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A REVIEW ON WHO CORE DRUG INDICATORS IN PEDIATRIC POPULATION

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Abstract

The World Health Organization (WHO) has long recognized the global issue of irrational drug prescribing, particularly highlighted during a major conference held in Nairobi in 1985. Since then, WHO has developed core and complementary drug use indicators to promote rational prescribing practices. These indicators serve as crucial tools to measure drug use patterns and prescribing behaviors, especially in pediatric populations where dosing errors and irrational use are prevalent. Key issues include antibiotic resistance, healthcare costs, and the increased burden on healthcare systems. WHO core drug use indicators are divided into three main categories: prescribing, patient care, and facility-specific indicators, each aimed at evaluating the efficiency and appropriateness of healthcare practices. Despite the advantages of these metrics in promoting cost-effective and safe drug use, challenges remain, such as the indicators' limited capacity to capture the reasoning behind prescribing decisions and complexities in pediatric care. Current trends include heightened awareness of adverse drug reactions (ADRs), antimicrobial stewardship programs, and a growing emphasis on monitoring and improving medication safety in pediatric populations.

Keywords: World Health Organization (WHO), pediatric populations, healthcare systems.

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Introduction

World health organization (WHO) organized a major conference in 1985 in Nairobi and developed core and complimentary drug use indicators regarding rational use of drugs. Since then, efforts have intensified to ensure rational use an objective methodis a crucial tool for measuring drug use patterns and prescribing behaviorsin healthcare facilities [1]. Irrational drug prescribing is a global issue, often influenced by factor such as clinical experience, patient pressure, the complexity of diseases, and high powered salesmanship [2]. Drugs plays a crucial role in protecting, maintaining,and restoring health. Prescription is an art, serving as a means of communication between the prescriber and the patient [1]. WHO emphasizes the treatment of diseases through the use of essential drugs prescribed by their generic names [3].

Incorrect prescribing is one of the most prevalent types of medication error in pediatric prescription. A systemic review conducted in the UK hasshow that there are up to 5,00,000 dosing errors annually in pediatric prescriptions [4]. The irrational use of medicines has greater consequences for children, particularly since studies show that preschoolers and infants receive the highest rate of prescriptions. These consequences include adverse treatment outcomes from antibiotic resistance, increased healthcare costs for families and greater burden on national health system [5].

Experts from the WHO warn that irrational use of medicine can lead to serious consequences, including adverse drug reactions, drug resistance, prolonged illness, and even death [1]. The promotion of rational medicine use is deemed a crucial intervention for the success of national medicine policies (NMPs). To support this, the WHO has established several metrics to assess medicine usage. These include five prescription metrics: (i) average number of medications per prescription, (ii). Percentage of medications prescribed using international non-proprietary names, (iii) percentage of medications included in the national essential medicine list, (iv) percentage of prescriptions with at least one antibiotic, and (v) percentage of prescriptions with at least one injectable [6]. Such quantitative metrics are now recognized as a universal benchmark for problem identification and have been extensively utilized in more than 30 developing countries [7].

History

The history of core drug use indicators can be traced back to the efforts by the World Health Organization (WHO) to address the irrational use of medicines, which has been a significant global health issue. Core drug use indicators are standardized measures developed to evaluate the performance of healthcare systems, specifically regarding the rational use of medicines. Here is a brief history:

1. Early Awareness of Irrational Drug Use (1960s-1980s)

Background: During the 1960s and 1970s, increasing concerns emerged about the misuse of medications, especially in developing countries. Issues included over prescription of antibiotics, polypharmacy (use of multiple drugs), and inadequate patient information.

Initial Efforts: The WHO began acknowledging these issues, stressing the importance of promoting rational drug use.

2. Development of the Essential Medicines Concept (1977) Essential Medicines: In 1977, WHO introduced the concept of essential medicines, which refers to a list of medicines that meet the priority healthcare needs of a population. This was a major step toward rational drug use as it encouraged countries to focus on providing access to a basic set of effective and affordable medications.

Global Acceptance: The Essential Medicines List (EML) encouraged countries to adopt similar lists, promoting rational prescribing [8].

3. Introduction of Core Drug Use Indicators (1993)

WHO/DAP Initiative: In 1993, WHO's Action Programme on Essential Drugs (DAP) developed a set of core drug use indicators to address irrational drug use practices. These indicators were designed to be simple, affordable, and easy to use in both primary healthcare settings and hospitals.

Three Categories of Indicators:

Prescribing Indicators: Measure the patterns of prescription, such as the average number of medicines prescribed per encounter, percentage of drugs prescribed by generic name, and antibiotics use.

Patient Care Indicators: Assess aspects like the average consultation and dispensing time, and the percentage of medicines actually dispensed.

Facility Indicators: Evaluate the availability of essential medicines and standard treatment guidelines (STGs).

4. Implementation and Global Monitoring (1990s-Present)

Global Adoption: Following their introduction, WHO encouraged countries to adopt these indicators to monitor and improve drug use practices. Countries like India, Kenya, and Bangladesh were among those that implemented these indicators to monitor prescribing behavior [9].

Periodic Assessments: Over the years, many countries have conducted periodic studies using these indicators to identify issues in medication use, inform policy decisions, and implement interventions aimed at improving drug use practices.

Challenges and Revisions: As healthcare systems evolved, there were challenges related to data collection, interpretation, and the need for additional indicators. WHO and other organizations have worked to refine these indicators over time [10].

Guidelines

The core drug use indicators, developed by the World Health Organization (WHO), are tools used to assess drug use patterns in healthcare facilities. These indicators help to ensure the rational use of medicines [8]. They are grouped into three categories: Prescribing indicators, Patient care indicators, and Facility indicators.

1. Prescribing Indicators:

These indicators focus on the prescribing habits of healthcare professionals and assess the appropriateness of prescriptions. Key indicators include:

I. Average number of drugs per prescription: Determines the tendency for polypharmacy. A high average can indicate irrational prescribing [11].
   Calculation: Average, calculated by dividing the total number of different drug products prescribed, by the number of encounters surveyed [8].

II. Percentage of drugs prescribed by generic name: Reflects the practice of using non-proprietary names, which can lead to cost savings and consistent drug use [12].
   Calculation: Percentage, calculated by dividing the number of drugs prescribed by generic name by the total number of drugs prescribed, multiplied by 100 [8].

III. Percentage of encounters with an antibiotic prescribed: Monitors the frequency of antibiotic use, which can be excessive and lead to resistance [11].
   Calculation: Percentage, calculated by dividing the number of patient encounter during which an antibiotic are prescribed, by the total number of encounters surveyed, multiplied by 100[8].

IV. Percentage of encounters with an injection prescribed: Tracks the use of injections, as unnecessary injections can be costly and increase the risk of infections.
   Calculation: Percentage, calculated by dividing the number of patient encounter during which an injection are prescribed, by the total number of encounters surveyed, multiplied by 100[8].

V. Percentage of drugs prescribed from an essential drug list (EDL): Ensures that the prescribed medicines are from a pre-approved list, promoting rational drug use [11].
   Calculation: Percentage, calculated by dividing the number of products prescribed which are listed on the essential drugs list or local formulary (or which are equivalent to drugs on the list) by the total number of products prescribed, multiplied by 100[8].

2. Patient Care Indicators:

These indicators examine how well patients are treated and informed during the dispensing process. They include:

VI. Average consultation time: Measures the time a healthcare provider spends with a patient. Short times might indicate poor patient-provider interaction [12].
Calculation: Average, calculated by dividing the total time for a series of consultations, by the number of consultations [8].

VII. Average dispensing time: The time taken to dispense medication, which affects patient understanding of medication usage [11].
Calculation: Average, calculated by dividing the total time for dispensing drugs to a series of patients, by the number of encounters [8].

VIII. Percentage of drugs actually dispensed: Compares prescribed versus dispensed medicines, indicating the availability of drugs.
Calculation: Percentage, calculated by dividing the number of drugs actually dispensed at the health facility by the total number of drugs prescribed, multiplied by 100[8].

IX. Percentage of drugs adequately labeled: Ensures that patients receive properly labeled medications, reducing the chance of misuse.
Calculation: Percentage, calculated by dividing the number of drug packages containing atleast patient name, drug name and when the drug should be taken, by the total number of drug packages dispensed, multiplied by 100[8].

X. Patient's knowledge of correct dosage: Measures if patients can correctly understand how to use their medication, which affects adherence.
Calculation: Percentage, calculated by dividing the number of patients who can adequately report the dosage schedule for all drugs, by the total number of patients interviewed, multiplied by 100[8].

3. Facility Indicators:

These indicators evaluate the facility's infrastructure and supply chain. Key indicators are:

XI. Availability of a copy of the essential drug list or formulary: Checks if the facility has an accessible list of essential drugs.
Calculation: Yes or no, per facility [8].

XII. Availability of key drugs: Monitors the presence of essential medicines that should be available at all times [12].
Calculation: Percentage, calculated by dividing the number of specified products actually in stock by the total number of drugs on the check list, multiplied by 100[8].

These guidelines provide a standardized approach to monitor and improve drug use practices, promoting safety, efficacy, and cost-effectiveness in healthcare systems [12].

Indications

Core drug use indicators are tools developed by the World Health Organization (WHO) to evaluate drug use practices in healthcare settings. These indicators help in assessing the efficiency and quality of drug prescribing, patient care, and the availability of essential medicines. The core drug use indicators are grouped into three main categories: prescribing indicators, patient care indicators, and facility-specific indicators [8].

1. Prescribing Indicators

These indicators measure the quality of drug prescribing practices by healthcare providers. They include:

- Average number of drugs per prescription: Helps identify polypharmacy and potential issues related to drug interactions.
- Percentage of drugs prescribed by generic name: Indicates adherence to cost-effective prescribing practices.
- Percentage of encounters with an antibiotic prescribed: Assesses the appropriateness of antibiotic use, which is critical for monitoring antibiotic resistance.
- Percentage of encounters with an injection prescribed: Highlights the use of injections and potential overuse, which can pose safety risks.
- Percentage of drugs prescribed from an essential medicines list (EML): Ensures that prescribed drugs are those recommended by national or international essential medicines lists, promoting rational drug use [13].

2. Patient Care Indicators:

These indicators assess the quality of care patients receive concerning drug usage[14]. They include:

- Average consultation time: Longer consultation times are often associated with better patient care and understanding of drug use.
- Average dispensing time: Indicates the efficiency of drug dispensing and opportunities to educate patients on drug use.
- Percentage of drugs actually dispensed: Measures the availability of prescribed medications at the health facility.
- Percentage of drugs adequately labeled: Ensures that patients receive properly labeled drugs with clear instructions.
- Patients' knowledge of correct dosage: Reflects the effectiveness of communication between healthcare providers and patients [8].

3. Facility-Specific Indicators:

These indicators measure the availability and adequacy of resources within a healthcare facility[15]. They include:

- Availability of a copy of the essential medicines list (EML): Indicates whether the facility is equipped with the necessary tools for rational prescribing.
- Availability of key drugs: Assesses whether essential medicines are consistently available in the health facility [8].

These indicators provide a standardized approach to monitor, assess, and improve drug use practices, ensuring better health outcomes and resource management in healthcare settings.

Advantages

1. Drug use indicators offer a straight forward tool for efficiently and reliably evaluating key aspects of pharmaceutical use in primary health care.
2. These are universally useful for any setting in the world in any nation which is highly standardized and are recommended for inclusion in any drug usage study using these indicators [16].
3. It aims to lower the occurrence of adverse drug events while maximizing the advantages of properly utilizing medications [17].
4. An essential tool is needed to analyze drug utilization patterns in hospitals to assess the appropriateness of medication use among physicians, patients, and healthcare facilities [18].
5. By tracking the availability and utilization of essential medications, healthcare systems can ensure that patients receive the appropriate treatments, resulting in improved health outcomes [19].
6. Core drug indicators assist in identifying shortages of essential medicines, helping to ensure that healthcare facilities remain sufficiently stocked [20].
7. By examining drug use and spending, health authorities can uncover cost-saving opportunities and optimize resource allocation [21].
8. Data from core drug indicators can guide health policy decisions, resulting in improved regulatory frameworks and policies that increase drug accessibility and affordability [22].

Disadvantages

1. WHO core drug use indicators fail to capture the reasons behind prescribing practices. Future research should utilize qualitative methods, such as focus group discussions or in-depth interviews, to examine the motivations for drug prescriptions [23].
2. These indicators did not determine whether the prescribed medications were suitable for the diagnosis. Furthermore, inpatient prescribing patterns were not analyzed, and the factors influencing these prescriptions were not investigated [24].
3. Many medications prescribed for pediatric patients are used off-label, which may not be captured by standard indicators, making it challenging to assess their safety and efficacy [25].
4. Core indicators may not capture the complexities and risks associated with polypharmacy in pediatric patients, particularly those with chronic illnesses [26].
5. Core indicators may not adequately reflect the unique needs or circumstances of various healthcare settings. For example, urban and rural healthcare environments often face significantly different challenges [27].
6. These indicators mainly emphasize quantitative metrics, which may lead to neglecting qualitative factors like patient satisfaction and the suitability of medication use [28].
7. The indicators are typically derived from a predefined list of essential medicines, which might not align with the local disease burden or emerging health concerns [29].
8. The focus of these indicators is often on supply-side factors rather than demand-side challenges, which can lead to an incomplete understanding of medicine use in different populations [30].

Current Trends

- Heightened awareness of adverse drug reactions (ADRs) in pediatric patients has resulted in more stringent monitoring and reporting systems. Safety initiatives are now concentrated on reducing harm and optimizing the use of medications [31].
- There is a growing focus on encouraging rational prescribing and medication use among healthcare providers, which involves verifying appropriate indications, dosages, and treatment durations [32].
- There is an increasing emphasis on monitoring adverse drug reactions (ADRs) in pediatric populations to improve drug safety. This effort includes the development of reporting systems and the training of healthcare professionals to identify and report ADRs effectively [33].
- In response to the growing problem of antibiotic resistance, there is a heightened focus on antimicrobial stewardship programs in pediatrics designed to encourage the appropriate use of antibiotics and decrease unnecessary prescriptions [34].
- Educating healthcare providers in pediatric pharmacotherapy and the guidelines of the WHO core drug indicators is vital for guaranteeing the safe and effective administration of medications in children [35].
- There is an increased focus on medication errors in pediatrics, resulting in initiatives designed to enhance prescribing practices and track adverse drug reactions more effectively [36].
- As pediatric patients frequently deal with chronic conditions, there is increasing concern about the risks linked to polypharmacy, resulting in more vigilant prescribing and monitoring practices [37].

Conclusion

The WHO core drug use indicators have played an instrumental role in addressing irrational drug use and promoting rational prescribing worldwide. While the indicators offer a standardized and efficient means of evaluating healthcare practices, particularly in primary care settings, they have limitations in capturing the

qualitative aspects of drug use and the unique challenges faced in pediatric populations. Ongoing efforts are necessary to refine these indicators, integrating both quantitative and qualitative assessments, to ensure they remain relevant in diverse healthcare environments. The increasing focus on antimicrobial stewardship, reducing adverse drug reactions, and improving prescribing practices reflects the evolving landscape of rational drug use, particularly in pediatric care, where polypharmacy and off-label drug use continue to pose challenges. Strengthening healthcare policies and increasing awareness among prescribers will be crucial in advancing rational drug use and safeguarding public health

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