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Review Paper

Self-Medication In Pediatrics Population: A Comprehensive Review

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ABSTRACT

Pediatrics self-medication is a widespread global practice where the parents or caregiver provide medicines to children based on their own diagnosis rather than a professional medical prescription. This behavior is especially common in developing nations like India, Brazil, Germany, with prevalence rates ranging from 24% to 91%. It is primarily driven by the factors such as economic pressures, limited healthcare access, and the influence of online information. Parents or caregiver commonly administer medications like antipyretics, antibiotics, antihistamines for minor ailments, often relying on imprecise dosing or leftover prescriptions. This behavior poses significant risks to pediatrics immature metabolic systems, leading to complications such as dosages errors and adverse reactions, masking of serious conditions like pneumonia. Furthermore, improper use contributes to dangerous outcomes like antimicrobial resistance and overdoses, with documented cases of blurred vision and gastrointestinal distress. Although many parents and caregivers recognize the risks of allergies and overdosing, these dangers ultimately outweigh any perceived short-term benefits. Protecting pediatrics health requires a multifaceted approach that includes improving health literacy, adhere to professional medical advice, and always use accurate, weight-based dosing as directed by healthcare professionals.

INTRODUCTION

Self-medication is a subject of global importance. Self- medication defined as using medicines without a valid prescription based on one's own diagnosis, is a widespread practice, particularly in developing countries such as India. This trend is often driven by a desire to save time and money, but it comes with serious risks, such as adverse effects and the potential to hide symptoms of chronic diseases [1]. The prevalence of self-medication in India is influenced by factors like media advertisements, convenience, affordability,

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and a lack of awareness among parents. It is particularly common in lower- and middle-income families who may not be able to afford medical insurance. The dangers of this practice are significant for children, as it can harm their developing immune system and metabolisms. The misuse of antibiotics in particular contribute to the global health crisis of antibiotics resistance [1][2]. In India, the combination of insufficient healthcare infrastructure and the widespread availability of medications has led to a notable rise in self-medication [3]. Economic challenges, limited access to medical services, hectic routines, and the desire for convenience often drive people to treat themselves without professional guidance [2][3]. This trend is especially prevalent among young adults and students, who are more likely to self-medicate due to their educational background and the ease of finding drug-related information online. Additionally, influences from peers and digital platforms promote self-care, which can increase the likelihood of making uninformed or risky medication decisions [3]. While self-medication may seem convenient, especially in children, it carries a significant risk of various sid e effects and adverse drug reactions, ranging from mild to potentially life-threatening. The prevalence of the self-medication in the pediatrics population presenting some studies like: Overall prevalence of self-medication is about the range of 25.2% to 91%[4]. The cross-sectional study is done in the brazil. In brazil's survey indicates a prevalence of 25.2% in children aged 0-12 years and 56.6% in individual aged <18 years [5]. In Germany's surveys found that 25.2% of the children aged 0-17 years [6]. In china's survey reported that 24.2% of the parents to their children [7]. The cross-sectional survey conducted in the Karnataka, India. The study shows that the 78.6% of the adolescents are taking the self-medication, in which the 55.9% were the females and the 66.8%were the males. The majority is that they are belong from the rural area and from the poor and nuclear family [8]. The cross-sectional study was conducted over a period of four months in the Ahmedabad, Gujarat. The study includes the pediatrics population from the 5-15 years. The prevalence of Self-medication was found to be 86.14% in which the including the medication of most common illness like fever, antipyretics, antibiotics and oral rehydration [9]. The self-medication given by the parent and caregivers in common condition like fever, coughs, minor injuries, diarrhea, and pain, providing medication without consulting a doctor. The frequency of this practice varies significantly across different countries and population with studies showing rates ranging from 24% to over 90%.[10][11][12][13][14][15].

The self-medication is addressing the fact that children are biologically distinct from adults, possessing developing systems that handle drugs with much less margin for error. While parents often reach for over-the counter remedies to provide the quick and comfort, a child's liver and kidney functions are still maturing, meaning they cannot metabolize or clear chemicals as predictably as an adult. This creates a high risk for accidental toxicity, especially when the doses are guessed or measured with inaccurate household spoons. There is also a significant diagnostic risk. Fever, cough and fatigue are not diseases they are messages from the immune system. When the parent treats it with ibuprofen without a diagnosis, they might successfully bring the temperature down, but they haven't touched the underlying cause. If the infection is serious like pneumonia, the child may appear fine for few hours while the infection continuous to spread. By the time the medicine wears off and the symptoms return more aggressively. This makes future infection for the child and the community at large- much harder to treat. By improving health literacy and encouraging professional consultation, we ensure

that the cure doesn't become more dangerous than the ailment itself.

2. ADVERSE-EFFECTS OF SELF-MEDICATION

Adverse drug reaction such as headache, vomiting, dizziness, irritability, and stomach pain, may be experienced by the children. Dosage errors is occur using the incorrect dosing and duration of frequent, increasing the risk of toxicity or therapeutic failure [16]. Self-medication can hide the symptoms of a serious disease delaying the proper diagnosis and necessary medical care[11][17]. The medication taking without any professional guidance there are very high chance of harmful drug interaction or accidental overdose [11][13]. The misusing of antibiotics contributes in the global problem of antimicrobial resistance, making these drugs less effective when actually needed [17][18][19].

- Inappropriate diagnosis and treatment: without a medical professional, individuals may misdiagnosis, leading to the use of the wrong drug or incorrect dosages[16].
- Adverse drug reaction: misuse can cause the serious unwanted effects, ranging from mild allergies to severe organ damage, such as kidney or liver failure/impairment.
- Antibiotic resistance: one of most critical risk in the development of antibiotic resistant bacteria. This happens when the antibiotic are taken unnecessarily or in incorrect doses, making future infections much harder to treat[16].
- Hospitalization & resource wastage: severe reaction or worsened condition can lead to hospitalization, straining healthcare facilities and wasting economic.[16]

Indian case: The self-medication study conducted in the Ahmedabad, Gujarat in which they experienced an adverse event. The most frequently encountered adverse events were diarrhea, skin rash, and headache[20].

Specific cases: two children in the same family had peculiar adverse events after using post-cataract medication prescribed for their grandmother. A 6-year old male experienced blurred vision and a severe headache after using mydriatic eye drops. A 14-year old female developed a skin rash after ingesting paracetamol and an antibiotic.[20]

International case: The self-medication is conducted in the 32 states of Mexico in which the caregiver experienced at least one adverse drug reaction. The most frequent adverse reaction were headache, vomiting, dizziness, irritability and stomachache.

Specific case: some children experienced headache or felt irritable (about 3% of cases) after taking the Loratadine and ibuprofen was associated with vomiting (14%), dizziness (7%), and stomachache (2%). Ambroxol was associated with vomiting (5%) and dizziness (5%).[13]

Although many parents understand the dangers of self-medicating children under 12 years, their specific concerns vary. According to the study which is conducted in the Romania, the most common fear is the risk of allergic reaction (58.68%), followed closely by worries overdoses (48.22%) and the worsening of the initial symptoms (46.63%). Many parents also recognize more clinical risks such as hepatotoxicity (45.92%) or the possibility that self-treatment could mask the signs of a more serious evolving diseases (42.19%). A smaller group (16.64%) also expressedconcern that improper medication used could contribute to the development of bacterial resistance.[21]

3. DRUGS USED IN SELF-MEDICATION

Self-medication for children typically occur when adults or adolescent administer medicines without professional guidance. This often include using

old prescription, directly buying medications from a pharmacy, or relying on informal advice for symptoms such as fever, cough, pain, or a cold [19][20][21]. Self-medication is given to the children by the parents (especially mothers aged 25-40 years). In older or adolescents (16-18 years), youth may administer minor ailments medications themselves, such as for headache or fever [12][13][22]. Medication is often given for minor, recognizable ailments, including cough, colds, flu, pain [12][13][22][23][24]. Parents often self-medication their children when they judge the illness not to be severe or when symptoms mirror a past illness [13][24][25]. Doses and formulation are determined in the various way for self-medication. Caregiver often select oral syrups or suspension for younger children, syrups were the preferred option in surveys conducted in Morocco and India [23][24]. Dosages are commonly estimated based on a child's age rather than their weight, or by simply replicating previous prescription [13][26][27]. Approximately half of all caregivers adjust doses themselves (either increasing or decreasing them), and many either do not read the accompanying instruction or ignore the sections detailing potential adverse effect [24]. The medications most commonly used for pediatric self-medication are primarily for symptom relief -

- **Antipyretics/Analgesics (Fever and Pain Reducers):**

Paracetamol is commonly used antipyretic and anti-analgesic drug for treating fever and pain in children. the recommended daily dose of paracetamol is 15mg//kg/day given every 6to8 hours as required. Caregivers should calculate the correct dose based on their child's weight, as dosage may vary depending on age and weight. For instance, if a child weighs 10kg, the recommended daily dose of paracetamol would be far the most common Acetaminophen mg/kg/day.[29]. A study from Odisha, India found that out of 400 children about 130 (32.5%) had self-medication by their caregiver[30]. Another study from Al-Baha region concluded that 41.9% of caregivers administered paracetamol to their children and about 27.2% of them reported that paracetamol administration was done in accordance to previous experience with similar symptoms. 58.8% of caregivers are aware of harmful effects caused by overdose[31]

- **NSAIDs:**

Ibuprofen is a nonsteroidal anti-inflammatory drug (NSAID) used to relieve pain, inflammation, and fever. It treats various condition includes headache, menstrual cramps, dental pain, and minor injuries. Ibuprofen have analgesic, antipyretic effects, and also have the anti-inflammatory properties. The recommended dose of children is 5-10 mg/kg/ given every 6-8 hours (maximum 40 mg/kg/day).[32]

- Antihistamines: the most commonly antihistamines are used in the treatment of allergies is the common practice of self-medication. Allergy such as itching, sneezing, and rhinitis are treated by the antihistamine drugs that are easily obtained without a doctor's prescription. e.g., diphenhydramine, promethazine, chlorpheniramine, and dimenhydrinate, dextromethorphan (DXM)- and codeine-based cough medicines [33].
- Antibiotics Medications- The prevalence of antibiotics self-medication in the pediatrics population was found through the surveys. A study is conducted in the Iraqi in which the parents was selected which is they gives self-medication to their children. The study found that 24% pediatrics was treated by the antibiotic medications. The study also found the lowest prevalence of antibiotic medication in Greece where 1% of parents use the medication without prescription. On other

hand, the highest prevalence of the antibiotic medication was found in the Saudi where the parents purchasing the antibiotics without the prescription about 69% [34].

Another study which is conducted in Urban Health Center of Gandhi Institute of Medical Science, Patna. Out of 173 respondents, 68.8% were mothers and 31.2% were fathers who identified as the primary caregiver. The study found the prevalence of the self-medication with the antibiotics was 31.8% [35].

- Anti-tussive: a study conducted in the Romania in which found that the caregiver treat their child by the anti-tussive medication. The range of cough medication is about (34.47%), cold is about (34.21%), and antitussive and mucolytic drugs 53.84%[21].

Some medicine that are used in the self-medications are antibiotic, antipyretics, antacids, cough-suppressant, antimicrobial, anti-allergy drugs. Self- medication can be an effective way to cure the minor ailments, but there are also some risk of adverse reaction, side-effects and diagnostic errors, drug abuse, drug resistance [12][34]. Clearly it is very crucial that the caregiver recognize the condition and able to choose the right medicine to give in the proper and responsible way to treat the condition [12][32][34][35][36]. Some time it leads to the misinterpret and misdiagnose the condition which is occur by the giving wrong medication and the wrong dose. With the wrong medication the real disease was not treated while the pediatric exposed to potential risk [12][32][34]. If the individual were not aware of the proper medicine usage and take wrong medicine or take it concomitantly with any serious disease, this can lead to the organ injuries [32][34]. Under-dosing leads to the insufficient medication or falling short of the needed efficacy, and the Over-dosing leads to the potential toxicity which can cause more serious health problems [25][32]. This reaction is occur due use of the common medication like paracetamol, ibuprofen and antihistaminic drugs [13]. WHO (world health organization) warn that significant proportion of antibiotic for use in the self-medication leads to the resistance of the antibiotic by the prolonged use of the antibiotic medication [25],[36].

4. FACTORS AFFECTING THE SELF-MEDICATION

The various factors that influencing the self-medication:

- Educational background- The knowledge level of the patient and the caregiver regarding the medication. A caregiver's knowledge level significantly shapes their approach to medication. Interestingly, research shows that the higher academic years in medical fields can sometimes lead to increased self-medication due to growing confidence in one's own pharmacological knowledge.
- Health awareness- The general understanding of health issues can be a double-edged sword. While it promotes proactive care, it also drives individuals to self-diagnose symptoms they perceive as 'minor' such as headache and mild fever. Increased awareness through the digital and online sources has further exacerbated this trend, as patients often use search engine to validate their choice of medication.
- Convenience and Ease- self-medication is frequently chosen because it is perceived as more convenient. It provided rapid relief and immediate access to remedies without the need for a doctor's appointment or a long wait in clinics.
- Cost of medical services: financial constraints are a major driver of self-medication. Patients often choose it to avoid high consultation fees, especially in private practices or in regions with limited health insurance. It is viewed as

a cost-saving measure because the only expense is the drug itself.

- Ineffective prescription- if the previous medical advice or prescribed treatment did not work as expected, a patient or caregiver may lost trust in professional consultation. This perception of 'treatment failure' can lead them to believe they are better suited to choose their own medication based on what they think will be more effective [41].
- Using leftover medication- Utilizing the remaining prescription drugs are common but risky habit. This practice is often driven by the desire to not waste medicine and the convenience of having it already available at home. However reusing old medicine for new symptoms is dangerous because the cause of the illness may be different, even if symptoms appear similar.
- Prior positive experience- Past personal experience regarding the effectiveness of a specific drug. Development of the new technologies that promoting the self-medication worldwide. Economic and cultural factors have contributes to the growth and spread of self-medication [41].

CONCLUSION

Self-medication in pediatrics is a widespread global health concern, with the prevalence rates varying significantly from approximately 24% to over 90% in countries such as India, Brazil, Germany, China. This trend is largely fueled by the economic pressures, the convenience of avoiding formal healthcare, limited medical access, and a reliance on internet resource or leftover medications. In developing regions like India, the misuse is further intensified by insufficient healthcare infrastructure and the easy availability of drugs. Typically, the caregivers-often mothers between the ages of 25 to 40 administer medications like painkillers, antibiotics, and cough syrups for minor ailments such as fevers and colds. However, they frequently do so without the professional advice, often relying on imprecise household measurements or age-based estimates rather than safer, weight-adjusted dosages. Self-medication in pediatrics carries severe and diverse risks due to their underdeveloped metabolic systems, which increase the likelihood of dosages errors and adverse drug reactions such as rashes, dizziness, or vomiting. This practice can alsomask the serious illnesses like pneumonia or lead to dangerous drug interaction and accidental overdoses. On a broader scale, the misuse of antibiotics contributes to global crisis of antimicrobial resistance. Real world examples from India and Mexico ranging from blurred vision to severe allergic reactions, further illustrate these dangers. Despite these significant risks, many parents continue the practice, even while expressing concerns about allergies, overdoses, and drug resistance, revealing a critical gap in public health awareness. Self-medicating pediatrics may seem convenient and cost effective in the short term, the risks including potential toxicity, misdiagnosis, and long term public health issues like antibiotics resistance, far outweigh any immediate benefits. Addressing this problem requires a multifaceted approach: improving health literacy for caregivers, enforcing stricter regulations on over-the-counter medication, and promoting the accurate weight-based dosing. By prioritizing professional medical consultation over impulsive self-diagnosis and leveraging digital platforms for reliable information, we can better protect the health of vulnerable children.

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