INTERNATIONAL JOURNAL OF PHARMACEUTICAL SCIENCES
[ISSN: 0975-4725; CODEN(USA): IJPS00]
Journal Homepage: https://www.ijpsjournal.com

Review Article

The Silent Threat: How Parental Actions Fuel Antibiotic Resistance

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ARTICLE INFO

Published: 25 Jun. 2025
Keywords:
Silent Threat, Parental Action Fuel, Antibiotic Resistance
DOI:
10.5281/zenodo.15738918

ABSTRACT

Despite being one of the most urgent global health issues, antibiotic resistance is frequently exacerbated by habits and behaviours that the general population, especially parents, ignores or misunderstands. This study looks at how the growing issue of antibiotic resistance is influenced by parental behaviours including the excessive or inappropriate use of antibiotics. The study emphasizes the critical role parents play in either escalating or reducing the crisis by examining aspects including self-medication, pressure on medical professionals for antibiotics, and inadequate adherence to prescribed therapies. The effects of these measures on the larger public health scene are also covered, with a focus on the necessity of raising awareness, educating people, and changing family behaviour to stop the silent menace of antibiotic resistance. This study examines recent studies and case studies to support public health campaigns aimed at better antibiotic stewardship as well as increased communication between parents and medical providers.

INTRODUCTION

Despite evidence showing that any usage of antibiotics can cause resistance in particular people, the public thought they were not at high risk of developing resistance. There are two possible explanations for this discovery. First of all, people frequently underestimate the adverse effects of medical interventions. Second, the social cognitive theory states that we feel less personal risk from a problem the more people who participate to its creation and more distant its effects are.[2] Among the greatest inventions of the 20th century were antibiotics. Prior to this, infectious diseases were a major cause of global high mortality and morbidity. However, this circumstance didn't last long. Antibiotic resistance quickly gained international attention. Antibiotics are currently the most widely distributed medications in poor nations. The issue of antibiotic

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Relevant conflicts of interest/financial disclosures: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

resistance has gotten worse due to the widespread and overuse of antibiotics for all ailments. Like many other poor nations, India does not usually require a valid prescription in order to purchase prescription-only medications. The majority of medications, including antibiotics, can be purchased over-the-counter, with the exception of opioids and a small number of tranquilizers. Previous studies conducted in India have revealed a number of trends of improper antibiotic use and distribution. Self-medication is also becoming more commonplace globally, particularly in India. Antibiotic prescribing practices are poorly regulated in many nations, particularly developing ones. All of these elements highlight the necessity of looking into and addressing these unhealthy behaviors. The purpose of this study is to examine parents' knowledge, attitudes, and practices about the use of antibiotics for their kids and to compare them with demographic traits. This could assist in determining which demographic groupings have the highest rates of antibiotic abuse and in creating effective interventional programs to raise public awareness of antibiotics and, ultimately, move toward antibiotic control.

Mechanism of Antibiotic Resistance

Antibiotics generally work in five main ways:

(a) blocking the synthesis of the bacterial cell wall (penicillin, cephalosporins, vancomycin);
(b) interfering with the function of the cell membrane (polymyxins, such as colistin);
(c) blocking the synthesis of proteins (tetracycline, streptomycin, chloramphenicol);
(d) blocking the synthesis of nucleic acids (rifamycin, quinolones); and
(e) acting as antimetabolites (trimethoprim, sulfamethoxazole). Agents that affect the bacterial cell wall or membrane are frequently categorized as bactericidal. Bacteriostatic antibiotics prevent bacterial growth by blocking the synthesis of proteins, deoxyribonucleic acid (DNA), or metabolism. Nevertheless, the distinction has minimal bearing on clinical practice because these categories may overlap based on the bacterial species, dosage, growth circumstances, etc. A multifarious mechanism of action is also used by some antibiotics, such nitrofurantoin.

ANTIBIOTIC BELIEF

The definition and mechanism of action of antibiotics varied greatly among parents. Some parents said, "I think it fights the bad bacteria," acknowledging that antibiotics were recommended to treat bacterial infections. In contrast, several people had a partial or whole misconception about antibiotics, such as "I'm guessing it helped by reducing whatever pain that was in her ear.", and "My understanding of how they work is that it just creates the antibodies in the body to fight off the infection. "Parents' expectations regarding whether their child would receive an antibiotic prescription varied before the consultation. Their child's symptoms and the fact that they had previously used antibiotics for their child or children affected their expectations. For instance, they anticipated an antibiotic if symptoms pointed to streptococcal pharyngitis. Antibiotic beliefs also affected predictions of side effects and effectiveness; six parents (46%) said they were worried about the antibiotic's possible negative side effects. These beliefs and expectations interacted with each other going into the visit and influenced later steps in the antibiotic process. Parents also had a range of prior experiences and expectations about the outcomes of treatment with an antibiotic. While many parents expected antibiotics to work well and improve their child's symptoms, some expressed thoughts that the antibiotic did not speed recovery as they expected.

The Misuse of Antibiotics

Antibiotic abuse was assessed using the European Centre for Disease Prevention and Control's (ECDC) definition. The latter included

(1) the over prescription of broad-spectrum antibiotics in lieu of more precisely targeted antibiotics due to more accurate diagnosis;
(2) the needless prescription of antibiotics for viral infections, against which they are ineffective; and
(3) the patient's poor use of the medication, disregarding dosage or treatment duration.

Common reasons for misuse

Acute bronchitis and upper respiratory infections are among the conditions for which some parents think antibiotics are helpful but for which no effect has been demonstrated. The current survey's results are consistent with those of a parent focus group research and other recent studies involving parents and adult patients. It's likely that parents' misconceptions regarding the proper indications for antibiotics are influenced by the way doctors prescribe them. Common colds, pharyngitis (without Streptococcus pyogenes tests), bronchitis, and upper respiratory tract infections are among the conditions for which antibiotics are frequently administered. According to an adult study, having previously taken antibiotics for a related condition was the best indicator of a patient's belief in the efficacy of antibiotics. This poll did not assess whether parents' knowledge Since just 28% of people were aware that antibiotics were used to treat bacterial infections, it was evident that people were unsure if they were meant to treat viruses or bacteria. The majority of parents (45.9%) believed that any microbiological infection could be treated with antibiotics. This could be explained by the fact that physicians refer to "germs" in general when prescribing antibiotics rather than addressing bacteria by name. Additionally, individuals think that antibiotics work against both bacteria and viruses because they don't know the difference between the two. Since just 15.5% of parents knew what antibiotic resistance was, it was clear that they didn't know anything about it. It's interesting to note that even though the majority were unaware of antibiotic resistance, many parents understood that using antibiotics excessively or in every circumstance could be dangerous. This is understandable given that 73.6% of parents acknowledged that overuse and needless antibiotic use could harm their kid, and 84.5% of parents believed that antibiotics were not necessary each time their child became ill. These results were in line with other research conducted in other nations, such as Greece, where parents believed that overuse of antibiotics could result in resistance. These percentages might not be generalizable because they seem greater than those found in previous Indian studies.

Understanding Parental Demands and the Pressure to Prescribe

The way and when antibiotics are given or administered, as well as the eventual occurrence of AMR, are significantly influenced by the knowledge, expectations, and beliefs of the general public. Patients frequently cannot connect the inappropriate and illogical use of antibiotics with AMR, despite their influence. In this sense, parents of small children represent a distinct demographic that primarily influences antibiotic use in the paediatric age range. Children's use of antibiotics has frequently been associated with parental expectations. For instance, even though the majority of childhood infections resolve on their own, parents frequently ask primary care doctors for antibiotics out of excessive anxiety or worry or a need for immediate relief. Overuse of antibiotics is the result of this hurried approach.

Parent view

From the parents' point of view, excessive anxiety, inadequate understanding of URTIs, ignorance of antibiotics, and a lack of patience and time might lead to irrational expectations for antibiotics. For instance, Goggin and colleagues' randomized control experiment, which involved 1051 parents in the US, discovered that parents' propensity to obtain antibiotics is more influenced by their level of understanding. Further research of 239 parents in the United Arab Emirates found that most of them knew very little about antibiotics (54.4%), were unaware that antibiotics are used to treat bacterial infections (66.1%), or were unaware that overuse of antibiotics causes antibiotic resistance (54.5%). However, 63% of respondents confirmed that if their child's doctor does not prescribe antibiotics, they would ask them to do so.The majority of 380 Palestinian parents in a different study by Zyoud and colleagues disagreed that viruses are the primary cause of URTIs (59%) and believed that antibiotics are the best treatment for URTIs (73%).These expectations could also differ depending on the parents' age, race, ethnicity, and other sociodemographic traits. Professional organizations and the scientific literature have issued some advice and guidelines in light of the possibility that parents may be the primary source of antibiotic prescriptions for their children. When it comes to antibiotic indications and conditions of use in the presence of various clinical conditions, such as fever, cold, flu, or respiratory infections, parents' attitudes toward antibiotic therapy in children show a moderate level of knowledge and fall short of an optimal and rational awareness level. The inclination for parents to self-medicate with antibiotics for their children and their lack of awareness regarding the safety of antibiotics are concerning. All of these study results indicate that parents in Kosovo are not receiving enough health education about antibiotics. Our results highlight the necessity of parent education and awareness efforts in Kosovo that emphasize the prudent use of antibiotics. The results of this poll may help us comprehend and lessen the overuse of antibiotics in the future. These include employing efficient communication techniques to inform parents about the potential risks of antibiotic treatment, when antibiotics are necessary and not, using watchful waiting and delayed prescription, avoiding providers' unilateral decision-making, having adequate discussions with parents about the diagnosis, involving triage and interdisciplinary teams, fostering trust between parents and children, providing opportunities for parents and children to voice their concerns and questions, having backup plans or prescriptions, providing symptomatic relief therapies for children, and making sure parents or guardians have timely and adequate access to healthcare providers with knowledge of URTIs in children.

Doctor’s view

Ambiguity in diagnosis. Many medical professionals stated that it is challenging to determine early on whether an infection is bacterial or viral, particularly when it comes to upper respiratory tract infections and diarrhoea. They give antibiotics to address the uncertainties surrounding the bacterial nature of the ailment. Finding the source proved challenging, even when patients complained of fever for a day or two. Furthermore, because most patients did not want to undergo a test for a day's fever or could not afford to do so because of time or financial constraints, medical tests were not advised to eliminate the ambiguity. Consequently, in situations where they are not necessary, antibiotics are recommended. Microbiology lab facilities are typically unavailable in public primary health care institutions, and the majority of patients who visit these clinics are unable to pay for the tests performed by private labs. Thus, physicians mostly used their clinical judgment. perceived

expectations and demands of doctors. Some patients want capsules and "strong" medications, according to doctors in the public and private sectors. A few individuals who had previously received antibiotic prescriptions requested to receive them once more. Patients who were educated also indicated which drugs they desired. Physicians frequently give in to patient demands or expectations. Many medical professionals stated that after spending money on a consultation or waiting a reasonable amount of time at a public institution, the patient expects them to write a prescription for antibiotics. Doctors believe that patients want them to prescribe something they haven't taken, which is why they prescribe antibiotics. Patients are not happy when they receive only paracetamol or oral rehydration solution packs (ORS) for fever and diarrhoea, which they might have taken on their own. Take economical and sustainable practices into account. Private practice physicians didn't want to lose any patients. They were afraid that the patient would see another physician if they implemented a wait-and-watch policy or just prescribed ORS for diarrhoea or paracetamol for fever. In order to keep the patient, the doctor prescribed antibiotics that met the patient's needs. Private sector physicians disclosed that many in their field either provide antibiotics that boost their profits or prescribe antibiotics even when they are not necessary to do so. This is most likely the cause of the widespread use of costlier and modern antibiotic brands.

Improper doses

Patients do not take the recommended dosage, according to the majority of physicians. They quit taking their prescription before the prescribed period once they feel better. Self-medication, in which patients purchase antibiotics over-the-counter, is another source of incorrect dosing. Patients only purchase as many antibiotic pills as they believe will help them or as much as they can afford. "You ask the patient to take a drug for five days," stated a doctor (GP19). After a day of respite, he quits taking it.

Not following up.

Physicians have noticed that patients don't show up for follow-up appointments. Physicians from both specialties reported that while they do ask patients to return for a follow-up, very few really do. Private sector physicians suggested that this might be because of high consultation costs, while public sector physicians suggested that it might be because of lengthy wait times in government hospitals. Physicians from both fields noted that patients typically either get better or continue taking the medications they were prescribed without needing to see a doctor again.

Self-medication

Patients "get prescription from a reputed physician," according to numerous private practice physicians. They continue to take the same medication, which they use anytime their symptoms reappear. Prescriptions are not held by pharmacists in India; instead, consumers keep their prescriptions after buying medications from retail pharmacies or after the pharmacists in the public sector gave them to them for "free." Patients frequently use their previous medicines for the same issues or symptoms. They also don't take the entire dosage or the recommended amount of time when taking repeat medicines. “The prescription is repeatedly repeated by them. They do not like to spend between 100 and 200 rupees on prescription drugs. They use that prescription for anything that occurs in the family.

Irrational prescribing

According to nurses, the primary reason for inappropriate prescribing in hospitals is diagnostic ambiguity (56%). Seventy-five percent of respondents said that illogical prescribing had a significant perceived cost. The use of protocols and international guidelines (94%), routine and systematic prescription inspection in clinics (90%), extension of etiological prescribing (89%), prescription-focused education (88%), electronic prescribing (84%), and the presence of computerized support with integrated instructions (81%), were cited by the majority of the sample as significant steps that would help reduce irrational prescribing. There were statistically significant correlations discovered between the kind of institution, professional experience, and AMR inquiries and illogical prescribing. Additionally, statistically significant associations were discovered between nurses' educational attainment and diagnostic uncertainty as the primary cause of irrational prescribing in their hospital (p=0.001), nurses' age and the perceived cost of irrational prescribing (p=0.041), and males (83%) and females (66%) with regard to the impact of AMR on treatment failure (p=0.018).

Inability to recognize the issue of resistance development

All of the groups acknowledged that there is worry about resistance development and the cause of ATBs' eventual loss of effectiveness, but their conversations revealed a lack of understanding of the issue. It's really concerning that serious illnesses that we treat with antibiotics and are treated might not be curable in a few years. Two groups made clear remarks on the lack of awareness of the problem's scope, saying things such, "I don't see it becoming a reality." I'm not sure how big of an issue this is. None of the groups considered it to be an urgent issue. In one group, the issue of resistant bacteria was not linked to the overuse of ATB. Why is resistance becoming noticeable now if we are already so aware? Antibiotics cannot be obtained in Spain without a prescription, unless specific circumstances are met, provided that the standard prescription procedures have been followed. According to all the organizations, the primary source of information regarding resistance is the media [for me, only the media]. statements regarding adults, claiming that opposition existed and that issues were emerging. In a similar vein, three groups expressed sorrow about the paediatrician's failure to provide an explanation for the resistance.

TREATMENT AND ADHERENCE

- **Everyday compliance:**

A busy schedule, forgetfulness, and problematic timing of administration were among the reasons given by parents for low antibiotic adherence. Nearly 50% of parents expressed serious worries about the adverse consequences of antibiotics.

- **Stopping:**

Responses to the open-ended questions revealed that many caregivers were still perplexed, even though almost all of them (92%) said they had received instructions from their doctors on the duration of antibiotic treatment (S2 Table). The participants explained various interpretations of when to stop taking the antibiotic, such as when they were instructed to do so, when the drug ran out, after a predetermined number of days, and when the child felt better.

- **Disposal:**

While 8 (62%) of parents stated that they had previously saved their children's leftover antibiotics, 11 (85%) parents stated that they intended to discard antibiotics.

Every single one of the 13 participants (100%) reported that the majority of their close friends or family members had stored leftover antibiotics from their kids' illnesses at home. Furthermore, six participants (46%) said that the majority of their close friends and family members donate or transfer leftover antibiotics to other individuals.

- **Preserving any remaining antibiotics:**

Delays in disposing of antibiotics were caused by a number of factors, such as the possibility that the child would need to use them again for the same or a different illness, sharing the antibiotics with family members, the high cost of the drugs, forgetting about them, or not knowing how to get rid of them. In the past, parents have reported storing leftover antibiotics for weeks, months, years, or until they expire.

Decision-Making Challenges with Antibiotic Prescriptions

Paediatricians thought that primary care doctors lacked specialized training in making antibiotic prescription decisions for kids. Conversely, the underutilization of clinical practice guidelines as a tool to support prescribers' clinical decision-making and the absence of ongoing education on antibiotic prescription were linked to paediatricians' abuse of antibiotics. According to the majority of paediatricians, the consequences of prescribing an antibiotic needlessly caused more anxiety and uncertainty than not prescribing one to a child who might have a potentially serious illness. Previous negative experiences with the administration of antibiotics led to concerns about prescriptions and a sense of apprehension about the medical procedure. Professionals also thought that deferred (delayed) medications were a useful tool for dealing with uncertainty. However, in the event of diagnostic doubt, this postponed prescription was viewed as a "double-edged sword." However, paediatricians believed that if families did not feel that the paediatrician was interested in or concerned about the child's health, they would not follow the doctor's instructions and would turn to a higher level of care for antibiotic treatment. When paediatricians employed trapping risk tactics as a means of exerting control and authority over the families in order to defend a restrictive prescribing practice, the asymmetry of clinical interactions became more apparent. But according to the participants, there should be a symmetrical relationship where families get knowledge from the doctor and see them as a close, approachable resource for any issues that may come up. In this regard, doctors' communication abilities were seen as a helpful instrument for giving parents a sense of comfort and confidence.

CONCLUSION:

Antibiotic usage and resistance are frequently caused by parental behaviors such as self-medication and doctor pressure. Many people use antibiotics incorrectly because they don't understand them or antibiotic resistance. Uncertainty in diagnosis and parental demands provide difficulties for doctors, leading to unnecessary medications. Important first efforts include educating parents and enhancing communication with medical professionals. This subtle but significant hazard can be managed by increasing knowledge and encouraging the careful use of antibiotics.

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HOW TO CITE: Sai Sravanthi Sunkara*, Juturu. Revathi Devi, Viharika Nemalikanti, Gogineni. Lohitha, Nadakuduru. Hemanjali, Chirala Vasanthi, Konda Siva Krishna, The Silent Threat: How Parental Actions Fuel Antibiotic Resistance, Int. J. of Pharm. Sci., 2025, Vol 3, Issue 6, 4271-4279. https://doi.org/10.5281/zenodo.15738918