharmacy students in Nigeria is lacking. Inter-professional collaboration to change perceptions and drive ASP in urgently needed.

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2024. A Multifaceted Intervention to Improve Oral Antimicrobial Prescription at the Emergency Department at a Japanese Tertiary Care Center

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Background. The emergency department (ED) is one of the most important settings where antimicrobials are frequently prescribed in developed countries, and at least 30% of antimicrobials prescribed at the ED are inappropriate. Some studies revealed that various factors, especially the physician-related factors were associated with inappropriate antimicrobial use. Implementing effective strategies to modify prescribing practice is needed to optimize antimicrobial therapy at the ED.

Methods. We implemented a multifaceted intervention to patients discharged with oral antimicrobial agents in the ED at a Japanese tertiary care center from October 2018 to March 2019. The intervention included (1) an educational didactic session to physicians, (2) an evidence-based tool book regarding antimicrobial use for common diagnoses, (3) antimicrobial order sets for common diagnoses, (4) monthly reports of the appropriateness of antimicrobial use, and (5) post-prescription review and feedback by an infectious diseases physician. The proportion of appropriate discharge antimicrobial prescription at ED, and changes in the prescription density, measured as the number of prescription per 1,000 patient visits between pre- and post-intervention were evaluated.

Results. The total number of patient visits at the ED during the study period was 52,274. With the intervention, the mean monthly discharge antimicrobial prescription decreased from 42.7 to 34.2 per 1,000 visits (proportional reduction 0.20; $P < 0.01$). Overall, appropriate prescription rate significantly increased from 47.7% (742/1,555) to 77.4% (421/544) ($P < 0.01$). The rate of unnecessary and inappropriate discharge antimicrobial prescription accounted from 27.5% (428/1,555) and 21.7% (337/1,555) to 8.5% (46/544) and 10.7% (58/544), respectively. A substantial improvement in discharge antimicrobial prescription against intra-abdominal infections and odontogenic infections during the intervention period was observed (changes in the proportion of appropriate prescription was 0.37 [$P < 0.01$] and 0.51 [$P < 0.01$], respectively.

Conclusion. An evidence-based, multifaceted intervention led to decreasing unnecessary prescription and optimizing physicians' antimicrobial prescriptions at the ED.

Disclosures. All authors: No reported disclosures.

2025. Evaluation of the Impact of an Antimicrobial Stewardship Program in a Tertiary Hospital in Northern Italy: Efficacy of a Persuasive Approach on Antibiotics Consumption and Rate of *Clostridium difficile* Infection

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Background. Antimicrobial resistance (AMR) situation in Italian hospitals and regions represents a major public health threat [ECDC, 2017]. Antimicrobial stewardship programs (ASPs), particularly when based on local epidemiology, have been beneficial in optimizing antibiotic therapy as well as reducing hospital rates of *Clostridium difficile* infection (CDI) and AMR [Akpan MR, *Antibiotics* 2016]..

Methods. Our ASP program has been conducted at *Spedali Civili* General Hospital of Brescia, Northern Italy (1300-bed tertiary hospital), between the beginning of 2016 and the end of 2017. A preliminary analysis of local epidemiological data was performed (Table 1). Seven groups ("districts") were identified according to microbiological and clinical similarities. This was a persuasive-based ASP. First, we trained physicians on general principles of AS, then guidelines for the management of "difficult-to-handle" infections were drafted based on international guidelines and local microbiological data (Table 2)..

Results. Here we show the results of pre-ASP (2015) vs. post-ASP (2018) analysis on antibiotic consumption (AC) and CDI rates. AC is expressed in DDD/100 bed-days. The overall hospital AC decreased from 84.31 to 76.84 (−9%), consistently with national recommendations [Italian National Plan against AMR, 2017]. In accordance with the local guidelines developed within our ASP, carbapenem consumption decreased from 5.77 to 4.87 (−16%) and fluoroquinolones (FLQ) from 14.45 to 9.94 (−31%). At the same time piperacillin/tazobactam use increased from 5.53 to 8.46 (53%). 3°–4°G cephalosporins and glycopeptides consumption slightly reduced from 11.78 to 11.42 (−3%) and from 4.07 to 3.83 (−6%), respectively. AC of the different districts involved is reported in Table 3. CDI rates decreased from 0.0434/100 bed-days in 2015 to 0.0315/100 bed-days in 2018 (−27%) (Figure 1).

Conclusion. Our ASP was a persuasive-based program in a setting of high AMR rates. In the short term, it has shown a positive impact in improving AC (in particular of broad-spectrum antibiotics with a high risk of resistance selection and CDI) and CDI rates. Audits for local guidelines adherence and the evaluation of AC, AMR and CDI rates are ongoing as long-term quality measures for assessing the impact of our ASP.

Table 1. Antimicrobial resistance (non-susceptibility) rates of selected pathogens, invasive isolated (2016). Local hospital data (blood cultures) are compared to Italian, European and US data (blood and CSF cultures).

	Spedali Civili General Hospital	Italy *	Europe *	United States *
% methicillin resistant *Staphylococcus aureus*	33,1	33,6	17,7	45
% 3G cephalosporin resistant *Escherichia coli*	25,5	29,8	14,9	15
% 3G cephalosporin resistant *Klebsiella pneumoniae*	39,2	55,8	25,7	12
% carbapenem resistant *Klebsiella pneumoniae*	19,5	33,9	6,1	3
% piperacillin/tazobactam resistant *Pseudomonas aeruginosa*	14,8	30,7	18,8	7
% ceftazidime resistant *Pseudomonas aeruginosa*	12,5	23	14,4	19
% carbapenem resistant *Pseudomonas aeruginosa*	15,9	23,5	18,2	10

* * Surveillance of antimicrobial resistance in Europe 2017. Annual Report of the European Antimicrobial Resistance Surveillance Network (EARS-Net). Stockholm: ECDC; 2018
* The Center for Disease Dynamics Economics & Policy. ResistanceMap. Antibiotic resistance. 2018. https://resistancemap.cddep.org/AntibioticResistance.php. Date accessed: April 30, 2019.
All the prevalence data refer to 2016 except for % ceftazidime resistant Pseudomonas aeruginosa (2014)