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Research paper

Expected clinical responses due to self-medicated Sudanese children; a pharmacological and family-medicine overview

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Abstract

This descriptive cross-sectional study was carried in Mohammed Alameen Hamid and Jaafar bin Auf Pediatrics Hospitals in Khartoum state, Sudan. This study was conducted from March to June 2021. The study respected confidentiality using a Unique Patient Identifier (UPI) code; the questionnaires were anonymous and included no personal identifiers. Consent forms were linked to the study participant using the UPI. 33.9% of the children were self-medicated with analgesics, the route of administration for 58.4% of them was oral, 54.5% of them were using the medications until the complains disappear. 51%of the mothers reported that they were using the medications three timed daily. 37.4% of the participants reported that the fever is one of the Clinical indications for self-medication, where as 30.3% of they reported common cold. All study results showed a significance level of ($p<0.05$).

Keywords: *Antibiotic Resistance; Bacterial Cells; Epidemiology; International Pharmaceutical Federation (IPF); Pharmacological Agents.*

1. Introduction

According to World Health Organization (WHO) self-medication is the use and selection of medicines by individuals to treat. Self-recognized illnesses or symptoms. The International Pharmaceutical Federation (IPF) has defined self-medication as drugs use by individuals on their own initiative [6]. Epidemiology is defined as, "the study of the distribution and determinants of health-related states or events in specified populations and the application of this study to control health problems" [11]. Different studies were conducted to evaluate the patterns of self-medication in children have shown that self-medication prevalence is quite high among children. These studies also showed that self-medication patterns are not appropriate enough and parents do not have sufficient and appropriate knowledge about the drug use in children [4]. Worldwide practice of self-medication has been reported to increase day by day. The studies which were conducted in developed countries revealed high prevalence among parents like in Germany 25.2% [3], France 96% [5], China 62% [15], Italy 69.2% [81.3% [10], 59% in India [14] and in Brazil about 56.6% [12]. Drug utilization in children is of great concern worldwide. Many drugs for this group of population are used in outpatient settings Parents generally give drugs to treat their child sickness. The trend of using drugs on their own that is self-medication has been increasing in developing countries as well as in developed countries in recent years. Drugs use without consulting any physician or health care provider for treating or preventing the ailments is self-medication. Drugs purchase and use without an authorized prescription or using previous prescription also comes under self-medication. It also included the use of leftover medicines which are stored at home and medicines advised by family members or friends[9] . Primary responsibility for the use of self-medication products comes not only to the individual but also on all people involved in self-medication. Therefore, all people must be aware of the benefits and risks associated with the self-use of medicines [1]. Self-medication practices are of great concern in case of children as children are considered to be more vulnerable regarding the use of medicines. In developing countries children constitute a large percentage of the population and they are more vulnerable and susceptible to different diseases [13]. It is observed that in developed countries people practice self-medication predominantly with nonprescription over the counter drugs whereas most developing countries have a high burden of irrational drug use. The reason behind is the poorly enforced drug utilization policies due to which individuals have access to both prescription and non-prescription medications. Children are given medications by their parents. When children become sick the first response by most of the parents is to self-medicate them. Majority of the parents in both developed and developing countries prefer to treat their child's common ailments like fever, cough/ cold and diarrhea without consulting a physician [9]. Analgesics, antipyretics, anti-inflammatory agents, cough and cold preparations are amongst the commonly practiced self-medications [13]. Improper self-medication may lead to adverse effects and undesired drug interactions. To prevent this, correct use of medicines should be observed and one class of drug that is of great concern are antibiotics. Antibiotics are pharmacological agents used to treat infections caused by bacteria that selectively kill or inhibit the growth of bacterial cells [7]. Self-medication with antibiotics is particularly problematic, as it has been cited as a major contributor to antibiotic resistance. Recent meta-analyses have estimated that 38% of the world's population engages in self-medication with antibiotics [2].

2. Statistical analysis

Statistical analyses was performed using Chi-Square Test and Fisher Exact to compare between different groups and variables tested results. All statistical analyses were established with a significance level of ($p < 0.05$). The statistical analysis was performed with Statistical Package for Social Sciences (SPSS) Version 26.0 and excel version 16.

3. Methodology

3.1. Study design

This descriptive cross-sectional study was carried in Mohammed Alameen Hamid and Jaafar bin Auf Pediatrics Hospital in Khartoum state, Sudan.

3.2. Study location and time

This study was carried out in highly frequent pediatric hospitals in Khartoum state, Sudan which are Mohammed Alameen Hamid in Omdurman Alshuhadaa and Dr. Jaafar bin Auf in Khartoum on Alsaied Abdul Rahman Street. This study was conducted from March to June 2021.

3.3. Ethical approval of study

Permission for the study was obtained from the Omdurman Islamic University Ethical Committee, Ministry of health ethical clearance and permission from Mohammed Alameen Hamid and Jaafar bin Auf Pediatrics Hospital.

3.4. Ethical considerations

3.4.1. Confidentiality of the study

Respected confidentiality using a Unique Patient Identifier (UPI) code; the questionnaires were anonymous and included no personal identifiers. Consent forms were linked to the study participant using the UPI.

3.4.2. Informed consent

Participants were given verbal explanation of the study and time to ask questions. The participants were informed that there was no consequence on the care given to in the clinic or hospital whether or not they chose to participate and that they could withdraw at any time without any consequences. A written consent form was signed before enrollment into the study.

3.4.3. Risks to participants

There were no significant physical, social, emotional, financial, or legal risks to participants identified. Covid-19 precautions will be considered during patient interview: (avoid shaking hands and close contact, wearing face masks and physical distancing between the participant and the interviewer)

3.5. Study population

The study population was mothers who attended the selected pediatric hospitals during study period and were randomly recruited on the basis of the study inclusion and exclusion criteria's.

3.6. Inclusion and exclusion criteria

3.6.1. Inclusion criteria

- Sudanese mothers Who have children younger than 10 years in selected Hospitals in Khartoum state.
- Sudanese mothers Who have children suffering from acute illness in previous five month

3.7. Exclusion criteria

- Mothers from other nationalities.
- Mothers who consented but did not fully complete the questionnaire.

3.8. Sampling procedure

In this study Non-probability convenience sampling was used to recruit study subjects on working days during working hours.

3.7.1. Sample size

The Rao soft website was used to calculate the sample size based on the following parameters: 95% level of confidence, 5% margin of error and expected prevalence of 50%. The sample size (n=310) was calculated.

3.7.2. Sampling technique

This study was conducted in highly frequent pediatric hospitals in Khartoum State by selection of one hospital in Omdurman and Khartoum. The data was collected over six working days per week in each hospital two days per week.

3.9. Research instrument

The survey will conduct in March to June 2021 through distribution of questionnaire with direct interview with mothers in study area. A Structured questionnaire was developed specifically for this study. This tool consist of a set open and closed ended questions, includes: socio-demography of the mothers; family history and practice of self-medication by the family; commonly used drugs as self-medication; knowledge toward antibiotics used and specific details regarding symptoms and use of medicines in the preceding month. This questionnaire was pre tested at 10 mother of study population.

4. Results and discussions

4.1. Socio-demographic characteristics of the mothers

The sample size in this study was 310 mothers, among them 35.5% of those mothers in age group between 15 to 25 years. 31.3% them studied until primary level, 89.7.5% of those mothers are unemployed and 71.0% of those mother's residence in rural area. 68.1% of those mothers had no health insurance. 53.5% of them the monthly income is more than 5,000 SDG. 43.2% of them had more than three children. 55% of the children were males, while 45% of them were females

Table 1: Socio-Demographic Characteristics of the Mothers

	Responses	N	%
Age	15 – 25 Yrs.	110	35.5
	26 – 30 Yrs.	079	25.5
	31 – 35 Yrs.	053	17.1
	36 – 40 Yrs.	050	16.1
	More than 40 Yrs.	018	05.8
Education level	Illiterate	051	16.5
	Primary	097	31.3
	Secondary.	053	17.1
	University	050	16.1
	Postgraduate	018	05.8
Employment History	Employed	032	10.3
	Unemployed	278	89.7
Residence	Rural area	220	071
	Urban area	090	029
Health insurance	Yes	099	31.9
	No	211	68.1
Monthly income	Less than 1000	011	03.5
	1000 – 3000	048	15.5
	3000 – 5000	085	27.4
	More than 5000	166	53.5
Number of children	One	058	18.7
	Two	053	17.1
	Three	065	21.0
	More than three	134	43.2

4.2. Socio-dimorphic characteristics of the children

53.2% of the children's' age was less than one year

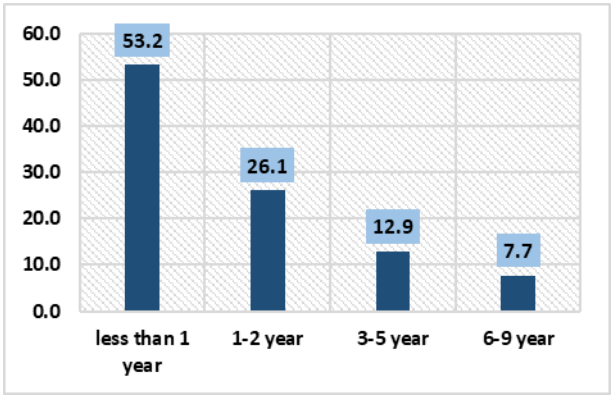

Fig. 1: Distribution of the Age of the Child.

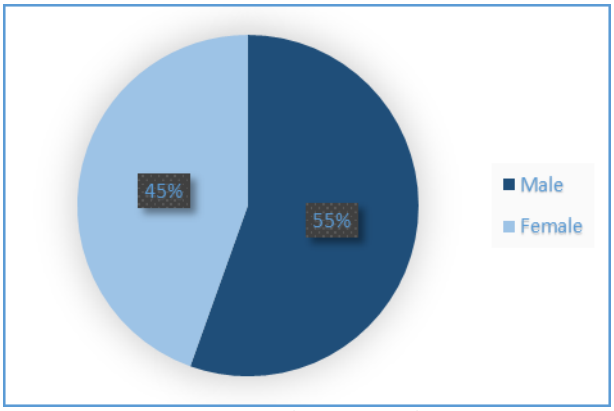

Fig. 2: Distribution of the Gender of the Child.

4.3. Medication information

33.9% of the children were self-medicated with analgesics, the route of administration for 58.4% of them was oral, 54.5% of them were using the medications until the complains disappear. 51%of the mothers reported that they were wee using the medications three timed daily.

Table 2: Medication Information

	Responses	N	%
Type of drugs	Analgesic	105	33.9
	Antibiotics	038	12.3
	Antifungal	001	003
	Others	166	53.5
Route of administration	Oral	181	58.4
	I.V	002	00.6
	I.M	003	001
	Topical	120	038
	Others	004	01.3
Duration of therapy	Until complain disappears	169	54.5
	Until drug finished	006	01.9
	Adjusted by advisors	135	43.5
Frequency of dosing	Once daily	065	21.0
	B.I.D	036	11.6
	T.D.S	158	51.0
	Q.I.D	039	12.6
	Others	012	03.9

37.4% of the participants reported that the fever is one of the Clinical indication for self-medication, where as 30.3% of they reported common cold

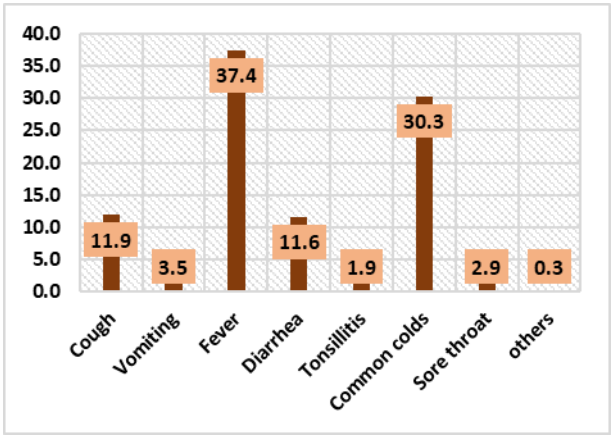

Fig. 3: Clinical Indication for Self-Medication (N=310).

46.1% of them were self-medicated with the drugs stores at home, while 37.7% of them reported that they purchase the medications from the pharmacy.

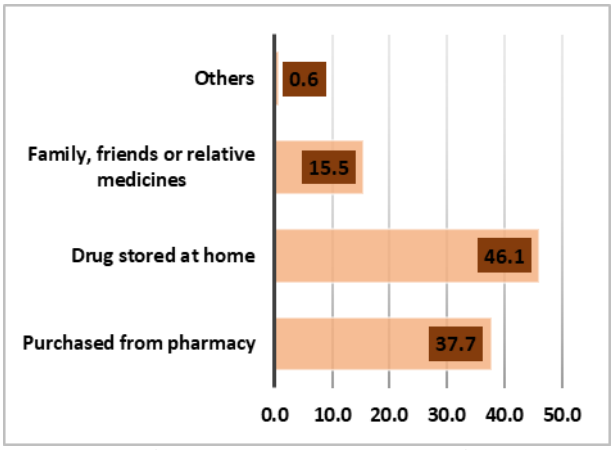

Fig. 4: Distribution of the Mothers According to Origin of Medicines (N=310).

54.8% of the mothers reported that they are self-medicated with drugs that are recommended by their families, friends or relatives

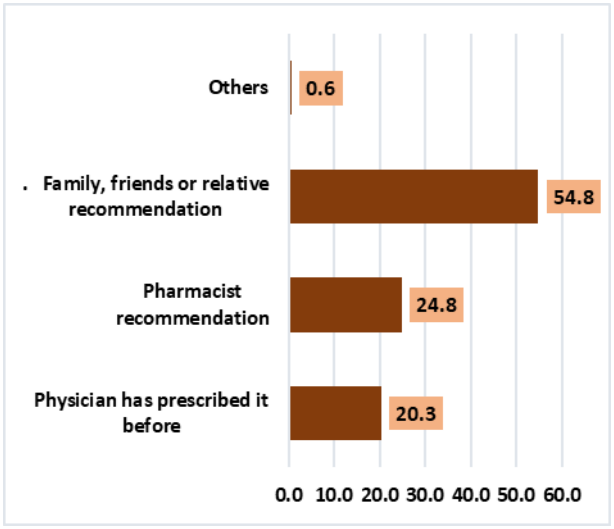

Fig. 5: Distribution of the Participant According to the Source of Recommendations (N=310).

82.3% of the mothers reported that they think that there is an improvement in the conditions when they use medication by their selves.

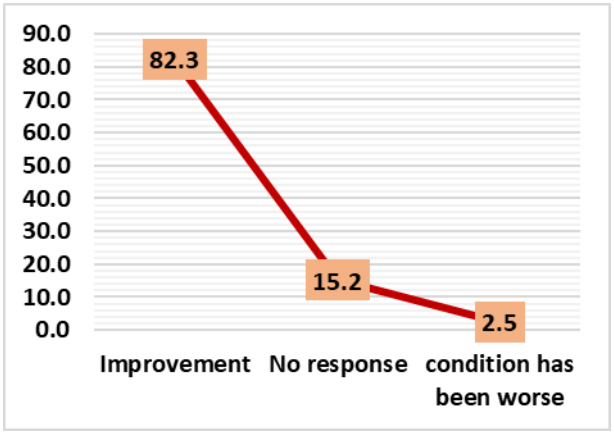

Fig. 6: Distribution of the Participant According Outcome of Self-Medications (N=310).

51.9%o of the participants reported that the reason behind the self-medication practice is that the condition is minor and there is no need for going to the doctor.

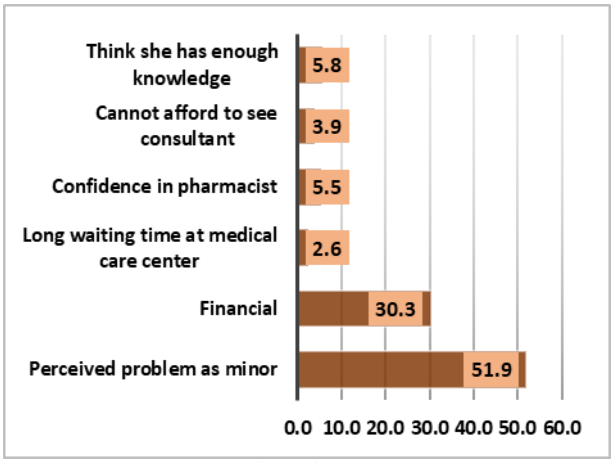

Fig. 7: Reasons for Self-Medication Practice.

17.4% of the mothers reported that pharmacists are the main source of information about antibiotics while 14.5% goes with relatives.

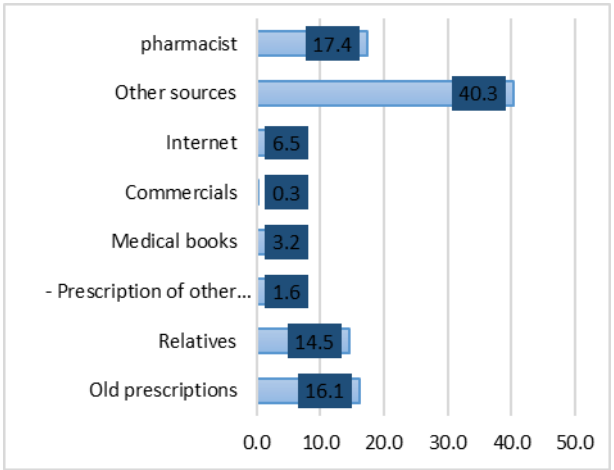

Fig. 8: Sources of Antibiotic Information of Mothers.

4.4. Knowledge towards antibiotics used by the mothers

73.9% of the mothers reported that they know the names of the antibiotics they used for their children, 95.2% know the correct dose of the antibiotics used, only 10.6% had an idea about the side effects of the antibiotics uses, 4.5% had an idea about the precautions and only 5.2% had an idea about the contra-indication.

	Responses	N	%
Do you know the name of The medicine used ?	Yes	299	73.9
	No	081	26.1
Do you know the Correct dose of the medicine used	Yes	295	95.2
	No	015	04.8
Do you have idea about the side effect of the drug	Yes	033	10.6
	No	277	89.4
Do you have idea about the precau-tion ?	Yes	014	04.5
	No	296	95.5
Do you have idea about the Contradiction ?	Yes	016	05.2
	No	293	94.8

The score of knowledge:
The average score of knowledge was 1.9 (SD 0.9) the score was ranged from 0-5

Mean	Std. dev.	Minimum	Maximu
1.89030	0.90713	0.00000	5.00000

67.7% of the participants had moderate level of knowledge, While 27.1% of them had a poor level of knowledge.

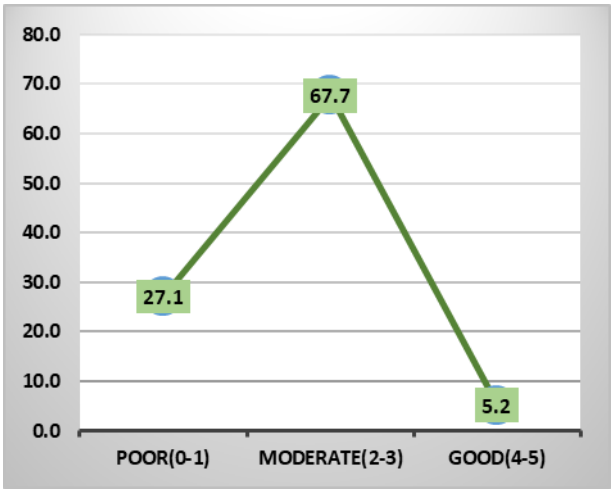

Fig. 9: Distribution of the Participants According to Their Level of Knowledge.

4.5. Tests of associations

When chi-square and fisher exact test were performed to determine the association of mother's knowledge towards medication and other factors and we found that: Knowledge was statistically significantly associated with the educational level of the mothers, residence, monthly income (p=0.000, 0.000 and 0.001) respectively while it had statistically insignificant associations with the mother's age, em-ployment status, health insurance, number of children and age of the child (p>0.05)

Knowledge		Poor	Moderate	Good	P
Age	15 – 25 Yrs.	30.9%	67.3%	1.8%	0.062
	26 – 30 Yrs.	27.2 %	65.8%	6.3%	
	31 – 35 Yrs.	9.4%	81.1%	9.4%	
	36 – 40 Yrs.	36.0%	58.0%	6.0%	
	More than 40 Yrs.	27.8%	66.7%	5.6%	
Education level	Illiterate	47.1%	52.9%	0.00%	0.000
	Primary	35.1%	63.9%	1.00%	
	Secondary	27.9%	66.2%	5.90%	
	University	08.0%	81.6%	10.3%	
	Postgraduate	00.0%	71.4%	28.6%	
Employment History	Employed	15.6%	71.9%	12.5%	0.065
	Unemployed	28.2%	67.5%	04.3%	
Residence	Rural area	20.9%	72.7%	06.4%	0.000
	Urban area	42.2%	55.6%	02.2%	
Health insurance	Yes	24.2%	70.7%	05.1%	0.730
	No	28.4%	66.4%	05.2%	
Monthly income	Less than 1000	45.5%	45.5%	09.1%	0.001
	1000 – 3000	34.8%	63.8%	01.4%	
	3000 – 5000	35.2%	62.0%	02.8%	
	More than 5000	13.9%	77.0%	09.0%	
Number of children	One	17.2%	81.0%	01.7%	0.132
	Two	26.4%	66.0%	07.5%	
	Three	32.3%	58.5%	09.2%	
	More than three	29.1%	67.2%	03.7%	
	Less than one year	26.7%	67.3%	06.1%	0.624
	1 – 2 Yrs.	24.7%	71.6%	03.7%	
	3 – 5 Yrs.	35.0%	57.5%	07.5%	
	6 – 9 Yrs.	75.0%	25.0%		

Furthermore, Knowledge was statistically significantly associated with the Type of drugs, Clinical indications of self-medications, Origin of medicines and source of recommendations (p=0.002, 0.018, 0.001, 0.037) respectively while it had statistically insignificant associations with the Outcome of using drug (p>0.05)

		Poor (0 -1)	Moderate (2 -3)	Good (4 -5)	P
Type of drug	Analgestic	12.4%	82.9	04.8%	0.002
	Antibiotics	36.8 %	57.9%	05.3%	
	Antifungal	100.0%	00.0%	00.0%	
	Others	33.7%	60.8%	05.4%	
Clinical indication of self -medication	Cough	35.1%	62.2%	02.7%	0.018
	Vomiting	18.2%	72.7%	09.1%	
	Fever	17.2%	78.4%	04.3%	
	Diarrhoea	25.0%	66.7%	08.3%	
	Tonsillitis	16.7%	50.0%	33.3%	
	Common colds	37.2%	58.5%	04.3%	
	Sore throat	33.3%	66.7%	00.0%	
	Others	100.0%	00.0%	00.0%	
Origin of medicine	Purchased from pharmacy	17.9%	67.1%	06.0%	0.001
	Drug stored at Home	25.2%	69.2%	05.6%	
	Famiy, friends or relative medicines	54.2%	43.8%	02.1%	
	Others	50.0%	50.0%	00.0%	

Source of recommendation	Physician prEscribed before	17.5%	74.6%	07.9%	
	Pharmacist	19.5%	75.3%	05.2%	0.037
	Family friends Or relatives	34.1%	61.8%	04.1%	
Outcome of drug Usage	Improvement	25.5%	68.6%	05.6%	
	No response	38.3%	59.6%	02.1%	0.143

The reason for the self-medication had statistically significant association with age, educational level, employment history and monthly income (p= 0.000, 0.048, 0.000 and0.001) respectively

5. Conclusions

Dependent (outcome) variable were factors influence of mothers self-medication and common drugs used in self-medication in addition to, their knowledge regarding antibiotic use among children. Independent variables were age, sex, level of education, socioeconomic status, number of children under 10 years of age; health insurance, determinant/predictors of mothers self-medication, relationship with the child, marital status. Potential confounders were site of interview and mode of completing questionnaire (verbal or written).

Recommendations

Antibiotic resistance is considered a global threat due to reasons such as increased morbidity and mortality rates due to uncontrolled infectious diseases as the standard treatments become ineffective. So self-medication is considered of high risk, hence proper clinical diagnoses followed by physician instructions are of great significance. Further studies are strongly recommended.

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