Incidence, pattern and determinants of self-medication for fevers in children: A survey of caregivers in an emergency unit in Benin City, Nigeria

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Abstract

Self-medication is common in medically underserved areas, with disastrous consequences. It is necessary to determine the frequency and risk factors in our area. The purpose of this study was to find out the frequency, pattern, and risk factors for self-medication for febrile childhood illnesses among caregivers seen in the emergency paediatric unit. A descriptive, cross-sectional design was used for this study. Participants included caregivers for children seen in the unit. A semi-structured questionnaire was used to collect data, which included sections on demography, determinants, pattern, and reasons for self-medication, as well as actual reports of self-medication in the previous three weeks. In order to identify risk factors for self-medication, inferential analyses were performed. P-values less than 0.05 were considered significant. The study included 153 caregivers, with an average (SD) age of 45.6 (13.8) years. Self-medication for fevers in children was 25.5%, with 20 (51.3%) of the children treated being under the age of five. Antipyretics (20.3%) and antimalarials (13.7%), particularly artemisinin-based combination therapy (ACT), were the most commonly used drugs. Place of residence (p= 0.011), living arrangement (p= 0.030), and awareness of an adverse drug event (p= 0.045) are factors that influence self-medication in the previous three weeks. Having health insurance, NHIS (OR = 2.734, 95% CI: 1.120-6.678; p=0.027), and using an insecticide-treated net (OR = 0.272, 95% CI: 0.117-0.634; p=0.003) are also independent predictors of self-medication. With multifactorial determinants in the setting, self-medication is common. There is a need for increased access to subsidized healthcare for children, as well as caregiver education on the potential harms of self-medication.

Introduction

The World Health Organization (WHO) defined self-medication as "the use of medicinal products by the consumer to treat self-diagnosed disorders or symptoms, or the intermittent or continued use of medication prescribed by a physician for chronic or recurrent diseases or symptoms."[1] Tesfamariam *et al.*[2] discovered inappropriate self-medication practice with Over-The-Counter (OTC) drugs in a study of 20 pharmacy stores in Eritrea, requiring early intervention to minimize the risks. In addition, Moritz *et al.*[3] discovered that only 179 (9%) of the 1,975 participants surveyed in assessing evidence-based self-medication counseling to clients agreed to participate in a nationwide survey of community pharmacists in German. Again, based on a scoping review, Kawuma *et al.*[4] concluded in 2021 that self-medication with OTC drugs,

including analgesics, is common in Sub-Saharan Africa. In Nigeria, self-medication for fevers and other symptoms is common in all paediatric age groups, as well as in rural and urban settings. In Kaduna, Babalola *et al.*[5] found that 52 (33.5%) of mothers who immediately considered treating their febrile under-five children self-medicate at home. Similarly, Omale *et al.*[6] discovered in a recent household survey in Ebonyi state, Nigeria, that the majority of febrile children in rural communities did not receive diagnostic testing before seeking treatment from medicine stores, drug hawkers, or traditional practitioners. Self-medication is encouraged in our setting due to easy access to over-the-counter medications and the proliferation of drug hawkers. Although self-medication may be encouraged in the case of a few minor illnesses in order to avoid overcrowding clinics and overworking the limited practitioners, self-medication has serious consequences.[1] Such practices may promote antimicrobial resistance, resulting in treatment failure, financial loss, serious health risks, missed diagnosis, delayed appropriate treatment, drug dependency, and adverse drug effects.[3,7] Antimicrobial resistance is frequently the result of prior exposure to suboptimal drug doses, which is common when self-medicating.[8,9] This can eventually lead to the emergence and spread of multi-drug resistant strains, resulting in increased morbidity in the community.[8,10] Furthermore, self-medication can result in significant direct fund losses as well as Quality-Adjusted Life Year (QALY) losses in children due to inappropriate treatments and subsequent complicated illnesses.[11,12] It is therefore critical to identify and mitigate factors that encourage self-medication, particularly in vulnerable groups such as children.

Recent research has found that self-medication increased during the corona virus disease (COVID-19) pandemic and its associated lockdown policy.[13,14] However, there is a scarcity of data on caregivers' self-medication practices in our area's emergency departments. The purpose of this study was to examine the pattern of self-medication for febrile childhood illnesses, as well as its predictors, among caregivers seen in our emergency department in this post-pandemic era.

Materials and Methods

Study location, design, and subjects

The study was carried out at the Children Emergency Room (CHER) of the University of Benin Teaching Hospital (UBTH), in Benin City, south-south Nigeria in May 2022.

This study adopted a descriptive, cross-sectional design.

All eligible caregivers whose children are on admission in CHER or on follow-up visits.

Inclusion and exclusion criteria

All caregivers of children aged between 1 month and 18 years who consented to the study. Caregivers of infants < 1month old were excluded (due to their direct admissions into the Neonatal Intensive Care Unit).

Sample size

The minimum sample size (N) was determined as follows:[15]

$$N = \frac{Z_{1-\alpha}^2 (P)(1-P)}{d^2}$$

where,

$Z_{1-\alpha}$ = normal standard deviation for confidence level of 95% = 1.96.

P = Proportion of caregivers who practise self-medication for a child with fever (we assume 90% in the setting).

d = margin of error to be tolerated (commonly fixed at 5% or 0.05).

Therefore, substituting the values,

$$N = \frac{1.96^2 \text{ X } 0.9 \text{ X } 0.1}{0.05^2} = 139$$

A non-response rate of 10% was considered. Therefore,

$$N = 139 + (139 \text{ X } 0.10)$$
$$= 139 + 14 = 153$$

A total of 153 caregivers were recruited during the study period.

Data collection

It was a study of the entire population. During the study period, participants were purposefully recruited. A semi-structured questionnaire with sections on demography, determinants, pattern, and reasons for self-medication was used to collect data (including actual reports of self-medication in the preceding 3 weeks). The pattern of fever self-medication sought includes antibiotics, analgesics, antimalarials, and others; participants were asked to describe their frequency of use of these drugs as 'never,' 'rarely, 'sometimes,' and 'always.' The questionnaires were administered by two senior medical students who had been trained as research assistants. Ibadin *et al.*'s revised scoring scheme was used to classify families' socioeconomic status.[16]

Statistical analysis

Descriptive and inferential analyses of the data were done using the IBM Statistical Package for Social Sciences (SPSS) version 26.0 for windows. Categorical variables such as gender, ethnicity, social class and pattern of medication were described using frequencies or percentages while continuous variables were described using means and standard deviations. Chi-square or Fisher's exact test was done to detect significant difference between proportions. Multivariate analysis was done to identify factors that independently predict recent self-medication among the caregivers, using adjusted odds ratio (aOR) and 95% confidence intervals (CI). The level of significance of each test was set at $p < 0.05$.

Results

Demographic characteristics of the participants

A total of 153 caregivers participated in the study, their mean (SD) age was 45.6 (13.8) years and 142 (92.8%) were females. They were mainly from middle (78.4%) and upper (17.0%) socioeconomic classes; 37.9% and 54.2% of female caregivers had secondary and tertiary levels of education respectively. The participants were from different tribes: 75 (49.0%) Bini, 17 (11.1%) Igbo, 7 (4.6%) Yoruba and the rest of them were from other ethnic groups. They were mainly Christians (94.8%) and predominantly lived in Benin City (87.6%), in flats type of accommodation (830%). Most of the caregivers were married (96.7%) in monogamous type of families (98.7%).

The mean (SD) number of children in the households was 3.0 (1.5); most of the children lived with both parents (88.9%). Ninety seven (63.4%) owned an insecticide-treated bed net (ITN) but only 74 (48.4%) had children who slept under the bed net in the preceding 3 weeks. One hundred and ten (71.9%) had a chemist store on

their streets, 10 (6.5%) bought drugs from hawkers and 120 (78.4%) of caregivers regularly kept drugs at home for children. Forty one (26.8%) of the participants had a health insurance (NHIS). Further details are shown on Table 1 below.

Pattern of self-medication for fevers in children

Table 2 shows types of drugs given to children with fevers by the caregivers, including Paracetamol (69.9%), Coartem/Lonart (23.5%), ampiclox (27.5%), worm medicine (34.6%) and blood tonic (22.2%). Quinine is sometimes used by 18 (11.8%) of the participants, Septrin by 26 (17.0%) and Bonababe by 21 (13.7%). Overall, the leading classes of drugs always administered to febrile children at home by the caregivers are antipyretics (70.6%) and antimalarial (37.9%); Only 7.8% always gave antibiotics while 15.7% treated with blood tonic, bonababe mixture and worm medicine as depicted in Figure 1.

Caregivers' reports of recent self-medication for fevers in children

Caregivers' reports of self-medication for fevers in children in the preceding 3 weeks are shown on Table 3. The incidence of self-medication for a febrile childhood illness was 25.5%, with 20 (51.3%) of the children treated being under-fives. The commonest drugs used were analgesics/antipyretics (20.3%), antibiotics 8 (5.7%) and antimalarial 21(13.7%) especially Artemisinin-based Combination Therapy (ACT).

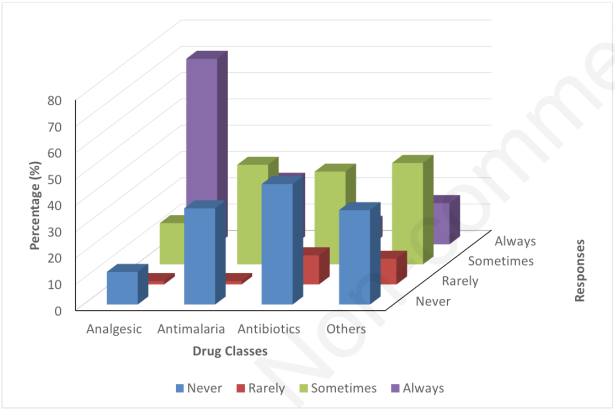

Figure 1. Classes of drugs used for self-medication for fevers in children. Others = Blood tonic, worm medicine, bonababe.

Reasons for self-medication for fevers in children by the participants

'The child's illness was not serious' was the reason for self-medication in 86 (71.1%) cases, 'self-medication is cheaper' in 36 (30.0%), 'they knew the cause of the fever in the child' in 29 (24.6%) and 'knowledge of a prior treatment given to the child in the hospital' in 22 (18.3%) cases.

Table 1. Demographic characteristics of the participants (N=153).

Characteristics	Frequency	Percentage (%)
Caregiver's age (years)		
<30	15	9.8
>30	138	90.2
Mean(SD)	45.6±13.8	
Sex		
Male	11	7.2
Female	142	92.8
Socioeconomic class		
Upper	26	17.0
Middle	120	78.4
Lower	7	4.6
Place of residence		
Benin City	134	87.6
Semi urban	1	0.7
Village	3	2.0
Others	15	9.8
Insecticide-treated net at home		
Yes	97	63.4
No	56	36.6
Slept under ITN in last 3 weeks		
Yes	74	48.4
No	79	51.6
Have health insurance (NHIS)		
Yes	41	26.8
No	112	73.2
Regularly keep drugs at home		
Yes	120	78.4
No	33	21.6
Know any child with ADR		
Yes	21	13.7
No	124	81.1
I don't know	8	5.2

ADR = adverse drug reaction; ITN = Insecticide-treated bed net.

Table 2. Pattern of self- medication for fevers in children (N=153).

Drugs	Never	Rarely	Sometimes	Always
Pracetamol/Panadol	19 (12.4)	4 (2.6)	23 (15.0)	107 (69.9)
Ibuprofen/Ibufen	93 (60.8)	13 (8.5)	26 (17.0)	21 (13.7)
Coartem/Lonart	58 (37.9)	5 (3.3)	54 (35.3)	36 (23.5)
Quinine	123 (80.4)	11 (7.2)	18 (11.8)	1 (0.7)
Ampiclox	83 (54.2)	18 (11.8)	42 (27.5)	10 (6.5)
Septrin	107 (69.9)	16 (10.5)	26 (17.0)	4 (2.6)
Bonababe	107 (69.9)	17 (11.1)	21 (13.7)	8 (5.2)
Blood tonic	90 (58.8)	14 (9.2)	34 (22.2)	15 (9.8)
Worm medicine	72 (47.1)	21 (13.7)	53 (34.6)	7 (4.6)

Determinants of self-medication for fevers in the preceding 3 weeks

Determinants of self-medication for febrile illnesses in children in the preceding 3 weeks include place of residence (p=0.011), living arrangement (p=0.030), ITN bed net in household (p=0.012) and knowledge of a child who suffered adverse drug reaction (p=0.045). Having health insurance (NHIS) marginally influenced self-medication for fevers in children on bivariate analysis ($x^2 = 3.630$; p= 0.057) as depicted on Table 4.

On multivariate logistic regression, caregivers who were previously unaware of any child who suffered an adverse drug reaction (OR = 0.326, 95%CI: 0.111-0.956; p=0.041) and those with an insecticide-treated net at home (OR = 0.272, 95%CI: 0.117-0.634; p=0.003) were less likely to have self-medicated a child for fever in the preceding 3 weeks. Having a health insurance nearly thrice increased the likelihood of self-medication in this study (OR = 2.734, 95%CI: 1.120–6.678; p=0.027) as shown on Table 5.

Discussion

This study discovered a high prevalence of self-medication for childhood febrile illnesses, with a quarter of the participants administering drugs to children for self-diagnosed illnesses in the previous weeks; this is consistent with reports by Iribhogbe *et al.*[17] and Omale *et al.*,[6] both from Nigeria, that many caregivers self-medicate for fever before presentation in health facilities. Similarly, Babalola *et al.*[5] reported a high prevalence (33.5%) of home treatment for under-five children with fever in Kaduna, north-west Nigeria. Again, in their surveys, Mensah *et al.*[18] in

Table 3. Caregivers' reports of self-medication for fevers in children in the last 3 weeks.

Caregivers' reports	Frequency	Percentage
Given drug for fever in a child		
Yes	39	25.5
No	114	74.5
Child's age		
<5	20	51.3
>5	19	48.7
Mean(SD)	5.69±4.40	
Child's sex		
Male	21	53.8
Female	18	46.2
Drugs*		
Antipyretics	31	20.3
Antimalarial	21	13.7
Antibiotics	8	5.2
Others	2	1.3

*≥1 drug given to a child; others = Bonababe syrup, herbal mixture.

Table 4. Determinants of self-medication of a child with fevers in the preceding 3 weeks.

Variables	Self-medicate a child for fever		Fisher's exact	P
	Yes	No		
Caregiver's Age				
<30	3 (20.0)	12 (80.0)	0.264	0.761
>30	36 (26.1)	102 (73.9)		
Social Class				
Upper	8 (30.8)	18 (69.2)	0.859	0.651†
Middle	30 (25.0)	90 (75.0)		
Lower	1 (14.3)	6 (85.7)		
Place of residence				
Benin City	38 (28.4)	96 (71.6)	9.624	0.011
Semi urban	1 (100.0)	0 (0.0)		
Village	0 (0.0)	3 (100.0)		
Others	0 (0.0)	15 (100.0)		
Living arrangement				
Both parents	32 (23.5)	104 (76.5)	7.591	0.030
Mother	6 (66.7)	3 (33.3)		
Father	0 (0.0)	2 (100.0)		
Others	1 (16.7)	5 (83.3)		
Insecticide-treated net at home				
Yes	18 (18.6)	79 (81.4)	6.708	0.012†
No	21 (37.5)	35 (62.5)		
Slept under ITN in last 3 weeks				
Yes	18 (24.3)	56 (75.7)	0.103	0.853†
No	21 (26.6)	58 (73.4)		
NHIS				
Yes	15	26	3.630	0.057†
No	24	88		
Regularly keep drugs at home				
Yes	34 (28.3)	86 (71.7)	2.368	0.175†
No	5 (15.2)	28 (84.8)		
Know any child with ADR				
Yes	9 (42.9)	12 (57.1)	6.181	0.045†
No	30 (24.2)	94 (75.8)		
I don't know	0 (0.0)	8 (100.0)		

†Chi-square; ADR = adverse drug reaction; ITN = Insecticide-Treated bed net; other demographic variables assessed were not significant.

Table 5. Multivariate logistic regression for selected variables as predictors of self-medication for fevers in a child in the preceding 3 weeks.

Variables	p-value	O.R	95% C.I.	
			Lower	Upper
Know any child with adverse reaction (*No*)	0.041	0.326	0.111	0.956
Living arrangement (*both parents*)	0.214	0.478	0.150	1.530
Place of residence (B*enin City*)	0.071	6.729	0.851	53.219
Have a health insurance (NHIS) (*Yes*)	0.027	2.734	1.120	6.678
Have an Insecticide-Treated bed net (*Yes*)	0.003	0.272	0.117	0.634
Constant	0.538	0.454		

Other demographic variables assessed were not significant.

Ghana and Bogale *et al.*[19] in Ethiopia found a high prevalence of self-medication, 40.8% and 67.3%, respectively. This could be due to inefficient health systems, limited health insurance, and poor health indices in the sub-regions.[20,21]

Analgesics/antipyretics were the most commonly used drugs for self-medication in febrile children in this study, which is consistent with a recent scoping review of analgesic misuse in Sub-Saharan Africa by Kawuma *et al.*[4] Similar to previous reports on presumptive paediatric malaria therapies, antimalarials were widely used in home fever treatments by our participants.[17-22] Artemesinin-based Combination Therapies (ACTs) are the most commonly used antimalarials in our study, which is consistent with their demonstrated efficacy for uncomplicated malaria in African settings in recent systematic reviews and meta-analyses.[23,24] Nonetheless, indiscriminate use of antimalarial drugs (ACTs) for self-diagnosed malaria will eventually lead to increased drug resistance, treatment failure, and complications.[25,26] Before treating children with malaria-like illnesses, appropriate rapid diagnostic testing should be performed.[6] Antibiotics were also given to febrile children by our participants on occasion, which is consistent with previous reports of antibiotic self-medication in paediatric febrile illnesses.[9,27] Muoneke *et al.*[27] discovered that more than one-fifth of their participants in Enugu, south-east Nigeria, self-medicate febrile under-five children with antibiotics. In addition, Samir *et al.*[28] discovered that approximately 17% of under-five children with febrile illnesses received antibiotics in a recent national survey in Bangladesh. Given the high risk of misdiagnosis, suboptimal dosages, and adverse drug reactions, self-medication is dangerous, especially in children.[8,11]

Our participants' reasons for self-medication were primarily related to their presumed knowledge of the child's illness, underestimating its severity, and minimizing costs, which is consistent with the findings of Muoneke *et al.*[27] who found that presumed experience with treatments, knowledge of previous prescriptions, and dislike of long waiting times in hospitals were the reasons for self-medication among their participants. Nonetheless, poor health-seeking behavior, such as delayed presentation to health facilities and self-treatment at home, is prevalent in our environment.[5,27,29] In our setting, this is a significant contributor to childhood morbidity and mortality.[30,31] Our primary health care system's limited functionality also impedes timely access to health facilities, as does indiscriminate access to prescription drugs in chemist stores, supermarkets, and sometimes from hawkers.[22,32] There is a need to regulate drug access in the general population as well as educate caregivers on the importance of medical evaluation before treatment.

Furthermore, as in previous studies, demographic factors such as place of residence and living arrangement influenced self-medication practice in this study.[6,27] Babalola *et al.*[5] discovered in Kaduna that uneducated caregivers of febrile under-five children in rural areas frequently delayed seeking care or resorted to self-medication with anti-malarial drugs. Similarly, Bogale *et al.*[19] found that self-medication with antibiotics was significantly related to participants' educational status and financial income in Addis Abeba. In this study, having an Insecticide-Treated bed Net (ITN) at home protects against self-treatment of febrile childhood illnesses, which is consistent with a recent report by Omonijo *et al.*[33] in Ekiti, south-west Nigeria, that ITN use resulted in a significant reduction in childhood malaria fever. Pryce *et al.*[34] recently confirmed that ITN reduces uncomplicated malaria fever episodes and child mortality in a Cochrane review of 23 trials. Interestingly, in our study, having health insurance did not prevent self-medication, possibly due to its current cumbersome processes and limited coverage.[35] Furthermore, caregivers' knowledge of adverse drug reactions influenced their self-medication practice; public awareness of the inherent dangers of self-medication in children is required.

The study's strength is the recruitment of caregivers who have recently taken care of febrile children and documented their actual pre-hospital care experiences. Nonetheless, because the majority of our participants live in cities, our findings may not be applicable to rural dwellers. A limitation is the skewed distribution of their place of residence, socioeconomic class, and living arrangement. In our area, a comparative study of rural-urban caregivers' self-medication practices would be beneficial.

Conclusions

With multifactorial determinants in the setting, self-medication is common. There is a need for increased access to subsidized healthcare for children, as well as caregiver education on the dangers of self-medication. Improved health insurance coverage and drug vendor regulation can deter people from self-medicating.

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