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ORIGINAL RESEARCH article

Prevalence of pediatric self-medication use and associated factors: A cross-sectional survey in Derna, Libya

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Abstract: Children represent a significant portion of the population in developing countries and are highly vulnerable to diseases. Self-medication, the practice of using medications without professional guidance, has been widely reported. While it can alleviate minor illnesses, self-medication, particularly in children, poses significant risks, including misdiagnosis, drug interactions, and antibiotic resistance. Little research exists regarding pediatric self-medication practices in Libya, raising concerns about the safety and appropriateness of these practices. This study aims to assess the prevalence of pediatric self-medication among parents and caregivers in Derna, Libya. Additionally, it aimed to investigate the factors influencing parental decisions and attitudes toward self-medication for children. A cross-sectional survey was conducted in Derna City using a self-administered questionnaire distributed through face-to-face interviews and an online link in 2025. The study revealed 54.4% of the participants practiced pediatric self-medication. Fever (66.4%) and cough (65.7%) were the most frequently treated symptoms. Pharmacies were the main source of medications (92.8%). Antibiotics were used by 20.4% of respondents, and 75.1% reported self-medication for their children within the past three months. When treatment failed, 83.4% sought medical advice. The prevalence of pediatric self-medication is alarmingly high, with several parents relying on pharmacies and previous prescriptions. This practice poses significant health risks, particularly in relation to the misuse of antibiotics.

Introduction

Children constitute a large proportion of the population, and they are more susceptible to different diseases, specifically diarrhea, vomiting, cough, and fever [1]. Worldwide, in 2023, the total number of deaths among children under-five years was 4.8 million [2]. Developing and developed countries are facing a significant prevalence of self-medication practice (SM) [3-5]. According to the World Health Organization (WHO), SM refers to the utilization of pharmaceutical drugs to treat self-identified disorders or symptoms, as well as the intermittent or prolonged use of previously prescribed medications for the management of chronic or recurrent diseases and symptoms [6]. In the pediatric population, pediatric self-medication (PSM) refers to the administration of medications to children by caregivers without obtaining prior medical advice or consultation [7]. SM may involve using over-the-counter (OTC) medications, prescription-only medicines, or complementary and alternative medicines [4, 5, 8]. Despite its important role in the management of minor illnesses [9, 10], and its ability to reduce the load on medical services and constrain treatment costs, SM cannot be considered a

completely safe practice [6], and it may give rise to many medical problems such as antibiotic resistance, misdiagnosis, use of excessive drug dosage, prolonged duration of use, drug interactions, and polypharmacy [11, 12]. The most common symptoms of childhood diseases are diarrhea, fever, cough, and vomiting, which are considered the main causes of morbidity and mortality among children, particularly in developing countries. These symptoms affect adversely the growth and development of infants and young children [13]. SM practice of these common symptoms results in poor quality of care and increases the development of drug resistance [11, 14]. Misuse of medications may also be ineffective and potentially harmful for young children [15].

Pediatric SM is a worldwide practice with a reported prevalence between 32.0%-98.0% in Madagascar, India, Greece, and Australia [16-18]. There is also a difference in education and economic factors associated with the choice to self-medicate. Previous studies reported that families with high income and with secondary and higher education level practice more SM than families with low income and low education level [19, 20]. On the other hand, family income and parental education did not significantly influence SM practice [21]. There is a notable lack of research specifically addressing pediatric SM practices in Libya [14, 22]. Preliminary observations suggest that parents and caregivers often administer medications to their children without prior medical consultation, relying on OTC products or leftover prescriptions. Although essential medicines are regulated in accordance with WHO standards, the regulation of OTC medications remains insufficient. This gap, combined with the growing threat of antibiotic resistance, raises serious concerns regarding the safety and appropriateness of pediatric SM practices [14]. Improper SM in children can lead to adverse drug reactions, masking serious conditions, and the escalation of antimicrobial resistance. Therefore, establishing baseline data on the patterns, determinants, and attitudes toward pediatric SM is critically needed in Libya. Such data would provide valuable insights for healthcare providers and policymakers in designing educational campaigns and implementing regulations aimed at promoting the rational and safe use of medicines among children. This study aimed to assess the prevalence of PSM as reported by parents and caregivers prior to seeking medical care at private and public health facilities in Libya. Furthermore, it seeks to investigate the factors influencing parental decisions and attitudes towards SM their children.

Materials and methods

Study design and data collection: This cross-sectional survey was carried out between February and April 2025 by means of a self-administered questionnaire designed for parents and caregivers in the municipality of Derna, Eastern part of Libya. Self-administered questionnaires were distributed to parents and caregivers using two methods: The first involved direct filling out by participants (face-to-face interviews), potential participants were approached opportunistically by a researcher in universities, schools, and workplaces and invited to participate, and the second involved sending an electronic link on the internet.

Data collection tool: A questionnaire was developed specifically for this study. To ensure the content validity of our data collection tool, it was first built by the principal investigator using previously published studies [23-25]. The first draft was then reviewed by four local experts in research (three pediatricians in Derna (CU, NM, & PC) and one statistician). There were four sections to the questionnaire: Sociodemographic characteristics of respondents; prevalence and patterns of SM practices; types and frequency of SM; and factors encouraging and discouraging the use of SM. Parents/caregivers were asked whether they have ever used SM for their children and, if so, what type they had used. Depending on their answers, they completed the appropriate questionnaire or the questionnaire for parents/caregivers who have never used SM for their children. Thus, not all subjects completed all sections of the questionnaires.

Sample size: The sample size was determined based on data from the Bureau of Statistics and Census [26], which estimated the population of Derna city at approximately 205,400 individuals, with an average household size of

five persons [26]. This corresponds to an estimated total of 41,080 households. Using the Krejcie and Morgan (1970) sample size table [27], a statistically representative sample of 380 households was required; therefore, 500 questionnaires were distributed to ensure adequate responses. After excluding 13 incomplete questionnaires, 487 valid responses were included in the analysis.

Ethical considerations: Ethical approval was obtained from the Research Ethics Committee of the Faculty of Pharmacy, University of Derna, Derna (UoD-01-20250. Participation was voluntary, and all data was collected anonymously and kept confidential.

Statistical analysis: Data were analyzed using descriptive statistics with IBM SPSS Statistics 26. Frequencies and percentages were calculated, and the results were graphically presented. Participants' attitudes were assessed through closed-ended questions and a three-point Likert scale (disagree, neutral, agree). The Chi-square test was applied to examine associations between sociodemographic variables and parents' decisions regarding PSM.

Results

Sociodemographic characteristics: A total of 487 parents/caregivers participated in this study on PSM practices. In **Table 1**, the majority were female (83.0%) and over the age of 30 (56.1%). Most participants were mothers (79.3%) and married (86.4%). Educational levels were generally high, with 81.1% holding a university degree and 9.7% having postgraduate education. A significant proportion were employed (67.8%), while 19.3% were housewives. The majority (75.8%) reported medium or low income. Regarding family size, 62.4% had more than one child under 10 years (**Table 1**).

Table 1: Sociodemographic characteristics of the Libyan participants

General data		Frequency	Percent
Gender	Male	83	17.0%
	Female	404	83.0%
Age	3 years or less	214	43.9%
	More than 3	273	56.1%
Status	Father	72	14.8%
	Mother	386	79.3%
	Guardians	29	06.0%
Educational level	Preparatory or lower	08	01.6%
	Secondary or intermediate	37	07.6%
	University or equivalent	395	81.1%
	Postgraduate	47	09.7%
Employment status	Student	24	04.9%
	Employee	330	67.8%
	Housewife	94	19.3%
	Retired	12	02.5%
	Other	27	05.5%
Marital status	Married	421	86.4%
	Divorced or widowed	66	13.6%
Income level	High	118	24.2%
	Medium or low	369	75.8%
Number of children under 10 years	One	183	37.6%
	More than one	304	62.4%

Prevalence of PSM among parents/caregivers: The prevalence of PSM among parents/caregivers was notably high. Over half of the participants (54.4%) reported using medications for their children without a medical prescription, while 45.6% denied doing so.

Pediatric SM practices: In **Table 2**, the survey results revealed that a substantial proportion of participants relied on physicians as the primary source of advice before using medication (52.1%), while 45.3% reported PSM without consultation. Additionally, 25.3% sought advice from friends, 21.1% used the internet, and 5.3% consulted traditional medicine practitioners.

Table 2: Source of advice before deciding to use the pediatric medication

Source of advice before deciding to use the pediatric medication?	Frequency	Percent
On my own	120	45.3%
Physicians	138	52.1%
Friends	67	25.3%
Internet	56	21.1%
Traditional medicine practitioner	14	05.3%
Others	07	02.6%

Regarding the symptoms treated with medications by PSM, fever (66.4%) and cough (65.7%) were the most commonly reported, followed by pain relief (40.0%), diarrhea/vomiting (19.2%), and breathing issues (11.7%). Skin conditions (6.4%) and intestinal worms (5.3%) were less frequently treated (**Table 3**).

Table 3: Symptoms treated with medication by Libyan pediatric self-medication practice

What symptoms are treated with the medication?	Frequency	Percent
Fever	176	66.4%
Cough	174	65.7%
Worms	14	5.3%
Pain relief	106	40.0%
Diarrhea/vomiting	51	19.2%
Skin diseases	17	6.4%
Breathing issues	31	11.7%
Others	07	02.6%

When asked about sources of medications, the majority obtained them from pharmacies (92.8%), while 15.1% used leftover medicine, and 5.7% received medications from friends. However, other sources represented only 3.8%. In **Table 4**, in cases where medications failed to produce the desired effect, 83.4% of participants reported consulting a physician. Others opted to increase the dosage (6.0%), repeat the same medication (4.9%), use a stronger medication (5.7%), or simply wait for the symptoms to subside (10.6%).

Table 4: Responses to medication failure

What actions do you take when the medication fails?	Frequency	Percent
Consult a physician	221	83.4%
Increase the dosage	16	06.0%
Repeat the same medication	13	04.9%
Use a stronger medication	15	05.7%
Wait for the symptoms to go away	28	10.6%

Concerning PSM, when treatment failed, nearly half of the respondents (49.1%) turned to private clinics, followed by public hospitals (30.4%) and pharmacies (18.1%), while 2.6% took no further action. In **Table 5**, In terms of non-prescribed medication use, paracetamol (antipyretic) was the most commonly used drug (76.2%), followed by cough medicine (58.9%), antibiotics (20.4%), and ibuprofen (17.7%). Deworming medicines (2.6%) and skin ointments (10.2%) were among the least used.

Table 5: Common medications used without prescription: Frequency and percentage

What medications do you usually use without a prescription?	Frequency	Percentage
Paracetamol	202	76.2%
Cough medicine	156	58.9%
Ibuprofen	47	17.7%
Antibiotics	54	20.4%
Deworming medicines	07	02.6%
Skin ointments	27	10.2%
Diarrhea/vomiting meds	43	16.2%
Others	18	06.8%

A notable 75.1% of respondents reported using medications without a prescription for their children in the past three months. Among them, 52.3% used such medications once, 41.2% used them two to five times, and 6.5% used them more than five times. In addition, 70.6% of participants indicated that they read the medication leaflet before administration, whereas 29.4% did not.

Reasons for PSM use among parents/caregivers: Regarding the main reasons for PSM use, 86.8% of respondents agreed that their child's symptoms were mild and did not require a physician's consultation, 80.4% believed they could recognize their child's illness based on symptoms, 85.3% had used the medicine before and found it effective, 67.9% preferred to treat their child quickly without waiting for medical consultation and, 52.5% believed the medicines used without prescription were safe (**Figure 1**).

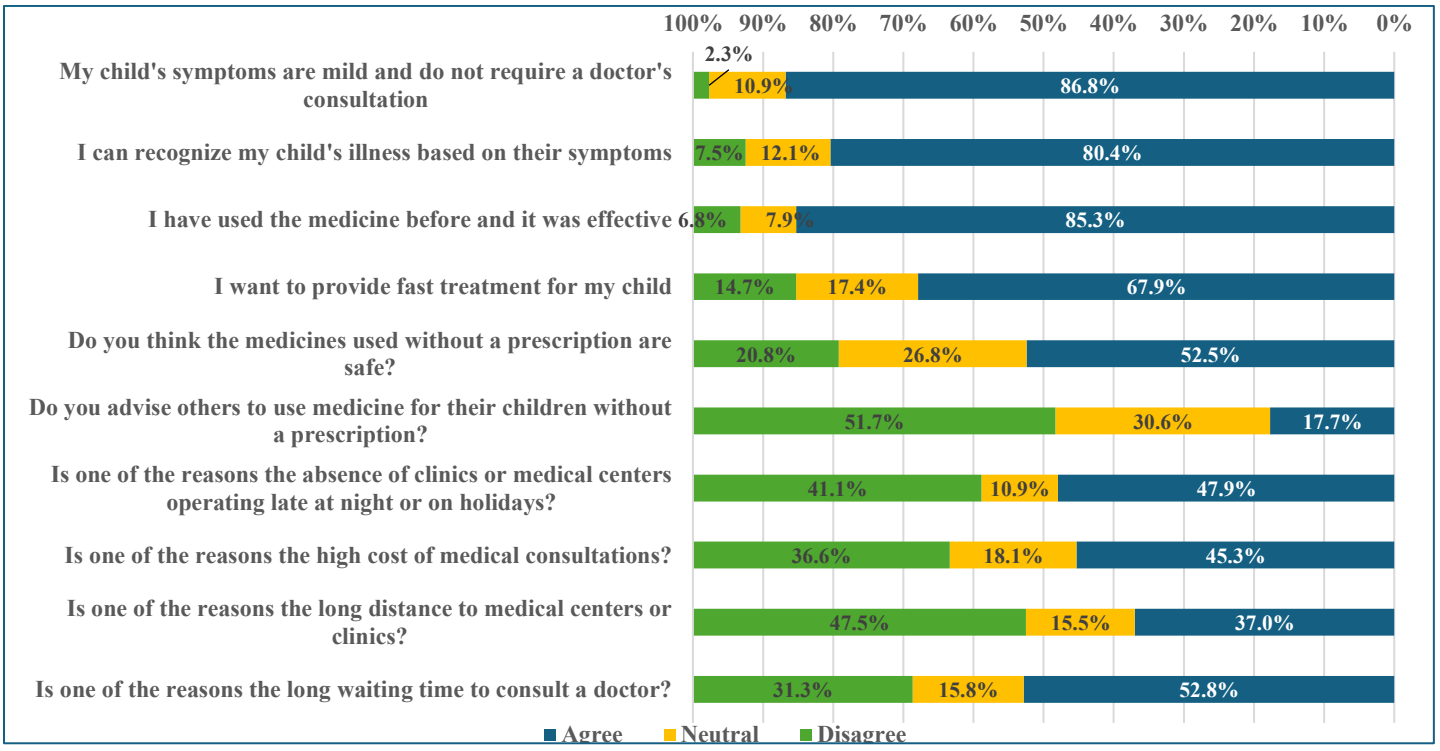

Figure 1: Reasons for practicing pediatric self-medication without medical prescription: Percentage distribution

In addition, Barriers to accessing healthcare played a role: Thus, 47.9% cited the unavailability of clinics during nights or holidays, 45.3% pointed to the high cost of medical consultations, and 52.8% mentioned long waiting times to see a doctor (**Figure 1**).

Reasons for not using PSM among parents/caregivers: However, not all parents supported PSM. Among the 45.6% who reported not using PSM, 90.5% believed PSM is dangerous, 62.2% found PSM ineffective, 62.2% indicated they had easy access to healthcare facilities, which might have reduced their need for SM, and 42.8% cited limited access to pharmacies as a reason for not practicing PSM (**Figure 2**).

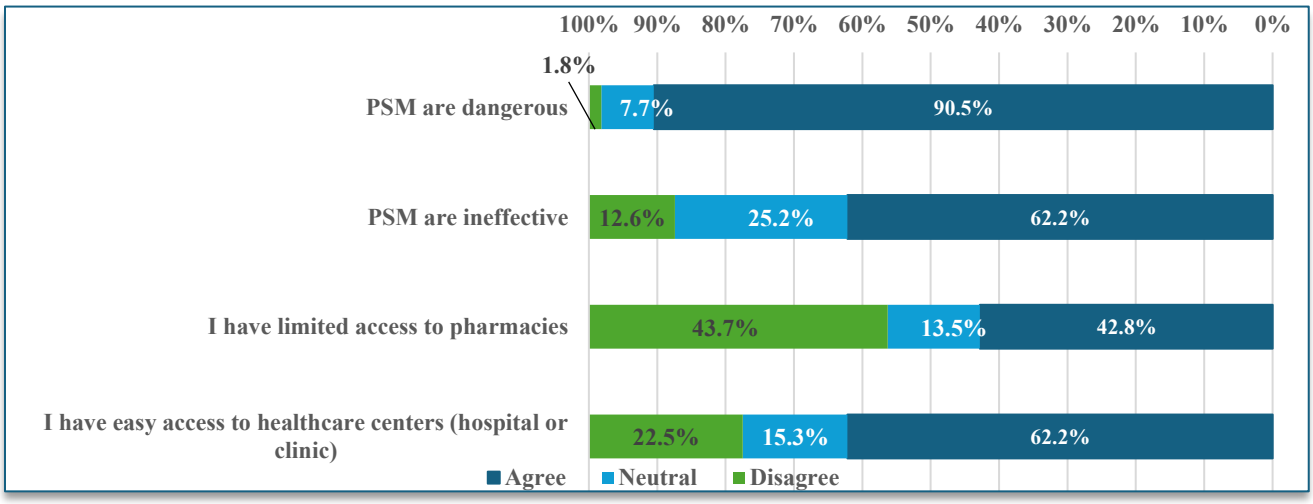

Figure 2: Reasons for not using pediatric self-medication: Percentage distribution

Discussion

To the best of our knowledge, this is one of the first studies assessing PSM practices in Derna, Libya, examining the prevalence and determinants of PSM among parents and caregivers. The data showed that more than half of the participants administered medications to their children without a medical prescription. Although SM is often perceived as a convenient way to manage minor illnesses, it may expose children to significant health risks such as inappropriate drug selection, incorrect dosing, delayed diagnosis, and adverse drug reactions [28]. Similar trends have been reported in other regional studies. Thus, in Egypt, 62.0% of adults reported practicing SM due to factors such as perceived mild symptoms, easy access to medications, and high healthcare costs [7]. Likewise, a study conducted in the Qassim region of Saudi Arabia found high rates of SM among parents, with 81.5% using antipyretics and 41.9% using cough syrups without medical consultation [29]. The main reasons included familiarity with symptoms, long waiting times in healthcare facilities, and the high cost of medical services. These factors are comparable to those observed in the current study, where many caregivers relied on personal judgment or advice from non-medical sources. Despite the high educational level of participants, unsafe medication practices were still reported [30]. In this study, the majority of caregivers held university degrees, yet behaviors such as increasing medication doses or repeating treatments without professional consultation were common. This suggests that general education alone may not guarantee adequate health literacy regarding safe medication use. Furthermore, several sociodemographic factors were significantly associated with PSM practices. Parents over 30 years of age, students, divorced or widowed individuals, and caregivers with more than one child under ten years old were more likely to administer medications without medical advice. These findings indicate that caregiving responsibilities, social circumstances, and healthcare accessibility may influence parental decision-making regarding child health management. Overall, the similarities between data from Libya and other Arab countries suggest that PSM is influenced by shared socioeconomic, healthcare system, and cultural factors. These

patterns highlight the need for targeted educational programs and improved communication between healthcare providers and caregivers to promote safer medication practices. Educational campaigns, communication between healthcare providers and caregivers, and improved regulation of over-the-counter drug sales may help reduce inappropriate PSM

Conclusion: Pediatric self-medication is a common practice among parents and caregivers in Libya. The findings revealed potentially unsafe behaviors and highlighted the need for public health interventions aimed at improving parental awareness of the risks associated with unsupervised medication use in children.

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