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The Trends of Antibiotic Prescribing among Indonesian Dentists: Evidence-Based or Empirical-Based Prescriptions?

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ABSTRACT

Antibiotics are frequently employed in the field of dentistry for both prophylactic and therapeutic applications. Prophylactic antibiotics are used as a preventive measure against endocarditis, whereas therapeutic antibiotics are employed to treat infections in the oral cavity. Orofacial infections constitute a substantial component of dental therapy, wherein antibiotics assume a prominent role. Nevertheless, the utilization of antibiotic prophylaxis has become deemed inappropriate as a result of its widespread implementation. This study investigates the trends of antibiotic prescription among dentists in Indonesia. The analysis demonstrates that there is a concerning trend among dentists in Indonesia who are engaging in unethical prescription practices, namely with regards to antibiotics such as amoxicillin and clindamycin. These antibiotics are frequently employed due to their cost-effectiveness, low levels of toxicity, and capacity to compete with the absorption of nutrients from food. Antibiotic resistance can arise as a consequence of the inappropriate use of broad-spectrum antibiotics. Hence, it is imperative for dentists to show judiciousness in the prescription of antibiotics, taking into account many criteria such as dental cleanliness, complexity of extraction technique, and kind of extraction.

1. Introduction

Antibiotics are commonly used within the dentistry field for both preventive and therapeutic purposes.¹ Prescribing prophylactic antibiotics is a preventive measure aimed at mitigating the risk of illness occurrence resulting from the transfer of oral flora members into either distant or localized regions of vulnerability in susceptible individuals. In the majority of instances, prophylaxis is employed as a preventive measure against endocarditis, whereas therapeutic antibiotics are mostly recommended for the treatment of oral cavity infections affecting the hard and soft tissues following unsuccessful local debridement.²⁻⁴

Dentists commonly administer pharmaceutical interventions to address various oral ailments, with a

particular focus on orofacial infections. Given that the majority of orofacial infections in humans stem from odontogenic infections, the prescription of antibiotics by dental practitioners has emerged as a significant facet of dental treatment. Hence, dentists frequently prescribe antibiotics as the predominant class of medications. The utilization of antibiotic prophylaxis, based on empirical evidence and its extensive application, has become more unacceptable.^{5,6} However, the precise guidelines for appropriate prescriptions remain a matter of concern. The objective of this review is to examine the antibiotic prescribing patterns among dentists in Indonesia and analyze the underlying justifications for antibiotic utilization.

2. Methods

The literature search process was carried out on various databases (PubMed, Web of Sciences, EMBASE, Cochrane Libraries, and Google Scholar) regarding antibiotics and prescription in Indonesian dentists. The search was performed using the terms: (1) "antibiotics" OR "evidence-based antibiotics" "empirical-based antibiotics" AND (2) "dentists prescription". The literature is limited to clinical studies and published in English and Indonesian. The literature selection criteria are articles published in

the form of original articles, observational studies or experimental studies about antibiotic prescribed by Indonesian dentists, studies were conducted in a timeframe from 2000-2023, and the main outcome was antibiotics used by Indonesian dentists. Meanwhile, the exclusion criteria were studies that were not related to antibiotics prescribed by Indonesian dentists, the absence of a control group, and duplication of publications. This study follows the preferred reporting items for systematic reviews and meta-analysis (PRISMA) recommendations.

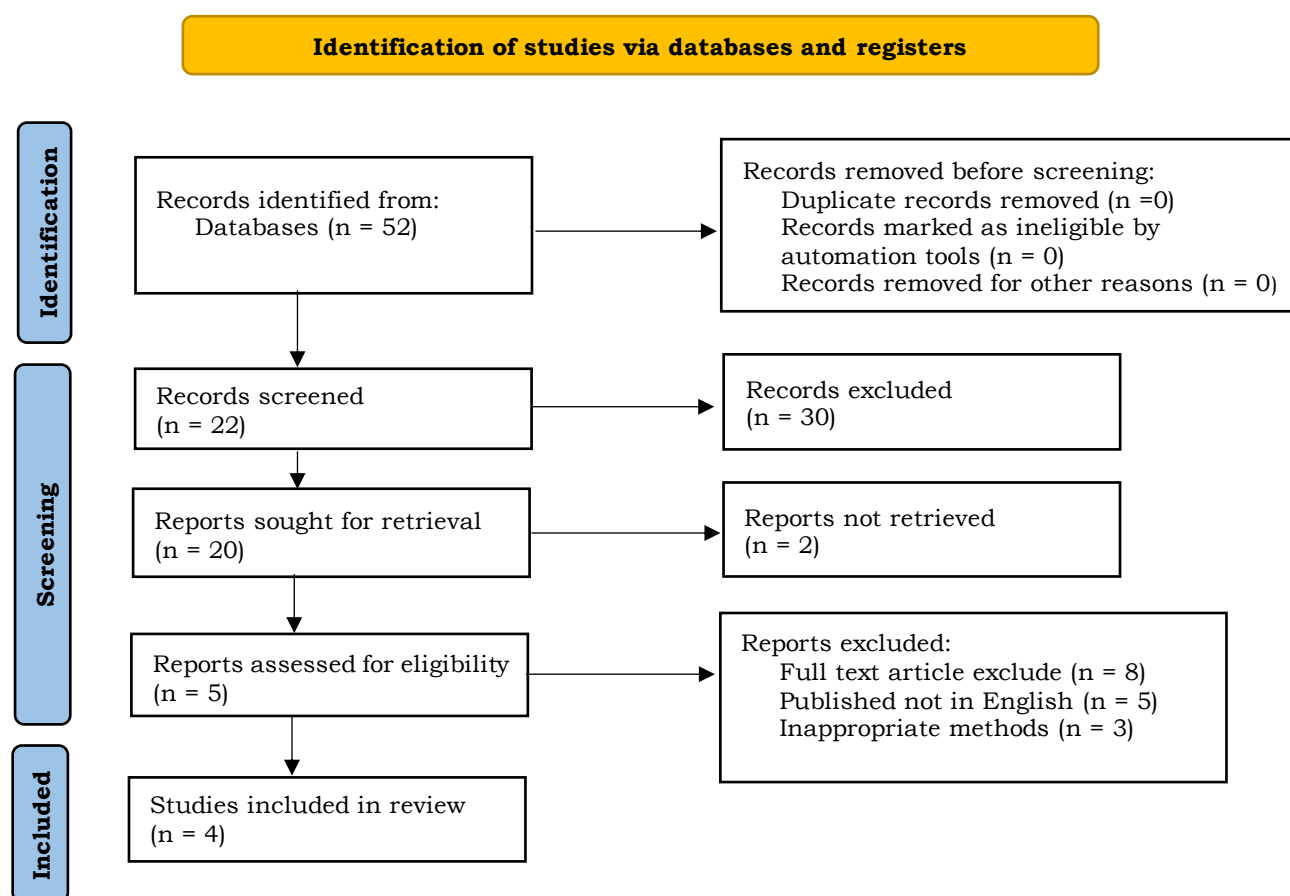


Figure 1. PRISMA flowchart.

3. Results and Discussion

Within the scope of the review, a total of four quantitative studies were incorporated (Table 1). Furthermore, the study failed to provide data

regarding potential deviations from the intervention, potential bias in outcome measurement, and potential bias in the selection of reported outcomes.

Table 1. Characteristics of included studies.

Authors	Assessment methods	Results
Apriadhanti et al. ⁷	This study used questionnaires to dentists and dental specialists in Palembang who had performed excision biopsy treatment for oral soft tissue disease.	Antibiotic prescription of amoxicillin was 55%, the combination of amoxicillin and clavulanic acid was 17.5%, and clindamycin was 12.5%.
Shasya et al. ⁸	This study used a questionnaire for general dentists and specialists in Bandung.	The most frequently used antibiotics were Amoxicillin 500 mg (83,1%) and clindamycin (24,3%). Most respondents prescribed antibiotics after tooth extractions for 5 days.
Rachmawati et al. ⁹	A cross-sectional study of adult outpatients' medical records in Dental Teaching Hospital Yogyakarta.	Amoxicillin (78.8%) was most commonly prescribed, followed by clindamycin (9.9%), metronidazole (5.0%), and lincomycin (2.1%). Significant inappropriate antibiotic prescribing occurred in this study.
Sari et al. ¹⁰	The observational data from medical records in Dr. Moewardi Hospital Dental Wards was rated for its accuracy by tracing using the Algorithm Gyssens.	Amoxicillin was the most widely used antibiotic, followed by clindamycin and cefixime. According to the Gyssens algorithm, it has been determined that a significant proportion, specifically 75%, of antibiotic prescriptions are deemed to be illogical.

The utilization of antibiotics has been linked to the occurrence of unfavorable outcomes, including gastrointestinal (GI) illnesses, deadly anaphylactic shock, and the emergence of resistance.^{2,3,11} The escalating issue of antibiotic resistance in contemporary times may be attributed to the excessive or inappropriate utilization of broad-spectrum medications, such as cephalosporins and fluoroquinolones. These changes have led to a new era in which many types of bacteria are resistant to a wide range of currently available antibiotics. Methicillin-resistant *Staphylococcus aureus* is the best example of this widespread resistance. The occurrence of significant issues linked to the use of antibiotics has prompted the investigation of antibiotic prescribing practices in dentistry. Within the dental profession, there is a prevailing inclination towards excessive prescription practices. According to a survey conducted in the United States, a mere 39% of dentists and 27% of physicians adhered strictly to antibiotic prophylactic requirements. Numerous professionals

depend on referrals from their peers, who frequently rely on anecdotal evidence or opt for a cautious and conservative approach by adhering to the recommended course of action when uncertain.¹²⁻¹⁵

This comprehensive review revealed that dentists in Indonesia engage in inappropriate prescribing of antibiotics. Amoxicillin is a highly accessible antibiotic that is readily available on the market. It is characterized by its relatively reasonable cost, minimal toxicity, and effective capacity to compete with food absorption. Another antibiotic commonly utilized by dental professionals is clindamycin. Various variables influence the utilization of clindamycin, including its role as an alternate antibiotic option for individuals with allergies to beta-lactam antibiotics. The administration of antibiotics necessitates adherence to logical drug criteria, including thorough evaluation of the patient's medical condition, accurate diagnosis, and appropriate selection of the drug. The indiscriminate utilization of broad-spectrum antibiotics can be a contributing

factor to the development of antibiotic resistance. Hence, it is imperative for dentists to use discretion when prescribing antibiotics to patients. Several aspects must be taken into account prior to administering antibiotics to a patient following a tooth extraction, including the patient's oral hygiene, the complexity of the extraction technique, and the specific type of extraction performed.^{16,17}

4. Conclusion

The rationale behind the prescription of antibiotics in dental care should be adhered to in accordance with relevant recommendations. In order to mitigate the risk of antibiotic resistance on a broader scale, it is imperative to consider various factors, including the specific disease type, duration of therapy, susceptibility to infections, and the potential advantages and drawbacks associated with the administration of antibiotics.

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